

*17th*

# **ANNUAL REPORT**

**SKUAST-J**

**2016-17**



**Sher-E –Kashmir University of  
Agricultural Sciences & Technology of Jammu**

(Jammu & Kashmir)

*“An institution for sustainable agriculture for food and nutritional security”*

***Credit Line***

***Correct Citation***

: Annual Report 2016-17  
Sher-e-Kashmir University of  
Agricultural Sciences and Technology of Jammu,  
Main Campus Chatha, Jammu - 180 009, India

***Contributors***

: Officers of the University HOD's/ Incharge Research  
Stations/Centres / KVKs

***Compiled, Edited and Executed by***

: Dr. Deepak Kher  
Director Planning & Monitoring

***Type Setting***

: Sh. Neeraj Gupta  
Sr. Stenographer, DPM

***Cover Photograph***

: Faculty of Agriculture, Chatha

***Published by***

: Dr. Pradeep K. Sharma,  
Vice Chancellor, SKUAST-Jammu  
Email: vc@skuast.org  
Fax: 0191-2262073



## PREFACE

It gives me immense pleasure to present the 17th Annual Report of Sher-e-Kashmir University of Agricultural Sciences & Technology of Jammu (SKUAST-J) reflecting salient achievements of the University during the year 2016-17. The University is mandated to address the basic, strategic and applied issues related to Agriculture Production and Livestock Wealth in addition to the human resources development and collaborative linkages with government, national and international organizations. The University has achieved many milestones in teaching, research and extension, and has remained front-runner for the cause of Agriculture and allied sectors, development of skilled human resource and improvement in the socio-economic status of the farming community have remained the prime focus of SKUAST-J.

The SKUAST-J offers undergraduate programmes viz., B.Sc.(Hons) Agriculture, B.Sc (Hons) Biotechnology and B.V.Sc & A.H, and programmes at Master and Doctorate level in 37 and 21 disciplines, respectively, in two academic campuses. The admission to Undergraduate and Master Programmes were made through Common Entrance Test (CET) conducted by the University and during the year under report, 208 students were admitted to various UG programmes and 145 to PG programmes. Besides, curricular and extracurricular activities including sports and cultural activities are being encouraged.

Research is a significant activity of the University. Directorate of Research is engaged in both applied and strategic research. Twelve new varieties in different crops viz. Rice, Wheat, Oilseeds, Vegetables and Fruits, were released by State Seed Sub-Committee. To further augment the seed replacement rate and to enhance productivity in the State, the University produced 60.4 quintals of breeder seed, 1200 quintals of foundation seed and 1305 quintals of certified seeds of oilseeds, pulses and cereals during the year under report. Research activities on many location specific problems are being intensified with the funds received from Indian Council of Agricultural research (ICAR), the State Government and other funding agencies. The total seven numbers of project were completed during 2016-17. 25 new projects with total amount of Rs. 8.32 crores were initiated during 2016-17. There is currently 115 number of projects is running in the University with an total outlay of Rs. 44.50 crores.

SKUAST-J has a strong and effective network of extension services with Directorate of Extension and seven Krishi Vigyan Kendras (KVKs) including the newly established KVK at Samba in Jammu Division disseminating latest technology, awareness and relevant skills to the farmers and extension functionaries. These units perform important tasks of assessment and refinement of technologies, organizing training programmes for farmers, extension personnel and NGOs, undertaking diagnostic field visits, veterinary clinical camps, conducting method demonstrations, group discussions and organizing field days and kisan melas. The information is shared among different stake holders through popular articles, information bulletins, press notes, radio and TV programmes.

The University has been able to make strides mainly because of patronage and guidance received from the Chancellor of SKUAST-J, The Governor of Jammu & Kashmir, Padam Vibhushan Sh.N.N.Vohra, Pro-Chancellor Ms. Mehbooba Mufti, The Hon'ble Chief Minister of Jammu & Kashmir State and Dr. Trilochan Mohapatra, Secretary, DARE & DG, ICAR during the year under report as well as for their whole hearted financial and technical support to the University. Special thanks are due to Sh. Parmod Jain, Financial Commissioner, Agriculture Production Department, Sh. B.B.Vyas, Financial Commissioner, Planning & Development Department, and Sh. Navin Kumar Choudhary, Principal Secretary, Finance Department J&K Govt. for their cooperation and personal efforts for the betterment of the University. My thanks are due to the Statutory Officers and staff members of the University for their Cooperation in sincere efforts made for the progress of SKUAST-J.

I hope this publication will be useful to teachers, scientists, students, administrators and planners. We always look forward to their valuable support and suggestions in accomplishing our mission.

Jammu



**(Pradeep K. Sharma)**  
Vice Chancellor

# CONTENTS

S. No.	Title	Page No.
<b>SKUAST-J: AN INTRODUCTION</b>		<b>vii</b>
<b>1.</b>	<b>Executive Summary</b>	<b>1</b>
<b>2.</b>	<b>Education</b>	<b>5</b>
	2.1 Academic Programmes Run by the University	5
	2.2 Details of P.G. Programme	5
	2.3 Faculty Spectrum	6
	2.4 Student Strengths	6
	2.5 Under Graduate Programme	6
	2.6 Post Graduate Programme	6
	2.7 Faculty Wise Admission	7
	2.8 Number of Students Who Completed Degree Programmes	8
	2.9. Thesis Accepted	8
	2.10 Students Welfare	14
	2.11 Students' Placement and Counseling Cell	15
	2.12 Hostels and Hostel Facilities	16
	2.13 Health Care Facilities	16
	2.14 Scholarship	16
	2.15 RAWE Programme	16
	2.16 Internship Programme	17
	2.17 Library	17
<b>3.</b>	<b>Research</b>	<b>20</b>
	3.1 Faculty of Agriculture	20
	3.2 Faculty of Basic Sciences	45
	3.3 Faculty of Veterinary Sciences & Animal Husbandry	45
	3.4 Research Stations/Centres	61

<b>S. No.</b>	<b>Title</b>	<b>Page No.</b>
<b>4.</b>	<b>Extension Education</b>	<b>76</b>
<b>5.</b>	<b>Infrastructure Development</b>	<b>97</b>
	5.1 Works Completed During 2016-17	97
	5.2 Works in Progress During 2016-17	100
	5.3 New Works Proposed During 2017-18	101
<b>6</b>	<b>Awards and Recognitions</b>	<b>102</b>
<b>7</b>	<b>Organization of National /International Seminars/Symposia/Conference/Short Courses/ Trainings/Workshops/Summer and Winter Schools</b>	<b>105</b>
<b>8</b>	<b>Participation of Scientists In National/International Seminars/Symposia/Conferences/Short Courses/Training/Workshops/Summer and Winter Schools held at Organizations other than SKUAST-J</b>	<b>110</b>
<b>9</b>	<b>Externally Funded Adhoc Research Projects</b>	<b>119</b>
<b>10</b>	<b>Research Publications in National / International Journals</b>	<b>124</b>
<b>11</b>	<b>Linkages and Collaboration</b>	<b>139</b>
<b>12</b>	<b>Statutory Meetings</b>	<b>140</b>
<b>13</b>	<b>Visits of Important Dignitaries</b>	<b>141</b>
<b>14</b>	<b>Resources and Financial Estimates</b>	<b>142</b>
<b>15</b>	<b>Staff Position</b>	<b>143</b>
<b>16</b>	<b>Appointments/Promotions and Superannuation</b>	<b>144</b>
<b>17</b>	<b>Personnel</b>	<b>145</b>

# An Introduction

---

Sher-e-Kashmir University of Agricultural Sciences and Technology of Jammu (SKUAST-Jammu) was established in 1999 to meet the aspirations and needs of farmers of Jammu division for the region specific advances in agricultural education, research and extension. The mandate of the University is to address the basic, strategic and applied research to enhance the production and productivity in agriculture and its allied sectors, improve livestock health and develop value added quality based products. SKUAST-Jammu is striving hard to achieve high standards of excellence in education, research and extension for bettering the lot of farming community of the region.

SKUAST-Jammu comprises of Faculty of Agriculture and Faculty of Basic Sciences at Chatha and Faculty of Veterinary Sciences and Animal Husbandry at R. S. Pura. Apart from these faculties, there are eight research stations and seven KVKs spread throughout the Jammu division, carrying out research and serving extension needs of the region, respectively. The administrative unit of the University is also located at Chatha. The University has grown at rapid pace in terms of infrastructure and human resource, right from its inception. The campus at Chatha comprises of Administrative block, Faculty buildings, School of Biotechnology, Examination halls, Seed processing unit, Seed stores and Farm machinery centre, Sports complex, Students' center and Health Centre, besides, research and instructional farms. Additional buildings for Faculty of Basic Sciences, Controller of Examinations and Seed Research Center have also come up recently. The campus also has residential facilities for teaching and non-teaching staff, hostel for girl students and farmers. Campuses of the University are connected through LAN and WAN set up. An International Guest House and ultra-modern Auditorium are under construction and will be ready very shortly.

The University has modern library system, with on-line facilities, providing accessibility to about 34,500 text and reference books, around 3925 e-journals and 1200 e-books in the field of Agriculture and allied

sciences. The Internet services are being provided to the scholars, students and the faculty through National Knowledge Network.

The Faculty of Veterinary Sciences and Animal Husbandry located at R.S. Pura, has a full-fledged academic block, a classroom cum examination complex fitted with audio visual aid, CCTVs and modern facility for conducting online examination of ARS/NET. The campus has also a separate library catering to the needs of the students pursuing various degree programmes in the field of Veterinary and Animal Sciences. The Veterinary Referral Hospital and Teaching Complex of the faculty has ultra-modern gadgetry for diagnosis and treatment of animals belonging to the farmers of the region, private owners, State and Central Forces. The teaching veterinary clinical complex is also routinely organizing clinical camps besides rendering treatment to referred cases in outpatient department (OPD). Additional infrastructure in the shape of new double storey building has been constructed to accommodate the divisions of Animal Breeding and Genetics (AGB) and Veterinary & Animal Husbandry Extension Education (VAHEE). Instructional cattle and poultry farms have been commissioned and strengthened with induction of additional high yielding cattle and poultry. New infrastructure in the form of post-mortem complex has also been developed. Faculty administration has adopted the concept of paper less administration, wherein all communications/correspondences are made electronically.

Under -graduate programmes in Agriculture, Biotechnology, Veterinary and Animal Husbandry are offered by the University. Post graduate programmes are also offered in various sub-disciplines of Agriculture, Veterinary and Basic Sciences, as well as in Agri-Business Management. The University has adopted a semester based academic programme and conducts its own entrance examination for admissions to under-graduate and post-graduate programmes. External examination system has been adopted by the University for Under-graduate Courses



in accordance to the guidelines of Indian Council of Agricultural Research (ICAR) for Agricultural Sciences and Veterinary Council of India (VCI) for Veterinary Sciences.

Several activities were taken up by the "Student Counseling and Placement Cell" during the last one year. Some agriculture graduates were selected by IFFCO, Akhil India Private Limited, National Bulk & Handling Corporation Ltd & Chambal Fertilizers & Chemical Ltd. through the initiatives of the placement cell. The cell also facilitated the placement of MBA (ABM) students in corporate sector namely Punjab National Bank, Tirumala Milk Products Pvt. Ltd., Mahindra Pvt. Ltd., etc. for summer internship. The "Student Counseling and Placement Cell" has also taken different initiatives for soft skill development of the students. In this behalf, a series of expert lectures for the students were organized from the experts in different fields.

Research activities form one of the broad mandates of the University and numerous adhoc projects, central and state schemes are being undertaken in various disciplines of agriculture, veterinary and basic sciences. There are more than 121 adhoc/network projects funded by different agencies like DBT, DST, IMD, NHB, ICMR, RKVY, etc. amounting to more than Rs. 46.17 crores running at different constituent units of the University. Among the eight research stations, two have been upgraded to Advanced Centers of Research namely "Advanced Center for Horticulture Research" (ACHR) at Udheywalla and "Advanced Center for Rainfed Agriculture" (ACRA) at Dhiansar. The University has initiated a project on development of pecan nut in Rajouri and Poonch region with the help of Ratan Tata Memorial Trust. An active research group on Basmati has been working to address the issues like enhancing its aroma and other quality parameters. In view of the concerns on quality and safety of food items for consumers the University has taken an initiative to set up an organic farm that would serve as a technology development and demonstration unit.

Achieving higher levels of productivity through scientific interventions is the major goal of the University. The University is pursuing a systematic and planned plant breeding programme and has

developed and released various crop varieties with improved agronomical traits including resistance to diseases and insect pests and such varieties of rice, wheat, oilseeds and pulses have been released. Yellow grain hybrid PHM-12, UDMH-101 and UDMH 108 have shown promising increase in maize yield over check variety. Efforts have been made to improve the production of world famous basmati rice through the development of new varieties like Basmati 564 (RR 564), which matures 15 days earlier to Basmati, without compromising on the quality. Other important varieties notified by the University in the recent past include wheat variety RSP 561 moderately resistant to all the three rusts; maize variety PHM 12 suitable for cultivation in mid hills of Jammu and rapeseed variety RSPN 25 with an oil content of 40%. These varieties stand notified by central sub-committee on crop standards, notification of varieties for agriculture crops. Apart from developing new varieties, the University is playing an active role in screening and selection of existing cultivars of fruit crops, flowers and agro-forestry-based plant species with a view to reduce disease and pest incidence and enhance the quantity and quality of the product. A number of vegetable varieties, like Cherry tomato (SJCT-01), white radish (SJWR-01), red radish (SJRR-01) and garlic (SJG-12-02) etc. are being bred and are nominated for evaluation under AICRP (VC).

Intellectual property rights (IPR) cell under Directorate of Research has been constituted involving core scientists that will frame policy, regulation and guidelines for the state. University has taken many steps for enhancing production of quality nucleus and breeder seed to meet the requirements indented by the State Department of Agriculture. The University is contributing significantly towards the seed replacement in the State by producing quality certified seed of cereal crops, pulses and oilseeds, through a modern seed processing and packaging facility created with financial assistance from the ICAR. The University is also engaged in providing quality planting material with respect to horticultural crops. Hi-tech poly houses, mist chamber and hardening units have been pressed into service for generating quality planting material of vegetables, ornamentals, fruits and medicinal plants.



With majority of the farmers being marginal and having small holdings in the region, emphasis on diversification in farming is being laid down for assured returns. In this regard, one hectare Integrated Farming System (IFS) model has been developed under the Farming Systems Research programme. The developed IFS model comprises of multiple components Crop, Horticulture (fruit, vegetable, flower), Animal, Fish cum Poultry, Vermi compost / Recycling of Farm Waste, Mushroom, Apiary, Bio-gas with Boundary Plantation. The model has been designed for a farmer family comprising of five members and generates round the year total employment of 730 days/year with main salient achievement of generate income on monthly basis. The model generates 220 kg N, 75 kg P O and 45 kg 2 5 K O/year through recycling / vermi 2 composting and generate profit of Rs. 3.06 lacs per year. The bio-gas unit of 2 cubic meter capacity generates bio-gas equivalent to 17 LPG gas cylinder of 14.5 kg capacity. This sustainable and economically sound model is developed in such a way that the waste output of one enterprise is used as an input in another unit, fetching up to three times the returns over a traditional agricultural system. It is commonly observed that some of the resources are over utilized and some under-utilized which provides a scope for the rational allocation of resources for enhancing returns for every rupee spent. Production function analysis and Marginal Value Productivity techniques are used to examine input-output relationship and productivity of different inputs used in production process. Studies have revealed that with one per cent increase on expenditure of labour and fertilization, there is an increase in returns to the extent of 0.45 per cent and 0.67 per cent, respectively in case of fruit crops.

The plains of Jammu have a wide network of canals. With the incidence of high water table, some of the low lying irrigated areas have become susceptible to water logging. It has been estimated that out of the total 75,000 ha of Ravi-Tawi canal area, nearly 25,000 ha remains waterlogged, particularly during monsoons. The University has successfully evaluated a raised bed-sunken bed technology model to make better use of these waterlogged areas. The raised beds can be used for agricultural activity like growing vegetables, flowers, whereas the sunken

beds act as ponds where fisheries can be taken up. Bench marking of Ranbir canal command area of Jammu region has been carried out for performance indicators of rice and wheat crop. Efficient irrigation schedules have been worked for enhancing water productivity in various cropping systems, especially that of the commonly followed rice-wheat rotation. WUE in rice-wheat sequence is up-scaled to 11.6 kg/ha-mm through laser levelling as compared to 8.3 kg/ha-mm in traditional leveled plots of farmer fields. Micro-irrigation systems, like drip irrigation and sprinkler systems, are being promoted in areas where there is water scarcity and uneven terrain conditions. A unique technique called trench cultivation for utilizing sub-surface water on the banks of river Chenab and Tawi for production of off-season vegetables have been developed and is being promoted.

Research in veterinary sciences is being pursued on identified flagship areas like nutritional enhancement of livestock feed, bio-prospecting of medicinal plants for different therapeutic activities, diseases monitoring and surveillance, disease diagnosis, value addition of animal products and skill development. Locally available feed resources in various district of the region have been identified and are currently supplemented with Urea Molasses Multinutrient Block (UMMB) to address the macro and micro-nutrient imbalance in cattle, buffaloes, sheep and goat. The University is a nodal centre for veterinary pathogens under Veterinary Type Culture Collection (VTCC) and outreach programme of zoonotic diseases of ICAR, New Delhi. Research on exploration of respiratory metagenome of small ruminants which includes mining of unique genes and establishment of diagnostic facilities for important infectious diseases is under progress. The research focus is also on pharmacological validation of local medicinal plants for different therapeutic effects and also on genetic characterization of Indigenous Bakharwali goat and Poonchi sheep for conservation and propagation of local germplasm. District wise pattern of various important diseases of livestock and their preventive schedule is being evolved. Skill development and training in veterinary critical care is being imparted through experiential learning modules. University has also excelled in various assigned extramural social projects for empowerment of rural women



like backyard poultry farming, development of value added animal products, adaptation of breeding and management strategies in dairy animals, creation and capacity building of Women Self Help Group members of UMEED as Community Parvets (Pashusakhi).

The University understands that the climate change is real and a potential threat to sustainability of agricultural systems. A number of initiatives in this regard have been carried out through awareness programmes and crop-weather relation studies under NICRA (National Initiative on Climate Resilient Agriculture) and other schemes. The Agromet Field Unit (AMFU) Jammu at present is issuing regularly Agromet advisory bulletins for the farmers of sub-tropical areas of Jammu region in order to apprise them about the various crop related field activities to be undertaken in accordance with the weather forecast. Soils are being understood to have a major role in mitigation of climate change threat through carbon sequestration. Studies on soil carbon levels under different land use/land covers and identifying agricultural practices that sequester carbon in the soils while simultaneously enhancing their health are being undertaken. The year 2015 being declared as the "International year of the Soils", awareness lectures were delivered among the school students to highlight the importance of soil health in not only sustaining agricultural productivity but also in combating climate change. Computer based approaches like remote sensing, Geographical Information System (GIS), modelling etc. are being extensively used in different fields. The University is in the process of digital mapping of soil properties for the entire Jammu division. Pre-season yield estimation through remote sensing has gained importance in recent times due to its advantages over traditional systems. The University is presently handling the FASAL project for pre-season estimation of maize and wheat yields.

The University is also involved in extension activities for the benefit of the farming community. The Directorate of Extension popularly known as the "Field Extension Wing" through its Krishi Vigyan Kendras (KVKs) in different districts of the Jammu division as well as Faculties at Chatha and RS Pura is taking care of farm advisory services in several villages. Regular trainings, field visits, clinical camps, *Kisan ghostis*, demonstrations, etc., are being conducted

to raise awareness among the farmers regarding improved practices in agriculture, horticulture, animal husbandry and other allied sectors laying main emphasis on diversified sustainability and integrated farming system. Directorate of Extension through its KVKs is also engaged in imparting skill oriented and need based trainings to rural youth for entrepreneurship development. The skill up-gradation of the field functionaries of agriculture and allied departments is carried out by regular in service trainings being conducted by KVKs at district level and Directorate of Extension and State Agriculture Management & Training Institute (SAMETI) at the divisional level.

The KVKs are also engaged in the assessment and refinement of generated technologies through On Farm Testing (OFTs) for location specificity of the technologies. The proven technologies are being demonstrated to the farmers through frontline demonstrations (FLDs) in a participatory mode with the farmers. The scientists posted in these KVKs are in direct contact with the farmers of their jurisdiction and render necessary advices about crop and livestock production and protection; soil and water management; family and farm resource management etc., at their doorsteps. The University extension wing has been well oriented to face new challenges on day to day basis in view of weather/climate changes so that the farmers and field functionaries are given advisories and strategic plans as per situations prevalent. The University is also offering diploma courses viz. Basic Agriculture Training (BAT) and Basic Horticultural Training (BHT) at the district level at its KVKs. The organization of Kissan Melacum- Exhibitions at the head quarter of the University as well as at its KVKs is a regular feature. A mega divisional level two-day Kisan Mela in collaboration with all the allied departments and J&K State Advisory Board for Development of Kissan at main campus, Chatha, was organized on 17<sup>th</sup> & 18<sup>th</sup> of March 2017, which was inaugurated by the Hon'ble Governor of Jammu and Kashmir and Chancellor of SKUAST-Jammu. The district level Kisan Mela were also organized by 6 KVKs located in various districts during the Kharif as well as Rabi seasons 2016-17. Technical information is disseminated to the farmers, field functionaries and agri-entrepreneurs through printed pamphlets,



bulletins, etc. Updated package of practices for field crops, fruit crops, vegetables and floriculture are made available to all stake holders. All necessary efforts are made with the goal of agricultural technology led economic development of farmers and enhance production and productivity of various crops as well as animal production in the region working hand in glove with the state line departments. The feedback from farmers and field functionaries are collected for refinement of available technologies for making them area specific and need based. The University also provides consultancy services to various line departments, Indian Army and Non-Government Organizations (NGOs).

The University maintains an atmosphere of sharing and interaction among the scientific community at both national and international level. In this regard, a number of scientists of the University have been deputed to various countries for higher training to enhance their research skills. Scientists are also encouraged and deputed to participate in national and international conferences, symposiums, workshop, trainings and short courses. The University has also organized such events from time to time, where delegates from national and international institutes are invited.

## OUR MISSION

- Ensuring food and household security of Jammu and Kashmir by enhancing the productivity and profitability on an ecologically and economically sustainable basis.

## MANDATE

- Advancement of education in agriculture, Animal Husbandry, Veterinary Sciences and other allied branches.
- Conduct basic, strategic and applied research in agriculture and allied sectors.
- Dissimination of knowledge and technology to the farming community.
- Collaborate with National and International Organizations for enhancing the knowledge, expertise and excellence for the well being of the people of Jammu and Kashmir in particular and country in general.

## UNIVERSITY AUTHORITIES

### University Council

The University Council is the apex advisory body of the University. It reviews policies and programmes of the University and advises in its future plans, development & expansion as well as examines the annual accounts and audit report of the University.

### Board of Management

The Board of Management is the principal executive body of the University. It has the power of management and administration of all the affairs of the University, including finance, revenue, property and academic affairs.

### Academic Council

The Academic Council is the principal academic body responsible for academic policies, rules and regulations of the University. All matters relating to academic programmes are regulated by the Academic Council.

### Research Council

The Research Council is responsible in respect of research programmes and projects undertaken by various university units with a view to promote effective coordination in the field of Agriculture, Veterinary & Animal Husbandry and other allied sciences.

### Extension Council

The Extension Council is responsible in respect of coordinating Extension Education activities for improvement of Agriculture and Animal Husbandry for development of rural communities. Development of farmers' education and training and advisory services, identification and resolution of field problems in transmission of information and integration of extension education with teaching and research are other responsibilities of Extension Education Council.

### Planning Committee

The Planning Committee advises the Board of Management in matters relating to Planning and Development of the University. It is also responsible for programme planning, monitoring and implementation of major projects of the University.



### Finance Committee

The Finance Committee advises the Board of Management on all matters concerning financial management of the University and examines the accounts and expenditure of the University.

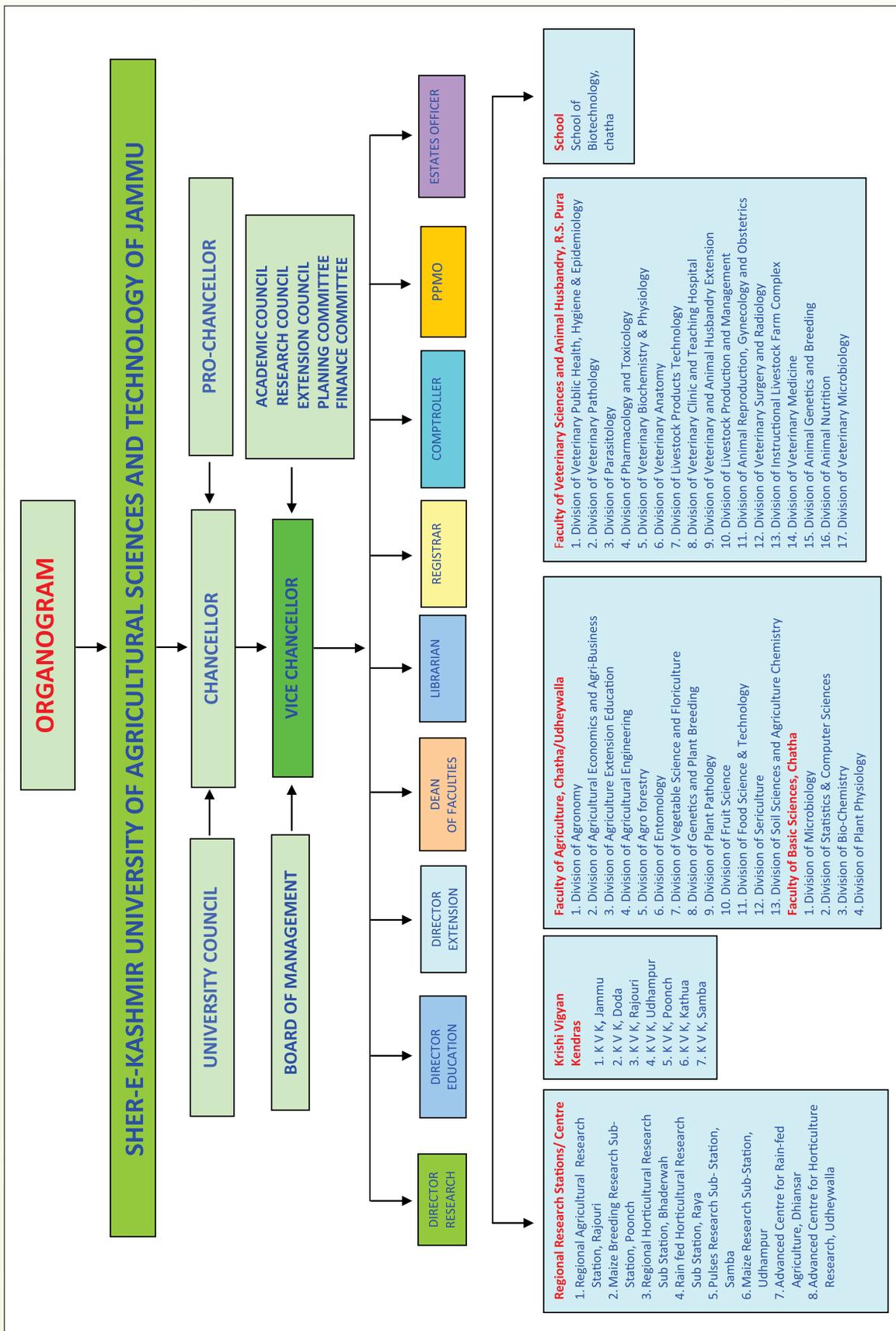
### FACULTIES AND SCHOOL

The Faculties comprise the Divisions of studies in various disciplines of Agriculture, Veterinary & Animal Husbandry and allied sciences. The faculties are basic academic units responsible for the formulation of academic programmes. The faculties review teaching work and suggest improvements. Each faculty has a Board of Studies. The Board of Studies proposes to the faculty concerned the course of study and curricula for various programmes of instructions offered by the faculty concerned. The University has the following faculties:

- i) Faculty of Agriculture
- ii) Faculty of Veterinary Sciences & Animal Husbandry
- iii) Faculty of Basic Sciences and School of Biotechnology

### UNIVERSITY ADMINISTRATION

The Vice-Chancellor is the Chief Executive of the University. He is supported by the Registrar in the administration, Comptroller in financial management, Project Planning & Monitoring Officer in planning and development of the University, Deans with respect to academic activities and Directors for management of research and extension activities in the field of Agriculture and Veterinary Sciences, besides, Librarian assists in library affairs, Students Welfare Officer in student activities and Estate Officer looks after civil works.





<b>UNIVERSITY COUNCIL (As on 31.03.2017)</b>	
Sh. N.N. Vohra, Hon'ble Governor, J&K State (Hon'ble Chancellor, SKUAST-Jammu)	Chairman
Ms. Mehbooba Mufti, Hon'ble Chief Minister, J&K (Pro-Chancellor, SKUAST-Jammu)	Member
Sh. Ghulam Nabi Lone Hon'ble Minister for Agriculture Production, J&K	Member
Sh. Choudhary Lal Singh Hon'ble Minister for Forest, Ecology and Environment, J&K	Member
Sh. Abdul Gani Kohli Hon'ble Minister for Animal, Sheep Husbandry & Fisheries, J&K	Member
Dr. Pradeep K. Sharma Vice Chancellor, SKUAST-Jammu	Member
Dr. Nazeer Ahmed Vice Chancellor, SKUAST-Kashmir	Member
Dr. Baldev Singh Dhillon Vice-Chancellor, Punjab Agriculture University, Ludhiana	Member
Prof. (Col.) A.K. Gehlot Vice-Chancellor, Rajasthan University of Veterinary & Animal Sciences, Bikaner	Member
Sh. Parmod Jain, IAS Financial Commissioner, Agriculture Production Department, Govt. of J&K	Member
Sh. B.B. Vyas, IAS, Financial Commissioner, Planning and Development Department, Govt. of J&K	Member (Co- opted)
Sh. Navin Kumar Choudhary, IAS, Commissioner/ Secretary to Govt. (Financial Advisor-SKUAST- Jammu), J&K Govt., Jammu	Member
Dr. Dileep Kachroo Registrar, SKUAST-Jammu	Non- Member Secretary



<b>BOARD OF MANAGEMENT (As on 31.03.2017)</b>	
Dr. Pradeep K. Sharma Vice Chancellor, SKUAST-J	Chairman
Dr. Nazeer Ahmed, Vice-Chancellor, SKUAST-K	Member
Dr. Anil Kumar Singh Vice-Chancellor, Rajmata Vijayaraje Sciendia Krishi Vishwa Vidyalaya Gwalior, MP	Member
Dr. Amarjit Singh Nanda Vice-Chancellor, Guru Angad Dev Veterinary & Animal Sciences University (GADVASU), Ludhiana	Member
Sh. Parmod Kumar Jain, IAS Financial Commissioner, Agriculture Production Department	Member
Sh. B.B. Vyas, IAS, Financial Commissioner, Planning and Development Department, Govt. of J&K	Member
Sh.. Navin Kumar Choudhary, IAS Commissioner/ Secreatry to Govt., Finance Department, Govt. of J&K,	Member
Dr. Arjava Sharma Director, National Bureau of Animal Genetic Resources, Karnal, Haryana	Member
Dr. K.S. Risam Director Extension	Member
Dr. J.P. Sharma Director Research	Member
Dr. T.A.S. Ganai Director Education	Member
Krishi Pandit Bakshi Ganesh Dass Progressive farmer	Member
Sh. Choudhary Harnam Dass, Agro Industrialisit M/s Asha Rice Mills, R.S. Pura	Member
Dr. Dileep Kachroo Registrar, SKUAST-J	Non- Member Secretary

**OFFICERS OF THE UNIVERSITY (As on 31.03.2017)**

Dr. Pradeep K. Sharma	Vice Chancellor
Dr. K. S. Risam	Director Extension
Dr. J.P. Sharma	Director Research
Dr. T.A.S.Ganai	Director Education
Dr. Deepak Kher	Project Planning & Monitoring Officer
Dr. Dileep Kachroo	Registrar
Sh. S.K. Koul	Comptroller
Dr. M.M.S. Zama	Dean, Faculty of Veterinary Sciences & AH
Dr. D.P. Abrol	Dean, Faculty of Agriculture
Dr. S.A. Mallick	Dean, Faculty of Basic Sciences
Dr. V. K. Razdan	Librarian
Sh. T.R. Bhagat	Estates Officer

# Executive Summary

1

With the generous and constant patronage of Chancellor and Pro-Chancellor; Central & State Governments, Indian Council of Agricultural Research, the University during 2016-17 under the stewardship of Hon'ble Vice-Chancellor continued its strive to achieve the goals for the development of competent and professional human resource, addressing farmers' problems through innovative research and transfer of technology in the fields of Agriculture, Veterinary and Basic Sciences. In spite of the various constraints the university successfully completed the academic programmes including B. Sc. (Ag), B.V.Sc. & A.H., M. Sc. (Ag), M.V.Sc., Ph.D (Ag.) and PhD (Vety), carried out assigned research agenda as approved by the Research Council and undertook numerous initiatives for the transfer of technology to the farmers. The brief summary is given as under:

## Education

- The University has total sanctioned strength of 345 faculty position. The academic and the gender wise spectrum of the faculty reveal that more than 90 per cent of the faculty holds Doctoral degrees and the female strength in the faculty is about 20 per cent.
- The admissions to the bachelor's degree programmes were made by University through SKUAST-J Common Entrance Test whereas for Master's and Doctoral degree programme, the University itself selected the candidates on the basis of merit. As many as 181 and 145 students were admitted to UG and PG programmes, respectively. The number of students who completed their B.Sc (Ag), B.Sc (Biotech), B.V.Sc & AH, M.Sc (Ag), M.V.Sc., M.Sc (Biotech), Ph.D. (Ag) and Ph.D (Vety) degrees were 219. The total number of students on roll remained 1205, comprising of 553 in Agriculture, 28 in Basic Sciences, 479 in Veterinary Sciences & 145 in Biotechnology
- The students of the university continued to participate in local/state/national level events.

The university extended all facilities to the students including medical health care through a university dispensary equipped with full time medical officers (male & female) and supporting staff with liberal contingency for medicines.

- The University has modular libraries at Chatha and R.S. Pura facilitating reference services to our faculty and students. The library has 34348 text and reference books. It annually subscribes 11 Indian journals. The University has access to about more than 44000 e-journals through CeRa consortium, CAB abstracts access to over 9 million bibliographic and full text articles related to agriculture and other sciences, CABI
- e-books access to about 625 CABI e-books related to agriculture and allied disciplines and EBESCO Business Source Elite+ access to 1800+ e journals related to management sciences and other related disciplines available in computer labs of libraries and all the campuses of SKUAST-J through NKN. LAN and CD-ROM workstation on CABCD, VETCED and FST, Internet services are also provided to the scholars and faculty. Solar power plant facility with 30KwA and 20KwA are available for the libraries at Chatha and R.S.Pura, respectively.

## Research

- Six varieties in field crops viz. Basmati Rice (SJR-129 for Irrigated Jammu Basmati growing areas); Wheat (JAUW-584 Timely sown irrigated areas and JAUW-598 for Rainfed areas); Rapeseed and Mustard viz. RSPT-6 (Toria) and RSPR-69 (Raya) for Jammu plains and Maize (JMC-3) for Mid Hills and Five varieties in Vegetable crops viz. Coriander (Jammu Coriander-07 Khushboo); Fenugreek (Jammu Fenugreek-07 Kasuri Supreme); Spinach Beet (Jammu Spinach); Beet-07 (C-13); Broccoli (Jammu Broccoli-08 Early Green); Okra (Jammu Okra-05 Seli Special)] and one variety of mango during 23<sup>rd</sup> State Seed Sub-Committee meeting held at SKUAST-K on 23<sup>rd</sup> March, 2017



- The mulberry variety S1635 is recommended for commercial propagation at field level.
- Mulberry variety S30 recommended as rust (*Ceroteliumfici*) resistant cultivar.
- Application of 4 percent Zn through ZnSO<sub>4</sub>.7H<sub>2</sub>O coated Urea + 0.2 % Zn Foliar spray (ZnSO<sub>4</sub>.7H<sub>2</sub>O) + recommended P and K has been found better in recording higher and economical yields with better Zn content in basmati rice under subtropical region of Jammu
- Application of pendimethalin @ 1.0 kg/ha (PE) fbispyribac-sodium @ 30 g/ha at 25 DAS fbfenoxaprop-p-ethyl @ 60 g/ha at 30 DAS OR pendimethalin @ 1.0 kg/ha (PE) fbazimsulfuron @ 25 g/ha + fenoxaprop-p-ethyl @ 60 g/ha at 30 DAS were found to be the economical treatments for broad spectrum weed control in direct seeded rice under aerobic conditions.
- On the basis of weather forecast based agro-advisories issued farmers were able to save 4, 2, 2, 4 and 5 irrigations in wheat, mustard, peas, maize and rice crop respectively.
- Organic farming package for high value cropping sequence like rice-potato-frenchbean is being developed.
- One ha Integrated Farming System (IFS) model comprising of cropping systems (rice-wheat-green gram, rice-potato-black gram, rice-mustard-green gram and Berseem+ oat-maize+ sorghum with hybrid Napier on bund) in 0.52 ha + horticulture (Guava as main crop, Lemon & mango (Amarpali) as boundary crop and broccoli, Knolkhol, Cabbage, Cauliflower, Radish, okra as intercrops) in 0.32ha + dairy (2cows, 1 buffalo heifer) including 2m<sup>3</sup> biogas and vermicompost unit in 0.08 ha + fish cum poultry in 0.1 ha) + mushroom (button & dhingri) developed for the Mid to high altitude plain zone (JK-1) in Western Himalayas provides round the year average production (23.35 t REY/year), profit (Rs. 3.05 lakhs/year) and employment (595 man days/year).
- Micro Irrigation Systems viz. Semi-permanent Sprinkler Irrigation System, Drip Irrigation System (Wide Spacing) and Large Volume Irrigation System (Raingun) has been installed and demonstrated to the farmers and line departments under on farm water management (OFWM).
- The Automatic Timer Based Variable Speed Device (VSD) developed for centrifugal pumps (5 hp and 10 hp) has been tested *under the field conditions*.
- Characterization of plant viruses (tomato leaf curl virus) of solanaceous crops has been done.
- KufriSindhuri variety of potato is recommended for production of seeds to the farmers.
- Accession IC471923 of Shatavarhas been recommended for cultivation under subtropical plains of Jammu. Application of vermicompost @ 2t/ha alongwith 30kg N per ha (½ of recommended dose of N) and 30kg P or FYM @ 6t/ha alongwith 30kg N per ha (½ of recommended dose of N) and 30kg P is beneficial to increase tuber yield in Shatavar.
- Placement of bee colonies has been recommended for increased crop production in oilseeds.
- The nesting material viz., bamboo stems and castor stems for solitary bees has been standardized.
- New Introductions of mango varieties (PusaArunima and Pusa Surya) and Sweet orange varieties (PusaSharad and Pusa Round), mandarin varieties (Daisy and W. murcott), Guava varieties (Arkaamulya, Shweta and Punjab pink), Lemon varieties (Baramasi and galgal), has been made
- Citrus Rootstock Rough lemon/JattiKhatti(Citrus jambhirilush), desi mango rootstock blocks and apple cultivars (Anna, Golden dorsett) at has been established at ACRA, Dhiansar.
- Blended phalsa beverage prepared from 80:20::Phalsa:pear was adjusted best on the basis of sensory attributes having overall acceptability score of 7.29. The beverage had shelf life of 90 days under ambient temperature.
- Genetic characterization of Bakerwali goat using 28 alleles with microsatellite locus showed a high level of polymorphism and significant level of genetic diversity of the population for bringing effective genetic improvement.
- For genetic characterization of Poonchi sheep, a total of 30 alleles observed by six microsatellite markers in Poonchi sheep substantial genetic



- variation and all the loci under study were polymorphic.
- Varietal differences were found amongst locally available paddy straw in terms of chemical composition, anti-nutritional factors and in vitro DM degradability.
  - Purine derivatives/ creatinine (PDC) index appears to be an effective indicator of energy deficiency in ration of goats, but unaffected by the dietary protein deficiency.
  - Maize may be replaced by pearl millet and broken rice mixture in diet of broiler birds up to 75% without any adverse effect.
  - Tanniferous tree leave water extract from *Acacia nilotica*, *Eugenia jambolana* and *Psidium guajava* showed antibacterial activity, while *E. jambolana* and *P. guajava* extracts were found to have potent antioxidant and anti-coccidian activity.
  - Hygienic milking and good management practices improved the quality and composition of buffalo milk including fat, protein, solid-not-fat and total solids under rural conditions.
  - *Tinospora cordifolia* and *Terminalia arjuna* improved the oxidative stability while *Asparagus racemosus* improved lipid oxidative stability and storage quality as alternatives to synthetic antioxidants and preservatives in chevon sausages.
  - *Colocasia esculenta* (3%) and *Ipomoea batatas* (3%) could be successfully utilized for restructured mutton blocks and the storage quality could be enhanced by using green 1% coffee bean extract as a natural antioxidant and preservative.
  - Storage quality of designer chicken nuggets could be improved with 2% *Bacopa monnieri* and 3% *Ocimum sanctum*.
  - Anatomical studies on the thyroid gland of Bakerwali goat (*Capra hircus*) showed increase in mean biometrical values between succeeding age groups and significant difference between prepubertal and senile animals.
  - Studies on entrepreneurial behaviour of dairy farmers through SWOT and STEEP analysis reveal that dairy entrepreneurship has a very bright future in the region and the same may be addressed by the Government and implementing agencies.
  - For oestrus induction, Crestar/ P4 Sponge along with PMSG or Ram effect can be conveniently used in non lactating ewes during non breeding season.
  - Endometritic cows were found to have higher cervico-vaginal mucus pH, a significantly lower mean serum phosphorus level, total serum protein, globulin and cholesterol levels while the serum AST, ALT and P4 during estrus were non-significantly higher than the normal repeat breeders.
  - Urea Molasses Multinutrient Block (UMMB) was found to be a good source of energy, protein and minerals and its supplementation @50 gm/day for 2 months in 5-6 months age Beetal-cross goats reared through grazing enhanced body weight gain.
  - Metabolic profiling in adult Beetal goats showed lowest average values of Ca and Pi during first week after kidding, whereas Mg, Cu and Zn levels were lowest after 2 weeks.
  - Evaluation of oxidative stress parameters during peri-parturient period revealed significant increase in MDA level along with decrease in antioxidant enzymes SOD, catalase, GSH, GPx and G-S-T during the peri-parturient period.
  - Prevalence of bovine mastitis was 71.97% and 30.00% in cows and buffaloes and mastitis milk had decreased fat and protein content than the normal milk.
  - Field isolates of *Pasteurella multocida* characterized for capsular antigen and type A, B and D were observed to be predominant in Jammu region including presence of a rare toxA gene in one sheep isolate.
  - A considerable prevalence of enteropathogenic *Escherichia coli* (EPEC) was found in Jammu with resistance to most antimicrobials.
  - With growing acaricide resistance in Jammu, it is recommended that synthetic pyrethroids and organophosphates (Diazinon and Malathion) be replaced with macrocyclic lactones.



- Calf isolate of *Cryptosporidium parvum* was pathogenic in immunocompromised mice and caused severe enteric disease and adversely impacted the general health, haematological indices and increased the levels of oxidative stress markers.
- An overall disease prevalence of 15.28% was seen in domestic pigeons (*Columba livia*) in Jammu, having the potential of cross border transmission across nearby Indo-Pakistan International border.
- Quercetin @ 100mg/kg body weight in rats had anti-diabetic potential, excellent wound healing property with 15% topical application and reduced DOCA-salt induced hypertension @ 20mg/kg body weight when treated for six weeks.
- Quercetin @ 20 mg/kg body weight in Wistar rats modulated the adverse effects on most of the biochemical parameters induced by Chlorfenapyr and/or fluoride.
- Catechin had ameliorative effect on aluminium chloride and/or chlorpyrifos toxicity in Wistar rats.
- Earlier development of testicular functional germ cells could be achieved in male Wistar rats by daily supplementation of zinc sulphate @ 50mg/kg body weight in growing rats.
- LAMP may be employed as a rapid, accurate and low cost molecular in situ diagnostic technique for field detection of *S. agalactiae* causing sub-clinical mastitis and the specificity of the assay was found to be similar to PCR.
- Season had significant influence on concentration of glucose, total protein, total cholesterol, LDL-cholesterol, copper, zinc, SOD activity and TAA in follicular fluid harvested from small and large follicles of local sheep.
- Epidemiological data (2016-17) on animal/ human rabies show highest post-bite vaccination in January and a total of 17 confirmed animal deaths in the region.
- Dexmedetomidine and ketamine combination was better than xylazine–ketamine combination in terms of onset, duration and quality of

anaesthesia and can be safely used in dogs without any deleterious cardio-respiratory effects.

- Corneal ulcers in dogs may be best treated by 360° conjunctival grafts or amniotic membrane transplantation with minimal complications.

### Extension

- 5858 farmers/farm women and rural youth were imparted training through 239 different trainings. The trainings were organized in crop production, crop protection, horticulture, home sciences, and soil and fertilizer management.
- The University organized as many as professional trainings for the benefit of farmers and departmental functionaries 818 scientists participated in different seminars/symposia/workshops at state/national level.
- The transfer of technology has been carried out through Krishi Vigyan Kendras and the involvement of subject matter resources personals from the Faculty of Agriculture and Faculty of Veterinary Sciences and Animal Husbandry.

### Publications

Among publications, the university brought out University Newsletter, various technical bulletins, Brochures and folders for dissemination to farmers, stakeholders and resource personnel. As many as 1305 publications including book chapters/bulletins/manuals/ research papers etc. were published by the scientists in various journals of repute.

### Other Important University Activities

- The university has developed strong linkages with national and international organizations with a view to harness the information, materials, expertise and exchange of scientists and students visits. MoUs have been signed by the University with the national and international organizations.
- Among various Statutory Meetings, University Council, Board of Management, and Academic Council were held accordingly.

# Education

Education programme in Agriculture and other allied branches of learning and scholarship is an important and basic objective of the University. University has made remarkable achievements during the period under report in the field of agriculture education and maintained the standard as per the national level by following up-dated curriculum at under graduate and post graduate level both in agriculture and veterinary sciences as per the recommendations of Education Division of Indian Council of Agricultural Research (ICAR) and Veterinary Council of India (VCI), respectively. Library has been

updated through purchase of books, journals, CD ROMs and automated literature search facility.

## 2.1 Academic programmes run by the university:

**UG Programme** : B.Sc. (Ag), B.V.Sc & AH and B.Sc (Biotechnology)

**PG Programme** : M.Sc. (Ag), M.V.Sc. and MBA (ABM)  
: Ph.D. (Ag), Ph.D. (Vet) and Ph.D. (Biotechnology)

## 2.2 Details of P.G. Programme running in the University:

S.No.	M.Sc.(Ag)	Ph.D.(Ag)	M.V.Sc.	Ph.D.(Vet)
1	Soil Science & Agriculture Chemistry	Soil Science & Agriculture Chemistry	Animal Nutrition	Animal Nutrition
2	Genetics & Plant Breeding	Genetics & Plant Breeding	Veterinary Public Health & Epidemiology	Veterinary Public Health & Epidemiology
3	Entomology	Entomology	Veterinary Medicine	Veterinary Medicine
4	Agriculture Extension Education	Agriculture Extension Education	Veterinary Pathology	Veterinary Pathology
5	Vegetable Science	Vegetable Science	Veterinary Gynaecology and Obstetrics	Veterinary Gynaecology and Obstetrics
6	Agriculture Economics	Agriculture Economics	Veterinary Surgery & Radiology	Veterinary Surgery & Radiology
7	Agronomy	Agronomy	Veterinary Parasitology	Veterinary Parasitology
8	Fruit Science	Fruit Science	Veterinary Anatomy	Veterinary Anatomy
9	Post Harvest Technology	Post Harvest Technology	Veterinary physiology and Biochemistry	Veterinary physiology and Biochemistry
10	Plant Pathology	Plant Pathology	Livestock Products Technology	Livestock Products Technology
11	Statistics	Biotechnology	Animal Husbandry Extension	Animal Husbandry Extension
12	Biotechnology	Biotechnology	Veterinary Pharmacology & Toxicology	-
13	Bio Chemistry	-	Animal Genetics & Breeding	-
14	Forestry	-	Veterinary Microbiology	-
15	Sericulture	-	Live stock Production and Management	-
16	Floriculture	-		-
17.	Microbiology -	-		-



### 2.3 Faculty Spectrum

Posts	Sanctioned
Dean	2
Associate Dean	2
Professor / Equivalent	31
Associate Professor / Equivalent	71
Asstt. Professor/ Equivalent	124
<b>Total</b>	<b>230</b>

The classified information pertaining to the faculty strength cadre wise are given in the table as evident there are 345 faculty positions as sanctioned strength for both the faculties viz Faculty of Agriculture and Faculty of Veterinary Sciences & Animal Husbandry

### 2.4 Student Strengths

The strength of the students admitted to B.Sc

(Hons) Agriculture, B.Sc (Biotechnology) and BVSc & AH programme during the academic session 2016-17 were 110, 28 and 70 respectively. The number of students admitted to M.Sc (Ag.) and Ph.D (Ag.) programme were 44 and 30 respectively in different divisions. In Veterinary faculty 40 MVSc and 14 Ph.D students were admitted during the academic session of 2016-17. In M.Sc Biotechnology and Ph.D Biotechnology programme 04 students were admitted. In Basic Sciences 05 M.Sc. & 08 Ph.D No. of students were admitted respectively. The total strength of the students on roll in Post Graduate and undergraduate Degree programme were 409 and 796 respectively. The distribution of the students' strength, intake capacity admitted year-wise and programme wise along with the number of students on roll are given in the following table:

### 2.5 Under Graduate Programme

S. No.	Name of faculty	Degree Programme	Students Strength										Total	
			I year 2016		II year 2015		III year 2014		IV year 2013		V year 2012		M	F
			M	F	M	F	M	F	M	F	M	F		
1.	Faculty of Agriculture	B.Sc. (Hons.) Agriculture	40	70	28	37	23	36	25	34	18	26	134	203
		B.Sc. (Hons.) Biotechnology	04	24	02	22	07	17	02	23	-	19	15	105
2.	Faculty of Veterinary Sciences & Animal Husbandry	B.V. Sc. & A.H.	43	27	39	31	41	29	43	27	28	31	194	145

### 2.6 Post Graduate Programme

Postgraduate Programme																	
S. No.	Name of faculty	Master's Programme				Sub Total		Ph. D Programme						Sub Total		Total	
		I Year		II Year		M	F	I Year		II Year		III Year		M	F	M	F
		M	F	M	F			M	F	M	F	M	F				
1.	Faculty of Agriculture	26	18	20	17	46	35	16	14	10	27	32	36	58	77	104	112
2.	Faculty of Veterinary Sciences & Animal Husbandry	23	17	25	14	48	31	08	06	09	03	18	17	35	26	83	57
3.	Faculty of Basic Sciences	01	04	-	08	01	12	04	04	-	03	01	03	05	10	06	22
4.	School of Biotechnology	-	01	01	03	01	04	-	03	-	03	02	12	02	18	03	22



## 2.7 Faculty wise Admission (2016-17)

S.No	Divisions		
<b>Faculty of Agriculture</b>			
		<b>Master's Degree</b>	
		<b>Doctoral Degree</b>	
1	Agronomy	02	-
2.	Agricultural Engineering	02	-
3.	Agri. Economics	03	-
4.	Agro-forestry	02	02
5.	Agricultural Extension & Communication	03	04
6.	Plant Breeding & Genetics	04	02
7.	Soil Sciences & Agriculture Chemistry	03	03
8.	Entomology	03	05
9.	Horticulture (Vegetable Science)	03	05
10	Plant Pathology	01	05
11.	Horticulture (Fruit Science)	03	02
12.	Food Sciences & Technology	-	06
13.	Sericulture	01	01
14.	Horticulture (Floriculture & Landscaping)	02	-
15.	MBA (Agri-Business Management)	12	-
16.	Biotechnology	01	03
	<b>Total</b>	<b>45</b>	<b>38</b>
<b>Faculty of Basic Sciences</b>			
1	Statistics & Computer Sciences	-	02
2	Biochemistry	02	06
4	Plant Physiology	01	-
4.	Microbiology	02	-
	<b>Total</b>	<b>05</b>	<b>08</b>
<b>Faculty of Veterinary Sciences &amp; Animal Husbandry</b>			
1	Veterinary Anatomy	-	01
2	Veterinary Physiology & Biochemistry	01	-
3	Veterinary Pharmacology & Toxicology	04	02
4	Veterinary Parasitology	01	01
5.	Veterinary Microbiology	03	01
6	Veterinary Public Health & Epidemiology	01	01
7	Veterinary Medicine	07	-
8	Veterinary Pathology	03	01
9	Animal Nutrition	04	-
10	Animal Genetics & Breeding	-	02
11	Livestock Production and Management	05	01
12	Livestock Products Technology	01	-
13	Veterinary Gynaecology & Obst.	02	-
14	Veterinary Surgery & Radiology	07	02
15	Veterinary & Animal Husbandry Education	01	02
	<b>Total</b>	<b>40</b>	<b>14</b>



## 2.8 Number of Students who completed degree programmes (2016-17)

S.No.	Degree	No. of students who completed degree programmes (2016-17)	
		Male	Female
<b>Post Graduate</b>			
1	Ph.D (Agriculture)	11	03
2	Ph. D (Veterinary)	03	02
3	Ph. D. (Biotech)	-	02
4	Ph. D (Basic Science)	-	-
5	M.Sc. (Agriculture)	32	10
6	M.V. Sc.	22	20
7	M.Sc. (Basic Sciences)	02	05
8	M.Sc. (Biotechnology)	-	05
9	MBA (Agri-Business Management)	04	04
<b>Under Graduate</b>			
1	B.Sc. (Agriculture)	14	15
2	B.Sc. (Biotechnology)	-	20
3	B.V. Sc. &A.H.	29	16

## 2.9 Thesis accepted (01-04-2016 to 31-03-2017):

### M.Sc Agriculture

S. No	Name of the student	Regd. No	Discipline	Name of the Major Advisor	Title of thesis
1	Rohullah Amin	J-14-M-396	Agril. Economics	Dr. Jyoti Kachroo	An Appraisal of Agricultural Development in Jammu Province of J&K State
2	Sanjeev Kumar	J-14-M-397	Agril. Economics	Dr. S.P. Singh	An Economic Analysis of Production and Marketing of Rajmash Crop in Doda District of J&K State
3	Navneet Kour	J-14-M-16-ABM	MBA (ABM)	Dr. Sudhakar Dwivedi	A Study of New Business Opportunities for Reitzel Products in Jammu and Kashmir
4	Anil Sharma	J-14-M-18-ABM	MBA (ABM)	Mr. Naveed Hamid	Study on Supply Chain Management of Basmati Rice with Special reference to Sarveshwar Foods Limited
5	Shaiq Jeelani	J-14-M-19-ABM	MBA (ABM)	Mr. Ashish Kr. Isher	A Study of Narwal Mandi – An Epicentre of Fruits and Vegetables
6	Sumaira Farooq	J-14-M-20-ABM	MBA (ABM)	Dr. Jyoti Kachroo, Prof.	A Study on Marketing Prospects for Tirumala Milk Products Private Limited in Jammu
7	Kushum Saini	J-14-M-21-ABM	MBA (ABM)	Mr. Naveed Hamid	Customer Perception and Satisfaction towards Sarveshwar Basmati Rice in Jammu
8	Mandeep Singh	J-14-M-22-ABM	MBA (ABM)	Dr. Sudhakar Dwivedi	A Study on Online Shopping of FMCG in Jammu
9	Tsewang Narboo	J-14-M-24-ABM	MBA (ABM)	Dr. Anil Bhat	A Study of Agricultural Input marketing in Jammu District of J&K
10	Payal Sharma	J-14-M-25-ABM	MBA (ABM)	Dr. Jyoti Kachroo	Customer Perception Towards Online Grocery Shopping



S. No	Name of the student	Regd. No	Discipline	Name of the Major Advisor	Title of thesis
11	Rajiv Sharma	J-14-M-23-ABM	MBA (ABM)	Mr. Ashish Kr. Isher	Study on Marketing Management of Amul Products in Jammu
12	Smaili Mehra	J-13-M-245	Sericulture	Dr. R.K.Bali	Development and evaluation of double hybrid crosses of silkworm ( <i>Bombyx mori</i> L.)
13	Bodh Raj	J-14-M-395	Sericulture	Sh. Darshan Singh	Cataloguing of some mulberry varieties and their bioassay studies.
14	Yudhishter Singh Bagal	J-14-M-393	Agril Ext Education	Dr. L. K. Sharma	Utilization of communication sources by the wheat growers of Samba district.
15	Stanzin Yangsdon	J-14-M-392	Agril Ext Education	Dr. P.S.Slathia	Human Health Hazards: Perception of different stakeholders on pesticide use in agriculture in Jammu district.
16	Mohd Jafar Tanin	J-14-M-368	PBG	Dr. S.K. Gupta	Phenotypic stability for yield and some quality traits in <i>Brassica Juncea</i> L.)
17	Sunil Kumar Kotwal, M.Sc.	J-14-M-369	PBG	Dr Bikram Singh	Characterizing diversity for heat and drought related traits in hexaploid wheat ( <i>Triticum aestivum</i> L.)
18	Ramesh Chand Bana	J-14-M-357	Agronomy	Dr. Ashok Gupta	Effect of zinc ferti-fortification on yield and quality of basmati rice under subtropical region of jammu
19	Sushil Kumar Suri	J-14-M-356	Agronomy	Dr. M C Dwivedi	Production potential and economic feasibility of blackgram ( <i>Vigna mungo</i> L.) + sesame ( <i>Sesamum indicum</i> L.) Intercropping under rainfed ecosystems of jammu
20	Susheel Rattan Sharma	J-14-M-354	Agronomy	Dr. B R Bazaya	Weedy rice management strategies in basmati rice ( <i>Oryza sativa</i> L.) Under subtropical irrigated conditions of jammu
21	Ravi Kumar	J-14-M-355	Agronomy	Dr. Vijay Khajuria	Effect of dates of transplanting, nitrogen levels and Foliar application of potash on growth, yield and Quality of basmati rice ( <i>Oryza sativa</i> L.)
22	Ashiana Javeed	J-14-M-353	Agronomy	Dr. Meenakshi Gupta	Effect of graded levels of N, P & K on growth, yield and quality of fine rice cultivar ( <i>Oryza sativa</i> ) under sub-tropical conditions
23	Kartikeya Chowdhary	J-13-M-358	Agronomy	Dr. Vijay Bharti	Effect of irrigation scheduling on growth, yield And quality of direct seeded basmati rice ( <i>Oryza sativa</i> L.) Varieties
24	Manmohan Singh	J-13-M-318	Plant Pathology	Dr. S.K. Singh	Studies on spot blotch [ <i>Bipolaris sorokiniana</i> (Sacc.) Shoem.] of wheat and its management
25	Raj Kumar	J-14-M-388	Plant Pathology	Dr. M.K. Pandey	Inheritance of stripe rust resistance (yr) gene in selected wheat cultivars to pathotypes of <i>Puccinia striiformis</i> .
26	Dechan Choskit	J-14-M-385	Plant Pathology	Dr. Ranbir Singh	Detection and Management of Tomato leaf curl virus in jammu region.
27	Kewal Krishan	J-14-M-389	Plant Pathology	Dr. Sonika Jamwal	Integrated management of root rot of urd bean caused by <i>Macrophomina phaseolina</i> .



S. No	Name of the student	Regd. No	Discipline	Name of the Major Advisor	Title of thesis
28	Sonali Abrol	J-14-M-386	Plant Pathology	Dr. Prachi Sharma	Molecular characterization of virus causing yellow mosaic in mungbean and identification of the resistance sources.
29	Sandeep Gupta	J-14-M-391	Plant Pathology	Dr. V.B. Singh	Studies on variability and management of pathogens causing <i>Alternaria blight</i> in rapeseed mustard.
30	Prem Chinabi Aryan	J-14-M-398	Plant Pathology	Dr. A.K. Singh	Management of bacterial leaf blight of paddy ( <i>Oryza sativa</i> L.) caused by <i>Xanthomonas oryzae pv. Oryzae</i> .
31	Indar Singh	J-14-M-387	Plant Pathology	Dr. Vishal Gupta	Virulence dynamics of <i>Puccinia striiformis</i> and prediction of stripe rust of wheat in Jammu sub tropics.
32	Brijpaul Singh	J-13-M-350	Entomology	Dr. R.K. Gupta	Exploring the possibility of using wax degrading bacteria for management of mealybug
33	Rajesh Gupta	J-14-M-364	Entomology	Dr. Hafeez Ahmad	MANAGEMENT OF INSECT PESTS ASSOCIATED WITH STORED CEREALS
34	Kapil Choudhary	J-14-M-361	Entomology	Dr. Hafeez Ahmad	"Seasonal Incidence and Management of painted bug, <i>Bagrada cruciferarum</i> Krik. on mustard and cauliflower"
35	Ayaz Ahmad Reshi	J-14-M-366	Entomology	Dr. Devinder Sharma	Studies on honey production potential of <i>Plectranthus rugosus</i> Wall.
36	Karandeep Singh	J-14-M-360	Entomology	Dr. Devinder Sharma	EFFECT OF PLANT VOLATILES ON INSECTS PESTS AND POLLINATORS OF MUSTARD ( <i>brassica campestris</i> var. sarson)
37	Arun Dubey	J-14-M-365	Entomology	Dr. Uma Shankar	Seasonal incidence and management of major insect pests of bell pepper, <i>Capsicum annum</i> L.
38	Kuldeep Koul	J-14-M-363	Entomology	Dr. A.K. Singh	Diversity of mite pests on some summer vegetable crops with special reference to management of okra mite ( <i>Tetranychus urticae</i> Koch.)
39	Shallu Raina	J-13-M-351	Entomology	Dr. A.K. Singh	Seasonal Incidence Of Major Insect Pests Of Cowpea, <i>Vigna Unguiculata</i> (L) Walp. With Special Reference To Management Of Mite Pest
40	Sandeep Kumar	J-14-M-362	Entomology	Dr. Uma Shankar	Seasonal Incidence and management of rice stem borers ( <i>Scirpophaga</i> spp.) on rice ( <i>Oryza sativa</i> L.)"
41	Piyush Kumar	J-14-M-379	Vegetable Science	Dr. Manoj Kumar	Integrated Nutrient Management Studies in Garden Pea ( <i>Pisum sativum</i> var. <i>hortense</i> )
42	Dechen Angmo	J-14-M-377	Vegetable Science	Dr. Sandeep Chopra	Bio-efficacy of Different Herbicides on Growth & Productivity of Onion ( <i>Allium cepa</i> L.)
43	Mamta Phogat	J-14-M-372	Soil Science	Dr.A.P.Rai	Effect of Boron application on pulses and oilseed crops";
44	Tejbir Buttar	J-14-M-373	Soil Science	Dr.Vikas Sharma	Spatial variability of soil properties of Chakroi farm and their mapping



### M.V.Sc.

S. No.	Name of the student	Regd. No.	Discipline	Name of the Major Advisor	Title of the thesis
1	Abhimanyu Chauhan	J-14-MV-376	VSR	Dr. Ashok Kumar	Effect of sterile medical grade chitosan powder and amorphous hydrogel with colloidal silver on healing of full thickness skin wound in rats
2	Girjesh Upmanyu	J-14-MV-372	VSR	Dr. H.R.Bhardwaj	Studies on mesenteric lymph nodes in heifers suffering from intussusception
3	Muzahir Ahmad	J-14-MV-375	VSR	Dr. Pankaj Gupta	Clinical evaluation of xylazine and dexmedetomidine as preanaesthetics to ketamine anaesthesia for soft tissue surgery in canines.
4	Abineet Singh Pandha	J-14-MV-383	VPT	Dr. Mudasir Sultana	Protective effect of catechin on biochemical and oxidative stress parameters following repeated administration of chlorpyrifos and aluminium chloride in wistar rats.
5	Nasir Manzoor Wani	J-14-MV-385	VPT	Dr. Rajinder Raina	Hepatic & Renal oxidative damage following repeated exposure to Chlorfenapyr and its toxic Interaction with Fluoride.
6	Aiman Khursheed	J-14-MV-404	VPA	Dr. Anish Yadav	Molecular characterization of Cryptosporidium spp. infection in pregnant goats & their implications in neonatal kids
7	Shaweta Dutta	J-14-MV-403	VPA	Dr. Rajesh Katoch	Detection of acaricide resistance in Rhipicephalus (Boophilus) microplus against malathion and amitraz
8	Fakhrun Nisa	J-14-MV-402	VPA	Dr. Anish Yadav	Status of acaricide resistnace in Rhipicephalus (Boophilus) microplus against diazinon and fenvalerate
9	Anamika	J-14-MV-387	AGB	Dr. D. Chakraborty	Genetic studies on growth patterns of Rambouillet sheep
10	Anil Ghorela	J-14-MV-388	AGB	Dr. Nishant Kumar	Phenotypic characterization of Poonchi sheep
11	Fahad Shahjar	J/14/MV/394	VAHEE	Dr. Bharat Bhushan	Training Needs Livestock Owners in Jammu District
12	Rohan Sharma	J/14/MV/392	VAHEE	Dr. Pranav Kumar	A study on Entrepreneurial Behaviour of Dairy Farmers of Jammu Distrct of Jammu and Kashmir
13	Sheihk Umair	J/14/MV/393	VAHEE	Dr. Bharat Bhusan	Adoption Pattern of Improved Animal Husbandry Practices of Doda District of Jammu and Kashmir
14	Faheem Raja	J-13-MV-340	LPT	Dr. Arvind Kumar	Effect of Artemisia nilagirica and Mentha longifolia on quality attributes of fish nuggets
15	H.M. Dilnawaz	J-14-MV-390	LPT	Dr. Sunil Kumar	Effect of Colocasia esculenta, Ipomoea batatas and Coffea arabica on the quality attributes of restructured mutton blocks.
16	Insha Kousar Kalem	J-14-MV-396	LPT	Dr. Zuhaib Fayaz Bhat	Effect of Tinospora cordifolia and Terminalia arjuna on storage quality of chevon sausages
17	Sabahu noor	J-14-MV-412	LPT	Dr. Zuhaib Fayaz Bhat	Effect of Tribulus terrestris and Asparagus racemosus on storage quality of chevon sausages.



S. No.	Name of the student	Regd. No.	Discipline	Name of the Major Advisor	Title of the thesis
18	Saniya Batoul Kamal	J-13-MV-341	LPT	Dr. Arvind Kumar	Effect of Papaver somniferum (Poppy seed) on quality characteristic of mutton, poultry and fish nuggets
19	Peer Mohd. Azhar	J-14-MV-389	AGB	Dr. D. Chakraborty	Molecular Characterization of Poonchi sheep by using molecular markers
20	Tanveer Ahmad Sofi	J-14-MV-386	AGB	Dr. D. Kumar	Molecular Characterization of Bhakarwali Goat
21	Harneet Kour	J-14-MV-366	VMD	Dr. Rajesh Agrawal	Clinico-Epidemiological Investigation in Obese Dogs with special emphasis on Cardiopathies
22	Patkar Jui Sukumar	J-14-MV-370	VMD	Dr. J. S. Soodan	Clinical studies on diagnosis & management of ear infections in dogs
23	Ravinder Singh	J-14-MV-371	VMD	Dr. Abha Tikoo	Epidemiological and managerial studies of hoof disorders in dairy cattle
24	Samisha Gupta	J-14-MV-369	VMD	Dr. S. K. Gupta	Epidemiological investigation of goat in commercial poultry and its management
25	Sumreen Kour	J-14-MV-367	VMD	Dr. Kafil Hussain	Evaluation of Novel Biomarker in Equine with Colic
26	Sheetal Dogra	J-14-MV-368	VMD	Dr. Rajiv Singh	Biochemical and mineral profile of crossbred cattle suffering from lameness and its correlation with udder health
27	Jaan Mohammad Wani	J-14-MV-410	VGO	Dr. Utsav Sharma	Studies on estrus induction in ewes during non breeding season
28	Pradeep Pal Singh	J-14-MV-409	VGO	Dr. Nishi Pande	Investigations on Repeat Breeding and immunomodulation in dairy cows
28	Menakshi Bhagat	J-14-MV-406	VPP	Dr. Shilpa Sood	Pathological conditions affecting the domestic pigeons (Columba livia) in Jammu region.
29	Syed Mehmood	J-14-MV-405	VPP	Dr. Nawab Nashiruddin	Pathological conditions affecting the domestic pigeons (Columba livia) in Jammu region.
30	Mokshata Gupta	J-14-MV-397	ANN	Dr R K Sharma	Evaluation of spot urinary purine derivatives concentration index as an indicator of plane of nutrition in goats
31	Suman Bala	J-14-MV-398	ANN	Dr R K Sharma	Effect of replacement of maize by pearl millet and broken rice mixture in broiler ration
32	Shafkat Sheikh	J-14-MV-413	LPM	Dr. Asma Khan	Assessing the impact of rural management practices on hygiene and composition of buffalo milk
33	Tanuj Tanwar	J-14-MV-391	LPT	Dr. Arvind Kumar	Effect of Bacopa monnieri and Ocimum sanctum on storage quality of chicken nuggets.
34	Uzma Sehrish	J-14-MV-407	VPB	Dr. P.S.Mahapatra	Effect of season on biochemical profile and oxidative stress markers in preovulatory follicular fluid in local sheep of Jammu
35	Faiyzan Javed	J-14-MV-395	VMC	Dr. Anil Taku	Molecular Typing of Staphylococcus aureus based on coagulase gene



## Ph.D. (Agri/Vety.)

### Agriculture

S.No	Name of the student	Regd. No	Discipline	Name of the Major Advisor	Title of thesis
1	Parvani Sharma	J-11-D-131-A	Agril Ext Education	Dr. Rakesh Nanda	Impact assessment of contract farming of basmati rice in Jammu division.
2	Rakesh Kumar	J-13-D-178-A	Agril Ext Education	Dr. P.S.Slathia	Adoption of Rapeseed Mustard Production Recommendations by the Farmers in Jammu Region of Jammu & Kashmir
3	Padma Lay	J-11-D-134-A	PBG	Dr. A.K. Razdan	Genetic Analysis of Maize ( <i>Zea Mays</i> L.) Inbreds Lines using Microsatellite Markers
4	Irfan Ahmad Shah	J-11-D-127-A	Agronomy	Dr. B C Sharma	Performance of promising basmati rice ( <i>Oryza sativa</i> L.) Cultivars in aerobic culture with different soil organic amendments in rice-wheat system
5	Parshotam Kumar	J-11-D-126-A	Agronomy	Dr. Dileep Kachroo	Effect of different resource conservation practices on growth, yield and productivity of different cropping systems
6	Lobzang Stanzen	J-12-D-151-A	Agronomy	Dr. Anil Kumar	Long term effect of tillage and weed Management strategies in irrigated maize wheat Cropping system
7	Suheel Ahmad Ganie	J-12-D-152-A	Entomology	Dr. Hafeez Ahmad	Management of major insect-pests of marigold <i>Tagetes erecta</i> L
8	Ichpal Singh	J-11-D-129-A	Entomology	Dr. D.P. Abrol	impact of insect pest management on pollinators of <i>sesamum indicum</i> L. and <i>cajanus cajan</i> L.
9	Anil Bhushan	J-12-D-161-A	Vegetable Sciences	Dr. R.K Samnotra	Phenotypic Stability Studies in Brinjal ( <i>Solanum melongena</i> L.)
10	Enoc Spalbar	J-11-D-141-A	Soil Science	Dr.A.K.Mondal	Studies on zinc in rice- wheat growing soils in sub-tropical areas of Jammu region

### Veterinary Sciences

S. No.	Name of the student	Regd. No.	Discipline	Name of the Major Advisor	Title of the thesis
1	Mahrukh Ahmad	J-12-D-42-V	VPT	Dr. Mudasir Sultana	Studies on the effect of quercetin on diabetic wound and hypertension in rats
2	Rajinder Kumar Bhardwaj	J-12-D-43-V	VMD	Dr. J. S. Soodan	Prevalence, clinico-haemato-biochemical alteration and management of haemoprotozoan and rickettsial diseases of cattle and equine
3	Sahil Kumar	J-12-D-45-V	VPA	Dr. Rajesh Katoch	Chemotherapeutic and Interaction studies between Visceral Larvae Migran and Diabetes mellitus
4	Shikha Sharma	J-12-D-44-V	VPA	Dr. Rajesh Katoch	Interaction studies on Cutaneous Larvae Migran and Diabetes mellitus



## 2.10 Students Welfare

- i. Participation of SKUAST-J students' team in REVERIE 2K16 – RESURGENCE (All India Inter-University Youth Festival at NDRI-Karnal, Haryana), a three days fest with effect from 11<sup>th</sup> -13<sup>th</sup> April, 2016. A team comprising of 25 students from Faculty of



Agriculture, Chatha, Faculty of Veterinary Sciences and Animal Husbandry, R.S.Pura and School of Biotechnology participated in this youth festival.

- ii. Intra Faculty Sports Meet of Faculty of Veterinary Sciences and Animal Husbandry, R.S.Pura was held from 4<sup>th</sup> - 6<sup>th</sup> April, 2016.



- iii. International day of Yoga was celebrated to promote the physical, mental and spiritual health of the students and staff of the University in the first week of August, 2016.
- iv. SKUAST-J Participated in North Zone inter University Cricket (M) tournament 2016-17 held in November, 2016 at Ch. Charan Singh University, Meerut.



- v. An Orientation programme for the newly registered students for the undergraduate course in SKUAST-Jammu was held from 3<sup>rd</sup> - 5<sup>th</sup> August, 2016 in the presence of Mr. Sundeep Kumar Naik, IAS, Principal Secretary, APD and Dr. Pradeep K Sharma, Vice-Chancellor, SKUAST-Jammu
- vi. SKUAST-J employee's team participated in 14<sup>th</sup> All India Vice-Chancellor T-20 Cricket Competition 2016(7<sup>th</sup> – 18<sup>th</sup> November, 2016) at PAU Ludhiana.



SKUAST-J Employee's Cricket Team



Welcome Freshers – Orientation Programme



vii. Celebration of Veterinary festival (VETFEST) held at the Faculty of Veterinary Sciences and Animal Husbandry, R.S.Pura. Competition for different sports including Chess, Volleyball, Cricket and Table Tennis was held from 24<sup>th</sup>-26<sup>th</sup> November, 2016.



Glimpses of Vet-Fest 2016

- viii. Participation of SKUAST-J in All India Veterinary Collage Badminton, Table Tennis and All India Professional Quiz Competition, held at Govind Ballabh Pant University of Agriculture & Technology, Pantnagar from 23<sup>rd</sup>-25<sup>th</sup> March, 2017.
- ix. Celebration of farewell function for outgoing students of 4<sup>th</sup> year at Faculty of Agriculture, Main Campus, Chatha was held on 24<sup>th</sup>, March, 2017.



### 2.11 Students' Placement and Counseling Cell

The Counseling and Placement Cell is established at main campus, Chatha and facilitates the students by providing information to them about various avenues of employment. A fortnightly e-bulletin



**“Career Calls”** containing information regarding opportunities for students in academics, public and private is available on the University website. To sensitize and develop the soft skills of the students, the Counseling and Placement cell has started a series of expert lectures covering different facets of personality development. Students are advised to seeking jobs in private, government, army and other government/non-government organizations. Counseling of students about career prospects, group discussions and mock interviews are done regularly in this cell.

### 2.12 Hostels and hostel facilities

Separate hostel accommodation for boys and girls are available at the RS Pura campus and one hostel is under construction at the main campus, Chatha. The girl boarders are housed in newly constructed Girls Hostel with additional accommodation comprising of four flats to facilitate the girl boarders. Male boarders are housed in two hostels namely Boys Hostel and Students Hostel. The boys hostel has 44 rooms for housing 138 students at a time with adequate furniture and fixture facility. The students hostel has a capacity to accommodate 143 boarders; 29 rooms are single seater, 49 rooms are double seater and have 16 single room suites for foreign students with facility of kitchenette and attached rest rooms. Spacious and well furnished dining hall, common room, lawn, courtyard, CTV with cable/dish connection etc., have also been provided in the hostels. Facilities for indoor games like table tennis, chess, ludo, and carom boards, also have been made available.

### 2.13 Health Care Facilities

The Annual Work done Statement of the Health Center is detailed below:

Total OPD	2726
Students	1436
Staff	1290
Hostellers	1005
Non-Hostellers	431
Medical patients	2420
Surgical patients	306
Males	1905
Females	821

Emergencies	196
Indoors	59
Refereed	32
Physiotherapy sessions	210
Dental sittings	184
Lab. Test	104 patients
Health checkup in Kissan Mela	142 patients
Free super specialty medical checkup camp was organized by Health Centre in collaboration with Fortis Hospital, Amritsar on 20-05-2016.	More than 300 patients

### 2.14 Scholarship

The under graduate and postgraduate students are being awarded various scholarship. The value of merit scholarship awarded per month was Rs.500/-, Rs.800/- and Rs.1200/- to B.Sc.(Ag) / B.V.Sc., M.Sc.(Ag)/ M.V.Sc. and Ph.D. students, respectively where as the amount of National Talent Search (NTS) scholarship awarded was Rs.1000/- per month.

### 2.15 RAWE Programme

The last Rural Agriculture Work Experience (RAWE) programme was offered in the first semester of 2016-17 to the final year students of B.Sc Agriculture, batch 2013 and concluded successfully. This programme provided the students the practical experience so that the graduates can respond to the real life situation in their profession. The activities undertaken under RAWE programme were: Techno-economic survey (2weeks), Soil and water sample collection and analysis (2 weeks), Plant clinic (3 weeks), Attachment to agro-industry (2 weeks) and rural experience in terms of Attachment (9 weeks) with farmers in village Jinder Melu of block R.S. Pura, Jammu. There were 53



Students performing practical at Rural Agriculture Work Experience (RAWE)



students registered for RAWE 2016-17. The students were paid a stipend of Rs. 3000/ each per month for 4.5 months.

## 2.16 Internship Programme

Students of B.V.Sc & A.H were exposed to internship programme for a period of 6 months in the 10<sup>th</sup> Semester. An amount of Rs 1800/- per student



Students performing practical at Rural Agriculture Work Experience (RAWE)

per month is paid as internship allowance except in-service nominee from J&K Government. During 2016-17, 44 students have successfully completed their internship programme in B.V.Sc & AH. The expenditure involved for one student for six months is Rs 10,800/- .

## 2.17 Library



## Usage

Campus	Books Borrowed		Library Consultation	
	Per day (avg.)	Total (annually)	Books/Journals/Back Volumes/ Current Issues Per day (avg.)	Total (annually)
Central Library, Chatha	14	3318	90	21159
Faculty Library, R.S. Pura	21	4965	74	17259
<b>Total</b>	<b>35</b>	<b>8283</b>	<b>164</b>	<b>38418</b>

## Book Collection

Campus	Books (No.)*
Central Library, Chatha	27035
Faculty Library, R.S. Pura	7313
<b>Total</b>	<b>34348</b>

\*Includes Gratis Books, Books in Book Bank, etc.

## Online Databases / e-Journals/e-Books

### New Additions

Campus	Books	Journals	Theses	e-Journals	e-Books	Gratis Books	Krishikosh (e-Theses)
Central Library, Chatha	1595	9	67	3925 (through CeRA)	1174 (CeRA)	6	48
Faculty Library, R.S. Pura	273	2	46		09 (EBSCO) 17 (Series)		
<b>Total</b>	<b>1868</b>	<b>11</b>	<b>113</b>	<b>3925</b>	<b>1200</b>	<b>6</b>	<b>48</b>

\* Remote access is provided to students, scholars and faculty members for making full utilization of the e-resources subscribed in the Library.

\*\* In addition to this, OKMS was subscribed during 2016-17 for creating metadata and aggregation platform for available resources.



### Journal Subscription (Print)

Campus	Journals		Total
	Indian	Foreign	
Central Library, Chatha	9	-	9
Faculty Library, R.S.Pura	2	-	2
<b>Total</b>	<b>11</b>	<b>-</b>	<b>11</b>

### Book Bank Services

Campus	No. of books available		No. of books Issued		Special Issue for JRF Aspirants
	General	SC/ST	General	SC/ST	
Central Library, Chatha	171		--		--
Faculty Library, R.S. Pura	506		--		--
<b>Total</b>	<b>677</b>		<b>--</b>		<b>--</b>

### Reprographic Services for students and researchers on payment basis

Campus	On payment
Central Library, Chatha	144564
Faculty Library, R.S. Pura	9285
<b>Total</b>	<b>153849</b>

\*The payment received is deposited regularly in the office of the Comptroller.

### Receipts

Campus	Overdue charges (₹)	Collection from lost ticket	Cost recovered from lost books	Text book bank	Reprographic services	Total (₹)
Central Library, Chatha	14976	-	-	-	144564	159540
Faculty Library, R.S. Pura	23814	-	-	-	9285	33099
<b>Total</b>	<b>38790</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>153849</b>	<b>192639</b>

### Other services provided

Campus	News Clippings	Internet	Journal Online	e-Books	CD ROM Services	Miscellaneous (Documentation Service)
Central Library, Chatha	Yes	Yes	Yes	Yes	Yes	Yes
Faculty Library, R.S. Pura	--	Yes	Yes	Yes	Yes	Yes

### Training provided to Library Users:

S. No.	Title	Participants	Venue
1	Orientation programme pertaining to the use of CeRA for the post graduate students (PGS-501) organised on 10-11-2016	110	Central Library, Chatha
2	User education programme regarding how to use Library resources held on 02.01.2017	115	Central Library, Chatha



## Library Membership

Type of Members	Central Library, Chatha	Faculty Library, R.S. Pura
Faculty & Staff	206	67
Ph. D students	145	61
M. Sc. students	86	87
UG students	275	323
<b>Total</b>	<b>712</b>	<b>538</b>

## Subscription to Newspapers & Magazines

Campus	Newspapers	Magazines
Central Library, Chatha	12	10
Faculty Library, R.S. Pura	5	11
<b>Total</b>	<b>17</b>	<b>21</b>

Jammu region is blessed with varying agro-climatic conditions ranging from sub-tropical areas of Doda, Poonch, Rajouri, Udhampur, Kathua and mid hill-zone around Chenab River, *kandi* areas of Rajouri, Udhampur, Kathua and Jammu. The Research is being carried out by the scientists at the Faculty of Agriculture, Faculty of Veterinary Sciences and Animal Husbandry, School of Biotechnology and at different Research Stations/Sub-Stations/Centers spread over the entire Jammu province of Jammu and Kashmir state in the areas of agriculture, horticulture, livestock, dairy, fisheries and home science. Post graduate research also forms an important component of research activity. The research is being funded through co-ordinated research projects and other schemes of Indian Council of Agricultural Research (ICAR), state plan and non plan and various other sponsoring agencies viz. DBT, DST, MIDH, MES, NMPB, RKVY etc.

The research outputs accrued from different disciplines are reported as under.

### 3.1 Faculty of Agriculture

#### 3.1.1 Division of Plant Breeding & Genetics

Following varieties have been released at 23<sup>rd</sup> State Seed Sub-Committee meeting held on 23<sup>rd</sup> March, 2017 at Shalimar campus, SKUAST-Kashmir

##### Basmati Rice: SJR-129

- Basmati SJR-129 is a high yielding (40-45 q ha<sup>-1</sup>) aromatic variety of basmati rice developed through hybridization followed by pedigree method of selection.
- Basmati 129 is resistant to lodging due to its short stature and moderately resistant to stem borer, leaf folder and bacterial leaf blight.
- It has long slender grains of 7.3 mm coupled with other desirable basmati quality characters like Head Rice Recovery (56.3), intermediate amylose content (22.4), soft gel consistency and aroma.
- The variety matures 15 days earlier with yield superiority of more than 15% over Basmati 370.



SJR-129

##### JAUW 584

- The wheat variety JAUW 584 developed through modified pedigree method of selection with pedigree PDW 233/*Ae. crassa*//PBW 343 is suitable for timely sown irrigated conditions of Jammu province.
- It is high yielding (45-52 q ha<sup>-1</sup>) with superiority upto 10.47 per cent over the check (PBW 343).
- It is moderately resistant to yellow and brown rusts.
- It has excellent grain characters (bold grain, semi hard to hard texture, amber colour seed) with high protein content (12.06%).
- It matures in 140-155 days.



JAUW-584



### JAUW 598

- The wheat variety JAUW 598 developed through modified pedigree method of selection with pedigree of HD 4702/*Ae. sharonensis*//HD 2687 is suitable for rainfed areas of Jammu province.
- It is high yielding (40-42q h<sup>-1</sup>) with yield superiority over the checks 33.2 and 16.8 per cent over national checks (PBW 175/WH 1080).
- It is moderately resistant to yellow and brown rusts and blight disease.
- It has excellent grain characters (bold grain, semi hard to hard amber colour seed), high protein content (12.8%) over the check (PBW 175 and PBW 644) and moderately resistant to lodging



JAUW-598

### Toria RSPT-6

- RSPT-6 matures in 85-90 days.
- It fits well in Maize-Toria-Wheat rotation for rain-fed areas and short duration Rice-Toria-Wheat crop sequence in irrigated areas.
- It gives average yield of 10-12 quintal per hectare with oil content of 42.0 per cent.
- It is moderately resistant to aphid infestation, *Alternaria* blight and White rust.



RSPT-6

### Maize composite JMC-3

- Jammu Maize Composite-3 is yellow grain composite distinguishable through its morphological features such as small leaf angle, semi-drooping leaf attitude, canico-cylindrical ear shape and semi flint yellow grain type. The variety has average potential yield of 50-60 q h<sup>-1</sup>.
- It takes 130-135 days to maturity under mid hill ecology of Jammu region.
- It performs well at 90:60:30 fertilizer doses with highest B: C ratio of 2.93. The composite is moderately resistant to prevailing diseases viz., TLB and MLB.
- It has 10.3 percent protein, 2.2 percent crude fibre and 62.11 percent starch content.



JMC-3

### Raya RSPR-69

- The variety RSPR-69 of Raya developed through intra-specific hybridization (RLM 198 × Varuna) followed by selection method, is medium in height (180-200 cm) and early maturing (by 8 days) than check varieties.
- It matures in 135-145 days.
- The plants are tolerant to lodging.
- It is moderately resistant to aphid infestation and *Alternaria* blight and White rust.
- It has average seed yield of 15-16 quintal per hectare with oil content of 39.4 %.

Genetic dissection of heat tolerance in wheat using multiple biparental RIL mapping



RSPR-69

The studies were conducted for validation of already identified QTLs/ genes for GFD, CTD, GW and GY; Identification of novel QTLs/genes for heat tolerance relate traits Study of QTL x QTTL, QTL x QTL x Env. Inter. for heat tolerance ; Identification of set suitable markers for enhancing heat tolerance for Indian weights. The work is under progress.

### 3.1.2 Division of Agricultural Economics & ABM

#### Vocational Education in Agriculture-Need in Present Context

The Study on Vocational Education in Agriculture –Need in Present Context was conducted during the Year 2016-17. The area of the present study is SAU's of Jammu and Kashmir. It has been observed on the basis of whole study maximum numbers of student are in favour of vocational education in agriculture. More than 90 per cent of the respondents are directly or indirectly connected with vocational courses more specifically with elective courses. The girls participate equally and want to choose vocational courses as a subject. The SAU's of Jammu and Kashmir are providing vocational trainings to students in one way or the other way. Maximum number of students was having their own decision for choosing vocational education. The attitudes of the students towards Elective/Vocational Education/Specialization were that such courses help in finding a job more easily. The overall view of students clarifies the researcher about the importance of the vocational education during the degree programme. According to the student view, vocational education improves the level of education and personality. It helps in getting

job after the degree programme. The student of SAU's was satisfied with knowledge and skill acquired from elective courses/vocational courses at degree level. There are various courses related to vocational education in degree programme in SAU's of Jammu and Kashmir. Every student gave their view point in respect to different course like honey bee, mushroom, dairying, organic farming, bio fertilizer production etc. The students' response was both ways i.e. positive as well as negative with regard to above mentioned vocational courses degree their programme. The infrastructural facilities in terms of space, library manpower facilities and other facilities of these two SAU's are up to the mark. The maximum modern lab.equipments to increase the standard of various courses is available in each division

#### Diagnostic study of farmers in context of price spread analysis, marketing pattern and assessment of agricultural diversification in Chenani block of Udhampur district

Cultivation of vegetables is increasing their standard of living also. Farmers of the area are also trying to get returns from the growing of fruit crops. Climate of the area is also suitable for growing walnut, bei, apricot, plum, apple etc. Moreover, area is famous for the production of amlook which is having religious importance as it is used in prashads. So, government can take initiative and promote cultivation of fruit crops in the area by providing subsidies under horticulture schemes, which will definitely help the farmers of the area to increase their income. Establishment of vegetable assembling centre will definitely help them to overcome the above problem. Most of the respondents are facing the problem of lack of irrigation facilities, high labour cost and non-availability of labour during peak period. Low prices of agricultural goods, pest disease insect problem, drought and lack of credit facilities are other problems faced by the farmers. Few of the farmers were of the opinion that latest technical knowledge and availability of good quality seedlings in sufficient quantity is lacking in the area. High cost of pesticides is the other production problem. With regard to irrigation, the solution lies in the construction of water tanks/ ponds with the help of government. As per the views of the farmers, a tank of 20x25 sq feet with depth of 6 feet is sufficient and minimum 10 tanks are required for the area. The estimated



cost for the construction of each tank is to the tune of ₹1.5 lakhs which according to them is beyond their capacity. So government should provide a fund for the same. Farmers of Bashat area in particular are facing a specific problem that is road connectivity from their fields to roadside. The fields are not well connected to the road and the link is in dilapidated conditions which force them to transport the produce through human labour which in turn increases their marketing cost resulting in decline in their profit. They are demanding proper road connectivity from their fields to road. Another problem is regarding the facility of Kissan Credit Card. As per KCC rules they are getting only ₹60000.00 per hectare for the production of the crop whereas actual expenditure is more than that. They are of the view to increase the limit under KCC so that they can use high quality inputs to increase the production. Irrigation channels are also absent in the study area and they are in favour of such type of channels. Farmers are also demanding trainings and awareness camps regarding latest technology for improving the production and marketing of crops.

### Production and Marketing Management of Basmati Rice in Jammu region of J&K state

From the Jammu region of J&K state, the Jammu district was purposively selected for the present study. In the second stage, two major sub-divisions of the district in terms of production namely R.S. Pura & Marh were selected. Further, one block from each sub-division was selected viz: R. S. Pura&Marh development block. Thereafter, three villages from each selected block were chosen randomly for further study. A list of Basmati cultivators, in each of these selected villages was prepared and ten farmers from each village were again selected using random sampling method (without replacement). Thus, 60 cultivators were selected for collection of the required primary data. The primary data was collected from the cultivators using an especially prepared and pre-tested questionnaire-cum-schedule. The collected data is under further processing for achieving the objectives of study.

### 3.1.3 Division of Sericulture

#### Evaluation of Advanced Silkworm Breeding Lines

As part of breeding programme 26 silkworm parental breeds for spring and autumn season were

advanced through selfing. Twelve breeding lines (six lines each for spring/autumn season specificity) are in  $F_{11}$  generation of breeding. The identification of potential inbred lines will be undertaken for their involvement in the development of single /double cross hybrids. For spring specific parental lines, larval survival ranged between 92-95 % with single cocoon weight varying from 1.55-1.73 g and single cocoon shell weight falling between 0.30-0.35 g. In autumn specific parental breeds the larval survival ranged between 93-98 % with single cocoon weight varying from 1.59-1.74 g and single cocoon shell weight falling between 0.32-0.34g.

#### Conservation and Genetic Resource Management

Under mulberry genetic resource management 52 varieties are maintained at mulberry germplasm bank at Udheywalla Campus. An initiative was taken to assess the genetic diversity of 19 mulberry varieties by using PCR based molecular markers in collaboration with School of Biotechnology. The cluster analysis based on UPGMA separated the varieties in two major groups which further got sub divided into sub clusters. The study identified highly polymorphic RADPs for developing stress tolerant varieties in near future. Under silkworm germplasm genetic resources, 16 indigenous breeds are maintained and utilized for different research experiments by scientists and PG students of the division.

#### Effect of mulberry variety leaf on commercial characters of silkworm *Bombyx mori* L.

Nine mulberry varieties viz.  $T_1, Tr_4, Tr_8, V_1, S_{1531}, S_{1608}, S_{1635}, S_{1708}$  and ChakMajara were selected and their leaf was fed to commercial silkworm hybrid  $SH_6 \times NB_4D_2$  to find out the varietal difference in leaf on silkworm growth, development and economic commercial characters like larval survival, cocoon yield and post cocoon traits. The trial was conducted during autumn rearing season. Higher larval survival was obtained by feeding mulberry leaf of varieties  $S_{1635}$  followed by  $V_1$ . Higher cocoon yield was recorded on variety  $S_{1635}$  (15.750 kg) / 10000 larvae brushed. Higher single cocoon weight (1.906g), single shell weight (0.382g) and total filament length (909 m) was obtained on variety  $S_{1635}$ . Among nine mulberry varieties studied, mulberry variety  $S_{1635}$  can be recommended for commercial propagation at field level.



Bivoltine silkworm hybrid fed on S-1635 mulberry variety

### Screening of mulberry varieties for leaf rust (*Cerotelium fici*) resistance

Eleven popular mulberry varieties viz. BC<sub>259</sub>, Tr<sub>10'</sub>, Kanva<sub>2</sub>, ChakMajara, Chinese White, S<sub>1</sub>, S<sub>30</sub>, S<sub>36</sub>, S<sub>54</sub>, V<sub>1</sub> and Sujapur were screened for leaf rust residence. Mulberry variety S<sub>54</sub> scored highest PDI (30.6) followed by and BC<sub>259</sub> (24.5), V<sub>1</sub> (11.4), S<sub>1</sub> (10.7), CM (8.8), Tr<sub>10</sub> (7.7), CW (7.3), K<sub>2</sub> (6.6), Sujapur (5.5), S<sub>36</sub> (3.3) and S<sub>30</sub> (1.1). Mulberry variety S<sub>54</sub> followed by



Mulberry plants of variety S54

variety BC<sub>259</sub> were found more susceptible to leaf rust (*Cerotelium fici*) disease. Variety S<sub>30</sub> was identified as rust resident cultivar with a PDI of 1.1. Mulberry variety S<sub>30</sub> recommended as rust (*Cerotelium fici*) resistant cultivar.

### 3.1.4 Division of Agricultural Extension Education

#### Determinants of income Diversification of family Farm Household for livelihood Security in J&K

A total sample of 630 farming families households from four agro-ecological zones were selected through multi-stage random sampling. A large majority of the respondents (78.26%) were marginal farmers and among these respondents 28.89 percent of the sample farm household possessed land holding ranging between 0.002-0.25 ha. From the 89.10 percent of the mobile holders only 12.60 percent farming families had internet connection in their phone. The major on-farm activity practiced by the rural farm households were crop production and dairy activity and major off-farm activities were government job, labour and private job. The workforce in on-farm activity was highest in temperate zone (49.25%) and from off-farm activity it was highest in intermediate zone (42.23%). From the selected variables, education, size of family members, fragments of land were the push factors towards off-farm economic activities. The overall average gross income from on-farm enterprise was Rs. 77, 623 per annum and from off-farm activities the average income was Rs. 1,17,643 per annum. The cropping pattern which was mostly followed by the farming family household in J&K state was maize-wheat followed by miscellaneous crops. Besides cropping pattern, the major horticulture crops i.e. walnut and apricot were mostly planted in temperate and cold arid zone respectively.

#### Impact Evaluation of Integrated Pest Management Technologies

The positive impacts of the IPM technologies are development and adoption of resistant varieties of rice crop in Punjab, and insecticide and fungicide free rice cultivation in the subtropics of the Jammu region as well as the Kashmir region of the Jammu and Kashmir state. In case of vegetable crops except in okra, none of the university developed/ recommended varieties were cultivated. The estimated total pesticide



consumption in Punjab was higher in rice at about 6000 tonnes (2.85 million ha) and in cotton it was 732 tonnes (0.27 million ha) in 2016. Pesticide use per ha ( active ingredients) was the highest in apple at 23.787 kg, followed by cotton at 2.660kg, summer vegetables ( brinjal 2.448kg, tomato 1.619kg and okra 1.061kg), and rice (Punjab =2.137kg and J&K= 1.190 only herbicides). Thus apple alone consumes estimated 3413 tonnes(on an area of 143.5 thousand ha in the Valley). The field environmental impact quotient (FEIQ) of the pesticides was the highest in apple at 511.1, followed by cotton (Bt 86.6, non-Bt 103.4 and desi 83.8), rice in Punjab (ranging between 45.9 and 53.5) and vegetables (32.1). The impact of IPM programmes in terms of reducing pesticide use frequency has neither been achieved in Punjab nor in the vegetables in the subtropics of Jammu region. The farmers had also applied extremely hazardous pesticides (some of these are banned for use in vegetable crops). The farmers and applicators did not wear protective clothing while handling, mixing and spraying pesticides, thus causing localized, systemic and neurotoxic problems to them.

### Climate Resilient Sustainable Agriculture in Rainfed Farming areas of J&K

The data were collected from all the 51 villages of Bhalwal block. From each village of Bhalwal block a random sample of 20 farmers was drawn. After calculating the vulnerability index of each village, 25 most vulnerable villages were delineated and were termed as vulnerable villages and the rest of the villages were termed as non-vulnerable villages for further analysis. The findings of the study further revealed that a whopping 83.4 per cent of respondents from vulnerable villages were marginal farmers. About 30 per cent of respondents from vulnerable villages were sustaining their livelihood on a land holding of less than 0.25 hectare (5 kanal). The results further showed that input factors like use of FYM, DAP, MOP, adequate seed rate and irrigation availability were significantly affecting the productivity of wheat, bajra, maize and paddy crop in Bhalwal block.

### 3.1.5 Division of Agronomy

#### Evaluation of Nano N, P, K and nano bio-potash in wheat

To study the effect of traditional and Nano

formulations (granular and liquid N, P, K) and nano bio-potassium formulations on growth and yield wheat the experiment was initiated in the rabi season of 2015-16 at Research Farm of Farming System Research, Chatha. It consisted of six treatments. The first year of expt. has been completed and second year data recording is in progress.

#### Evaluation of Bolt-G in transplanted rice

To study the effect of formulation (Bolt-G) on growth and yield transplanted rice, the first year of expt. has been completed and second year data recording is in progress

#### Evaluation of Nano-Bio Zinc in transplanted rice

To study the effect of traditional and Nano-bio Zn formulations on growth and yield of basmati rice. First year experimental data analysis is in progress.

#### Evaluation of Nano-Bio N,P, K in transplanted rice

To study the effect of traditional and Nano bio formulations (N, P, K) on growth and yield of basmati rice. First year experimental data analysis is in progress

#### Weed management in rice-wheat-green gram cropping system under conservation agriculture

The *Alternanthera raphanoxeroides* and *Caesulia axillaris* were significantly higher in transplanted rice as compared to direct seeded rice. However, density of *Phyllanthus niruri* and *Physalis minima* were significantly higher in direct seeded rice as compared to transplanted rice. Amongst all the tillage and weed management combinations, highest net returns and B: C ratio was recorded in direct seeded rice and integrated weed management (pendimethalin @ 1 kg/ha as PE fb. bispyribac-sodium @ 25 g/ha at 25 DAS fb. HW at 45 DAS) treatment combination.

#### Weed management options in high value basmati rice-potato-french bean cropping system under organic farming

The *Cyperus* spp. and *Echinochloa* spp. were effectively controlled by mustard seed meal 2.5 t/ha than all other organic weed management treatments in transplanted rice. The highest number of panicles/m<sup>2</sup>, grain yield and straw yield of transplanted rice were recorded with mustard seed meal 2.5 t/ha + one hand weeding which was statistically at par with rice bran 2.5 t/ha + 1 hand weeding, rice husk extract +



1 hand weeding and mustard plant extract +1 hand weeding and weed free.

### Evaluation of different herbicide mixtures for post-emergence weed control in maize and residual effect on succeeding mustard under rainfed conditions

Tembotrione 100 g/ha + atrazine 500 g/ha as POE recorded lowest weed biomass which was significantly lower than other herbicidal treatments. The highest grain yield of maize was recorded with tembotrione 100 g/ha + atrazine 500 g/ha as POE which was statistically at par with tembotrione 100 g/ha + halosulfuron 67.5 g/ha as POE, atrazine 1000 g/ha as PE + tembotrione 100 g/ha as POE and atrazine 1000 g/ha as PE + metribuzin 250 g/ha as POE. Highest net returns and B.C ratio were recorded in with tembotrione 100 g/ha + atrazine 500 g/ha followed by atrazine 1000 g/ha + tembotrione 100 g/ha and atrazine 1000 g/ha + metribuzin 250 g/ha in maize.

### Effect of irrigation methods and weed management on weed flora dynamics in direct-seeded rice and wheat

The lower weed density and weed biomass were recorded in flooding irrigation as compared to sprinkler. The density of *Caesulia axilaris* was higher in flooding irrigation as compared to sprinkler. However, density of *Echinochloa* spp., *Cynodon dactylon*, *Digitaria sanguinalis*, *Setaria glauca*, *Phyllanthus niruri*, *Physalis minima*, *Euphorbia* spp. and *Cyperus* spp. were higher in sprinkler irrigation method as compared to flooding irrigation. The lowest total density of grassy and broad-leaved weeds were recorded in pendimethalin 1000 g/ha (PE) + bispyribac-sodium 25g/ha + ethoxysulfuron-ethyl 18 g/ha as POE which was statistically at par with pendimethalin 1000 g/ha (PE) + penoxsulam + cyhalofop-butyl 135 g/ha as POE and significantly lower than all other herbicidal treatments. Different irrigation treatments had non-significant effect on growth, yield attributes and grain and straw yield of rice. The higher grain yield was recorded in pendimethalin 1000 g/ha (PE) + bispyribac-sodium 25g/ha + ethoxysulfuron-ethyl 18 g/ha as POE which was statistically at par with pendimethalin 1000 g/ha (PE) + penoxsulam + cyhalofop-butyl 135 g/ha as POE.

### Weedy rice management strategies in basmati rice (*Oryza sativa*) under subtropical irrigated conditions of Jammu

Stale seed-bed with glyphosate @1.5 kg/ha or paraquat @0.8kg/ha application prior to transplanting



Seed shattering of weedy rice



Layout of stale seed bed



Herbicide spray on germinated weedy rice



After spray



has been found to be most effective and economical method for the control of weedy rice in transplanted rice

### Effect of graded levels of N, P & K on growth, yield and quality of fine rice (*Oryza sativa*) cultivar under subtropical conditions

Application of  $N:P_2O_5:K_2O @ 45:25:15$  kg/ha was found to be the most suitable as it gave higher grain and straw yield along with higher net returns as well as B:C ratio

### Effect of zinc ferti-fortification on yield and quality of basmati rice under subtropical region of Jammu

Application of 4 % Zn through  $ZnSO_4 \cdot 7H_2O$  coated Urea + 0.2 % Zn Foliar spray ( $ZnSO_4 \cdot 7H_2O$ ) + recommended P and K has been found better in recording higher and economical yields with better Zn content in grains



Field view of zinc ferti-fortification trial in rice

### Effect of different weed management practices on growth and yield of rice under aerobic conditions

Application of pendimethalin @ 1.0 kg/ha

(PE) fbispyribac-sodium @ 30 g/ha at 25 DAS fbfenoxaprop-p-ethyl @ 60 g/ha at 30 DAS or pendimethalin @ 1.0 kg/ha (PE) fbazimsulfuron @ 25 g/ha + fenoxaprop-p-ethyl @ 60 g/ha at 30 DAS were found to be the economical treatments for broad spectrum weed control in direct seeded rice under aerobic conditions.

### Effect of times of transplanting and nitrogen levels on productivity of fine rice SJR-129 in irrigated Sub-tropics of Jammu and Kashmir

Newly developed university variety SJR-129 can be transplanted up to 30<sup>th</sup> July with 60 kg N/ha for releasing higher and economical yields under subtropical conditions of Jammu

### Productivity and profitability of rice establishment methods under varying INM practices and its residual effect on succeeding wheat crop

For realizing highest economical yield of fine rice Pusa-1121, the crop has to be established through mechanical means with recommended dose of fertilizer

### Effect of dates of transplanting, nitrogen levels and foliar application of potash on growth, yield and quality of basmati rice

Fine rice variety, Pusa-1509 transplanted on 15<sup>th</sup> July, with N application of 90 kg/ha and foliar application of potash (2%) realized higher grain yield with improvement in head rice recovery under subtropical conditions of Jammu

### Studies on time of application of imazethapyr and its ready mix combination with imazamox (Odyssey) against weeds in blackgram

Among the herbicidal treatments, the lowest weed density and weed biomass were recorded with pre-emergence application of imazethapyr + pendimethalin (RM) 1000 g/ha which was statistically at par with post-emergent applications of imazethapyr 80 g/ha and imazethapyr + imazamox 80 g/ha. The highest grain yield was recorded with imazethapyr + pendimethalin (RM) 1000 g/ha which was statistically at par with the all the post-emergent applications of herbicides. Highest net returns and B.C ratio were recorded in with imazethapyr + pendimethalin (RM) 1000 g/ha as PE followed by imazethapyr 70 g/ha



as POE. There was no visual phytotoxicity observed in any of the herbicidal treatments in blackgram as well as in the succeeding transplanted rice crop. The imazethapyr + pendimethalin (RM) 1000 g/ha as pre-emergence or imazethapyr 70 g/ha as post emergence or imazethapyr + imazamox (RM) 70 g/ha as post emergence is recommended for most effective control of the weeds in summer blackgram in blackgram-rice cropping system.

### On-Farm Research on weedy rice management

The stale seed-bed with glyphosate 1.5 kg/ha or paraquat 0.8 kg/ha was found most effective in controlling the weedy rice in transplanted rice. The highest grain yield, net return and B:C ratio were obtained under stale seed-bed with glyphosate. The stale seed-bed technique with glyphosate 1.5 kg/ha or paraquat 0.8 kg/ha at 10-15 days before transplanting is recommended for most effective control of the weedy rice in transplanted rice.

## Agrometeorology

### Agro climatic Characterization:

Long term data of Jammu region were analyzed for initial and conditional probability of rainfall for crop planning.

### Crop weather relationship in wheat

A field experiment is conducted in order to develop the crop weather relationship in which four sowing environments  $E_1$  - 25<sup>th</sup> Oct.,  $E_2$  - 14<sup>th</sup> Nov.,  $E_3$  - 04<sup>th</sup> Dec. &  $E_4$  - 23<sup>rd</sup> Dec.), three varieties ( $V_1$  - HD 2967,  $V_2$  RSP 561  $V_3$  - Raj 3077) along with four replications. Plot Size is 6 x 3 m. Based on this data various weather based agro meteorological indices are developed. Further using this data the correlation between weather parameters and yield at different phenophases will be done and thereafter the relationship between crop and weather parameters will be developed.

### Crop Simulation Modeling in wheat

In the above experiment of wheat crop data is also recorded for crop weather simulation modeling in wheat crop using CERES- Wheat (DSSAT)

### Insect pest weather relationship

For developing insect pest and weather

relationship particularly Aphid in mustard crop. A field experiment is conducted in order to develop the insect pest weather relationship in which three sowing environments ( $E_1$  - 20<sup>th</sup> Oct.,  $E_2$  - 4<sup>th</sup> Nov. & 19<sup>th</sup> Nov., 2016), three varieties ( $V_1$  - NRCDR-2,  $V_2$  - DRMR-IJ31 &  $V_3$  - RSPR01) and two sowing methods ( $M_1$  - Broadcasting,  $M_2$  - Line Sowing) with three replications in mustard crop during *rabi* 2016-17.

### Weather based Agro Advisory

The Agromet Research Centre SKUAST-J, Chatha issues bi-weekly weather forecast based agro-advisories (Crop weather bulletins) through various means of communications including electronic and print media, personnels of the line departments, KVKs and SMS for the farmers of sub-tropical area of Jammu region encompassing districts of Jammu, Samba and parts of Kathua and Reasi having both the rainfed and irrigated agro-ecologies.

### Gramin Krishi Mausam Sewa, AMFU, Chatha, Jammu

416 Bulletins (Weather forecast based agro advisory) were issued, 104 each for Jammu, Kathua, Reasi & Samba district in English. 60 mobile SMS (weather forecast based advisory) were delivered to farmers of Jammu, Kathua, Reasi & Samba district in Hindi & English through Kisan Portal while 210 SMS (weather forecast based advisory), 105 each in English & 90 in Hindi to farmers of Jammu, Kathua, Reasi & Samba district were delivered through imdagrimet.gov.in.





### Dissemination of Agromet advisory

Bulletins were disseminated biweekly personally by messenger through display board. Email & fax to state departments officers and mass media (newspapers, radio station & TV Channels)

### Economic Impact assessment

In wheat crop, 4 irrigations were saved each on presowing, tillering, booting & flowering. Total saving is Rs 3600-4000 @ Rs 900-1000/acre. In Mustard crop, 2 irrigations were saved each on presowing & flowering. Total saving is Rs 900-1000 Rs 900-1000/acre. In Pea crop 2 irrigations were saved each on pre-sowing & flowering. Total saving is Rs 1800-2000 Rs 900-1000/acre. In Maize crop 4 irrigations were saved each on presowing, early vegetative, Tasseling & Silking. Total saving is Rs 3600-4000 @ Rs 900-1000/acre. In Rice crop 5 irrigations were saved each on sowing, Transplanting, Seedling establishment / Tillering, Panicle initiation & Milking. Total saving is Rs 4500-5000 @ Rs 900-1000/acre

### Farmer Awareness programme

3 farmers awareness programmes were organized on "Climate, Weather and Farmer" at Village ChakDulma, ChakLala under block Samba, district Samba on 3rd February, 2017 and Village Pathwal under block Dayalchak, district Kathua on 6th February.

### National Initiative on Climate Resilient Agriculture (NICRA)

The temperature variations during the period

1985 to 2016 at Kathua were worked out. It was observed that the annual maximum and minimum temperatures showed increasing trends by 0.008 and 0.023 °C, respectively though the increase is non-significant. The mean annual maximum and minimum temperature was 29.3 and 16.5 °C, respectively. The trend test indicated that there is a non-significant decreasing trend in the post-monsoon rainfall over Kathua @ 0.20 mm per year. Agromet advisories are prepared biweekly (Tuesday and Friday) in Hindi with active collaboration between KVK Kathua and AICRPAM-NICRA, SKUAST-J, Chatha. Farmers from the adopted villages viz. Sherpur, Chappaki and Dhalli adopted under AICRPAM-NICRA when asked to rate AAS in terms of reliability (the skill of forecasting terms of lead time and accuracy) and helpfulness (the decision taken on farm level operations such as sowing/harvesting and investment in farm investments such as irrigation, fertilizer, insecticides, pesticides, etc based on weather forecast), more than two-third of the farmers in the villages agreed that AAS is reliable and enables them to plan their farm level operations. Saving of irrigation based on rainfall forecast also work out in all the selected villages under NICRA- AICRPAM.

### Forecasting Agricultural Output Using Space, Agro Meteorology and Land Based Observations (FASAL)

District wise Crop Yield Forecast (F1) for Wheat (Rabi 2016-17: Crop yield forecasting (F1) was carried out for 5 selected districts (Jammu, Udhampur, Doda, Rajouri, and Kathua) during *rabi* season for Wheat crop. The grain yield was found to be predicted were 19.04, 12.39, 18.55, 15.43 and 25.06 q/ha for Jammu, Udhampur, Doda, Rajouri, and Kathua district, respectively during rabi 2016-17 in Jammu region of J&K state. The sowing of wheat crop under rainfed condition in Jammu region was affected due the long dry spells (27<sup>th</sup> September, 2016 to first week of January, 2017). However, in irrigated areas the sowing of wheat crop was done on timely and it is near to the flag leaf stage. The wheat crop yield forecasting (F2) was carried out for 5 selected districts viz; Jammu, Udhampur, Doda, Rajouri and Kathua). The predicted wheat yield during F2 forecast were 21.17 q ha<sup>-1</sup> for Udhampur district. The lowest yield of (17.30 kg ha<sup>-1</sup>) was predicted for Doda district. Crop yield forecasting



(F3) was carried out for 5 selected districts (Jammu, Udhampur, Doda, Rajouri, and Kathua) during *rabi* season for Wheat crop. The grain yield predicted was 19.78, 15.14, 11.77, 19.31 and 23.33 q/ha for Jammu, Udhampur, Doda, Rajouri, and Kathua district, respectively during rabi 2016-17 in Jammu region of J&K state

## Farming System Research

### Identification of need based alternative cropping system under assured irrigated conditions of Jammu region

The diversified cropping system like rice-broccoli-mash, rice-potato-bhindi, rice-oat (fodder)-oat (seed) and rice-cauliflower-cucumber are the better choice for obtaining higher net return of Rs. 388582, 376452, 366798 and 360525 as compared to existing rice-wheat system (49111). Whereas system profitability of (1065 Rs/ha/day) in Rice-broccoli-mash, Land use efficiency (92.60%) in Rice-Wheat-GM and Production efficiency (84.41 kg/ha/day) in Rice-cauliflower-Cucumber was recorded higher under diversification and intensification of rice based cropping under irrigated condition of Jammu region. However, soil organic carbon content was buildup upto 6.4gm/kg soil under rice-berseem and rice-wheat-green manuring over initial value of 5.5 gm/kg soil which was 16% higher over initial level. Available N and K was recorded higher under rice-berseem, while available P was higher under rice-wheat-green manuring sequence, respectively.

### Development of Organic Farming package for system based high value crops

Organic farming package for high value cropping sequence like rice-potato-frenchbean is being developed for the last 5 years and found that the REY under the treatment where 100% recommended N was applied through different organic sources each equivalent to 1/3 of recommended N through FYM +vermi-compost +non-edible oil cake range varied from 14.54 to 16.51 t/ha with highest in T6 where organics applied with biofertilizers which was 32% higher from 100% RDF (T7) was applied through fertilizers alone. The system net return varied from Rs.  $141.72 \times 10^3$ / ha to Rs.  $210.39 \times 10^3$ / ha under organic treatments, while net return of Rs.  $145.43 \times 10^3$ / ha was recorded under T7, where 100% recommended

dose of NPK was applied through inorganic fertilizer respectively. Soil organic carbon content was recorded higher in all the organic treatments which varied from 5.6g/kg soil to 8.0 g/kg soil over initial value of 5.1 g/kg soil. Available NPK content in soil was slightly enhanced where organic sources like FYM/vermi-compost/neemcake were applied. The microbial count was affected by the organic treatments, initial population of Fungi, bacteria and actinomycetes in experimental area was recorded 6.0, 12.0 and  $10.0 \times 10^5$  CFU/g soil, respectively which was enhanced to all the treatment after 5th year of study period. The maximum count of Fungi ( $28 \times 10^5$  CFU/g) and bacteria ( $55 \times 10^5$  CFU/g) were recorded in plot where 50% recommended N through vermi-compost + bio-fertilizers + rock phosphate to substitute the P requirement + PSB were applied to each crop while the population of actinomycetes in the soil was recorded higher ( $17 \times 10^5$  CFU/g) under treatment T6 where different organic sources like (FYM + vermi-compost + non-edible oil cake ) with VAM was applied to each crop.

### Development and validation of on station Integrated Farming System research Model for small and marginal farmer toward livelihood security.

One ha Integrated Farming System (IFS) model comprising of cropping systems (rice-wheat-green gram, rice-potato-black gram, rice-mustard-green gram and Berseem+ oat-maize+ sorghum with hybrid Napier on bund) in 0.52 ha + horticulture (Guava as main crop, Lemon & mango (Amarpali) as boundary crop and broccoli, Knolkhol, Cabbage, Cauliflower, Radish, okra as intercrops) in 0.32ha + dairy (2cows, 1 buffalo heifer) including  $2\text{m}^3$  bio-gas and vermicompost unit in 0.08 ha + fish cum poultry in 0.1 ha) + mushroom (button & dhingri) developed for the Mid to high altitude plain zone (JK-1) in Western Himalayas provides round the year average production (23.35 t REY/year), profit (Rs. 3.05 lakhs/year) and employment (595 man days/year). The maximum average production and profit was realized in June. While employment was in May month signifying the work even during lean period. The model also meets around 75% of inputs required for different enterprises within the farm besides providing all the commodities (cereals, pulses, oilseeds, vegetables,



fruits, mushroom, milk, egg and fish) required for the farm family. The value addition with intervention at small scale of the produce realised in the Integrated Farming System Model has great potential. The profit of Rice from raw to processed has shown a proportional increase of 41%. Similarly Turmeric and Wheat flour has shown a profit of Rs. 1430 and Rs. 5475 realised through value addition, which was 119% and 90% higher than unprocessed. The overall increase of the profit through value addition has been realised to R. 13805, which is 57% higher than without value addition.

### 3.1.6 Division of Agricultural Engineering

#### Establishment of Testing Centre for Testing Of Farm Implements & Machinery at SKUAST-Jammu (J&K)

The purchase of testing machinery and equipments, prime movers, test van and related equipments have been procured. The building of Testing Center has been completed. The field for testing has been developed. The guidelines for testing, testing fee have been notified. The firms have been approached to send machinery for testing.

#### Establishment of Micro Irrigation Systems Under On Farm Water Management (OFWM)

<p><b>Semi-permanent Sprinkler Irrigation System:</b></p> <p>a) Division of Agricultural Engg 1.5 ha            b) Seed Production Farm Chakroi 1ha            c) Dryland Research Station Dhainsar 1ha            d) KVK R. S. Pura 1ha            e) KVK Kathua 1ha            f) Horticultural Sub Station Raya 1ha            g) Pulses Research Sub Station Samba 1ha            h) KVK, Rajouri 1ha            i) KVK Poonch 1ha</p>	<ul style="list-style-type: none"> <li>The system have been installed and demonstrated on 9.5 ha area.</li> </ul>
<p><b>Drip Irrigation System (Wide Spacing)</b></p> <p>a) Faculty of Agriculture Chatha 2ha            b) Regional Agriculture Research Station, Rajouri 1ha            c) Horticultural Sub Station Raya 1ha            d) KVK Kathua 1ha</p>	<ul style="list-style-type: none"> <li>The system have been installed and demonstrated on the selected sites.</li> </ul>
<p><b>Large Volume Irrigation System(Raingun)</b></p> <p>a) Faculty of Veterinary Sciences, R. S. Pura for fodder crop production on 2 ha area with rainguns            b) Faculty of Agriculture, Chatha for fodder crop production on 2 ha area with rainguns</p>	
<p><b>Land Leveling and Construction of the Field Channel</b>            More than 30 ha land area has been levelled and also field channel developed at FoAChatha and Seed Production Farm, Chakroi.</p>	
<p><b>Secondary Storage Structure</b></p> <p>a) Faculty of Agriculture, Chatha</p>	<p>A secondary storage structure of approximately triangular shape of dimensions 90 m, 65 m and 84 m with 1.20 m depth has been constructed at Division of Agril. Engg. experimental field Chatha with a capacity of 3100 m<sup>3</sup> at the lowest elevation with proper inlet and out let arrangement. The structure is fed by surface and sub surface flow. A 30 cm elevation difference was provided at inlet and outlet point so that in case excess rainfall the surplus water will be safely disposed off from the outlet which is connected in to the cement concrete main drain near the water storage pond.</p>



<p><b>Drip Irrigation System (Closed Spacing)</b> Earlier it was proposed to installed at Faculty of Agriculture, Chatha 1.42 ha. Now, it is shifted to KVK, Reasi vide No: AUJ/AED/16-17/F-15/662-67 dated:10/11/2016</p>	<p>The drip irrigation system (closed spacing) has been installed and demonstrated at KVK, Reasi.</p>
<p><b>On Farm Drainage</b> a) Faculty of Agriculture, Chatha 10 ha</p>	<p>A drainage network consisting main and sub-main drainage channels was developed in proposed area of organic farming, existing experimental field of Division of Agricultural Engineering with number of culvers on the farm road using RCC pipe of 2' dia. The size of main drain is of width 1.20 m, depth 0.75m and a total length of 1280 m (1.28 km) and 0.6 km sub-main drainage channel is of width 0.60 m and length 600 m(0.60 Km). This total length of drainage network was developed of about 1.88 Km. Initially for easy in construction drainage network was developed in rectangular shape but due course of time it will stabilize in trapezoidal shape. Drainage system is working satisfactorily as observed during previous rainy season. RCC pipe culverts were developed at different locations of the farm roads and entry point of the field.</p>

### Demonstration of Soil and water Conservation Technologies For improving Agriculture Systems in Rainfed Area of Jammu District

For creation of water harvesting and recharging structures and efficient utilization of harvested water for improving livelihood minor equipments were purchased. The further studies are in

### Development and evaluation of automatic timer based variable speed device for sprinkle system

The Automatic Timer Based Variable Speed Device (VSD) developed for centrifugal pumps in the project has been tested *initially under laboratory conditions and after testing-modification-testing procedures and successfully testing the prototype; now it has been tested under the field conditions*. 5 hp and 10 hp irrigation pumps were operated for one hour with variable speed device (VSD) and compared the result with existing irrigation pump. The result shows that there is a significant energy saving with the variable speed device in comparison to existing centrifugal pump. Energy consumption by 5 hp and 10 hp irrigation pumps with VSD were 3.67% and 1.77% less with respect to existing irrigation pumps respectively. 5 hp irrigation pump with VSD was operated for one hour at different frequency and 10 minutes time intervals at the rated voltage of 350 volt. It was observed that when irrigation pump is used with VSD, energy consumption was 22.98% less as compared to existing irrigation pump. Similarly, 10 hp irrigation pumps is operated at various frequencies for 10 minute intervals for one hour duration. Energy consumption was 40.43% less when irrigation pump is operated

with VSD as compared to existing irrigation pump.

### 3.1.7 Division of Plant Pathology

#### Exploration of plant growth promoting rhizobacteria, antagonistic and plant pathogenic microbial resources from high altitude agro-climate/ cropping system of Jammu and Kashmir state for sustainable agriculture.

Fifty -two isolates of *Bacillus* spp. collected from different high altitude agro-climate/cropping system. The sequences of selected isolates of *Bacillus* spp. submitted to National Centre for Biotechnology Information (NCBI), GenBank. Out of total only, four (BT1, KotG1, GP1 and RiBe1) showed showed plant growth promotion traits like production of indole acetic acid, siderophore, phosphate solubilization and production of hydrolytic enzymes and bio-control potential (*in-vitro*) against soil borne pathogens *viz.*, *Sclerotiumrolfsii*, *Fusariumoxysporumf. sp. lycopersici* and *Rhizoctoniasolani*. Plant growth-promoting rhizobacteria (BT1, KotG1, GP1 and RiBe1) and plant growth-promoting fungal (*Trichodermaasperellum*) strains showed growth promoting characters such as increase in root length, shoot length, germination and vigour index of tomato seeds when tested singly or in combinations.

#### Degradation and effective utilization of agrowastes through technologies evolving mushroom or Macro-fungi.

Surveys were conducted in Rajouri, Doda, Udhampur districts of Jammu to collect the edible wild mushroom flora. The collected samples have



been identified as *Flammulina velutipes*, *Russula* spp., *Helvella* spp., *Ramaria* spp., *Coprinus* spp. etc. 27 types of wild mushrooms were collected and their cultures, dried specimen have been submitted to DMR Solan. Antioxidant profiling viz., 2,2-Diphenyldipicrylhydrazil radical (DPPH) scavenging activity, Maximum reducing power and Highest chelating ion power as well as Enzymatic profiling viz. activity of cellulase, xylanase, laccase was assayed in wild edible mushrooms and these mushrooms have been found to be rich source of antioxidants.

### Isolation, identification and characterization of Plant viruses of solanaceous crops in different agro-climatic zones of Jammu region

Survey was conducted in different locations of low altitude subtropical areas of Jammu region to assess the incidence of tomato leaf curl virus. In Jammu district the incidence of the disease ranged from 29.6-45.6 percent while in Kathua and Udhampur the incidence of the disease ranged from 31.2-39.2% and 33.6-42.4 percent respectively. While in case of potato leaf roll virus the incidence of the diseases ranged from 20-37.6 percent in Jammu district while in Kathua and Udhampur districts the incidence of the disease was 33.6-44.8 percent and 25.6-33.6 percent respectively. Total genomic DNA was extracted from infected leaves and extraction was carried out by CTAB method. Tomato leaf curl viral DNA was amplified in PCR using ToLCV specific primers. The virus was detected through PCR and the sequences were submitted to NCBI gene bank. The isolates collected from different locations showed very close (95.10 to 99.6 %) homology among themselves with respect to nucleotide sequence and revealed 99% homology with tomato leaf curl New Delhi virus (Accession No. U150152), tomato leaf curl New Delhi virus Junagadh isolate (Accession No. KF515617), tomato leaf curl New Delhi virus Bhavnagar isolate (Accession No. KF515616), tomato leaf curl New Delhi virus isolate PUMIARI (Accession No. JN129254), tomato leaf curl New Delhi virus Pakistan solanum isolate (Accession No. DQ116885) and 98% homology with tomato leaf curl New Delhi virus isolate TNUDUBG1 (Accession No. KM383744), tomato leaf curl New Delhi virus Uttar Pradesh isolate (Accession No. KC207815) and tomato leaf curl New Delhi virus Auranagabad isolate (Accession No. GU112088). The virus was isolated

from cold arid region of Leh, Ladakh. The incidence of the disease was narrow and restricted to some areas only. The disease incidence ranged from 13.33 to 20.00 per cent. Alignment analysis of the amplified PCR fragments showed that the virus shared sequence homology of 99% with tomato leaf curl China virus isolates LZ1 (Accession No. KU980924), tomato leaf curl China virus isolate G16 (Accession No. AJ558119), tomato leaf curl China virus isolate YL1 (Accession No. KU 980923), tomato leaf curl China virus isolates G18 (Accession No. KU980917) and tomato leaf curl Vietnam isolate (Accession No. AF254053) and 98% homology with tomato leaf curl China virus isolate NN1 (Accession No. KU980918), tomato leaf curl Vietnam virus isolate Haiduong 122 (Accession No. GQ338768) and tomato leaf curl Vietnam virus segment DNA (Accession No. DQ541705). For detection of potato leaf roll virus, the samples were collected from the seed multiplication farm, Kotli Mianfateh of Jammu region. Three varieties namely Pukhraj, Kufri Badshah and Kufri Sindhuri were grown in the farm for production and distribution of seeds to the farmers. The percentage of Disease Incidence in Pukhraj was 14.00% while in Kufri Badshah it was 9% and in Kufri Sindhuri it was 6%. The infected samples were brought in the laboratory for detection of virus by serological methods (ELISA).

### 3.1.8 Division of Agroforestry

#### Inter-cropping studies on Poplar plantation under sub-tropical conditions of Jammu

Five clones of poplar viz. Udai, WSL-22,  $S_7C_{15}$ , WSL-32,  $G_{48}$  were planted in the year 2012 in the Research Farm, SKUAST-J at a spacing of 5m x 4m to study the growth and biomass production of poplar clones and performance of different intercrops under their canopy. On the basis of 5 years' growth performance, the maximum tree height of 14.29m was observed in the clone Udai which was significantly different from other clones. WSL-22 and  $S_7C_{15}$  clones recorded a height of 13.45m and 13.29m, respectively but were statistically alike. Minimum height of 12.55m was recorded in  $G_{48}$  which was statistically at par with height (12.68m) recorded in WSL-32. The maximum DBH of 22.15cm was also observed in Udai clone followed by WSL-32 (20.82 cm) and  $S_7C_{15}$  (19.56cm), respectively. The values of diameter recorded in



WSL-22 ( 19.50 cm) and S<sub>7</sub>C<sub>15</sub> (19.56 cm) clones were statistically at par with each. Turmeric and ginger intercrops has been planted in the month of May, 2017 under the canopy of poplar trees to evaluate their performance under shade.

### To study the growth and productivity of *Meliacomposita*

To estimate the growth and performance of *Meliacomposita* under sub-tropics of Jammu, seedlings of the species were planted at a spacing of 6m x 4m in the experimental area of division of agroforestry in the year 2016. Two treatments i.e. pruned and unpruned seedlings were assessed for growth parameters after one year of planting. The average height of the pruned trees was higher (3.42 m) compared to un-pruned trees (2.62 m). The diameter of the pruned trees was also higher (46.06 cm) compared to un-pruned trees (41.46 cm).

### Conservation, Production and Sustainable Management of Shatavar (*Asparagus racemosus* Willd.).

Accession IC471923 of Shatavar was found superior over others in terms of higher dried tuber yield under subtropics of Jammu. Wide range of variability is observed in number of tubers per plant, fresh and dry tuber yield parameters, which can be exploited for crop improvement. Application of vermicompost @ 2t/ha alongwith 30kg N per ha (½ of recommended dose of N) and 30kg P or FYM @ 6t/ha alongwith 30kg N per ha (½ of recommended dose of N) and 30kg P is beneficial to increase tuber yield in Shatavar. The crop can be raised as rainfed under subtropical plains of Jammu.



Field evaluation of different accessions



Dried tubers of different accessions

### 3.1.9 Division of Entomology

#### AICRP on Honeybee and Pollinators

##### Pollination studies in cauliflower

Sixteen species belonging ten families under five order were observed visiting the blossoms of cauliflower seed crop. Among the insect pollinators, *A. dorsata* was the predominant pollinator followed by *A. mellifera*, *A. cerana*, *A. florea*, *Halictus sp.*, *Megachile sp.* and *Andrena sp.* were the dominant flower visitors. The order of their predominance was *Apis dorsata* > *A. pismellifera* > *Apis cerana* > *Apis florea* > others. The seed yield of 5.63/ha and 3.23q/ha was recorded in the plants kept under open pollinated and bee pollinated plants, respectively. The seed yield was 2.34q/ha under the caged condition.

##### Pollination studies in coriander

The honeybees viz. *A. mellifera*, *A. dorsata* and *A. cerana* were the dominant flower visitors. Their abundance was in the order of *A. mellifera* > *A. cerana* > *A. dorsata* > *A. florea*. The other insect visitors such as *Megachile sp.*, *Xylocopa sp.*, *Halictus sp.*, *Ceratina sp.*, *Andrena sp.*, *Lassioglossum sp.*, *Pithitis sp.*, *Nomia sp.*, *Pieris brassicae*, *Danaus sp.*, houseflies, syrphid flies and some beetles visited the coriander bloom at interrupted intervals and was not considered as the reliable pollinators. The highest seed yield was found in the open-pollinated (13.95 q ha<sup>-1</sup>) followed by caged honey bee treatment (13.25 q ha<sup>-1</sup>) and pollinator excluded (9.15 q ha<sup>-1</sup>) treatments. The results clearly indicates the significance of pollinators in seed yield of coriander crop.

##### Survey and surveillance of honeybee enemies and disease

More than 250 colonies were examined for the



presence of diseases and enemies. The wax moth incidence was recorded from the First fortnight of June. The presence of ectoparasitic mites, *V. destructor*, *T. clareae*; *T. koenigerum* and stored product mites, *Tyrophagus longior*, *Caloglyphus indica*, *Hypopus* and phoretic mites *Neocyphophthalmus indica* were observed in debris as well as on the bodies of honeybees. The predatory wasps *Vespa velutina*, *V. orientalis*, *V. cincta*, *V. basali* and *V. mandarina*. The three species of wasp i.e., *Vespa mandarina*, *Vespa tropica* and *Vespa basalis* showed their maximum predatory activity during September and October. The survey of *A. mellifera* colonies indicated that greater wax moth infestation increased progressively from and acquired its peak in month of August-September.

#### **Artificial domiciliation of Non – Apis pollinators *Xylocopa* species**

The solitary bee *Pithitis viridissima* have been domiciled in the nesting hut prepared for housing shelters of solitary bees. The different materials viz., bamboo stems and castor stems of varying size are tested for their acceptance by *Xylocopa* species.

#### **Exploratory studies on *Apis florea***

The survey *Apis florea* and associated host plants was conducted in different zones of Jammu Division. The nests were found on slender branches of tree or shrubs covered with relatively dense foliage. In total 05 nests were found in different locations. The bees were found to visit wide variety of plants for nectar and pollen which included vegetable crops, trees, ornamental plants, medicinal and aromatic plants, fruits and plantation crops, weed plants, oil seed crops and field crops.

#### **Evaluation of performance of *Galleria mellonella* trap designed at Bangalore**

The traps have been received and installed in apiary to study their performance. The observations are being regularly recorded. The traps seem to be more attractive to honeybee *Apis mellifera* L. instead of *G. mellonella*.

#### **Scientific intervention for validation and popularization of traps for management of insect pests in vegetable growing areas of Jammu Region**

Four awareness cum training programme and Four field demonstrations cum distribution of IPM

Kits for farmers were organized in collaboration with Directorate of Agriculture, Jammu. More than 50 progressive farmers participated in awareness cum training programme in each training programme. 15 progressive farmers in consultancy with Sarpanches and Officials of State Agriculture Department from each village of Mishriwalla and Kanhachak were selected. Farmers were registered and their major insect pests problem in vegetables were recorded. Field practical and installation techniques of pheromone and other traps were demonstrated to farmers. Flex charts and pamphlets etc. were distributed among progressive farmers and displayed. Regular visit on scheduled dates and time for field visits were done. They will be made aware about technological inputs pertaining to synchronization insect traps for management of insect pests.

#### **AICRP on Linseed**

The two different trials of AICRP on linseed i.e, entomological trials and breeding trials were conducted during 2016-17 at SKUAST-J, Chatha Farm. Entomology comprises two trials viz., screening of linseed entries against Linseed bud fly having 46 entries whereas, screening of Breeding materials for Linseed bud fly attack contains 78 entries. The maximum mean bud damage was observed on Neela (11.55 per cent bud damage) followed by Neelum (10.36 per cent bud damage) in check entries of linseed. The minimum damage by linseed bud fly was observed below four per cent in UPN-17 with 3.08 per cent bud damage followed by UPN-18 (3.12 %). Rest of the entries revealed more than 4 per cent damage by linseed bud fly. In the experiment screening of Breeding materials for Linseed bud fly attack, the maximum bud damage was observed in Neela



Interaction of Scientist at Linseed Field



ranged from 9.62 to 10.14 per cent. Out of 78 entries, the minimum damage by linseed bud fly, *Dasyneura lini* was recorded in BM-6 (2.88 per cent). Remaining entries and their corresponding damage per cent against bud fly in the field condition were found to be intermediary.

### Monitoring committee members visited the AICRP trial at SKUAST-J during 2017

### Evaluation of bio-efficacy of Abamectin 1.9% w/w EC (Vertimec) against Mites in Apple during Kharif, 2016 and 2017 (Two seasons)

Evaluation of bio-efficacy of Abamectin was conducted in Batotearea at Farmer's field which is about 140 km away from SKUAST-Jammu city during 2016-2017. Batote is typically temperate area suitable for good quality apple in Jammu region. The Red Apple Mite, *Panonychus ulmi* (Koch). (Acari: Tetranychidae) is a major pest and has been established in most of the apple fruit growing areas of Jammu region. All motile stages of red mites feed on the foliage. The Apple trees of the varieties Royal Delicious, Red Delicious, Red Vealox, golden delicious were selected for the study. Mite counts were made at fortnightly intervals on three leaves selected from three different heights of plant viz lower, middle and upper. The acaricides Abamectin 1.9% were sprayed with knapsack sprayer to evaluate the bio-efficacy for two years.

### Network project on Conservation of Lac Insect genetic resources

In addition to past year, explorative survey conducted revealed the natural occurrence of lac from four more locations. Dense canopy has enhanced conservation efforts. All seven collections were maintained in the gene bank at SKUAST Jammu. A Brood lac farm with new plantation was established at two locations. About six farmers were awarded for conservation efforts and were given plants of *Flamingia* for involving them in future brood requirements. About 350 kg brood was reinoculated for brood production as well as for three small scale demonstrations. A lac conservation campaign was conducted in all potential areas and people participation was ensured to restore lac on host trees.

### Community based mass production for bio agents in J&K: Popularization of low cost technology for

### Agri entrepreneurship through farm based bio-control units

The project envisaged the both research and development aspects on mass production of *Trichogramma* and microbial (viral) biopesticides for farm validation and promotion for sustainable production in J&K. Initially, the beneficiaries were given training to rear the host insect on which the bio agent was to be reared e.g. *Corcyra* and *Spodoptera litura* and *Helicoverpa armigera* and subsequently mass production of *Trichogramma* and NPV biocontrol agents. More than 350 farmers were exposed to the exposure training and got benefited besides while about 60 farmers were successfully demonstrated low cost production system in the farmer field as well. So far, sufficient quantity of *Trichogramma* (>950 Tricho cards) to be released over 50 ha area was produced while for NPV (10000 LE) to cover about 40 Ha area was produced in respective locations. Since March to June is the peak season our efforts are being intensified to cover more number of farmers as well as farm area. The response of the farmer was enormous (>87%) but some showed reluctance towards chemical insecticides. However, all the farmers showed interest towards Neem Seed Kernel Extract and Neem Oil. A success story on the achievement of project was also published in a reputed journal.

### 3.1.10 Division of Fruit Science

#### Establishment of rootstock and bud-wood bank and their large scale production

New Introductions of mango varieties (Pusa Arunima and Pusa Surya) and Sweet orange varieties (Pusa Sharad and Pusa Round) has been made from Indian Agricultural Research Institute and have been introduced at ACRA, Dhiansar. Various mandarin varieties (Daisy and W. murcott), Guava varieties (Arkaamulya, Shweta and Punjab pink), Lemon varieties (Baramasi and galgal), has been made from Punjab Agricultural University and have been introduced at ACRA, Dhiansar. Citrus Rootstock Rough lemon/Jatti Khatti (*Citrus jambhirilush*) and desi mango rootstock blocks have been established at ACRA, Dhiansar. New apple cultivars (Anna, Golden dorsett) have been introduced from YS Parmar University of Forestry and Horticulture, Nauni, Solan at ACRA, Dhiansar.



Planting of mother blocks of elite varieties of various subtropical fruits at Advanced Centre for Rainfed Agriculture, Dhiansar



### Domestication of Naturally Occurring and Wild Relatives of some Fruits for Specific Horticultural Traits

Survey of different areas of Kishtwar, Rajouri, Kathua and other areas to locate promising strains of different fruit crops. Establishment of the collection block of pomegranate, Anardana, and grapes at ACHR, Udheywalla. Multiplication of the promising strains of pomegranate and grape at ACHR, Udheywalla. Identified a promising strain of citrus (sangtara) at Chak (Dandsar) Rajouri. Identified Tamarillo plant in Manjakote area of Rajouri district.



Selection of Locally grown promising strain of pomegranate and grapes from Dool area of Kishtwar



Collection Block of Pomegranate and grapes at Udheywalla

### Development of aonla based cropping system for Jammu subtropics

Vegetable crops like French bean, turmeric, peas

were sown as an intercrops in the aonla orchard of Mr. Shamlal at village PalwanAkhnoor. Cultural management practices in phalsa intercropped in between aonla orchard were adopted. Yield and quality parameters of aonla and different intercrops were recorded. Vegetable crops like broccoli, brinjal, knoll khol, lettuce, beet root and marigold were sown as an intercrops in the aonla orchard of Mr. Rampal at village Swankha, block Vijaypur, Samba. Observations of quality parameters and yield of aonla and intercrops were recorded to assess the benefit cost ratio.

### Establishment of nuts center in intermediate agro-climatic zone of Jammu province to augment requirement of quality planting material

Established mother block of pecan nut with 40 plants of seven varieties (Nellis, Mahan, Burkit, Clero, Scissor, Jammu local, Western Shelly etc.). Established mother block of walnut with 30 plants of ten varieties (K-1, GL, CITH Selection, RHRS, 1, 2 etc.). Grafting of 4000 walnut and 3000 pecan nut by professional grafter with different scion woods of various varieties viz. RHRS1, 2 and Kagzi. 1.10 quintals of walnut seeds of walnut were scarified and stratified for breaking of seed dormancy and sown in nursery beds for raising of rootstocks. Installed two low cost poly houses/shade net for raising of root stocks for production of quality planting material of walnut and pecan nut. 3500 root stocks of walnut were raised or ready for grafting in next grafting season and 1500 root stocks of pecan nut available for grafting in next grafting season. Sale of 1250 grafted walnut and 124 grafted plants of pecan nut to the different government agencies like, KVK, Rajouri, KVK, Poonch, CHO, Department of Horticulture, Bhandarwah, J&K Government, CHO, Department of Horticulture, Bhandarwah, J&K Government, CHO, Department of Horticulture, Rajouri, J&K Government and OFRC, SKUAST-Jammu.

### 3.1.11 Division of Food Science & Technology

#### Development and evaluation of Phalsablended beveages

Blended phalsa beverage can be prepared by blending phalsa and pear juice in different ratios., The blended crush prepared from 80:20:: Phalsa:pear was adjusted best on the basis of sensory attributes having overall acceptability score of 7.29. The beverage had shelf life of 90 days under ambient temperature



**Effect of humectants on storage stability of intermediate moisture beetroot cubes**

Intermediate moisture beetroot cubes were prepared by soaking the beetroot cubes in the soaking solution containing sugar: glycerol/sorbitol in the ratio of 10:0, 90:10, 80:20, 70:30, 60:40, 50:50 and 60:40. Intermediate moisture beet root cubes prepared from treatment (sugar : glycerol::50:50) was adjusted best on the basis of nutritional and sensory attributes.



**Minimal processing of carrots using edible coating**

Carrots were peeled and dipped in chlorine (0.1%) followed by benzoic acid dip (1%) and ascorbic acid (1%). The carrots were sliced and treated with carboxy methyl cellulose and it was observed that application of 2% carboxy methyl cellulose followed by shrink wrap packaging maintained fresh like characteristics of carrot slices upto 21 days of storage under refrigerated conditions.



**Enhancing post harvest life of peach using active packaging**

Active packaging of peach fruits by packaging in polypropylene bags having 4 perforations and ethylene absorbent (5g/500g fruits) enhanced the shelf life of fruits up to 28 days as compared to control having shelf life of 7 days under refrigerated conditions.



Fresh beetroot cubes Intermediate Moisture Beetroot Cubes Treatment T6 (Sugar : Glycerol :: 50 : 50)

**3.1.12 Division of Vegetable Science & Floriculture**

Following varieties have been released at 23<sup>rd</sup> State Seed Sub-Committee meeting held on 23<sup>rd</sup>

Crop	Varieties	Salient features	Photographs
Coriander	Jammu Coriander-07 (Khushboo)	<ul style="list-style-type: none"> <li>• Dark green leaves rich in fragrance.</li> <li>• Multi-cut variety giving 4-5 cuts in a season</li> <li>• Late bolting variety</li> <li>• Average yield 150q/ha</li> </ul>	



Crop	Varieties	Salient features	Photographs
Fenugreek	Jammu Fenugreek-07 (Kasuri Supreme)	<ul style="list-style-type: none"> <li>Bushy erect type</li> <li>Leaves dark green with broader lobes.</li> <li>Multi-cut variety.</li> <li>Moderately resistant to pests and diseases.</li> <li>Average yield 200-250q/ha.</li> </ul>	
Spinach Beet	Jammu Spinach Beet-07 (C-13)	<ul style="list-style-type: none"> <li>Plant type erect (35-45cm height).</li> <li>Leaf erect, dark green.</li> <li>Multi-cut variety giving 4-5 cuts in a season.</li> <li>Ready for first cut after 25-30 days.</li> <li>Moderately tolerant to blight and alternaria leaf spot.</li> <li>Average yield is 250- 300q/ha.</li> </ul>	
Broccoli	Jammu Broccoli-08 (Early Green)	<ul style="list-style-type: none"> <li>Dark green curds (120-140g).</li> <li>Leaves dark green.</li> <li>Bears 7-8 lateral shoots for subsequent cuttings.</li> <li>Matures in 75-80DAT.</li> <li>.Average yield is 180-200q/ha.</li> <li>Sets seeds under subtropical conditions.</li> </ul>	
Okra	Jammu Okra-05 (Seli Special)	<ul style="list-style-type: none"> <li>Leaves are dark green</li> <li>Flower bud larger.</li> <li>Dark green fruits, medium in size (9-11cm) when tender.</li> <li>Plants medium in height (90-100cm) with short internodes.</li> <li>Field resistance against YVMV.</li> <li>Average yield 100-150q/ha.</li> </ul>	

March, 2017 at Shalimar campus, SKUAST-Kashmir

### Dissemination of refined production technology of rare/exotic vegetable crops in Jammu region

Demonstration plots of exotic vegetables were laid out at Chatha farm and farmer's field. Technology for seed production of exotic vegetables like broccoli and swiss chard was disseminated. Training cum brain storming sessions were held at village Panjore, Kannachak and Barnai regarding scope and scenario

of cultivation of rare exotic vegetables in Jammu region. Innovative farmers of the villages were disseminated to adopt growing of exotic vegetables on commercial scale.

### Technology refinement and dissemination of Ginger and Turmeric in Jammu region

The seed rhizomes of promising cultivars in turmeric and in ginger have been planted for evaluation, multiplication and distribution among



the farmers. Demonstration and multiplication plots on turmeric and ginger have been laid out at Chatha, and farmer's field. Extension Bulletins on Scientific cultivation of turmeric & ginger was distributed among the growers.

### Commercial production of vegetable seedlings for livelihood security: An entrepreneurship venture

Six number of one day training programmes were organised at Chatha, R. S. Pura, Marh and Bishnah blocks in which over four hundred farm men and women were trained in vegetable seedling production and cultivation and encouraged or motivated for adoption as entrepreneurship venture. Distributed quality planting material of cucurbits comprising of bottle gourd (15,000), bitter melon (10,000) and cucumber (5,000) and Solanaceous vegetables like tomato (55,000), brinjal (10,000) and chilli (5,000).

### Production of quality planting material of commercially important vegetables of Jammu region

Nursery raising techniques to the farmers was demonstrated at Chatha. Quality planting material produced for further multiplication was done. Demonstration of *in situ* and *ex situ* seed production to the visiting farmers and students was conducted. Limited level breeder seed production was done in Fenugreek (Jammu Fenugreek-07), spinach beet (Jammu Spinach Beet-07), coriander (Jammu Coriander-07), broccoli (Jammu Broccoli-07), cauliflower (CCS-08), broad bean (local) and peas (P-89).

### Production and demonstration of quality planting material of commercially important cut and loose flowers in Jammu region

Flower growers have been exposed to the latest technologies for quality planting material multiplication of ornamentals (Marigold, gladiolus, tuberose and chrysanthemum) production technologies through trainings/ demonstrations and exposure visits at the Experimental Farm, Chatha. Scientific Production technology of marigold, tuberose, chrysanthemum and gladiolus has been demonstrated to the farmers through on-farm demonstrations. Distributed seedlings ( Over One Lakh) in Marigold cv. Pusa Narangi Gainda,; Corms in gladiolus ( Over eight thousand) and tuberose bulbs

( Over eleven thousands) ; and two Kg seeds of marigold cv. Pusa Narangi Gainda among the farmers enrolled with the project. A total of 05 number of farmer groups have been formed in the villages for effective and smooth running of the project. More than 122 farmers interested in floriculture venture representing R.S.Pura, Chakbhalwal and Jorian are registered on roll in the project.

### All India Coordinated Research Project (Vegetable Crops)

#### Okra

*Resistant trial:* In okra eight entries including two checks namely, Arka Anamika and NBH-180, were evaluated. Maximum average fruit weight was observed in entry 2014/OKHYB-2 (205.00 g) followed by 2014/OKHYB-3 (202.25 g) and these were better than both the checks.

#### Green Mustard/Laipatta

In *green mustard* (AVT I): Five entries of including check Pusa Saag were evaluated. Maximum yield (q/ha) was observed in 2014/04 MGVAR (311.11 q/ha) which was statistically better than check Pusa Saag.

#### Broccoli

*Hybrid AVT I:* Six entries including check KTS-1 were evaluated during 2016-17. Maximum yield (q/ha) was recorded in 2015/02 BROHYB (136.27 q/ha) which was statistically more than the check KTS-1 (130.80 q/ha)

#### Tomato

##### Varietal trials

*Tomato indeterminate AVT I* (In progress): Six genotypes are being evaluated.

*Tomato determinate AVT II* (In progress): Six genotypes are being evaluated.

##### Hybrid trials

*Hybrid Determinate IET* (In progress): Five genotypes are being evaluated.

*Hybrid Determinate AVT I* (In progress): Four genotypes are being evaluated.

*Hybrid Determinate AVT II* (In progress): Eight genotypes are being evaluated.

#### Cherry Tomato

*Cherry tomato AVT I* (In progress): Five genotypes are being evaluated.



## Capsicum

### Varietal trials

*Capsicum AVT I* (In progress): Four genotypes are being evaluated.

### Hybrid trials

*Hybrid IET* (In progress): Four genotypes are being evaluated.

## Bottle gourd

### Varietal trials

*Bottle gourd IET* (In progress): Five genotypes are being evaluated.

## Production trials

*Integrated Nutrient Management in peas*: Pea (P-89) was grown under Integrated Nutrient Management conditions with 10 different treatment combinations. Highest yield and maximum B: C ratio was observed in treatment T10 (FYM @ 5.0 tonnes/ha + Neem cake @ 2.5 q/ha + Vermicompost @ 2.5 tonnes/ha + Poultry manure @ 2.5 tonnes /ha) i. e., 93.29 q/ha and 2.75 respectively.

## All India Network Research Project on Onion and Garlic

### Garlic

#### Trial 1: AVT-I

Ten garlic entries including check were evaluated and maximum marketable yield(142.30q/ha) was recorded in GN-14-01.

#### Trial 2: AVT-II

Seven garlic entries including check were evaluated and maximum marketable yield(85.00q/ha) was recorded in GRS-1330.

### Kharif onion

#### Trial 1: Onion Short day kharif (Initial Evaluation Trial)

Thirteen onion entries including check were evaluated and maximum marketable yield305.0q/ha) was recorded in ON-15-06

#### Trial 2: Onion Short day kharif (Advance Varietal Trial-I)

Eight onion entries including check were evaluated and maximum marketable yield(389.3q/ha)

was recorded in ON-14-15

#### Trial 3: Onion Short day kharif (Advance Varietal Trial-II)

Eleven onion entries including check were evaluated and maximum marketable yield(302.8q/ha) was recorded in OSK-1306.

#### Trial 4: Onion Short day Hybrid kharif (Advance Varietal Trial-II)

Seven onion entries including check were evaluated and maximum marketable yield(377.75q) was recorded in OSK-1337.

### Rabi onion

#### Trial 1 : IET (Varietal)

Fourteen onion entries including check were evaluated and maximum marketable yield(165.2q/ha) was recorded in ON 15-42.

#### Trial 2: AVT-I (Varietal)

Nine onion entries including check were evaluated and maximum marketable yield (269.48q/ha) was recorded in ON 14-11.

#### Trial 3: AVT-II (Varietal)

Eleven onion entries including check were evaluated and maximum marketable yield(264.40q/ha) was recorded in OSR-1344.

#### Trial 4: AVT-II (Hybrid)

Seven onion entries including check were evaluated and maximum marketable yield(263.0q/ha) was recorded in OSR-1372.

During 2016-17, 03 trials in kharif onion, 2 trials in garlic and 03 trials in rabi onion have been laid out and necessary data is being collected. Storage studies of all the trials is being conducted as per the guidelines of DOGR. 13 advanced lines in indigenous/local garlic has been evaluated and bulk multiplied.

## Centre of Excellence for Vegetables

Centre of excellence in Vegetables of Jammu has been implemented as joint project by SKUAST-J and Department of Agriculture, Jammu w.e.f January, 2017. In SKUAST-J component tomato genotypes have been collected for evaluation. The strengthening of Lab has also been initiated with purchase of a few equipments and consumables at Chatha.



## Vegetable varieties nominated for testing in National trials 2016-17

### (AICRP (VC) and AINRPOG)

S. No.	Crop	Variety	Description
1	Cherry tomato	SJCT-01 (AVT-I)	Indeterminate with plant height of 50 – 180 cm, and red colored fruits borne in clusters (15–18/plant). Each cluster bears 5 – 8 fruits with each fruit weighing 15-17g. The fruit yield is about 6 t/ha. (AICRP-VC)
2	Okra	Seli Special/ JBS-01 (AVT II)	Medium tall variety with profuse fruit bearing, short inter nodal length, dark green fruits, moderately resistant to YVMV. (AICRP-VC)
3	Garlic	SJG-12 (AVT I)	A local selection with a yield potential of 120 q/ha. It has got pinkish- white cloves with ovate shaped bulbs and takes 190 days to harvest from sowing/planting in Jammu plains. (AINRPOG)

### Vegetable varieties under testing in Minikit trials 2016-17

S. No.	Crop	Variety	Description
1	Cauliflower	CCS-08/ SJCA-01	Medium duration variety with snow white curds, self blanching type with average yield of 250-300q/ha and ready for harvest in 70-80 DAT
2	Radish (White)	CR-45/ SJWR-01	Roots cylindrical with 30-40cm length, smooth, ivory white, matures in 45–50 days. Average yield: 250-270q/ha
3.	Swiss Chard	SJSC-01	Leaves green, waxy, ready for first cut after 30 – 35 days. Average yield 300-350q/ha.

### Promising varieties/genetic stocks identified

The promising varieties/genotypes identified over a period of time in externally funded/institutional projects including students trial are given as under:

#### Brinjal

**Stability analysis in brinjal:** Of 25 genotypes of brinjal evaluated for yield and its components under 6 different environments, 5 have performed well under favorable environments (PPL-74, Chhaya, PBH-3, Shamli, PusaKranti and PusaUttam while 3 were found suitable unfavourable environments (Rajni, Abhishek and PPL). The two genotypes Chaya and PPL were

found suitable for all environments for marketable yield. The genotypes Rajni and PusaKranti were found tolerant to shoot borer infestation under all types of environments. The genotypes PPL-74 and Sandhya were adapted to un-favourable environments. The genotype Sandhya was found tolerant to phomopsis blight in all types of environments'.

**Heterosis studies in brinjal:** Among 42 cross combinations developed using 7 parental lines, five cross combinations (Pusa Purple Cluster x IC 261797, IC 354611 x IC 310886, IC 261767 x IC 354611, IC 354611 x IC 203585 and IC 261797 x IC 203585) were identified as good for six traits (days to first picking, number of fruits per plant, fruit yield per plant, fruit yield per hectare, ascorbic acid content and total phenol content). Three parental lines (IC 261797, IC 261767, Pusa Purple Cluster) were found as good combiners for 50 % flowering, while three (IC 310886, IC 104101, IC 203585) for number of fruits per plant and another three (IC 104101, IC 310886 and IC 354611 for fruit yield per plant and fruit yield per hectare.

**Broad bean:** Among various genotypes evaluated over a period of time, one genotype SJBB-09-01 has consistently performed better for over last eight years in sub tropical plains of Jammu. It has average plant height of 120 cm., No. of pods/plant ranging between 140-190, having 4 seeds/pod. No. of leaflets /petiole is 6. It is suitable for planting in October and first picking starts in February.

### Collection, evaluation & maintenance of germplasm of vegetable crops.

S. No.	Crop	Lines/genotypes
1	Tomato	40
2	Cherry tomato	1
3	Brinjal	30
4	Turmeric	2
5	Okra	3
6	Garlic	13
7	Broad bean	2
8	Peas	20
9	Knolkhol	20
10	Kale	20
11	Sponge gourd	1



**Turmeric:** Among various genotypes evaluated, one promising line SJT-01 has been identified. It has got bright orange coloured rhizome with slender fingers. It is ready for harvest after 8-9 months of planting with fresh yield of 200q/ha and dry recovery percentage of 20.0.

### **Standardization of Seed/planting material production techniques of conventional and exotic vegetables**

Seed production techniques of Broccoli, Knolkhol and Swiss chard under non-traditional environments and that of Broad bean have been standardized. Seed production in some lines of chinese cabbage and kale under sub-tropical plains have also been recorded. The genotypes/varieties of cole crops, root crops, onion and garlic, turmeric, legumes, tomato etc are being maintained through nucleus/breeder/TLS seed production for further use in breeding programmes.

### **Standardization of production techniques of vegetables under protected conditions.**

Techniques for nursery raising in poly tubes/polybags has been standardized under protected conditions. Varietal identification continue for protected conditions.

### **Standardization of production techniques of vegetables under eco-friendly management.**

Validation of techniques for eco-friendly management in okra, leafy vegetables and cole crops being standardized.

### **Standardization of production techniques of vegetables under open conditions.**

#### **Bolting studies in onion**

Maximum vegetative growth, yield and quality was recorded in the treatment having 8 week old seedlings treated with paclobutrazol @ 2000 ppm at three different stages i.e., 30 (Thermo phase), 60 (Competition phase and 90 (Completion phase) DAT recorded minimum bolting (9.64%). During storage studies minimum rotting (72.20%) and total weight loss (70.00%) was observed in this treatment. Economically too, this interaction showed maximum net returns of Rs. 3,46,869 with a benefit cost ratio of 4.4 as compared to control with net returns of Rs.2,27,253 and benefit cost ratio of 2.9 respectively.

#### **INM in garden pea**

INM treatment combination of 75% NPK through inorganic fertilizers + 25% through vermicompost + seed treatment with PSB yielded maximum number of pods per plant (21.16), pod weight (8.67g), productivity index (46.97%), shelling %age (53.28%), weight of 100 grains (53.51g) and green pod yield (102.57q/ha). Maximum cost benefit ratio of 2.65 was recorded in the same treatment.

#### **INM in cabbage**

INM treatment combination of 75% NPK through inorganic fertilizers + vermicompost + azotobacter +PSB yielded maximum net head weight (928.33g) and marketable yield/ha (324.69q/ha). Maximum cost benefit ratio of 2.58 was also recorded in the same treatment.

**Weed management studies in onion:** The lower weed density, weed dry matter accumulation, weed index and relatively higher weed control efficiency was recorded in weed free plots followed by treatment with pre-emergence application of oxyflurofen @ 0.15kg/ha +one hand weeding @ 40-60 DAT which was at par with pre-emergence application of oxyflurofen @ 0.15kg/ha+ post emergence application of quizalofop-ethyl@ 0.05kg/ha applied at 40 DAT. The weed free plots resulted in higher cost of cultivation (Rs 81112.00) and net returns but lower B:C ratio (2.56) whereas pre-emergence application of oxyflurofen @ 0.15kg/ha+ post emergence application of quizalofop-ethyl@ 0.05kg/ha showed highest B:C ratio (3.6).

### **Breeding of ornamental crops through conventional and tissue culture means**

Promising varieties identified in crops like Gladiolus, Chrysanthemum, Marigold, Tuberose, Annual flowers and Bulbous ornamentals (Ornithogalum, Freessai, Oxalis pink, oxalis, amaryllis, zephyranthes, narcissus) for sub tropical plains of Jammu.

### **Standardization of seed/planting material multiplication techniques in ornamentals crop through traditional and innovative means**

Techniques standardized for seed production in Marigold, multiplication in Chrysanthemum through stem cuttings and quality bulb production in Gladiolus.



### Standardization of production techniques of ornamentals under open and protected conditions.

Production technologies like integrated nutrient management, date of planting, spacing and different concentrations of growth regulators for quality bulb production have been standardized and practised in major floriculture crops (including Marigold, Gladiolus, Chrysanthemum and annuals)

#### 3.1.13 Division of Soil Science

##### Refinement and improvement of soil quality and water productivity enhancement technology in rainfed orchards of Jammu region

Integrated nutrient management practices (75% inorganics+25% organics+ micronutrients) gave Soil Quality Index value of 0.45 (LESS) for Panthal, 0.75 (OPTIMUM) for Basholi & 0.95 (MORE) for Billawar. The SQI was calculated by using soil physical, chemical and biological parameters. As such use of integrated nutrient management practices is recommended in rainfed orchards of Jammu for better Soil Quality Index. Full moon water harvesting structure gave highest value of soil moisture (15.10%) as compared to control (11.50%). As such full moon water harvesting structure is recommended for better moisture conservation in rainfed orchards of Jammu. Highest soil moisture content was recorded (15.14%) with the use of black plastic mulch (black colour with 100 -150 micron) when compare to organic mulches (11.50%). As such black plastic mulch (black colour with 100 -150 micron widths) is recommended for higher moisture conservation in rainfed orchards of Jammu.

### 3.2 Faculty of Basic Sciences

#### 3.2.1 Division of Plant Physiology

##### Hormonal intervention for mitigating the alternate bearing problem in Mango varieties of Jammu region

The trial is going on in mango orchard situated at the Regional research sub-station for sub tropical fruits, Raya, Distt: Samba, SKUAST-Jammu. Nine commercial varieties of mango Amarpali, Dashehari, Bombay Green, Langra, Chausa, Alphanso, Varun, Rajeev and Arun was selected for the study. The paclobutrazole 28% SC was applied through

soil drench in all the varieties @ 25 ml/tree. After application of paclobutrazole 1.5 meter area around the tree trunk was covered with black polythene for mulching. Phenotypic changes observed on regular basis and waiting for the appearance of flowers.



Measuring for making trench around the tree trunk

Trench around the tree trunk

### 3.3 Faculty of Veterinary Sciences & Animal Husbandry

#### 3.3.1 Division of Animal Genetics and Breeding

**Genetic studies on Rambouillet sheep:** Studies on the growth pattern of Rambouillet sheep revealed the overall least squares means were  $3.39 \pm 0.04$  kg,  $14.20 \pm 0.14$  kg,  $19.65 \pm 0.20$  kg,  $24.71 \pm 0.25$  kg and  $27.62 \pm 0.23$  kg, for BW, 3MW, 6MW, 9MW and YW, respectively and in different growth rate traits were  $0.120 \pm 0.001$  kg,  $0.061 \pm 0.002$  kg,  $0.063 \pm 0.003$  kg,  $0.045 \pm 0.002$  kg,  $0.053 \pm 0.001$  kg and  $0.051 \pm 0.002$  kg, respectively for ADG1, ADG2, ADG3, ADG4 and ADG5. The effect of period of lambing was highly significant ( $P < 0.01$ ) on all the growth traits as well as growth pattern traits. The effect of season of lambing was non-significant on all growth and growth rate traits. The effect of type of birth i.e. single and twinning was significant on BW only. The effect of sex of lamb was highly significant on growth traits and growth pattern traits except for ADG1. The estimates of heritability for BW, 3MW, 6MW, 9MW and YW were  $0.223 \pm 0.17$ ,  $0.156 \pm 0.04$ ,  $0.402 \pm 0.09$ ,  $0.586 \pm 0.11$  and  $0.550 \pm 0.11$ , respectively. The heritability estimates of growth rate ranged from  $0.107 \pm 0.03$  for ADG4 to  $0.944 \pm 0.16$  for ADG3. 6MW had high heritability, high genetic correlations and significant phenotypic correlations with other pre-weaning growth and growth rate traits indicate that early selection on the basis of BW and 3MW also improve the 6MW.

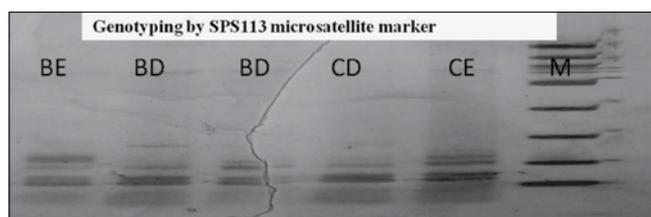


### Molecular Characterization of Poonchi sheep:

Poonchi sheep was characterized by using molecular markers recommended by FAO. A total of 30 alleles were observed by six microsatellite markers in Poonchi sheep. The Chi-square test revealed non-significant effect of different genotypes for HWE. The mean  $n_a$  and  $n_e$  in the population were  $5.17 \pm 0.75$  and  $3.98 \pm 0.58$ , respectively. The Shannon's information index (I) were 1.25, 1.42, 1.51, 1.54, 1.66 and 1.45, respectively for MAF70, SPS113, OarFCB128, OarFCB48, BM1329 and MAF209 markers. The average expected heterozygosity (Nei, 1973) ranged from 0.68 (MAF70) to 0.79 (BM1329) with an overall mean  $0.74 \pm 0.04$ . Out of 30 alleles observed in the Poonchi sheep population 22 alleles showed negative  $F_{IS}$  values. The overall  $F_{IS}$  value in the population was 0.06. From the present study it can be concluded that microsatellite markers can successfully be used to define genetic relationship and genetic characterization of Poonchi sheep and there was substantial genetic variation and all the loci under study were polymorphic (100%) in Poonchi sheep.



PCR amplification in 3% Agarose gel: Lane: 1-4 & 6-10: PCR amplicon; Lane: 5: DNA ladder



Molecular Characterization of Poonchi sheep

### Phenotypic characterization of Poonchi sheep:

Poonchi sheep are indigenous breed of Jammu and Kashmir. These animals provide income, employment and food security to the resource poor farmers and people of the area. Very scanty information is available

for morphological characterization of this sheep. Three different body colours i.e. white, black, and black & white were found in Poonchi sheep. The head of Poonchi sheep is slightly convex from lateral view in all animals. It was observed that the ear is short and slightly pendulous. Horns were present in both sexes. Length of the tail is small to medium. The sheep is of low to medium body weight. The chest girth, height at withers of Poonchi sheep is medium sized. Sex had highly significant effect on ear length only. On other hand, age group had highly significant ( $P < 0.01$ ) effect on all the morpho-metric traits in the study except for horn length. Height at wither had high phenotypic correlation with other traits except with ear length. The values of analysis of wool parameters suggested that wool of Poonchi sheep is of more coarse type.



Phenotypic characterization of Poonchi sheep

### Characterization and Conservation of Poonchi Sheep:

Twenty five numbers of Poonchi Sheep Rams have been tagged and are being provided with antihelmintic drugs against various parasitic diseases from time to time. They are also provided with mineral mixture for better management of the livestock. Breeders have been instructed to castrate the other rams available with them. About forty two quality lambs from these selected rams have also been identified and breeders have been instructed to manage these animals on scientific lines.

### Molecular Characterization of Bakerwali Goat:

Bakerwals tribes of Jammu & Kashmir rear a goat population commonly named as "Bakerwali" which is



still nondescript. Molecular characterization of native breeds of goat was done on by using microsatellite locus recommended by FAO. A total of 28 alleles were observed. The number of alleles per locus varied from four (ORAF48, MAF 209 and BM1329) to six (SPS113). The allelic frequency varies from 0.11 to 0.44 (ORAF48), 0.10 to 0.35 (MAF 209), 0.05 to 0.50 (ORAF48), 0.07 to 0.30 (SPS113), 0.17 to 0.33 (MAF 209) and 0.05 to 0.55 (BM1329). The highest number of effective number of alleles ( $n_e$ ) were found in microsatellite primer SPS113. The effective number of alleles was found to be lesser than the observed number in all the loci studied. The Nei's expected heterozygosity was highest in (0.79) in SPS113 and the lowest 0.64) in BM1329. The Shannon's Information index (I) was highest in microsatellite primer SPS113 with mean value 1.36 under all the primers. The Fis value ranged from positive to negative. The mean Polymorphic Information Content (PIC) was 0.65 ranging from 0.54 (BM1329) to 0.77 (MAF209), revealed the high level of polymorphism for studied microsatellite markers set in this study. The significant level of variability in this population reflects that the Bhakarwali goat population contains a valuable and substantial amount of genetic diversity for bringing effective genetic improvement.

### 3.3.2 Division of Animal Nutrition

#### **Varietal difference in paddy straw utilization:**

Locally cultivated varieties of paddy straw (SJR-5; K-39; Basmati 564; IET-1410; Giza-14; Pusa-1121; Basmati 1509; Basmati 370; Ranbir Basmati; Ratna; SJR-51 and K-343) were evaluated regarding their nutrient and anti-nutrient profile, response to different treatments for quality improvement and *in vivo* utilization by goats as model ruminants. Results indicated that varietal differences exist among locally available paddy straw in terms of chemical composition, anti-nutritional factors and *in vitro* DM degradability. Varieties also differ in their response to water soaking, urea treatment and concentrate supplementation. Further, *in vivo* utilization of studied paddy straw varieties differed in their ADF digestibility and calcium balance without impacting the feed intake and utilization of other nutrients.

**Urinary purine derivatives as Nutrition indicator:** Studies conducted to evaluate effect of

variable plane of nutrition on purine derivatives (PD) excretion in goats indicated that PDC index was significantly positively correlated with Digestible organic matter intake ( $r=0.831$ ) but not with digestible crude protein intake. It was concluded that PDC index appears to be an effective indicator of energy deficiency in ration of goats, however it is unaffected by the dietary protein deficiency.

**Economic ration for broilers:** A study to determine the effect of replacement of maize by graded levels of pearl millet and broken rice mixture on performance of broilers birds showed that maize may be replaced by pearl millet and broken rice mixture in diet of broiler birds up to 75% without any adverse effect.

**Tanniferous tree leaves as functional feed ingredient:** Effect of tanniferous tree leaves was studied on nutrient utilization, health status and growth performance of broiler chickens. It was concluded that water extract of *Acacia nilotica*, *Eugenia jambolana* and *Psidium guajava* showed better antibacterial activity against *E. coli*, *S. aureus* and *S. enteridis*. Further, *E. jambolana* and *P. guajava* extracts were found to have potent antioxidant and anti-coccidian activity. Supplementation of leaf meal (1-4%) improved weight gain, reduced feed intake resulting in better FCR and improved antioxidant status, immune response, and therefore may be a better alternative in terms of producing healthy low cholesterol broiler meat.

### 3.3.3 Division of Livestock Production and Management

**Buffalo management practices:** Dairy buffalo management practices in rural households were studied in four rural villages of R.S. Pura tehsil of district Jammu by means of designed questionnaires. The common housing practices followed by majority of the farmers had conventional type of housing with Kachha floors and improper drainage. Majority had well ventilated sheds with clean roofs, walls and mangers. None of the household under study followed scientific feeding. All the households had clean drinking water availability for the animals (running tap water). Full hand milking technique was the preferred method of milking in all the households. Most of the households follow good milking practices



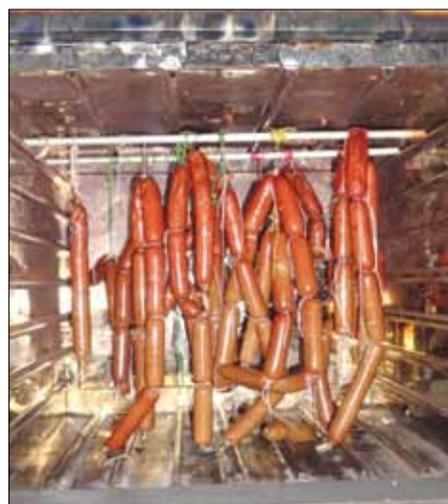
like washing of hands, udder and teats and collecting vessels before milking but majority do not follow hygienic milking practices like washing of animals before milking, washing of udder and teats after milking and teat dipping. Milk samples were collected and analyzed for milk physico-chemical composition, somatic cell count and microbiological quality. It was found that housing and milking practices had no significant effect on milk composition. However, fat, protein, solid-not-fat and total solids were higher under hygienic milking conditions. The type of floor, washing of udder & teats before milking, however were found to have a significant ( $p < 0.05$ ) effect on somatic cell count and the microbiological quality of buffalo milk. It was recommended that better management practices be advised and followed by farmers to improve the quality and composition of buffalo milk under rural conditions.

**Impact of thermal stress:** Thermal stress impact in dairy cattle of Jammu region is being currently being assessed with development of location specific heat and cold stress indicators and designing low-cost managerial interventions for amelioration of thermal stress.

### 3.3.4 Division of Livestock Products Technology

**Storage quality of chevon sausages:** The study was undertaken to explore the possibility of utilization of *Tinospora cordifolia*, *Terminalia arjuna* and *Asparagus racemosus* as alternative to synthetic antioxidants and preservatives in fat rich meat products which are highly susceptible to lipid oxidation and microbial spoilage. The chevon sausages were prepared by incorporating different concentrations of *Tinospora cordifolia*, *Terminalia arjuna* and *Asparagus racemosus* (0.25%, 0.50%, 0.75%) separately and were vacuum packaged and assessed for various lipid oxidative stability and storage quality parameters under refrigerated ( $4 \pm 1^\circ\text{C}$ ) conditions at regular intervals of 0, 14, 28, 42 and 56 days. Both *Tinospora cordifolia* and *Terminalia arjuna* showed a significant ( $P < 0.05$ ) effect on the lipid oxidative stability as the treated products exhibited significantly ( $P < 0.05$ ) lower TBARS values (mg malonaldehyde/kg). *Asparagus racemosus* successfully improved the lipid oxidative stability and storage quality of the products

during refrigerated ( $4 \pm 1^\circ\text{C}$ ) storage. All products remained safe up to 42<sup>nd</sup> day of refrigerated storage under vacuum packaging.



Herbal chevon sausage treatment as alternative to synthetic antioxidants and preservatives

**Quality attributes of restructured mutton blocks:** The effect of *Colocasia esculenta*, *Ipomoea batatas* and *Coffea arabica* on the quality attributes were studied and based on product yield and sensory scores, 15% added water level, 18 minutes of massaging time and 40 minutes of cooking time were found to be optimum for the development of restructured mutton blocks. Products containing green coffee bean extract showed significantly ( $P < 0.05$ ) higher acceptability with lower TBARS and FFA values owing to its high antioxidant potential. The restructured mutton blocks containing green coffee bean extract also showed significantly ( $P < 0.05$ ) lower TPC and PC counts. It was found that *Colocasia esculenta* (3%) and *Ipomoea batatas* (3%)



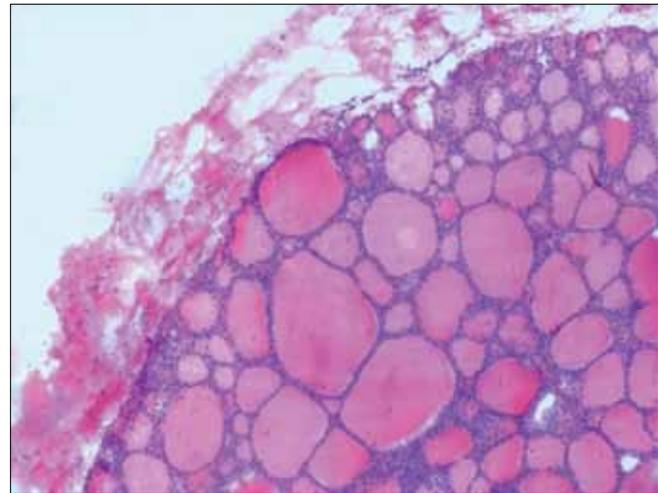
could be successfully utilized in the development of restructured mutton blocks and the storage quality of the developed products could be further enhanced by using green coffee bean extract (1%) as a source of natural antioxidant and preservative.

**Storage quality of chicken nuggets:** Based on sensory attributes, chicken nuggets prepared with 2% of *Bacopa monnieri* and 3% *Ocimum sanctum* were adjudged best. Chicken nuggets fortified with extracts of *Bacopa monnieri* and *Ocimum sanctum* were found to be safe for consumption till 21 days under aerobic packaging and 45 days under vacuum packaging at refrigerated storage ( $4\pm 1^\circ\text{C}$ ) on the basis of pH, FFA, TBARS, microbiological profile and sensory evaluation of chicken nuggets. The developed designer chicken nuggets could be conveniently packed for a period of 21 days under aerobic packaging and 45 days under vacuum packaging in refrigerated ( $4\pm 1^\circ\text{C}$ ) condition without any marked loss of physico-chemical, microbial and sensory quality.

**Development of value added meat products:** Besides, the division is also engaged in imparting skills and training programmes on the development of various value-added meat products (meat pickle, meat biscuits, meat snacks, meat balls, meat nuggets and meat patties), and empowerment of rural women through income generation while utilizing surplus backyard poultry, and improving the nutritional status of the rural society.

### 3.3.5 Division of Veterinary Anatomy

**Breed characterization of local animals:** The division has been actively involved in the breed characterization of the local animals with emphasis on their conservation as indigenous breed in collaboration with division of Animal Genetics and Breeding. The preliminary studies have also been conducted on the seasonal anatomical variations on the ovaries of adult Bakerwali goat (*Capra hircus*) and Beetal goat of Jammu region. Anatomical studies on the thyroid gland of Bakerwali goat revealed that the gland was bilobed, reddish brown in colour, elongated and elliptical in outline. The right lobe of the gland extends from posterior extremity of larynx to 5<sup>th</sup> tracheal ring while as left lobe extends from posterior extremity of larynx to 7<sup>th</sup> tracheal ring. The two lobes were connected by isthmus around the ventral aspect



Photomicrograph showing well defined capsule in the thyroid gland in Prepubertal Bakerwali goat, H&E, 100X.



Photograph showing thyroid gland of prepubertal, pubertal and senile group in Bakerwali goat.

of trachea and position varies between 5<sup>th</sup> and 6<sup>th</sup> tracheal ring irrespective of age groups. The mean biometrical values increased between succeeding age groups. The isthmus is a glandular band connecting the lateral (right and left) lobes of the thyroid gland. It was observed that the thyroid gland was covered with distinct capsule, comprised of three layers: outer layer, middle layer and inner layer. The reticular fibers formed wire mesh like structure around the follicles. The small and medium size follicles were mostly seen in the peripheral zones whereas larger and abnormally large follicles were seen in the deeper zone of the gland. In prepubertal group only small and medium sized follicles were observed. In pubertal group, small, medium and large size follicles were seen while in senile group abnormally large size follicles were also



reported besides the medium and large size follicles. The thyroid follicles were lined by epithelium which varied from squamous epithelium to high cuboidal or columnar with flattened to rounded well defined nuclei, respectively. The inactive follicles were usually large and active follicles were smaller in size irrespective of age groups. The parafollicular cells in the present study were characterized by light stained and basophilic cytoplasm. Various micrometrical parameters conducted in this study showed significant ( $P \leq 0.05$ ) difference between prepubertal and senile age groups.

### 3.3.6 Division of Veterinary and Animal Husbandry Extension Education

**Entrepreneurial behaviour of dairy farmers:** A study conducted by the division indicated that around 76% and 57% of dairy animal holders possessed medium and moderate level of awareness about prevailing support system for dairy entrepreneurship. Amongst a set of nine parameters used to determine the Entrepreneurial Behaviour Index (EBI), the attribute 'Manageability' ranked first (78%). SWOT analysis revealed dairy farming being the main strength and livelihood occupation of the majority of the rural populace. The major weakness was the large unorganized dairy sector while the opportunity lay in the vast untapped indigenous milk and milk products market. A crucial threat of the middlemen controlling a very large portion of milk procurement was observed that hamper the growth and expansion of dairy entrepreneurship in Jammu.

A STEEP analysis (sociological, technological, economical, environmental and political) revealed that the major sociological driver was the 'favourable demographic factors for milk consumption' whereas, 'appropriate technology access and data transfer through internet and mobiles' as the major technological drivers. Large and untapped rural market for milk and milk products' being the major economic driver, whereas 'awareness and importance given to organic dairy milk and milk products due to increased health consciousness' was the major environmental driver and 'supportive and encouraging Government policies for dairy farming and dairy related operations' constituted the major political drivers the area of study. Serious constraints

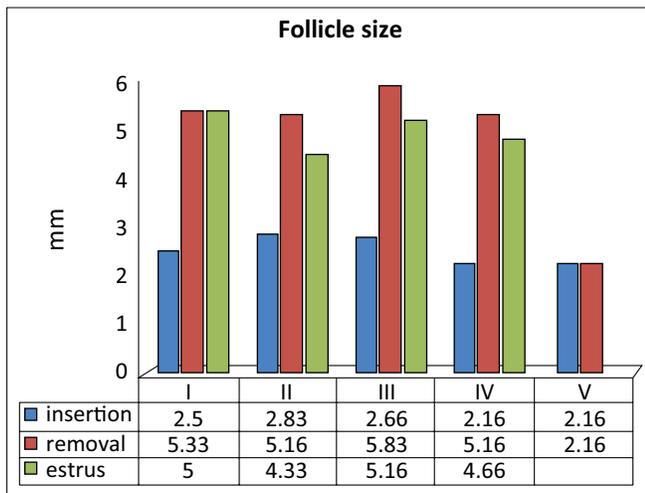
in dairy entrepreneurship were- less remunerative price for cow's milk, high cost of transportation and poor conception rates in crossbred animals.

It was concluded that dairy entrepreneurship has a very bright future in the Jammu division if various factors identified through SWOT and STEEP analysis are addressed by the Government and implementing agencies.

**Women Self Help Groups:** To build a cadre of female community animal care services in sustainable manner at the farmer's doorstep, creation and capacity building of women Self Help Group members as paravets (*Pashu Sakhi*) were initiated in Jammu.

### 3.3.7 Division of Veterinary Gynaecology and Obstetrics

**Estrus induction in ewes:** Estrus induction in randomly selected ewes was studied during the non breeding season at Govt Sheep Breeding Farm Panthal, Katra, Reasi, Jammu. Ewes selected were divided into 5 groups (GI, GII, GIII, GIV, GV), which were treated with different hormonal protocols as (GI= 1/3 Norgestomet + 200 IU PMSG, GII=1/3 Norgestomet + Ram effect, GIII=  $P_4$  sponge + PMSG 200 IU, GIV= $P_4$  sponge + Ram effect, GV=untreated control). All the ewes covered under hormone protocols exhibited induced estrus with intense, fair or weak estrus signs within mean onset of  $25.83 \pm 1.49$  hrs,  $44.16 \pm 3.97$  hrs,  $29.16 \pm 1.62$  hrs and  $54.83 \pm 1.95$  hrs and mean duration of estrus  $28.83 \pm 1.81$  hrs,  $36.33 \pm 2.75$  hrs,  $25.66 \pm 0.71$  and  $28.33 \pm 2.89$  hrs in GI, GII, GIII and GIV, respectively. The Conception rate was similar in GI, GII, GIII (50%), while GIV showed lowest conception rate among treated groups (16.66%). The lambing rate was similar in all the groups (100%). In untreated control (GV), none of the ewes exhibited estrus. In all the treatment groups biochemical parameters viz, Glucose, Ca and P levels increased significantly ( $P < 0.05$ ), while as Cholesterol, Albumin increased non significantly ( $P > 0.05$ ) and Globulin decreased significantly ( $P < 0.05$ ) in GI, GII, GIII, GIV at induced estrus. USG evaluation suggested that follicle size was largest on the day of withdrawal of  $P_4$  source. It was concluded that Crestar/  $P_4$  Sponge along with PMSG or Ram effect can be conveniently used to induce estrus in non lactating ewes during non breeding season.



**Repeat breeding and immunomodulation in dairy cows:** The physico-chemical characteristics of cervico-vaginal mucus was assessed in repeat breeder cows to determine the the serum biochemical parameters and progesterone during estrus and to study the effect of immunomodulation in endometritic cows. The cervical mucus samples of repeat breeders were evaluated for appearance, consistency, pH, fern pattern and white side test (WST). Endometritis positive cows as determined by WST were randomly allocated one of the three treatment groups: I (500 mg of oyster glycogen intrauterine on the day of estrum), II (synthetic PGF2 $\alpha$  500  $\mu$ g I/M single dose, one week after presented estrus) and III (Levamisole HCl @ 2.5 mg/kg wt s.c. on three alternate days. Blood samples were collected at presented estrus and at post- treatment estrus for estimation of biochemical parameters and progesterone (P4). The incidence of endometritis among repeat breeders as judged by a positive white side test was 75%; with mild infection in 55.56% and moderate infection in 44.44% cows. The endometritic cows had higher pH of CVM and a significantly ( $P < 0.05$ ) lower mean serum phosphorus level and non-significantly lower total serum protein, globulin and cholesterol levels while the serum AST, ALT and P4 during estrus were non-significantly higher than the normal repeat breeders. About 1/3<sup>rd</sup> (33.33%) repeat breeders had supra-basal P4 ( $\geq 0.5$  ng/ml) concentration at the time of estrus. A clearer CVM having lower pH value at post-treatment estrus indicated improvement. Recovery (on the basis of WST) was highest in OG group (83.33%) followed by 66.67% in PG and LE groups. The conception rate at 1<sup>st</sup>

insemination post-treatment for OG, PG and LE group was 40%, 25% and 25%, respectively. The overall conception rate till three successive inseminations post-treatment was 66.67%, 50% and 50% in OG, PG and LE groups, respectively as compared to 33.33% in the control group. Irrespective of group, the recovery rate showed a decreasing trend with increase in number of repeat services; 90.90% in 3-5 times, 66.67% in 6-8 repeats and 25% in case of  $\geq 9$  repeats. A similar trend was observed with conception rate. Immunomodulation in endometritic cows led to alterations in CVM and blood biochemical indices suggestive of increased uterine defence, decreased infection and cellular damage; and attainment of basal P4 concentration (if suprabasal pre-treatment) at estrus.

### 3.3.8 Division of Veterinary Medicine

**Nutritional enhancement of livestock: Urea Molasses Multinutrient Block (UMMB), Roughage and Complete block supplementation nutritional enhancement in livestock had been under study.** Effect of UMMB supplementation on body weight gain was evaluated in Beetal-cross goats of 5-6 months age reared through grazing and provided with 50 gm UMMB/day for 2 months. It was concluded that UMMB being a good source of energy, protein and minerals needs to be supplemented in diet.

**Metabolic profile and oxidative stress during periparturient period:** To study the metabolic profile and oxidative stress during pregnancy and lactation, adult Beetal goats were categorized into 3 parity groups viz. group-A (1-3 parity), group-B (4-6 parity) and group-C (7-8 parity). Blood samples were collected 3 and 1 week before and 1, 2, 4, 8 and 16 weeks after kidding. Analysis of haematological parameters viz. Hb and PCV revealed significant decline during the peri-parturient period. TPP, albumin, BUN, total cholesterol, HDL-C, uric acid and triglyceride level declined 1 week before and remained low till 4 weeks after kidding compared with level observed 16 weeks post kidding. Plasma creatinine level was significantly ( $P < 0.05$ ) increased for 2 weeks following kidding. Ca and inorganic P levels of plasma samples were significantly higher 3 weeks and 1 week before kidding thereafter, non-significant decline was observed till 8 weeks after kidding. Lowest average values of Ca and



Pi were observed 1 week after kidding whereas, Mg, Cu and Zn levels were lowest after 2 weeks. Evaluation of oxidative stress parameters during peri-parturient period revealed significant increase in MDA level along with decrease in anti-oxidant enzymes viz., SOD, catalase, GSH, GPx and G-S-T during the peri-parturient period and lowest levels were observed 2 weeks after kidding. Parity-wise, it was concluded that animals in 4-6 parity showed lowest stress compared with early and late parity animals.

**Studies on bovine mastitis:** Occurrence of bovine mastitis during lactation and dry period was studied, with evaluation of causative bacterial pathogen and their antimicrobial resistance pattern. Milk samples from cows and buffaloes were collected from organized and unorganized dairy farms including 18 different villages of study area of Jammu region and subjected to cow-side test (California Mastitis Test, CMT), Somatic Cell Count (SCC) and cultural isolation for bacterial agents. Individual and pooled milk samples were analysed for milk composition to study the impact of mastitis on milk and milk products that is food safety. Overall animal-wise prevalence of mastitis was 71.97% and 30.00% in cows and buffaloes, respectively. Moreover, Quarter-wise prevalence of mastitis in dairy animals was 51.47% and 6.60% in cows and buffaloes, respectively. Most important concern is very high rate of blind teats 8.21% and 1.25% in cows and buffaloes, respectively. Out of 407 milk samples subjected for cultural isolation, 359 (88.23%) samples showed bacterial growth. A total 882 isolates were obtained from 359 milk samples. *Staphylococcus aureus* (30.71%) was found as chief etiological agent of mastitis followed by *Streptococcus agalactiae* (30.22), *Salmonella enteritidis* (29.00%), *Corynebacterium spp.* (28.26%), *E. coli* (27.02), *Bacillus spp.* (18.19%), *Enterococcus spp.* (18.18%), Fungal (14.50), *Klebsiella spp.* (7.62%), *Proteus spp.* (4.91%), *Salmonella typhae* (4.18%) and other *Staphylococcus spp.* (3.93%). Individual isolates were subjected for antibiotic sensitivity tests by standard disc diffusion method and found all isolates were highly sensitive to Ciprofloxacin, Enrofloxacin and Gentamicin followed by others such as Amoxyclave, Ceftriaxone, Cefolexin, Cefixime, Cefotriaxon/ Tazobactam and Cefotaxime/ Clavulanic acid. However, Cefixime were least effective against most of bacterial isolates. Milk samples from

healthy (CMT negative) and mastitis cows (CMT positive) were subjected for composition analysis using Lactoscan to study the impact of mastitis on milk quality. Milk samples were analysed for milk fat, density, lactose, solid not fat (SNF), protein, water, temperature, freezing point and salts. It was found that fat and protein content of milk were decreased in mastitis milk than the normal milk.

### 3.3.9 Division of Veterinary Microbiology and Immunology

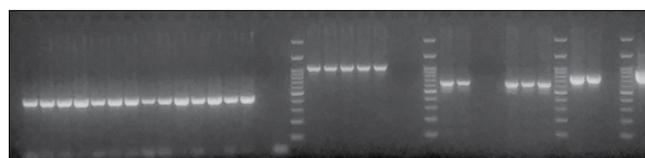
#### Submission of various bacterial cultures:

Important veterinary microbial cultures are deposited to the National repository at VTCC (National Veterinary Type Culture Centre). Till date about 50 isolates have been submitted. This year, a total of 29 confirmed bacterial isolates were submitted. Out of these, 11 were *Pasteurella multocida* belonging to type A, B and D confirmed by species specific PCR, while 18 isolates of various unusual bacteria from respiratory tract of sheep (6 from lower respiratory tract and 11 from from upper) were confirmed by 16S rRNA. All of isolates were sequenced and submitted to Genbank.



PCR amplified 16S rRNA gene Product (715 bp) of the isolates using Universal 16S rRNA gene Primers for amplifying (V1-V4) regions

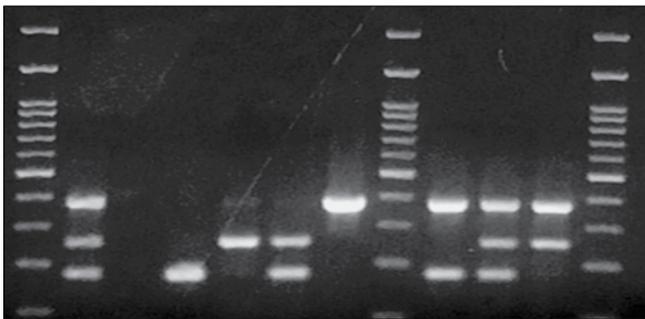
**Molecular Typing of *Pasteurella multocida*:** Field isolates of *Pasteurella multocida* were characterized for capsular antigen and antibiotic sensitivity. Capsular type A, B and D were observed to be predominant in Jammu region. Also, presence of *toxA* gene in an isolate belonging to sheep was a significant finding as it has been previously reported as rare in India.



Species specific PCR (16S) for *Pasteurella multocida* (460bp); molecular type A (1044bp); molecular type B (760bp); molecular type D (657bp); *toxA* gene (846bp)



**Characterization of enteropathogenic *Escherichia coli* (EPEC):** Faecal samples of domestic animals were screened for characterization of *E. coli* and assessment of virulence and colonisation factors. The isolates were screened for presence of *bfpA*, *astA* and *ecpA* genes and antibiotic sensitivity profile was evaluated with reference to clinically used antimicrobials. The study showed a considerable prevalence of EPEC in Jammu. All isolates were resistant to most of the clinically available antimicrobials like Enrofloxacin, Gentamicin and Oxacilin.



Genes profile of *Escherichia coli* isolates using multiplex PCR. Lane M 100bp DNA ladder. Lane 1, positive control. Lane 2, negative control. Lane 3, *stx<sub>1</sub>* positive. Lane 4, *stx<sub>2</sub>* positive. Lane 5, *stx<sub>1</sub>*, *stx<sub>2</sub>* positive. Lane 6, *eaeA* positive. Lane 7, *stx<sub>1</sub>*, *eaeA* positive. Lane 8, *stx<sub>1</sub>*, *stx<sub>2</sub>*, *eaeA* positive. Lane 9, *stx<sub>2</sub>*, *eaeA* positive

### 3.3.10 Division of Veterinary Parasitology

**Acaricide resistance in ticks:** Investigation in Jammu region reveals that tick resistance against Amitraz and Malathion is mild (Resistance Level-I) in Kathua, Poonch, Doda and Kishtwar districts. It is recommended that synthetic pyrethroids and organophosphates (Diazinon and Malathion) should be replaced by macrocyclic lactones. Farmer awareness about breeding places is important, so that the life cycle of ticks could be broken to provide a sustainable and long term relief from tick infestation with minimum use of drugs.

**Technological intervention in livestock and poultry production:** The division is also engaged in a multi-disciplinary collaborative project concerned with the technological intervention to improve production of dairy and poultry in rainfed areas of Jammu district. Women volunteers were selected and trained on technological aspects in the development of various value added livestock products, their packaging, preservation and marketing. In total 120

participants (20 per training) belonging to different villages (Sangarh, Khara, Madana and Chakshian) were provided hands-on training. Awareness on nutritive value of milk, meat and their products and the various benefits of value addition was imparted. Naked-neck poultry chicks were distributed to 148 beneficiaries from Villages of Sangarh, Khara, Madana and Chakshian. Ten birds were provided to each beneficiary. Various camps were organized in the villages to train the farmers on good management practices for backyard poultry production and sustainable health of the livestock. The weight gain in the chicks per month has been recorded at regular intervals. Livestock of the beneficiaries was provided specific dewormers after doing faecal samples examination. Fenbendazole and oxclozanide were administered to the animals that are diagnosed as positive for paramphistomiasis and strongyle infection. Amprolium salt was administered to the poultry birds found positive for coccidiosis. The animals are being examined for strongyle infection in the month of February. Selected animals were given mineral mixture supplementation before the start of the estrus induction and heifers, postpartum anestrus cows and buffalo were treated with Ovsynch protocol. Awareness about animal infertility and improved animal husbandry practices has been made and through estrus synchronization, 53 cows and 8 buffaloes have been inseminated out of which 16 are positive for pregnancy.

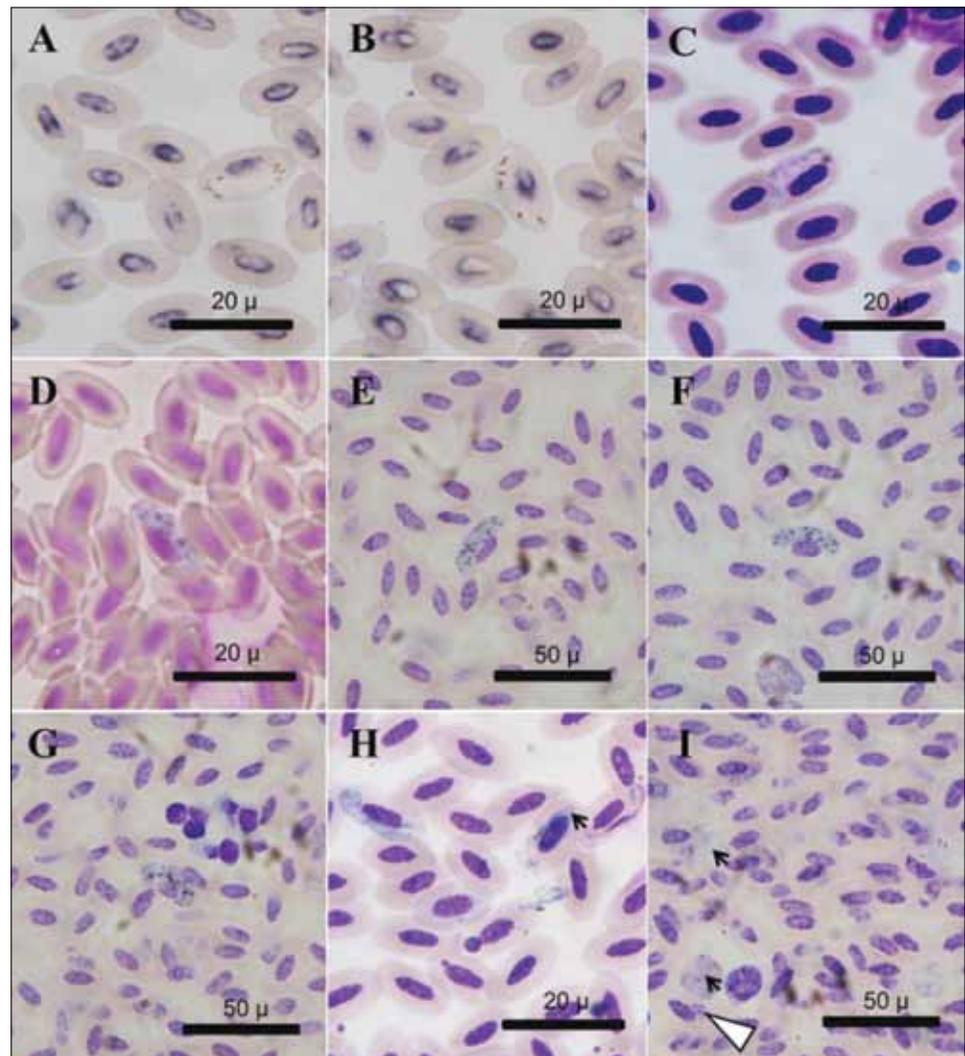
### 3.3.11 Division of Veterinary Pathology

**Pathology of *Cryptosporidium parvum*:** Pathological studies were conducted in a mice model induced by a well characterized strain of *C. parvum* isolated from the faecal sample of diarrhoeic calf. It was observed that the strain was pathogenic in immunocompromised mice and caused severe enteric disease. Besides, it adversely impacted the general health, haematological indices and increased the levels of oxidative stress markers. Exacerbated pathological lesions in various organs were noticed in immunosuppressed mice when infected with *C. parvum* especially at the peak of infection occurring at 10 dpi.

**Pathological conditions in domestic pigeons (*Columba livia*):** Domestic pigeons reared by pigeon fanciers were screened for clinical disease in Jammu.

The overall estimate of disease prevalence was 15.28% with an overall mortality of 1.51%. The predominant cause of death diagnosed was due to *Haemoproteus columbae* induced pneumonia and hepatitis (45.00%); Newcastle disease (20.00%); mycotoxicosis (13.33%); aspergillosis (8.33%); traumatic injury (6.67%); pigeonpox (3.33%); Salmonellosis and colibacillosis (1.67%).

Haemoproteosis (45.00%) caused a high mortality amongst pigeons with severe and consistent hepatic and pneumonic lesions, revealing various stages of protozoan parasite development and schizogony within vascular endothelium causing severe vascular and tissue reaction. Newcastle disease (ND) infection was manifested predominantly in a severe neurological form with high haeagglutination titres with characteristic malacia and demyelination of brain parenchyma. Satellitosis, microgliosis and neuronophagia were also seen. Mycotoxicosis was associated with typical hepatic and renal degeneration. *Aspergillus flavus* could be isolated and differentiated from feed grains while tissue and grain samples were positive for Aflatoxin B1, while as citrinin and ochratoxin was also found in the feedgrains. Presence of aflatoxin in feeds and fungal cultures were also detected by UV light. Aspergillosis was associated with encapsulated lymphohistiocytic granulomatous pneumonia and a non-encapsulating invasive infection with isolation of *Aspergillus fumigatus* organisms. Pigeon pox was prevalent with scabby lesions on the unfeathered parts characterized by ballooning degeneration of keratinocytes



Haemoproteus columbae gametocytes within erythrocytes of pigeons (A-B) Microgametes with polar granules; (C-F) Macrogametes (G) Halter-shaped macrogamete (H) Immature gametocyte (black arrow), (I) Immature gametocyte (white arrow head) and extra-corpuseular macrogametes.

containing eosinophilic A-type intracytoplasmic inclusions. Isolation of Pigeonpox virus revealed typical pock lesions on the chorioallantoic membrane (CAM) on 14<sup>th</sup> day developing chicken embryo. *E. coli* and *Salmonella* sp. associated with mortality were also isolated. Numerous ectoparasites and endoparasites were also recovered, including the chewing lice *Columbicola columbae*, small pigeon louse *Campanulotes bidentatus*, pigeon flatfly or louse fly *Pseudolynchia canariensis*, mite *Psoroptes* sp. and a flea tentatively identified as *Ctenocephalides* sp. Gastrointestinal parasites included the tapeworm *Raillietina* sp., the large roundworm *Ascaridia* sp. and the hairworm *Capillaria* sp., *Eimeria* sp., *Cryptosporidia*



sp. and *Haemoproteus columbae* gametocytes were recorded. Macrogametocytes, microgametocytes, immature stages, extra-corporeal forms of *Haemoproteus columbae* could be detected in the blood.

### 3.3.12 Division of Veterinary Pharmacology and Toxicology

**Studies on diabetes and hypertension:** A study was designed to evaluate the ameliorative effect of quercetin on streptozotocin-induced diabetes, diabetic wound and DOCA salt induced hypertension in Wistar rats. Rats of 150-200g body weight were divided into six groups of six animals each and were subjected to various daily oral treatment regimes for 21 days to determine the effect of quercetin on diabetic wound healing. For evaluating the effect of quercetin on hypertension male Wistar rats were divided into four groups of six animals each and were subjected to various daily oral treatment regimes for six weeks. Oral administration of quercetin @100mg/kg B.W. for 21 days in diabetic rats normalized the altered blood glucose, TC, HDL, triglycerides, LDL, protein profile, plasma urea nitrogen, creatinine and antioxidant biomarkers (MDA, SOD, CAT, GST, GPx). Topical application of quercetin ointment (15%) on the excised wound in diabetic Wistar rats healed the wound area. Hypertension was induced in uninephrectomized Wistar rats by weekly twice subcutaneous injection of DOCA @25mg/kg B.W for six consecutive weeks. Treating the hypertensive rats with quercetin @20 mg/kg B.W for six weeks significantly reduced ( $P < 0.05$ ) the mean arterial pressure. Furthermore, the lipid profile was improved along with other biochemical (plasma urea nitrogen, plasma creatinine, SGOT, SGPT) and oxidative stress parameters (MDA, CAT, SOD, GST, GPx). Therefore, it is concluded that quercetin @ 100mg/kg B.W has antidiabetic potential. Wound healing property has been excellently produced by 15% topical application alone and 15% topical application + 100mg/kg B.W orally. Quercetin @ 20mg/kg B.W for six weeks in rats was sufficient enough to reduce DOCA-salt induced hypertension.

**Chlorfenapyr interaction with fluoride toxicity:** Oral sub-acute toxic effects of chlorfenapyr alone and its interaction with fluoride was studied in Wistar rats. Chlorfenapyr administered @ 48.4 or 96.8mg/kg

inhibited PChE and plasma protein activity but elevated blood biochemical indices like phosphatases (ACP & ALP), aminotransferases (AST & ALT), creatinine and BUN. Both doses induced oxidative stress as revealed by alteration in different biomarkers like increase in lipid peroxidation and decrease in blood glutathione (GSH), glutathione peroxidase and transferase (GPx & GST), and superoxide dismutase (SOD). Fluoride @10 ppm in drinking water produced biochemical changes viz. inhibition in activity of PChE with elevation of ACP, ALP, AST, ALT, creatinine and BUN. Oxidative stress parameters in blood and tissues as evidenced by increased lipid peroxidation and decrease in activities of GSH, SOD, and GPx were also altered by fluoride. Co-exposure of chlorfenapyr with fluoride also resulted in inhibition in plasma cholinesterase activity and elevation of blood biochemical indices and changes in oxidative stress parameters in blood co-exposure also induced oxidative changes in liver and kidney. Such changes were found to be dose dependent, varied in different tissues and were more pronounced. Histopathologically liver showed hepatocytic degeneration, necrosis and MNC's infiltration. Kidney showed glomerular engorgement, degeneration of epithelial cells of PCT and presence of protein casts. Quercetin @ 20 mg/kg body weight modulated the adverse effects induced by Chlorfenapyr and/or fluoride on most of the biochemical parameters. However, complete amelioration in altered oxidative stress parameters was not observed.

**Catechin in Chlorpyrifos and aluminum chloride toxicity:** A study was designed to evaluate the effects of chlorpyrifos, aluminium and catechin alone, and in combinations on various biochemical and oxidative stress parameters in Wistar rats. Rats of 150-200g body weight were divided into nine groups of six animals each and were subjected to various daily oral treatment regimes for 28 days. Group I and group II served as controls and received corn oil and CMC respectively, group III received chlorpyrifos @ 27mg/kg b.wt, whereas animals in group IV were administered with aluminium chloride @ 38.5 mg/kg b.wt. Group V received combination of chlorpyrifos @27 mg/kg b.wt and aluminium chloride @38.5 mg/kg b.wt, group VI received catechin @20mg/kg b.wt in CMC, group VII received chlorpyrifos @ 27 mg/kg b.wt and catechin @ 20 mg/kg b.wt and group VIII were



treated with aluminium chloride @ 38.5 mg/kg b.wt along with catechin@20mg/kg b.wt. Group IX received chlorpyrifos @ 27 mg/kg b.wt along with aluminium chloride @38.5 mg/kg b.wt and catechin @20 mg/kg b.wt. Chlorpyrifos and aluminium alone or in combination caused significant decrease in Hb.values, with elevation in levels of plasma aminotransferases, phosphatases, creatinine and blood urea, and decreased the levels of cholinesterases and plasma protein. Among the oxidative stress parameters, a significant increase in lipid peroxidation and a decrease in activities of GSH, GST, GPx and SOD were observed by administration of both these toxicants either alone or in combination. Ameliorative effect of catechin with co administration of chlorpyrifos was observed with increase in Hb. level and in plasma enzyme ACP, with increase in antioxidant enzymes like GPx in erythrocytes and in GST of liver towards control. Other biochemical and oxidative stress parameters did not showed any modulatory effect. The results of this study indicate that ameliorative effect of catechin was more prominent when given with aluminium chloride in comparison to chlorpyrifos alone and in combination.

**Antimicrobial residues in foods of animal origin:** Estimation and evaluation of antimicrobial residues in foods of animal origin have been under way in the interest of human health with the objective to quantify such residues in animal tissues, eggs, milk and milk products and thereby generate and compile necessary scientific data for regulatory authorities to frame guide lines for protection of consumers.

### 3.3.13 Division of Veterinary Physiology and Biochemistry

**Zinc supplementation on testicular development:** A study was conducted in weaned Wistar male rats to find out the effect Zn supplementation on their growth and development of testis and epididymis. Two groups of rats were fed with diet containing zinc sulphate @ 50 mg/kg body weight/day (T1) and 100 mg/kg body weight/day (T2) for 8 weeks (4 – 12 weeks of age). Significant increase ( $P<0.01$ ) in growth rate (body weight) of rats, plasma enzymes (ALT, AST and ALP), hormone ( $T_3$ ,  $T_4$  and Testosterone) and plasma zinc levels were observed in zinc-supplemented groups compared to control

group (fed with diet containing no Zn). Higher body weight, ALT, AST, ALP, ACP,  $T_3$ ,  $T_4$  and testosterone concentrations were observed in group T1 than T2. Oxidative enzymes viz SOD, GPX, GST, CAT and LPO activities showed decreasing trend in T1 group, and increasing trend in T2 group as age advanced. No such increasing or decreasing trend observed in control group, except increasing trend LPO activities. Testicular and epididymal dimensions (biometry & micrometry) showed increasing trend from 6 to 12 weeks of age in all groups and significantly higher ( $P<0.01$ ) growth in Zn-supplemented groups than control at different ages. Increased biometrical parameters of testes were observed in T1 group compared to T2 group in later phase of Zn-supplementation (10 - 12 weeks). Higher values for epididymal biometry and testicular and epididymal micrometry were observed in T1 group compared to other groups. Histological study revealed earlier development of functional germ cells in zinc-supplemented rats as compared to control. Hence, study indicated that earlier development of functional germ cells could be achieved by supplementation of zinc sulphate @ 50mg/kg body wt/day and a better choice than feeding zinc sulphate @ 100mg/kg body wt/day in growing rats.

**Molecular detection of *Streptococcus agalactiae* in milk:** A LAMP assay was developed for screening of *Streptococcus agalactiae* in cattle milk related subclinical mastitis in field and to compare its efficacy with PCR. LAMP and PCR assays for *Streptococcus agalactiae* were standardized by targeting its *cfb* gene and their relative specificity and sensitivity were determined. The optimized LAMP protocol was employed at field level. LAMP products were detected by agarose gel electrophoresis and hydroxynaphthol blue dye detection method. Optimized LAMP protocol involved 6mM level of  $MgSO_4$ ; presence of loop primers; concentration of 5 $\mu$ M outer primers, 40 $\mu$ M internal primers and 20 $\mu$ M loop primers (ratio of 1:8:4); 64.4°C temperature and 90 minutes reaction duration. Specificity of both the PCR and LAMP assays were comparable. The detection limits was found to be  $10^{-5}$  dilution ( $2.2 \times 10^7$  CFU/ml and 0.25ng/ $\mu$ l DNA) and  $10^{-3}$  dilution ( $2.2 \times 10^9$  CFU/ml and 25ng/ $\mu$ l DNA) of *S. agalactiae* for LAMP and PCR, respectively. On deployment of optimized LAMP protocol for screening of milk samples at field



(n=175), the detection efficiency of LAMP and PCR assays was found to be 100% and 93.3%, respectively. The result of detection of LAMP product by agarose gel electrophoresis was comparable to naked eye detection using hydroxynaphthol blue dye. It was concluded that standardized LAMP protocol is a rapid, accurate and low cost molecular diagnostic technique for detection of *S. agalactiae* with specificity similar to PCR concurrent with 100-fold sensitivity. Hence, LAMP may be employed as an *in situ* diagnostic technique for field detection of *S. agalactiae* caused sub-clinical mastitis.

**Effect of season in local sheep:** The investigation was undertaken in ovaries of local sheep of Jammu region to study the effect of season (autumn, winter and summer) on concentration of biochemical metabolites, minerals and oxidative stress markers in follicular fluid (FF) of preovulatory follicles. Sheep ovaries were procured from local municipal slaughter house and the surface ovarian follicles were grouped according to their diameter into small (< 6 mm), large (> 6 mm) and pooled (both small & large). The follicular fluid was aspirated and after processing, the concentration of biochemical metabolites (glucose, total protein, albumin, globulin, total cholesterol, LDL-cholesterol and nitric oxide), minerals (Fe & Mg), and oxidative stress markers (SOD & TAA) were estimated by spectro-photometric method. But the concentrations of Cu & Zn were estimated using atomic absorption spectrophotometer. It was observed that season had significant ( $P < 0.05$ ) effect on concentration of glucose, total protein, total cholesterol, LDL-cholesterol, copper, zinc, SOD activity and TAA in follicular fluid harvested from small and large follicles. In addition to above parameters, season had also significant ( $P < 0.05$ ) effect on nitric oxide content in follicular fluid harvested from pooled follicles, but no significant difference observed in NO content of FF of either large & small follicles during different seasons. It was also observed that studied biochemical profile, mineral content of small & large follicle differed significantly ( $P < 0.05$ ) in all three seasons. The observed alterations in biochemical composition of FF during different seasons might have some control on the folliculogenesis & oogenesis process in the breed.

Division of Veterinary Public Health and Epidemiology

**Screening for *Coxiella burnetii*:** To determine the prevalence of *C. burnetii* in sheep and goats in Jammu region, laboratory for handling and processing samples has been developed. The samples are collected and transported to DRDE, Gwalior for screening by ELISA and molecular methods. Sheep samples in the lambing season have been collected in collaboration with Sheep Husbandry Department from Reasi, Panthal and Billawar farms. A total of 128 sera/ whole blood samples, 74 placental bits and 36 vaginal swabs from aborted and normally parturited animals were collected besides milk samples (49) and faecal samples (64). Ticks (67) from cattle, buffalo, sheep and goats have been collected from different clusters of villages and dispatched to DRDE.

**Outreach Programme on Zoonotic Diseases:** Epidemiological data on animal/ human rabies and scrub typhus in man/ rodents in Jammu and Kashmir have been generated. Various veterinary hospitals reported 2883 post-bite vaccination cases amongst bovines in all the districts of Jammu (2016-17). The highest cases (525) were reported in January month followed by June (430) and July (418) months. Majority of cases were reported in Kathua district (January) and highest number from Rajouri district (July). Jammu region had 6299 prophylactic vaccines in dogs based on Government veterinary hospitals records at more than 300 per month (range 327-852). Maximum vaccinations were in August (852) month while January to March witnessed another peak with the vaccinations cases as 654, 593 and 705, respectively, for January, February and March. A total of 17 animal rabies deaths were confirmed / reported from region. Laboratory diagnostic facilities for confirmation of rabies and scrub typhus have been initiated. Out of 360 sera samples collected from various categories of vaccinated dogs, 178 (49.45%) samples tested positive for antibodies to rabies where as 51% did not reveal antibodies to rabies.

**Parasitic zoonoses of livestock and their rearers:** The occurrence of common external and internal zoonotic parasites of livestock, dog and their rearer belonging to scheduled caste/ scheduled tribe communities have been studied. Interventional



strategies for prevention and control of common parasitic zoonoses of livestock by way of training and education/ awareness in respect of zoonoses have been initiated by formulating action plans, organizing camps and distributing appropriate literature in local language.

**Parasitic zoonoses of sheep, goats and nomadic women:** Interventional strategies for prevention and control of common parasitic zoonoses of sheep, goats and nomadic women for socio-economic upliftment of nomads have been initiated. A total of 31 liaison campaigns and 42 awareness cum treatment camps were conducted in the far flung villages of Poonch and Rajouri districts. The villages covered under study while conducting the awareness cum treatment camps from Poonch District include, Fazalabad, Machakki, Pathian (Draba), Tandil and Lathung (Surankote) whereas from Rajouri District were Stuntla Kura -Tattapani, Barmandal, Kharakpanjah, Panjah, Kurlian, Katwari, Surrah, Kura Gujran, Bara marhote, Chainpur, Dalhote, Keri and BrohBarmandal (Tehsil Kalakote), Chingus, Chatyari, HadayatpurNarian, Rajalmore, Rajalkote, Gurn, Dogiani, Sangpur (Tehsil Nowshara). The people of nomadic communities were made aware about the different aspects of parasitic diseases and taught about the different control measures. A total of 11640 sheep and goats (sheep - 5050 + goats - 6590) have been examined during the treatment camps. It was observed that 57.90% sheep and 47.11% goats were infested with external parasites like ticks, lice and fleas; whereas 14.59% sheep and 0.47% goats were infested with mites. Samples were collected for identification of parasites consisting of ticks (295), sheep mange (30), goat mange (31) and dog scabies (2) cases. Two human scabies and several lice infestation cases were reported. It was observed that in both the districts, the most commonly abundant genera of ticks were *Rhipicephalus* sp., *Hyalomma* sp., *Haemophysalis* sp. *Sarcoptes* scabies, a zoonotic mange was diagnosed in 2 humans, 3 goats and 9 sheep. Faecal samples (170) of sheep and goats and their handlers (32) were processed for identification of endoparasites. It was observed that flock were suffering with mixed worm infestation of *Haemonchus contortus*, *Strongyles*, *Strongyloides*, *Fasciola hepatica*, *Amphistomes* etc. However the stool samples of 2 women were found having Ascariid eggs. Besides external and internal

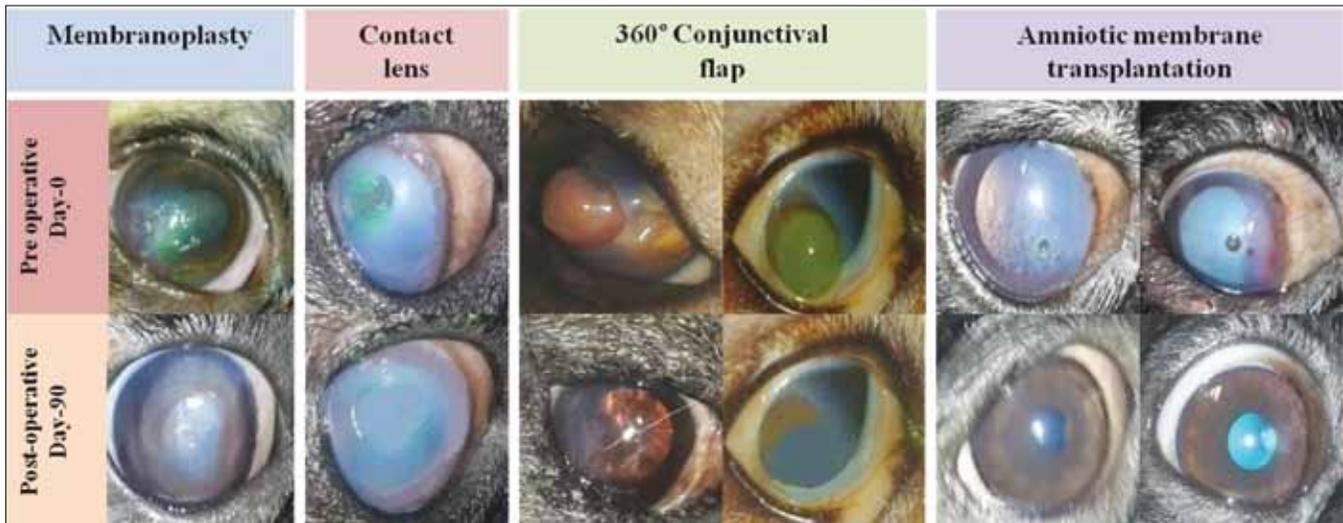
parasites the flocks were found suffering with number of other diseases, showing the signs and symptoms of orf, contagious agalactia, foot-rot, FMD, sheep and goatpox, CCPP, PPR etc. The brief impact of study conducted was encouraging. A total of 1380 men and women participated in the awareness cum treatment camps on different occasions. Results were significantly encouraging and lot of interest among people with active participation has been observed. The overall impact of study was very encouraging and ranged from 50-95% in respect of different aspect of study calculated on the bases of questionnaires.

### 3.3.14 Division of Veterinary Surgery

The division has been working on the thrust areas to evolve safer anaesthesia protocols and improve the efficiency in diagnosis and management of surgical affections of livestock and pet animals. In this direction the division conducted following studies during the period under report:

**Anaesthesiology:** Xylazine, an alpha-2 agonist, has been in use for decades as preanaesthetic to ketamine anaesthesia in pet animals. However the drug is not free from life threatening side effects. Newer selective alpha-2 agonists like detomidine, medetomidine, dexmedetomidine etc. are reported to have lesser side effects. A study was conducted for use of xylazine and dexmedetomidine as preanaesthetics to ketamine anaesthesia for soft tissue surgery (ovariohysterectomy) in canines and it was concluded that dexmedetomidine and ketamine combination was better than xylazine-ketamine combination in terms of onset, duration and quality of anaesthesia and can be safely used in dogs without any deleterious cardiorespiratory effects.

**Corneal ulceration:** ulceration of the cornea has been found to be a common occurrence in dogs particularly in the age group of 0 to 2 years. Four surgical techniques viz., Membranoplasty, Conjunctivoplasty, Bandage contact lens, and Preserved amniotic membrane were evaluated for best results with least complications in the surgical management of corneal ulcers in dogs. It was concluded that although, all the four surgical techniques resulted in healing of corneal ulcers in approximately the same



Corneal ulcers in dogs treated by different techniques: Pre-operative and post-operative appearance

time; however, it was recommended that corneal ulcers may be better treated by 360° conjunctival grafts or amniotic membrane transplantation with minimal complications. *Staphylococcus* sp., a normal commensal of the ocular flora, predominated in 100% of the tested samples; Gatifloxacin and Moxifloxacin were effective antibiotics against corneal ulcers in dogs.

### 3.3.15 Instructional Livestock and Farm Complex

**Livestock farm practices:** Besides dairy unit activities, this division is imparting instructions and demonstrations to B.V.Sc. and A.H., B.Sc. (Ag.) and Agri-business (MBA) students in their respective courses. The scientists of the division are also involved in the PG teaching. Entrepreneurships courses, Livestock Farm Practices I and II are offered by the Division under which hand on training to B.V.Sc. and A.H. students regarding feeding, breeding, management, large animal health care, fodder production, poultry management and recycling of animals washings and wastes.

**Entrepreneurship development:** Under entrepreneurship courses sale of poultry is usually done after scientific rearing by the students. Division dairy unit provides clean milk to students, faculty and university staff at Chatha campus.

**Fodder unit:** For dairy unit a *Chara Vatica* was initiated to produce green fodder throughout the year

to the dairy animals. Studies were also initiated on the effect of azolla (*Azolla pinnata*) supplementation on milk yield, composition and economics of crossbred cows with promising results.

**Vermicomposting:** Work on vermicompost unit has been initiated in the dairy unit of ILFC Division. Good quality vermicompost is being produced with the sell of approximately 1.30 quintals in the initial phase. Trainings and lectures on Vermicompost and Azolla production is also imparted. Training and lectures delivered on ASCI and NSDC sponsored skilled training programme on Vermicompost organised by KVK, SKUAST-J. Although the division does not have a post-graduate programme, yet, the divisions dairy and poultry units provide opportunities for various experimentation of student research.

### 3.3.16 Division of Teaching Veterinary Clinical Complex

In the Teaching Veterinary Clinical Complex, equipments which have been added in the urban animal care clinic and pet care services are 500mAX-Ray Machine, Computed Radiography Unit, Automated biochemical analyzer, Automated haematological analyzer, Colour Doppler Ultrasonography, Video Gastro scope –Flexible endoscope unit, Multi parameter monitor for Veterinary Use, 5 to 10 Mhz Linear Rectal Probe, Orthopedic equipments, Refrigerator Printer/Photocopier and two exam tables and stand.



With the addition of 500 mA x ray unit and computed radiography unit the diagnostic imaging facility has been enhanced and has made marked improvement in diagnosis of large and small animal diseases. So far we have conducted radiographic examination of 579 clinical cases and 186 PG research and academic purposes (From 1st June 2016 onwards).

The faculty has also established fully equipped diagnostic laboratory wherein automatic haematological analyzer and automated biochemical analyzer had been added for diagnosis of samples of clinical cases being presented at the Referral Veterinary Hospital of the University. So far this facility has been extended for analyzing research samples of PG students of Gynaecology, physiology, surgery

and in running of departmental projects. We have analyzed 325 samples so far with these analyzers.

With addition of Color Doppler and multi parameter monitor the cardiac emergency unit has been upgraded. Video gastroscope i.e. endoscope addition for small animal has helped in upgrading diagnostic and therapeutic gastric emergencies. Though this is at standardization level and we are in the process of giving advanced training to the scientist in these equipments. Addition of the orthopedic facilities has helped us in handling orthopedic emergencies in small animal care system.

A total of 45 students of B.V.Sc & AH batch 2011 had been trained to use these facilities for entrepreneurship.



Students at Experiential Learning Programme: Urban Animal Care Clinic and Pet Care Services



### 3.4 Research Stations/Centres

#### 3.4.1 Regional Agricultural Research Station, Rajouri

##### Integrated Agromet Advisory Services for mid to high altitude intermediate zone of J&K / Gramin Krishi Mausam Sewa (GKMS)

- During 2016-17, 102 number of forecast were received for Tuesday & Friday of each district Doda, Poonch, Rajouri, Ramban & Udhampur, respectively from Meteorological Centre, Srinagar and based on these forecasts 510 crop weather bulletins (102 for each district) were prepared and disseminated for the benefits of the farmers.

Agro meteorological Field Unit (AMFU), Rajouri sent 60 crop and location specific SMS based on medium range weather forecast through m kisan portal to the 4900 registered farmers in english, urdu and hindi languages during the year 2016-17

#### All India Coordinated Research Project

##### All India Coordinated Wheat and Barley Improvement Project

Regional Agricultural Research Station Rajouri is the volunteer center for AICRP on Wheat and Barley. The experiments are laid out as per the technical programme provided by Directorate of Wheat Research, Karnal. The unanalyzed results of the experiments are submitted to the Indian Institute of Wheat and Barley Research, Karnal.

#### All India Coordinated Research Project on Maize

##### Trial -1AVT-1 Early maturity (Kharif 2016)

Seven coded entries were received from the Indian Institute of Maize Research, New Delhi under this trial, which was worked upon and it was found that the entries IMR-522 had maximum cob wt./plot in comparison to all other entries. Some entries were at par in cob wt./plot with the IMR-525 and IMR-527. The maximum cob wt. /plot was found in 16.53 kg/plot (IMR -522) while the minimum cob wt. /plot was noted 10.54 kg/plot (IMR-526). The final data has already been sent earlier.

##### Trial -1AVT-1 Medium maturity (Kharif 2016)

Seven coded entries were received from the Indian Institute of Maize Research, New Delhi under this trial, which was worked upon and it was found that the entries IMR-464 had maximum cob wt./plot in comparison to all other entries. Some entries were at par in cob wt./plot with the IMR-466 and IMR-467. The maximum cob wt. /plot were found in 19.23 kg/plot (IMR -464) while the minimum cob wt. /plot was noted 15.52 kg/plot (IMR-463). The final data has already been sent earlier.



Farmers visiting research activities at RARS, Rajouri

#### All India Coordinated Research Project on Rice

1. **Advance Varietal Trials AVT 1- E (H) KHARIF 2016:** Fifteen entries were evaluated for grain yield and yield contributing traits. Of these, entries 2504, 2509, 2510 and 2512 performed significantly better over local checks (K-39).



## 2. Advance Varietal Trials AVT 1- M (H) KHARIF

**2016:** Twelve entries were evaluated. Entries 2701, 2702, 2704, 2708, 2709 and 2710 performed better over the local check (K-39).

### All India Coordinated Research Project on Forage Crops

#### Trial -1. IVTM: Initial Varietal Trial of Forage Maize (Kharif 2016)

Twelve coded entries were received from the centre which was worked upon and it was found that the entries IVTM-1 had maximum green forage yield in comparison to all other entries. Some entries were at par in green forage yield with the IVTM-6 and IVTM-11. The maximum green forage yield was found in 188.6q/ha (IVTM -1) while the minimum green forage yield was noted 120.4 q/ha (IVTM-5). The final data has already been sent earlier.

#### Trial -2. IVTC: Initial Varietal Trial of Forage Cowpea (Kharif 2016)

Ten coded entries were received from the centre which was worked upon and it was found that the entries IVTC-6 had maximum green forage yield in comparison to all other entries. Some entries were at par in green forage yield with the IVTC-11 and IVTC-12. The maximum green forage yield was found in 538.9/ha (IVTC-6) while the minimum green forage yield was noted 314.4 q/ha (IVTC-1). The final data has already been sent earlier.

### To Study the Insect Pest Complex of Cucumber and Development of IPM Module for Major Pests

#### Result of 1<sup>ST</sup> Year Trial :-

The seeds of hybrid Cucumber variety *Malini* (seminis) were sown in plastic bags filled with soil & cow dung manure in the nursery on 23-05-2016. The cucumber seedlings were transplanted in the field on 16-06-2016. Staking in cucumber field would be done on 16-06-2016. Two insects namely Blister beetle and Fruit Fly were recorded in the field. Blister beetle was the major pest recorded & it causes about 20 per cent damage to the crop during flowering stage and fruit fly causes around 10-15 per cent damage to fruits in the field.

## Experiment – 2

**Title: Standardization of seed production technology of okra var. Seli Special under intermediate zone of J&K**

#### Result of 1<sup>ST</sup> Year Trial :-

An experiment was conducted at RARS, Rajouri to standardize the seed production technology of okra var. Seli Special during rainy season of 2016 under organic system. The treatments comprised of FYM, Vermicompost and Poultry manure alone or in combinations were compared with control (recommended fertilizer dose. The 1<sup>st</sup> year results revealed significantly highest seed yield (19.3 kg/ha) in treatment combination T<sub>7</sub> - Half dose FYM + 1/4<sup>th</sup> dose each (VC @ 1.87t/ha + PM @ 1.25t/ha) as compared to other organic treatments. However, maximum seed yield of 19.8 kg/ha was recorded in T<sub>8</sub>- Control-Recommended fertilizer dose (100:60:60 NPK/ha) which was at par with T<sub>7</sub>. Half dose FYM + 1/4<sup>th</sup> dose each (VC @ 1.87t/ha + PM @ 1.25t/ha).

### c. Concluded research projects:

#### Entrepreneurship opportunities for socio-economic up-liftment rural farmers through QPM hybrid seed production techniques

The study was conducted regarding the profitability of seed production over grain crop showed that the enhancement in the farmer's income was about 2.78 times than the grain crop with the net return of Rs. 34,010.00 from grain yield and Rs. 94,553.00 in case of seed yield of single cross hybrid QPM. The B:C ratio of grain yield was 1.72 whereas; it was observed 2.78 in case of seed yield. The highest hybrid seed yield of single cross hybrid maize was recorded 16.40 q / ha with 1:3 ratio of male and female parents than the other ratios i.e., 1:2, 2:2 and 1:4 ratio.

The data collected from FLDs in terms of grain yield revealed that though there was no significant difference among the cultivars demonstrated and popularly grown cultivars of the area. But the cultivars under demonstration were nutritionally superior for food and fodder than the check. The cultivars under demonstration are rich in protein content especially in two essential amino acids i.e., Lysine and Tryptophan and this may improve the condition of growing children, lactating mothers and pregnant



women and old persons of the community where maize is consumed as staple food. Hence cultivation of QPM was recommended to address the problem of malnutrition and better income to the tribal farm families of hilly region.

**Recommendations:** The study was conducted regarding the profitability of single cross hybrid seed production through different planting ratios and row spacing. It was revealed that the highest hybrid seed yield of single cross hybrid maize was recorded 16.40 q/ha with 1:3 ratio of male and female parents having a spacing of 75 cm x 25 cm apart over the planting ratios i.e., 1:2, 2:2 and 1:4 of with a spacing of 60 cm x 25 cm.

### Technologies Developed

The profitability of seed production over grain crop showed that the enhancement in the farmer's income was about 2.78 times than the grain crop with the net return of Rs. 34,010.00 from grain yield and Rs. 94,553.00 in case of seed yield of single cross hybrid QPM. The B:C ratio of grain yield was 1.72 whereas; it was observed 2.78 in case of seed yield.

- The highest hybrid seed yield of single cross hybrid maize was recorded 16.40 q/ha with 1:3 ratio of male and female parents than the other ratios i.e., 1:2, 2:2 and 1:4 ratio.

### 3.4.2 Regional Horticultural Research Sub-Station, Bhadarwah

#### Networking Project on Outreach of Technologies for Temperate Fruit Crops

#### Productivity enhancement of elite apple cultivars through high density planting and efficient water and pollination management

Different apple cultivars grafted on MM-106 rootstock and planted at a spacing of 2.5m x 2.5m are being studied for their plant survival, plant height, girth, spread, flowering, fruit set and yield parameters. Gap fillings in the experiment were also done.

- **Medium density orcharding for higher almond productivity**  
Seven almond cultivars viz. Non-Pariel, Merced, Primorskii, Pranyaz, Waris, Shalimar and Makhdoom planted at a spacing of 4m x 4m are being studied for their growth and flowering

characteristics. Gap fillings required were also met.

- **Plant architectural engineering for higher energy harvest vis-à-vis productivity in apple**

Apple cultivar Red Delicious (standard) and cultivar Starkrimson (dwarf) on clonal rootstock MM-106 and MM-111 planted at a spacing of 2.5m x 2.5m for Modified Central Leader System, 1.5m x 2.5 m for Spindle Bush System, 1.5m x 3.0m for Trellis system, 1.5m x 2.5m for Head and Spread system, 0.75m x 1.5m for Vertical Axis and 1.5m x 3.0m for Cordon System, are being studied under this study.

- **Multi-location testing of elite walnut genotypes under medium density**

Growth parameters of different walnut genotypes namely CITH-W-01, CITH-W-02, CITH-W-03, CITH-W-04, CITH-W-05, Hamdan, Sulaiman and OpexCulchery planted at a spacing of 6m x 6m, are being studied.

- **Multi-location testing of elite apricot genotypes under medium density**

Different genotypes of apricot namely, CITH-Apr-01, CITH-Apr-02, CITH-Apr-03 and New Castle planted at a distance of 5m x 5m are being studied under this.

- **Survey and mapping of major pests and diseases of temperate fruits**

Data on the attack and severity of major pests and diseases in temperate fruit crops viz. apple, almond, walnut, apricot and cherry have been collected for this year for further studies.

- **Testing of identified genotypes of temperate fruit crops**

Different walnut genotypes viz. CITH-W-06, CITH-W-07, CITH-W-08, CITH-W-09 & CITH-W-10 & local, cherry genotypes viz. CITH-C-01 & CITH-C-02 & local, and apple genotypes viz. CITH-Apple-Lodh-01 & local have been taken under study at RHRSS, Bhaderwah.

- **Water harvesting and moisture conservation techniques in apple**

Rain water harvesting systems viz. half moon system, full moon system, cup and plate system and trench system, along with mulching



techniques viz. Paddy straw mulch and plastic mulch have been laid out for further studies at RHRSS, Bhaderwah.

- **Low cost poly house propagation techniques in walnut**

Two low cost poly house structures have been installed for propagation studies of walnut at RHRSS, Bhaderwah.

- **Imparting training to stakeholders for technology outreach**

Five trainings of one day each for farmers were conducted on 'Outreach of Technologies for Temperate Fruit Crops' during 2016-17.

- **Exploitation of natural variability of walnut for export related traits**

Walnut germplasm with superior traits from erstwhile Doda district is being surveyed for further evaluation at RHRSS, Bhaderwah.

- **Survey of Ambri apple variants in Doda district**

Ambri apple germplasm with superior traits from erstwhile Doda district is being surveyed for further evaluation at RHRSS, Bhaderwah.

- **Nutritional survey of apple orchards of Doda district with respect to important micronutrients.**

Nutritional survey of apple orchards of district Doda (J&K) was undertaken. Based on productivity, altitude and hill aspect, a total of 105 orchards from major apple growing areas in Bhaderwah, Ghatt, Maramat, Doda and Bhalessa blocks were selected. Composite soil samples drawn from two depths *i.e* surface (0-20 cm) and sub surface (20-40 cm) from tree basins of these orchards were analysed for important physico chemical characteristics (texture, pH, EC, OC) and available micronutrients (DTPA extractable Zn, Fe, Mn, Cu) using standard procedures. Studies revealed that the soils were mostly sandy loam to clay loam in texture, low in OC and slightly acidic to slightly alkaline in reaction. Majority of the studied soils were found to be in low to medium range of available Zn and Cu (except for Fe and Mn). In general, the concentration of available micronutrients was higher in surface soils which decreased with depth and their distribution followed the similar trend as of OC and clay

content as revealed by positive correlations existing between them.

### Collection, evaluation and selection of quality Rajmash for commercial cultivation in Doda District

A total of sixty lines were collected from different places of Bhadarwah, Kishtwar and Patnitop area of Jammu Province (Thirty lines from Bhadarwah, 15 lines from Patnitop and 15 lines from Kishtwar). Two lines were also collected from Himachal Pradesh. All these lines were evaluated for different characters, like seed colour, seed shape, growth habit, stem colour, flower colour, days to 50 % flowering, days to maturity, no. of seeds per pod and no. of pos per plant.

Characterisation of four bush type advanced lines was also carried out during kharif 2016 for different characters like seed colour, seed shape, seed length, seed width, seed thickness, growth habit, stem colour, flower colour, days to 50 % flowering, days to maturity, no. of seeds per pod and no. of pod per plant.

Seed of two advanced lines (BR 104 and BR 39) were



Pole type Rajmash



Bush type Rajmash



RHRSS Scientist monitoring seed multiplication under participatory mode

multiplied at farmers' field under farmer participatory mode. Total 180 kg (172 kg of BR 104 and 8 kg seed of BR 39) seed was procured from farmer under PPP mode.

#### **To work out the organic package of Maize+Rajmash (1:1)+Pea cropping system under the hilly tracts (Bhaderwah) of Jammu conditions.**

Sowing of Maize+Rajmash in Kharif 2016 and Peas in Rabi 2016 were done as per the technical programme and observations were recorded. In terms of Rajmash, the observations for length of pod, number of pods per plant, number of grains per pod, test weight (1000 grain weight) and grain yield were recorded and preliminary observations showed that supplement of nutrients with through FYM, vermicompost, neem cake and pine needles in combination

with biofertilizers performed better.

The data revealed that maximum yield of maize + rajmash and pea were observed in  $T_7$ , where 100% recommended N was applied through 1.25 t/ha through FYM + 1.25 t/ha through vermicompost + 1.25 t/ha through neem cake + 1.25 + pine needle and was found at par with  $T_6$ ,  $T_8$ , and  $T_9$  and was significantly superior over rest of the organic combinations and recommended dose of fertilizers, respectively. There is no significant difference among the yield attributing character of maize and rajmash.

However, the soil properties after completion of 2<sup>nd</sup> year crop cycle, there was slightly improvement in soil organic carbon content in all the organic treatment combinations which varied from 5% to 30% over initial level. The available NPK content in soil was also slightly enhanced where organic sources like FYM/vermi-compost/neem cake/pineneedles were applied.

#### **Nutrient indexing of Gwari and Sartangal farm soils of SKUAST-J**

Nutrient indexing of 60 kanal land of RHRSS Bhaderwah at 10 locations and 160 kanal land of KVK Doda at 12 locations, are being carried out during the current season that will help in delineating nutrient deficiency / sufficiency and formation of recommendations for better nutrient management of crops in these areas.

- **Evaluation of bio-efficacy of Promalin on enhancement on growth (fruit size & shape), yield and quality of apple .**

The experiment was conducted as per the technical programme provided by M/s Sumitomo Chemical India Private Limited, Mumbai, during June 2016, and data was recorded. Fruit samples were sent to Ross Lifesciences Pvt. Ltd., Pune, for residual studies, as required by the funding agency.

- **Evaluation of bio-efficacy of Etaxazole on enhancement on growth (fruit size & shape), yield and quality of apple**

The experiment was conducted as per the technical programme given by M/s Sumitomo Chemical India Private Limited, Mumbai, during June and July 2016, and data was recorded. Fruit



samples were sent to Ross Lifesciences Pvt. Ltd., Pune, for residual studies, as required by the funding agency.

### 3.4.3 Maize Breeding Research Sub-Station, Poonch

#### Development of Hybrids/Composites/ Synthetics in maize (*Zea mays* L.) suitable for intermediate hill (rainfed) zone.

##### Evaluation of developed station hybrid:

A replicated station trial on 32 new single cross hybrids in white and yellow maize group along with local popular hybrid DKC as check, respectively was carried out during Kharif-2016. Out of these 3 single crosses i.e. C4/15-18/5, C4/15-62/61 and C4/15-58/7, revealed more than 15% superiority over the respective checks with regard to their yield.

##### Evaluation of station entries in public sector Multilocational trial

Five station entries of promising single cross hybrids/composites PHM 34, 15, 17, PMSY3 and PMSW4 identified in station hybrid evaluation trial



View of research trials



View of research trials

were evaluated in Public sector multilocational trial during *kharif* 2016, constituted by Division of PBG and conducted across the area jurisdiction of SKUAST-J at two locations Poonch, and Chatha.. Where all the station entries showed yield superiority with respective check hybrid over the locations.

#### Genetic amelioration of specialty corns viz., pop corn, sweet corn and baby corn suitable for intermediate hill region

One QPM and two specialty corn composites were evaluated trial no. QPM123 and Trial popcorn/sweetcorn, respectively during *kharif* 2016 in AICRP. The grain yield (kg./ha) of SJPC1 was 3030 q/ha which was 11.4% superior to national check. Based on the performance of SJPC1 in IVT trial during *kharif* 2016, the entry has been promoted to 3<sup>rd</sup> year during *kharif* 2017.

#### Survey, collection, conservation, evaluation and utilization of elite maize germplasm suitable under intermediate hill (rainfed) zone.

A sum of 900 inbred/germplasm lines (Poor lines have been discarded due to non availability of selfed seed) available with the station (both white and yellow group) is in different selfing generations. These lines include Germplasm lines, station inbred lines, CIMMYT lines and speciality corn inbred lines including popcorn, sweetcorn and babycorns. These inbreds were advanced through selfing followed by selection between and within progenies during *kharif* 2016. The selfed seed of the aforesaid inbreds have been collected and data has also been recorded to assess their performance during next *kharif* season.

#### Training cum input distribution for seed production in different crops under Tribal sub plan (TSP) seed component.

Tribal farmers of different tribal clusters have been selected through survey programme. Three training on seed production, management of storage techniques conducted along with input distributions to the selected farmers during the period.

Result of OFT Evaluation: One composite PMSY3 of this station was evaluated at all six KVKs of the university. The result of the OFT trial is shows 40-50 q/ha yield per ha. of the composite.



### 3.4.4 Maize Research Station, Udhampur

#### Germplasm collection, evaluation, Maintenance and its enhancement

Thirty three local maize germplasm collections (Yellow, white, blue etc.) representing Udhampur district, some parts of Reasi, Kathua and Doda district are being maintained and advanced through selfing.

200 numbers of inbred lines are being maintained through selfing and the appropriate elite lines are being used in hybrid development programme by taking advantage of Winter Nursery Centre Rajendra Nagar, Hyderabad for generation advancement facility provided by ICAR, Indian Institute of Maize Research.

- AICRP Maize Centre, Udhampur contributed 25 No. of Maize inbred lines of different genetic background for use in PG research programme and for research purpose in the Division of PBG, SKUAST Jammu, main campus, Chatha, Jammu.
- **Development of maize varieties/ hybrids with emphasis on single cross hybrids for improved nutritional adequacy and health.**

Nine single cross hybrids viz. UDMH-112, UDMH-114, UDMH-115, UDMH-121, UDMH-122, UDMH-124, UDMH-128, UDMH-130, and UDMH-131, contributed by AICRP Maize Centre Udhampur in public sector hybrid maize varietal evaluation trial conducted by Division of PBG, SKUAST Jammu, Main campus Chatha, Jammu.

AICRP Maize Centre Udhampur has contributed two single cross hybrids UDMH-128, UDMH-129 for testing in Co ordinated trial No. 62 IVT during Kh. 2016 conducted by ICAR, Indian Institute of Maize Research, Pusa Campus New Delhi.

AICRP Maize Centre Udhampur has contributed three single cross hybrids UDMH-130, UDMH-131 and UDMH-132 for testing in Zonal Co-ordinated trial no.102 conducted by CSKHPKV, HAREC Bajaura during Kh. 2016.

AICRP Maize Centre Udhampur has also contributed one single cross hybrid UDMH-133 for testing in Zonal Co-ordinated trial no.103 conducted by VPKAS, Almora, (U.K.) during Kh. 2016.



View of research trials laid out at Research Station Udhampur



### 3.4.5 Pulse Research Sub Station, Samba

#### AICRP on Chickpea:

#### Crop Improvements

A) Experiments					
Rabi 2015-16					
Scheme/Project	Expt.	Entries	Checks	Best (ch)	Promising entries
a) AICRP on chickpea	1)AVT-1(Rainfed)	05	3	CSJ 515(1988)	GNG 2263
	2)IVT (Rainfed)	30	3	RSG-931(1507)	CSJ-870,DBGV-104,GJG-1307, GNG-2307
	3)IVT (Desi)	40	3	GNG-1958 (1681)	GL 29095,NDG 14-11
b) AICRP on MuLLaRP	1)Lentil AVT-1(SS)	05	3	PL-406(749)	LL-1320
	2)Lentil IVT(SS)	21	3	L-4147(855)	IPL-232,BPL-14
Kharif 2016					
AICRP on MULLaRP	1)Moong IVT	31	3	IPM 02-3 (1352)	ML-818 (ch) MH-1142,PM-11-26, IPM-312-9,IPM 14-7
	2)Urd IVT	21	3	Uttara (1053)	DKU-116,IPU-13-3,KPU-12-1730, Pant U-31(ch.)
	3)Urd Germplasm Nursery	25	-	One selection made on the basis of disease resistance & seed yield	
B. Breeding Programme					
Segregating generation					
Rabi 2015-16					
Generation	Progenies/lines		SPS made		
F2	40		200		
F3	20		100		
F4	66		300		
F5	14		70		
Total	140		670		
Kharif 2016					
Crop	No. of crosses	Generation	Progenies	Remarks	
Moongbean	01	F8	3	Entry proposed & included in MIVT for kharif 2017 at national level	
Urdbean	01	F8	5	Progenies to be tested once again in kharif 2017 Station Varietal Trial, before proposing entries for U.I.V.T for Kharif, 2018	
	02	F8	40		

#### Production technologies for Mungbean var. IPM-02-3 and Urdbean (PU-31)

#### Mungbean IPM-02-3

#### Summer season:

Results : The finding of the two consecutive summer season experiments on summer mungbean conducted during the summer season of 2015 and 2016 under NFSM –QSP project revealed that the

cultivar IPM-02-3 recorded significantly higher seed yield of 11.10 q/ha followed by PM-5 with yield of 8.35 q/ha. The lowest yield was recorded with Pusa 0672 (4.30q/ha). Therefore, on the basis of two years results it is recommended that the variety IPM-02-3 may please be considered for promotion during summer season under the irrigated areas of Jammu , samba and Kathua districts



### **Kharif season:**

**Significant finding:** The finding of the two consecutive summer season experiments on *Kharif* mungbean conducted under NFSM project during the year 2015 and 2016 revealed that the cultivar IPM-02-3 recorded significantly higher seed yield of 9.12 q/ha followed by PM-5 with yield of 6.44 q/ha. The lowest yield was recorded with PDM-139 (4.81q/ha). Therefore, on the basis of two years results it is recommended that the variety IPM-02-3 may please be considered for promotion under the subtropical *rainfed* conditions areas of Jammu, Samba and Kathua districts

### **Urdbean (PU-31)**

#### **Summer**

**Significant finding:** The finding of the two consecutive summer season experiments on summer urdbean conducted under NFSM-QSP project during the year 2015 and 2016 revealed that the cultivar PU-31 recorded significantly higher seed yield of 12.59 q/ha followed by Mash1008 with yield of 11.34 q/ha which was at par with earlier variety. The lowest yield was recorded with PU-19 (5.04 q/ha). Therefore, on the basis of two years results it is recommended that the variety PU-31 may please be considered for promotion under irrigated conditions of Jammu, Samba and Kathua districts during summer season.

#### **Kharif**

**Significant finding:** The findings of the two consecutive *kharif* season experiments on *Kharif* urdbean conducted under NFSM-QSP project during the year 2015 and 2016 revealed that the cultivar PU-31 recorded significantly higher seed yield of 8.40 q/ha followed by HimMash1 with yield of 5.95 q/ha. The lowest yield was recorded with farmer selection (5.04 q/ha). Therefore, on the basis of two years results it is recommended that the variety IPM-02-3 may please be considered for promotion under the subtropical *rainfed* conditions areas of Jammu, Samba and Kathua district during *kharif* seasons.

#### **Recommendation:**

- One mungbean and one urdbean variety is recommended for cultivation in both summer as well as in *kharif* season under Jammu, Kathua and Samba districts

- The Production technologies for Mungbean var. IPM-02-3 and Urdbean (PU-31) stands discussed and presented in RCM and ZREAC

#### **e. Technology developed :**

- One mungbean and one urdbean variety is recommended for cultivation in both summer as well as in *kharif* season under Jammu, Kathua and Samba districts
- The Production technologies for Mungbean var. IPM-02-3 and Urdbean (PU-31) stands discussed and presented in RCM and ZREAC

### **3.4.6 Organic Farming Research Centre (OFRC), Chatha:**

#### **Evaluation of Basmati genotypes under Organic Environment.**

An experiment was laid out in RBD with three replications having fifteen varietal treatments; SBR 121, Basmati 1509, PB03, Pusa 1612, SBR 123, RR 564, SBR 97, SBR 109, PUSA 1121, SJR 129, SBR 104, SBR 95, SJR 70, SBR 120, BASMATI 370. After taking observations it was observed that Pusa 1121(51.58 q/ha.) followed by SJR 129 (46.72) and SBR 109(41.36) performs better yield wise. It was also observed that the maximum effective tillers were found in SJR 70(13), SBR 95(11) followed by PUSA 1121(9.33). Of these fifteen varieties Basmati 1509, SBR 123,RR 564 mature 38, 33 and 32 days respectively earlier over to check Basmati 370.

#### **Evaluation of different Basmati rice (*Oryzasativa* L.) based cropping systems for system productivity and economics under organic farming practices.**

##### **Summary / Outcome**

First crop of experimentation in this year is over. Different crops are taken up in the rabi season and the rotations will be evaluated over time.

#### **Effect of different crop establishment methods and organic nutrient sources on growth and productivity Basmati rice in Jammu region**

A field experiment was conducted at Organic Farming Research Centre, Chatha to find out most suitable crop establishment methods on growth and productivity Organic Basmati rice in Jammu region. First year results revealed that SRI practices showed significant response in root number, number



of effective tillers per hill, days to flowering and harvest index. In addition, SRI was found effective in minimizing pest and disease incidence, shortening the crop cycle, and improving plant stand. The improved panicle characteristics, lower plant lodging percentage and higher harvest index that ultimately led to comparable grain yields of Basmati rice.

### **Biological Management of Diseases in Basmati Rice under Eco-friendly and Organic Cultivation**

An experiment with var. Basmati-370 under organic conditions was laid down and soil amendments with bio-agents were applied, before transplantation of the crop, @ 5kg/ha *Trichoderma harzianum* and *Pseudomonas fluorescens* along with one unamended. Recording of plant pathological data were made, to know the prevalence and extent of damage caused by rice leaf spot disease. Dipping of rice seedlings for 30 minutes in suspension of 5% N.S.K.E, managed brown leaf spot diseases by reducing maximum disease incidence upto 58.83% at the date of observation on 13/10/2016 and also on 28/10/2016 as PDI was recorded by reduction of max disease incidence upto 72.63%, after 10% Pear leaves suspension was sprayed by w/v. It was observed that in different dates 13<sup>th</sup> and 28<sup>th</sup> Oct., 2016 disease in control plot without spray was spreading fast.

### **Influence of Organic Sources on Soil Health and Crop Productivity of a Basmati based Cropping System.**

Basmati being one of the primary crops of the region, multiple plots were laid down to assess growth and yield as affected by organic sources of nutrient such as FYM, vermicompost, poultry manure and neem cake. Preliminary results revealed that FYM + poultry manure as well as FYM + neem cake with prior incorporation of Dhaincha proved to be most effective as far as Basmati (B370) grain yield is concerned.

### **Studies on High density organic guava orchard established under organic conditions.**

As per the technical programme the high density orchard guava cv. L-49 was planted at a spacing of 3.0m x 6.0m . Planting of orchard was done in the month of August, 2016-17 under water logged conditions on the raised beds of 5.0 feet from the ground level which was made with the help of JCB.

Before planting, layout was done for pit digging, pits of size 0.5 m x 0.5 m (LxBxD) were dugged out and the dugged soil was mixed with well rotten FYM@40 kg and neem leaves @20kg. Initial Soil Analysis of the orchard area where it was found organic carbon is in the medium range. Monitoring and management of pest and diseases in the guava orchard was done organically. Intercropping was carried out in the HDP guava orchards with aloe vera plants procured from IIM, Jammu and were planted in the downstrips of the raised beds of the high density guava orchard.

### **Studies on organically grown High density mango orchard.**

As per the technical programme the high density orchard mango cv. Dashehari (30no.), Baramasi (06no.) and Vellaikolumban (02no.) was planted at a spacing of 4.5m x 4.5m. Planting of orchard was done in the month of August, 2016-17 under water logged conditions in the raised beds of 5.0 feet from the ground level which was made with the help of JCB. Before planting, layout was done for pit digging, pits of size 0.5 m x 0.5 m (LxBxD) were dugged out and the dugged soil was mixed with well rotten FYM@40 kg and neem leaves @20kg. Initial soil analysis of the orchard area was done where it was found that organic carbon is in the medium range. Monitoring and management of pest and diseases in the mango orchard was done organically.

### **Studies on high density aonla orchard established organic environment.**

As per the technical programme, the high density organic orchard of aonla cv. NA7 (40No.s) and NA6 (05no.s) was planted at a spacing of 4.0m x 5.0m (plant to plant and row to row) intercropped with phalsa. Planting was done in the month of August, 2016-17. Intercropping was carried out in the HDPaonla orchards with Phalsa.

### **Comparative evaluation of pecan cultivars under Jammu sub-tropics.**

As per the technical programme five pecan cv:s (A) Mahan (B) Clero (C) Miransahib selection (D) Burket (E) Success were planted in the month of January, 2017 at a spacing of 6 m x 6 m. Before planting, layout was done for pit digging, pits of size 1.0m x 1.0m x 1.0m (L x B x D). The dugged soil was mixed with well rotten FYM@40 kg and neem leaves @20kg.



### 3.4.7 Advanced Centre for Rainfed Agriculture, Dhiansar

#### AICRP on Dry Land Agriculture

- Application of integrated use of inorganic and organic fertilizers, i.e., FYM@10 t/ha + 40 N kg/ha (urea) with recommended dosage of phosphorus and potassium resulted in 1.06 times higher grain yield over control (unfertilized) with concomitant 94 and 44 % increase respectively in rainwater use efficiency (RWUE) and soil organic carbon over control.
- The pooled data for the last three years revealed that the 75% N Inorganic +25% N VC recorded the highest pearl millet mean grain yield of 2637 kg/ha with 70% increase over control.
- The highest maize equivalent yield (MEY) was obtained with paired rows of maize with 2 rows of cowpea with the corresponding maize equivalent yield (MEY) and LER values of 2423 kg/ha and 1.32, respectively with the highest RWUE of 5.86 kg/ha-mm.
- The mixed fodder grown in the alleys of *Aonla* trees during *Kharif* and gobhi sarson during *rabi* under Agri-horti-Pastoral system is found to be the most remunerative system as compared to all other systems.
- Significantly highest maize grain yield was obtained in Broad Bed Furrow (BBF) + Mulching with *Leucaena* leaves to the tune of 2777 kg/ha with net returns, B:C and RWUE of Rs. 27564, 2.23 and 10.51 kg/ha-mm, respectively which was followed by Broad Bed Furrow (BBF) + Mulching with *in-situ* raised *Sunhemp* and Broad Bed Furrow (BBF) + Mulching with *in-situ* raised *Dhaincha* which were statistically at par with each other.
- Highest grain yield of maize (1780 kg/ha) was obtained with two life saving irrigation at critical stages with highest net returns, B: C ratio and RWUE values of Rs. 12550/ ha, 1.7 and 2.73 kg/ha-mm, respectively over the farmers practice.
- Significantly higher wheat grain yield of 2044 kg/ha was obtained in treatment wherein combined foliar spray of 0.5% K solution in water (KCl) + foliar spray of 0.5% N solution in water (Urea) was applied during dry spells and it was found to be statistically at par with combined foliar spray of

0.5% K solution in water ( $\text{KNO}_3$ ) + foliar spray of 0.5% N solution in water (Urea) with grain yield of 1819 kg/ha.

- Highest grain yield of maize (1695 kg/ha) was obtained when recommended dose of NPK whereas, the lowest grain yield of (1280 kg/ha) was obtained in the Conventional tillage + inter culture with 50% N (organic) + 50% N (inorganic). Highest net return, B: C ratio and Highest RWUE was observed with recommended dose of NPK (Rs 10772/ ha, 1.59 and 2.60, respectively).



Visit of Hon'ble VC to Research farm ACRA, Dhiansar



Visit of farmers to Research farm ACRA, Dhiansar



Fodder Crop Growing in Alley of Aonla



Long term Experiment on Mustard + Chickpea



Experiments on rainfed wheat



Wheat crop at dough stage

### NICRA

- Among the four varieties of maize sown during *Kharif*, the hybrid variety *Double Dekalb* produced maximum yield to the tune of 2422 kg/ha with the highest net returns, B.C ratio and RWUE values of Rs.23981/-, 1.22 and 5.63 kg/ha/mm, respectively.
- Intercropping of mash (*Uttra*) and moong (*SML 668*) was done with maize (var. *Double Dekalb*) crop in additive series (2+1) with no extra fertilizers for intercrop. The intercropping system (maize + mash) registered a maize equivalent yield to the tune of 2734 kg/ha with B: C ratio of 1.22. Likewise, the intercropping system (maize + moong) registered a maize equivalent yield to the

tune of 2677 kg/ha with B:C ratio of 1.17.

- Seven different cropping sequences were tested viz: Pulse-Oilseed (Moong-Mustard), Pulse-Pulse (Mash-Chickpea), Pulse-Cereal (Moong-Wheat), Cereal-Cereal (Maize-Wheat), Cereal-Oilseed (Maize-Mustard), Oilseed-Oilseed (Til-Mustard) and Pastoral-Pastoral (Fodder-Fodder) using recommended package of practices of SKUAST-J for rainfed sub-tropical region and it was observed that during *kharif* season maize under Cereal-Cereal system recorded highest net returns of Rs.24423/- along with B.C ratio and RWUE of, 1.23 and 5.61 kg/ha/mm, respectively followed by maize crop sown under Cereal-Oilseed and Pastoral-pastoral systems which produced net returns of Rs. 24157/- and 20457/- with B.C ratio of 1.22 and 1.75, respectively.
- Maize sown under different methods of sowing revealed that the maximum yield was obtained by using Maize Planter followed by Liner and the lowest yield was obtained in Broadcasting method of sowing.
- Aonla + mixed fodder (maize+jowar+bajra) - gobhi sarson was demonstrated at ACRA, Rakh Dhiansar and comparison was drawn with farmer's practice. The results revealed that mixed fodder yield to the tune of 32800 kg/ha with B:C ratio, net returns and RWUE values of 1.88, Rs 21409/ha and 64.08 kg/ha/mm, respectively while the fodder yield realized under farmer practice was 18500 kg/ha (sole Bajra as fodder only).

### NAFCC

An exhaustive survey of Bhalwal block comprises of 51 villages under component1(a) of NAFCC project –base line survey and vulnerability analysis was done by the team of scientist from ACRA Rakh Dhiansar, Extension Education division of Agrometrology of Chatha and the data was fed in the excel sheet for final analysis. After analyzing the data preliminary work done report of the project has been send to the Director Agriculture Department of Agriculture Talab Tillo Jammu.

#### a. Name of the technologies evaluated through OFT:

**Mustard aphid management through organic and inorganic plant nutrition**



Basal application of MOP (40kg/ha) in addition to the recommended dose or neem cake @ 5t/ha reduced aphid incidence by 41.12%, thereby increasing the grain yield by 18.24% in mustard (DGS-1).

#### **Biopesticidal management of mustard aphid**

When mustard aphid population crossed ETL (50-60 aphids per 10 cm twig), spraying of 2.5% castor seed extract reduced aphid population by 49.18% and *Cannabis* leaf extract reduced the aphid population by 39.29% in comparison to control and was at par with Thiamethoxam @ 0.33g/lit spray (38.04% reduction in aphid population) after seven days of spray.

#### **Fusarium wilt management in Chickpea**

Seed treatment with Bavistin @ 2 g/kg and spraying of *Trichoderma viride* @ 4g/kg after two months of sowing showed minimum wilt incidence and increased the grain yield of chickpea by 59.08%.

#### **Nutrient management in maize**

Application of integrated use of inorganic and organic fertilizers, i.e., FYM @10 t/ha + 40 kg N /ha (urea) with recommended dosage of phosphorus and potassium resulted in 1.06 times higher grain yield over control (unfertilized) with concomitant 94 and 44% increase respectively in rainwater use efficiency (RWUE) and soil organic carbon over control.

#### **Integrated plant nutrient management in pearl millet**

The pooled data for the last three years revealed that the 75% N (Inorganic) +25%N vermicompost recorded highest pearl millet mean grain yield of 2637 kg/ha with 70% increase over control.

#### **Integrated disease management in urdbean**

Seed treatment with carbendazim @ 2gm per kg of seed and application of *Trichoderma viride* @ 4g/litre of water after two months of sowing showed minimum root rot incidence, increased growth parameters thereby increasing the grain yield of urdbean by 51.10%.

#### **Maize stem borer management through organic/inorganic plant nutrition**

MOP (80 kg/ha) either alone or in combination with Neem cake @ 2 t/ha significantly reduced

stem borer infestation in Maize under rainfed conditions. However, for resource rich farmers MOP @ 80 kg along with Neem Cake @ 5 t/ha proved to be the most promising technique for stem borer management in Maize.

#### **Biorationals against citrus psylla causing greening disease in citrus**

Wild tobacco extract prepared in cow urine and sprayed @ 2.5%, recorded 58.17% reduction in citrus psylla population which was comparable to the application of Imidacloprid @ 1.0 ml/L recording 62.63% reduction.

### **3.4.8 Advanced Centre for Horticulture Research (ACHR), Udheywalla**

#### **Bio-Control Laboratory**

- Production of bio-control agents (bio-pesticides) has been initiated on the small scale and the bio-pesticides thus produced has been supplied to Department of Horticulture, Jammu.
- About 300 kg of bio-control agent (*Trichoderma* spp.) was distributed among farmers of different district of Jammu province.
- Three trainings (one-day) were conducted in which 150 nos. of farmers were trained on application of bio-pesticides in management of diseases/pests in horticultural crops.

#### **Promotion of Soil health testing for food and livelihood Security of Farming Community.**

The working area of the project is Samba district of Jammu region of J & K. Four blocks of district Samba were selected. Purposive sampling method applied to select two villages from each block. Thus, a total of 8 (eight) villages were selected. The villages have been selected with help of Deptt. of Agriculture (Concerned Agriculture Extension officer of the Block and DDM NABARD, Samba taking in to the consideration of irrigated and rainfed area both. Every block have both irrigated and as well as rainfed area so accordingly one village from irrigated area and one from rainfed was selected from each block. In each selected village, awareness cum interaction camp on importance of soil testing in agriculture was conducted. During the camp, knowledge on the methods of soil sampling, soil testing and its benefits were disseminated. Practical demonstration on method of soil sampling was also



given to the farmers. Simultaneously farmers' queries were also rectified. During the camp, two farmers were selected from each village by following observation method. The farmers showing keen interest and having an educational background were selected. Thus, a total number of 16 respondents were selected for the subsequent trainings and skill development, who later will act as para soil technicians for testing of soil of their own as well as other villages.

### 3.4.9 Rainfed Research Sub-station for Sub-tropical Fruits, Raya

#### Screening of elite germplasm of kazgilime (*Citrus aurantifolia*)

Survey was conducted to identify and assess the naturally superior germplasm of kazgi lime in various locations viz., Samba, Jammu and Rajouri districts in Jammu sub-tropics during the years of 2015-2016. During the investigation it was reported that the maximum diversity of kagzi lime was reported in *kandi belt* in samba and Jammu districts. Selected superior elite strains were code and propagated by layering during rainy season 2016. After three months layering plants were transplanted in research station at RRSS Raya for further evaluation. Moreover their fruits samples were analyzed in research laboratory of RRSS, SKUAST-Jammu. Among the selected selections after screening of elite germplasma, it was observed that selection code 1001 was best in terms of almost all parameter during investigation and the maximum average fruit size (55.60g), fruit length (48.21mm), fruit width (47.37 mm), fruit length and width ration (0.99), minimum number of seed per fruit (2.33), seed length (5.66 mm), seed width 3.55 mm, predominate colour (green), fruit skin colour at maturity stage (yellow), whereas, the maximum number of section per fruit (10.70) was also noticed in selection code 1001 during investigation

#### Screening of elite germplasm of red flesh guava

Survey was conducted to identify and assess the naturally superior germplasm of Red flesh guava in various locations viz., Samba, Jammu, Kathua and Rajouri districts in Jammu sub-tropics during the years of 2016-2017. During the survey, it was registered that the wide variability exist in: tree shape (upright, tall and medium spreading), leaves (wide and elliptical to

oblong in shape), fruit shape (round, smooth oblong-ridged and pear shape), fruit skin colour (green and light yellowish), flesh colour (red and purple colour), seed (soft and hard), seed core (around to large shape), fruit surface (smooth surface and dots) fruit are medium to large and weight varies from (78.0-142.0 gm), fruit length (56.59 to 70.0 mm), fruit width (48.73 to 61.63 mm) and TSS ranges from (7.3- 11.0° Brix) various location in field and fruit analyzed study at RRSS Raya. However, guava seeds were sown under the polyhouse and 80% germination was recorded. The root-stocks will be propagated with selected strains of red flush guava during the rainy season after attaining proper thickness.

#### Soil carbon sequestration potential in relation to horticulture landuse systems

Survey and collection of soil samples from four district in the Jammu, Samba, Kathua and Udhampur at 15 different location viz Tali, Shallan, Hiranagar, Dayalachak, Sangwal, Rajinder pura, Bari khad, Pati, Smailpur, Raya, Sidra, Bajalta, Sukatar, Sada and Research farm Raya. The soil samples collected in fruit crops in sole, intercropping and farmer field from 0-15, 15-30, 30-60 and 60-100 cm soil depth viz. Aonla, Mango, Citrus, Guava, Phalsa, Intercropping-horticulture and Agri- horticulture. Observation were recorded with soil depth in 1 meter are analyzed in soil properties i.e. soil pH range from (6.35-8.22) slightly acidic to slightly alkaline. The electrical conductivity (EC) ranged from 0.08 - 0.62 dSm<sup>-1</sup>. Based on the limits for organic carbon (OC) i.e. low (<5.0 g kg<sup>-1</sup>) medium (5.0-7.5 g kg<sup>-1</sup>) and high (>7.5 g kg<sup>-1</sup>), the soils were general low in OC content in the sole crops of aonla, mango and phalsa in the areas of Sangwal, Rajinder pura, Raya and Pati village in surface soil (0-15 cm). The intercropping of horticulture and agriculture was medium range in surface soil. The work for rest of soil properties, aggregate stability and carbon pools is under progress.

#### Studies on epidemiology and management of powdery mildew (*Oidium mangiferae*) of mango

The trial was laid out during 2015-16 crop season in randomized block design, where in, six fungicides i.e. copper oxychloride (0.25%), carbendazim (0.1%), wettable sulphur (0.2%), mancozeb (0.25%), hexaconazole (0.1%) and dinocap (0.1%) along with



two plant extracts i.e. Drake seed kernel extract (DSKE 4.0%) and neem seed kernel extract (NSKE 4.0%) were tested for their efficacy to manage the powdery mildew of mango. The fungicides and plant extracts were sprayed twice at 20.0% flowering stage and above 80% flowering stage. The fungicide hexaconazole was found most efficacious in reducing the disease severity (40.55%). It was followed by dinocap (32.5%). However, plant products NSKE and DSKE were less effective in managing the disease.

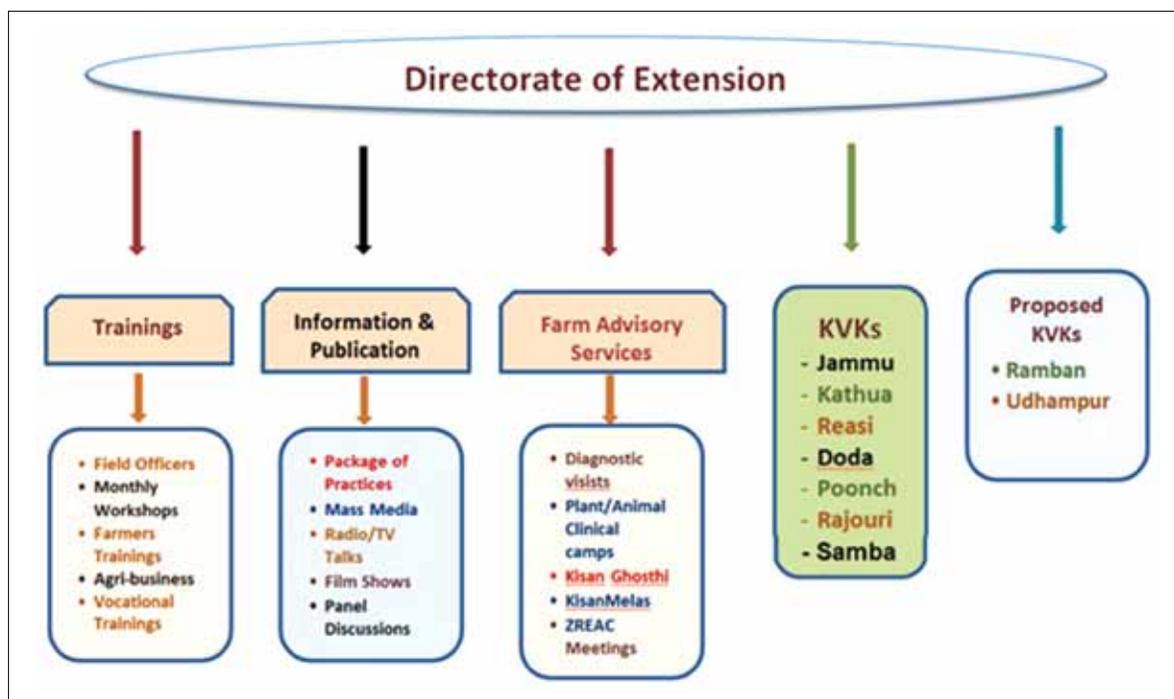
#### **Diagnosis and Management of insect-pest and diseases to enhance the production of planting materials under protected condition.**

A survey was conducted in RRSS, Raya and Vijaypur nursery for occurrence of major insect-pest and diseases under protected nursery condition.

The mango seedlings infected with wilt (*Fusarium oxysporum* f. sp. *mangiferae*) and anthracnose (*Colletotrichum gloeosporioides*). In Vijaypur nursery the incidence was 28.5% (wilt) and 34.0% (anthracnose). In Raya, the seedlings were infected with only anthracnose (20.5%). In citrus seedlings canker (*Xanthomonas axenopodis* pv *citri*) was a major disease in both the nursery with the disease incidence 28.4% (Vijaypur) and 23.5% (Raya). Citrus psylla (*Diphornia citri*) was identified as a major insect. In aonla seed rot (*Rhizoctonia solani*) and rust (*Ravenelia emblicae*) were major diseases. The phalsa seedlings were infected with leaf spot (*Cercospora grewiae*). The disease severity was 34.5% (Vijaypur) and 27.5% (Raya). The maximum severity was recorded during the month of August and September.

At the national level Extension Education has recently been realized to be one of the most important components for bringing desired improvements in agriculture production and productivity at the farmers' level. Extension education is one of the most important mandates of the Sher-e-Kashmir University of Agricultural Sciences and technology of Jammu. The Directorate of Extension popularly known as the "Field Extension Wing", is taking care of the farm advisory services in the villages surrounding the main campus of the university and at different districts through Krishi Vigyan Kendra. The responsibility for planning, organizing, conducting and coordinating the extension activities of the university in the Jammu region of Jammu & Kashmir State lies with the Directorate of Extension. Its main aim is to transfer the proven/tested technologies to the farmers, livestock owners, rural youth, field staff of State Govt. and other personnel engaged in developmental and professional activities in the fields of agriculture, animal husbandry, horticulture, home science and other allied areas through its well planned, skill-oriented and need based programmes.

The Directorate acts as bridge between the research scientists and the farmers and other stakeholders to provide feedback. Therefore, the role of the Directorate is twofold, i.e., transfer of technologies from scientists to the end users i.e. farmers through field functionaries and to find out the problems of the field to be passed on to various research divisions of Faculty of Agriculture, Faculty of Veterinary sciences & A.H. and Faculty of Basic Sciences. Farm Advisory Service (FAS) is the major wing and field arm of the Directorate of Extension Education covering the entire Jammu Division through KrishiVigyanKendras (KVKs) located in various districts of Jammu Division. The scientists working in these KVKs have direct contact with farmers and render the necessary advice about the crops and livestock production and protection, soil and water management, child care, family and farm resource management etc. at their door steps. The functional setup of the Directorate has been oriented to face the traditional and new challenges emerging on day to day basis so that the farmers and the field functionaries are benefited.





### The main responsibilities/functions of the Directorate of Extension are:

- To Plan and execute Extension Education activities of the University.
- To coordinate extension education activities among Divisions of three Faculties, Research Stations, Sub-Stations, KVKs etc. of the University.
- To act as a strong liaison between university scientists and allied developmental department, national & international institutes and farming community for developing demand driven technologies.
- To timely transfer the innovative/proven technologies through KVKs.
- To supplement and complement the efforts of state development departments through elite/frontline/limited extension work.
- Organizing training programmes for officers, farmers and un-employed/ rural youth.
- Organizing skilled demonstrations, on farm trials, exhibitions, fairs etc.
- Communicating/updated farm information through package of practices, books, booklets, leaflets, folders, posters, bulletins, pamphlets and through print and electronic media.
- Farm advisory services

### Major Programmes Organized By Directorate Of Extension

#### ZREAC Kharif 2016

The Zonal Research and Extension Advisory Committee (ZREAC) meeting for *Kharif*2016 for Jammu province was held on 25<sup>th</sup> May, 2016 under the chairmanship of Prof. P.K. Sharma, Hon'ble Vice Chancellor, SKUAST-Jammu in the conference Hall of SKUAST-J, Main Campus, Chatha.

Dr. K.S. Risam, Director Extension, Dr. J.P. Sharma, Director Research, Dr. T.A.S. Ganai, Director Education, Dr. Deepak Kher, PPMO, Dr. S.K. Sen, Comptroller, Dr. DileepKachroo, Registrar, Dr. D.P. Abrol, Dean Faculty of Agriculture, Dr. S.A. Mallick, Dean Basic Sciences, Dr. S.S. Jamwal, Director Agriculture, Jammu, Sh. SudeshKoul, Joint Director Agriculture (Input), Sh. Rajeev Mahajan, Deputy Director

(Central) Horticulture, Heads of Divisions of Faculty of Agriculture, Associate Director Extension, Senior Scientist & Heads of Krishi Vigyan Kendras, Scientists Incharge Stations, Resource personnel of the officers monthly workshops, Chief Agriculture Officers, Chief Horticulture officers as well as other officers of Agriculture, Horticulture, Floriculture and other line departments participated in the meeting.

Prof. P.K. Sharma, Vice Chancellor, SKUAST-J and Chairman, ZREAC meeting gave following instructions for boosting the Agriculture and allied sector in the Jammu region.

- Officers of the line department should provide specific feedback related to applicability and adoptability of the university technologies at the farmers field.
- Identification of factors responsible for gap in yield potential and adoption of appropriate measures for minimizing the gap.
- Department should focus specific issues for climate change research.
- All the recommendations should come in ZREAC meeting after testing through on farm trials (OFTs).
- Addition of a separate chapter for important cropping sequences in upcoming package of practices.
- Officers of the line departments should correspond with the Director Extension and Director Research, authorities designated for the purpose in the University rather than making direct correspondence with the scientists of the university.



ZREAC Meeting (Kharif)



### ZREAC Rabi-2016

The Zonal Research and Extension Advisory Committee (ZREAC) meeting for Rabi 2016 for Jammu region was held on 15th Dec, 2016 under the chairmanship of Prof. P K Sharma, Hon'ble Vice Chancellor, SKUAST-Jammu in the Conference Hall of SKUAST-J, Main Campus, Chatha with 155 participants.

Dr.K.S.Risam, Director Extension, Dr. J.P. Sharma, Director Research, SKUAST-J, Sh. A.K.Malhotra, Director Agriculture, Jammu, Dr. Deepak Kher, PPMO, Dr. D.P. Abrol, Dean Faculty of Agriculture, Dr. S.A. Mallick, Dean Faculty of Basic Sciences, S.Tarvinder Singh, Joint Director Horticulture, Sh. DharamVir Gupta, Nodal Officer (CSS) Floriculture, Heads of Divisions of Faculty of Agriculture, Associate Directors of Extension/Research, Sr. Scientists and Heads of Krishi Vigyan Kendras, Incharge Stations, Resource personnel of the officers monthly workshops, Chief Agriculture Officers, Chief Horticulture officers as well as other officers of Agriculture, Horticulture and other line departments participated in the meeting. The Hon'ble Vice Chancellor projected the following key areas for boosting the Agriculture and allied sector in the Jammu region for uplifting the farmers' socioeconomic conditions.

- University scientists as well as officers of the line departments must focus on efforts for improvement of the socioeconomic status of the farmers of Jammu Province.
- Line departments should come up with specific and prioritized issues so that same can be taken up for the research by the university.
- Focus should be on issues keeping in view the current scenario for strategic as well as applied research.
- Technologies/Recommendation made by the university should be practically applied on farmers' fields by the extension functionaries of the line departments and proper feedback of their applicability or refinement, if required, must be communicated to the university.
- Emphasis should be laid on promotion and adoption of cooperative system for increasing the income of the farmers.
- Recommendations put forth by different divisions during the meeting should always be supported

by the complete data including OFTs for their release.

- Concerned scientists should make the presentation themselves for the proposed recommendations during the meeting in future.



ZREAC Rabi-2016

### State level Kisan Mela organized at SKUAST-Jammu

Two days Kisan Mela 2017 on the theme "Integrated Farming: Profitable and Sustainable Farming" was inaugurated by Sh. N.N. Vohra, Hon'ble Governor, Jammu and Kashmir & Chancellor, SKUAST-





Sh. N.N. Vohra, Hon'ble Governor, J&K & Chancellor, SKUAST-Jammu inaugurating State level Kisan Mela & visiting the Exhibition



Er. Abdul Gani Kohli, Hon'ble Minister for Animal, Sheep Husbandry & Fisheries, J&K Govt. visiting Exhibition & attending valedictory of Kisan Mela

Jammu in presence of Sh. Ghulam Nabi Lone, Minister for Agriculture Production, J&K Govt., Sh. Daljit Singh Chib, Vice Chairman, J&K State Advisory Board for Development of Kisans, Sh. Parmod Kumar Jain, Financial Commissioner Agriculture, J&K Govt. and Dr. Pradeep K. Sharma, Vice Chancellor SKUAST-Jammu. More than 6000 farmers from different districts of Jammu region and outside the state participated in this Kisan Mela.

Sharma, Hon'ble Vice Chancellor, SKUAST-Jammu on 11<sup>th</sup> January, 2017. The centre conducted five training programmes on Organic farming/cow based farming/natural farming during the year 2016-17 in which 150 farmers participated.

### Establishment of Organic Training Centre

“Organic Training Centre” under Pt. Deen Dayal Upadhaya Unnat Krishi Shiksha Yojana, sponsored by Education Division, Indian Council of Agricultural Research has been established under the ambit of Sher-e-Kashmir University of Agricultural Sciences & Technology of Jammu (J&K) in Village Talwara of Reasi District. The centre was inaugurated by Dr. Pradeep K.





### University Level Workshop of KVKs

One day University Level Workshop of all Krishi Vigyan Kendras under SKUAST-Jammu was held on 30<sup>th</sup> March, 2016 at the University Headquarter in which Heads of the divisions from Faculty of Agriculture and Faculty of Veterinary Sciences & A.H and scientific staff of all KVKs participated. The workshop provided a platform to 36 participants to interact on the technology generation, refinement and dissemination and to deliberate upon the proven technologies generated through research for dissemination through FLDs with farmers participation in the Jammu region and those technologies which require assessment in the various districts and their refinement for location specificity at KVK level as On Farm Trials (OFTs).

### Annual Action Plan Meeting of KVKs

The Annual Action Plan Meeting 2016-17 of Krishi Vigyan Kendras of Jammu region was held at Conference Hall of KVK, Jammu on 13<sup>th</sup> May 2016 which was attended by scientific staff of the KVKs of Jammu region along with Heads of various divisions from Faculty of Agriculture and Faculty of Veterinary Sciences & Animal Husbandry of SKUAST-Jammu. The main focus of the meeting was to discuss the salient recommendations of On-Farm Trials (OFTs) and Front Line Demonstrations (FLDs) conducted by KVKs of Jammu region during the years 2013-14 and 2014-15 and also to finalise action plans of KVKs for the year 2016-17. Prof. P.K. Sharma, Hon'ble Vice Chancellor, SKUAST-Jammu was the chief guest of the meeting and the meeting was chaired by Dr. Rajbir Singh, Director, ICAR-ATARI, Zone-I, Ludhiana.

The meeting begun with the welcome address presented by Dr. Keshava, Principal Scientist, ICAR-ATARI, Zone-I, Ludhiana. Dr. Rajbir Singh, Director, ICAR-ATARI, Zone-I, Ludhiana in his opening remarks deliberate upon the growing expectations of central government from Krishi Vigyan Kendras to uplift the rural and agricultural economy. While acknowledging and appreciating the works of KVKs, he emphasized upon the fact that a number of centrally sponsored schemes now will be implemented through KVKs and therefore KVKs should be ready to boost their efforts for achieving the targets assigned to them.

Dr. J.P. Sharma, Director Research, SKUAST-J elaborated the importance of research findings of the university. Dr. R.K. Arora, Associate Director Extension reported the activities of Directorate of Extension, SKUAST-Jammu and briefed about the future plans for making the working of KVKs more effective in Jammu region. The chief guest of the meeting, Prof. P.K. Sharma in his address stressed upon the building of strong linkage between research and extension wings of the university. He advised the house to have deep and in-depth knowledge of all the state and



Annual Action Plan Meeting of KVKs



centrally sponsored schemes related to agriculture for wider dissemination and publicity to the rural masses. The vote of thanks was presented by Dr. Amrish Vaid, Senior Scientist & Head, KVK, Kathua.

### **ASSOCHAM's conference on "Agri Food Processor Conclave: Finance, Technology & Market"**

A one day Conference on Agri and Food Processor's Conclave: Finance – Technology – Market was organized on 19th October, 2016 by The Associated Chambers of Commerce and Industries of India (ASSOCHAM) in collaboration with SKUAST-Jammu as a joint venture for providing a platform to aspiring food entrepreneurs. Dr. Ombeer Tyagi, Sr. Director ASSOCHAM-India welcomed the dignitaries and elaborated the purpose of organizing the Conclave. Sh. Jugal Kishore Sharma, Member of Parliament Jammu-Poonch Constituency was the Chief Guest and Dr. Gagan Bhagat, MLA, R S Pura was the Guest of Honour on the occasion.

Prof. Pradeep K. Sharma, in his presidential address, stressed upon the development of marketing and industrial infrastructure for complimenting the increasing food grain production and farm income of marginal and small farmers. Rakesh Gupta, President, Chambers of Commerce, Jammu thanked ASSOCHAM-India for organising the conference at Jammu. Dr. K.S Risam, Director Extension, SKUAST-J highlighted the need for organizing vocational training for rural youths to make them confident in developing their own vocations in rural areas. Amit Sharma, MD, J and K SIDCO highlighted the food processing infrastructure developed in the State. B.R Patnaik, General Manager, NABARD discussed various financial schemes funded by NABARD to help farmers and rural youths to develop into successful agripreneurs. Amit Sharma also shared the steps taken by the State Government to boost Agro-food and processing industries in the State. He elaborated the benefits available to the youths of the State for creating employment opportunities. Dev Raj, a progressive farmer expressed concerns of farmers in terms of developing agro-processing units. Dr. R.K Arora, Associate Director Extension, SKUAST, Jammu presented the vote of thanks.



Agri-Food Processor Conclave

### **Officers Monthly Workshops:**

Monthly Officer's Workshops are organized every year with the departments of Agriculture and Horticulture in each district of Jammu province on scheduled dates for effecting close coordination of the extension activities of the University with concerned state departments. In the above meetings, Monthly messages compiled crop-wise on the basis of calendar of operations are discussed which are to be conducted in various fields of agriculture and horticulture in the ensuing month. Directorate of Extension conducted 48 Officers Monthly Workshops at various KVKs and district headquarters of the Jammu region during the period 2016-17. The workshops were attended by the district and sub-divisional level officers from Department of Agriculture and Department of Horticulture.

### **Workshop on Extension Methodology**

A five days Workshop on Extension Methodology was organized w.e.f. 21-25 June, 2016 in collaboration with Extension Education Institute (EEI) Nilokheri, Govt of India Ministry of Agriculture & Farmers Welfare



Department of Agriculture and Cooperation, CCSHAU Nilokheri Haryana.



Workshop on Extension Methodology

Trainings Programmes for Kisan Call Centre organized by Directorate of Extension

Title of the Training	Date	Participants
Training Programme for Level –I experts of Kisan call centre	01-02 November, 2016	05
Training programme under MIDH for orchardists of Udhampur district	17-18 Feb. 2017	30

### Technological backstopping of KVKs

The Directorate is organizing capacity building programmes for scientific staff of all KVKs for providing technological backstopping. Three training programmes in the identified areas were organized for scientific staff of all KVKs by the Directorate of Extension in collaboration with various divisions of Faculty of Agriculture. The details of trainings conducted are as under:

S. No.	Title of the training programmes	Date	Participants
1.	Agricultural Marketing – The New Paradigm	6 <sup>th</sup> to 7 <sup>th</sup> January, 2017	29
2.	Integrated Farming System	4 <sup>th</sup> March 2017	31
3.	Micro Irrigation Technology for improving Agricultural Productivity	31 <sup>st</sup> March 2017	31

### Scientific Advisory Committee (SAC) Meetings of KVKs:

The scientific Advisory Committee meetings of KVKs under the administrative control of Directorate of Extension were conducted in order to plan, review and monitor the action plan of KVKs. The details are given below:

S. No.	Name of KVK	Date
1.	Krishi Vigyan Kendra Jammu	06-02-2017
2.	Krishi Vigyan Kendra Rajouri	09-02-2017
3.	Krishi Vigyan Kendra Poonch	08-02-2017
4.	Krishi Vigyan Kendra Reasi	08-03-2017
5.	Krishi Vigyan Kendra Kathua	03-02-2017
6.	Krishi Vigyan Kendra Doda	31-05-2016
7.	Krishi Vigyan Kendra Doda	15-02-2017



Technological backstopping of KVKs



## Establishment of new KVK Samba

KVK Samba has been sanctioned by ICAR vide Council's letter no. 5-9/2011.Ae-II, dated 15th November, 2016. Dr. Jitendra Singh, Hon'ble Union Minister of State for Development of North Eastern Region (Independent Charge), Ministry of Personal, Public Grievances and Pensions, Department of Atomic Energy and Department of Space, Government of India unveiled the foundation stone of Krishi Vigyan Kendra Samba at Pulse Research Sub-Station, Sumbh Road, Samba on 4th December, 2016 in the presence of Sh. Chandra Prakash Ganga, Hon'ble Minister of Industries & Commerce, J&K Government, Sh. Jugal Kishore Sharma, Hon'ble Member of Parliament, Jammu-Poonch Constituency, Sh. Rashpal Verma, Vice Chairman OBC Board, J&K, Dr. Devinder Kumar Manyal, Hon'ble MLA, Samba, Dr. Pradeep K. Sharma, Hon'ble Vice Chancellor, SKUAST-J, Dr. Rajbir Singh, Director, ICAR-ATARI, Ludhiana, statutory officers of the University and Dr. Raj Kumar Arora, Associate Director Extension (KVKs).

Training Programmes Organized by the Directorate under State Agricultural Management and Extension Training Institute, Jammu (SAMETI-J):

Under the Sub Mission on Agri Extension, a component of National Mission on Agriculture Extension and Technology (NMAET), Directorate of Extension is the nodal agency designated as State



Agriculture Management Extension Training Institute for Jammu Division. As per the SEWP of each district the trainings are being organized for the extension functionaries of Agriculture and allied departments. The details of training programmes organized during the financial year are:

### Training Programmes under SAMETI-Jammu

S. No.	Name of the training	Participants
1.	Two days training programme on "Impact of climate change on agriculture sector and its mitigation measures" w.e.f. 24-25 May, 2016.	22
2.	Three days training programme on "Rice Production Technology for Jammu Region" w.e.f. 31st May to 2nd June, 2016.	42
3.	Two days training programme on "High Density Plantation for Jammu Region" w.e.f. 26-27 July, 2016.	18
4.	One day Orientation cum Review workshop on "Sub-Mission on Agricultural Extension" for ATMA Staff on 22-08-2016.	29
5.	Two days training programme on "Pesticide formulations for technical staff" w.e.f. 23-24 August 2016.	30
6.	Two days training programme on "W.T.O & Its Implications in agriculture" w.e.f. 06-07 Sept. 2016.	23
7.	Two days training programme on "Enhancing soil health for productive agriculture system" w.e.f. 20-21 Sept. 2016.	32
8.	Two days training programme on "Communication Skills and Motivation" w.e.f. 22-23 Sept. 2016.	33
9.	Two days training programme on "Nursery production and management of vegetables and flowers" w.e.f. 27-28 Sept. 2016.	58



S. No.	Name of the training	Participants
10.	Two days training programme on "Rabi oilseeds/Pulses for Jammu region" w.e.f. 24-25 Oct. 2016.	25
11.	Two days training programme on "Wheat production technology for Jammu region" w.e.f.01-02 Nov. 2016.	48
12.	Two days training programme on "Management of Silkworm diseases in Jammu region" w.e.f.15-16 Nov. 2016.	36
13.	One days training programme on "Biofertilizers and Biopesticides" on 17th Nov. 2016.	42
14.	Two days training programme on "Mushroom Cultivation, Preservation and value addition" w.e.f.22-23 Nov. 2016.	45
15.	Two days training programme on "High-tech interventions in underutilized fruit crops for enhancing productivity in rainfed areas" w.e.f.24-25 Nov. 2016.	15
16.	One day workshop on "Status and Strategies for the Management of Stripe Rust of Wheat" on 14 <sup>th</sup> Dec., 2016.	65
17.	Two days training programme on "Modern Diagnostic techniques for livestock diseases" w.e.f. 14-15 Dec. 2016.	24
18.	"R-E interface-cum- Rabi conference" under "Sub-Mission on agricultural Extension" on 17-12-2016.	120
19.	Two days training programme on "Agricultural Marketing-New Paradigms" w.e.f.06-07 January, 2017.	79
20.	Five days "Induction training programme for V.A.E.A's" w.e.f.30 <sup>th</sup> Jan - 3 <sup>rd</sup> Feb,2017.	62
21.	One day Sensitization workshop cum training on "Processing payments through Public Financial Management System (PFMS) Platform on 10-02-2017.	70
22.	Three days training programme on "Innovative Beekeeping" w.e.f.13-15 Feb, 2017.	29
23.	One day Refresher course/Orientation Workshop on "N.M.A.E.T" for A.M.C's/ B.T.T's on 16-02-02017.	36
24.	Two days training programme on "Nutritional interventions for optimum livestock production" w.e.f.16-17 Feb, 2017.	19
25.	Two days training programme on "Management of Problematic Soils" w.e.f. 22-23 Feb, 2017.	56
26.	Two days training programme on "Farmer Producer Organizations" w.e.f.03-04 March,2017.	35
27.	Five days "Induction training programme for V.A.E.A's" w.e.f.06-10 March, 2017.	46
28.	Two days training programme on "Revitalization of rainfed agriculture" w.e.f. 23-24 March, 2017.	37
29.	One day Refresher course/Orientation Workshop on "N.M.A.E.T" for A.M.C's/ B.T.T's on 17 <sup>th</sup> of March, 2017.	20
30.	Two days training programme on "Food Nutrition and Health Concerns for rural households"	36
31.	Two days training programme on "Efficient Utilization of Water resources for Enhancing Agricultural Productivity" w.e.f.28-29 June 2016.	33
32.	Two days training programme on "Micro Irrigation Technology for improving Agricultural Productivity / Production" i.e. 01-02 December 2016.	57
33.	Two days training programme on "Multiple use of water for improving water productivity in Jammu Region" w.e.f.22-23 December 2016.	53
34.	Two days training programme on "Micro Irrigation Technology for improving Agricultural Productivity / Production" w.e.f.24-25 Jan, 2017.	59
35.	Two days training programme on Water management technologies for agro-ecological conditions of Jammu region w.e.f.01-02 March, 2017.	112
36.	Two days training programme on "Micro Irrigation Technology for improving Agricultural Productivity / Production" w.e.f.22-23 March, 2017.	82
37.	Two days training programme on "Micro Irrigation Technology for improving Agricultural Productivity / Production" w.e.f.30-31 March, 2017.	94
	<b>Total</b>	<b>1722</b>



Training Programmes under SAMETI - Jammu

### Training programmes and Other Extension activities organized by KVKs

Krishi Vigyan Kendras (KVKs) working under the administrative control of SKUAST-Jammu are organising training programmes and other extension activities for dissemination of proven technologies. Some of the major activities undertaken by different KVKs of SKUAST-Jammu are mentioned below:

### Farmers' Training Programmes

Krishi Vigyan Kendras (KVKs) of SKUAST-Jammu are organising both on and off campus trainings programmes for benefit of farmers to enrich their knowledge regarding the new agricultural technologies being generated through research and other innovations. The following table indicates the farmers training programmes organised by different KVKs.

Trainings	KVK Jammu	KVK Rajouri	KVK Doda	KVK Reasi	KVK Poonch	KVK Kathua
No. of trainings	36	38	35	54	35	41
No. of Participants 1021		888	774	1194	840	1141



Farmers' Training programmes

### In-service Training Programmes

The following table indicates the In-service training programmes organised by different KVKs:

Trainings	KVK Jammu	KVK Rajouri	KVK Doda	KVK Reasi	KVK Poonch	KVK Kathua
No. of trainings	07	03	10	7	08	11
No. of Participants	123	38	170	126	130	231



In-service Training programmes

### Rural youth/Vocational Training programmes including Skill development trainings

The following table indicates the rural youth/vocational training programmes organised by different KVKs:

Trainings	KVK Jammu	KVK Rajouri	KVK Doda	KVK Reasi	KVK Poonch	KVK Kathua
No. of trainings	05	07	07	6	05	6
No. of Participants	138	125	93	184	139	106



Vocational Training programmes



### Technology transferred and assessed (KVK Wise)

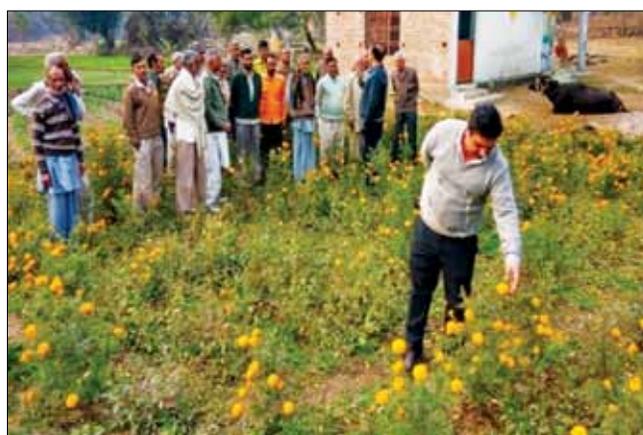
S. No.	Name of Technology	Technical Intervention	Economic Benefit (C :B Ratio)	Feedback
<b>KVK Jammu</b>				
1	Assessment of improved Basmati varieties for yield potential	Pusa-1121	1:1.84	Farmers satisfied with the yield potential of Pusa 1612 variety
		Pusa-1509	1:1.93	
		Pusa-1612	1:2.09	
2	Assessment of Wheat varieties for yield potential under timely sown irrigated condition	HD-2967	1:1.93	HD-3086 does not showed any symptoms of yellow rust
		WH-1105	1:2.14	
		HD-3086	1:2.32	
3	Varietal Evaluation of Wheat varieties under Rainfed condition of Jammu district	PBW-175	1:1.07	Farmers satisfied with the yield potential of VL-907 wheat variety
		VL-892	1:1.31	
		VL-907	1:1.83	
4	Assessment of different varieties of oats under sub-tropical conditions	Kent	1:2.57	Farmers were satisfied with the varieties
		Palampur-1	1:2.84	
		Sabjar	1:2.87	
5	Assessment of superior clones of Harad with respect to survival and establishment	JH-1 JH-2 Jh-3	-	First year clones recorded 72.0 % 66.5 % and 68.5% survival
<b>KVK Rajouri</b>				
6	Assessment of improved perennial grasses for herbage production under subtropical	Local Grass	1:2.91	Farmers adopted the cultivation of perennial grasses at the bunds
		Napier Hybrid (NB-22)	1:2.67	
		Setaria (PSS-1)	1:1.69	
		Cenchrusciliaris (CAZRI-1)	1:2.91	
7	Effect of integrated Nutrient management in Maize crop under Rainfed condition	70% of Recommended dose of NPK + zinc sulphate@10kg /ha	1:2.22	Intervention gave higher yields as compared to other treatments
8	Assessment of herbicides on yield of blackgram	Imazethayper @40 gms.a.i /ha ( 25 DAS)	1:4.47	Imazethyper gave maximum yield of 4.47 q/ha & B.C ratio 2.33
9	Evaluation of different cultivars of mustard under intermediate conditions	Varietal evaluation	-	-
10	Utilization of Grinded Maize cobs as Roughage	25% & 50% replacement with Grinded Maize cobs	1:2.43 1:2.82	Feeding of Straw with 50% replacement with grinded Maize cobs recorded highest yield (6.85 lt/day)
11	Management of Stem Borer in paddy	Carbofuran (1kg /ha)	1:1.96	Use of Carbofuran (1kg /ha) gave best results.
<b>KVK Doda</b>				
12	Hybrids of maize crop	Pro-Agro 4794, Bioseed-9621, DMH-7314	1:1.72	Farmers responded positively to the technology



S. No.	Name of Technology	Technical Intervention	Economic Benefit (C :B Ratio)	Feedback
13	Seed treatment for management of cut worms in maize	Seed treatment with chloropyriphos @ 5ml/kg	1:2.09	Farmers successfully adopted the technology
14	Weed management in maize crop with Atrazine	Pre emergence application of Atrazine @ 1 Kg. Ha,	1:1.62	
15	Management of paddy blast through trycyclozole	Trycyclozole @ 0.06% (10 gram/kanal)	1:2.96	Farmers opined technology of immense use
16	Weed management in mash	Pendimethalin @ 1 Kg a.i. per hectare.	1:2.64	-
17	Management of Ipomea weed	Atrazine 1.0 Kg a.i. (0-3 DAS)	1:167	-
18	Evaluation of farmer practice with different weedicides in maize	T1 Farmer's Practice: Two Hand weeding & hoeing after 20/45DAS T2 Recommended: Pre-emergence Atrazine 1.5kg / ha T3 :Laudis 42% SC (tembotrione) 120 g /ha 25 DAS	20.4q/ha 22.6 q/ha 29.6 q/ha	Farmers were satisfied after observing the results and they were ready to adopt the technology
19	Integrated weed management in mash	T1Farmer's Practice One Hand weeding after 30DAS T2 Pendimethalin@30 EC 1ltr/ha +1 HW 30 DAS T3:Imazethapyr100g/ha 15 and 30 DAS (50 g each)	5.45 q/ha 7.2 q/ha 8.4 q/ha	Farmers were satisfied after observing the results of T3
20	Low productivity of ginger due to rhizome rot of ginger	T1-Farmers' practice T2-Seed treatment with Mancozeb + bavistin or Ridomil T3-Recommended practice + Drenching bavistin or ridomil	T1- 90 q/ha T2- 125 q/ha T3-140 q/ha	Farmers were satisfied after observing the results
21	Effect & Role of leaf meals on growth, production and parasitic control in sheep and goat	T1-Farmer practice T2-Leaf meal T3-Complete Feed block	T2 gave the better result	Farmers were satisfied after observing the results
22	Early Detection of mastitis using California Mastitis Test and comparison of different antibiotics	T1: Enrofloxacin T2:Gentamycin T3: intramamry Cephalosporins	In progress	Farmers were satisfied after observing the initial results
23	Management of chilli wilt	T1-Farmers' practice (without Seed treatment). T2-Recommended practice(Seed treatment with Carbendazim+ Thiram 1:1 ratio) T3- T2 + Drenching with Carbendazim	75.0 q/ha 105. q/ha 150.0 q/ha	Farmers were satisfied after observing the results



S. No.	Name of Technology	Technical Intervention	Economic Benefit (C :B Ratio)	Feedback
24	Varietal evaluation in wheat crop	T0-Farmer's Practice T1-JAUW-598 T2-Raj.3765 T3-PBW-175	18.3 24.0 26.0 30.0 1:2.23 1:2.78 1:3.12	Farmers were satisfied after observing the results and they were ready to adopt the technology
25	Effect of 2, 4-D on fruit drop in mango.	T0-Control T1-10ppm T2-20ppm T3-30ppm	T3 gave the best result with 14% increase in yield	Farmers were satisfied after observing the results
26	Effect of spacing on the yield of brinjal.	T1-Farmer practice T2-60x45cm T3-90x60cm	T3 gave the best result (155q/ha) than T2(140q/h) & T1(110q/h) 1:2.02 1:3.1 1:3.6	Farmers were satisfied after observing the results
<b>KVK Poonch</b>				
27	IDM	Management of Anthracnose in Rajmash	1:4.49	Farmers satisfied with recommended treatment
28	IDM	Management of Powdery mildew in cucumber	1:4.33	Farmers satisfied with recommended treatment
29	INM	Integrated Nutrient Management in Apple (12 years of age)	1:5.24	
30	INM	Integrated Nutrient management in Plum (9 years of age)	1:3.14	
31	Crop production	Evaluation of Oats Varieties	1:2.89	Farmers appreciated the new variety
<b>KVK Kathua</b>				
32	New varieties of Basmati Rice	Evaluation of Pusa-1121, Pusa-1509, Pusa-1612	1:2.2 1:2.5 1:2.5	These varieties are highly preferred by the farmers
33	Management of Bakanae (foot rot) disease in paddy	Seed treatment followed by Seedling dip in Carbendazim (0.2%)	1:2.9	Farmers are satisfied with the technology and are adopting the same
34	Wheat varieties under timely sown irrigated conditions	Evaluation of wheat varieties HD-2967, HD-3086 & WH-1105	4.7 5.3 5.5	All varieties are high yielding and resistant to rust



Technology Assessment & Refinement carried out by Krishi Vigyan Kendras

### Front Line Demonstrations

S. No.	Crop/Enterprise	Variety/Technology	Name of District	Area (ha)/ No.	No. of Participants	Crop Impact % Increase
<b>KVK Jammu</b>						
1	Mustard	DGS-1	Jammu	2.75	54	15.32
		RSPN-25		2.10	35	13.1
2	Gobi sarson	DGS-1	Jammu	0.45	9	14.24
		RSPN-25		1.0	14	27.6
3	Toria	RSPT-02	Jammu	0.65	7	8.3
4	Chick Pea	GNG-1581	Jammu & Samba	16.5	203	11.8
5	Paddy	B-370	Jammu	8.0	32	13.2
	Paddy (IARI linkage programme)	Pusa 1509		0.4	3	8.59
		Pusa 1612		4.0	21	14.0
	Paddy under CATAT programme	Pusa 1612		4.0	17	8.9
Pusa 1121		1.6	7	2.91		
6	Maize	Pusa 1509	Jammu	8.0	22	8.91
		DKC 7074		5.0	12	23.8
		Bioseed 9220			12	21.6



S. No.	Crop/Enterprise	Variety/Technology	Name of District	Area (ha)/ No.	No. of Participants	Crop Impact % Increase
7	Wheat	HD-2967		8.0	40	12.4
		HD-3086		1.6	7	13.3
		VL-892		1.0	10	53.6
		VL-907		1.0	10	7.9
8	Urd Bean	PU-31 Uttara		4.5	41	Crop in field
<b>KVK Rajouri</b>						
1	Maize	Rasi-4794	Rajouri	4.4	22	35
	Maize	DD		3.6	18	45
2	Paddy	K-343		2.5	12	38.4
	Paddy	K-448		2.5	13	34.0
3	Mash	Uttara		1.5	15	24
	Mash	PU-31		1.3	39	24
	Mash	Shekhar -3		1.4	13	31
4	Wheat	VL-907		17.4	87	Crop in field
	Wheat	VL-892		12.6	62	Crop in field
	Wheat	HD2967		0.55	3	Crop in field
5	Oats	Kent		8.6	43	Crop in field
	Oats	Palampur 1		0.35	01	Crop in field
6	G. Sarson	RSPN25		0.75	14	Crop in field
7	Mustard	RSPR01		2.3	23	Crop in field
	Mustard	NRCHB 101		0.15	03	Crop in field
8	Chickpea	GNG1581		5.0	47	Crop in field
9	Chicks	Vanraja		3000 chicks	210	-
<b>KVK Doda</b>						
1	Maize	Bio 9621	Doda	10 Ha	50	47.09
2	Mash	Him Mash 01 Shekher-3	Doda	10 Ha	50	29.24
3	Rapeseed Mustard*	KS-101	Doda	18.4	92	12.08
4	Paddy	Trycyclazolefor management of paddy blast	Doda	7.4	37	
<b>KVK Reasi</b>						
1	Maize	PG – 2320, PG-2475, Bioseed 9220	Reasi & Udhampur	5 ha	44	47.52
2	Black Gram	PU-31	Reasi & Udhampur	6ha	51	52
3	Green Gram	SML-668	Reasi & Udhampur	2	18	50
4	Vegetables (knol-khol, cabbage, turnip, okra etc)	King of Market, Pride of India, Purple Vienna, Purple Top, VarshaUphaar	Reasi & Udhampur	2	45	
5	Sorghum	SSG-1	Reasi & Udhampur	2	23	43.8



S. No.	Crop/Enterprise	Variety/Technology	Name of District	Area (ha)/ No.	No. of Participants	Crop Impact % Increase
6	Marigold	Pusa Narangi, Pusa Basanti	Reasi & Udhampur	2	34	51
7	Wheat	PBW-175	Reasi & Udhampur	5	40	62.64
8	Chickpea	GNG-1581	Reasi & Udhampur	6	81	57.41
9	Gobi Sarson	RSPN-25	Reasi & Udhampur	6	47	44.68
10	Oats	Kent	Reasi & Udhampur	2	34	54.00
11	Complete Feed Block	Urea mineral molasses block	Reasi & Udhampur	500 nos.	32	0.75-1.25 kg/ animal (28.57%) increase in milk yield
12	Backyard Poultry	Kadaknath	Reasi & Udhampur	159	159	In progress
13	Dhingri	Pleortus sp.	Reasi & Udhampur	32 bags	8	-
<b>KVK Poonch</b>						
1	Rajmash	Local Ioran	Poonch	3.0	15	75.90
2	Maize	Double- deklab Pro Agro 4794		24.75	95	44.90
3	Wheat	HS 490		05	26	At harvest stage
4	Oats	Kent		10.8	82	At harvest stage
5	Fodder	Napier			12	-
6	Strawberry	chandler		0.5	10	-
7	Garlic	G-313		0.2	04	-
<b>KVK Kathua</b>						
1	Paddy	Pusa-1121, Pusa-1509,	Kathua	32 ha	45	36.8% yield increase with C:B ratio 4.78
2	Maize	Dekalb Double	Kathua	10 ha	28	84.2% yield increase with C:B ratio 4.30
3	Black gram	PU-31	Kathua	5 ha	55	71.4% yield increase with C:B ratio of 8.5
4	Okra	Varsha-Uphar	Kathua	1.3 ha	17	38% yield increase with C:B ratio 3.47
5	Wheat	HD-2967, HD-3086, WH-1105	Kathua	41.2	103	29.9 % yield increase with C:B ratio 5.53
6	Gram	GNG-1581	Kathua	5	54	42.2 % increase in yield with C:B ratio of 2.5
7	Gobhi-Sarson	DGS-1	Kathua	7.2	32	45.8 % increase in yield with C:B ratio of 3.04



Front Line Demonstrations conducted by Krishi Vigyan Kendras



## Farm Advisory Services (FAS)

### KVK Jammu

- Providing weather forecast to the farmers and allied departments with the help of Agrometeorological Unit of SKUAST-J, Chatha.
- Agro-advisory services are provided to the registered farmers via SMS through M-Kissan portal. A number of advisories were passed on to 10000 farmers.

### KVK Rajouri

- About **500 SMS** are sent every month to the farmers of the district regarding Farm Advisory Services.
- T&V workshops are conducted every month

### KVK Doda

- Kisan Mobile Advisory Services were provided to about 3500 farmers covering agriculture and allied disciplines.

### KVK Reasi

- Kisan Mobile Advisory Services including weather and disease were provided to the farmers of the district.

### KVK Poonch

- KVK is providing weekly weather forecast to the farmers and allied departments with the help of Agrometeorological Unit of SKUAST-J.
- Unit of Regional Agriculture Research Station, Rajouri.
- KVK is also providing current prices of the commodities with the help of NCDEX through NSE/BSE.

### KVK Kathua

- Kisan Mobile Advisory Services were provided to 700 registered farmers covering agriculture and allied disciplines through SMS and 4200 SMSs were sent for bi-weekly weather forecast.
- KVK is also providing current prices of the commodities with the help of NCDEX through NSE/BSE.
- Advisories were also issued in relation to mushroom cultivation, horticulture and poultry & dairy farming.

## Consultancy Services provided to different departments/organizations

S. No.	Department	Type of consultancy	KVK
1.	Agriculture Production Department, J&K Govt. Jammu	Preparation of Comprehensive District Action Plans (CDAPs) of all districts and Comprehensive State Action Plan (CSAP)	All KVKs
2.	Department of Sheep Husbandry, J&K Govt.	Formulation of Annual Action plan in all districts of Jammu region	All KVKs
3.	NABARD	Formation of Farmers Clubs in all districts of Jammu region	All KVKs
4.	Nehru Yuva Kendra	Formulation of Annual Training Calendar for Capacity building programmes of rural youths	All KVKs
5.	Department of Floriculture, J&K Govt.	Formulation of Annual Training Calendar for Capacity building of farmers and demonstrations	All KVKs
6.	Department of Agriculture, J&K Govt.	Preparation of Strategic Research and Extension Plans	All KVKs
7.	Department of Agriculture, J&K Govt. Jammu	Rejuvenation of Vermicompost units at villages Kirpind, R S Pura, Miransab, Riapur Sajda, Sungal Bagwanachak	KVK Jammu
8.	RSETI, Kathua	Formulation of Annual Training Calendar for skill development programmes of rural youth	KVK Kathua
9.	District Rural Development Agency	Formulation of training programmes for rural youths	KVK Kathua

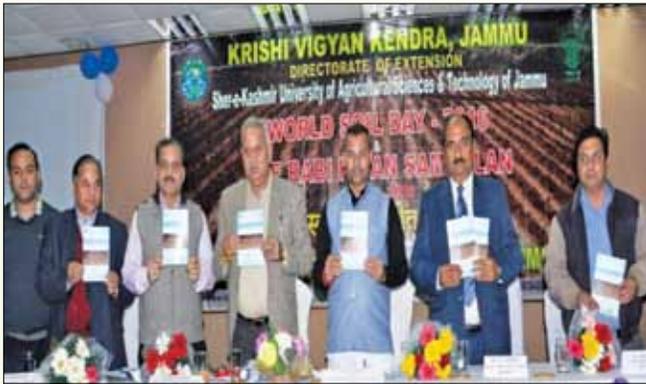


S. No.	Department	Type of consultancy	KVK
10.	Department of Horticulture, J&K Govt., Rajouri	Rejuvenation of old and senile orchards at villages Budhal, Sunderbani, Rajouri, Thanamandi, Darhal, Doongi, Nowshera	KVK Rajouri
11.	Govt. PG College, Department of Higher Education, J&K Govt. Rajouri	Establishment of Apiary and Mushroom units	KVK Rajouri
12.	Deptt. of Horticulture, J&K Govt. Poonch	High Density Plantation of Apple	KVK Poonch
13.	Department of Agriculture, J&K Govt. Poonch	Collection, Screening and Conservation of local germplasm of Rajmash	KVK Doda & KVK Poonch

### Farmers Educative Events

S. No.	Programme	KVK Jammu		KVK Rajouri		KVK Doda		KVK Kathua		KVK Reasi		KVK Poonch	
		N	P	N	P	N	P	N	P	N	P	N	P
KVK Jammu													
1.	Field days	07	254	06	150	03	94	04	158	04	186	03	50
2.	KisanGhoshti	03	79	12	552	03	110			03	125	01	27
3.	Awareness programme cum campaigns	6	405	12	710	12	236	01	250	05	787	01	126
4.	Animal camp			02	309			-	-	-	-	02	71
5.	KisanMela (Organised)	01	590	01	297			02	829	01	300		
6.	KisanMela (Participated)			02	7100	03	850	03	1500	06	1890		
7.	Celebration of important days	12	506	01	92	02	279	04	414	04	1524	02	204
8.	Campaigns	06	578					01	255	03	845	01	39
9.	Collaborative/ Sponsored programmes											06	388
10.	Radio talks	01		-	-	-	-	-	-	-	-	07	-
11.	Exposure visits	03	300	03	24	02	48			02	241	01	05
12.	Farmers Scientist interactions	02	88	01	18	04	84			04	76	02	50
13.	Lectures delivered by scientific staff			49	1779	14	668	-	-	-	-	-	-
14.	Scientist visits to farmers field			101	1206	58	64			25	125		
15.	Diagnostic visits			-	-	28	28			12	54		
16.	Farmers visit to KVK			1202	1202	36	36			-	130	-	132
17.	Research Papers			-	-					04	-	-	-
18.	Extension literature			-	-	09	3200			-	-	03	1500
19.	Film Show			06	365			-	-	-	-	-	-
20.	Farmers' Clubs formed					10	195						

**N : No. of Programmes; P : No. of Participants**



Educative events carried out by KVKs during 2016-17

# Infrastructure Development

## 5.1 Works completed during the year 2016-17

S. No	Name of the Work
1	Internal finishes of under construction University Auditorium by way of Acoustic treatment, Audio-Video & Stage lightening System, HVAC System, Fire Fighting System and Internal Electrification works (Composite work) at Main Campus, Chatha, Jammu.
2	Construction of First Floor of International Guest House at Main Campus, Chatha.



Baba Jitto Auditorium



Trikuta International Guest House

S. No	Name of the Work
<b>Repair/Reonvations works completed during the year 2016-17</b>	
1	Reconstruction of damaged Compound wall and providing Angle iron grills on the front side of the Main Campus, Chatha, Jammu.
2	Reconstruction & fixing of Chain link fencing to the Western Part (periphery) of the Research Farm at Main Campus, Chatha, Jammu.
3	Repair/Renovations to footpaths and Central Verge at Main Campus, Chatha, Jammu.
4	Reconstruction of damaged Roads at Main Campus, Chatha, Jammu.
5	Reconstruction of damaged floors in the Administrative Block, Faculty buildings and Farmers' Hostel at Main Campus, Chatha, Jammu.
6	Repair/Renovation to the Main Faculty building by way of distempering and other minor civil works in Blocks (1) to (6) at Main Campus, Chatha, Jammu.
7	Repair/Renovation to the Main Faculty building by way of Textured paint (outside) and other civil works in Block Nos. (1), (2), (7) and (8) at Main Campus, Chatha, Jammu.
8	Repair/Renovations to the sanitary and plumbing fittings in the Main Faculty and Central Library building at Main Campus, Chatha, Jammu.
9	Repair/Renovations to the Water Supply System including extension to new blocks (Sports etc.) in the Faculty building at Main Campus, Chatha, Jammu.
10	Repair/Maintenance to Sewerage System/Plant at Main Campus, Chatha, Jammu.
11	Repair/Maintenance by way of providing adequate PVC sheet covering over hollow angle trusses (Block No. 1 to 4) at Main Campus, Chatha, Jammu.



S. No	Name of the Work
12	Repair/Maintenance by way of providing adequate PVC sheet covering over hollow angle trusses (Block No. 5 to 8 ) at Main Campus, Chatha, Jammu.
13	Repair/Maintenance by way of civil and sanitary works including drainage to Administrative Block, Farmers' Hostel and Conference Hall at Main Campus, Chatha, Jammu.
14	Electrical Repair work to the Dean's Office, Canteen, Lecture Hall and Students' Centre at Main Campus, Chatha, Jammu.
15	Electrical Repair work to the Central Library building at Main Campus, Chatha, Jammu.
16	Electrical Repair work to the Main Faculty buildings at Main Campus, Chatha, Jammu.
17	Repairs to electrical work by way of extension of LT conductor in the Experimental Area of different Divisions of Research Farm at Main Campus, Chatha, Jammu.
18	Repair/Maintenance to the drainage System at Main Campus, Chatha, Jammu.
19	Repair/Renovations to the Main Faculty building (old) by way of snowcem and distempering (front portion upto Old Plant Pathology Section) & other civil works at FVSc & AH Campus, R.S. Pura.
20	Repair/Renovations to the Main Faculty building (old) by way of snowcem and distempering (present Veterinary physiology Division to last portion) & other civil works at FVSc & AH Campus, R.S. Pura.
21	Repair/Renovations by way of painting, distempering, whitewashing and other minor works to the Teaching Veterinary and Clinical Complex. (front portion) at FVSc & AH Campus, R.S. Pura
22	Repair/Renovations by way of sanitary fittings, drainage, plumbing and other minor works to the Teaching Veterinary and Clinical Complex at FVSc & AH Campus, R.S. Pura.
23	Repair/Renovations to the sanitary and plumbing to the Main Old Faculty building at FVSc & AH Campus, R.S. Pura.
24	Repair/Renovations to the sanitary and plumbing to the Pragati Hostel and Medical Section at FVSc & AH Campus, R.S. Pura.
25	Repair/Renovation by way of repairing of sanitary and drainage works in the Lakshya Hostel at FVSc & AH Campus, R.S. Pura.
26	Electrical repair work to the existing street lights and LT panel board for DG set at FVSc & AH Campus, R.S. Pura
27	Electrical repair work in Lakshya, Pragati Hostel and Dean's Office at FVSc & AH Campus, R.S. Pura.
28	Repair/Maintenance to the Guest House/PG Hostel at FVSc & AH Campus, R.S. Pura.
29	Repair/Renovations to the Main building including labs. by way of distempering, painting and other civil works at Advanced Centre for Horticulture Research, Udheywalla, Jammu.
30	Repair/Renovations to the sanitary/plumbing including drainage facility at Advanced Centre for Horticulture Research, Udheywalla, Jammu.
31	Electrical repair work to the existing street lights, Office building and Research Farm at Advanced Centre for Horticulture Research, Udheywalla, Jammu.
32	Repair/Maintenance by way of whitewashing, distempering, snowcem and other minor civil and sanitary works to the Office-cum-Lab building at DLRSS, Dhiansar
33	Electrical repair work to the existing building and street lights at DLRSS, Dhiansar.
34	Repair/Maintenance by way of whitewashing, distempering, snowcem and other minor civil and sanitary works to Office-cum-Lab building at PRSS, Samba.
35	Electrical repair work to the existing building and street lights at PRSS, Samba
36	Electrical repair work to the existing building and street lights at RRSS, Raya
37	Repair/Maintenance by way of protection work to the Residential Area at KVK Reasi.
38	Repair/Maintenance by way of protection work (crate work) to the Farm fencing at KVK Reasi.
39	Repair/Maintenance by way of protection work (crate work) to the Farm fencing at KVK Reasi.
40	Repair/Maintenance by way of protection work (crate work) to the Farm fencing at KVK Reasi
41	Electrical repair work to the existing office/store building at Seed Production Farm, Chakroi.



S. No	Name of the Work
42	Repair/Maintenance to Dean Office , lectures theater, canteen and spine of Main Faculty Building at Faculty of Agriculture, Main Campus Chatha, Jammu.
43	Repair/Maintenance to Central Plaza/Museum and ramp for handicapped persons in Main Faculty Building, Chatha, Jammu.
44	Repair/Maintenance by way of civil works in existing workshop/shed at Main Campus Chatha, Jammu.
45	Repair/Maintenance by way of providing sheet & other minor works in workshop shed at Main Campus Chatha, Jammu.
46	Repair/Maintenance by way of improvement of Drainage Channels in the Research Farm Area Chatha.
47	Repair/Maintenance by way of providing & fixing collapsible doors for safety at the entry /exit of the Faculty blocks & other Civil works at Chatha
48	Repair/Maintenance to the Seed Processing Unit & Farm Manager Office at Research Farm, Chatha.
49	Repair/Maintenance by way of providing PVC sheet covering for entrance to the Faculty blocks on the 1 <sup>st</sup> floor through spine at Faculty of Agriculture, Main Campus Chatha, Jammu.
50	Electrical repair work by way of extension of HT line with weasel conductor on SST Pole 11 mt. from Receiving Station 6.3 MVA to various Sub Stations at Faculty of Agriculture, Chatha, Jammu.
51	Electrical repair work by way of providing & fixing of exterior isolation points with link set, painting & erection of pole 11 mt. at Faculty of Agriculture, Chatha.
52	Repair/Maintenance by way of white washing, distempering and other minor works to LPM Division at FVSc & AH, R.S.Pura Campus
53	Construction/Installation of Fountain in the courtyard of Administrative Building at Main Campus, Chatha, Jammu.
54	Repair/Maintenance of the existing AC Plant 49.5 Ton Capacity and Servo Stabilizers installed at Conference Hall at FVSc. & A.H. R.S. Pura
55	Repair/Renovation to the Conference Hall including new stairs for exit at FVSc & AH Campus, R.S. Pura, Jammu.
56	Repair/Maintenance of the Instructional Farms at FVSc. & A.H. R.S. Pura
57	Repair/Maintenance by way of providing platforms for electrical substations near School of Biotechnology/Seed Processing Unit and other locations including providing and fixing of 02 Nos. collapsible shutters in Urja Hostel at Main Campus, Chatha.
58	Electrical repair work by way of providing DG Set ( 250KVA) supply to the School of Biotechnology, School of Agri. Business Management, Controller of Examination and 3 phase supply to the Dean Office and Block No. 5 with LT Conductor at Faculty of Agriculture, Chatha.
59	Providing uninterrupted water supply to old Boys and Girls Hostel at FVSc & AH Campus, R.S. Pura, Jammu
60	Providing & fixing of wire guage shutters to the newly established Boys' Hostel (Farmers' Hostel) at Main Campus, Chatha
61	Repair/Maintenance by way of white washing, distempering and other minor works to Office-cum-Stores, Workshop and Tubewell Room building at SPF,Chakroi.
62	Repair/Renovation to the Administrative Building by way of civil and sanitary and other allied works at Main Campus, Chatha.
63	Modular Cabins for office use in the offices of Directorate of Research, Project Planning & Monitoring Officer's Office and Estates Division at Chatha and Dean's Office at FVSc & AH, R.S. Pura, Jammu.
64	Repair/Maintenance by way of white washing, distempering and other minor works to Office buildings at RARS, Rajouri.
65	Repair to Solar System in Central Library at R.S. Pura
66	CCTV cameras at Main Gate, Adm. Building and Girls Hostels Gate, Chatha(tentative cost)
67	Repair of benches of 04 No. Lecture Theatres at FoA, Chatha
68	Purchase of Wall fans in 4 No. Lecture Theatres at FoA, Chatha
69	Wi-fi facility at FoA, Chatha, FVSc. & A.H. R.S. Pura & Estates Division
70	Furniture items purchased by Director Education for Hostels
71	Model Class room at FoA, Chatha/FVSc. & A.H.R.S. Pura



S. No	Name of the Work
72	Providing & fixing Fire Extinguishers in the Office/Labs at Chatha & R.S. Pura Campuses.
73	Repair/Maintenance by way of providing and fixing street lights and other allied electrical works at KVK, Gwari, Bhaderwah.
74	Installation of Video Conference facility in the Committee Room of Vice-Chancellor's Sectt.
75	Repair to existing building by way of providing and fixing of Telephone wire along with MDF box and socket with PVC conduit at Administrative Block, Dean Office, Central Library and Main Faculty buildings at Main Campus, Chatha
76	Providing & fixing of wire guage shutters to the newly established Boys' Hostel (Farmers' Hostel) at Main Campus, Chatha
77	Construction of Cemented side shelves in UG Lab (Bio-Chemistry) in the newly constructed Faculty of Basic Science building at Main Campus, Chatha
78	Implement of front portion of Faculty of Basic Science by way of concreting.
79	Construction of Cemented side shelves in UG Lab (Plant Pathology) in the newly constructed Faculty of Basic Science building at Main Campus, Chatha
80	Flooring in Spawn Production Laboratory at Main Campus, Chatha
81	Facelifting/implement of Corner at Rotary near Vehicle/Genset Shed at Main Campus, Chatha

## 5.2 Works in progress during 2016-17

S. No	Description
	<b>New works</b>
1	Construction of New Girls Hostel (Double storeyed) alongwith associated sanitary fittings and internal electrification at Main Campus, Chatha, Jammu.
2	Construction of Boys' Hostel (Double Storeyed) alongwith associated sanitary fittings and internal electrification at Main Campus, Chatha, Jammu
3	Construction of Office complex for Organic Farming Research Centre at Research, Farm, Chatha, Jammu
4	Construction of Compound wall, Guard Room and internal paths of Vice-Chancellor's Residence at Main Campus, Chatha, Jammu
5	Providing approach road connectivity, parking facility to the VIP Vehicles and other vehicles around University Auditorium at Chatha, Jammu
6	Construction of Tissue Culture lab including electrification at Advanced Centre for Horticulture Research at Udheywalla, Jammu
7	Construction of Platform and Control rooms for 630 KVA Sub-Station and synchronizing panels for University Auditorium at Main Campus, Chatha, Jammu.
8	Creation of 630 KVA Substation, transformer, DG Sets, Panels and other allied electrical works of University Auditorium at Main Campus, Chatha, Jammu.
	<b>Repair/Renovation works</b>
1	Establishment of Bio-control Laboratory by way of modification & alteration in the existing building (old Pathology building) at Advanced Centre for Horticulture Research, Udheywalla, Jammu.
2	Modification to laboratories / office building (1st Floor) for Centre of Excellence at Advanced Centre for Horticulture Research, Udheywalla, Jammu
3	Providing internal electrification to Bio-Control Lab at Advanced Centre for Horticulture Research at Udheywalla, Jammu.
4	Construction of Office/Meeting Hall on the First Floor of existing Sr. Scientist building at Advanced Centre for Rainfed Agriculture, Dhiansar.
5	Repair/Maintenance by way of Construction of Main Gate and conversion of Store into Training Hall office building at KVK Kathua.
6	Providing Chain link fencing to the Farm at KVK Rajouri.
7	Providing Chain link fencing to the Farm at KVK Poonch



### 5.3 New works proposed for the year 2017-18

S. No	Description
<b>New Civil works</b>	
1	Construction of PG Hostel for Female Students at Main Campus, Chatha, Jammu
2	Covering by presheet roofing of remaining portion of spine against rain at Main Campus, Chatha, Jammu.
3	Development of Sports facility by way of construction of Hand ball court, basketball court, swimming pool, lawn tennis court and volley ball court etc. at Main Campus, Chatha, Jammu
4	Construction of Parking facility for vehicles (03 No.) at Main Campus, Chatha, Jammu
5	Upliftment of playgrounds by way of filling Drainage System, pavillion, bathroom, change rooms etc. at Main Campus, Chatha, Jammu
6	Fencing to the remaining portion of research farm at Main Campus, Chatha, Jammu
7	Construction of drainage in the research farm for safeguarding experimental trials of students at Main Campus, Chatha, Jammu
8	Construction of Committee room for Dean office at FVSc & AH Campus, R.s. Pura, Jammu
9	Construction of PG Hostel for Male students at FVSc & AH Campus, R.s. Pura, Jammu
10	Development of Sports facility by way of construction of Hand ball court, basketball court, swimming pool, lawn tennis court and volley ball court etc. at FVSc & AH Campus, R.s. Pura, Jammu
11	Residential accommodation for officer of Remount Vety. Corps (RVC) at FVSc & AH Campus, R.s. Pura, Jammu
12	Residential accommodation for staff of Remount Vety. Corps (RVC) at FVSc & AH Campus, R.s. Pura, Jammu
13	Construction of Indoor Games facility & Gymnasium
<b>Repair/Renovation works</b>	
1	Electrification work both internal & external at different Stations of the University.
2	Repair/Renovation to the Laboratories at Main Campus, Chatha
3	Repair/Renovation/Additions/Alterations to the Classrooms including acoustic treatment for overcoming echo at Main Campus, Chatha
4	Repair/Renovation to the Central Library at Main Campus, Chatha
5	Repair/Renovation to the Central Library at FVSc & AH Campus, R.s. Pura, Jammu
6	Repair/Renovation/Additions/Alterations to the Classrooms including acoustic treatment for overcoming echo at FVSc & AH Campus, R.s. Pura, Jammu
7	Repair/Renovation to the Laboratories at FVSc & AH Campus, R.s. Pura, Jammu
8	Repair/Renovation to PRSS building at Samba
9	Repair/Renovation to the Laboratories/Infrastructure of KVKs including water supply, road network, sewerage
i	KVK Jammu
ii	KVK Kathua
iii	KVK Reasi
iv	KVK Doda
v	KVK Poonch
vi	KVK Rajouri

Name of Teacher/ Scientist	Name of Award/ Distinction/ Recognition	Awarding Institution/ Organization
Dr. J. S. Manhas	"Young Scientist Award" by Indian Society of Extension Education during National Seminar on "Information and Communication Management Concerning Climate Smart Agriculture for Sustainable Development and Poverty Alleviation"	Indian Society of Extension Education (ISEE), IARI, New Delhi at RVSKVV, Gwalior, M.P
Dr. B.R. Bazaya	REVIEWER EXCELLENCE AWARD (2016)	Agricultural Research Communication Center (ARCC), Karnal as best reviewer and outstanding contribution for the so many years to the Indian Journal of Agricultural Research and Legume Research-An International Journal.
Dr. R. Puniya	Young Scientist Award (2017)	In Biennial Conference on "Doubling Farmer Income by 2022 held at MPUAT, Udaipur by Indian Society of Weed Science in
Dr. Dileep Kachroo, Dr. N.P. Thakur, Dr. A.K. Gupta & Dr. Vijay Khajuria	Best Centre	ICAR
	Live stock show (Poultry) Kissan Mela	SKUAST-J, Chatha
Dr. Sanjay Khar	Fellow of the Institution of Engineers (India)	Institution of Engineers(India) Kolkata
	Elected to the Executive Council of Institution of Engineers (India) Kolkata Agricultural Engineering Division	Institution of Engineers(India) Kolkata
Dr. R.K.Srivastava	Member of editorial board of Agricultural Engineering Today Journal of Indian Society of Agricultural Engineering (ISAE)	Indian Society of Agricultural Engineering (ISAE)
Dr. RK Gupta	President, Society for Plant Research, India	Executive body of Society (SPR)
	Vice President, Crop Improvement Society of India	Executive body of Society (PAU Ludhiana)
Dr. V.M Arya	Best poster award for presentation entitled "Impact of Conservation Practices on Soil Quality of Mango Orchards of Rainfed Zone of Jammu".	Soil Conservation Society of India New Delhi
Dr. Sunil Kumar	Emerald Literati Award	Emerald Group
Dr. Arvind Kumar	Ram RakshaKiranShukla Gold Medal	Association of Public Health Veterinarians
Dr. Z. F. Bhat	Emerald Literati Award	Emerald Group
	NetajiSubhash International Fellowship	ICAR, New Delhi
Dr. Rajesh Katoch	Conferred fellow of Indian Association for Advancement of Veterinary Parasitology.	IAAVP
Dr. Anish Yadav	ICAR Fellow	ICAR
Dr. Sanku Borkataki, Dr. Rajesh Katoch, Dr. Anish Yadav	1 <sup>st</sup> position in oral presentation	26 <sup>th</sup> NCVPat Shimoga, Karnataka.
Dr. Sanku Borkataki, Dr. Rajesh Katoch, Dr. AnishYadav	3 <sup>rd</sup> Position in poster presentation	26 <sup>th</sup> NCVPat Shimoga, Karnataka.



Name of Teacher/ Scientist	Name of Award/ Distinction/ Recognition	Awarding Institution/ Organization
Dr. Mudasir Sultana	Awarded as Fellow of ISVPT) during 15 <sup>th</sup> Annual Conference of ISVPT at ICAR-NDRI Karnal. (2016)	Indian Society of Veterinary Pharmacology & Toxicology
Sabahat Gazal	Netaji Subhash – ICAR International Fellowships	ICAR
Dr Gurdev Chand	Scientific Educational Research Society (SERS) Fellow Award-2016	International Conference on Global Initiatives in applied Sciences and Green Technology (GiAgT-2016) at SRM University, NCR Campus, Modinagar, Gaziabad (U.P), India
Dr. S.E.H. Rizvir	Appreciation certificate for successful organizing the 19 <sup>th</sup> Annual Conference of SSCA	Society of Statistics & Computer Applications, New Delhi
Dr. Manish Kr. Sharma	Appreciation certificate for successful organizing the 19 <sup>th</sup> Annual Conference of SSCA	Society of Statistics & Computer Applications, New Delhi
Dr.M.Iqbal Jeelani Bhat	Appreciation certificate for successful organizing the 19 <sup>th</sup> Annual Conference of SSCA	Society of Statistics & Computer Applications, New Delhi
Dr. S.A. Mallick	Fellow of Society of Agriculture Biochemistry	Society of Agriculture Biochemistry
Dr. Sanjay Guleria	Member of Editorial Board	International Journal of Agricultural Research and Crop Sciences (Acta Scientifica)
Dr. Moni Gupta	Newton Bhabha Fund Award	Jointly organised by DBT, GOI and University of Cambridge, UK
	BiocARE fellowship by DBT for three years (2015-2018)	DBT, GOI
Dr. Vikas Sharma	Bharat Excellence Award	Friendship Forum
	Best poster Award in 25th National Conference of	Soil Conservation Society of India
	Appreciation Certificate 19 <sup>th</sup> Annual Conference of SSCA	Society of Statistics & Computer Applications, New Delhi
	Awarded Second Prize (oral presentation)	National Symposium on Advances in Biotechnological Research in Agri-Horticultural Crops for Sustaining Productivity, Quality Improvement & Food Security organised at SVPUAT, Meerut
	Best Indian Educationist Award	Friendship Forum
Dr. A.P. Singh	Young Scientist award	Asha Foundation, Meerut, U.P.
Dr. Parshant Bakshi	Award of Honour	Kashmir Yoga Society
Dr. Pradeep Kumar Rai	Gold Medal Award- 2016	Soil Conservation Society of India, New Delhi
Dr. Vijay Kumar	Best Poster paper award	Banaras Hindu University, Varanasi (U.P.)
	International Conference on Climate Change and its Implications of Crop Production and Food Security (ICCCICPFS)- 2016	
Dr. Rakesh Kumar	Best Poster paper award	Banaras Hindu University, Varanasi (U.P.)
	International Conference on Climate Change and its Implications of Crop Production and Food Security (ICCCICPFS) 2016	
Dr. PunitChoudhary	Appreciation certificate	Society of statistics and computer application
Dr. AS Charak	Scientist of the year	Astha Foundation Meerut
	Best KVK Professional	SFRI Agra
Dr. GN Jha	Best KVK Professional	SFRI Agra
Dr.Narinder Paul	Best Resource Person	CTAE, MPUAT Udaipur



Name of Teacher/ Scientist	Name of Award/ Distinction/ Recognition	Awarding Institution/ Organization
Dr. Sanjay Khajuria	Appreciation award	IIM, CSIR, Govt of India
	Fellow Award	Academy of plant Sciences
	Young Scientist Award	APSI
Dr.Amitesh Sharma	Best Poster Award	Astha Foundation Meerut
Dr. Banarsi Lal	Special Prize for the stall	GBPUAT&T, Pantnagar
Dr. Berjesh Ajrawat	Best Oral Paper Presentation Award	8 <sup>th</sup> National Extension Education Congress, 2017 of Society of Extension Education, Agra held at Hyderabad
Dr. Pawan Kumar Sharma	Best Paper Award (Oral)	19 <sup>th</sup> Annual and 2 <sup>nd</sup> International Conference of MHAЕ. at MPKV, Rahuri, Maharashtra
Dr. Ajay Kumar	Best Poster Presentation Award	8 <sup>th</sup> National Extension Education Congress, 2017 of Society of Extension Education, Agra held on at Hyderabad
	Appreciation Award	8 <sup>th</sup> National Extension Education Congress, 2017 of Society of Extension Education, Agra held at Hyderabad
Dr. Anil Bhat	Appreciation Award	19 <sup>th</sup> Annual National Conference of SSCA on "Statistics and Informatics in Agricultural and Allied Sciences" organized by Division of Statistics and Computer Science, SKUAST-Jammu
	Reviewer Excellence Award	As reviewer of Indian Journal of Agricultural Research



Dr. J.S. Manhas received "Young Scientist Award" by Indian Society of Extension Education during National Seminar at IARI, New Delhi



Dr. Vivak M. Arya and Ms. Sweeta Manhas receiving best research paper award from Union Agriculture Minister Sh. Sudarshan Bhagat at IGKV, Raipur in an international conference on WLMFLS-2017"



Dr. Anil Bhat receiving "Appreciation Award" in 19<sup>th</sup> Annual National Conference of SSCA at SKUAST-Jammu



Dr. Vikas Sharma of SKUAST-J receiving best faculty award for his achievements

## Organization of National/International Seminars/ Symposia /Conferene / Short Courses/Trainings/ Workshops/ Summer and Winter Schools.

### Major Programmes

#### 19th Annual National Conference of SSCA

19th Annual National conference of the Society of Statistics, Computer and Applications (SSCA), has been organized by Division of Statistics and Computer Science, Faculty of Basic Sciences at Sher-e-Kashmir University of Agricultural Sciences & Technology of Jammu, Chatha w.e.f March 06-08, 2017. The focal theme of the conference was "Statistics and Informatics in Agricultural and Allied Sciences". The Chief guest and guest of honour during the inaugural function on March 06, 2017 were Prof. R. B. Barman Chairman, National Statistical Commission and Prof. Pradeep K Sharma, Honble VC, SKUAST Jammu. The M. N. Das Memorial Lecture address was delivered by Prof. R.B.Barman and Prof. Alope Dey delivered the Keynote address. There were nine technical sessions viz. Sample Surveys and Statistical Quality Data; Significance of Experimental Designs in Agricultural Sciences; Synthesis of Statistics and Informatics in Relation to Hill Ecosystem; Data Analytics and Statistical Computing; Role of Bioinformatics in Agriculture Statistics and Informatics in Protection of

Plant Varieties and Farmers Welfare; Session Organized and Managed by the Students and Macro Financial Statistics and three Plenary sessions. Approximately 200 research papers have been presented including invited talks by the eminent scientists including Prof. Sat Gupta, University of North Carolina – Greensboro, North Carolina, USA and Prof. Murari Singh (through video call). The delegates participated in the conference were from different corners of the nation besides the Jammu which includes Madras, Assam, Tamilnadu, Himachal Pradesh, Punjab, Uttar Pradesh, Uttarakhand, Maharashtra, Haryana, Karnataka, Kashmir etc. The Valedictory Function was held on March 08, 2017 in which Prof. A.K. Nigam, Eminent Statistician was Chief Guest and the Guest of Honour was Prof. J.P. Sharma, Director Research, SKUAST-Jammu. At the Valedictory Function Prof. V.K. Gupta, President of SSCA presented detailed report of various activities of the conference. The conveners of the conference were Prof. S.A. Mallick, Dean, FBSc and Prof. S.E. H. Rizvi, Prof. & Head, Division of Statistics & Computer Science. The organizing secretary was Dr. Manish Kumar Sharma, Associate Professor, Division of Statistics and Computer Science.



Glimpses of 19th Annual National Conference of SSCA



## Biennial Workshop of AICRP-Integrated Farming System

SKUAST-Jammu in collaboration with ICAR-Indian Institute of Farming System Research, Modipuram, is organizing four-day Biennial Workshop of AICRP-Integrated Farming System at Chatha campus. More than 140 scientists from 23 States and 2 union territories covering all the agro-climatic regions of the country and renowned dignitaries from ICAR and other august bodies are attending the workshop. In his inaugural address, Prof P K Sharma, Vice Chancellor SKUAST-Jammu, said that need of the hour is to double the income of the farmer and mitigate the ill effects of climate change and for that matter adoption of Integrated farming system approach is the only answer which will make our farming profitable, thereby provide livelihood security to small and marginal farmers. He expressed pleasure that the scientists of SKUAST-Jammu are the part of this noble research programme and revealed that the IFS model on one ha of land realized a profit of

Rs 3.04 lakhs as compared to Rs 0.80-0.90 lakhs profit under farmers practice. Dr S Baskar, Assistant Director General (AAFCC) ICAR, informed that Government of India was concentrating on various schemes for doubling of farmers income through soil health, more from less resources (input use efficiency), 'har khet ko pani' (water management) 'har med Pad' (Agro forestry), 'National Gokul Mission etc. Dr A S Panwar, Director, ICAR-IIFSR, Modipuram, who presided over the function, informed that 84 percent of farm households in India have crop and dairy together but their recycling was very low (<25 percent. Dr Jag Paul Sharma, Director Research, hoped that the four-day deliberations will go in a long way to bring some valuable futuristic research needs and also will help to boost its adoption strategies at farmers level. About twenty one publications written by various scientists from different centres of this group across the country were released during the programme. Dr. Dileep Kachroo, Organising Secretary and leader of IFS group SKUAST-J, presented vote of thanks



Glimpses of Biennial Workshop of AICRP-Integrated Farming System



## Other Programmes

### (i) Farmers Training

Name of the Training	Funding/sponsoring agencies	Organizers	No. of Farmers Participated	Date & venue
One day farmers awareness programme on climate Change	India Meteorological Dept, Ministry of Earth Sciences, New Delhi	Gramin Krishi Mausam Sewa, AMFU-Chatha	86	At village Chak Dulma, district Samba, on 2 <sup>nd</sup> Feb, 2017
			90	At village Chak Lala, district Samba, on 2 <sup>nd</sup> Feb, 2017
			122	At village Pathwal, district Kathua, on 6 <sup>th</sup> Feb, 2017
Tikkau Kheti- Khushhal Kisan	IIFSR- Modipuram	IIFSR- Modipuram	16	28-30 Nov.2016/Muzzafarnagar
Hands on training w.r.t. Rearing of backyard poultry	ICAR (TSP)	AICRP-IFS	90	11 <sup>th</sup> March, 2017/ Badikhad & Meencharkan
Farmers meet	ICAR (TSP)	AICRP-IFS	100	26 <sup>th</sup> March, 2017/ Badikhad & Meencharkan
Hands on training w.r.t. poultry entrepreneurship	ICAR (TSP)	AICRP-IFS	05	Regular interval/ Badikhad & Meencharkan
Awareness about boundary planting of trees	AICRP on Agroforestry	Agroforestry	51	Village Sagoon, Tehsil, Nagrota, District, Jammu 27 <sup>th</sup> August, 2016
Innovative techniques for nursery raising under protected structures	NABARD	VSF	50	30 <sup>th</sup> of January, 2017 Amir Nagar, Bishnah
Production technology of Marigold	NABARD	VSF	50	01 <sup>st</sup> of Feb., 2017 Chak Bhalwal
Nursery management for efficient land use	NABARD	VSF	70	16 <sup>th</sup> of Feb., 2017 Badyal Brahmna, R.S. Pura
Nursery raising on scientific lines	NABARD	VSF	55	22 <sup>nd</sup> of Feb., 2017/ Nai Basti, Marh (Jammu)
Nursery management for efficient land use	NABARD	VSF	55	23 <sup>rd</sup> of Feb., 2017 Ban Sultan, R.S. Pura
Refresher course on marketing of quality planting material for livelihood security	NABARD	VSF	88	27 <sup>th</sup> of Feb., 2017 SKUAST, Chatha
Innovative techniques for nursery raising under protected structures	NABARD	VSF	59	02 <sup>nd</sup> of March, 2017 Bhure Chak, Satwari
Value addition of livestock products (preparation of meat pickle, meat biscuits, meat balls, shrikhand, paneer)	DST, New Delhi	LPT	120	8 <sup>th</sup> -9 <sup>th</sup> November 2016, 1-2 <sup>nd</sup> December 2016, 13 <sup>th</sup> -14 <sup>th</sup> March 2017
Infertility Management in Dairy Animals	DST sponsored project	VGO	12	Village Khara, Samba on 14 <sup>th</sup> of Dec., 2016
Awareness on production diseases of dairy animals	J&K State Science Technology & Innovation Council DST, J&K State Government	VMD	61	Panchayat- Talhar (Moolachak), R.S. Pura, Jammu



Name of the Training	Funding/sponsoring agencies	Organizers	No. of Farmers Participated	Date & venue
Awareness of dairy farmers regarding mastitis in dairy animals	J&K State Science Technology & Innovation Council DST	VMD	47	Village- Badyal, R.S. Pura
“Technology Awareness-cum-Demonstration Programmes” on “Management of Production Diseases in Livestock”	J&K State Science Technology & Innovation Council DST	VMD	489	Sunderbani, Rajouri and Manjakot, Rajouri (24 <sup>th</sup> of June, 2016) Poonch (25 <sup>th</sup> of June 2016) Beli village, Udhampur District (19 <sup>th</sup> of Nove. 2016) Panchari, Udhampur District (20 <sup>th</sup> of Nov, 2016) Kalakote, Rajouri (11 <sup>th</sup> of August, 2016) Dera Baba BandaBhadur, KVK Reasi (12 <sup>th</sup> of August, 2016)
Sustainable control of Parasite and backyard poultry products	DST, New Delhi	VPA	60	19 <sup>th</sup> – 20 <sup>th</sup> October, 2016 KhadaMadana, BadhaKhatar, Sangar (Samba)
Sustainable control of Parasite and backyard poultry products	DST, New Delhi	VPA	60	21 <sup>st</sup> -22 <sup>nd</sup> December, 2016 KhadaMadana, Sangar (Samba) Chakshiyar (R.S.Pura)
Sustainable control of Parasite and backyard poultry products	DST, New Delhi	VPA	27	13 <sup>th</sup> – 14 <sup>th</sup> March, 2017 Flora Nagbani, Jammu
Farmers Training	DST	VPHE	38	11 <sup>th</sup> of Feb., 2017, Gurubala area
ZoonosesAwareness camps	ICAR	VPHE	25	12 <sup>th</sup> of Feb., 2017, Surinsar area
Awareness cum treatment camps	NABARD	VPHE	37	12 <sup>th</sup> of Feb., 2017, Guru Kawan area
Diagnostic Camps	NABARD	VPHE	37	12 <sup>th</sup> of Feb., 2017, Gurukawan area
Training cum Awareness of Vets and paravets regarding Q-Fever	DRDE, Gwalior	VPHE	20	11 <sup>th</sup> of March, 2017, SBF, Reasi

## (ii) In-service Trainings

Title of the training programme/ conference /workshop/Seminars	Name of organizing secretary	Name of Organizers / Collaborators	Venue	Duration with dates
Climate change impacts on insects and Pest management adaptations	Dr. V. K. Razdan	Directorate of Research	SKUAST-J, Chatha	28 <sup>th</sup> Nov. 2016
Two Days Seminar on “ Use of Technical terminology of Agriculture in Dogri”	Dr. S.K. Gupta	Sponsored by Commission for Scientific & Technical Terminology (CSTT), Min. HRD, Gol	SKUAST-J, Chahta	Jan.18-19, 2017



Panchayat Ghar, Sunderbani



Distribution of UMMB and Area Specific Mineral Mixture among farmers



Interaction with farmers at DakBanglow, Poonch



Interaction with farmers at Manjakot Block, Rajouri

## Participation of Scientists in National/ International Seminars / Symposia / Conferences / Short Courses / Training / Workshops / Summer and Winter Schools

- Dr Brajeshwar Singh, Assistant Professor (Microbiology) attended/participated/presented
  - ◆ “Refresher course (3 weeks) in Life Sciences w.e.f. 06 March 2017” organized by Academic Staff College, University of Jammu, Jammu.
  - ◆ 6th International Conference at NASC Complex, New Delhi, India organized by Indian Phytopathological Society (IPS) with the theme on “Plant, Pathogens and People” from 23-27, Feb. 2016.
  - ◆ Eco-Friendly Approaches for Plant Disease Management: Recent Trends and Opportunities” at ICAR-Indian Institute of Pulses Research, Kalyanpur, Kanpur, from 29-30, December 2016.
  - ◆ research paper at ‘International conference on ‘Technological advancement for sustainable Agriculture and Rural Development (TASARD-India, 2017)’ at NAAS complex, New Delhi on 20-22, Feb 2017 organized by Society for Plant Research.
- Dr Neetu Sharma, Asstt. Professor (Agronomy) attended Application of Advanced statistical tools in Agricultural Research at Dept. Of Agricultural Statistics, University of Agricultural Sciences, Dharwad w.e.f 08-28, Nov. 2016.
- Dr R K Sharma, Professor and Head (Animal Nutrition) participated in Xth Biennial conference of Animal Nutrition Association on ‘Newer approaches in animal nutrition research for augmenting animal productivity’ Tirupati, India; Nov. 9-11, 2016
- Dr R.K. Gupta, Professor and Head (Vegetable Science and Floriculture) acted as panellist and delivered talk in “Panel discussion on Doubling Farmer’s income’ in National Conference on “Addressing agriculture sustainability road map for doubling the farmers income by 2022” organized from 29-30 March, 2017 at University of Jammu.
- Dr Rajan Salalia, Jr Scientist (Entomology) attended national conference on “ Nematode-Emerging threat in Rice cultivation at Goa w. e. f 11-13 Jan.2017.
- Dr S.K. Rai, Jr Scientist ( PBG) attended
  - ◆ International Oilseed Conference at Jaipur w. e. f 24-25 Feb., 2017.
  - ◆ National Brassica Conference at IARI w. e. f 16-18, Feb., 2017.
- Dr Upma Dutta, Assistant Professor (Microbiology) participated in 21 days training programme on “Fungal diversity and modern trends in taxonomy through DNA Barcoding and Chemo-profiling” from 26 September -16 October 2016 in the Centre of Advanced Faculty Training, Division of Plant Pathology, IARI New Delhi
- Dr. Raj Kumari kaul, Professor & Head (FST) attended 02 days convention of Food Scientists & Technologists on Food Process for sustainable and Agriculture Industry in GNDU , Amritsar, Punjab.w.e.f. 10-12<sup>th</sup> November, 2016
- Dr. A. K. Gupta, Assoc. Prof. & Head (VSR) attended 40th Annual Congress of ISVS and National Symposium on “Biomaterials and stem cells for tissue repair and regeneration in Veterinary Surgery” at Dept of vety. Surgery & Radiology, Madras Vety. College, Chennai w.e.f 2-4 Dec, 2016)
- Dr. A.K. Pandey attended 12th JK Science Congress at University of Jammu w.e.f 2-4 March 2017
- Dr. A.K. Singh, Assistant Professor, (Plant pathology) attended National Symposium on Phytopathogenic Mollicutes: Indian scenario of diagnosis, epidemiology and disease



management held at IARI, New Delhi w.e.f. 17-18 December, 2016.

- Dr. Ajay Gupta attended
  - ◆ 21 days winter school on Resource conservation technologies at PAU Ludhiana w.e.f. 05 -25 Oct., 2016
  - ◆ Zonal workshop of KVKs of Zone-I at CSK, HPKV, Palampur w.e.f. 12-14, December 2016
- Dr. Amit Jasrotia, Sr. Scientist (Fruit Science) attended winter school on "Exploitation of underutilized fruits of arid and semi arid region" sponsored by ICAR, New Delhi organized by Directorate of Research, MPUAT, Udaipur, Rajasthan from 4-24, October 2016.
- Dr. Anamika Jamwal, Assistant Professor (Plant Pathology) attended Fungal diversity New trends in taxonomy through DNA barcoding and chemoprofiling at IARI, New-Delhi
- Dr. Anil Bhat, Asstt. Professor (Agril. Economics) attended and presented research paper in the 19<sup>th</sup> Annual Conference of Society of Statistics, Computer & Applications organized by Division of Statistics & Computer Science, FBSc, SKUAST-J, Chatha w.e.f. 06 -08 March., 2017.
- Dr. Anil Gupta, Professor, (Plant Pathology) attended
  - ◆ 51st Annual Rice Group meeting cum conference held at Indira Gandhi Krishi Viswavidyalaya, Raipur w.e.f. 2 -5 April, 2016.
  - ◆ chaired one day conference cum Mela on Beekeeping, Mushrooms and organic farming at Krishi Bhawan Lawns, held at Directorate of Agriculture, Talab Tillo, Jammu, on 10th Dec., 2016.
- Dr. Anil Kumar, ADR, ACRA, Dr. Arvind Pratap Singh, Sr. Scientist (Agronomy) and Dr. Vikas Abrol, Sr. Scientist (Soils) Participated in the 4th International Agronomy Congress held at New Delhi, India w.e.f. 22 - 26 Nov., 2016.
- Dr. Anish Yadav, Associate Professor (Veterinary Parasitology) attended 26th NCVP (National congress of Veterinary Parasitology) & International Symposium on "Current concepts in diagnosis & control of parasitic diseases to combat climate change" at Shimoga, Karnataka
- Dr. Ankur Sharma and Dr. Pankaj Gupta, Asstt. Prof.(s) (VSR) attended 4th J&K Women Science Congress National Symposium on "Career in science for women –challenges and opportunities" at Govt. College for Women, Jammu w.e.f 1-3 Sep., 2016)
- Dr. Arti Sharma, Assistant Professor (Fruit Science) attended 12th JK Science Congress "Science and Technology: Emerging Trends and innovations" held at University of Jammu w.e.f. 02-04 March, 2017.
- Dr. Arvind Kr. Ishar, SMS (Entomology) attended
  - ◆ Workshop at SAMETI, SKUAST-J Chatha on 30 March 2017
  - ◆ MDP for Programme Coordinators at NAARM Hyderabad, KVK Calicut, ATARI Ludhiana w.e.f MDP for Programme Coordinators
  - ◆ Summer School at MPUAT Udaipur w.e.f. 2-22 Aug 2016
  - ◆ Training Programme on IFS at SKUAST-J Chatha w.e.f. 4 March 2017
  - ◆ attended 12th Association of Public Health Veterinarian conference on Zoonotic diseases of national importance and the control and contaminants of such diseases in India held at Kamdhenu Veterinary University, Chhattisgarh, Durg on 2-3 December 2016
- Dr. Arvind Pratap Singh, Sr. Scientist (Agronomy) and Dr. Jai Kumar, Jr. Scientist participated in
  - ◆ Silver Jubilee Biennial Workshop of AICRPDA organized by CRIDA, Hyderabad and Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, w.e.f. 17 - 21 January, 2017.
  - ◆ 4th Annual Workshop of AICRPDA- NICRA held at Kovilpatti, Tamil Nadu w.e.f. 3- 6 May, 2016.
- Dr. AS Charak, SMS (Agronomy) attended
  - ◆ 2nd National conference on cryosphere and impact on ecosystem services and rural livelihood in Himalayan region at Jammu University Bhaderwah Campus-Doda w.e.f. 21-22 November, 2016
  - ◆ National conference at PJT-SAU, Hyderabad, Telangana w.e.f. 10-11 December, 2016
  - ◆ Training on "Wheat production technology for Jammu region" at SAMETI-J w.e.f. 01-02 Nov 2016



- Dr. Ashok Kumar, Assistant Professor (VSR) attended 21 days advanced training course on “Diagnostic Imaging and minimal invasive surgical techniques in veterinary patients” organized by department of VSR, GADVASU, Ludhiana w.e.f. 5-25 Oct 2016.
- Dr. B.R. Bazaya, Sr. Scientist Agronomy attended
  - ◆ Ten days training on “Advances in Weed Management” held at DWR, Jabalpur w.e.f. 30 Nov. – 09 Dec., 2016.
  - ◆ XXII Annual Review Workshop Meeting of AICRP and Biennial Conference on “Doubling Farmer Income by 2022 held at Udaipur Rajasthan w.e.f. 27 Feb. - 03 March, 2017.
  - ◆ XXIII Annual Review Workshop Meeting of AICRP on Weed Management held at Jalgaon, Maharashtra from 28-30, April.2016.
- Dr. Berjesh Ajrawat, Assistant Professor attended Information communication technology – mediated Agriculture Extension at IARI, New Delhi w.e.f. 2- 22 August, 2016
- Dr. Bhav Kumar Sinha, Assistant Professor (Plant Pathology) attended 19th Annual National Conference on “Statistics and Informatics in Agricultural and Allied Sciences” at SKUAST-J, Chatha-Jammu w.e.f. 06-08, March 2017.
- Dr. D. Chakraborty, Assistant Professor, (Animal Genetics & Breeding) attended National Conference on Challenges in Quantitative Genetics for Improvement of Indigenous Animal Genetic Resources (AnGR) at ICAR-IVRI, Izatnagar, Barielly, U.P. w.e.f. 19-20, January 2017.
- Dr.D.K.Dwivedi, Assistant Professor (VSR) attended 14th National Congress & National Symposium on “ Newer approaches in management of canine health & rewarding clinical practice” at Pantnagar w.e.f. Feb, 9 –11 Feb., 2016
- Dr. Deep Ji Bhat, Assistant Professor (Fruit Science) attended winter school on “Exploitation of underutilized fruits of arid and semi arid region” sponsored by ICAR, New Delhi organized by Directorate of Research, MPUAT, Udaipur, Rajasthan from 4-24, October 2016.
- Dr. Dileep Kachroo Chief Scientist (Agronomy), Dr. N.P. Thakur Sr. Scientist (Soil), Dr. A.K. Gupta Sr. Scientist (Agronomy) attended IV (XXXII of Project) Biennial Workshop of AICRP on Integrated Farming Systems by AICRP-IFS, FSR Centre, SKUAST-J, Chatha from 20-23 December, 2016.
- Dr. GN Jha, SMS (Fisheries) attended
  - ◆ NFD sponsored refresher training programme at MANAGE Hyderabad w.e.f. 27 June to 02 July, 2016
  - ◆ Workshop of fisheries scientist from Zone I&IV at NFDB, NBFGR Lucknow w.e.f. 07.10.2016
- Dr. Gurdev Chand, Assistant Professor (Plant Pathology) attended 19th Annual National Conference on “Statistics and Informatics in Agricultural and Allied Sciences” at SKUAST-J, Chatha-Jammu w.e.f. 06-08, March 2017.
- Dr. J. P. Singh, Associate Professor (Agricultural Engineering) attended International Conference on “Sustainable Natural Resource Management: from Science to Practice (SNRMSP)” at BHU, Varanasi, U.P. during 12-13th January, 2017.
- Dr. J. S. Manhas, Assistant Professor (Agricultural Extension Education) participated in
  - ◆ presented paper (oral presentation in ISEE National Seminar-2016 on “Information and Communication Management Concerning Climate Smart Agriculture for Sustainable Development and Poverty Alleviation” organized by Indian Society of Extension Education (ISEE), IARI, New Delhi at RVSKVV, Gwalior, M.P from 28-30, November, 2016.
  - ◆ the seminar on “Use of Technical Terminology of Agriculture in Dogri” organized by Commission for Scientific and Technical Terminology at SKUAST-Jammu from 18- 19, January, 2017.
- Dr. Jafrin Ara Ahmed, Assistant Professor (VPB) attended a one-day Brainstorming workshop on ‘Climate Change and its Impact on Hill Agriculture’ SKUAST-Jammu, Chatha Jammu on 2 December 2016.
- Dr. Julie D. Bandral, Asstt. Professor (FST) Attended 12th JK Science Congress 2017 at Jammu University w.e.f. 2-4, March, 2017.
- Dr. L.K.Sharma, Assistant Professor (Agriculture Extension Education) attended the training



- programme on the topic "Harnessing Social Media for Agricultural Development" at TNAU Coimbatore w.e.f 20-23 of June, 2016.
- Dr. M. Iqbal Jeelani Bhat, Asstt. Prof. (Statistics) attended national conference of Society of Statistics & Computer Applications (SSCA) at SKUAST-Jammu w.e.f. 06-08 March, 2017.
  - Dr. M. Rashid, Associate Professor (VPH) Attended workshop on "ISO methods for detection of Listeria monocytogenes and introduction to PFGE analysis" at Nagpur Veterinary College, Nagpur w.e.f 16-18 March, 2017
  - Dr. Mahender Singh, Sr.Scientist (Agromet) attended
    - ◆ 10th Annual Review meeting on GKMS and 7th Annual Review meeting on FASAL Project w.e.f: 14- 17 Dec., 2016 held at OUAT, Bhubaneswar.
    - ◆ Annual Review Meeting-cum-Farmers' Interactive Session w.e.f: 27-29 April, 2016 and brainstorming meeting "Future Thrusts and Strategies for Agrometeorological Research, Education and Extension in India" w.e.f: 29-30 April, 2016 at CRIDA, Hyderabad.
    - ◆ stake holders meeting at SKUAST-K, Srinagar on 23 March, 2017.
    - ◆ National Symposium "AGMET 2016" at Tamil Nadu Agricultural University, Coimbatore w.e.f: 20-22, Dec. 2016.
    - ◆ Fourth Capacity Enhancement Program on "Application of Advanced Agrometeorological Tools in Agricultural Production System" CCS-HAU, Hisar 2-3 March, 2017.
    - ◆ meeting on implementation of Pradhan Mantri Fasal Bima Yojana (PMFBY) in J&K State at Chanakypuri on 27 Jan, 2017.
    - ◆ XIV Biennial Workshop of AICRP on Agrometeorology at Punjab Agricultural University, Ludhiana w.e.f: 5-7 Dec, 2016.
  - Dr. Mahital Jamwal, Sr. Scientist/ Assoc. Prof. (Fruit Science) attended 10 days national training programme on Plant Tissue Techniques in Quality Planting Material Production and Crop Improvement at School of Biotechnology, SKUAST-J, Chatha, w.e.f. 1-10, September 2016.
  - Dr. Maninder Singh, SMS (Animal Science) Attended workshop on "Recent Diagnostic tools for Hydatidosis, Cysticercosis and Trichinellosis" at Bomaby Veterinary College w.e.f 5-7 January, 2017
  - Dr. Manish Kr. Sharma, Assoc. Prof. (Statistics) attended national conference of Society of Statistics & Computer Applications (SSCA) at SKUAST-Jammu w.e.f. 06-08 March, 2017.
  - Dr. Manoj Kumar. Jr. Scientist (Soil Science) attended 21 days winter school on Advance training programme on resource conservation and paddy resource management held at Punjab Agriculture University Ludhiana on 5-25, October, 2016.
  - Dr. Meenakshi Gupta, Associate Professor (Agronomy) attended
    - ◆ Agromet Research Explicate Programme (AREP) at BCKU, Mohanpur, WB w.e.f 10-19, Feb 2016.
    - ◆ National Symposium on "AGMET-2016 at TNAU, Coimbatore w.e.f. 20-22, Dec. 2016
  - Dr. Moni Gupta, Associate Professor (Biochemistry) attended
    - ◆ 19th Annual Conference SSCA-2017 on "Statistics and informatics in Agriculture and Allied Sciences" at SKUAST Jammu w.e.f 6-8, March 2017.
    - ◆ National Seminar on "Recent Trends In Genomics & Metabolomics" at School of Biotechnology, University of Jammu w.e.f 17-18 March, 2017.
  - Dr. Monika Sood, Asstt. Professor (FST) Attended 12th JK Science Congress 2017 at Jammu University w.e.f. 2- 4 March, 2017.
  - Dr. Mudasir Sultana, Prof. & Head (Vety. Pharmacology & Toxicology) attended 16th Annual Conference of ISVPT at Navasari, Gujrat on Nov. 2016
  - Dr. Muneeshwar Sharma Asstt. Professor (Ento) attended 05 days Short course on Pest Risk Analysis at NIPHM, Hyderabad w.e.f. 13-17 Feb., 2017
  - Dr. N.K. Pankaj, Asstt. Prof. (Vety. Pharmacology & Toxicology) attended 16th Annual Conference of ISVPT at Navasari, Gujrat on Nov. 2016



- Dr. Narinder Paul attended Workshop on Extension Methodology at SKUAST Jammu w.e.f. 21- 25 June, 2016
- Dr. Nawab Nashiruddullah, Associate Professor, VPP attended a one-day Brainstorming workshop on 'Climate Change and its Impact on Hill Agriculture' SKUAST-Jammu, Chatha Jammu on 2 December 2016.
- Dr. Neelash Sharma, Assistant Professor, attended
  - ◆ 12th National Conference of Association of Public Health Veterinarians and National Symposium on One Health: Approaches towards Practice and Future Challenge" w.e.f., 2-3 December, 2016
  - ◆ 35th National Convention of ISVM and National Symposium on "Innovative Techniques Emerging Issues and Advancement in Veterinary Medicine to meet the challenges, Present and the future" w.e.f., 22-24 February, 2017
- Dr. Neeraj Gupta, Asstt. Professor (FST) attended
  - ◆ 12th JK Science Congress 2017 at Jammu University w.e.f. 2-4, March, 2017.
  - ◆ 21 days ICAR sponsored summer school at CIPHET Ludhiana on "Exploitation of underutilized fruits of arid and semi arid areas w.e.f. 04-24th of Oct., 2016.
- Dr. Neeraj Kotwal. Jr. Scientist (Entomology) attended two day national conference on Change in Cryosphere its Impact on Ecosystem Services and Rural Livelihoods: Climate Change, agricultural and sustainable development in the Himalayan region held at Institute of mountain environment, Bhadarwah campus, University of Jammu on 21-22, November, 2016.
- Dr. P. S. Slathia, Associate Professor (Agricultural Extension Education) participated in the seminar on
  - ◆ "Use of Technical Terminology of Agriculture in Dogri" organized by Commission for Scientific and Technical Terminology at SKUAST-Jammu from 18-19 of Jan., 2017.
  - ◆ Technical Terminology of Agricultural in dogri organized by commission for scientific and technical terminology at CSK University at Palampur on 19-20, May 2016.
- Dr. P.K. Rai, Sr. Scientist (Soil Science) attended/participated training programme on
  - ◆ "Technological Advances and productive strategies in organic agriculture and their internalization with Agro-Ecosystem, at MPUAT-Udaipur w.e.f. 01-21, June, 2016
  - ◆ 19th Annual National Conference on "Statistics and informatics in Agricultural and Allied Sciences". at SKUASTY-J, Jammu w.e.f. 06-08, March 2017
  - ◆ International Conference "1st Asian Conference on land and water management for food and livelihood Security at IGKV, Raipur, w.e.f 20-22, January, 2017
- Dr. P.K. Verma, Asstt. Prof. (Vety. Pharmacology & Toxicology) attended 16th Annual Conference of ISVPT at Navasari, Gujrat on Nov. 2016
- Dr. P.S. Mahapatra, Assoc. Prof (Vety. Physiology & Biochemistry) attended national symposium on "Physiological challenges in the changing global scenario for the sustainable production and reproduction of Livestock & Poultry" at CVSc, ND Veterinary Science University, Mhow, MP w.e.f 21-23, December 2016
- Dr. Parul Gupta, SMS attended
  - ◆ National seminar at CSWRI, Avikanagar w.e.f. 9-10 March 2017
  - ◆ Training Programme at SAMETI, SKUAST-J Chatha w.e.f. 06-07 March 2017
  - ◆ Workshop at SAMETI, SKUAST-J Chatha on 30 March 2017
- Dr. Pawan Kumar Sharma, SMS attended
  - ◆ 19th Annual and 2nd International Conference of Agricultural Economics 2017 at ICAR-IARI, New Delhi w.e.f. 14 Dec.- 03 Jan., 2017
  - ◆ 21 days winter school on Impact Assessment of Agricultural Technology at MPKV, Rahuri, Maharashtra w.e.f. 10- 11 Feb., 2017
- Dr. Peeyush Sharma, Associate Professor (Soil Science) attended "12th J&K Science congress" organised by Jammu University at 2 to 4 March, 2017.
- Dr. Prachi Sharma, Assistant Professor, (Plant pathology) attended 21 days CAFT training programme on Advanced Omics-Techniques and



Tools for Crop Improvement held at IARI, New Delhi w.e.f. 8 – 28 March 2017.

- Dr. Punit Choudhary attended
  - ◆ Certified ASCI Trainers training (Vermicompost) at ATARI Zone 1 Ludhiana w.e.f. 26-28 Oct. 2017
  - ◆ Summer School on Livelihood and climate change mitigation and adaptation through Agroforestry at CAZRI Jodhpur w.e.f. 03-23 Aug. 2017
- Dr. R. K. Bhardwaj, Assistant Professor attended
  - ◆ 13th Annual Convention ISACP and national symposium entitled “Concepts of one health in canine health care management” w.e.f. 27-29 April, 2016 at Pookode, Kerala
  - ◆ 14th Annual Convention ISACP and national symposium entitled “Newer approaches in management of canine health and clinical practice as well as Trade” w.e.f., 9-11 February, 2017 at Pantnagar, Uttarakhand
- Dr. R. Puniya, Jr. Scientist, (Agronomy) attended
  - ◆ XXII Annual Review Workshop Meeting of AICRP and Biennial Conference on “Doubling Farmer Income by 2022 held at Udaipur Rajasthan w.e.f. 27 Feb. - 03 March, 2017.
  - ◆ XXIII Annual Review Workshop Meeting of AICRP on Weed Management held at Jalgaon, Maharashtra from 28-30, April. 2016.
  - ◆ International Agronomy Congress on Natural Resources Management held at ICAR-IARI, Pusa, New Delhi w.e.f. 22-26 November, 2016.
- Dr. R.K. Pandey, Assoc. Professor (Floriculture) attended training programme on “Use of Technical Terminology of Agriculture in Dogri” at SKUAST, Jammu w.e.f. 18-19 Jan., 2017
- Dr. Rajesh Katoch, Professor & Head (Division of Veterinary Parasitology) attended 26th NCVP (National congress of Veterinary Parasitology) & International Symposium on “Current concepts in diagnosis & control of parasitic diseases to combat climate change” from 25-17 February, 2017 at Shimoga, Karnataka
- Dr. Rajesh Kumar Assistant Professor / Jr. Scientist (Soil Science) attended
  - ◆ Winter School on “Exploitation of Under Utilized Fruits of Arid and Semi Arid Region” at Maharana Pratap University of Agriculture and Technology, Udaipur, Rajasthan w.e.f., from 4-24 Oct., 2016.
  - ◆ “Exploitation of underutilized Fruits of Arid and Semi Arid Region” w.e.f. 4-24, October 2016 at MPUAT, Udaipur organized by Department of Horticulture, Rajasthan College of Agriculture, Maharana Pratap University of Agriculture & Technology, Udaipur, Rajasthan and Sponsored by ICAR, New Delhi
- Dr. Rajinder Peshin, Associate Professor (Agricultural Extension Education) invited lead paper in International Conference on Climate change Ecological Sustainability and Resource Management for Livelihood Security at Port Blair from 8-10 Dec., 2016.
- Dr. Rakesh Kumar (Jr. Scientist), International Conference on Climate Change and its Implications of Crop Production and Food Security (ICCCIPFS), Banaras Hindu University, Varanasi (U.P.) during 12-13 November, 2016
- Dr. Rakesh Sharma attended Summer School on ICT use in Agriculture held at PAU Ludhiana w.e.f. 15 June-05 July 2017.
- Dr. Ranbir Singh, Assistant Professor (Plant Pathology) attended
  - ◆ National Seminar on “New Vistas in Plant and Microbial Sciences” held at Department of Botany, University of Jammu, Jammu w.e.f. 11-12th March, 2016.
  - ◆ 19th Annual conference of society of Statistics, Computer and Application held at SKUAST-J, Main Campus Chatha w.e.f. 6-8 March, 2017.
  - ◆ National Symposium on Challenges to Plant Pathologists under changing Disease Scenario held at Goa University w.e.f. 5-7 October 2016.
  - ◆ 12th JK Science Congress, 2017 held at University of Jammu w.e.f. 2-4 March, 2017.
- Dr. Ravneet Kour, SMS attended Summer school at MPUAT, Udaipur Rajasthan w.e.f. 01-21 August, 2016
- Dr. RK Gupta, Professor and Head ( Division of Vegetable Science and Floriculture) attended
  - ◆ “National Conference organized by ICAR-CIPHET” at CIPHET, Ludhiana w.e.f. 29-30 September, 2016



- ◆ Agro-biodiversity, Breeders right and Farmers welfare some strategies in “19th Annual Conference of Society of Statistics, Computers and Applications” from 6-8 March, 2017 at SKUAST-Jammu.
- ◆ “International Conference of Technological Advancement on Sustainable Agriculture and Rural Development (TASARD-2017) organized from 20-22 February, 2017 at NASC Complex, New Delhi
- Dr. Rohit Sharma, Technical Officer, AMFU, RARS – Rajouri participated in
  - ◆ two farmer awareness programmes organized by AMFU, Chatha at Village Chak Dulma and village Chak Lala under district Samba.
  - ◆ 2 day kisan mela programme organized by SKUAST- Jammu, Main Campus, Chatha.
  - ◆ 10th Annual Review Meeting of Gramin Krishi Mausam Sewa (GKMS) w.e.f. 22-24 Nov., 2016 held at OUAT, Bhubaneswar, Odisha.
  - ◆ stake holders meeting on 23 March, 2017 organized by SKUAST- Kashmir for strengthening the Agro Advisory Services in J & K state.
- Dr. S. K. Gupta, Professor (Agroforestry) attended
  - ◆ Annual Group Meeting of AICRP on Agroforestry at University of Horticulture and Forestry, Nauri, Solan w.e.f 18-20, June 2016
  - ◆ National Symposium on “Agroforestry for environmental challenges, sustainable land use, biodiversity conservation and rural livelihood options” at CAFRI, Jhansi w.e.f 03-05 December, 2016
  - ◆ two days seminar on “ Agricultural Research and Technical terminology ” at College of Veterinary Sciences & AH, Palampur w.e.f 19-20 May, 2016
- Dr. S.E.H. Rizvi, Prof. & Head (Statistics) attended national conference of Society of Statistics & Computer Applications (SSCA) at SKUAST-Jammu w.e.f. 06-08 March 2017.
- Dr. S.K. Singh, Associate Professor, (Plant Pathology) attended
  - ◆ 19th Annual national conference of Societies of Statistics, Computer and Applications on “Statistics and Informatics in Agricultural & Allied Sciences held at SKUAST Jammu from 6-8 March, 2017.
- ◆ 21 days Training on “Perspectives of Plant-microbe interaction in promoting Plant health and disease management” held at G.B. Pant University of Agriculture Sciences & Technology, Pantnagar, w.e.f. 7-27 September 2016
- Dr. S.P. Singh, Asstt. Professor (Agril. Economics) attended and presented research paper entitled ‘Technology Practices & Livelihood Security in Western Himalayas’ in the 19<sup>th</sup> Annual Conference of Society of Statistics, Computer & Applications organized by Division of Statistics & Computer Science, FBSc, SKUAST-J, Chatha w.e.f. 06 –08 March., 2017.
- Dr. Sachin Gupta, Assistant Professor (Plant Pathology) attended
  - ◆ 19th Annual conference of society of Statistics, Computer and Application held at SKUAST-J, Main Campus Chatha w.e.f. 6 -8 March, 2017.
  - ◆ National Seminar on New Vistas in Plant and Microbial Sciences held at University of Jammu w.e.f. 11-12 March, 2016.
  - ◆ XVIII Annual workshop of All India Coordinated Research Project on mushroom and training on mushroom taxonomy held at Directorate of Mushroom research, Solan w.e.f. 9 -13 June, 2016.
  - ◆ 21 days training on “Bioactive compounds from medicinal plants: A wealth of novelties and opportunities” held at ICAR, DMAPR, Anand w.e.f. 1-21 December, 2016.
  - ◆ workshop on Development of skill modules for entrepreneurship development in agriculture held at MPUAT, Udaipur w.e.f. 10 -11 March, 2017.
- Dr. Sandeep Sehgal, Assoc. Professor (Agroforestry) attended IUFRO Regional Congress for Asia and Oceania: “Forests for Sustainable Development: The Role of Research” at Beijing, China w.e.f. 24-27 October, 2016
- Dr. Sanjay Agarwal, attended 12th JK Science Congress at University of Jammu w.e.f 2-4 March 2017



- Dr. Sanjay Khajuria attended 21 days UGC sponsored refresher course at University of Jammu w.e.f. 6-27 March, 2017
- Dr. Sanjay Khajuria attended
  - ◆ 2nd National conference on cryosphere and impact on ecosystem services and rural livelihood in Himalayan region at Jammu University Bhaderwah Campus-Doda w.e.f. 21-22 November, 2016
  - ◆ North Zone KVKs Workshop at CSKHPKVV Palampur (HP) w.e.f. 13-15 Nov 2016
- Dr. Satesh Kumar, Assistant Professor (Vegetable Science) attended
  - ◆ "6th Annual workshop of All India Network Research Project on Onion and Garlic" at C.S. Azad University of Agriculture and Technology, Kanpur w.e.f. 4-5 April, 2016
  - ◆ "23rd State Seed Sub-Committee meeting" at SKUAST-Kashmir on 23 March, 2017
- Dr. Sheetal Badyal, SMS attended
  - ◆ Certified ASCI Trainers training (Mushroom grower) at ATARI Zone 1 Ludhiana w.e.f. 26-28 Oct. 2017
  - ◆ Winter School on Disaster management at Jammu University w.e.f. 07-29 Dec. 2016
- Dr. Shilpa Sood, Asstt. Prof (VPP) attended 4th J&K Women Science Conference (JKWSC) at Govt. College for Women, Gandhi Nagar, Jammu on focal theme "Carrier in Science for women-Challenges and Opportunities" w.e.f. 1-3 September 2016
- Dr. Sudhakar Dwivedi, Assoc. Professor (Agril. Economics) attended
  - ◆ National Seminar on "Rainfed Agriculture in India: Perspectives and challenges" organized by Punjabrao Deshmukh Krishi Vidyapeeth, Akola w.e.f. 7-9 December, 2016.
  - ◆ 'Research Extension Interface-cum-Rabi conference under Sub Mission on Agricultural Extension of National Mission on Agri-Ext. & Tech. (NMAET) Interaction with state functionaries at SKUAST-Jammu on 17 December, 2016.
  - ◆ National Conference on "Advances in Global Research in Agriculture & Technology" (AGRAT - 2017) organized by Society of Human Resource & Innovation, Agra (U.P.) w.e.f. 19-20 March, 2017.
- Dr. Sudhir Kumar, attended 12th JK Science Congress at University of Jammu w.e.f. 2-4 March 2017
- Dr. Sunil Kumar, Associate Professor and Head and Dr. Z.F. Bhat, Asstt. Prof. LPT attended International Conference of Indian Meat Science Association (IMSACON VI) on "New horizons for augmenting meat production and processing to ensure nutritional security, food safety and environmental sustainability" held at GADVASU, Ludhiana w.e.f. 10-12 November, 2016
- Dr. Sushil Sharma, Prof. & Head (Agricultural Engineering) attended
  - ◆ as a chairperson for technical session in the area of Farm Machinery and Power Engineering in 51st Annual Convention of Indian Society of Agricultural Engineers (ISAE) and National Symposium on the theme Agricultural Engineering for Sustainable and Climate Smart Agriculture organized at College of Agricultural Engineering and Technology, CCS HAU, Hisar during 16-18, Feb. 2017
  - ◆ as a Convener of Technical Session in 19th Annual national Conference of Society of Statistics, Computer and Applications on "Statistics and Informatics in Agricultural and Allied Sciences" at SKUAST Jammu during 06-08 March, 2017
  - ◆ training programme on "Climate Change and its impact on Hill Agriculture" at SKUAST-Jammu on 08 Dec., 2016
- Dr. Sushmita M. Dadhich, Asst. Prof. (Agricultural Engineering) attended
  - ◆ National Symposium "AGMET-2016" on "Climate Driven Food Production System, Agrometrological Interventions" Coimbatore w.e.f. 20-22 December, 2016.
  - ◆ Model Training Course on "Conservation Agriculture vis-à-vis effect of climate change on productivity" Srinagar w.e.f. 2-9 March, 2017.
- Dr. Utsav Sharma, Associate Professor (VGO) attended 12th JK Science Congress at University of Jammu w.e.f. 2-4 March 2017



- Dr. Vijay Khajuria Jr. Scientist (Agronomy) attended
  - ◆ training programme on “Potential application of quantitative analysis tools in farming system using farm design” at IIFSR-Modipuram (UP) on 17-18 March 2017.
  - ◆ International Conference on Climate Change and its Implications of Crop Production and Food Security (ICCCICPFS), Banaras Hindu University, Varanasi (U.P.) during 12-13 November, 2016.
- Dr. Vikas Mahajan, Assistant Professor (Div. of ILFC) attended XIX Annual Conference of the Society of Statistics, Computer and Applications ‘Statistics and Informatics in Agricultural and Allied Sciences at SKUAST-J, Chatha, Jammu w.e.f. 6-8 March, 2017
- Dr. Vishal Gupta, Assistant Professor (Plant Pathology) attended
  - ◆ National symposium on Diagnosis and Management of Plant Diseases: Integrated approaches and recent trends held at ICAR Research complex for NEH Region Umam, Meghalaya w.e.f. 9 - 11 Jan., 2017.
  - ◆ national symposium “Diagnosis and Management of Plant Diseases: Integrated Approaches and Recent Trends” at ICAR-Research Complex for NEH Region Umam, Meghalaya from 09-11, January 2017.
- Dr. Vishal Sharma attended
  - ◆ Training Programme at SAMETI, SKUAST-J Chatha w.e.f. 06-07 March 2017
  - ◆ Training Programme on IFS at SKUAST-J Chatha w.e.f. 4 March 2017
  - ◆ Workshop at SAMETI, SKUAST-J Chatha on 30 March 2017
- Dr. Banarsi Lal, SMS (Agriculture Extension Education) attended
  - ◆ Workshop at Himachal Krishi Vishabvidhyala, Palampur w.e.f. 12-14 Dec., 2016
  - ◆ Workshop at PAU, Ludhiana w.e.f. 23-24 Jan. 2017
- Dr. Veena Sharma, Tech. Officer, GKMS attended
  - ◆ 10th Annual Review meeting on GKMS w.e.f. 14-16 Dec., 2016 held at OUAT, Bhubaneswar.
- ◆ 4th International Agronomy Congress on “Agronomy for Sustainable Management of Natural Resources, Environment, Energy and Livelihood Security to Achieve Zero Hunger Challenge” w.e.f. 22- 26 Nov., 2016 held at ICAR-IARI, Pusa Campus, New Delhi
- Dr. Vijay Kumar Sharma attended Advances in rumen manipulation to improve livestock productivity at IVRI, Izatnagar w.e.f. 1-21 Feb., 2017
- Dr. Renu Gupta, Assistant Professor (Soil Science) attended
  - ◆ 12th J&K Science congress” organised by Jammu University at 2- 4 March, 2017
  - ◆ 21 days refresher course in Life Sciences, Department of Biotechnology, University of Jammu from 6-26 March, 2017.
- Dr. Sarabdeep Kour, Assistant Professor (Soil Science) attended 21 days refresher course in Life Sciences, Department of Biotechnology, University of Jammu from 6-26 March, 2017.
- Dr. Vikas Sharma, Associate Professor (Soil Science) attended
  - ◆ ‘Statistics and informatics in Agricultural and Allied Sciences’ to be held locally at SKUAST-Jammu from 6-8, March 2017, Jammu
  - ◆ 1st Asian Conference on “Water and Land Management for Food and Livelihood Security WLMFLS-2017” to be organized at IGKV, Raipur (Chhattisgarh), India during 20-22 January, 2017.
- Dr. Vivak M. Arya Assistant Professor (Soil Science) attended
  - ◆ Statistics and informatics in Agricultural and Allied Sciences’ to be held locally at SKUAST-Jammu from 6-8, March 2017, Jammu
  - ◆ 1st Asian Conference on “Water and Land Management for Food and Livelihood Security WLMFLS-2017” to be organized at IGKV, Raipur (Chhattisgarh), India during 20-22, January 2017.
  - ◆ 21 days CAFT course on “Soil Air & Water Pollution & its Mitigation Strategies” in Soil Science, Dept. of Soil Science PAU Ludhiana, University of Jammu from 2-22 Nov, 2016.

# Externally Funded ADHOC Research Projects (As on 31.03.2017)

S.No.	Title of the Project	Name of the P.I.	Duration
<b>Funding Agency: Department of Biotechnology, GOI</b>			
1.	Development of single nucleotide polymorphisms (SNPs) for Brassica juncea	Dr. Ravinder Singh	2013-17
2.	Socioeconomic up-liftment of rural women through development of value added meat products	Dr. Sunil Kumar	2013-17
3.	Erucic acid profiling and introgression of low erucic acid trait in desirable cultivars of Brassica juncea L. (DBT)	Dr. Gyanendra Kumar Rai,	2014-17
4.	Isolation, identification and characterization of plant viruses affecting solanaceous crops in different agro climatic zones of Jammu region	Dr. Ranbir Singh,	2015-18
5.	Expression profiling of dof genes for accumulation of seed storage protein and nitrogen profiling in beans (Rajmash)	Dr. Moni Gupta	2015-18
6.	Exploration of respiratory meta-genome of small ruminants and establishment of referral diagnostic facility	Dr. Anil Taku	2015-18
7.	Development of semi-dwarf blast and bacterial blight resistant version of Ranbir Basmati by marker assisted backcross breeding	Dr. R.K. Salgotra	2015-18
8.	Genetic dissection of heat tolerance in wheat using multiple bi-parental RIL mapping populations	Dr. Bikram Singh	2015-18
9.	Economic empowerment of rural goat farmers through scientific intervention in block R.S. Pura of Jammu Division	Dr. J.S. Soodan	2015-18
10.	SSR based Germplasm characterization for resistance to powdery mildew in cucumber (Cucumis sativus L.)	Dr. Susheel Sharma	2015-18
11.	Exploitation of existing bio-diversity for sustainability and farm profitability under rainfed agriculture	Dr. Meenakshi Gupta	2015-18
12.	Community based mass production for bio-agents in J&K: Popularization of low cost technology for agri entrepreneurship through farm based bio-control units	Dr. R.K. Gupta	2015-18
13.	Upliftment of marginal basmati growers through System of Rice Intensification in Jammu region	Dr Anuradha Saha	2016-18
14.	Hydroponically grown fodder for sustainable livestock production and farm profit	Dr. R.K.Sharma	2017-19
<b>Funding Agency: Department of Science &amp; Technology, GOI</b>			
15.	Design and development of a tractor operated soil compaction measurement device	Dr. Hemant Dadhich	2013-17
16.	Development and Evaluation of Automatic Timer Based Variable Speed Device for Sprinkler System	Dr. Sushmita M. Dadhich	2013-17
17.	Entrepreneurship opportunities for socio-economic upliftment of rural farmers through QPM hybrid seed production techniques	Dr. Vikas Sharma	2013-17
18.	Molecular marker assisted selection of powdery mildew resistance genes into the elite cultivars of pea (Pisum sativum L.)- SERB	Dr. Susheel Sharma	2014-17
19.	Farmers' participatory collection, characterization and conservation of endangered genetic diversity of ginger (Zingiber officinale Rosc.) in Shivaliks	Dr. Susheel Sharma	2014-17



S.No.	Title of the Project	Name of the P.I.	Duration
20.	Molecular marker assisted introgression and validation of blast resistance genes in the rice cultivar K 343 recommendation for the hill zone of Jammu and Kashmir	Dr. Manmohan Sharma	2014-18
21.	Demonstration of techniques for improving productivity of rainfed areas in Jammu district	Dr. R.K. Srivastava	2015-18
22.	Genome wide analysis of small c-terminally encoded peptide (CEP) multigene family and elucidating its role in abiotic stress tolerance in rice ( <i>Oryza sativa</i> L.)	Dr. Sumita Kumari	2015-18
23.	Technological interventions to improve production of dairy and poultry in rainfed areas of Jammu district	Dr.Rajesh Katoch	2016-18
24.	Estimation and Evaluation of anti-microbial residues in foods of animal origin in Jammu region and their impact on human health	Dr.Mudasir Sultana	2016-18
25.	Revival of village ponds through scientific intervention	Dr.Vivek M.Arya	2016-18
26.	Diagnosis and interventional strategies for prevention and control of common parasitic zoonoses of livestock and their reares belonging to schedule caste and schedule tribe population for socio-economic upliftment	Dr. Modh. Rashid	2016-18
27.	Rural Women Technology Park in Deoli Village, Bishnah Block, Jammu District, J&K State (Technological interventions in clean meat, milk, fish production and socio economic empowerment of rural women through training's on value added livestock products)"	Dr Arvind Kumar	2016-18
28.	Assessment of impact of thermal stress on dairy animals of Jammu region and designing low-cost input managerial interventions for its amelioration	Dr. Dipanjali Kanwar	2017-18
29.	Synthesis of new gene pool following introgression of disease resistance and drought tolerance genes from secondary( <i>Phaseolus coccineus</i> L.) and tertiary ( <i>Phaseolus acutifolius</i> L.) gene pools into cultivated <i>Phaseolus vulgans</i> L.	Dr.Sanjeev kumar	2017-18
<b>Funding Agency: Rashtriya Krishi Vikas Yojna (RKVY)</b>			
30.	Establishment of testing centre for testing of farm implements and machinery	Dr. Susheel Sharma	2013-17
31.	Detection of Acaricide resistance in ticks	Dr. Rajesh Katoch	2014-17
32.	Nutritional enhancement of livestock through Urea Mollases Malnutrient Block and roughage block supplementation	Dr. Rajeev Singh	2014-17
33.	Production of quality planting material of commercially important vegetables of Jammu region	Dr. Sanjeev Kumar	2014-17
34.	Assessment of soil fertility and its spatial variability for nutrient management using GIS in various districts of Jammu Division	Dr. K.R. Sharma	2014-18
35.	Establishment of Nut Centre in intermediate agro-climate zone of Jammu Province to augment requirement of quality planting material	Dr. Rajesh Kumar	2014-17
36.	Standardization of commercial protocol for condensed tannis enriched multi nutrient blocks	Dr. A.K. Pathak	2014-17
37.	Development of organic production pacakage for field crops	Dr. Vikas Sharma	2016-18
38.	Demonstration of agro-techniques and mass production of planting material of kala zeera in Paddar Valley	Dr.Sushil Kr.Gupta	2016-18
39.	Entrepreneurship development in organic farming for sustainable livelihood security of small & marginal farmers	Dr. Narendra Panotra, OFRC	2016-18
40.	Composting technology for farm waste management and nutrient recycling	Dr.Pradeep Wali, ADR Seeds	2016-18



S.No.	Title of the Project	Name of the P.I.	Duration
<b>Funding Agency: Applications of Micro-organisms in Agriculture and allied Sectors (AMAAS)</b>			
41.	Exploration of Plant Growth Promoting Rhizo-bacteria antagonistic and plant pathogenic microbial resources from high altitude agro-climatic/cropping systems of Jammu and Kashmir State for sustainable agriculture...	Dr. Vishal Gupta	2014-17
42.	Degradation and effective utilization of agrowastes through technologies evolving mushroom or macro-fungi...	Dr. Sachin Gupta	2014-17
<b>Funding Agency: National Bank For Agriculture and Rural Development (NABARD)</b>			
43.	Production & demonstration of quality planting material of commercially important cut and loose flowers in Jammu region under FITF	Dr. R.K.Pandey	2014-17
44.	Commercial production of vegetable seedlings for livelihood security: An entrepreneurship venture	Dr. Manoj Kumar	2014-17
45.	Interventional strategies for prevention and control of common parasitic zoonoses of sheep, goats and nomadic women for socio-economic upliftment of nomads	Dr. Modh. Rashid	2015-17
46.	Promotion of vermi-composting and vermi-wash as a Venture for the up-liftment of socio-economic status of the rural youth district Jammu and Samba	Dr. Pardeep Kumar Rai,	2016-18
47.	Scientific intervention for validation and popularization of traps intensive insect pest management in vegetable growing areas of Jammu region	Dr. Devinder Sharma	2016-18
48.	Training and demonstration of Leaf Color Chart (LCC) based fertilizer N management to farmers under Climate Smart Agriculture Practices (CSAP)	Dr. Vivak M. Arya,	2016-18
49.	Production and demonstration of quality planting material of commercially important medicinal trees for livelihood security	Dr. Punit Choudhary	2016-18
50.	On-farm training and demonstration of biochar for carbon sequestration and climate change mitigation in kandi belt of Jammu	Dr. Peeyush Sharma	2016-18
51.	Setting of Spawn production	Dr. Amrish Vaid	2015-18
<b>Funding Agency: National Food Security Mission</b>			
52.	Quality seed production for higher productivity of pulses through farmer's participatory programme in Shiwalik foot hills of Jammu region (NFSM)	Dr. Brij Nandan	2015-17
53.	Creation of seed hubs for increasing indigenous production of pulses in India	Dr. B.S. Jamwal (Nodal Officer)	2017-19
<b>Funding Agency: Horticulture Mission for North East Himalayas (HMNEH) (MIDH)</b>			
54.	Establishment of root stock and bud wood bank at SKUAST-J and their large scale multiplication (HMNEH)	Dr. Arti Sharma	2014-17
55.	Domestication of naturally occurring and wild relatives of some fruits for specific horticultural trait (s) (HMNEH)	Dr. Amit Jasrotia	2014-17
56.	Dissemination of refined production technology of rare exotic vegetable crops in Jammu region (HMNEH)	Dr. R.K. Samnotra	2014-17
57.	High density orcharding of mango and guava in Jammu sub-tropics (HMNEH)	Dr. Akash Sharma	2014-17
58.	Technology refinement and dissemination of ginger and turmeric in Jammu region (HMNEH)	Dr. Sandeep Chopra	2014-17
59.	Development of Aonla based cropping system for Jammu sub-tropics (HMNEH)	Dr. Deep Ji Bhat	2014-17
60.	Refinement and improvement of soil quality and water productivity enhancement technology in rainfed orchard of Jammu region (HMNEH)	Dr. Vivek M Arya	2014-17
61.	Training and demonstration on rejuvenation of old/unproductive orchards in Jammu subtropical (HMNEH)	Dr. Prashant Bakshi	2014-17
62.	Disease/Forecasting Unit (MIDH)	Dr. V.K. Razdan	2014-17



S.No.	Title of the Project	Name of the P.I.	Duration
63.	Establishment of biological control laboratory in SKUAST-J (MIDH)	Dr. R.K. Gupta	2014-17
64.	National Bamboo Mission (MIDH)	Dr. Sushil K Gupta	2014-17
65.	Centre of Excellence for Horticulture (MIDH)	Director Research	2014-17
66.	Setting up of New Tissue Culture Unit (MIDH)	Dr. V.K. Wali,	2014-17
67.	Screening of elite Germplasm of Kagzi lime ( <i>Citrus aurantifolia</i> Swingle) and their mass multiplication in subtropical areas of Jammu (MIDH)	Dr. Rakesh Kumar	2014-17
<b>Funding Agency: National Mission for Sustainable Agriculture</b>			
68.	Establishment of micro irrigation systems under On farm water management component (NMSA)	Dr. Susheel Sharma	2014-17
69.	Soil sampling /analysis under Soil Health card (NMSA)	Dr. K.R. Sharma	2016-18
70.	Updation of District Agriculture Contingency Plan	Dr. Abhijeet Samanta	2017-19
<b>Funding Agency: UMEED....Govt. of J&amp;K</b>			
71.	Creation & capacity building of women self help group members from UMEED as paravets (Pashu Sakhi) of Jammu Division of J&K State....	Dr. M.S. Bhadwal	2015-17
<b>Funding Agency: Defence R &amp; D Establishment, Ministry of Defence</b>			
72.	Screening of suspected animal samples for the presence of <i>Coxiella burnetii</i> (DRDE)	Dr. S.K. Kotwal	2015-17
<b>Funding Agency: Directorate of Agriculture</b>			
73.	Centre of Excellence in Vegetables	Dr. R.K. Gupta	2017-19
74.	Climate Resilient Sustainable Agriculture Project-Bhalwal	Dr. Anil Sharma	2017-19
<b>Funding Agency: ICAR Extramural Projects</b>			
75.	Unraveling occurrences pattern, molecular details of etiology and cost effective preventive measures of bovine mastitis and its impact milk quality and dairy food safety	Dr. Neelesh Sharma	2016-19
<b>Funding Agency: ICAR funded projects under NAIP, Mega Seed Project, NICRA etc.</b>			
76.	Seed Production in Agricultural Crops	Dr. Pradeep Bali	2010 onwards
77.	National Initiative on Climate Resilient Agriculture (AICRPAM-NICRA)	Dr. Mahender Singh	2011 onwards
78.	National Initiative on Climate Resilient Agriculture, AICRPDA-NICRA-Component-II	Dr. A.P. Singh	2011 onwards
79.	National Initiative on Climate Resilient Agriculture (AICRP)	Dr. Amrish Vaid	2012 onwards
80.	Climate change on lac crop performance (NICRA)	Dr. R. K. Gupta	2012 onwards
81.	Veterinary Type Culture Collection (VTCC) Network Centre	Dr. Anil Taku	2012 onwards
82.	Soil erosion mitigation and carbon sequestration potential of climate resilient agriculture practices in foothill shivaliks of Jammu province	Dr. Vikas Sharma	2016 onwards
83.	Exploring economic opportunities for farmers of kandi villages through application of proven rainfed technologies	Dr. R.K. Arora	2017 onwards
<b>Funding Agency: IMD</b>			
84.	Forecasting Agricultural Output using Space, Agrometeorology and Land based observations (FASAL), Jammu	Dr. Mahender Singh	2011 onwards
<b>Funding Agency: National Horticulture Board</b>			
85.	Establishment of mother plant nurseries for high pedigree plant material for fruit crops	Dr. V. K. Wali	2012 onwards



S.No.	Title of the Project	Name of the P.I.	Duration
<b>Funding Agency: All India Coordinated Research Project Networking/AICRP (Voluntary Centers) (ICAR)</b>			
86.	Network Project on Outreach of Technologies for Temperate fruit crops	Dr. Mahital Jamwal	2009 onwards
87.	Networking project on Poonchi Sheep	Dr. R.K. Tagger	2014 onwards
88.	Conservation of Lac Insect Genetic Resources	Dr. R.K. Gupta	2014 onwards
89.	Outreach Programme on Zoonotic Disease	Dr. S.K. Kotwal	2015 onwards
90.	Integrated Agro Advisory Services (Jammu)	Dr. Mahender Singh	1995 onwards
91.	Agro Advisory Services (Rajouri) mid to high intermediate zone of J&K (Gramin Krishi Mausam Sewa)	Dr Vinod Gupta and Dr Rohit Sharma	2007 onwards
92.	Livelihood opportunities through agro-technological interventions of tribal communities of Budhal Block	Dr. Arvind Ishwar	2014 onwards
93.	Biotic Stress management in wheat triple Rust	Dr. Tuhina Dey	2013 onwards
<b>Funding Agency: All India Coordinated Research Project VOLUNTARY CENTRES (Long Term) (ICAR)</b>			
94.	All India Network Research Project on Onion and Garlic	Dr. Satesh Kumar	2010 onwards
95.	All India Co-ordinated Research Project on Vegetables	Dr R. K. Samnotra	2005 onwards
96.	All India Co-ordinated Project on Wheat and Barley, Rajouri	I/C RARS, Rajouri	1998 onwards
97.	All India Co-ordinated Rice Improvement Project, Rajouri	I/C RARS, Rajouri	2005 onwards
98.	All India Co-ordinated Research Project on Linseed	Dr. D.P. Abrol	2009 onwards
99.	Coordinating Centre under AICRP on Agroforestry	Dr. S.K. Gupta,	2015 onwards
100.	All India Co-ordinated Maize Improvement Project, Maize	I/C RARS, Rajouri	2005 onwards
101.	All India Co-ordinated Maize Improvement Project, Maize	Dr Praveen Singh	2012 onwards
102.	All India Co-ordinated Project on Wheat and Barley, Rajouri	Dr.Tuhina Dey	2009 onwards
103.	All India Coordinated Research Project on Nematodes	Dr.Rajan Salalia	2016 onwards
104.	All India Co-ordinated Research Project on Mushroom, Chatha	Dr. Sachin Gupta	2015 onwards

### All India Coordinated Research Projects (ICAR)

S.No.	Title of the project	Directorate/Division
1	All India Co-ordinated Rice Improvement Project, Chatha	Division of Plant Breeding&Genetics
2	All India Co-ordinated Project on Wheat and Barley, Chatha	Division of Plant Breeding&Genetics
3	All India Co-ordinated Research Project on Dryland Research	Directorate of Research (DLRSS,Dhiansar)
4	All India Co-ordinated Research Project on Integrated Farming System, Chatha	Division of Agronomy
5	All India Co-ordinated Research Project on Water Management, Chatha	Division of Soil Science&Agril.Chemistry
6	All India Co-ordinated Research Project on Chickpea	Directorate of Research (PRSS, Samba)
7	All India Co-ordinated Research Project on Agrometeorology, Chatha	Division of Agronomy
8	All India Co-ordinated Research Project on Rapeseed and Mustard, Chatha	Division of Plant Breeding& Genetics
9	All India Co-ordinated Research Project on Maize, Udhampur	Directorate of Research (MRC, Udhampur)
10	All India Co-ordinated Research Project on Weed Management	Division of Agronomy
11	All India Co-ordinated Research Project on Honeybee and Pollinators	Division of Entomology

## Research Publications in National/ International Journals

- Abrol D.P., Uma Shankar, K.S. Nitin, and G. Basana Gowda, 2016, Honeybees and Beekeeping: The Global Scenario. In: Arthropod Diversity and Conservation in the Tropics and Sub-tropics, A.K. Chakravarthy, S. Sridhara (eds.), Springer Science, 345-372.
- Ahmad, H., Mir, I. A., Sharma, D. Srivastava, K. Ganai, S. A. and Sharma, S., 2016, Seasonal incidence and management of wheat aphid *Sitobion avenae* (F). *Indian Journal of Entomology*, 78 (2): 148–152
- Ahmad, M A and Gupta, L.M. 2016. Genetic variability, correlation and path coefficient analysis of some yield-related traits in Aloe (*Aloe barbadensis* Mill.). *Indian Journal of Horticulture* 73(2): 251-55
- Ahmad, M A, Gupta, L.M. and Gupta, M. 2016. Effect of integrated nutrient management on growth and yield of *Aloe barbadensis* Mill. *The Indian Journal of Agricultural Sciences* 86(1): 91-95
- Ahmad, N., Singh, J., Babita., Malik, A., Chauhan, H., Kaur, H. and Gupta, P. 2016. Effect of osmo air drying method on nutritional quality of peach (*Prunus persica* batsch.) cultivars during storage. *Journal of Applied and Natural Science*, 8(3):1214-1218.
- Ahmed, J.A., Dutta, D., Nashiruddullah, N. 2016. Comparative efficacy of antioxidant retinol, melatonin and zinc during in vitro maturation of bovine oocytes under induced heat stress. *Turkish Journal of Veterinary and Animal Sciences*, 40: 365-373.
- Ahmed, J.A., Nashiruddullah, N. and Konwar, D. (2016). The surface electrocardiogram in unanesthetized adult domestic cats (*Felis catus*), *Journal of Animal Research*, 6(5): 809-812. DOI: 10.5958/2277-940X.2016.00102.9
- Ahmed, J.A., Nashiruddullah, N. and Pathak, A.K. (2016). The normal electrocardiogram of non-migratory Bakarwali goats. *Bhartiya Krishi Anusandhan Patrika*, 31(1): 69-73.
- Ahmed, J.A.; Dutta, D. and Nashiruddullah, N. (2016). Comparative efficacy of antioxidant retinol, melatonin and zinc during in vitro maturation of bovine oocytes under induced heat stress. *Turkish Journal of Veterinary and Animal Sciences*, 40: 365-373. DOI: 10.3906/vet-1507-15.
- Ahmed, N., Chauhan, H., Babita, A. and Bakshi, P. 2017. Review on development of Wine and Vermouth from the blends of different fruits. *Journal of Food Processing and Technology*. 8(1) 1-7. D.O.I. 10.4172/2157-7110.1000646.
- Ali Akbar, Mondal A. K. , Wali Pardeep , Rai A. P. , and Kumar V. 2016 Submergence effect of availability of micronutrients in basmati growing areas of Soils of Jammu. *Environment and ecology* 34: 1896-1899.
- Ali, L., Kher, S.K., Slathia, P.S., Bali, R.K., Kumar, M. and Bakshi, P. 2016. Knowledge Level of Silkworm Rearers of Jammu Division of Jammu and Kashmir State. *Indian Journal of Extension Education*. 52(1 & 2) 65-68.
- Ali, L., Kher, S.K., Slathia, P.S. and Kumar, P. 2016. Adoption status of recommended silk-worm rearing practices by rearers in Jammu division of Jammu and Kashmir. *Indian Journal of Ecology*, 43(Special Issue) 811-815.
- Amin, Rohullah, Dwivedi, Sudhakar & Sharma, Pawan Kumar. 2016. India and Afganistan: An Overview of their Economic Relations. *Agro Economist – An International Journal*. 21-27.
- Anil Kumar, Neetu Sharma, Jai Kumar and Amit Mahajan. 2016. Influence of multiple herbicidal interventions in wheat in Shiwalik foot hills of Jammu region. *Annals of Agricultural Research*, 37(3): 1-4.
- Arafat, I., Gupta, A.K., Bhadwal, M.S. and Soodan, J.S. 2016. Occurrence of ocular affections in farm



- and companion animals. *IntasPolivet*, 17(2), 411-413.
- Arafat, I., Gupta, A.K., Bhadwal, M.S. and Soodan, J.S. 2016. Occurrence of Ocular Affections in Farm and Companion Animals. *Indian Veterinary Journal*. 17 (II):336-338.
  - Baba N.A., Raina, R., Verma, P.K., Sultana, M. 2016. Free radicals induced nephrotoxicity following repeated oral exposure of chlorpyrifos alone and in conjunction with fluoride in rats. *Turkish Journal of Medicinal Sciences*. 46:512-517.
  - Badroo G A, Taku A, Mir I A, Bhat M A and Gazal S. 2017. Virulence Characterization of *Dichelobacter nodosus* from Clinical Cases of Ovine Footrot. *Israel Journal of Veterinary Medicine* 72 (1): 17 –21.
  - Bagati, S., Singh, A.K., Salgotra, R.K., Bhardwaj, R., Sharma, M., Rai, S.K. and Bhat, A.K. 2016. Genetic variability, heritability and correlation coefficients of yield and its component traits in basmati rice (*Oryza sativa* L.). *SABRAO Journal of Breeding and Genetics*, 48(4) 445-452.
  - Bakshi, M, Wali, V.K., Bakshi, P., Sharma, A., Sharma, D. and Shah, R.A. 2017. Integrated nutrient management induced changes, fruit yield and quality of Kinnow mandarin. *Indian Journal of Agricultural Sciences*. 87(3): 414-418
  - Bali, A., Bazaya, B.R, Chand, L. and Swami, S. (2016). Weed management in soybean (*Glycine max* L.). *The Bioscan* 11(1): 255-257.
  - Bali, A., Bazaya, B.R. and Puniya. R. (2016). Effect of weed management practices on growth, yield, yield attributes and quality of soybean (*Glycine max*. L), *Ecology Environment and Conservation* 22 (2): 281-284.
  - Bali, R.K., 2015. Estimates of gene interaction in four bivoltine hybrids of *Bombyx mori* L. *Global Journal of Biological Science & Biotechnology*, 4(1):12-16.
  - Batth, R., Singh, K., Kumari, S. and Mustafiz, A. 2017. Transcript profiling reveals the presence of abiotic stress and development stage specific ascorbate oxidase genes in plants. *Frontiers in Plant Sciences*. doi:10.3389/fpls.2017.00198.
  - Bhagat, M.; Sood, S.; Yadav, A.; Verma, P. Manzoor, N.; Chakraborty, D.; Katoch, R. and Sangha, N. (2016). Alterations in oxidative stress parameters and its associated correlation with clinical disease on experimental *Cryptosporidium parvum* infection in Swiss albino mice. *Journal of Parasitological Diseases*. Doi:10.1007/s126.39.016.0871.5
  - Bharat, R., Samanta, A., Bazaya, B. R., Sharma, V., Gupta, M., Kour S, Arya, V. and Rai, P. K. 2016. Management of moisture stress in indian mustard (*Brassica juncea* L.) under sub tropical rainfed Conditions of North India. *The Ecoscan*. 10(3&4): 443-447.
  - Bhardwaj, R.K. and Singh, R. 2016. Therapeutic management of ear sores in buffaloes. *IntasPolivet* 17(II): 314-315.
  - Bhardwaj A., Pandey A. K., Sharma U., Razaque W. A. A., Gupta S. K., Kumar S. and Kumar S. 2016. Effect of cysteine hydrochloride on post thaw viability and acrosomal integrity of jersey bull semen. *Veterinary Practitioner*, 17(2):227-228.
  - Bhargav, Sumit., Rai, Gyanendra Kumar., Mallick, S.A., Rai, S.K., Kumar, R.R., Singh, Monika., Parveen, A., Jamwal, D., Saikia, Subha Lakshmi. and Bagati, Sreshti. 2016. Assessment of Genetic Diversity in Local Genotypes of common bean (*Phaseolus Vulgaris* L.) using biochemical markers. *The Bioscan* 11(3): 1955-1961.
  - Bhat I. H., Devi, J., Kour K., Sarma K. 2016. Blood biochemical profile and cortisol level in Toggenberg goat during lactation. *Journal of Animal Research*. 6(5):873-878
  - Bhat, A. A., Kumar, A. and Kaur, M. 2016. Effect of clove oil on oxidative stability and microbial quality of almond and walnut enriched chevon nuggets. *Journal of Pure and Applied Microbiology*, 10(2): 1341-1349.
  - Bhat, A. A., Kumar, A. and Dua, S. 2016. Storage quality and oxidative stability attributes of almond (*Prunus dulcis*) fortified chevon nuggets. *Journal of Animal Research*, 6 (4): 367-370.
  - Bhat, Anil, Kachroo, Jyoti and Sharma, Rakesh (2016) Financial Profitability, Marketing Analysis and Technical Efficiency of Cabbage Cultivation in Jammu Region of J&K State, India. *Indian Journal of Ecology* 43 (Special issue-1):563-568.
  - Bhav Kumar Sinha, Mudasir Iqbal and Reena. 2016.



- Drought stress affecting physio-biochemical characters and yield attributes in wheat (*Triticum aestivum* L.). *Annals of Agricultural Research*. New Series. 37 (4): 363 – 368.
- Brahma B, Patra MC, Mishra P, De BC, Kumar S, Maharana J, Vats A, Ahlawat S, Datta TK, De S. 2016. Computational studies on receptor-ligand interactions between novel buffalo (*Bubalus bubalis*) nucleotide-binding oligomerization domain-containing protein 2 (NOD2) variants and muramyl dipeptide (MDP). *Journal of Molecular Graphics & Modeling*. 65:15-26. doi: 10.1016/j.jmgm.2016.02.004.
  - Charak AS, Jha GN, Sharma A. and Bandral RS. 2016. Response of organic chemical and biofertilizers on productivity of garden pea (*Pisum sativum*). *Bioinfolet* 13(3): 459.
  - Chaudhary, S., Rastogi, A., Sharma, R.K., Raghuwanshi, P. and Khan, N. 2017. Formulation of kinnow mandarin (*Citrus Nobilis* Lour x *Citrus Deliciosa* Tenora) waste and paddy straw based complete feed blocks and its utilization by goats. *Indian Journal of Animal Research*, 51(1): 105-110.
  - Chauhan, H, Kaul, R.K., Ahmed, N., Gupta, P, Malik, Anisa Anjum., 2016 Development and evaluation of bael (*Aegle marmelos*) Fruit Wine. *Environment & Ecology* 34(4D):2611-2616,
  - Chhibber, S., Hussain, K., Shah, M. A., Muheet and Singh, R. 2017. Clinico-Haematological and Biochemical Studies in Dogs with Renal Failure. *International Journal of Livestock Research*. 7 (3): 2277-1964.
  - Chopra S; Samnotra R.K; Kumar M and Kumar S 2016. Integrated nutrient management practices influencing the productivity Potato under subtropical plains of Jammu, India. *Indian Journal of Ecology* 43(1):428-431.
  - Choudhary, P., Singh, N.B., Sharma, J.P., Verma, A. 2016. Estimation of Genetic Parameters Among Intra and Interspecific Progenies of Tree Willows, *Indian Forester*, 142(12): 1157-1163.
  - Chowdhary D; Kumar S and Samnotra RK 2016. Effect of seedling age and plant hormones on growth and bulb yield in onion (*Allium cepa* L.). *Indian Journal of Agricultural Sciences*. 85 (7): 906–909.
  - Dadhich, S.M., Srivastava, R.K., Dadhich, H., Kumar, R. and Sharma, P.K. 2016. Application of Irrigation Management Model under Deficit Irrigation. *Indian Journal of Ecology*, 43 (Special Issue-2): 650-654.
  - Dalal, V.; Bhardwaj, K.K.; Khajuria, S.; Singh, M.K. and S. Pradyuman. 2016. Effect of agri-silvi-horticultural system on growth and yield of Wheat. *Indian Journal of Agroforestry*. 18(1): 34-38.
  - Dar, K. H. and Gupta, A. K. 2016. Total intravenous anaesthesia in adult mules. *Veterinary Anaesthesia and Analgesia*, 43 (2): 204-208.
  - Dar, M.A., R. Raina, Mir AH, Verma PK, Pankaj NK, Sultana M. 2016 Protective role of L-ascorbic acid in oxidative stress induced by repeated oral administration of bifenthrin in wistar rats. *Journal of Animal Research* 6(1): 921-926.
  - Dar, Y., Sarma, K., Suri, S., Devi, J. 2017. Prenatal development of the lingual epithelium in goat (*Capra hircus*). *Journal of Applied and natural Science*. 9 (1): 421-426.
  - Deepika, U. K., Varshney, M. P. and Chand, G. 2016. Effect of planting time on physiological parameters of German chamomile (*Matricaria chamomilla* Linn.). *Indian Ecological Journal*, 43: 126-127.
  - Devi, A., Sharma, N., Wali, V. K., Bakshi, P., Jamwal, M. and Kumar, R. 2016. Effects of pre-harvest bio-regulator application on shelf-life and disease incidence during storage of kinnow mandarin. *Bangladesh Journal of Botany*. 45(5): 1091-1099.
  - Dolkar, D, Bakshi, P., Gupta, M., Wali, V.K., Kumar, R, Hazarika, T.K. and Kher, D. 2017. Biochemical changes in guava fruits during different stages of ripening. *Indian Journal of Agricultural Sciences*. 87(2) 257-260.
  - Dolkar, D., Bakshi, P., Wali, V.K., Sharma, V. and Shah, R.A. 2017. Fruits as Nutraceuticals. *Ecology, Environment and Conservation*. 23(Suppl) 113-118.
  - Dorjey, S., Gupta, V. and Razdan, V.K. 2017. Evaluation of *Pseudomonas fluorescens* isolates for the management of *Fusarium oxysporum* f.sp. *lycopersici* and *Rhizoctonia solani* causing wilt complex in tomato. *Indian Phytopathology*. 70 (1): 127-130.



- Dorjey, S., Gupta, V. Razdan, V.K. and Sharma R. 2016. Evaluation of *Pseudomonas fluorescens* Isolates for their bio-control potential against soil borne disease of tomato. *Journal of Pure and Applied Microbiology*. 10 (4): 3079-3085.
- Manhas J. S., Ahmed N. and Slathia, P.S. 2016 "Entrepreneurial Behaviour of Dairy Farmers of Jammu Region". *Indian Journal of Extension Education*, 52 (182):83-86.
- Dutta, S.; Rahman, S.; Azmi, S.; Prawez, S.; Kpou, N. and Wani, H. 2016. Patho-morphological changes in kidneys of slaughtered sheep and goats in Jammu region. *Journal of Animal Research* 6(4): 705-709. DOI:10.5958/2277-940X.2016.00086.3
- Dwivedi, D. K., Bhadwal, M. S., Gupta, A. K., Kushwaha R. B., Sharma, A., Gupta, P., Kumar, A. and Upamanyu, G. 2016. Surgical management of congenital anomalies in ruminants. *Ruminant Science*, 5(1): 113-16.
- Dwivedi, Sudhakar, Dolma, Morup & Sharma, Pawan Kumar. 2016. Economics of Small Broiler Units in Jammu District of Jammu & Kashmir State. *Journal of Animal Research*. 6(1)L 157-165.
- Dwivedi, Sudhakar, Dolma, Morup & Sharma, Pawan Kumar. 2016. Improving Marketing Efficiency of Broiler for Small Production Units in Jammu and Kashmir State of India. *Indian Journal of Ecology*. 43(Special Issue-1): 400-403.
- Dwivedi, Sudhakar, Kour, Navneet, Sharma, Pawan Kumar & Hamid, Naveed. 2016. Exploring Business Opportunities for Reitzel Products in Jammu & Kashmir. *Agro. Economist : An International Journal*. 3, 2: 63-68.
- Dwivedi, Sudhakar, Sunder, Shyam & Sharma, Pawan Kumar. 2016. Impact of Kissan Credit Card (KCC) Scheme on Input Use: An economic Analysis of Basmati Rice Cultivation. *Journal of Hill Agriculture*. 7(1): 121-124.
- Ganai, A.W.; Kotwal S K, WaniNajimaana, Malik M A, JeelaniRizwan, KourSumeet, Zargar Rizwana 2016 Detection of *mecA* gene of methicilin resistant *Staphylococcus aureus* by PCR assay from raw milk *Indian Journal of Animal Sciences* 86 (5): 508-511.
- Ganaie, S. A. and Kaul, V, 2016. Growth inhibiting effects of some essential oils against *Callosobruchus chinensis* L. *Indian Journal of Ecology* 43(1) : 526-529.
- Ganie, L.A., Kumar, A. Bhardwaj, D. and Kumar, S. 2016. Efficacy of incorporation of combinations of rice (*Oryzasativa* L.) flour and Kidney bean (*Phaseolus vulgaris* L.) flours investigation on quality characteristics of low sodium fish balls. *Fleishwirtschaft International*, 3: 74-77.
- Ganie, L.A., Kumar, A., Bhat, A. A. and Bhardwaj, D. 2016. Storage quality of fish ball prepared in various combinations of flours with and without addition of nisin at refrigeration temperature. *Journal of Food, Agriculture and Environment*, 14(2):44-48.
- Ghosh M., Cho H.W., Park J.W., Choi J.Y., Chung Y.H., Sharma Neelesh, Singh A.K., Kim N.E., Mongre R.K., Huynh D., Zhang J.J., Do K.T., Lee H.K., Song K.D., Cho B.W. and Jeong D.K. 2016. Comparative transcriptomic analyses by RNA-seq to elucidate differentially expressed genes in the muscle of Korean thoroughbred horses. *Applied Biochemistry and Biotechnology*, 180(3): 588-608.
- Ghosh M., Sodhi S.S., Sharma Neelesh, Mongre, R.K., Kim N.E., Singh A.K., Lee S.J., Kim D.C., Kim S.W., Lee H.Y., Song K.D. and Jeong D.K. (2016). An integrated in silico approach for functional and structural impact of non-synonymous SNPs in the MYH1 gene in Jeju Native Pigs. *BMC Genetics*. 17: 35-50.
- Gogna, N. Kumar, A. Kaur, M. and S. Kumar 2016. Efficacy of Tertiary Butyl Hydroquinone in enhancing shelf-life of chevon pickle. *The Indian Journal of Small Ruminants*, 22(2): 213-217.
- Goutam Avinash Kumar, Shrivastav Atul Kumar and Sinha Abhay Kumar. 2016. Effect of different sowing system on growth and yield of soyabean crop in vertisol. *Environment and ecology* 34(4C):2379-2385.
- Gupta A. K., Kushwaha R. B., Bhadwal M. S., Sharma A., Dwivedi D. K. and Arafat I. 2016. Management of cherry eye using different surgical techniques- A study of 10 dogs. *IntasPolivet*, 17(2): 411-413.
- Gupta, A. K., Bhadwal, M. S. and Singh, R. 2016. Laparoscopic versus ultrasound guided hepatic biopsy in dogs using automated biopsy gun. *Indian Veterinary Journal*, 93(07): 74-77.



- Gupta, A. K., Bhadwal, M. S. and Sood, N. K. 2016. Laparoscopic versus ultrasound guided renal biopsy in dogs using automated biopsy gun. *Indian Journal of Veterinary Surgery*, 37(1): 23-25.
- Gupta, A. K., Gupta, P., Kushwaha R. B., Dwivedi, D. K., and Sharma, A. 2016. Gastro-Intestinal Obstruction by Linear Foreign Bodies in Dogs. *Indian Veterinary Journal*, 93(06): 52-54.
- Gupta, A. K., Kushwaha, R. B., Sharma, A, Bhadwal, M. S., Dwivedi, D. K. and Gupta, P. 2016. Perineal hernia and its surgical management in five dogs. *Indian Journal of Canine Practice*, 8(1): 38-40.
- Gupta, L.M., Sandeep Kumar, Gupta, Meenakshi, Sood, K. K. and Gupta, S. K. 2016. Variability in different sources of Glory Lily (*Gloriosa superba* L.) under subtropical plains of Jammu. *Indian Journal of Ecology* 43 (special issue-1): 379-381
- Gupta, M., Mahajan, S., Sharma, D., Gupta, S. and Mallick, S. A. 2016. Agrowastes as substrates for hydrolytic enzymes and biomass production of native isolates of *Trichoderma* spp. *Indian Phytopath.*, 69 (4s) : 558-564
- Gupta, Meenakshi., Kour, Sarabdeep., Sharma, Charu and Kachroo, Dileep. 2016. Effect of sowing environments and genotypes on growth and yield of linseed (*Linum usitatissimum*). *Indian Journal of Agronomy*. 61(2):237-241.
- Gupta, N. and Singh, V. B. 2016. Pre-harvest foliar application of calcium chloride, bavistin and bayleton on post-harvest life of aonla (*Emblica officinalis gaertn.*) fruit. *Bangladesh Journal of Botany*, 45 (1): 211-219.
- Gupta, N., Wali, V. K., Singh, V.B., Singh, M. and Kumar, V. 2016. Effect of seasonal variations and weather parameters on yield, quality and disease incidence in guava cultivars under rainfed conditions of Jammu region. *The Bioscan*, 11(1):627-633
- Gupta, P, Gupta, V., Ishar, A., Sharma, V. and Panotra, N. 2016. SWOT Analysis of Small Ruminants Rearing of Bakarwal Tribe in District Rajouri of Jammu and Kashmir. *Journal of Animal Research*:6:1-4.
- Gupta, P., Bhat, D.J., Wali, V.K., Bakshi, P., Bhat, A. and Jasrotia, A. 2016. Cost and return analysis of different treatments of mulching and herbicide application on peach (*Prunus persica* L.) Batcsh cv. Shan-e-Punjab. *Economic Affairs*, 61(3): 481-486.
- Gupta, Parul; Gupta, Vinod; Ishar, Arvind; Sharma, Vishal and Panotra, Narinder. 2016. SWOT Analysis of Small Ruminants Rearing of Bakarwal Tribe in District Rajouri of Jammu and Kashmir. *J. of Animal Research*: 6 (6) : 1057-1060.
- Gupta, R. K., Gani, M., Kaul., V. and samnotra, R. K., 2016. Field evaluation of *Lymantria obfuscata* multiple nucleopolyhedrovirus for the management of Indian gypsy moth in Jammu & Kashmir, India, *Crop Protection*, 80 : 149-158
- Gupta, R. K.; Bali, K. and M. Gani. 2016. Plant-herbivore asynchrony necessitates augmentative releases of the exotic beetle, *Zygogramma bicolorata*, to enhance the biological control of *Parthenium hysterophorus*. *Weed Biology and Management*, 14:1-13.
- Gupta, R. K.; Mudasir Gani; Kaul, V.; Bhagat, R. M.; Bali, K.; Samnotra, R. K. 2016. Field evaluation of *Lymantria obfuscata* multiple nucleopolyhedrovirus for the management of Indian gypsy moth in Jammu & Kashmir, India. *Crop Protection* 80:149-158.
- Gupta, S., Mahajan, S., Gupta, M., and Sharma, D. 2016. Screening of native isolates of *Trichoderma* spp. of Jammu for their biocontrol potential through hydrolytic enzyme activities. *Indian Phytopathology*, 69: 173-180.
- Gupta, V., Khajuria, A., Razdan, V.K., Sharma, Kher, D. and Kumar, A. 2017. Effect of epidemiological factors on the severity of stripe rust of wheat caused by *Puccinia striiformis*. *Journal of Agrometeorology*. 19 (1): 62-66.
- Gupta, Vinod, Rai, P.K., Bandral, Rakesh, Dwivedi, Sudhakar, Khar, Sanjay, Abrol, Poonam & Risam, K.S.. 2016. Diversification and Innovation in Farming System Changes the Livelihood of the Farmers of District Samba of Jammu Region (J&K) – A Success Story. *Agro Economist – An International Journal*. 3(1): 17-20.
- Hamid S, Bhat M A, Mir I A, Taku A, Badroo G A, Nazki S, Malik A 2017. Phenotypic and genotypic characterization of methicillin-resistant *Staphylococcus aureus* from bovine mastitis, *Veterinary World*, 10(3):363-367.
- Haq, Z., Khan, N., Rastogi, A., Sharma, R.K.,



- Amrutkar, S., Gupta, M., Manzoor, N. and Mudasir, M. 2016. Nutrition and Metabolic Diseases in Dairy Cattle- A Review. *International Journal of Agriculture Sciences*, 8(12): 1154-1159.
- Himalini, Gupta, S. K., Bhardwaj, R.K., Singh, R., Soodan, J S., Gupta, A. K. 2016. Radiographic and electrocardiographic changes in dogs with dilated cardiomyopathy. *Indian Journal of Canine Practice* 8(2): 112-114.
  - Huynh D.L., Sharma Neelesh, Singh A.K., Sodhi S.S., Zhang J.J., Mongre R.K., Ghosh M., Kim N.E., Park Y.H., and Jeong D.K. 2017. Anti-tumor activity of wogonin, an extract from *Scutellaria baicalensis*, through regulating different signaling pathways. *Chinese Journal of Natural Medicines*, 15(1): 15-40.
  - Iqbal, M., Bakshi, P., Wali, V.K., Kumar, R, Bhat, D.J. and Jasrotia, A. 2016. Efficacy of organic and inorganic mulching materials on weed count, growth, flowering and yield of aonla (*Emblica officinalis* Gaertn) cv. NA-7 under rainfed conditions of shivalik foothills of Himalayas. *Indian Journal of Agricultural Sciences*. 86(4) 545-549.
  - Isher, Ashish Kumar, Dwivedi, Sudhakar, & Jeelani, Shaiq. 2016. Socio-Economic Features of Intermediaries and Transaction Pattern of Agricultural Commodities in Narwal Mandi, Jammu . *Agro. Economist : An International Journal*. 3, 2: 91-96.
  - Isher, Ashish Kumar, Kachroo, Jyoti, Singh, S. P. and Bhat, Anil. 2016. Export Scenario of Dry Fruits in Jammu & Kashmir. *Indian Journal of Plant & Soil*. 03(1): 23-26.
  - Jain, M., Batth, R., Kumari, S. and Mustafiz, A. 2016. *Arabidopsis thaliana* contains both Ni<sup>2+</sup> and Zn<sup>2+</sup> dependent Glyoxalase I enzymes and ectopic expression of the latter contributes more towards abiotic stress tolerance in *E. coli*. *PLoS ONE* 11(7): e0159348. doi:10.1371/journal.pone.0159348.
  - Javed R, Taku AK, Sharma RK, Badroo G A 2017 Molecular characterization of *Rhodococcus equi* isolates in equines, *Veterinary World*, 10(1): 6-10.
  - Jeelani, M.I., Rizvi, S.E.H., Sharma, Manish, Mir, S.A., Raja, T.A., Maqbool, S.M., Khan, I., Nazir, N and Jeelani, F. 2016. Improved Ratio Estimation under Rank set Sampling. *International Journal of Modern Mathematical Sciences*. 14(2), 204-211.
  - Jeelani, M.I., Rizvi, S.E.H., Sharma, Manish, Nazir, N and Jeelani, F. 2017. A new approach of ratio estimation in sample surveys. *International Research Journal of Agricultural Economics and Statistics*, 8(1), 100-103
  - Jha, GN and Charak AS. 2016. Integrated fish farming technology for Doda district of Jammu & Kashmir. *Bioinfolet* 13(3): 458.
  - Kachroo, Dileep., Kachroo, Joti., Bhat, Anil., Thakur N. P., Gupta A. K., Khajuria Vijay and Iqbal Mudasir (2016). Characterization of farming system of Jammu region of Jammu and Kashmir State and its policy implication. *African Journal of Agricultural Research*. 11(9): 783-791.
  - Kachroo, Dileep., Thakur, N. P., Kour, Manpreet., Sharma, Rohit., Kumar, Parshotam., Gupta, A. K., and Khajuria Vijay. 2017. Conservation tillage and planting practices in rice (*Oryza sativa*) – wheat (*Triticum aestivum*) cropping system for sustainable agriculture. *Indian Journal of Agronomy*. 62(1): 5-13.
  - Kachroo, Jyoti, Gangal, Diraj and Bhat, Anil 2016 Cost and Return Analysis of Sheep Rearing in Rajouri district of Jammu and Kashmir State. *Indian Journal of Ecology* 43 (Special issue-1): 382-391.
  - Kalsotra, K., Sharma U., Kumar S. and kumar S., 2016. Study of the incidence and factors affecting postpartum anestrus in murrah buffaloes around Jammu region *Buffalo Bulletin*. 35(4):731-735
  - Kalsotra, K., Sharma U., Kumar S., kumar S., and Hussain K. 2016. Studies on changes in haemato-biochemical and enzymatic profile in postpartum Murrah buffaloes with hormonal protocols. *Buffalo Bulletin*. 35(4):723-729.
  - Kour Ranjeet, B.C. Sharma, Anil Kumar, Paramjeet Kour and Brij Nandan. 2016. Study of physiological growth indices of chickpea in chickpea (*Cicer arietinum*) + mustard (*Brassica juncea*) intercropping system under different weed management practices. *Legume Research*, Print ISSN:0250-5371 / Online ISSN:0976-0571
  - Kaur, M., Kumar, A., Bhardwaj, D. and Bhat, A.A. 2016. Storage quality of fish ball prepared in various combinations of flours with and without addition of nisin at refrigeration temperature.



- Journal of Food, Agriculture and Environment, 14(2):49-53.
- Kesh, H; Yadav, A. S; Sarial, A. K; Khajuria, S and Jain, B. T. 2017. Variability for nitrogen and phosphorus content in Pigeon Pea (*Cajanuscajan L.*) in response to rhizobium and Piriformosporaindica. Research journal of Agricultural sciences 8(1): 203-206.
  - Kesh, H; Yadav, A. S; Sarial, A. K; Khajuria, S and Jain, B. T. 2017. Genotypic variability and character association among yield and yield contributing traits in Pigeon Pea (*Cajanuscajan L.*) Research journal of Agricultural sciences 8(1): 194-198.
  - Khajuria RK; Sharma JP; Samnotra RK; Kumar S and Kaki Ranjit 2016. Variability studies in okra (*A. esculentus L. Moench*). Green farming, 7 (2): 266-271
  - Khajuria, A., Gupta, V., Razdan, V.K., Sharma, B.C., Kher, D. and Kumar, A. 2016. Epidemiological studies of stripe rust of wheat caused by *Puccinia striiformis*. Indian Phytopathology. 69 (4s): 244-247.
  - Khajuria, P., Pratiksha, P., Rastogi, A., Koul, A.L., Zargar, R., Kour, S. and Mudasir, M. 2016. Ameliorating Effect of Seabuckthorn Leaf Extract Supplementation on Streptozotocin Induced Diabetes Mellitus in Wistar Rats. Journal of Animal Research, 6(5): 787-794.
  - Khar, S. 2016 Quality of Bajra harvested by Impact Type Forage Harvester. Indian Journal of Ecology. 43 :60-162.
  - Kour R., Dr. Sharma M., Bhushan B. and Bandral RS. 2016. Study on storage behaviour of Pear. Advances in life sciences. 5 (2) 702-703.
  - Kour, D., Sharma, A., Wali, V. K., Bakshi, P. and Bandhari, A. 2016 Effect of Regulated Irrigation at Delayed Intervals and Calcium Sprays on Yield and Quality of Litchi (*Litchi chinensis Sonn.*) cv. Dehradun. Indian Journal of Ecology. 43 (Special Issue-2): 719-723
  - Kour, G, Wali, V.K and Bakshi, P. 2016. Growth and quality of low chilling peach cultivars under different irrigation rainfed conditions. Indian Journal of Horticulture. 73(4) 502-505.
  - Kour, J., Ahmed, J.A., Nashiruddullah, N. 2016. Electrocardiographic interpretation of the nasopharyngeal response in conscious rabbits, Indian Journal of Animal Research, 50(6): 900-904.
  - Kour, J.; Ahmed, J.A. and Nashiruddullah, N. 2016. Electrocardiographic interpretation of the nasopharyngeal response in conscious rabbits. Indian Journal of Animal Research, 50(6): 900-904. DOI 10.18805/ijar.v0i0f.3793
  - Kour, M, Thakur, N.P., Kumar, P and Charak, A.S 2016. Productivity, profitability and competitive indices of maize (*Zea mays*) + Rajmash (*Phaseolus vulgaris*) intercropping system under different nutrient management techniques for sub – alpine conditions of Jammu. Legume Research – An International Journal 39(6): 970-975.
  - Kour, N.; Rahman, S.; Azmi, S.; Wani, H. and Sharma, M. 2017: Haemato-biochemical observations in experimentally induced Cadmium chloride toxicity in Wistar rats. Indian Veterinary Journal 94(02): 13-16.
  - Kour, R., Rastogi, A., Sharma, R.K. and Singh, M. 2016. Evaluation of Kinnow Mandarin fruit waste in rations of goats. Indian Journal of Animal Nutrition, 33(4): 416-420.
  - Kour, S., Kumar, R., Wali, V.K., Sharma, A and Sharma. N. and Bhat, D.J. 2016. Post-harvest chemical manipulation in strawberry regeneration under Jammu sub-tropics Indian Journal of Horticulture, 73(4):592-96
  - Kour, S., Masud, S and Khan, A. 2016. Effect of organic manure and inorganic fertilizer on the growth and proximate composition of common carp, *Cyprinus carpio*. Journal of Environmental Biology. 37 (1): 149-53
  - Kour Ravneet , Sharma Munish, Bandral R.S. and Sharma Amitesh, 2016. Utilization of organic and inorganic nutrient sources for sustainable vegetable production. Eco. Env. & Cons. 22(2) pp: 271-74
  - Kour Ravneet, Charak, AS, Bandral RS, Sharma Munish and Sharma Amitesh. 2016. Scaling up of pulse production under front line demonstration technology transfer programme in district Doda of J&K state. Advances in life sciences. 5 (2) 700-701.
  - Kour Ravneet, Samnotra R.K, Sharma Munish, Bandral R.S, Sharma A., Sarkar K. and Sparston S. (2016). Male sterility in vegetable hybrid



- seed production *Eco.Env. and Cons.* 22(2) : pp : 265-269.
- Kumar Anil, Kumar Jai, Puniya R., Mahajan Amit, Sharma Neetu and Stanzen Lobzang (2015). Weed management in maize-based cropping system. *Indian Journal of Weed Science* 47(3): 254–266.
  - Kumar Anil, Sharma Neetu, Sharma Ashu, Mahajan Amit and Stanzen Lobzang 2016. Bio-efficacy of halosulfuron methyl against *Cyperus* spp. in maize (*Zea mays* L.). *Ann. Agric. Res. New Series* 37 (2):189-193.
  - Kumar S; Kumar M; Chopra S; Samnotra RK and Fathima S 2016. Studies of organic nutritional management on growth, yield and economics of cabbage under subtropical conditions of Jammu. *Progressive Horticulture* 48(1): 95-100.
  - Kumar Vijay, Kumar Manoj and Rai A. P. 2016 .Mulching in fruit and vegetable crop production under rainfed conditions: A review *Journal of Soil & Water Conservation* 15(4) 313-317.
  - Kumar, A., Shankar, U. and Razaq, A, 2016. Seasonal incidence of major insect pests and their natural enemies of cucumber (*Cucumis sativus* L.) in Jammu region, *Progressive Research – An International Journal*11(8): 5296–5301.
  - Kumar, A., Solanki, I.S., Akhtar, J. and Gupta, V. 2016. Efficacy of *Pseudomonas fluorescens* and combination fungicide as seed treatment and foliar spray for management of brown spot of paddy. *Journal of Pure and Applied Microbiology*, 10(1): 643-647.
  - Kumar, A., Solanki, I.S., Akhtar, J. and Gupta, V. 2016. Morpho-molecular diversity of *Bipolaris oryzae* causing brown spot of paddy. *Indian Journal of Agricultural Sciences*, 86(5): 615-20.
  - Kumar, P., Khar, S., Sharma, R., Choudhary, P. 2016. Impact evaluation of frontline demonstrations on fish farming in sub tropical regions of Jammu and Kashmir. *Indian Journal of Ecology*: 58-64.
  - Kumar, Prem, Khar, Sanjay, Dwivedi, Sudhakar, Kumar, Sharma Shiv & Himabindu. 2016. An overview of Fisheries and Aquaculture in India. *Agro Economist – An International Journal.* 3(1): 1-6.
  - Kumar, R., Kumar, M., Farooq, Z. and Dadhich, S.M. 2017. Evaluation of models and approaches for effective rainfall in irrigated agriculture – An overview. *Journal of Soil and Water Conservation* 16(1):
  - Kumar, R., Slathia, P. S., Peshin, R., Gupta, S.K. and Nain, M.S. 2016. A test to measure the knowledge of farmers about rapeseed mustard cultivation. *Indian Journal of Extension Education*, 52 (3&4)157-159.
  - Kumar, S; Batra, V. K; Khajuria, S. and Kumar, R. 2016. Poly tunnel technique in Bottle Guard: a cost effective and affordable method for early season production. *Journal of community mobilization and sustainable development* 11(2): 193-196.
  - Kumar, S; Malik, T. P and Khajuria, S. 2017. Plant growth traits based characterisation of coriander (*Coriandrum sativum* L.) genotypes. *Research Journal of Agricultural sciences*, 8(1): 188-193.
  - Kumar, V., Sharma, V., Bhat, A.K., Gupta, N., and Singh, V.B. 2016, Effect of various mulches on soil properties and fruit quality attributes of Eureka Lemon (*Citrus limon* Brum) in kandi area. *Indian Journal of Ecology*, 43:238-241
  - Kumar, Vikas, Dwivedi, Sudhakar, Narain, Sarju & K., Rawat Sudhir. 2016. Assessment of Marketable and Marketed Surplus of Rice in Relation to Farm Size. *Agro Economist – An International Journal.* 3(1): 13-16.
  - Kumari, S., Bhat, D.J., Wali, V.K., Bakshi, P. and Kumar, R. 2016. Studies on vegetative growth and floral biology of ber (*Zizyphus mauritiana* Lamk.) germplasm under rainfed conditions of Jammu. *Ecology, Environment and Conservation.* 22(2) 641-646.
  - Lal, B, Shahid, A. and Vikas, T. 2016. Impact of vocational training programmes on income of the rural youths. *Journal of Communication studies*, 69-72.
  - Lal, B., Tandon, V. and Shahid, A. 2016. Constraints identified in rearing of the livestock in hilly areas. *Research in Environment and life science*, 561-562.
  - Lal, S.V., Mukherjee A, Brahma B, Gohain M, Patra MC, Saini SK, Mishra P, Ahlawat S, Upadhyaya RC, Datta TK, De S. 2016. Comparison of copy number of HSF genes in two buffalo genomes. *Animal Biotechnology.* 27(3):141-47.



- Lalotra P., Gupta D., Yangdol, R., Sharma, Y. P. and Gupta, S.K. 2016. Bioaccumulation of heavy metals in the sporocarps of some wild mushrooms. *Current Research in Environmental & Applied Mycology*. 6(3): 149-150.
- Mahajan, D., Bhat, Z. F. and Kumar, S. 2016. Pine needles (*Cedrus deodara* (Roxb.) Loud.) extract as a novel preservative in cheese. *Food Packaging and Shelf Life*, 7: 20-25.
- Mahapatra, P.S., Singh, R., Kumar, K., Sahoo, N.R., Agarwal, P., Mili, B., Das, K., Sarkar, M., Bhanja, S.K., Das, B. C., Dhara, S.K., Bag, S. 2017. Valproic acid assisted reprogramming of fibroblasts for generation of pluripotent stem cells in buffalo (*Bubalus bubalis*). *International Journal of Developmental Biology* 61:81-88.
- Mallick, S.A., Kumari, P., Gupta, M., Gupta, S. and Jeelani, M.I. 2017. Augmentation of Biochemical Defense against *Alternaria* Blight of Mustard by induction of drought stress. *Journal of Plant Pathology*, 99(1), 47-60
- Manzar Masood, Slathia, P. S.; Gupta, S. K.; Peshin, R. and Kumar Rakesh. 2016. *Pinus gerardiana*: A boon for livelihood security in Jammu and Kashmir. *Indian J Agroforestry* 18 (2): 91-94.
- Meenakshi Gupta, Sarabdeep Kour, Charu Sharma and D. Kachroo. 2016. Performance of linseed (*Linum usitatissimum*) varieties as influenced by various sowing environments. *Indian Journal of Agronomy*. 61(2):237-241.
- Nazir, T., Katoch, R., Yadav, A., Godara, R. 2016. Comparative efficacy of pour-on eprinomectin and ivermectin against *Sarcoptes scabiei* in buffaloes. *J. Parasit. Dis.*, 40(2): 359-361.
- Pande, N., Agrawal, R., Shrivastava, O.P. and Swamy, M. 2016. Alterations in haemato-metabolic status and body condition score of buffaloes during the transition period. *Journal of Livestock Science* (ISSN online 2277-6214) 7: 122-125.
- Pande, N., Shrivastava, O.P. and Agrawal, R. 2016. Parturient blood metabolite status influences the occurrence of postparturient reproductive disorders in buffalo. *Indian Journal of Animal Reproduction*, 37 (1): 45-46.
- Pandey A.K., Gupta S. K., Rao M. M., Kalsotra R., Dubey N., Sharma U. and Kaul A. K. 2016. Ovulatory response and embryo recovery in rambouillet sheep using fsh. *Veterinary Practitioner*, 17 (2): 229-230
- Pandit, R.K. and Bali, R.K. 2015. Influence of leaf position and picking timing on post harvest moisture in stored mulberry leaves (*Morus Spp.*) leaves. *Journal Biology Innovation*. 4(6): 357-362.
- Panicker, V.C., Sirothia, A. R. and Upadhyay, S. R. Production performance of nagpuri buffalo under field condition. *Buffalo Bulletin* 35 : 723-727
- Panotra, N. Gupta, V. Sharma, V. and Sharma, A.K. 2016. Impact of different weed management practices in commercial vegetable crops under western Himalayan Agro-Climatic zones Jammu and Kashmir. *International Journal of Advanced Research in Computer Science and Software Engineering* 6(9): 430-433.
- Panotra, N. Sharma, V., Sharma, A.K., Gupta, V. and Sharma, V. 2016. Economic evaluation and energy use of Turnip Rape (*Brassica campasteris* L.) cv. KOS-1) in Intermediate zone of Jammu and Kashmir. *International Journal of Advanced Research in Computer Science and Software Engineering* 6(7): 160-163.
- Panotra, Narinder; Gupta, Vinod, Sharma, Vishal and Kumar, Ashwani .2016. Studies on nitrogen and phosphorus management in Wheat (*Triticum aestivum* L. emend Fiori & Paol) under rainfed conditions of Jammu and Kashmir. *International J. of Applied Sciences*, 04 ( 03 ) : 420-424.
- Panotra, Narinder; Gupta, Vinod; Sharma, Vishal and Kumar, Ashwani. 2016. Impact of Different Weed Management Practices in Commercial Vegetable Crops under Western Himalayan Agro-Climatic Zone of Jammu and Kashmir. *International J. of Advanced Research in Computer Science and Software Engineering*. 6 (9) : 430-432.
- Panotra, Narinder; Gupta, Vinod ; Kumar ,Pawan; Kumar, Ashwani and Vikas, V. 2016. Future Strategies for Sustainable Livelihood of small and marginal farmers in Rajouri district of Jammu and Kashmir. *IJAEB*. 9 (6) : 1015-1021.
- Peshin, Rajinder, Sharma, Rakesh, Nanda, Rakesh, Sharma, L.K., Kumar, Raj, Dwivedi, Sudhakar, Gupta, Vinod & Risam, K.S.. 2016. Impact of Government Policy Intervention in Procurement



- of Wheat in Jammu Region of Jammu & Kashmir State. *Indian Journal of Ecology*. Vol. 43(Special Issue-1): 569-573.
- Pradyuman S.; Khajuria, S and Dalal, V. 2016. Productivity of Paddy under Populus deltoids based Agrisilviculture system. *Research journal of Agricultural Sciences*, 7(1): 229-30.
  - Pradyuman S.; Rao, O.P; Khajuria, S. and Dalal, V. 2016. Growth and yield attributes of Wheat and Paddy under Populus deltoids based Agrisilviculture system. 2016. *Indian Journal of Ecology*. 43(1) 58-64.
  - Rai GK., Jamwal, D., Singh, S., Parveen, A., Kumar, R.R., Singh, M. M., Rai, P.K. and Salgotra, R.K. 2016. Assessment Of Genetic Variation In Tomato (*Solanum Lycopersicum* L.) based on quality traits and molecular markers. *SABRAO Journal of Breeding and Genetics* 48 (1) 80-89.
  - Rai, G.K., Jamwal, D., Singh, S., Singh, M., Kumar, R.R., Salgotra, R.K. and Rai, P.K. 2016. Electrophoretic characterization of tomato (*Solanum lycopersicum* L. Mill.) using SDS-PAGE. *Environment & Ecology* 34 (4): 1399-1403.
  - Raina, V., Bhushan, B., Bakshi, P. and Khajuria, S. 2016. Entrepreneurial Behaviour of dairy farmers. *Journal of Animal Research*. 6(5) 1-7. DOI 10.5958/2277-940X.2016.00123.6.
  - Rajeev, S., Singh, G., Verma, P.K., Singh, R. and Upadhyay, S.R. 2016. In-vitro anthelmintic efficacy of aqueous and ethanotic extracts of *Artemisia Absinthium* Linn. on *Haemonchus contortus* of small ruminants. *Journal of Veterinary Pharmacology and Toxicology*. 15 (1): 59-61
  - Rani, S., Gupta, S. and Singh, S.K. 2016. Status and assessment of yield losses due to maize leaf blights in foot hills of North Western Himalayas. *Indian Journal of Plant Protection*, 44: 94-98.
  - Rani, S., Sharma, A, Wali V.K., Bakshi, P., Bakshi, M. and Gupta, S. 2017. Effect of foliar nutrition on yield, quality and shelf-life of mango (*Mangifera indica*) cv. Dashehari under Jammu sub-tropics. *Indian Journal of Agricultural Sciences*. 85(9) 185-190.
  - Rathee, P., Kaushik, N., Khajuria, S., Singh, P. and Manjeet. 2017, Performance of coriander and fenugreek as intercrops under different spaces of popular plantations in North Western India, *Int. Jor. Pure and applied Bio Science*, 5(1): 857-863.
  - Rathee, P., Kaushik, N., Khajuria, S., Singh, P. and Manjeet. 2017. Performance of fennel and Anjulan of intercrops under different spaces of popular plantations in North Western India, *IntJor Pure and applied Bio Science*, 5(1): 901-907.
  - Razvi, R., Suri, S. and Sarma, K. 2016. Anatomical Studies on the Hair Follicles of Skin of Bakerwali Goat *Indian Journal of Veterinary Anatomy*. 28 (1): 1-3.
  - Reothia A., Devi, J., Upadhyaya, R., Kour, K., Koul A., Sarma K. 2016. Studies of Some Hormonal Parameters in Rambouillet Sheep during Seasonal Migration in Jammu Region *Journal of Animal Research*. 6(6): 1137-1141.
  - Reshi, I. A., Singh, Qadri, S.I.A., Bhat, A. H. and Upadhyay, S.R. 2016. Incidence of gastrointestinal helminthiasis in Bovines from of Jammu region. *Indian Veterinary of Veterinary Journal*. 36 (1): 46-47.
  - Saleem, R., Suri, S., Sarma, K. and Sasan, J.S. 2016. Histology and Histochemistry of Oviduct of Adult Bakerwali Goat in Different Phases of Estrus Cycle. *Journal of Animal Research*. 6(5): 897-903
  - Saleem, T., Katoch, R., Yadav, A., Mir, I., Godara, R. and Ahamed, I. 2017. Prevalence of ovine oestrosis in plain and kandi areas of Jammu, North India. *International Journal of Science, Environment and Technology*, 6, 2017, 1117 – 1122.
  - Saleem, T., Katoch, R., Yadav, A. and Godara, R. 2017. Study on pathological changes caused by oestrus ovis in small ruminants of jammu. *Indian Journal of Small Ruminants*. 23(1): 52-55.
  - Slathia PS, BC Sharma, Narinder Paul, Rakesh Kumar and SK Gupta. 2016. Traditional water conveyance modes, their management and use in Udhampur district of Jammu and Kashmir. *Indian Journal of Traditional Knowledge* 15 (3): 503-508
  - Slathia PS, Narinder Paul, SK Gupta, BC Sharma, Rakesh Kumar and SK Kher. 2017. Traditional uses of under-utilized tree species in sub tropical rainfed areas of Kathua, Jammu & Kashmir. *Indian Journal of Traditional Knowledge* 16 (1): 164-169.



- Sanjeev Kumar, Praveen Singh, Sanjay Kher and Magdeshwar Sharma. 2016. Variability and association studies and screening of genotypes against pea seed borne mosaic virus (psmv) in lentil (*lens culinaris medik*) under NW Himalayas of Jammu and Kashmir. *Legume Research*. 39(1):26-30.
- Sasan.J.S, Sarma, K, Suri S., Malik.M. R. Osteometry of the appendicular skeleton in buffalo. *Indian Journal of Veterinary Anatomy* 28(2): 46-47.
- Shagufta B., Sarma, K., Devi J. 2016. Micrometrical studies on the epididymis in adult Bakerwali goat (*Capra hircus*). *Vet. Practitioner*. 17(1):129-130.
- Shah, R.A., Bakshi, P., Wali, V.K., Jasrotia, A. and Choudhary, P. 2017. Tri and Tetralobed walnut fruits are first reported from walnut germplasm of Jammu province. *International journal of Scientific and Engineering Research*. 8(1) 523-525.
- Shahid, A., Lal, B., Sinha, A., Sharma, A. and Sharma JP. 2016, Impact of plant protection activities on production and productivity of crops in Jammu Region (J&K), India. *Vegetos- An International Journal of Plant Research*. 2-4
- Shankar, U., Abrol, D. P., Chatterjee, D. and Rizvi, S. E. H., 2017. Diversity of native bees on *Parkinsonia aculeata* L. in Jammu region of North-West Himalaya, *Tropical Ecology*, 58(1): 211–215.
- Sharma Peeyush, Vikas Abrol, K.R. Sharma, V.K. Phogat and Vishaw Vikas. 2016. Impact of Conservation Tillage on Soil Organic Carbon and Physical Properties - A Review. *International Journal of Bio-resource and Stress Management*. 7(1):151-161.
- Sharma Ashu, Dileep Kachroo, R. Puniya, Neetu Sharma, Amit Mahajan, and Lobzang Stanzen 2016. Performance of spring maize (*Zea mays* L.) varieties under varying plant rectangularity and fertility levels. *Ann. Agric. Res. New Series* 37 (3): 243-247.
- Sharma H.K., Kotwal S.K., Singh D.K., Malik M.A., Kumar Arvind, Katoch R. and Singh M. 2016 Seroprevalence studies in Brucellosis in Goats of Jammu Region; *The Indian Journal of Small Ruminants* 22(2):198-201.
- Sharma Manish, Kumar Banti, Bhat Anil, Jeelani Iqbal M. and Mahajan Sunali (2016). Robust Regression Model to Study the Number of Indian Agriculture Workers. *Indian Journal of Ecology*. 43(1): 599-601.
- Sharma Neelesh, Ghosh M., Lee S.J. and Jeong D.K. 2016. Computational interpretation and comparative annotation of lipocalin-2 protein having the candidate for antibacterial agent. *Indian Journal of Biotechnology*, 15(7): 313-324.
- Sharma Neelesh, Sodhi S.S., Kim J.H., Ghosh M., Zhang J.J., Koo D.B., Kang M.J. and Jeong D.K. (2016). Molecular cloning of lipocalin-2 into a eukaryotic vector and its expression in bovine mammary epithelial cells as a potential treatment for bovine mastitis. *Turkish Journal of Biology*, 40: 55-68.
- Sharma Neetu, Kumar Anil, Kumar Jai, Mahajan Amit and Stanzen Lobzang 2016. Sowing time and weed management to enhance productivity of direct-seeded aromatic rice. *Indian Journal of Weed Science* 48(1): 21–24.
- Sharma R. and Peshin R. 2016 Impact of integrated pest management of vegetables on pesticide use in subtropical Jammu, India, *Crop Protection*, 84: 105–112.
- Sharma, A., Kushwaha R. B., Gupta, A. K., Bhadwal, M. S., Gupta, P. and Dwivedi, D. K. 2016. Mammary gland tumours in dogs- a report of ten cases. *Indian Journal of Canine Practice*, 8(1): 58-60.
- Sharma, A., Sharma, V., Arora, S., Arya, V.M., Maruthy Shankar, G.R., & Jalali, V.K. 2016. Potassium Fixation Capabilities of Some Inceptisols Belonging to Plain and Sub-mountainous Region. *Journal of the Indian Society of Soil Science* 64, 368–380.
- Sharma, A., Sharma, V., Sharma, P., Sharma, S.K. and Sharma P.N. 2016. Molecular characterization and genome organization of temperature insensitive necrosis inducing strain of BCMV infecting common bean in India. *Australasian Plant Pathology*, 45: 219-227.
- Sharma, A., Wali, V. K., Sharma, R. M. and Sharma, B. 2016. Effectiveness of various crop regulation treatments in guava (*Psidium guajava*) cv. Allahabad Safeda. *The Bioscan*. 11(1): 335-338
- Sharma, A., Wali, V. K., Sohnik, R. and Sharma, N. 2016. Sexual propagation technique: Novel approach for raising quality planting material of



- guava. *Indian Journal of Agriculture Business*. 2(1): 39-45.
- Sharma, A., Wali, V.K., Bakshi, P., Sharma, V., Sharma, V., Bakshi, M., & Rani, S. 2016. Impact of poultry manure on fruit quality attributes and nutrient status of guava (*Psidium guajava*) cv. L 49 plant. *The Indian Journal of Agricultural Sciences* 86, 533–540.
  - Sharma, Arti, Kachroo, Jyoti, Bhat Anil, Kachroo, Dileep and Ahmad, Peer Quadri Javeed. (2016) Resource use efficiency of maize production in Jammu Region of J&K State. *Journal of Applied and Natural Science* 8(2): 691-700.
  - Sharma, D., Gupta, M. and Gupta, S. 2016. Diversity of Native Rhizosphere Pseudomonad Of Jammu With Potential For Plant Growth Promoting Activity. *Indian J Agric Biochem.*, 29 (1): 62-67.
  - Sharma, D.S., Kaul, R.K., Bhat, Anju., and Singh, J. 2016. Quality evaluation and storage stability of jamun-mango blended squash, *Indian Journal of Horticulture*, 73(1): 153-156.
  - Sharma, H.K., Kotwal S.K., Singh D.K., Malik M.A., Kumar Arvind, Katoch R. and Singh M. 2016 Sero prevalence of Sheep Brucellosis in Jammu; *Journal of pure and applied Microbiology* 10(3), 2277-2282.
  - Sharma, P., Meena, P.D., Razdan, V.K., Gupta, V. and Singh, D. 2016. Worldwide new host record of *Sclerotinia sclerotiorum* on *Cannabis indica* in Jammu, India. *Journal of Oilseed Brassica*. 7 (2): 192-193.
  - Sharma, P., Sharma, S., Gautam, I. and Baranwal, V. K. 2016. Natural infection of glycine max by seven viruses belonging to different genera in India. *Journal of Plant Pathology*, 98: 563-569.
  - Sharma, P., Sharma, S., Singh, J., Saha, S. and Baranwal, V. K. 2016. Incidence of Lettuce mosaic virus in Lettuce and its detection by polyclonal antibodies produced against recombinant coat protein expressed in *Escherichia coli*. *Journal of Virological methods*, 230:53-56.
  - Sharma, Peeyush, Yaellaor, Michael Raviv Shlomit Medina Ibrahim Saa Arkady Krasnovs Maggie Vagera Guy J. Levy, Asher Bar-Tal, Mikhail Borisove 2017. Compositional characteristics of organic matter and its water-extractable components across a profile of organically managed soil. *Geoderma*, 286: 73-82
  - Sharma, R. and Peshin, R. 2015. Impact of integrated pest management of vegetables on pesticide use in sub-tropical Jammu. *Crop Protection Journal*: 105-112.
  - Sharma, R.M., Kour, K., Bandral, J.D., Singh, B., Rana, J.C. and Jamwal, M. 2016. Analysis and utilization of genetic diversity of 'Ambri' apple (*Malus × domestica* Borkh.) in Jammu region. *Indian Journal of Horticulture*. 73(1): 1-7
  - Sharma, V., Mir, S.H., & Sharma, A. 2016. Nitrogen Mineralization as Influenced by Different Organic Manures in an Inceptisol in the Foothill Himalayas. *Communications in Soil Science and Plant Analysis* 47, 194–202.
  - Sheikh, M., Rastogi, A., Singh, S., Sharma, R.K. and Khan, N. 2016. Effect of urea treated olive meal as maize replacer on in-vitro rumen fermentation pattern. *Environment and Ecology*, 34(4): 1342-1345.
  - Shivangi Singh, Upma dutta, AK bhat, Sachin Gupta, Vikas Gupta and Sonika Jamwal. 2017. Morpho-cultural and Biochemical identification of *Pseudomonas* sp. Isolated from the rhizosphere of different vegetable crops and study its efficacy on *Solanum melongena* (Brinjal).. *Journal of Pharmacognosy and phytochemistry*. 6(2), 22-28.
  - Shrivastav AK., Alok Dubhey and Sinha Abhay Kumar. 2016. Computer model to select optimum size of Farm power for paddy, wheat crop rotation in Madhya Pradesh India. *Environment and ecology* 34(4C):1868-1873.
  - Singh Mandeep, Dwivedi, Sudhakar, & Hamid, Naveed. 2016. A Study of consumer awareness and perception towards shopping of fast moving consumer goods in Jammu Region . *Agro. Economist : An International Journal*. 3, 2: 97-102.
  - Singh N.K., Kour S. and Sharma Neelesh (2016). Impact of A1/A2 forms of cow's milk on human health-A review. *Journal of Animal Research*, 6(6): 923-931.
  - Singh, G., Soodan, J. S., Tikoo, A. and Tripathi, A. K. 2016. Alterations in clinical, hematological and biochemical parameters in the cases of equine colic. *Indian Veterinary Journal*. 94(02):36-40.



- Singh, J. P. and Thakur, T. C. 2016. Development and Evaluation of Subsoiler-cum-Organic manures and Soil Amendments applicator. *Indian Journal of Ecology* (2016) 43 (Special issue-1) 1-5.
- Singh, J. P. and Thakur, T. C. 2017. Design, Development and Evaluation of Subsoiler-cum-Organic Manures and Soil Amendment Applicator. *Environment & Ecology* 35(1): 148-156.
- Singh, J., Ahmad, N., Sharma, V. and Babita. 2016. Evaluation of minor fruits from Jammu region for possible antioxidant role and vitamin C. *Indian Journal of Ecology*, 43(2): 888-890.
- Singh, N.P., Kachroo, J., Hamid, N., Bhat, A., Dwivedi, S. & Singh, S.P. 2016. A study of status and scenario of retail outlets of biscuits of Britannia Industries Ltd. *Advances in Social Research*. 2(1): 07-13.
- Singh, P. and Kumar, A. 2016. Quality attributes of chevon meat patties substituted with rabbit meat. *The Indian Journal of Small Ruminants*, 22(2): 206-212.
- Singh, R., Singh, V. and Baigh, S.A. 2016. Haemato-biochemical and mineral status of crossbred cattle from various agroclimatic zones of North-West Himalayan region of Jammu division. *Indian Journal of Animal Sciences* 86 (10): 1125-1131.
- Singh, S. G., Thakur, Y. P., Taggar, R. K., Kaur, A., Chakraborty, D., Kumar, D. and Sankhyan, S. 2016. Genetic bottleneck effect and analysis of intra-population genetic diversity in Gaddi goat breed of Western Himalayas using microsatellite markers. *Journal of Livestock Biodiversity*, 6(1): 33-39.
- Singh Shivani, Vipin, V., Sadhna, T. and Jha, GN. 2017. Effect of lead nitrate on the ovaries of the striped snakehead *Channa striatus* (Bloch, 1793). *Indian Journal of Fisheries*. 64(1), 98-100.
- Singh, S. P., Kumar, Nimit, Singh, Harminder and Rizvi, S.E.H. 2016. Economic Analysis of Cultivation of Basmati Rice in Jammu District of J&K state: An appraisal of Resource Use Efficiency. *International Journal of Agricultural and Statistical Sciences*. 12(1):249-251.
- Singh, S.K., Jamwal, B.S., Razdan, V.K., Singh, V.B. and Singh, A. K. 2016. Status of nodulation and mycorrhizal association in black gram (*Vigna mungo*) and its effect on severity of root rot and web blight diseases under different soils in Jammu subtropics. *Indian Phytopathology* 69(2): 195-197.
- Singh, S.P., Kumar, Chandan, Kachroo, Jyoti, Singh, Harminder, Hamid, Naveed and Kumar, Nimit. (2016) An Economic Analysis of Mushroom Marketing in Jammu and Kashmir. *Indian Journal of Economics and Development* 12(3): 587-590.
- Singh, S.P., Kumar, Nimit, Bhat, Anil, Singh, Harminder, Jeelani, M. Iqbal, Sharma, Sanjeev and Kumar, Amit. 2016. Diversification, livelihood security and sustainable hill agriculture: an economic analysis of Brinjal crop cultivation in Jammu district (J&K), India. *Ecology, Environment & Conservation*. 22 (September Supplementary): S347-S350.
- Singh, V., Singh, R. and Hussain, K. 2017. Evaluation of urea molasses multinutrient block supplementation in beetal cross goats. *Indian Journal of Small Ruminants*. 23(1): 111-113.
- Sinha AK., Shrivastav, AK., Goutam, AK. and Shahid, A. 2016. A decision support system for farm mechanization with the use of computer modeling for soyabean wheat crop rotation. *International of innovative science. Engineering and Technology*. 3(7):1825-1831.
- Sinha AK., Shrivastav, AK., Goutam, AK., and Shahid, A. 2016. Selection of stationary power for soyabean- Wheat cropping system by using a computer programme. *International journal of Agricultural sciences*. 8(54):2819-2821.
- Sinha, B. K. and Chhabra, M. L. 2016. Amelioration of photo assimilates translocation pattern by the application of phytohormones in indian mustard under abiotic stress environment. *Journal of Hill Agriculture*, 7(1): 84-89.
- Sinha, B. K., Iqbal, M. and Reena. 2016. Drought stress affecting physio-biochemical characters and yield attributes in wheat (*Triticum aestivum* L.). *Annals of Agricultural Research*, 37: 363-368.
- Slathia, P.S., Paul Narinder, Gupta, S.K., Sharma, B.C., Kumar Rakesh and Kher, S.K. 2017. Traditional uses of under-utilized tree species in sub-tropical rainfed areas of Kathua, Jammu and Kashmir.



- Indian Journal of Traditional Knowledge.16 (1): 164-169.
- Slathia, P.S., Sharma, B.C., Narinder Paul, Kumar Rakesh and Gupta, S.K. 2016. Traditional water conveyance modes, their management and use in Udhampur district of Jammu and Kashmir. Indian Journal of Traditional Knowledge .15(3) : 503-508.
  - Spalbar Enoch, Mondal A. K. and Rai A. P. 2017, Distribution of Zinc fraction & its Association with soil properties in some rice-wheat growing soils of Jammu region , India International Journal of Current Microbiology and Applied Science 6. 711-721
  - Spaldon S; Samnotra R K; Kumar S; Chopra S and Bhushan A 2016. Stability analysis for fruit yield and its components in tomato (*Solanum lycopersicon L.*) Green Farming 7(3): 586-590.
  - Srivastava,R.K. and Sharma, H.C. 2016. Drought investigation for crop planning in Badri Gad Watershed of Uttarakhand. Indian Journal of Ecology 43 (special issue-1): 50-54.
  - Srivastava,R.K., Mittra, B.N. Sushmita, M.Dadhich and J.P.Singh.(2016) Agricultural resource management using optimization technique – A case study. Indian Journal of Ecology 43 (special issue-2): 619-623.
  - Trilokia, M., Gandhotra, A., Kumar, R. and Bakshi, P. 2016. Value addition, nutritional status and shelf-life evaluation of cocoa, cardamom and sugar free dietary fibre supplements. Indian Journal of Agricultural Sciences. 86(4) 512-515.
  - Tripathi, A. K., Soodan, J. S. and Kushwaha, R. B. 2016.Clinical, haemato-biochemical and therapeutic studies on rumen impaction in buffaloes.Buffalo Bulletin, 35(3): 325-29.
  - Vaishnav, P, Kaul, V. and Bhagat, R. M. and Sharma, D, 2016. Effect of host plants on ecological life table parameters of *Pieris brassicae L.* Indian Journal of Ecology,43(1) : 494–499.
  - Verma PK, Raina R, Sultana M, Singh M, Kumar P. (2016). Total antioxidant and oxidant status of plasma and renal tissue of cisplatin-induced nephrotoxic rats: Protection by floral extracts of *Calendula officinalis* Linn. Renal Failure 38:142-50. (6.94/0.775)
  - Verma Pawan K, RajinderRaina, Mudasar Sultana, Maninder Singh. 2016. Modulatory effect of *Calendula officinalis* on altered antioxidant status and renal parameters in diabetic rats. Pharmaceutical and Biomedical Research. 2(4): 52-64.
  - Vijay Kumar, Rakesh Kumar, V.B. Singh, K.R. Sharma, Ajay Kumar, Neeraj Sharma, Anamika Jamwal, Satbir Singh, Sonika Jamwal, Manoj Kumar, Shalini Khajuria and Rohit Kumar Arora (2016). Soil management options for improving physical atmosphere for sustainable agriculture production: a review, International Journal of Agriculture Sciences, 8 (57): 3101-3105
  - Vikas Sharma, Rajesh Kumar, Vikas Tandon and Anil Bhat (2016). Impact of irrigation methods and mulching on vegetative growth, yield and quality of strawberry under mid hill conditions. J. of Soil & Water Conservation 15 (1): 64-68.
  - Wali, A., Gupta, M., Mallick, S. A., Gupta, S. and Sundeeep, J. 2016. Antioxidant potential and phenolic contents of leaf, bark and fruit of *Aegele Marmelos*. Journal of Tropical Forest Science, 28: 268-274.
  - Wanchoo, V., Singh, J., and Sharma, D.S. 2016. Quality evaluation and storage stability of blended aloe vera- jamun juice. The Bioscan, 11(3):1445-1448.
  - Wang, J., Guleria, S., Koffas, M.A.G., Yan, Y. 2016. Microbial production of value-added nutraceuticals. Current Opinion in Biotechnology. 37: 97-104.
  - Wani,H.and Rahman,S.2017.Pathomorphological alterations due to sub-lethal doses of chlorpyrifos in immune organs of broiler chickens. Journal of Experimental Zoological India 20(1): 521-525.
  - Yasotha T, Singh, R., Kumar, K., Mahapatra, P.S., Kumar, M., Das, B. C., Sarkar M, Dhara, S., Bag, S.2016. Generation and characterization of induced pluripotent stem cells in domestic Asian water buffalo (*Bubalus bubalis*). International Journal of Stem Cell Research and Transplantation04(5): 182-189.
  - Zargar, M.A., Pathak, A.K., Sharma, R.K. and Daing, M.I. 2016. Antioxidants and anticoccidial potential of aqueous extract from various tree leaves containing condensed tannins. Journal of Animal



- Research, DOI:10.5958/2277-940X.2016.000.64.4
- Zargar, R., Pratiksha, P., Rastogi, A., Koul., A.L., Khajuria, P., Ganai, A.F., Kour, S. 2016. Protective and ameliorative effect of seabuckthorn leaf extract supplementation on lead induced haemato-biochemical alterations in wistar rats. *Veterinary World*, 9(9): 929-934.
  - Zari, D., Arya, V., Sharma, V., Rai, P.K., Sharma, B.C., Sharma, C., Manhas, S. and Sharma, K.R. 2016. Effect of Long term application of organic and inorganic nutrient sources on soil moisture and yield of maize under rainfed condition. *Journal of Soil and water Conservation* 15 (3): 273-276.

## Books Published

Title of the Book	Author/Co-Author	Publisher
Mulching in aonla Influence of organic and inorganic mulching on tree growth, yield and fruit quality of aonla	Iqbal, M, Bakshi, P. and Wali, V.K	LAP Lambert Academic Publishing AG & Co. KG., Germany
Biometrical methods in Horticulture	Sharma, N, Wali, V.K. and Bakshi, P	New India Publishing Agency, New Delhi
Integrated nutrient management in Kinnow mandarin	Bakshi, M., Wali, V.K. and Bakshi, P	My Research Publications., New Delhi
Growth of Kinnow plants influenced by media and potting material	Ilyas K. M., Sharma A. and Sohnika R	LAP Lambert Academic Publishing AG & Co. KG., Germany
Effect of foliar nutrition on yield, quality and shelf life of mango	Gupta S. K., Sharma A. and Wali V. K.	LAP Lambert Academic Publishing AG & Co. KG., Germany
Computers in Agriculture	Manish Kumar Sharma, Anil Bhat, M.Iqbal Jeelani Bhat	NIPA, New Delhi
Impact assessment of contract farming of basmati rice in Jammu division	Ms. Parvani Sharma/Dr. Rakesh Nanda	LAMBERT Academic Publishing
Breeding Oilseed Crops for Sustainable Production- Opportunities and Constraint.	Gupta, S.K.	Elsevier Academic Press, USA
Fundamentals of Horticulture. Practical Manual	Jasrotia, A., Bakshi, P., Wali, V.K. and Bhat, D.J.	Division of Fruit Science, SKUAST-J
Growth of Kinnow plants influenced by media and potting material.	Ilyas K. M., Sharma A. and Sohnika R.	LAP Lambert Academic Publishing,
Effect of foliar nutrition on yield, quality and shelf life of mango.	Gupta S. K., Sharma A. and Wali V. K.	LAP Lambert Academic Publishing,
Biometrical Methods in Horticultural Sciences.	Sharma, N., Wali, V.K., Bakshi, P.	New India Publishing Agency. New Delhi,
Weed at a glance	Kumar Anil, Puniya R, Mahajan Amit, Sharma Ashu and Stanzen Lobzang	Jaya Publication House, NPH, New delhi. ISBN: 978-93-86110-13-8 PP-104.
Veterinary public health-One health	Sushovan Roy, Manju Roy, Neelesh Sharma and P.K. Sanyal	New Delhi Publishers, New Delhi, India. Pages- ix + 285. ISBN: 9789385503627
A practical guide on techniques in microbiology and immunology	V. Sharma, R.K. Sharma and Neelesh Sharma	New Delhi Publishers, New Delhi, India. Pages-v + 105. ISBN: 9789385503542
Zoo/Wild animals healthcare, nutrition and management	K. Hussain, Neelesh Sharma, M.M.S. Zama, A.K. Pathak and A. Sharma	Renu Publishers, New Delhi. Pages-iv + 145. ISBN: 9789385502231

# Linkages and Collaboration

The university has developed strong linkages with national and international organizations with a view to harness the information, materials, expertise and exchange of scientists and students visits. MoUs have been signed by the University with national and international organizations to facilitate the exchange of new technology of mutual interest, students and the faculty.

Given the national leadership in almost all major agricultural research areas, the university has close linkages with following other institutes of the country.

- Cornell University, USA.
- Indian Agricultural Research Institute, New Delhi.
- National Dairy Research Institute, Karnal, Haryana
- CSK HP Agricultural University, Palampur, HP
- Integrated Farming System Research, Modipuram (UP)
- Institute of Himalayan Bio-resource Technology (CSIR), Palampur (H.P)
- State Forest Research Institute, Jammu & Kashmir
- Directorate of Sheep Husbandry, Jammu.
- ICRISSAT, Hyderabad
- NBAIM, Mau Nath Bhanjan (UP).
- IPFT, Gurgoan.
- VPKAS, Almora.
- IFGRI, Jhansi.
- IUST, Kashmir.
- IIHR, Bangalore.
- BGBSU, Rajouri.
- PAU, Ludhiana.
- National Research Centre on Litchi, Muzaffapur (Bihar)
- CIPHET, Ludhiana.
- NRC on Equines, Hisar.
- SRFI, J&K.

**i) University Council Meetings**

a) 15<sup>th</sup> University Council Meeting of SKUAST-J held on 17.10.2016

**ii) Board of Management**

a) 26<sup>th</sup> Board of Management Meeting of SKUAST-J held on 01.04.2016

b) 27<sup>th</sup> Board of Management Meeting of SKUAST-J held on 11.02.2017

**iii) Research Council Meeting**

16<sup>th</sup> Research Council was held on 09<sup>th</sup> March, 2017

**iv) Extension Council**

8<sup>th</sup> meeting of Extension Council was held on 29<sup>th</sup> of March, 2017

**v) Academic Council**

17<sup>th</sup> Academic Council was held on 23<sup>rd</sup> August, 2016



15<sup>th</sup> University Council Meeting of SKUAST-J held on 17.10.2016

## Visits of Important Dignitaries

1. Sh. N. N. Vohra, Hon'ble Governor, J&K & Chancellor, SKUAST-Jammu
2. Dr. Jatinder Singh, Hon'ble Union Minister of state with independent charge for the Ministry of Development of North Eastern Region, Prime Minister Office, Personnel, Public Grievances and Pensions, Atomic Energy and Space
3. Sh. Chandra Prakash Ganga, Hon'ble Minister of Industries & Commerce, J&K Government
4. Sh. Jugal Kishore Sharma, Hon'ble Member of Parliament, Jammu-Poonch Constituency
5. Sh. RashpalVerma, Vice Chairman OBC Board, J&K
6. Dr. Devinder Kumar Manyal, Hon'ble MLA, Samba
7. Dr. Rajbir Singh, Director, ICAR-ATARI, Ludhiana
8. Dr. Gagan Bhagat, MLA, R S Pura
9. Sh. GhulamNabi Lone, Minister for Agriculture Production
10. Sh. Daljit Singh Chib, Vice Chairman, J&K State Advisory Board for Development of Kisans
11. Sh. Parmod Kumar Jain, Financial Commissioner Agriculture, J&K Govt



Sh. N.N. Vohra, Hon'ble Governor, J&K (Chancellor, SKUAST-Jammu) inaugurate Kissan Mela on 18th & 19th of March, 2017

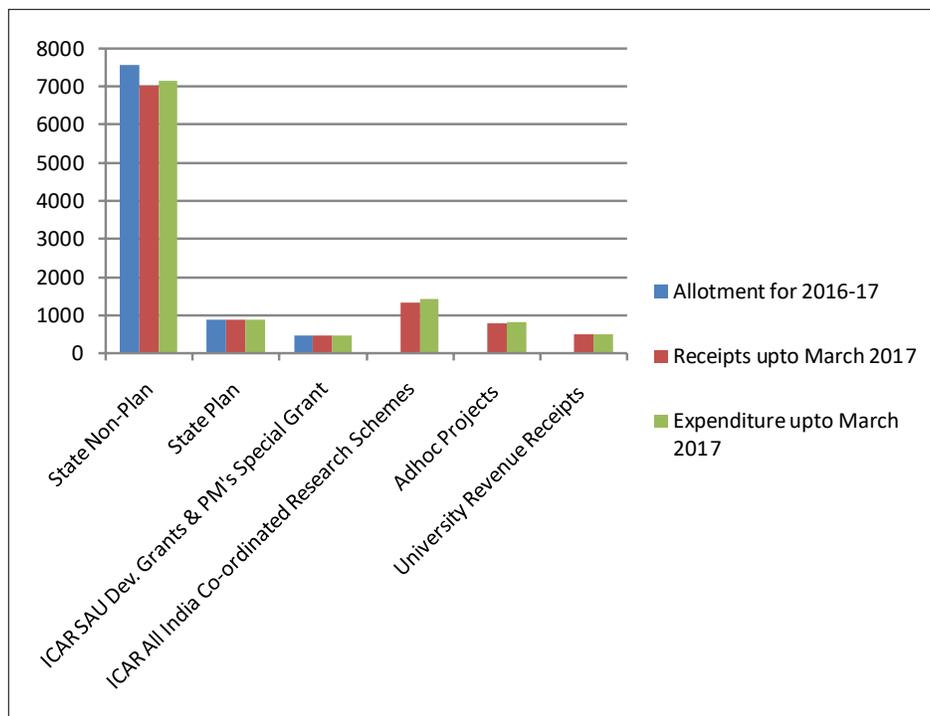


Dr. Jatinder Singh, Hon'ble Union Minister unveiled the foundation stone of KVK,Samba

## Resources and Financial Estimates (2016-17)

(Rs. In Lakhs)

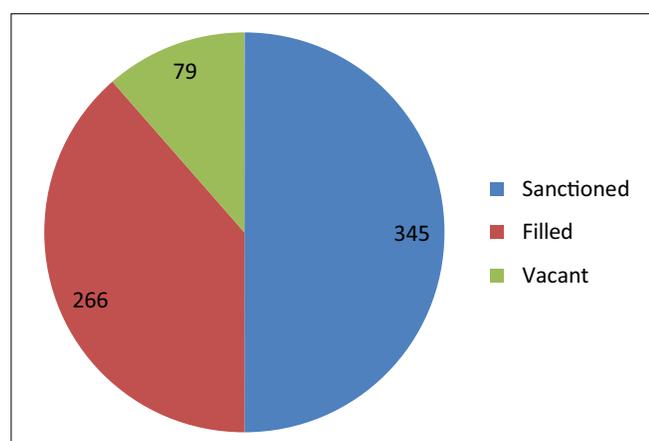
S.No	Particulars	Allotment for 2016-17	Receipts up to March 2017	Expenditure upto March 2017
1	State Non Plan	7583.33	7049.92	7179.29
2	State Plan	900.00	900.00	900.00
3	ICAR SAU Dev. Grants & PM's Special Grant	483.29	466.93	471.11
4	ICAR All India Co-ord. Research Schemes	-	1328.79	1437.38
5	Adhoc Projects	-	813.01	836.61
6	University Revenue Receipt	-	500.50	500.47



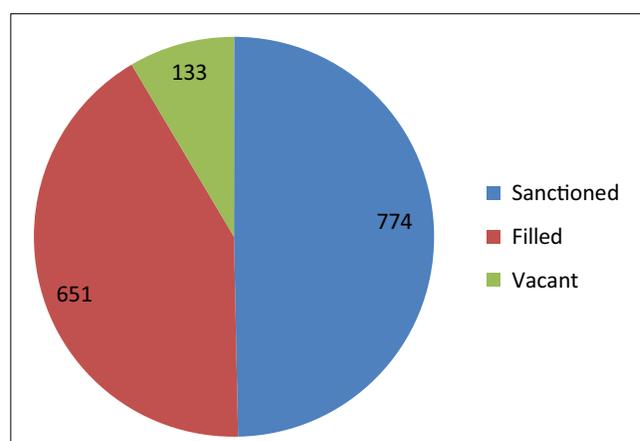
# Staff Position

## Staff Position (As on March 31, 2017)

Category	Sanctioned	Filled	Vacant
<b>A. Teaching</b>			
Dean	03	02	01
Associate Dean	01	01	00
Professor / Equivalent	34	16	18
Assoc . Professor / Equivalent	86	64	22
Asstt .Professor / Equivalent	221	183	38
<b>Total</b>	<b>345</b>	<b>266</b>	<b>79</b>
<b>B. Non-Teaching</b>			
Administrative Officers	9	8	1
Administrative staff	232	186	46
Technical staff	36	29	7
Auxiliary / supporting staff	507	428	79
<b>Total</b>	<b>774</b>	<b>651</b>	<b>133</b>
<b>Total A+B</b>			



Teaching



Non- Teaching

# Appointments, Promotions and Superannuation

## Appointments

### Teaching

S. No.	Name	Appointed as
01.	Dr. D.P. Abrol	Dean, FoA
02.	Dr. Sanjay Khar	Professor, Agril. Engineering
03.	Dr. Romesh Kumar Salgotra	Professor, Biotechnology
04.	Dr. Mahender Singh	Sr. Scientist, Agrometerology
05.	Dr. Sanjeev Kumar	Sr. Scientist, PBG
06.	Dr. Mahital Jamwal	Sr. Scientist, Fruit Science/ Pomology

### Non-Teaching

S. No.	Name	Appointed as
01.	Sh. Rakesh Sharma	Stenographer
02.	Ms. Neharika Pandita	
03.	Sh. Dev Raj	
04.	Mohd. Nissar	
05.	Ms. Neha	
06.	Abdul Hafiz	Computer Assistant
07.	Sh. Suresh Kumar	Jr. Engineer
08.	Sh. Sonu Bhagat	OCC (under SRO-43)

### Superannuation:

Sr. No.	Name	Date of Superannuation
01.	Sh. Darshan Singh, Asstt. Professor, Div. of Sericulture, FoA, Udheyawalla	30.09.2016
02.	Sh. S. P. Gupta Subject Matter Specialist (Pomology) KVK, R. S. Pura	30.11.2016
03.	Dr. Rajkumari Koul Prof. & Head Division of Food Science & Tech. FoA, Chatha	31.01.2017
04.	Dr. Shagufta Azami Prof. & Head Division of Vety. Pathology FVSc. & AH., R. S. Pura	31.03.2017

# Personnel (As on 31.03.2017)

## \* Assistant Professor / Equivalent and above

### Governance

#### Vice – Chancellor's Office

S. No	Name	Designation
1	Dr. Pradeep K. Sharma	Vice-Chancellor
2	Sh. Ajay Sharma	Secretary to Vice Chancellor

#### Registrar Office

S.No.	Name	Designation
1.	Dr. Dileep Kachroo	Registrar
2.	Sh. Jatinder Raina	Dy. Registrar (Secy.)
3.	Dr. Bharat Bhushan	Dy. Registrar (Acad.)
4.	Sh. Keemti Lal	Asstt. Registrar
5.	Sh. Devinder Sharma	Asstt. Registrar
6.	Sh. Manohar Lal	Asstt. Registrar (Acad.)
7.	Sh. Atul Mahajan	Asstt. Registrar (Legal)

#### Project Planning & Monitoring Office

S.No	Name	Designation
1.	Prof. Deepak Kher	PPMO

#### Comptroller Office

S.No.	Name	Designation
1.	Sh. S.K. Koul	Comptroller
2.	Sh. Sohan Lal Sharma	Dy. Comptroller
3.	Ms. Poonam Makhnotra	Dy. Comptroller
4.	Sh. Devinder Samnotra	Asstt. Comptroller
5.	Sh. Manmohan Singh	Asstt. Comptroller
6.	Smt. Veena Gupta	Asstt. Comptroller
7.	Sh. Raman Sharma	Asstt. Comptroller

### Estates Division Office

S.No	Name	Designation
1.	Sh. T.R. Bhagat	Estates Officer
2.	S. Iqbal Singh Sudan	Executive Engineer
3.	Sh. Kewal Kumar Raina	Asstt. Executive Engineer
4.	Sh. R.K. Kapoor	Asstt. Comptroller

### Directorate of Education

S.No	Name	Designation
1	Dr. T.A.S. Ganai	Director Education
2	Dr. A.K.Gupta	Medical Officer
3	Dr. (Mrs.) Sushma Gupta	Medical Officer

### Directorate of Extension

S.No.	Name	Designation
1.	Dr. K. S Risam	Director Extension
2.	Dr. R.R. Jat	Assoc. Director Extension
3.	Dr. R.K. Arora	Assoc. Director Extension

### Directorate of Research

S.No.	Name	Designation
1.	Dr. J.P. Sharma	Director Research
2.	Dr. Parmod Baru	Assoc. Director Research
3.	Dr. Pradeep Wali	Deputy Director Research
4.	Dr. M. C. Dwivedi	Farm Manager/ Jr. Scientist
5.	Dr. Satish Sharma	Farm Manager/ Jr. Scientist

### Library

S.No	Name	Designation
1.	Prof. V.K. Razdan	University Librarian
2.	Smt. Shashi Prabha Raina	Asstt. Librarian
3.	Sh. Leela Dhar Mengi	Asstt. Librarian



## Faculty of Agriculture, Chatha

### Dean's Office

S.No	Name	Designation
1.	Dr. D.P. Abrol	Dean
2.	Smt. Hancy Koul	Administrative Officer
3.	Sh. Vijay Sharma	Accounts Officer

### Division of Agricultural Extension Education

S.No.	Name	Designation
1.	Dr. S. K. Kher	Professor
2.	Dr. Rakesh Nanda	Professor
3.	Dr. Rajinder Peshin	Assoc. Professor
4.	Dr. R. S. Slathia	Asstt. Professor
5.	Dr. Poonam Parihar	Asstt. Professor
6.	Dr. Jasbir Singh Manhas	Asstt. Professor
7.	Dr. Laxmi Kant Sharma	Asstt. Professor

### Division of Agriculture Engineering

S.No.	Name	Designation
1.	Prof. Sushil Sharma	Prof. & Head
2.	Dr. J. P. Singh	Assoc. Professor
3.	Dr. R.K. Srivastava	Assoc. Professor
4.	Dr. Sushmita M. Dadhich	Asstt. Professor

### Division of Agronomy

S.No	Name	Designation
1.	Dr. B.C.Sharma	Professor & Head
2.	Dr. Anil Kumar	Professor
3.	Dr. Neetu Sharma	Asstt. Prof.
4.	Dr. N.P.Thakhur	Sr. Scientist
5.	Dr. Ashok Kumar	Sr. Scientist
6.	Dr. Vijay Khajuria	Jr. Scientist
7.	Dr. Meenakshi Gupta	Sr. Scientist
8.	Dr. Veena Sharma	Technical Officer

### Division Agricultural Economics & ABM

S.No.	Name	Designation
1.	Dr. Jyoti Kachroo	Professor and Head
2.	Dr. Sudhakar Dwivedi	Assoc. Professor
3.	Dr. S. P. Singh	Asstt. Professor
4.	Dr. Anil Bhat	Asstt. Professor

### Division of Agroforestry

S.No.	Name	Designation
1.	Dr. K. K. Sood	Professor & Head
2.	Dr. S. K. Gupta	Professor
3.	Dr. N.S. Raina	Assoc. Professor
4.	Dr. L. M. Gupta	Assoc. Professor
5.	Dr. Sandeep Sehgal	Assoc. Professor
6.	Ms. Meenakshi Gupta	Asstt. Professor

### Division of Entomology

S. No.	Name	Designation
1.	Dr. V. Kaul	Professor and Head
2.	Dr. R. M. Bhagat	Professor
3.	Dr. D. P. Abrol	Professor
4.	Dr. Hafeez Ahmad	Professor
5.	Dr. R. K. Gupta	Assoc. Professor
6.	Dr. Uma Shankar	Asstt. Professor
7.	Dr. Amit Kumar Singh	Asstt. Professor
8.	Dr. Devinder Sharma	Asstt. Professor

### Division of Vegetable Science & Floriculture

S. No.	Name	Designation
1.	Dr. R.K.Samnotra	Professor & Head
2.	Dr. R.K. Gupta	Professor
3.	Dr. R.K. Pandey	Assoc. Professor
4.	Dr. Sandeep Chopra	Assoc. Professor
5.	Dr. Manoj Kumar	Asstt. Professor
6.	Dr. Satesh Kumar	Asstt. Professor
7.	Dr. Sanjeev Kumar	Asstt. Professor
8.	Dr. Sheetal Dogra	Asstt. Professor
9.	Dr. Arvinder Singh	Asstt. Professor
10.	Dr. Nomita Laishram	Asstt. Professor

### Division of Plant Breeding & Genetics

S.No	Name	Designation
1.	Dr. A.K.Razdan	Professor & Head
2.	Dr. S.K. Gupta	Professor
3.	Dr. B.B. Gupta	Professor
4.	Dr. Bikram Singh	Professor
5.	Dr. S.K. Mondal	Professor
6.	Dr. S.K. Sudan	Assoc. Professor



S.No	Name	Designation
7.	Dr. Sanjeev Kumar	Asstt. Professor
8.	Dr. Reyazul Rouf Mir	Asstt. Professor
9.	Dr. Bupesh Kumar	Jr. Scientist
10.	Dr. Anuradha Saha	Jr. Scientist
11.	Dr. Rajan Salalia	Jr. Scientist
12.	Dr. Tuhina Dey	Sr. Scientist
12.	Dr. M.K. Pandey	Jr. Scientist
13.	Dr. S.K. Rai	Jr. Scientist
14.	Dr. Rajeev Sangra	Jr. Scientist

### Division of Plant Pathology

S. No.	Name	Designation
1.	Dr. Anil Gupta	Professor & Head
2.	Dr. V.K. Razdan	Professor
3.	Dr. S.K. Singh	Assoc. Professor
4.	Dr. Sachin Gupta	Asstt. Professor
5.	Dr. Ranbir Singh	Asstt. Professor
6.	Dr. Vishal Gupta	Asstt. Professor
7.	Dr. A.K. Singh	Asstt. Professor
8.	Dr. Prachi Sharma	Asstt. Professor

### Division of Fruit Science

S.No.	Name	Designation
1.	Dr. V.K. Wali	Professor & Head
2.	Dr. Parshant Bakshi	Assoc. Professor
3.	Dr. Amit Jasrotia	Asstt. Professor
4.	Dr. Arti Sharma	Asstt. Professor
5.	Dr. Kiran Kour	Asstt. Professor
6.	Dr. Rajesh Kumar	Asstt. Professor
7.	Dr. Deep ji Bhat	Asstt. Professor
8.	Dr. Akash Sharma	Asstt. Professor
9.	Dr. Nirmal Sharma	Asstt. Professor

### Division of Food Science & Technology

S.No	Name	Designation
1.	Dr. Rajkumari Kaul	Professor
2.	Dr. Anju Bhat	Assoc. Professor
3.	Dr. Julie D. Bandral	Asstt. Professor
4.	Dr. Monika Sood	Asstt. Professor
5.	Dr. Neeraj Gupta	Asstt. Professor

### Division of Sericulture

S. No.	Name	Designation
1.	Dr. V. Kaul	Professor & Head
2.	Dr. R.K. Bali	Assoc. Professor
3.	Sh. Darshan Singh	Asstt. Professor
4.	Dr. Kamlesh Bali	Asstt. Professor

### Division of Soil Science and Agricultural Chemistry

S. No	Name	Designation
1.	Dr. K.R.Sharma	Professor & Head
2.	Dr. A. K. Raina	Chief Scientist
3.	Dr. A.K Bhat	Professor
4.	Dr. M.P.Sharma	Professor
5.	Dr. A.K.Mondal	Professor
6.	Dr. Vikas Sharma	Assoc. Professor
7.	Dr. Peeyush Sharma	Assoc. Professor
8.	Er. N. K. Gupta	Sr. Scientist
9.	Dr. Abhijit Samanta	Sr. Scientist
10.	Dr. Vijay Bharti	Sr. Scientist
11.	Dr. B.R. Bazaya	Sr. Scientist
12.	Dr. Ajai Partap Rai	Asstt. Professor
13.	Dr. Renu Gupta	Asstt. Professor
14.	Dr. Sarabdeep Kour	Asstt. Professor
15.	Dr. Vivak Manohar Arya	Asstt. Professor

### School of Biotechnology

S. No	Name	Designation
1.	Dr. R.K.Salgotra	Coordinator
2.	Dr. A K Singh	Asstt. Professor
3.	Dr. G K Rai	Asstt. Professor
4.	Dr. Sumita Kumari	Asstt. Professor
5.	Dr. Ravinder Singh	Asstt. Professor
6.	Dr. Manmohan Sharma	Asstt. Professor
7.	Dr. Susheel Sharma	Asstt. Professor



## Faculty of Basic Sciences

### Deans Office

S. No	Name	Designation
1.	Dr. S.A. Mallick	Dean

### Division of Biochemistry

S. No	Name	Designation
1.	Dr. S.A. Mallick	Professor & Head
2.	Dr. Sanjay Guleria	Assoc. Professor
3.	Dr. Moni Gupta	Assoc. Professor
4.	Dr. Vikas Sharma	Asstt. Professor

### Division of Plant Physiology

S. No	Name	Designation
1.	Dr. Gurdev Chand	Asstt. Professor
2.	Dr. Bhav Kumar Sinha	Asstt. Professor

### Division of Statistics & Computer Science

S. No	Name	Designation
1.	Dr. S.E.H. Rizvi	Professor & Head
2.	Dr. Manish Kumar Sharma	Assoc. Professor
3.	Dr. Iqbal Jeelani Bhat	Asstt. Professor

### Division of Microbiology

S. No	Name	Designation
1.	Dr. Brajeshwar Singh	Asstt. Professor
2.	Dr. Upma Dutta	Asstt. Professor

## Faculty of Veterinary Sciences and Animal Husbandry R.S. Pura

Administration		
S.No	Name	Designation
1.	Dr. M.M.S. Zama	Dean
2.	Dr. M.S. Bhadwal	Associate Dean
Division of Animal Genetics and Breeding		
S.No	Name	Designation
1.	Dr. R. K. Taggar	Professor & Head
2.	Dr. Nishant Kumar	Asstt. Professor
3.	Dr. Dharendra Kumar	Asstt. Professor

4.	Dr. Dibyendu Chakraborty	Asstt. Professor
----	--------------------------	------------------

### Division of Instructional Livestock Farm Complex

S.No	Name	Designation
01.	Dr. Manpreet Kour	Asstt. Professor
02.	Dr. Vikas Mahajan	Asstt. Professor
03.	Dr. Nazam Khan	Asstt. Professor
04.	Dr. Suraj Ashok Rao Amrutkar	Asstt. Professor

### Division of Livestock Production & Management

S.No	Name	Designation
01.	Dr. Asma Khan	Associate Professor
02.	Dr. Sahar Masud	Asstt. Professor (Fisheries)
03.	Dr. Depanjali Konwar	Asstt. Professor

### Division of Livestock Products Technology

S.No	Name	Designation
01.	Dr. Sunil Kumar	Assoc. Professor & Head
02.	Dr. Arvind Kumar	Asstt. Professor
03.	Dr. Z. F. Bhat	Asstt. Professor

### Division of Veterinary & Animal Husbandry Extension Education

S.No	Name	Designation
01.	Dr. S. A. Khandi	Asstt. Professor
02.	Dr. Pranav Kumar	Asstt. Professor

### Division of Animal Nutrition

S.No	Name	Designation
01.	Dr. R.K. Sharma	Professor & Head
02.	Dr. Ankur Rastogi	Asstt. Professor
03.	Dr. A.K. Pathak	Asstt. Professor

### Division of Veterinary Anatomy

S.No	Name	Designation
01.	Dr. Shalini Suri	Professor & Head
02.	Dr. Kamal Sarma	Assoc. Professor
03.	Dr. Jasvinder Singh Sasan	Asstt. Professor



<b>Division of Veterinary Gynaecology and Obstetrics</b>		
S.No	Name	Designation
01.	Dr. Utsav Sharma	Assoc. Professor & Head
02.	Dr. Sanjay Agarwal	Asstt. Professor
03.	Dr. Nishi Pande	Asstt. Professor
04.	Dr. A.K. Pandey	Asstt. Professor
05.	Dr. Sudhir Kumar	Asstt. Professor
<b>Division of Veterinary Medicine</b>		
S.No	Name	Designation
01.	Dr. Rajiv Singh	Professor & Head
02.	Dr. S.K. Gupta	Professor
03.	Dr. V.S. Wazir	Assoc. Professor
04.	Dr. Kafil Hussain	Assoc. Professor
05.	Dr. Rajesh Agarwal	Assoc. Professor
06.	Dr. Neelesh Sharma	Asstt. Professor
07.	Dr. R.K. Bhardwaj	Asstt. Professor
08.	Dr. Abha Tikoo	Asstt. Professor
<b>Division of Veterinary Microbiology &amp; Immunology</b>		
S.No	Name	Designation
01.	Dr. Anil Kumar Taku	Professor
02.	Dr. Mohd. Altaf Bhat	Professor
03.	Dr. Sabahat Gazal	Asstt. Professor
<b>Division of Veterinary Pathology</b>		
S.No	Name	Designation
01.	Dr. Shagufta Azmi	Professor & Head
02.	Dr. Nawab Nasiruddullah	Assoc. Professor
03.	Dr. Shilpa Sood	Asstt. Professor
04.	Dr. Shafiqur Rehman	Asstt. Professor
<b>Division of Veterinary Physiology &amp; Biochemistry</b>		
S.No	Name	Designation
01.	Dr. P.S. Mahapatra	Associate Professor & Head
02.	Dr. Jonali Devi	Assoc. Professor
03.	Dr. Jafrin Ara Ahmed	Asstt. Professor

04.	Dr. Pratiksha Raghuvanshi	Asstt. Professor
05.	Dr. Aditi Lal Koul	Asstt. Professor
06.	Dr. Kwardeep Kour	Asstt. Professor
<b>Division of Veterinary Pharmacology &amp; Toxicology</b>		
S.No	Name	Designation
01.	Dr. Mudasir Sultana	Professor & Head
02.	Dr. Rajinder Raina	Professor
03.	Dr. Nrip K. Pankaj	Asstt. Professor
04.	Dr. Pawan Kumar Verma	Asstt. Professor
<b>Division of Veterinary Parasitology</b>		
S.No	Name	Designation
01.	Dr. Rajesh Katoch	Professor & Head
02.	Dr. Anish Yadav	Assoc. Professor
03.	Dr. Rajesh Godara	Asstt. Professor
04.	Dr. Sanku Borkataki	Asstt. Professor
<b>Division of veterinary Public Health &amp; Epidemiology</b>		
S.No	Name	Designation
01.	Dr. S.K. Kotwal	Professor
02.	Dr. M.A. Malik	Assoc. Professor
03.	Dr. M. Rashid	Assoc. Professor
04.	Dr. H.K. Sharma	Asstt. Professor
05.	Dr. Maninder Singh	Asstt. Professor
<b>Division of Veterinary Surgery &amp; Radiology</b>		
S.No	Name	Designation
1.	Dr. A.K. Gupta	Assoc. Professor
2.	Dr. D.K. Diwedi	Asstt. Professor
3.	Dr. Ankur Sharma	Asstt. Professor
4.	Dr. Pankaj Gupta	Asstt. Professor
<b>Division of Teaching Veterinary Clinical Complex</b>		
S.No	Name	Designation
01.	Dr. J.S. Soodan	Professor & Head
02.	Dr. Hans Raj Bhardwaj	Assoc. Professor



03.	Dr. Ashok Kumar	Asstt. Professor
04.	Dr. Ram Bilas Khushwaha	Asstt. Professor
05.	Dr. Sharad Kumar	Asstt. Professor

## Regional/Sub-Stations/Centres/Schemes

### Regional Agricultural Research Station, Rajouri

S. No	Name of the Scientist	Designation
01.	Dr. Vinod Gupta	Sr. Scientist (Agril Extn.)
02.	Dr. Manmohan Sharma	Sr. Scientist (PBG)
03.	Dr. Sourav Gupta	Jr. Scientist (Ento.)
04.	Dr. Vikas Sharma	Jr. Scientist (Agronomy)
05.	Dr. Sunil Kr. Mishra	Jr. Scientist (Agronomy)
06.	Dr. Anil Bushan	Jr. Scientist (Vegetable Science)
07.	Dr. Narinder Panotra	Jr. Scientist (Agronomy)
08.	Dr. Sushil Sharma	Jr. Scientist (Pomology)
09.	Dr. Deepak Kumar	Jr. Scientist (Plant Pathology)
10.	Dr. Sudhir Kr. Singh	Jr. Scientist (Plant Pathology)

### Maize Breeding Research Sub Station, Poonch

S.No.	Name	Designation
01.	Dr. Praveen Singh	Jr. Scientist, (Plant Breeding & Genetics)

### Regional Horticulture Research Sub-station, Bhaderwah

S.No.	Name	Designation
01.	Dr. Mahital Jamwal	Sr. Scientist (Pomology)
02.	Dr. D. K. Chouhan	Jr. Scientist (Seed Science & Technology)
03.	Dr. Neeraj Kotwal	Jr. Scientist (Ento.)
04.	Dr. Rohit Sharma	Jr. Scientist (Agronomy)
05.	Dr. Sanjeev Kumar	Jr. Scientist (Soil Science)
06.	Dr. Manoj Kumar	Jr. Scientist (Soil Science)

### Rainfed Research Sub-station for sub-tropical fruits, Raya

S.No.	Name	Designation
01.	Dr. Vijay Bahadur Singh	Jr. Scientist (Plant Pathology)
02.	Dr. Rakesh Kumar	Jr. Scientist (Fruit Science)
03.	Dr. Vijay Kumar	Jr. Scientist (Soil Science)

### Advanced Centre for Rainfed Agriculture, Dhiansar

S.No.	Name	Designation
01.	Dr. Anil Kumar	Associate Director Research (Agronomy)
02.	Dr. Reena	Sr. Scientist (Ento.)
03.	Dr. Sanjeev Kumar	Sr. Scientist (PBG)
04.	Dr. A. C. Jha	Jr. Scientist Pl. Path.)
05.	Dr. Sonika Jamwal	Jr. Scientist (Plant Pathology)
06.	Dr. Permendra Singh	Jr. Scientist (Agronomy)

### Pulse Research Sub-Station Samba

S.No.	Name	Designation
01.	Dr. B.S. Jamwal	Chief Scientist (PBG)
02.	Sh. B.N.Singh	Sr. Scientist (Agronomy)
03.	Dr. Sudhir Kumar	Jr. Scientist (Plant Pathology)

### All Indian Coordinated Research Project on Maize (ICAR), Udhampur

01.	Dr. R.S.Sudan	Sr. Scientist, (PBG) & I/C
02.	Sh. Akhil Verma	Jr. Scientist, (Agronomy)

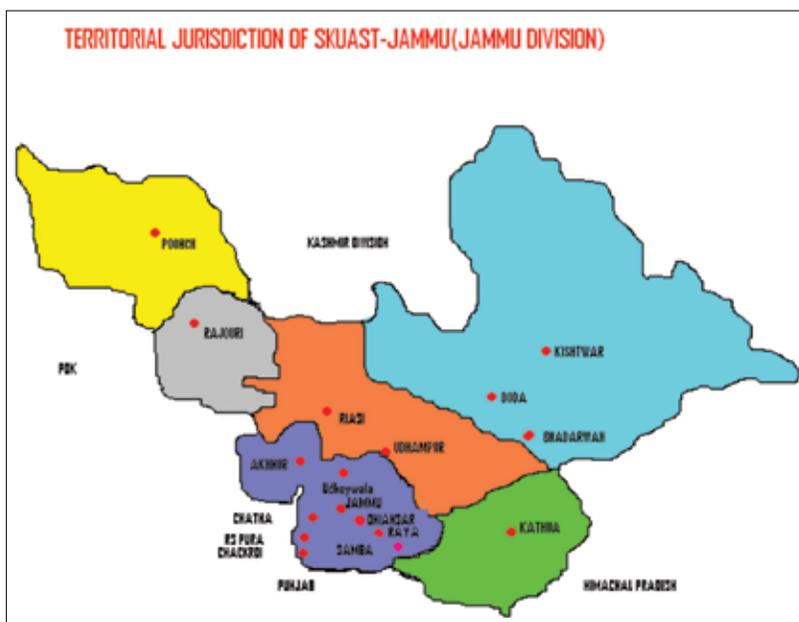
### Advanced Centre for Horticulture Research, Udheywalla

01.	Dr. Prashant Bakshi	Sr. Scientist (Fruit Sci.)
02.	Dr. P. K. Rai	Sr. Scientist (Soil Science)
03.	Dr. Kiran Kour	Jr. Scientist (Fruit Science)
04.	Dr. Akash Sharma	Jr. Scientist (Fruit Science)
05.	Dr. Kamlesh Bali	Jr. Scientist (Entomology)
06.	Dr. Vishal Gupta	Jr. Scientist (Plant Pathology)



S.No.	Name	Designation
<b>KVK Jammu</b>		
01.	Dr. VikasTandon	Sr. Scientist & Head
02.	Dr. Rakesh Sharma	Sr. Scientist (Agriculture Extension)
03.	Dr. PunitChoudhary	SMS (Agro forestry)
04.	Dr. SheetalBadyal	SMS (Home Science)
05.	Dr. Prem Kumar	SMS (Fisheries)
<b>KVK Rajouri</b>		
01.	Dr. Arvind Kumar Ishar	SMS (Entomology)
02.	Dr. SurajPrakash	SMS (Agril. Extension)
03.	Dr. Abhay Sinha	SMS (Agril. Engineering)
04.	Dr. Vishal Sharma	SMS (Agronomy)
05.	Dr. Parul Gupta	SMS (Animal Sciences)
<b>KVK Doda</b>		
01.	Mrs. RavneetKour	SMS (Horticulture)
02.	Sh. Sanjay Khajuria	SMS (Agro forestry)
03.	Dr. Amit Singh Charak	SMS (Agronomy)
04.	Dr. Narinder Paul	SMS (Extension Education)
05.	Dr. G. N. Jha	SMS (Fisheries)

S.No.	Name	Designation
<b>KVK Reasi</b>		
01.	Dr. Banarsi Lal	Sr. Scientist-cum-Head
02.	Sh. Lalit Upadhyay	SMS (Agroforestry)
03.	Dr. Mandeep Singh Azad	SMS (Animal Sciences)
04.	Dr. Sanjay Koushal	SMS (Agronomy)
05.	Dr. Suja Nabi Qureshi	SMS (Horticulture)
<b>KVK Poonch</b>		
01.	Dr. Ajay Gupta	SMS (Agronomy) & I/c
02.	Dr. Muzaffar Mir	SMS (Horticulture)
03.	Dr. Muneeshwar Sharma	SMS (Plant Protection)
<b>KVK Kathua</b>		
01.	Dr. AmrishVaid	Sr. Scientist & Head
02.	Dr. Neerja Sharma	SMS (Horticulture)
03.	Dr. AnamikaJamwal	SMS (Plant Protection)
04.	Dr. Pawan Kumar Sharma	SMS (Agril. Economics)
05.	Dr. BerjeshAjrawat	SMS (Agril. Extension)
06.	Dr. Vijay Kumar Sharma	SMS (Animal Sciences)
07.	Sh. Vishal Mahajan	SMS (Agro Forestry)



**SHER-E-KASHMIR  
UNIVERSITY OF AGRICULTURAL  
SCIENCES AND TECHNOLOGY OF JAMMU (J&K)**

**Head Quarter:**

Main Campus, Chatha

**Faculties:**

Agriculture: Chatha

Veterinary Sciences & AH: RS Pura

Basic Sciences, Chatha

**Schools:**

School of Biotechnology

**Krishi Vigyan Kendras:**

R.S.Pura (Jammu)

Bhaderwah (Doda)

Tandwal (Rajouri)

Reasi (Udhampur)

Poonch (Poonch)

Kathua (Kathua)

Samba (Samba)

**Research Stations/Centre:**

- Regional Agricultural Research Station, Rajouri
- Advanced Centre for Dryland Agriculture, Dhiansar
- Advanced Centre for Horticulture Research, Udheywalla
- Rain fed Research Sub-Station for Sub-tropical Fruits, Raya
- Regional Horticulture Research Sub-Station, Bhaderwah
- Pulses Research Sub-Station, Samba
- Maize Breeding Research Sub-Station, Poonch
- Seed Production Farm, Chakroi, RS Pura
- Maize Research Centre, Udampur