## ABSTRACT

**Title of the Thesis :** Effect of Different Weed Management Practices on

Weed Dynamics and Yield of Organic Basmati Rice

(*Oryza sativa* L.)

**Name of the student :** Ritika Gupta

**Registration No. :** J-20-M-703

**Major Subject :** Agronomy

**Name and Designation of :** Dr. Narinder Panotra, Assistant Professor (Agronomy),

**Major Advisor** School of Biotechnology

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Technology, Jammu.

**Abstract**

An experiment entitled, **“Effect of Different Weed Management Practices on Weed Dynamics and Yield of Organic Basmati Rice (*Oryza sativa* L.)”** was conducted at the Organic Farming Research Centre, Chatha of SKUAST- J, during *Kharif* season of 2021. The soil of the experimental site was sandy clay loam in texture, slightly alkaline in reaction, medium in organic carbon, available phosphorus and potassium but low in available nitrogen. The experiment consisted of 11 treatments *viz*. Weedy Check (T1), Weed Free (T2), Two hand weeding at 20 and 40 DAT (Recommended Practice) (T3), Vinegar @ 5 % at 5 DBT (T4), Vinegar @ 10 % at 5 DBT (T5), Vinegar @ 5 % at 5 DBT + Hand Weeding at 30 DAT (T6), Vinegar @ 10 % at 5 DBT + Hand Weeding at 30 DAT (T7), Rice Bran @ 2.5 t/ha (extract at 1:3 wt./vol. basis) at 5 DBT (T8), Rice Bran @ 5 t/ha (extract at 1:3 wt./vol. basis) at 5 DBT (T9), Rice Bran @ 1.25 t/ha (extract at 1:3 wt./vol. basis) at 5 DBT + Hand Weeding at 30 DAT (T10) and Rice Bran @ 2.5 t/ha (extract at 1:3 wt./vol. basis) at 5 DBT + Hand Weeding at 30 DAT (T11), arranged in randomized block design with three replications. After layout, vinegar and rice bran extract was applied to the respective experimental plots five days before transplanting. The transplanting of the crop variety Basmati 370 was done on 13th July, 2021. The recommended dose of NPK nutrients for basmati rice @ 30, 20, 20 kg/ha was applied to the crop through organic source of FYM, neem cake and vermicompost. The irrigation was applied at regular intervals in rice crop as per need.

The major weed flora observed in the rice field were *Cyperus spp.*, *Echinochloa spp., Cynodon dactylon* and *Ammania baccifera,* whereas the crop was predominantly infested with *Cyperus spp.* with maximum percentage of relative density throughout the crop growing period. The experimental results revealed that lowest weed density, weed dry matter accumulation, and highest weed control efficiency was recorded with application of twice hand weeding at 20 and 40 DAT (T3) at 30 and 60 DAT and with application of vinegar @ 10 % at 5 DBT fb one hand weeding at 30 DAT (T7) at 90 DAT and at harvest stage, and lowest weed index and NPK uptake by weeds was recorded with application of vinegar @ 10 % at 5 DBT fb one hand weeding at 30 DAT (T7) whereas highest weed density, weed dry matter accumulation, weed index and NPK uptake by weeds was recorded in weedy check (T1) plots. The weed free (T2) plots recorded significantly highest growth and yield attributes i.e. plant height, number of tillers/m2 , dry matter accumulation, leaf area index, crop growth rate, effective tillers/hill, grains per panicle, 1000-grain weight, grain yield (31.17 q/ha), straw yield (54.27 q/ha) and nutrient (NPK) uptake by crop which were found to be at par with application of twice hand weeding at 20 and 40 DAT (T3) and application of vinegar @ 10 % at 5 DBT fb one hand weeding at 30 DAT (T7). Maximum net returns and B: C ratio were recorded with the application of vinegar @ 10 % at 5 DBT fb one hand weeding at 30 DAT (T7) to the tune of ₹ 139562 per hectare and 2.80 respectively.

Henceforth, based on the one year study it may be concluded that the application of vinegar @ 10 % at 5 DBT fb one hand weeding at 30 DAT may be recommended for economical control of weeds for realization of potential yield in organic basmati rice crop.

**Key Words:** Organic basmati rice, Vinegar, Rice bran, Weed control efficiency, Weed index

**Signature of Major Advisor Signature of Student**