

Research note :

Weed control and nitrogen losses through weeds in transplanted rice

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Rice is an extensively grown food grain crop of India. It can be grown under a wide range of edaphic and environmental condition. The average yield of rice in India is very low than world average. Weed infestation is one of the major cause in reducing rice yield. A severe crop weed competition leads to severe reduction in yield, if weeds are not properly checked (IRRI,1973). Crop weeds compete for the same production inputs resulting increase in cost of production. Nitrogen is one of the important plant nutrient required for growth and development of the rice crop, but due to weed infestation in early stage of crop growth leads a sizable amount of nitrogen loss through the uptake by weeds for their own growth and development and rice crop suffers adversely. So the present study was done to evaluate the performance of various weed control treatment in controlling weed population and nitrogen losses.

The experiment was conducted with twenty treatments. Treatments consisting of different herbicides, their combination and dose, manual and cultural methods were studied in a Randomized Block design with four replications.

Herbicides were applied 3 days after transplanting (pre-emergence) as spray in solution form at the rate of 800-1000 l/ha. Granular formulation of Anilophos was applied directly in granule form. Weeding in weed free and two handweeding treatments were done manually. Rice variety "Pant dhan-4" a cross of IR x Ramadja was used in the experiment. Seedlings were transplanted in rows manually at 20 cm x 20 cm distance except high plant population+1hand weeding where 15 cm x 15 cm distance was kept. After seedling establishment 5 cm standing water level was maintained up to milk dough stage. Observations were recorded at 65 days after transplanting and maturity stage of crop growth for weed density, weed dry matter and nitrogen uptake by weeds. Nitrogen content in weeds was estimated as per modified micro-kjeldahl method (Jackson, 1973). The data on weed

density, weed dry matter and nitrogen uptake by weeds were analysed after doing $\log_e(X+1)$ transformation as given by Kemthorne (1967). The data on different characters were analysed by using the analysis of variance technique as suggested by Panse and Sukhatme (1967).

Weed control treatments had significant effect on total weed density. All the weed control treatments were found to reduce significantly the density of weeds over weedy check both at 65 days after transplanting and maturity. At 65 days after transplanting, Butachlor (T_9) herbicide check had total weed density ($29/m^2$) statistically at par with two hand weeding. Treatments T_{11} , T_8 , T_6 were found as effective as Butachlor (T_9) in reducing the weed population. In addition to above treatments, T_{12} , T_{10} , T_7 , T_{17} could also reduce the weed density but statistically at par with two hand weeding (T_{18}). T_{14} and T_3 were statistically at par with non weeded control.

At maturity stage of crop Butachlor herbicide check (T_9) had lowest ($8/m^2$) total weed density. Treatments T_{10} , T_8 and two hand weeding (T_{18} , $9/m^2$) were found to reduce the weed density but statistically at par with Butachlor. The highest total weed density in non weeded control was observed at 65 days after transplanting and thereafter weed population decreased at maturity stage of crop. This indicated that the majority of weeds emerged during the first 65 days and thereafter competition among the weeds themselves and with the crop resulted into less weed population.

All the weed control treatments reduced total weed dry matter production both at 65 days after transplanting and maturity stage of crop growth significantly over non weeded control (T_{20}). Non weeded control had highest total weed dry matter production $373g/m^2$ at 65 days after transplanting and $310g/m^2$ at maturity stage. At both the stages of crop growth two hand weeding (T_{18}) has lowest total weed dry matter production ($28g/m^2$ at 65 DAT $19g/m^2$ at maturity) after the weed free treatment (T_{19}).

At 65 days after transplanting high plant population + 1 hand weeding (T_{17}) ($40g/m^2$) was statistically at par with two hand weeding (T_{18}) and Butachlor, the herbicide

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