J.Farming Systems Research & Development 8 (1&2) : 143-145 (2002)

WEED MANAGEMENT IN RICE - WHEAT CROPPING SEQUENCE IN SIKKIM

R.D. SINGH

I.C.A.R. Research Comples for N.E.H. Region, Sikkim Centre, Tadong Gangtok - 737 102

Rice-wheat is an important cropping sequences in Sikkim. Direct sown rice in hilly terraces hold a good promise for upland rice. Cool climatic situation with high humidity (88-90%) encourages the growth of wide ranges of annual and perennial weeds. Use of herbicides is found to be economical as compared to manual weeding, which is labour intensive and expensive too.

A field experiment was carried out from 1993-94 to 1994-95 at ICAR Research Complex farm, Gangtok, Sikkim to work out the effective weed management system in rice-wheat sequences on the terraced land of Sikkim. The soil was rich in organic carbon (1.5%), available phosphorus (52.3ppm) and available potash (191.5 ppm) with pH of 5.1. Experiment was carried out in randomized block design with four replications.

Rice cv. DR-92 was sown with a spacing of 20 x10 cm apart. A basal dose of NPK @ 60:40:40 kg/ha was applied uniformly to all the plots before sowing except N, which was applied in three splits i.e as basal, tillering and panicle initiation stage. Crop was sown during first week of June and harvested in the last week of October to first week of November in all the years.

Wheat cv. Sonalika was sown at 20 x 5 cm spacing in November and harvested in April. A basal dose of NPK @ 100:60:40 kg/ha was applied uniformally to all the treatment before sowing except N, which was applied in three splits i.e. as basal, maximum tillering and flowering stage of the crop.

All the three categories of weeds viz., grasses (narrow leaved) broad leaved and sedges were found growing in abundance in upland rice field terraces. Among them, *Cyperus rotundus*, L. (30%) *Cyperus eragrostis*, L. (9%) *Echinocloa crusgalli*, L (50%) *Echinocloa colonum*, L. (21%), *Ageratum conyzoids*, L. (9%) and *Paspalum posploids*, L. (5%) were the dominating weeds associated with upland rice. The important rabi weeds those are dominantly growing in the wheat field were *Phalaris minor*, L (90%), *Polygonum capitata*, L. (27%), *Cyperus rotundus*, L. (18%), *Chenopodium album* L. *(12%)* and *Amaranthus viridis* L. (8%).

Minimum weed biomass was recorded in weed-free check followed by mechanical weeding (25 & 50 DAS), which was significantly superior over most of the treatments in rice-wheat crop sequences.

Present address: Principal Scientist, Land Water, Environment, and Engineering Research Programme, ICAR Reseatch Complex for Eastern Region, WALMI Complex, Patna - 801 505, Bihar

Table 1. Effect of weed control treatments on weed biomass and grain yield of rice-wheat sequences (1993-95)

Treatment	Dry matter of weed (q/ha)		Grain yield (q/ha)			
	Rice	Wheat	Rice grain yield (q/ha)	% increase over control	Wheat grain yield (q/ha)	% increase over control
T_1 — Unweeded-Unweeded	55.6	2.74	14.9	-	22.5	-
T_2 — Weedfree-Weedfree	23.9	1.79	29.4	97.3	34.3	52.4
T_3 — Mechanical -Machanical Weeding Weeding (25 & 50 DAS) (25 & 50 DAS)	27.0	2.15	25.0	67.8	28.8	28.0
T_5 — Benthiocarb -Weedfree 50 EC @ 3 L/ha Weeding (25 & 50 DAS)	33.5	1.42	21.5	44.3	32.5	44.4
T_4 — Benthiocarb -Weedfree 10 G @ 3 kg/ha	44.3	2.06	19.6	31.5	28.7	27.5
T_6 — 2,4-D Na salt-Weedfree @ 1 kg/ha (Post emergence)	43.8	1.74	20.4	36.9	34.0	51.1
T_7 — Oxidiazon-Mechanical @ 0.75 kg/ha Weeding (25 & 50 DAS)	47.6	2.10	18.7	25.5	30.3	34.6
L.S.D. (0.005)	7.5	0.6	2.96	-	5.10	-

Maximum grain yield was recorded in weed-free treatment (29.4 q/ha) followed by mechanical weeding (25.0q/ha) and were found significantly superior over unweeded control and herbicidal treatments. All the herbicidal treatment viz. benthiocarb, 2, 4-D, Na salt and oxadiazon have also found excellent control of all categories of weeds and have produced increase of grain yield over control to the tune of 44.3%, 31.5%, 36.9% and 25.5%, respectively (Table 1) and remain non-significant among themselves. Nandal (1993) reported similar findings of weed control from rice-wheat cropping sequences. The results revealed that weed-free situation proved to be better than herbicides in both the years of experimentation.

Maximum grain yield of wheat was recorded in weed-free conditions (34.3. 32.5 and 34.0 q/ha) followed by mechanical weeding (28.8, 28.7 and 30.3 q/ha) and found significantly superior over control.

From the above study, it has been revealed that among all the treatments, a weed-free crop and mechanical weeding (25 and 50 DAS) during entire cropping season registered highest grain yield in both rice and wheat crop. Among the herbicidal treatments benthiocarb (50 EC) @ 3 L/ha and 2, 4-D Na salt @ 1 kg/ha were proved better than oxadiazon @ 0.75 kg/ha and benthiocarb (10 G). These two herbicidal treatments may be suitable since they are economical and not labour intensive like manual weeding and can be safely be recommended to farmers (Singh, 1993).

References

Nandal, D.P. and Singh, C.M. 1993. Weed management in direct sown puddle rice-wheat cropping system. Proc. International Symp. *Indian Soc. Weed Sci.* Hissar Nov. 18 - 20th (3) 57-61.

Singh, R.D. 1993. Studies on crop weed competition and chemical weed control for rice in Sikkim. *Indian J. Hill Fmg.* 5(2) : 107-111.