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Integrated Weed Management in Mustard *(Brassica juncea* L.)

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Integrated weed management is the preferable approach to minimize the crop-weed competition; alleviate the residue and pollution problems besides giving higher production and profiles. The present investigation was carried out to know the effect of integrated weed management on weeds and crop of mustard.

A field experiment was conducted at Research Farm, R. S. Pura, Sher-e-Kashmir University of Agricultural Sciences & Technology, Jammu. The soil of the experimental field was clay loam in texture with pH 6.8, available N 218 kg ha^{-1}, phosphorus 19 kg ha^{-1} and available potassium 125 kg ha^{-1}. The experiment with 12 treatments was laid out in randomized block design replicated thrice (Table 1). Fluchloralin was incorporated in the soil as pre-plant application one day prior to sowing, while pendimathalin and isoproturon were applied as pre-emergence with 650 l water ha^{-1} one day after sowing using knapsack sprayer fitted with flat fan nozzle. The variety Pusa Bold was sown on October 25, 1999 at the rate of 5 kg seed ha^{-1}. The sowing was done by *Kera* method in all the plots except the one which was treated with polythene mulch cover where *dibbling* method was followed. The black polythene having 25 *u* thickness was used and holes of 2.5 cm diameter were made at a distance of 30 cm between rows and 10 cm between plants. All agronomic practices except weed management were carried out as per the recommended practices.

The experimental field was predominantly infested with *Medicago denticulata* (23.3%), *Anagallis arvensis* (22.5%), *Fumaria parviflora* (18.9%), *Lathyrus aphaca* (9.6%) and *Vicia sativa* (7.2%). The population and dry weight of weeds at crop harvest were significantly reduced by all weed control treatments over weedy check (Table 1). Polythene mulch was most effective in controlling the weeds. It may be attributed to the fact that polythene mulch cover prevented the weeds to germinate due to the high temperature of soil and exposure to the sunlight, thereby hampering the photosynthetic activities of weed plants. However, significant reduction in population and dry matter of weeds were also recorded when fluchloralin at 0.70 kg ha^{-1} was applied in combination with two hand weedings at 30 and 60 DAS which remained at par with isoproturon and pendimethalin at 1.0 kg ha^{-1} coupled with two hand weedings at 30 and 60 DAS.

The polythene mulch and weed-free treatments recorded significantly improved all the growth and yield attributes of mustard over rest of the treatments. Whereas among the herbicidal treatments, fluchloralin at 0.70 kg ha^{-1} alone or in combination with hand weeding produced maximum growth and yield attributes of mustard. The maximum seed yield (1668 kg ha^{-1}) was recorded in polythene mulch treatment which was at par with weed-free. However, among the herbicidal treatments, fluchloralin at 0.70 kg ha^{-1} coupled with two hand weedings produced higher seed yield (1500 kg ha^{-1}) which was at par with isoproturon and pendimethalin at 1.0 kg ha^{-1} coupled with two hand weedings. These results are in confirmity with those of Gill *et al.* (1984), Tomar and Namdeo (1991) and Balyan (1993). The maximum benefit : cost ratio (1.83) was obtained in fluchloralin at 0.70 kg ha^{-1} supplemented with one hand weeding at 30 DAS. However, polythene mulch treatment also showed slightly higher B : C ratio (1.23) than weed-free check (1.08).

Table 1. Effect of treatments on weeds and crop

Treatment	Dose (kg a. i. ha^{-1})	Total weed density (No. m^{-2})	Total weed dry weight (g m^{-2})	No. of branches plant^{-1}		No. of siliquae plant^{-1}	No. of seeds siliqua^{-1}	1000-seed weight (g)	Seed yield (kg ha^{-1})	B : C ratio
				Primary	Secondary					
Weedy	-	248 (15.76)	135.1 (11.64)	4.1	6.4	112	9.9	5.2	1083	1.68
Weed-free	-	0.00 (0.70)	0.00 (0.70)	6.1	9.5	195	13.5	5.4	1630	1.08
Polythene mulch	-	0.00 (0.70)	0.00 (0.70)	6.2	9.6	199	13.6	5.5	1668	1.23
Fluchloralin	0.70	110 (10.51)	88.2 (9.41)	4.6	7.6	139	11.2	5.3	1273	1.80
Isoproturon	1.00	128 (11.33)	93.1 (9.67)	4.5	7.3	130	11.1	5.4	1220	1.73
Pendimethalin	1.00	122 (11.06)	90.1 (9.51)	4.6	7.4	134	11.1	5.3	1245	1.75
Fluchloralin fb weeding 30 DAS	0.70	58 (7.64)	57.8 (7.63)	5.3	8.5	165	12.2	5.4	1437	1.83
Fluchloralin fb weeding 30 and 60 DAS	0.70	36 (6.04)	39.4 (6.31)	5.4	8.7	173	12.4	5.5	1500	1.67
Isoproturon fb weeding 30 DAS	1.00	68 (8.27)	60.6 (7.81)	5.1	8.2	160	12.2	5.4	1398	1.79
Isoproturon fb weeding 30 and 60 DAS	1.00	50 (7.10)	44.5 (6.70)	5.3	8.6	169	12.3	5.3	1476	1.65
Pendimethalin fb weeding 30 DAS	1.00	66 (8.15)	59.4 (7.73)	5.2	8.4	157	12.2	5.4	1418	1.80
Pendimethalin fb weeding 30 and 60 DAS	1.00	40 (6.36)	41.7 (6.49)	5.4	8.6	172	12.3	5.3	1481	1.64
LSD (P=0.05)	-	0.73	0.93	0.4	0.6	16	1.0	0.2	112	-

DAS–Days after sowing.
Figures in parentheses are the values transformed to $\sqrt{x+0.5}$ of actual values.

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