Evaluation different weed control methods in sunflower

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Weeds compete more during *Kharif* season. During *Kharif*, sowing is undertaken with commencement of monsoon. At the same time, number of weeds comes up simultaneously with the emergence of crop seeding. Unchecked weeds cause 33-63% losses in seed yield of sunflower (Saraswat *et al.* 2003). Recently some new low dose, high potent and broad spectrum herbicide like chlorimuron ethyl, imazethapyr and quizalofop ethyl have been developed and extensively used as pre and early post emergence in crops like soybean which is major *Kharif* oilseed crop. Information on the suitability of these herbicides in sunflower crop is lacking. Moreover, in situations where sunflower is raised in soybean based systems, sunflower response to the aforesaid recent herbicides needs to be ascertained.

METHODOLOGY

A field experiment on growth and yield of sunflower as influenced by chemical and non-chemicalweed management practices was carried out to study the weed control efficiency and the economic feasibility of chemical and non-chemical weed management and Integrated Weed Management practices at the farm of Agronomy Department, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola during the 2005-06 *Kharif* season. The experiment was laid out in Randomised Block Design with three replications and twelve treatments.

RESULTS

In the experimental field, predominant weed species were *Lagascea mollis*, *Euhorbia geniculate*, *Digera arvensis*, *Parthenium hysterophorus*, *Amaranthas viridis* among dicot weeds; *Commelina benghalensis*, *Echinochloa crusgalli*, *Cynodon dactylon* among grasses and sedge *Cyperrus rotundus*. Two hoeings and two hand weedingsrecorded lowest weed dry matter productionwhich was at par with application of imazethapyr PE 1 HW at 40 DAS 1 H + 1 HW at 20 DAS in paired row planting + green gram with straw retained as surface mulch after harvest, 1 H + 1 HW at 30 at DAS with crop residue as surface mulch and application of chlorimuron ethyl PE 75.0 t/ha *fb*1 H + 1HW at 40 DAS followed by application of pendimethalin PRE 1.0 kg t/ha *fb* 1 HW + 9.0 t/ha *fb* 1 H + 1 HW 40 at DAS. Two hoeings + two hand weedings recorded over all maximum weed control efficiency. However, season long suppression of weeds was found with non-chemical weed management through 1 Hoeing + 1 Hand weeding 20 DAS in paired row planting + smoother intercrop (green gram) with straw retained as surface mulch after harvest (Table 1).

Two hoeings + two hand weedings recorded significantly highest seed yield (0.91 t/ha) which was statistically equivalent to non-chemical treatments 1 H + 1 HW at 30 DAS with mulching of weed biomass and 1 H + 1 HW at 20 DAS in paired row planting + green gram with straw retained as surface mulch after harvest. However, it was at par with application of pendimethalin PRE 1.0 kg/ha *fb* 1 H + 1 HW at 40 DAS and non-chemical weed management treatment1 H + 1 HW at 20 DAS in paired row planting + green gram with straw retained as surface mulch after harvest. Additional 0.18 t/ha grain yield of green gram obtained from non-chemical weed management through 1 Hoeing + 1Hand weeding at 20 DAS in paired row planting + smoother intercrop (green gram) with straw retained as surface mulch after harvest due to which it recorded highest GMR (‘. 18033/ha) and net profit (‘10306 /ha) followed 2 H + 2 Hand weeding at 20 and 40 DAS, imazethapyr PRE 75.0 t/ha *fb*1 H + 1 HW 40 DAS and 1 H + 1 HW at 30 DAS with crop residue as surface mulch. The results are in conformity with Anonymous, (2005) in cotton crop.

Table 1. Weed index, Weed control efficiency, yield of sunflower and benefit cost ratio as influenced by different weed control treatments.

Treatment	Weed Dry weight gm^{-2} at harvest	WI (%)	WCE (%)	Seed yield (qha^{-1})	GMR (`.ha^{-1})	NMR (`.ha^{-1})	B:C ratio
T1-Weedy check	340.8	59.52	-	3.72	6995	1464	1.26
T2-Pendimethalin PRE 1.0 kg ha^{-1}	143.5	34.05	57.89	6.06	10909	3791	1.53
T3-Imazethapyr PRE 75.0 g ha^{-1}	148.1	37.54	57.53	5.74	10443	3309	1.46
T4-Chlorimuron ethyl PRE 9.0 g ha^{-1}	160.0	52.44	53.05	4.37	8060	1561	1.24
T5-Pendimethalin PRE 1.0 kg ha^{-1} fb1 H + 1HW 40 DAS	60.0	14.36	82.39	7.87	14031	5779	1.70
T6-Imazethapyr PRE 75.0 g ha^{-1} *fb*1 H + 1HW 40 DAS	47.3	7.72	86.12	8.48	15065	6797	1.82
T7-Chlorimuron ethyl PRE 9.0 g ha^{-1} *fb*1 H + 1HW 40 DAS	67.7	41.24	80.13	5.40	9731	2098	1.27
T8-Quizalofop-p-ethyl POE 50.0 g ha^{-1} 20 DAS *fb*1 H + 1HW 40 DAS	97.0	27.85	71.54	6.63	11934	3741	1.45
T9-1 H + 1HW 30 DAS with mulching of weed biomass	79.7	17.19	76.62	7.61	13517	6382	1.89
T10-1 H + 1HW 30 DAS with crop residue as surface mulch	71.3	11.09	79.06	8.17	14500	6647	1.84
T11-1 H + 1HW 20 DAS in paired row planting + green gram with straw retained as surface mulch after harvest	61.5	23.39	81.95	7.04	18033	10306	2.33
T12- 2 H + 2 Hand weeding at 20 and 40 DAS	33.6	--	90.12	9.19	16158	8359	2.07
SE (m)±	0.35			0.51			
CD (P=0.05)	1.04			1.52			

CONCLUSION

Two hoeings + two hand weedings recorded over all maximum weed control efficiency and highest seed yield (0.91 t/ha). However, season long suppression of weeds was found with non-chemical weed management through 1 Hoeing + 1 Hand weeding at 20 DAS in paired row planting + smoother intercrop (green gram) with straw retained as surface mulch after harvest. Efficiency and increased GMR (‘ 18033 /ha) and NMR (‘10306 /ha) through bonus intercrop yield caused higher benefit cost ratio (2.33).

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