

Short Communication

Weed Management in Blond Psyllium (*Plantago ovata* Forsk.)

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Seed husk of blond psyllium (*Plantago ovata* Forsk.) has medicinal value in treating intestinal disorders (Maheshwari and Singh, 1965). India is annually earning Rs. 685.5 million as foreign exchange through export of various products of blond psyllium (Gupta and Chadha, 1995). Due to low cost of production and higher returns, the area under this crop is increasing rapidly in western Rajasthan. But its productivity (426 kg ha^{-1}) is very low (Anonymous, 1996). It is a short statured, slow-growing crop in initial stage, hence the crop faces severe competition with weeds, resulting in poor yields. An attempt was made to study the effect of pre and post-emergence application of various doses of isoproturon in controlling weeds in blond psyllium crop.

The experiment was conducted at Agricultural Research Station, Mandore, during winter seasons of 1995-96 and 1996-97. The soil was loamy sand, having pH 8.2, low in organic carbon (0.30%) and available nitrogen (146.3 kg ha^{-1}), medium in available phosphorus (22.0 kg ha^{-1}) and high in available potassium (390 kg ha^{-1}). Nine treatments viz., weedy check, hand weeding 30 days after sowing, hand weeding 30 and 50 days after sowing, isoproturon pre-emergence @ 0.3 kg ha^{-1} , isoproturon pre-emergence @ 0.6 kg ha^{-1} , isoproturon

pre-emergence @ 0.9 kg ha^{-1} , isoproturon post-emergence 25 DAS @ 0.3 kg ha^{-1} , isoproturon post-emergence 25 DAS @ 0.6 kg ha^{-1} and isoproturon post-emergence 25 DAS @ 0.90 kg ha^{-1} were replicated three times in randomized block design. Half dose of N (10 kg ha^{-1}) and full doses of phosphorus (20 kg ha^{-1}) were drilled at the time of sowing and remaining half dose of N was top dressed 30 days after sowing. The crop was sown on 23 November in 1995 and 17 November in 1996. Variety GI-2 was sown in shallow furrows @ $6 \text{ kg seed ha}^{-1}$, covered with a thin layer of soil with the help of brushwood, followed by irrigation. One light irrigation was applied 6 days after sowing. Thereafter, irrigations were applied at 30, 55 and 75 days after sowing, coinciding with tillering, flowering and seed formation stages of crop. The crop was thinned 20 days after sowing, to maintain plant-to-plant distance of 5 to 7 cm. Dimecron @ 0.5 ml L^{-1} and dithane M-45 @ 2 g L^{-1} were sprayed at post-flowering stage to check infestation of aphids and downy mildew during both the years of study. The crop was harvested on 25 March in 1996 and on 22 March in 1997.

The predominant weeds were lambs quarter (*Chenopodium album* L.), goose

Table 1. Growth, yield attributes and seed yield of blond psyllium as affected by weed control treatments (Pooled data of 2 years)

Treatment	Plant number (000, ha ⁻¹)	Plant height at harvest (cm)	Primary branches plant ⁻¹	Spikes plant ⁻¹	Spike length (cm)	1000-seed weight (g)	Seed yield (kg ha ⁻¹)
Weedy check	157	28.5	4.1	15.5	3.70	1.659	606
One hand weeding 30 DAS	275	33.2	4.7	25.7	4.25	1.732	1049
Two hand weedings 30 & 50 DAS	300	33.5	5.1	32.6	4.45	1.796	1417
Isoproturon @ 0.3 kg ha ⁻¹ pre*	277	32.5	4.4	28.0	4.00	1.757	1121
Isoproturon @ 0.6 kg ha ⁻¹ pre	300	34.0	5.0	32.7	4.51	1.802	1432
Isoproturon @ 0.9 kg ha ⁻¹ pre	299	33.3	5.0	32.7	4.51	1.802	1432
Isoproturon @ 0.3 kg ha ⁻¹ post**	284	33.1	4.6	29.8	4.15	1.778	1288
Isoproturon @ 0.6 kg ha ⁻¹ post	300	33.2	5.0	33.4	4.35	1.805	1475
Isoproturon @ 0.9 kg ha ⁻¹ post	301	33.7	4.8	30.2	4.20	1.790	1392
SEm±	6	1.0	0.1	0.9	0.7	0.010	70
CD at 5%	18	3.02	0.30	2.75	0.20	0.030	208

*Pre-emergence, **Post-emergence.

foot (*Chenopodium murale* L.), bermuda grass (*Cynodon dactylon* (L) Pers.), sweet clover (*Melilotus indica* L.), fumitory (*Fumaria parviflora* Lam.) and corn spurry (*Spergula arvensis* L.). Weed control efficiency was worked out following Mani *et al.* (1973).

In weedy check, weeds flourished well and did not allow the blond psyllium crop to establish, resulting in significant reduction in final plant stand. Singh and Chauhan (1994) and Singh (1997) reported similar results. The effect of pre and post-emergence applications of isoproturon (0.6 kg ha⁻¹) were statistically at par, but significantly increased seed yield of blond psyllium over the weedy check (Table 1). Both these treatments were at par with two manual weedings at 30 and 50 days after sowing where the blond psyllium produced the seed yield of 1417 kg ha⁻¹. The growth

and yield attributes of the crop exhibited similar trend. Compared with the weedy check, pre and post-emergence applications of isoproturon @ 0.6 kg ha⁻¹ significantly increased the harvest index by 4.90 and 6.10%, respectively. Isoproturon proved to be more effective than manual weeding at 30 and 50 days after sowing due to lower cost and higher net returns (Table 2). Higher seed yield of blond psyllium was due to better expression of growth and yield attributes under longer weed-free condition that prevailed with the use of pre and post-emergence applications of isoproturon. Patel and Mehta (1990) and Singh and Chauhan (1994) reported similar results. The seed yield of blond psyllium and weed control efficiency declined significantly by 311 kg ha⁻¹ and 33.1%, respectively, when the dose of isoproturon (pre-emergence) was reduced from 0.6 to

Table 2. Stover yield, harvest index, weed dry matter, net return and weed control efficiency of blond psyllium as influenced by weed control treatments (pooled data of 2 years)

Treatment	Weed control efficiency (%)	Weed dry matter at harvest (kg ha ⁻¹)	Stover yield (kg ha ⁻¹)	Harvest index (%)	Net return* (Rs. ha ⁻¹)
Weedy check	—	2808	1770	24.75	6820
One hand weeding 30 DAS	62.6	1051	2840	26.80	14980
Two hand weeding 30 & 50 DAS	87.5	350	3389	28.85	21640
Isoproturon @ 0.3 kg ha ⁻¹ pre*	35.5	1811	2823	28.05	16898
Isoproturon @ 0.6 kg ha ⁻¹ pre	68.6	882	3360	29.65	22966
Isoproturon @ 0.9 kg ha ⁻¹ pre	75.0	703	3339	29.60	22674
Isoproturon @ 0.3 kg ha ⁻¹ post**	60.4	1111	3059	29.15	20238
Isoproturon @ 0.6 kg ha ⁻¹ post	75.5	687	3247	30.85	23826
Isoproturon @ 0.9 kg ha ⁻¹ post	86.6	376	3275	29.50	22014
SEm±	—	103	143	0.65	—
CD at 5%	—	305	430	2.00	—

*Cost of cultivation of blond psyllium Rs. 5300.00 ha⁻¹, Sale rate of blond psyllium Rs. 20.00 kg⁻¹.

0.3 kg ha⁻¹. Similar situation was also observed under post-emergence application of isoproturon. It was due to reduction in dose of isoproturon from 0.6 to 0.3 kg (pre and post) there was a significant increase in the dry matter of weeds. It indicates that crop-weed competition prevailed in these treatments. However, with the increase in dose of isoproturon from 0.6 to 0.9 kg ha⁻¹ (pre and post) the yield attributes, seed yield and harvest index remained unaffected. The highest net return of Rs. 23,826 ha⁻¹ was achieved with the use of isoproturon @ 0.6 kg ha⁻¹ applied 25 days after sowing.

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