

SHORT COMMUNICATION

## Chemical Weed Control in Field Peas (*Pisum sativum* L.)

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### ABSTRACT

Rainfed field experiments on field pea (Variety T-163) were conducted at the Assam Agricultural University Farm, Jorhat in seasons Rabi 1983, 84 and 85 to compare efficacy of benthio carb[S-(4-Chlorobenzyl)-N, N-diethylthiocarbamate], fluchloralin[N-Propyl-N (2, chloroethyl-2, 6-dinitro-n-trifluoromethyl aniline)] and metolachlor (2-ethyl-6 methyl N-(2 methoxy-1-methyl-ethyl) (chloro-acetanilide) with hand weeding.

*Polygonum hydropiper*, *Oldenlandia diffusa*, *Chenopodium album*, *Setaria glauca* and *Paspalum conjugatum* were the dominant weeds. Fluchloralin at the rate of 1.5 and 1.0 kg ai/ha and metolachlor at the rate of 2.0 kg ai/ha gave yield comparable to hand weeding at 20 and 40 days after seeding (1156 kg/ha). The grain yield loss due to weeds was 43 percent. Fluchloralin at 1.0 kg ai/ha gave the highest return per rupee invested (Rs.4.47) as compared to Rs.3.35 in hand weeding.

### INTRODUCTION

Weeds are a serious problem in field peas and minimize yield. Reduction to the

extent of 32.9 percent was reported by Mani *et al* (1968). Manual weeding is the common practice to control weeds in this crop. This has to be repeated more than once to obtain good yield. Moreover, non-availability of labour at the opportune time as well as increasing labour wages warrant the search for an alternative, cheaper and less laborious weed control measures.

### MATERIALS AND METHODS

Rain-fed field experiments were conducted at the Assam Agricultural University Farm, Jorhat, during Rabi season of 1983-84 and 85 in randomized blocks. Sandy loam soil with high available potash (43.32 kg/ha) and of pH 4.8 was used. On the average (of years), 113 mm of rain was received during the crop period.

Seeds of pea variety 'T-163' inoculated with *rhizobium* culture were seeded in rows 30 cm apart. Fertilizer at the rate of 15-25-0 NPK kg/ha was used as basal. Benthio carb, fluchloralin and metolachlor at the rates of 1.0 and 1.5 kg ai/ha; (Pre-emergence) oxadiazon at the rate of 0.5 and 1.0 kg ai/ha (Pre-emergence) and bentazon at the rate of 0.5 and 1.0 kg ai/ha (Post emergence) were compared with hand weeding 20 and 40 days after seeding (DAS) and weedy check. Pre-emergence application of herbicides were conducted 1 DAS and the Post-emergence herbicide was applied 25 DAS. Due to their non-availability, oxadiazon and bentazon treatments were deleted in 1984 and 85

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experiments.

Weeds were sampled from two (50 x 50 cm) quadrats in each treatment 55 DAS. These were pooled, counted species-wise and oven dried for dry weight.

## RESULTS AND DISCUSSION

The weed flora of the experimental area consisted of *Polygonum hydropiper*, *Paspalum conjugatum*, *Setaria glauca*, *Cynodon dactylon*, *Oldenlandia diffusa*, *Chenopodium album*, *Ageratum conyzoides*, *Nasturtium indicum* and *Centella asiatica*. Of these *O. diffusa*, and *C. album* in the first year (comprising 67 percent of the total); *P. hydropiper* and *S. glauca* in the second year (comprising 67 percent of the total); and *P. hydropiper* and *Paspalum conjugatum* (comprising 93 percent of the total) in the third year were the most dominant weeds.

All the herbicide treatments significantly reduced the weed population and dry weight as compared to control. Fluchloralin (1.5 kg ai/ha) in the first and third year; and benthocarb (1.5 kg ai/ha) and metolachlor (2.0 kg ai/ha) in second and third year were as effective as hand weeding in reducing weed population and dry weight.

Yield data pooled for third year (Table 1) revealed that the highest grain yield of pea (1156 kg/ha) was obtained with hand weeding and was comparable to fluchloralin (1.5 and 1.0 kg ai/ha) and metolachlor (2.0 kg ai/ha) treatments. The percentage increase in yield in these herbicide treatments over control was 69.27, 58.56 and 53.36, respectively. The yield loss due

to weeds was 43.42 percent. Higher yield associated with the herbicide treatments was due to satisfactory weed control obtained. Efficacy of fluchloralin in controlling the weeds and increasing yield of pea was also reported by Bhalla and Chourasia (1982) and Rathi *et al.* (1982).

From the economic view point, fluchloralin at the rate of 1.0 kg ai/ha was the most remunerative with the highest return (Rs. 4.50) per rupee invested (Table 2), followed by the treatment benthocarb at the rate of 2.0 kg ai/ha. Though hand weeding produced the highest yield, it could not bring about higher profit because of the high labour wages (Rs. 15.00/days). Although benthocarb treatment (2.0 kg ai/ha) produced lower yield as compared to fluchloralin (1.5 kg ai/ha) and Metolachlor (2.0 kg ai/ha), Yet this treatment resulted in comparatively higher net return because of the lower cost of the herbicide.

## REFERENCES

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Table 1 Weed count, weed dry weight and grain yield of pea as influenced by weed control treatments.

Treatments	Rate kg/ha	Time of applica- tion DAS	Weed count/m <sup>2</sup>			Weed dry wt. (g/m <sup>2</sup> )			Grain yield (kg/ha)			Pooled
			1983-84	84-85	85-86	83-84	84-85	85-86	83-84	84-85	85-86	
Benthiocarb	1.0	1	146	65	81	112	95	61	621	956	954	810
Benthiocarb	1.5	1	79	45	49	101	90	47	675	997	1193	921
Fluchloralin	1.0	1	59	72	51	54	102	46	1081	947	1084	1037
Fluchloralin	1.5	1	40	61	49	53	105	41	1140	987	1195	1107
Metolachlor	1.5	1	180	51	69	120	83	54	471	1004	952	809
Metolachlor	2.0	1	137	37	47	77	70	46	635	1145	1229	1003
Oxadiazon	0.5	1	52	-	-	52	-	-	1177	-	-	-
Oxadiazon	1.0	1	51	-	-	48	-	-	1170	-	-	-
Bentazon	0.5	20	169	-	-	65	-	-	963	-	-	-
Bentazon	1.0	20	96	-	-	72	-	-	965	-	-	-
Hand-weeding	-	20, 8, 40	52	37	53	47	59	42	1196	1069	1203	1156
Weedy-check	-	-	165	104	100	138	244	69	416	715	829	654
SE, d	+ / -		10	9	8	30	1714	663	83	52	83	138
CD (0.05)			21	18	16	564	3602	1392	175	111	175	295

Table 2. Economics of weed control treatments,

Treatment	Grain yield (kg/ha)	Yield increase over control (kg/ha)	Additional return due to treatment (Rs)*	Cost due to treatment (Rs)**	Cost/benefit ratio
Benthiocarb 1.0 kg/ha	810	156	780	209	1:3.73
Benthiocarb 1.5 kg/ha	921	267	1335	298	1:4.47
Fluchloralin 1.0 kg/ha	1037	383	1915	425	1:4.50
Fluchloralin 1.5 kg/ha	1107	453	2265	623	1:3.64
Metolachlor 1.5 kg/ha	809	155	775	NA	—
Metolachlor 2.0 kg/ha	1003	349	1745	NA	—
Hand-weeding (20 x 40 DAS)	1156	502	2510	750	1:3.35
Weedy check	654	—	—	—	—

NA — Price of the herbicide not available

\*Price of pea seeds - Rs.500.00 per 100 kg

Cost of fluchloralin (as Basalin 50 EC) - Rs.190/l

Cost of bethiocarb (as saturn 50EC) - Rs.89.50/l

Cost of manual labour - Rs.15.00/day

Assistance provided by the staff  
of  
*Weed Science Programme, NARC, Islamabad*  
particularly Mrs Shahida Khalid, Mr. Abdul  
Ghafoor, Mr. Sadarudin, Mr. Altaf Sher and  
Mr. Karimullah Beg, in publishing this issue is  
acknowledged with appreciation.

Chief Editor