

## Herbicidal Control of Weeds in Coriander (*Coriandrum sativum*) with Special Reference to *Coronopus didymus*

A. N. Tewari, S. N. Tiwari, A. K. Tripathi and S. K. Singh

Department of Agronomy

C. S. Azad University of Agriculture & Technology, Kanpur-208 002 (U. P.), India

### ABSTRACT

Pre-emergence application of pendimethalin at 1.0 kg ha<sup>-1</sup> and pretilachlor at 1.5 kg ha<sup>-1</sup> was very effective in controlling associated weeds especially *Coronopus didymus* and registered 54.6 and 50.7% increased seed yield of coriander and fetched net monetary return of Rs. 17,999 and 17,051 ha<sup>-1</sup>, respectively. Allowing weed growth throughout crop period registered 45.8% reduction in seed yield compared to manual weeding twice at 20 and 40 DAS.

### INTRODUCTION

Weeds are great problem in coriander crop. Infestation of weeds especially *Coronopus didymus* occurs heavily and offers severe competition for available resources. In fact, *C. didymus* mimics with coriander crop and hence escapes easily during manual weeding operation. The seed yields have been found to be reduced to the extent of 72.8-74.6% depending upon the intensity and types of weed flora (Thakral *et al.*, 1989). This warrants developing an effective and economical weed control schedule for this crop involving the use of selective herbicide.

### MATERIALS AND METHODS

Efficacy of metolachlor at 1.5 kg ha<sup>-1</sup>, pretilachlor at 1.5 kg ha<sup>-1</sup>, pendimethalin at 1.0 kg ha<sup>-1</sup> and oxyfluorfen at 0.10 kg ha<sup>-1</sup> was compared with untreated, weeding at 20 days and weeding at 20 and 40 days after sowing in a four replicated randomized block design for two consecutive years (1998-99 and 1999-2000) at Students' Instructional Farm of this University. The soil was sandy loam in texture with slightly alkaline in reaction, low in organic carbon and medium in available phosphorus and potassium. The crop was sown at a row spacing of 30 cm during second week of November and harvested during last week of March during both the years. 'Azad Dhan-1'—a cultivar maturing

within 120-125 days was used in this experiment. Application of 30 kg N, 30 kg P<sub>2</sub>O<sub>5</sub> and 30 kg K<sub>2</sub>O ha<sup>-1</sup> was done basally and remaining 30 kg N ha<sup>-1</sup> was top-dressed. Herbicides were applied second day after sowing as pre-emergence at a spray volume of 800 l ha<sup>-1</sup>. In all, two irrigations were given. Weed species population, their dry matter accumulations and finally seed yields were recorded. The economic viability of the treatments was worked out keeping in view the cost of herbicides and current selling price of produce.

### RESULTS AND DISCUSSION

#### Effect on Weeds

On an average, experimental field was infested with *C. didymus* (63.6%), *Chenopodium album* (18.4%), *Anagallis arvensis* (11.9%), *Melilotus alba* (3.4%) and *Phalaris minor* (2.6%) during both the years (Table 1). Incidence of *P. minor* and *M. alba* was found quite low. Pretilachlor at 1.5 kg ha<sup>-1</sup> and pendimethalin at 1.0 kg ha<sup>-1</sup> demonstrated effective mortality of *C. didymus* (35.5 and 69.1%). Pendimethalin was found very effective against *C. album* showing 96.5% control. The overall weed control efficiency varied from 41-50% due to application of pretilachlor, pendimethalin and metolachlor. Chaudhary (2000) also reported acceptable effectiveness of pendimethalin (77-84%

Table 1. Weed density m<sup>-2</sup> and dry matter of weeds under different treatments

Treatment	1998-99					1999-2000						
	C. <i>album</i>	C. <i>didymus</i>	A. <i>arvensis</i>	M. <i>alba</i>	P. <i>minor</i>	Dry matter of weeds (g m <sup>-2</sup> )	C <i>album</i>	C <i>didymus</i>	A. <i>arvensis</i>	M. <i>alba</i>	P. <i>minor</i>	Dry matter of weeds (g m <sup>-2</sup> )
Unweeded	9.74 (94)	34.43 (1185)	12.11 (146)	4.14 (17)	4.35 (18)	181.4	17.07 (291)	21.00 (441)	11.57 (133)	7.36 (54)	6.28 (39)	253.7
Weeding 20 DAS	8.74 (76)	31.45 (989)	9.05 (81)	4.14 (17)	3.41 (11)	144.4	2.46 (5)	7.11 (50)	5.97 (35)	1.51 (2)	0.71 (0)	140.7
Weeding 20 and 40 DAS	4.77 (22)	25.58 (654)	3.41 (11)	2.46 (5)	0.65 (113)	66.7	2.04 (4)	4.96 (24)	5.48 (29)	1.51 (2)	0.71 (0)	75.9
Metolachlor 1.5 kg ha <sup>-1</sup>	4.96 (24)	27.05 (731)	7.73 (59)	2.80 (7)	3.4 (11)	109.2	7.96 (63)	16.3 (267)	4.77 (22)	3.91 (15)	2.46 (5)	124.0
Pretilachlor 1.5 kg ha <sup>-1</sup>	5.82 (33)	18.01 (324)	4.35 (18)	1.51 (2)	2.04 (4)	98.1	8.74 (76)	13.63 (185)	5.48 (29)	3.41 (11)	4.35 (18)	118.4
Pendimethalin 1.0 kg ha <sup>-1</sup>	4.36 (18)	29.51 (870)	0.71 (0)	2.46 (5)	1.51 (2)	88.9	0.71 (0)	12.27 (150)	2.79 (7)	0.71 (0)	0.71 (0)	96.2
Oxyfluorfen 0.10 kg ha <sup>-1</sup>	6.84 (46)	20.74 (429)	10.72 (114)	2.46 (5)	3.12 (9)	122.2	12.19 (148)	13.76 (189)	6.70 (44)	2.80 (7)	3.41 (11)	135.1
LSD (P=0.05)	1.12	5.54	1.53	NS	2.38	30.4	1.97	1.59	3.81	1.39	1.90	21.8

Original values in parentheses were transformed to  $\sqrt{x+0.5}$ .

Table 2. Seed yield and net income due to weed control received under different treatments

Treatment	Seed yield (kg ha <sup>-1</sup> )			Additional income over unweeded (Rs. ha <sup>-1</sup> )	Cost of treatment (Rs. ha <sup>-1</sup> )	Net income due to weed control (Rs. ha <sup>-1</sup> )
	1998-99	1999-2000	Mean			
Unweeded	1904	979	1441.5	-	-	-
Weeding at 20 DAS	3439	1719	2079.0	15,937	1,740	14,197
Weeding at 20 and 40 DAS	3400	1917	2658.5	30,400	2,900	27,500
Metolachlor 1.5 kg ha <sup>-1</sup>	2796	1501	2148.5	17,675	1,959	15,716
Pretilachlor 1.5 kg ha <sup>-1</sup>	2825	1521	2173.0	18,275	1,224	17,051
Pendimethalin 1.0 kg ha <sup>-1</sup>	2857	1600	2228.5	19,675	1,676	17,999
Oxyfluorfen 0.10 kg ha <sup>-1</sup>	2500	1336	1918.0	11,900	1,044	10,856
LSD (P = 0.05)	645	249	-	-	-	-

Rate : Metolachlor-Rs. 595 l<sup>-1</sup>, Pretilachlor-Rs. 350 l<sup>-1</sup>, Pendimethalin-Rs. 490 l<sup>-1</sup>, Oxyfluorfen-Rs. 2000 l<sup>-1</sup>, Selling price of coriander-Rs. 25 kg<sup>-1</sup>.

WCE) in coriander. Manual weeding once was found ineffective against *C. didymus* as this weed emerged in different flushes. Weeding twice done at 20 and 40 DAS brought about 67% weed control efficiency.

#### Effect on Crop

Effect of the weed control treatments was found significant on seed yield of coriander (Table 2). Allowing weed growth registered 45.8% reduction in seed yield of coriander. The highest seed yield was obtained when weeding was done twice (2658 kg ha<sup>-1</sup>). Among herbicides, pretilachlor and pendimethalin recorded 50.7 and 54.6% increased seed yield over unweeded. No significant

variations could be visualized due to application of herbicides and weeding once done at 20 DAS with regard to seed yield of coriander. The highest net monetary return was received through the use of pendimethalin (Rs. 17,999 ha<sup>-1</sup>) followed by pretilachlor (Rs. 17,051 ha<sup>-1</sup>).

#### REFERENCES

- Chaudhary, G. R. 2000. Weed management in coriander (*Coriandrum sativum*). *Indian J. agric. Sci.* **70** : 603-605.
- Thakral, K. K., S. C. Khurana and U. K. Srivastava, 1989. Evaluation of herbicides in coriander seed crop. In : Proc. First National Seminar on Seed Spices, Jaipur, Rajasthan, 24-25 October. pp. 82-83.