

Dry-matter accumulation and nitrogen uptake in cumin (*Cuminum cyminum*) as affected by weed control and time of N application

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A field experiment was conducted during the winter (*rabi*) season of 1991–92 at Jobner (Rajasthan), to study the effect of weed control and time of nitrogen application on weed biomass, dry-matter accumulation of cumin (*Cuminum cyminum* L.), N depletion by weeds and N uptake by crop. The experiment comprised 6 weed-control treatments (weedy check, metolachlor @ 0.5 and 1.0 kg/ha, oxyfluorfen @ 0.15 and 0.30 kg/ha and hand-weeding twice) and 3 times of application of 30 kg N/ha (full basal, full top-dressed 30 days after sowing and half basal + half at 30 days after sowing, replicated thrice in randomized block design. The soil was loamy sand with pH 8.5, organic carbon 0.23%, available N 128 kg/ha, available P₂O₅ 17 kg/ha and K₂O 147 kg/ha. Cumin cv. 'RZ 19' was sown in lines 30 cm apart. Metolachlor and oxyfluorfen were applied as pre-emergence. Hand-weeding was done 20 and 50 days after sowing. Nitrogen

Table 1. Dry-matter accumulation and N uptake by weeds and crop and net returns as affected by weed-control treatments and time of N application in cumin

Treatment	Dry-matter accumulation (g/m ²)		N uptake (kg/ha)		Net returns (Rs/ha)
	Weed	Crop	Weeds	Crop	
<i>Weed control</i>					
Weedy check	247.6	49.6	43.4	9.4	12,863
Metolachlor 0.5 kg/ha	238.5	74.4	42.0	12.1	17,087
Metolachlor 1.0 kg/ha	234.4	77.5	36.2	12.8	17,807
Oxyfluorfen 0.15 kg/ha	20.9	83.3	3.9	15.6	22,527
Oxyfluorfen 0.30 kg/ha	13.5	81.9	2.6	15.3	21,757
Hand-weeding	56.2	86.2	11.2	16.5	23,543
CD (P = 0.05)	4.1	4.7	1.6	0.8	
<i>Time of N application</i>					
All basal	124.0	74.1	22.5	13.2	18,719
All at 30 days*	135.3	75.3	23.0	13.6	19,139
½ basal + ½ at 30 days*	136.3	77.1	24.1	14.1	19,865
CD (P = 0.05)	NS	NS	1.1	0.6	

*Days after sowing

was applied as per treatment through urea.

The dominant weed flora in the experimental field consisted of *Chenopodium album* L., *Chenopodium murale* L., *Cynodon dactylon* (L.) Pers., *Cyperus rotundus* L., *Melilotus alba* Desr., *Argemone mexicana* L., *Asphodelus tenuifolius* Cavan and *Plantago pumila* Willd.

All the weed-control treatments were effective in controlling weeds, but differed in their extent of damage (Table 1). Hand-weeding twice 20 and 50 days after sowing caused significant reduction in dry matter of weeds and provided congenial conditions for the growth of crop plants. Oxyfluorfen at both the levels markedly reduced the dry matter of weeds; however, higher dose proved best among all the treatments in suppressing the weed growth.

Hand-weeding and oxyfluorfen at both levels being at par resulted in significant increase in dry matter of crop compared with weedy check and metolachlor (0.5 kg/ha). Weed-control treatments provided competition-free environment for nutrients, moisture and light etc. to crop plants, resulting in better plant growth. The results confirm the findings of Choudhary (1986).

Time of N application had no effect on weed biomass and dry matter of crop. All

the weed-control treatments significantly reduced N removal by weeds compared with weedy check except metolachlor @ 0.5 kg/ha. Oxyfluorfen @ 0.30 kg/ha being at par with its lower dose caused maximum reduction in N removal by weeds. Similarly, all weed-control treatments significantly increased the N uptake by crop (Table 1). Hand-weeding, oxyfluorfen and metolachlor at both the rates resulted in significant increase in N uptake by crop. Hand-weeding gave the highest net return (Rs 23,543/ha), followed by oxyfluorfen @ 0.15 kg/ha (Rs 22,527/ha).

Application of 30 kg N/ha in 2 equal splits caused greater N depletion by weeds and higher N uptake by crop compared with its application as full basal (Table 1). The superiority of split application may be attributed to better N-use efficiency. The results confirm the findings of Mann (1980). Split application recorded the highest net returns of Rs 19,865.

REFERENCES

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