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Effect of weed control and time of nitrogen application in cumin (*Cuminum cyminum*)

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A field experiment was conducted during the winter season of 1991–92 at S K N College of Agriculture, Jobner (Rajasthan), to study the effect of weed control and time of N application in cumin (*Cuminum cyminum* L.). The treatments comprised 6 weed-control treatments (weedy check, metolachlor at 0.5 and 1.0 kg/ha, oxyfluorfen at 0.15 and 0.30 kg/ha and hand-weeding twice) and 3 times of application of 30 kg N/ha (at sowing, 30 days after sowing and half at sowing + 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%, and available N, P and K 128, 7.3 and 122.0 kg/ha respectively. Cumin cv. 'RZ 19' was sown in rows 30 cm apart on 4 December 1991. Metolachlor and oxyfluorfen were applied as pre-emergence. Hand-weedings were done at 20 and 50 days as per treatments.

The predominant weed species were *Chenopodium album* L., *Chenopodium murale* L., *Cynodon dactylon* (L.) Pers., *Cyperus rotundus* L., *Heliotropium ellipticum* L., *Melilotus alba,* Desr., *Argemone maxicana* L., *Plantago pumila* Wild. and *Asphodelus tenuifolius* Cavan.

Umbels/plant, umbellets/umbel, and seed and straw yields were significantly higher under all the weed-control treatments compared with weedy check (Table 1). However, umbels/plant and umbellets/umbel were not significantly affected by both the levels of metolachlor when compared with the weedy check. Hand-weedings significantly increased umbels/plant compared with other weed-control treatments. Oxyfluorfen at 0.5 kg/ha being at par with its higher level recorded more umbels/plant as compared to both the levels of metolachlor. Weed control could not affect 1,000-seed weight.

The maximum seed yield of 4.01 q/ha wasd obtained in twice hand-weeded plots, being 4.15 and 5.25% higher than oxyfluorfen at 0.15 and 0.30 kg/ha and 24.53 and 31.04% higher than metolachlor at 1.0 and 0.5 kg/ha respectively. Hand-weeding not ony reduced the extent of crop-weed competition but may have also improved the physical environment in rhizosphere and thus helped the plant to achieve good growth and ultimately higher yield. Among the herbicidal treatments, oxyfluorfen at 0.15 kg/ha was at par with its higher dose and recorded significantly higher seed yield being 25.8 and 19.6% higher than metolachlor at 0.5 and 1.0 kg/ha respectively. Hand weeding and oxyfluorfen at 0.15 and 0.30 kg/ha being at par also recorded higher straw yield than both the levels of metolachlor and the

Table 1. Effect of weed control and time of nitrogen application on yield attributes and yield

Treatment	Umbels/ plant	Umbellets/ umbel	1,000-seed weight (g)	Seed yield (q/ha)	Straw yield (q/ha)
Weed control					
Weedy check	6.89	4.50	3.54	2.39	3.17
Metolachlor at 0.5 kg/ha	6.93	4.57	3.65	3.06	3.84
Metolachlor at 1.0 kg/ha	6.95	4.73	3.75	3.22	4.03
Oxyfluorfen at 0.15 kg/ha	7.31	5.54	3.95	3.85	4.63
Oxyfluorfen at 0.30 kg/ha	7.24	5.38	3.83	3.81	4.59
Hand-weeding 20 and 50 DAS	8.05	5.80	3.96	4.01	4.78
CD (P = 0.05)	0.35	0.28	NS	0.14	0.46
Time of N application					
At sowing	7.20	4.88	3.77	3.31	4.09
30 DAS	7.23	5.11	3.71	3.37	4.16
1/2 at sowing + 1/2 at 30 DAS	7.26	5.26	3.86	3.48	4.28
CD (P = 0.05)	NS	0.20	NS	0.10	NS

*Days after sowing

weedy check. The increase in seed and straw yields by weed control might be attributed to reduced crop–weed competition for growth resources like nutrients, moisture, light and others. Similar increase in yield attributes and yield in cumin by weed control were also reported by Choudhary (1986) and Singh (1986).

Application of 30 kg N/ha in 2 splits (at sowing and 30 days after sowing and full dose 30 days) being at par recorded more umbellets/umbel than full dose at sowing. Umbels/plant and 1,000-seed weight, however, remained unaffected by time of N application. Split application of N increased the seed yield by 4.9 and 3.3% over single application of N at sowing and 30 days after sowing respectively. This might be attributed to better N-use efficiency in split application of N. Similar results were also reported by Mann (1980).

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