

Effect of methods of sowing and weed management on yield of chicory (*Cichorium intybus*)

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A field experiment was conducted during winter season of 1992–93 to study the effect of methods of sowing and weed management on weed control and root yield of chicory (*Cichorium intybus* L.) at Anand. The soil was loamy sand. Nine treatments comprised 2 herbicides (trifluralin @ 0.5 kg/ha and pendimethalin @ 0.5 kg/ha both as pre-emergence), 2 conventional weeding treatments (hand-weeding at 30 days after sowing and 2 hand-weedings at 30 and 60 days), 2 methods of sowing (line sowing by seed drill and shallow sowing through furrow opened by *kudali*, each at 20 and 30 cm width) along with unweeded control, were tried in randomized block design with 3 replications. Chicory cv. 'Rexor' was sown on 20 November 1992 and harvested on 17 April 1993. The crop was uniformly fertilized with 100 kg N + 50 kg P₂O₅ + 50 kg K₂O/ha as basal application in the form of urea, single superphosphate and muriate of potash respectively. The crop was irrigated 5 times during the crop season. Species-wise weed density was recorded using 0.25 m² quadrat from randomly selected 2 spots in a plot at 60 days. However, predominant weeds counted separately. In hand-weeding, the count was taken just before the operation and subsequently the dry weight was recorded.

Though the weed-management treatments barring unweeded control did not differ significantly among themselves; however, proved superior to the unweeded control for weed density (at 60 days). The dry weight of weeds was influenced significantly by different treatments. Methods of sowing treatments and 2 hand-weeding treatments proved effective in reducing dry weight of weeds. Though the herbicides and 1 hand-weeding treatments significantly reduced the dry weight of weeds compared with the unweeded control, these did not show superiority to methods of sowing treatment and 2 hand-weedings (broadcast sown). Both the herbicides found more or less equally effective in controlling *Chenopodium album* L., *Digitaria sanguinalis* (L.) Scop. and *Eragrostis cilianensis* (All.) Link compared the unweeded treatment. Both herbicides significantly reduced the weed density compared with the unweeded control. Patel and Upadhyay (1989) noted the effectiveness of pendimethalin in reducing the weed density throughout the growth period of chicory. Significant differences were observed in fresh as well as dry weight of chicory roots due to different treatments. Significantly highest yields of chicory (20,648 kg fresh and 4,750 kg dry roots/ha) were recorded with 2 hand-weedings when compared with

Table 1. Effect of method of sowing and weed management on weed density at 60 days after sowing on dry weight of weeds and yield of chicory

Treatment	Weed density (60 DAS) 0.5/m ²		Dry weight of weeds (60 DAS) (g)		Species-wise weed density						Chicory yield (kg/ha)	
					<i>Chenopodium album</i>		<i>Digitaria sanguinalis</i>		<i>Eragrotis cilianensis</i>		Fresh root	Dry root
	√ X	Retr.	Log √ X	Retr.	√ X	Retr.	√ X	Retr.	√ X	Retr.		
Trifluralin @ 0.5 kg/ha as pre-em.	5.53	31.58	1.46	29.04	2.04	4.16	1.28	1.64	1.00	1.00	15,185	3,486
Pendimethalin 0.5 kg/ha as pre-em.	5.14	26.42	1.64	43.35	2.43	5.90	1.28	1.64	1.00	1.00	19,167	4,597
1 hand-weeding (30 DAS)	5.66	32.26	1.65	44.98	1.63	2.66	2.94	8.64	1.61	2.59	14,815	3,551
2 hand-weedings (30 and 60 DAS)	5.81	33.76	1.26	18.37	1.90	3.61	2.70	7.29	1.69	2.86	20,648	4,750
Line sowing by drill 30 cm (HW + IC)	4.39	19.27	1.16	14.42	1.00	1.00	1.52	4.10	1.00	1.00	17,315	3,981
Line sowing by drill 20 cm (HW + IC)	5.16	26.63	1.29	19.32	1.99	3.96	1.88	3.53	1.52	2.31	12,222	2,931
Shallow sowing by hand 30 cm (HW + IC)	4.63	21.44	1.34	21.88	1.41	1.99	1.72	2.96	1.00	1.00	17,778	4,088
Shallow sowing by hand 20 cm (HW + IC)	4.93	24.30	1.37	23.28	2.31	5.34	2.37	5.62	1.72	2.96	14,722	3,522
Unweeded Control	7.55	57.00	1.87	73.96	3.55	12.60	3.98	15.84	1.52	2.31	13,380	3,074
QD (P = 0.05)	1.25		0.27		0.50		0.53		0.42		4,085	953

DAS, Days after sowing; HW, hand-weeding; IC, inter-culturing

1 hand-weeding (14,815 kg fresh and 3,551 kg dry roots/ha). This clearly indicated that the crop could not alleviate weed competition up to 60 days and hence second weeding is necessary. Between the 2 herbicides, though the differences were not significant, pendimethalin was better. Both the herbicides up to 60 days were more or less equal in their total weed-control effect; however, trifluralin @ 0.5 kg/ha might have some injurious effect on the crop which led to reduced the yield. Chicory is generally broadcast-sowing crop. Hand-weeding is the mainstay for weed control, therefore possibility of line sowing was exploited in this experiment. Of the 2 sowing distances, 30 cm was conducive than 20 cm. Chicory is a root crop and yield of this crop is directly

related with development of roots. In 20 cm (high seed rate) spacing between plant competition did not allow roots to flourish, whereas in 30 cm (lower seed rate) as the distance between 2 plants (within row) was wider it helped in avoiding competition. Differences between hand-sowing and seed drill sowing were not conspicuous.

Thus line sowing is possible and farmers may adopt 30 cm distance between rows with application of pendimethalin at 0.5 kg/ha for weed control in chicory.

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Sprouting and yield of yam (*Dioscorea* species) planted through minisettts

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A major factor responsible for the decline in cultivation of yam (*Dioscorea* spp.) is the limited availability of planting material, as the tubers that constitute the propagules are themselves the consumable or marketable produce. The traditional system of using settts of 200-250 g size needs about 3 tonnes/ha of yam tubers as planting material, which in turn yields only 6 times the

weight of seed material planted. Therefore an attempt that evolves rapid-multiplication techniques in yams is gaining importance. Minisett technique of planting tuber pieces of 2.5 ± 3 g size presents a rapid and cheap multiplication method for yam (Igwill and Okoli, 1988; Kalu *et al.*, 1989). It is also reported that minisettts survived better when pre-sprouted in a nursery medium and trans-