

Grain yield of oat (*Avena sativa*) as influenced by cutting and nitrogen management

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Grain crop of oat (*Avena sativa* L.) differs in its nitrogen requirement from fodder-cum-grain crop. Therefore an experiment was conducted to study the effect of cutting and nitrogen management on grain yield of oat.

The field experiment was conducted at during the winter (*rabi*) season of 1988 and 1989 at Tiptur, on 'Kent' oat. Three cutting managements (no cut, 1 cut at 50–55 days after sowing, i.e. early cut, and 1 cut at 70–75 days, i.e. late cut) at different nitrogen levels. The N levels of 40, 80, 120 and 160 kg/ha and 40, 80 and 120 kg/ha were tried during 1988 and 1989 respectively. The trial was laid out in factorial randomized block design and replicated thrice. The soil of the experiment area was red sandy, acidic in reaction, medium in available N and K and low in available P status. The crop was sown in the first fortnight of November in both years with a seed rate of 100 kg/ha under protective irrigations. A uniform dose of 40 kg P_2O_5 /ha and half the dose of N as per treatment were applied basal and the remaining N was top-dressed to the crop.

The green-fodder and dry-matter yields were significantly higher with late cut than early cut in both the years (Table 1). This difference in fodder yields was mainly due to difference in duration of cuts from sowing

time. There was a significant increase in green-fodder yield (30.3% in first year and 23.7% in second year) with 120 kg N/ha compared with 40 kg N/ha. However, the dry-matter yield was significantly increased with 120 kg N/ha (29.9%) over 40 kg N/ha during the first year only. The findings confirm the results of Gill and Malik (1983) and Joon *et al.* (1988). The grain and straw yields were significantly higher in no-cut treatment than with cut treatments. With early cut, the grain yields in both the years and straw yield in the first year were significantly higher compared with late cut. The grain yields in fodder-cum-grain crop were low in first year compared with second year, since the crop suffered for moisture after grain-formation stage in the first year. The grain yield was not influenced by N levels. However, significant improvement in straw yield (18.6%) at 80 kg N/ha over 40 kg N/ha was observed during the second year.

Among the significant interactions for cutting and N managements, late cut at 120 kg N/ha resulted in the maximum green-fodder yield during 1988 and was on a par with 160 kg N/ha, but both N levels gave higher yields than at 40 and 80 kg N/ha which gave an equal yield of 168.4 q/ha under late cut. However, the green-fodder yields did not vary significantly due to N levels with early cut. The grain yield was

Table 1. Fodder, grain and straw yields of oat as influenced by cutting and nitrogen management during winter season of 1988 and 1989

Treatment	Fodder yield (q/ha)				Grain yield (kg/ha)		Straw yield (kg/ha)	
	Green fodder		Dry matter		1988	1989	1988	1989
	1988	1989	1988	1989				
<i>Cutting management</i>								
No cut					1,971	1,766	5,609	5,175
Early cut	68.2	108.7	12.27	13.98	800	1,540	4,743	4,296
Late cut	190.3	176.8	39.37	27.93	463	1,171	2,875	3,833
CD (P = 0.05)	18.8	17.8	2.57	5.73	343	195	720	561
<i>N (kg/ha)</i>								
40	112.0	126.7	22.42	17.85	1,056	1,521	4,025	3,888
80	113.5	145.0	22.70	21.11	1,111	1,566	4,431	4,610
120	145.9	156.7	29.12	23.90	1,029	1,390	4,622	4,805
160	145.5		29.05		1,029		4,558	
CD (P = 0.05)	26.6	21.8	3.64	NS	NS	NS	NS	561
Interaction	Sig	NS	NS	NS	NS	Sig.	NS	NS

Sig., Significant

highest with no-cut treatment at 40 kg N/ha during the 1989. Increase in N level beyond 40 kg/ha suppressed the grain yield significantly when oat was grown purely for grain purpose. In fodder-cum-grain crop, with early cut, there was a significant increase in grain yield (31.7%) at 80 kg N/ha over 40 kg N/ha, giving 1,348 kg grain/ha, and there was a decline in grain yield at 120 kg N/ha. With late cut, improvement in grain yields (15.0 and 14.6% respectively) at 80 and 120 kg N/ha were not significant over 40 kg N/ha, giving 1,066 kg grain/ha during the second year.

It was concluded that oat for grain purpose needs 40 kg N/ha, whereas fodder-cum-grain crop needs a dose of 80–120 kg N/ha over an uniform dose of 40 kg P₂O₅/ha under irrigation. The farmer may cut the crop either early or late or do not cut depending on his requirement for green fodder or grain.

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