

Performance of oat (*Avena sativa*) in rice (*Oryza sativa*) fallows under different levels of nitrogen and sowing method

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ABSTRACT

A field experiment was conducted during winters of 1995–96 and 1996–97 at Jorhat, to study the effect of N levels and sowing methods on fodder yield of oat (*Avena sativa* L.) grown after transplanted rainy-season rice (*Oryza sativa* L.). Increase in N levels up to 80 and 40 kg/ha significantly increased the green fodder and dry-matter yields during both the years and when averaged over 2 years. None of the sowing methods could influence the growth and fodder yields of oat.

Key words : Fodder oat, Rice fallows, Nitrogen, Sowing method, Fodder yield

In Assam, green fodders are in short supply during the winter months for which animals are to depend mainly on rice straw and semi-dried standing grasses found in fallow lands. Inadequate intake of poor-quality forages in this period results in low milk production. After the harvest of rainy-season rice in November, the lands are mostly kept unutilized until the next rainy season. These lands can be profitably utilized for growing winter fodder crops (Pal and Jawai, 1985; Das, 1994). To exploit the possibilities of growing fodder crop after transplanted rainy-season rice, this experiment was conducted with oat under the influence of nitrogen levels and

sowing methods.

MATERIALS AND METHODS

A field experiment with rainfed fodder 'Kent' oat was conducted with 3 methods of sowing (broadcasting, line sowing and cross-sowing) and 3 levels of N (0, 40 and 80 kg N/ha) in randomized block design with 3 replications during the winter seasons of 1995–96 and 1996–97 at Jorhat after the harvest of transplanted rainy-season 'Mashuri' rice on medium land. The soil was sandy loam containing 0.49% organic carbon, 270.75 kg/ha available N, 9.51 kg/ha available P and 87.54 kg/ha available K, with pH 5.1 Oat was sown @

Table 1. Growth, fodder yield and crude protein content of oat as influenced by sowing method and levels of nitrogen

Treatment	Plant height (cm)		Green leaves/plant		Plant population (million/ha)		Green-fodder yield (q/ha)			Dry-matter yield (q/ha)			Crude protein content (%)	
	1995-96	1996-97	1995-96	1996-97	1995-96	1996-97	1995-96	1996-97	Mean	1995-96	1996-97	Mean	1995-96	1996-97
<i>Sowing method</i>														
Broadcasting	106.7	111.5	3.91	4.20	3.267	3.420	173.49	204.60	189.05	44.78	49.46	47.12	6.16	6.34
Line sowing (25 cm)	112.7	119.5	3.80	4.29	3.636	3.778	205.85	222.57	214.21	45.24	50.07	47.66	6.35	6.48
Cross sowing (25 cm × 25 cm)	109.6	118.2	3.98	4.27	3.636	3.738	191.42	222.92	207.17	45.89	51.02	48.51	6.25	6.50
CD (P=0.05)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
<i>N (kg/ha)</i>														
0	84.7	99.7	3.89	4.20	3.342	3.253	112.67	144.10	128.39	30.20	35.87	33.04	5.52	5.80
40	120.0	124.2	3.89	4.27	3.707	3.898	207.80	235.16	221.48	51.18	56.00	53.65	6.44	6.51
80	124.1	125.3	3.91	4.29	3.458	3.613	250.29	270.83	260.56	54.54	58.68	56.61	6.80	7.01
CD (P=0.05)	9.4	9.9	NS	NS	NS	NS	38.81	30.01	32.25	10.78	5.01	8.33	0.32	0.45

100 kg/ha as per treatment on 30 December in each year. A uniform dose of 20 kg/ha each of P_2O_5 and K_2O was applied at sowing. Nitrogen was applied as per treatment, half at sowing and half 30 days after sowing. The crop was harvested at 50% flowering on 12 and 16 March during 1996 and 1997 respectively. Total rainfall received during the crop season of 1995-96 and 1996-97 was 66.5 and 110 mm distributed in 18 and 24 days respectively.

RESULTS AND DISCUSSION

The green-fodder and dry-matter yields were higher in the second year compared with that in the first year. On an average, the increase was 13.9 and 10.8% for green-fodder and dry-matter yield respectively. Increase in yield in the second year was owing to higher and well-distributed precipitation during the cropping period.

Sowing method

Various methods of sowing did not influence the growth and fodder yields of oat (Table 1). Similar non-significant effect of sowing methods, viz. cross-sowing over line sowing, was also reported by Singh *et al.* (1989). The crude protein content was not affected significantly owing to methods of sowing.

Nitrogen

The green-fodder and dry-matter yields increased with increasing levels of N.

However, the green-fodder yield increase was significant and consistent up to 80 kg N/ha and dry-matter yield up to 40 kg N/ha. The differential response of green-fodder and dry-matter yields of oat with N application was also reported by Tripathi and Gill (1990). The increase in forage yield with increase in N levels can be attributed to tall plants. The increase in mean green-fodder yield owing to 40 and 80 kg N/ha over the control was 72.5 and 102.9%. The corresponding increase in dry-matter yield was 62.4 and 71.3%. Nitrogen fertilization significantly increased the crude protein content, the response being linear up to 80 kg N/ha. Increase in crude protein with N fertilization could result from an increased N supply and ready availability of synthesized carbohydrates to promote increased protein synthesis.

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