

Integrated nitrogen management in 'Bhagyalakshmi' chewing tobacco (*Nicotiana tabacum*)

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ABSTRACT

A field experiment was conducted during 1990–91 to 1991–92 to evaluate integrated nitrogen management in 'Bhagyalakshmi' chewing tobacco (*Nicotiana tabacum* L.). Substituting 50% N with any one of the organic sources, viz. poultry manure, farmyard manure, enriched coir pith and neem-cake, and applying the remaining 50% N as urea recorded higher green- and cured-leaf yields over application of 100% recommended dose of N as urea alone. *Azospirillum* with 75% recommended dose of N as urea and soil application of 50% recommended dose of N as urea along with foliar spray of the remaining 50% N as 2% urea were also found better N-management practices than soil application of 100% recommended dose of N as urea alone.

Tobacco (*Nicotiana tabacum* L.) is mostly grown under irrigated conditions from October to February in Tamil Nadu. Normally, nitrogen is applied in the form of fertilizer urea to chewing tobacco. As the cost of inorganic N is increasing, it is appropriate to adopt integrated N management to achieve better quality and yield with reduced cost of tobacco production. Hence a study was carried out to evaluate the performance of 'Bhagyalakshmi' tobacco under different integrated N management practices.

MATERIALS AND METHODS

A field experiment was conducted during the winter seasons 1990–91 to 1991–92 at Bhavanisagar, Tamil Nadu. The soil of the experimental field was low in available N (154 kg/ha), medium in available P (13.2 kg/ha) and high in available K (264 kg/ha). The treatment schedules included different sources, levels and methods of N applica-

tion, viz. T₁, 100% recommended N (150 kg/ha); T₂, 100% recommended N as ammonium sulphate; T₃, *Azospirillum* + 75% recommended N as urea; T₄, 50% recommended N as urea + 50% recommended N as 2% urea foliar spray at 65, 75 and 85 days after transplanting; T₅, 50% recommended N as farmyard manure + 50% recommended N as urea; T₆, 50% recommended N as enriched coir pith + 50% recommended N as urea; T₇, 50% recommended N as poultry manure + 50% recommended N as urea; and T₈, 50% recommended N as neem-cake + 50% recommended N as urea.

The experiment was conducted in randomized block design with 3 replications. As per the treatment fertilizer urea and ammonium sulphate were top-dressed in 2 equal splits at 45 and 60 days after transplanting. In treatment 3, *Azospirillum* was applied both through seedling dipping and soil application and out of the 75% recom-

Table 1. Effect of integrated N-management practices on growth and yield of tobacco var. 'Bhagyalakshmi'

Treatment	1990-91				1991-92			
	Leaf length at harvest (cm)	Leaf breadth at harvest (cm)	Leaf yield (kg/ha)		Leaf length at harvest (cm)	Leaf breadth at harvest (cm)	Leaf yield (kg/ha)	
			Green	Cured			Green	Cured
T ₁	77.4	51.0	23,889	2,949	58.1	36.6	18,579	2,509
T ₂	77.1	50.0	25,139	3,486	59.2	37.6	22,222	2,963
T ₃	78.2	54.0	26,079	3,611	60.6	38.9	23,301	3,139
T ₄	78.3	51.6	26,852	3,810	61.5	40.4	24,537	3,338
T ₅	77.9	48.3	24,815	3,736	61.3	41.5	21,713	2,968
T ₆	77.9	50.5	26,389	3,644	62.5	42.5	25,556	3,477
T ₇	79.6	54.3	28,857	4,273	66.1	44.1	26,588	3,565
T ₈	77.7	53.8	27,162	3,889	64.0	40.1	26,051	3,505
CD (P = 0.05)	NS	NS	NS	537	2.5	3.3	3,815	194

Treatment details are given in text

mended N as urea, 50% N was applied at 45 days and remaining 25% N at 60 days. Phosphorus (100 kg/ha) and potassium (100 kg/ha) were applied uniformly to all the treatments as single superphosphate and muriate of potash respectively. The organic sources were analysed for their N content and it was 0.5, 1.5, 3.2 and 4.5% in farm-yard manure, enriched coir pith, poultry manure and neem-cake respectively. Based on the N content the quantity of organic N sources was worked out and applied basally.

RESULTS AND DISCUSSION

In general, basal application of 50% N through organic sources and top-dressing the remaining 50% N as urea recorded higher leaf length, breadth, green-leaf yield and cured-leaf yield compared with inorganic sources alone. Among the organics, poultry manure application registered marginally higher values over others. Organic N is considered to prevent tobacco from ripen-

ing too rapidly by maintaining a more uniform N level. The beneficial effects of organics in increasing the yield and quality of tobacco was also reported by Patel *et al.* (1992) and Krishnamurthy *et al.* (1972). Soil application of 50% N as urea and foliar application of the remaining 50% N as 2% urea also increased the cured-leaf yield by 18.0% in 1990-91 and 25.0% in 1991-92 compared with soil application of 100% N as urea alone. Sinha *et al.* (1991) also observed the positive influence of foliar application over soil application of urea in tobacco. Though seedling dipping and soil application of *Azospirillum* along with reduced level of 75% recommended N resulted in moderate yields when compared to organic sources + urea combinations, it was found an efficient N-management practice with 22.5-25.0% yield increase over soil application of 100% N as urea alone.

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