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Production Potential of Advanced bidi Tobacco Lines under Different Levels of Nitrogen and Topping

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ABSTRACT

A field experiment was conducted at Regional Agricultural Research Station, Nandyal during 2007-08 to find out the optimum level of topping and Nitrogen for the advanced breeding lines *viz.,* ABD 87, ABD 90 with check A 119 under two levels of topping *Viz.,* 14 and 16 to leaves stage and three levels of nitrogen (90,110,130 kg ha^{-1}). The experiment was conducted in a split a split plot design with three ereplications. The soil of the experimental site was clay loam with pH of 9.06, low in avilable N (201 kg ha^{-1}), high in available P (106 kg ha^{-1}) and medium in available K (191 kg ha^{-1}). The results of the study revealed that different advanced breeding lines (ABD 87 and ABD 90 with check variety A 119) and topping levels did not significantly influence the plant height where as increase in the N levels increased the plant height. Topping and N levels did not show significant difference in leaf length and leaf width. ABD 90 recorded significantly higher cured leaf yield than check A 119. The cured leaf yield did not show significant differences between the levels of topping and nitrogen. The percent of leaf chemical parameters like Nicotine, reducing sugars and chlorides were not significant due to different treatments.

Key words : Bidi tobacco, Cured leaf yield, Nitrogen, Topping.

Bidi tobacco is an important crop cultivated in black soils under rainfed conditions in Kurnool district of Andhra Pradesh. A 119 variety is popular variety grown in this region. Prereleased varieties *i.e.,* ABD 87 and ABD 90 were found better in the breeding trials.

Nitrogen is the most important element and has a more pronounced effect on the growth and development of tobacco plant and the quality of tobacco than any other essential element. Due to paucity of information, farmers are using very high doses of Nitrogen which adversely affect the leaf quality. As the yield of quality tobacco fetches maximum returns to the farmers. It is essential to evaluate the impact of N levels to find out the optimum dose of N for getting the higher yield of superior quality of leaf. Studies at the Tobacco Research Station, Anand revealed that application of 210 kg N ha^{-1} recorded the highest leaf length. leaf width, cured leaf yield, total N and nicotine content of Bidi tobacco (Patel et al., 2004).

Topping prevents the development of seed heads and transfers energy for increasing the leaf size,weight, body, nicotine and other chemical constituents. Topping has been employed basically to alter the leaf quality. Level of topping is an important criterion which is governed by the variety and level of agronomical crop management.

The present study was taken up to find out proper topping level and suitable nitrogen dose for pre released bidi tobacco varieties ABD 87 and ABD 90.

MATERIAL AND METHODS

A field experiment was conducted at RARS, Nandyal during 2007-08 to find out the proper topping level and suitable nitrogen dose for the advanced breeding lines viz., ABD 87, ABD 90 with check A 119 under two levels of topping viz., 14 and 16 leaves stage and three levels of Nitrogen (90,110 and 130 kg ha^{-1}). The experiment was conducted in a split-split plot design with three replications. The soil of the experimental site was clay loam with pH of 9.06, low in available N (201 kg ha^{-1}), high in available P (106 kg ha^{-1}) and medium in available K (191 kg ha^{-1}). Sixty five days old seedlings were planted in the first week of October, 2007. Different doses of Nitrogen were applied as per the treatment in two splits *i.e.,* 50% basal and 50% top dressed at 30 days after planting.

Table 1. Effect of Topping and Nitrogen levels on growth and yield paramters of Advanced Bidi Tobacco lines.

Treatments	Plant height (cm)	Leaf length (cm)	Leaf width (cm)	Cured leaf yield (kg ha^{-1})	Nicotine (%)	Reducing sugars (%)	Chlorides (%)
Main PlotsL (Varieties)							
A119	50.1	33.1	12.1	767	3.81	1.85	0.92
ABD 87	52.4	35.2	13.2	998	2.89	1.53	0.96
ABD 90	48.5	36.4	13.3	1144	3.54	1.93	1.03
SEm ±	2.3	0.6	0.3	73	0.13	0.16	0.06
CD (P=0.05)	NS	2.3	1.0	288	0.51	NS	NS
Sub plots: (Topping)							
14 leaves	48.8	34.6	12.6	974	3.39	1.80	1.00
16 leaves	51.9	35.1	13.1	966	3.44	1.74	0.93
SEm ±	1.4	1.0	0.4	37	0.13	0.13	0.03
CD (P=0.05)	NS	NS	NS	NS	NS	NS	NS
Sub-sub plots: ('N' levels)							
90	47.6	35.4	12.9	977	3.54	1.70	0.95
110	49.6	35.0	13.0	912	3.28	1.93	1.00
130	53.9	34.3	12.7	1020	3.43	1.68	0.94
SEm ±	1.8	0.6	0.2	52	0.16	0.12	0.03
CD (P=0.05)	5.2	NS	NS	NS	NS	NS	NS
CV (%)	15.2	7.4	8.1	22	19.8	30.1	16.1

Table 2. Interaction effect of variety and topping on cured leaf yield (kg ha^{-1}).

Varieties	Topping		Mean
	At 14 leaves stage	At 16 leaves stage	
A119	788	749	767
ABD 87	1057	948	999
ABD 90	1087	1040	1144
Mean	977	913	
	SEm ±	CD (P=0.05)	
Variety	73	288	
'N' level	52	NS	
Interaction	90	264	
CV (%)	22.8		

Table 3. Interaction effect of variety and 'N' levels on cured leaf yield (kg ha^{-1}).

Varieties	'N' levels (kg ha^{-1})			Mean
	90	110	130	
A119	788	749	765	767
ABD 87	1057	948	991	999
ABD 90	1087	1040	1305	1144
Mean	977	913	1020	
	SEm ±	CD (P=0.05)		
Variety	73	288		
'N' level	52	NS		
Interaction	90	264		
CV (%)	22.8			

Table 4. Interaction effect of Topping and 'N' levels on cured leaf yield (kg ha^{-1}).

Varieties	'N' levels (kg ha^{-1})			Mean
	90	110	130	
14 Leaves	967	891	1064	974
16 Leaves	987	934	977	966
Mean	977	913	1020	
	SEm ±	CD (P=0.05)		
Variety	37	NS		
'N' level	52	NS		
Interaction	74	NS		
CV (%)	22.8			

The crop was topped at 14 and 16 leaves at bud stage as per the treatment. Recommended cultural practices were followed for raising the crop. Manual desuckering was done as and when necessary. Harvesting was done during 2nd week of February by cutting the whole plant and kept for sun curing. The leaf samples were analysed for reducing sugars, nicotine and chlorides. The data were subjected to statistical analysis as per standard procedures.

RESULTS AND DISCUSSION

A) Growth Parameters:

Results of growth parameters *viz.,* plant height, leaf length, leaf width are presented in Table 1. There was no significant difference in plant height due to different varieties and topping levels. Increase in the Nitrogen level increased the plant height. Application of 130 kg N ha^{-1} produced significantly taller plants (53.9 cm) than the 90 kg N ha^{-1} (47.6 cm). Topping and 'N' levels did not bring any significant difference in leaf length and leaf width. However, significantly higher values for leaf length (36.4 cm) and leaf width (13.3 cm) were recorded in ABD 90 than check variety A 119 (33.1 and 12.1 cm).

B) Yield:

Topping and 'N' levels did not show any significant difference in cured leaf yield where as ABD 90 recorded significantly higer cured leaf yield (1144 kg ha^{-1}) than the check variety A 119 (767 kg ha^{-1}).

C) Chemical quality parameters:

Topping and 'N' levels did not show any significant difference in Nicotine content and reducing sugars concentration. Nitrogen dose could not produce any significant effect on leaf nicotine content and chlorides. Similar results were reported by Campbell *et al* (1982) and Patel et al (2003). Chlorides were well with in the acceptable limits in all the samples and there was no significant difference among the treatments.

As regards the interaction effects, ABD 90 recorded higher cured leaf at 14 leaves stage which was on par with 16 leaf stage.(Table 2) and also at application of 130 kg N ha^{-1} (Table 3) and interaction effect of Topping and 'N' levels were not significant (Table 4).

From this study it can be concluded that Bidi tobacco variety ABD 90 can be grownwith application of 130 kg N ha^{-1} and topped at 14 leaves for higher yields.

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