

EFFECT OF SPACING AND TOPPING LEVELS ON YIELD AND QUALITY OF *JATI* TOBACCO (*NICOTIANA TABACUM*) GROWN IN NORTH BENGAL

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Jati tobacco (*N. tabacum* L.) occupies an area of about 4000 ha in Cooch Behar district of North Bengal with an average productivity of 1300 to 1600 kg/ha and this type of tobacco is mostly cultivated either as monoculture or in rotation with jute or Aman paddy. The cured leaf of *Jati* tobacco processed in this region is mainly sold in North Eastern states of India. Two distinctly different types and races of *Jati* tobacco viz., *Chama* and *Podali* types are being cultivated with spacing of 90 x 90 cm. The topping level adopted by the farmers of this region is 6 - 7 leaves. Influence of different spacing and topping was investigated in the present study especially in relation to productivity and quality of newly released *Jati* tobacco variety Manasi.

A field experiment was conducted in two consecutive seasons of 2004 -2005 and 2005-06 at Central Tobacco Research Station, Dinhata, Cooch Behar district. Treatment combinations comprised of three spacing levels viz., 90 x 90, 90 x 75 and 75 x 75 cm and four topping levels viz., 8, 10, 12 and 14 leaf stage replicated four times in randomized block design. Tobacco seedlings of 50-55 days old were transplanted in first week of November in the respective seasons of study. The priming of tobacco leaf was done periodically on the basis of maturity of tobacco leaves. The soil in sandy loam, acidic (pH: 4.5), low in organic carbon (0.43%), medium in available phosphorus (22.05 kg/ha) and low in potassium (78.5 kg/ha). Tobacco crop was fertilized with 20 tonnes FYM + 125 kg N + 50 kg P₂O₅ +75 kg K₂O /ha as a basal application. The crop was irrigated two times at 30-35 and 60-65 days after transplanting. All cultural practices were followed in raising the crop. Observations on cured leaf yield, first grade leaf yield were collected after grading of cured leaves. Leaf samples were collected and analysed for nicotine and reducing sugar (Harvey *et al.*, 1969)

and nutrient compositions by standard procedures.

Significantly highest cured leaf yield was recorded at narrow spacing i.e 75 x 75 cm as compared to 90 x 75 cm during 2004-05 and 2005-06 respectively (Table 1). During 2004-05, highest cured leaf was obtained in 75 x 75 cm spacing which is at par with 90 x 75 cm and significantly superior to 90 x 90 cm. In second year as well as in pooled, the cured leaf yield at 75 x 75 cm was significantly superior to other spacings. Wider spacing of 90 x 90 cm recorded significantly highest first grade leaf yield as compared to lower spacings (90 x 75 and 75 x 75 cm). Topping at 14 leaves showed significantly higher cured leaf yield over 8 and 10 leaves. Significantly lower first grade leaf was recorded with 14 leaves topping compared to other topping levels. Maximum gross and net returns and benefit: cost ratio were recorded when tobacco leaves were topped at 14 leaf stage followed by 12 and 10 leaf stage whereas minimum was realized in topping at 8 leaf stage during 2004-05 and 2005-06. Kumaresan *et al.* (2001) and Kumaresan and Palanichamy (2002) reported higher net returns and benefit:cost ratio by topping at 18 leaves stage in chewing tobacco in the Vedaranyam area of Tamil Nadu.

Highest nicotine content in the leaf of *Jati* tobacco was observed at 90 x 90 cm followed by 90 x 75 cm and 75x 75 cm spacing (Table 2). Reducing sugars content (1.15%) was significantly highest at 90 x 90 and 90 x 75 cm. Among different topping levels, 8 leaf stage recorded highest nicotine content followed by 10, 12 and 14 leaf stage. Increase in topping levels increased the reducing sugars.

Thus, it may be concluded that for *Jati* tobacco a spacing of 75 x 75 cm and topping at

Table 1: *Jati* tobacco (var *Manasi*) yield (kg/ha) as influenced by spacing and topping

Treatment	Cured leaf yield			First grade leaf yield		
	2004-05	2005-06	pooled	2004-05	2005-06	pooled
Spacing (cm)						
90 x 90	1358	1334	1348	736	586	661
90 x 75	1413	1349	1383	591	498	544
75 x 75	1489	1564	1527	527	480	504
SEm ±	34.8	49.6	42.2	49.0	22.6	35.8
CD (P=0.05)	100.7	142.8	121.8	141.5	65.0	103.3
Topping						
8 leaves	1280	1197	1239	725	595	660
10 leaves	1413	1301	1357	731	566	648
12 leaves	1459	1498	1478	633	490	562
14 leaves	1530	1672	1601	384	435	409
SEm ±	41.8	57.3	49.6	58.1	26.1	42.1
CD (P=0.05)	120.8	164.9	142.8	167.9	75.0	121.4

Table 2: Economics of *Jati* tobacco Mansai as influenced by spacing and topping

Treatment	Net return (Rs/ha)			Benefit : cost ratio			Nicotine	Reducing sugar
	2004-05	2005-06	pooled	2004-05	2005-06	pooled		
Spacing (cm)								
90 x 90	31434	9020	20227	2.10	1.28	1.69	3.77	1.15
90 x 75	31812	7837	19825	2.11	1.24	1.68	3.69	1.15
75 x 75	33705	11828	22760	2.18	1.36	1.77	3.61	1.00
S E m ±					0.12	0.012		
CD (P=0.05)					NS	0.049		
Topping								
8 leaves	27951	6861	17406	1.98	1.22	1.60	3.82	1.00
10 leaves	33365	8320	20843	2.17	1.26	1.72	3.79	1.08
12 leaves	33741	10186	21964	2.18	1.31	1.75	3.71	1.10
14 leaves	34209	12836	23523	2.20	1.39	1.80	3.43	1.17
SEm ±					0.13	0.019		
CD (P=0.05)					NS	0.056		

12-14 leaves have better impact on higher productivity and monetary returns in *terai* region of North Bengal.

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