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SCIENTIFIC NOTE

Screening Tobacco Varieties for Maximum Biomass Production

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An experiment was conducted to screen out tobacco varieties that produce maximum biomass among eight viz., NC-95, K-326, CCDV, Motihari, DV, Jati, CC Sesmeria and Korban-60 at Bangladesh Sugarcane Research Institute, Ishurdi, Pabna during the cropping season 2004-2005. It revealed that Korban 60 gave highest tonnage (6.74 t ha^{-1}) of green leaf that produced 1.19 t ha^{-1} dry leaf followed by 6.17 t ha^{-1} green leaf in K 326 that produced 0.94 t ha^{-1} dry leaf. The variety CCDV produced highest tonnage of green stick resulting highest green biomass of 11.21 t ha^{-1} that produced highest dry biomass of 2.39 t ha^{-1} followed by 10.03 t ha^{-1} green biomass in DV and 10.35 t ha^{-1} green biomass in Korban 60 that produced 2.03 and 1.98 t ha^{-1} dry biomass respectively.

Tobacco plant (*Nicotiana tabacum*) belongs to the family Solanaceae. It was originated in South America (Possibly North-West Argentina) and later introduced in Haiti, France, Spain, Italy and England in sixteenth century. It spread out in Indo subcontinent, Africa, Middle East, Philippines and Japan within Seventeenth century. About 4.36 million hectare of land is under tobacco cultivation in the world which produces 5.44 million ton tobacco leaves. China (1 million ton) and United States (0.91 million ton) are the highest tobacco producing countries of the world where India produces 0.45 million ton. In Bangladesh about 51417 hectare of land is under tobacco cultivation which produce 47000 ton tobacco leaves yielding about one ton per hectare. About two third tobacco of the country is produced in greater Rangpur district. It is also cultivated in Sylhet, Mymensingh, Faridpur and Kushtia. Three classes of tobacco viz., Virginia, Motihari and Jati are commercially cultivated in Bangladesh which produces 1.2, 1.1 and 1.0 ton tobacco leaves per hectare (Ahmad, 1984).

Sugarcane pests specially borers and soil pests are serious problem in cane cultivation. Many synthetic chemicals are recommended against sugarcane pests in addition to cultural and mechanical control. Synthetic insecticides are costly, health hazardous and sometimes pollutes environments. The indiscriminate use of chemical insecticides has given rise to many serious problems including genetic resistance of pest species. On the other hand, indigenous plant materials are economic and available else where in Bangladesh. Moreover, there is no side effect in botanical compounds/ insecticides. Therefore, Botanical products like tobacco are environmentally safe and non-hazardous which could be handled without much caution as needed for chemical pesticides. Botanical insecticide has recently been used to control a variety of insect pests in field crops. Several commercially produced plant derived compounds have exhibited enormous potential for use as insecticides. Neem derivatives have been reported to

provide broad spectrum control of more than 200 species of phytophagous insects (Ascher, 1993). Nicotine and nornicotine occurs in leaves of tobacco plants, *Nicotina tabacum* L. Although these compound were used to a considerable extent as insect stomach poisons before the advent of DDT, they are seldom used as insecticides today in the United States (Jacobson, 1977). *Nicotina glauca* Graham (tree tobacco) is extensively used in the Soviet Union to combat thrips, mites, leafhopper, sawflies, lice, and mosquitoes (Feinstein and Jacobson, 1953). Tobacco leaves are used elsewhere to control pest of some crops. Tobacco leaves powder applied to soil improve the soil quality results less infestation by the soil insects. Different tobacco varieties have different pungent smell and different biomass. Tobacco extract spray in sugarcane repels the pests from feeding due to non-palatable in taste. Depending on the content of Nicotine in tobacco plants, the efficacy of pest control may vary. Therefore, the experiment was undertaken to screen out tobacco variety (s) which produce maximum biomass.

An experiment was conducted at Bangladesh Sugarcane Research Institute (BSRI), Ishurdi, Pabna during the cropping season 2004-2005. Seeds of Motihari, Jati, CCDV, DV, CC Sesmeria NC-95, K-326 and Korban-60 were collected from Rangpur and Kushtia. Tobacco seedlings were raised in seedbeds at BSRI farm. Seeds of different tobacco varieties were sown in the seedbed in November 2004. The size of seedbed for each variety was 3m x 1m. Soil of the seedbed was prepared finely so that there was no clods and weeds. The experiment was conducted in main field and laid out in RCB design with three replications. The plot size was 5m x 3m. Block to block distance was 2m and plot to plot distance was 1m. Tobacco seedlings were planted at a distance of 60 cm in a row. Row to row distance was 90 cm in the plot. Tobacco seedlings of 30 days age were transplanted at the main field in December, 2004. After transplanting tobacco seedlings in the field life irrigation was applied. All types of intercultural operations like weeding, mulching and irrigation were done as and when necessary. Fertilizer was applied at the rate of 75 kg Urea, 50 kg TSP and 100 kg sulphate of potash per hectare (Ahmad, 1984). Tobacco leaf plucking was started of its mature stage from third week of March and continued up to mid May depending upon the maturity of the varieties. Weight of tobacco leaves and sticks were taken at its green stage. Green tobacco leaves and sticks were allowed for drying in the laboratory for 30 days and then weight was recorded.

It is observed from the Table 1 that weight of green leaves significantly varied among the tobacco varieties. The highest green leaf (6.74 t ha^{-1}) was obtained in Korban 60 followed by 6.17 t ha^{-1} in K 326, 5.63 t ha^{-1} in CCDV and 5.09 t ha^{-1} in NC 95 and DV that were statistically at par. Green leaf weight of Korban 60 differed significantly over Motihari, Jati and CC Sesmeria. Lowest green leaf yield was recorded in Motihari (3.36 t ha^{-1}), Jati (3.76 t ha^{-1}) and CC Sesmeria (4.30 t ha^{-1}) that were statistically at par. Green stick had no significant differences in weight among the test varieties. The weight of green stick ranged from 3.50 to 5.58 t ha^{-1} among the varieties. The highest green stick weight (5.58 t ha^{-1}) was obtained in CCDV followed by 4.94 t ha^{-1} in the DV. Lowest green stick weight were recorded in K 326 (3.50 t ha^{-1}) and NC 95 (3.53 t ha^{-1}) among the varieties. Total green biomass (leaf + stick) production ranged from 7.89 to 11.21 t ha^{-1} among the varieties. Total highest green biomass (11.21 t ha-1) was recorded in variety CCDV followed by 10.35 t ha^{-1} in Korban 60 and 10.03 t ha^{-1} in DV. Total minimum green biomass of 7.89 t ha^{-1} was recorded in Jati and 7.93 t ha^{-1} in CC Sesmeria.

Significant differences in the weight of dry leaves and dry stick were observed among the varieties (Table 1). Dry leaf weight ranged from 0.70 to 1.19 t ha^{-1} among the

varieties in which Korban 60 had the highest dry leaf weight (1.19 t ha^{-1}) followed by 0.94 t ha^{-1} in K 326 and 0.91 t ha^{-1} in DV. Lowest dry leaf weight was recorded in Motihari (0.70 t ha^{-1}), NC 95 (0.73 t ha^{-1}) and Jati (0.74 t ha^{-1}) among the test varieties.

Dry stick weight ranged from 0.61 to 1.63 t ha^{-1} among the varieties. The highest dry stick weight (1.63 t ha^{-1}) was observed in CCDV which differed significantly over other varieties followed by 1.13 t ha^{-1} in DV and 1.11 t ha^{-1} in CC Sesmeria and that were statistically similar. The lowest dry stick weight (0.61 t ha^{-1}) was recorded in variety NC 95 and Korban 60. Motihari (0.63 t ha^{-1}) and K 326 (0.67 t ha^{-1}) were very close in dry stick weight and did not differ significantly with previous two varieties.

Table 1. Effects of tobacco varieties on biomass production. Ishurdi, Pabna. June, 2005.

Tobacco varieties	Green biomass (t ha^{-1})			Dry biomass (t ha^{-1})		
	Leaf	Stick	Total	Leaf	Stick	Total
NC 95	5.09 abcd*	3.53	8.64	0.73 b*	0.61 d*	1.34
K 326	6.17 ab	3.50	9.67	0.94 b	0.67 d	1.61
CCDV	5.63 abc	5.58	11.21	0.76 b	1.63 a	2.39
Motihari	3.36 d	4.76	8.12	0.70 b	0.63 d	1.39
DV	5.09 abcd	4.94	10.03	0.91 b	1.13d b	2.04
Jati	3.76 cd	4.13	7.89	0.74 b	0.96 c	1.70
CC Sesmeria	4.30 bcd	3.63	7.93	0.84 b	1.11 b	1.95
Korban 60	6.74 a	3.61	10.35	1.19 a	0.61 d	1.80
LSD (5%)	2.699	NS	-	0.3229	0.1837	-

* Figures followed by the same letter (s) are not significantly different at 5% level as per DMRT

Total dry biomass varied from 1.34 to 2.39 t ha^{-1} among the test varieties. Gous *et al.* (1971) reported tobacco yield of 2.82 t ha^{-1} which is close to the biomass of the present study. The highest total dry biomass (2.39 t ha^{-1}) was recorded in CCDV followed by 2.04 t ha^{-1} in DV, 1.95 t ha^{-1} in CC Sesmeria, 1.80 t ha^{-1} in Korban 60 and 1.70 t ha^{-1} in Jati. The lowest total dry biomass (1.34 t ha^{-1}) was recorded in NC 95. Motihari and K 326 showed a total dry biomass of 1.39 and 1.61 t ha^{-1} respectively. It was reported that *Nicotina rustica* Linn. yields 2.0 to 2.5 t ha^{-1}, but Indian farmers get on an average of 1.182 t ha^{-1} only (Government of India,1985) which was also close to biomass obtained in the present study.

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