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Effect of Plant Gaps on Growth of Bidi Tobacco (*Nicotiana tabacum* L.) Plant

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Uniform plant stand in each plot of the experiment is the prime requirement for precised estimates of treatment effect (s). Various procedures for adjusting yield based on plant stand have been used in different crops (Arceneaux and Stocks, 1939; Leng and Finley, 1957 and Crews and Jones, 1962). The method of analysis of covariance provides satisfactory method of adjusting the experimental data as compared to the method of adjustment by way of direct proportion which results in to over estimation of yield (Crews and Jones, 1962 and Buch and Patel, 1978). The decision whether to adjust yield data for plant stand reduction is a difficult one, especially when the reduction in plant stand is more. For this purpose, it is of importance to know the effect of plant gaps on plant growth (yield).

An experiment was conducted at the College Agronomy Farm, GAU, Anand Campus, Anand in split plot design with five replications to study the effect of plant gap(s) on yield of bidi tobacco plant. The treatments comprised of all 20 combinations of period of occurrence of gap (P) and the plant stand(S) are given below :

P : Period of occurrence of gap (main plot treatments)

- P1 = 0 day after transplanting
- P2 = 30 days after transplanting
- P3 = 60 days after transplanting
- P4 = 90 days after transplanting

S : Plant stand in net plot of 7.5 m x 1.8 m (sub plot treatments)

- S1 = 20 plants (no gap)
- S2 = 18 plants (10% gap)
- S3 = 16 plants (20% gap)
- S4 = 14 plants (30% gap)
- S5 = 12 plants (40% gap)

At appropriate time the plants were removed at random to create required gaps in the experimental plots.

The bidi tobacco variety Anand-2 was transplanted at 90 cm x 75 cm spacing. Crop cultivation was done as per the practices in vogue and all plants were uniformly topped leaving twenty leaves per plant.

The results (Table 1) revealed significant influence of number of plant gaps in experimental plot on yield of bidi tobacco. The yield per plot decreased from 3.011 kg (No gap) to 2.411 kg (40 per cent gaps per plot), the difference being significant. The decreasing trend in yield per unit area is akin to the findings reported by Arceneaux and Stokes (1939) and Crews and Jones (1962).

Gaps arround the plant provides more space (area) for development by way of low competition between plants for nutrients, moisture, light etc. Bidi tobacco being space planted deep rooted nitrogen loving crop is likely to be influenced by the gaps. The expected yield at full plant stand [(actual yield per plot × 20) ÷ actual number of plants per plot)] given in Table 1 showed upward bias in treatment estimates. The tobacco yield per plant increased with the increase in number of gaps per unit area. On the basis of "no gap" (S_1), the compensation

TABLE 1

The average tobacco yield (kg/plot) as influenced by the gap(s) and period of occurrence of gaps(p).

S \ P	P_1	P_2	P_3	P_4	Av.	Expected yield at full stand
S_1	3.027	3.006	3.198	2.813	3.011	3.011
S_2	3.032	3.022	2.974	2.745	2.943	3.270
S_3	2.934	2.660	2.568	2.609	2.693	3.366
S_4	2.233	3.055	2.637	2.667	2.649	3.784
S_5	2.289	2.446	2.561	2.346	2.411	4.018
Av	2.703	2.838	2.787	2.636	–	–

Effect	P	S	P x S
S. Em.	0.084	0.072	0.199
C. D. 0.05	NS	0.202	NS
C. V. %	15.200	11.700	–

(increase in yield) per plant due to gap was 8.6, 11.8, 25.7 and 33.5 per cent for S_2, S_3, S_4 and S_5 respectively. The results thus lead to the conclusion that the observed yield of gappy experimental plot is not a normal yield, affecting precision of the estimates (treatment as well as error). This suggest that if random gaps occur in the experimental plots of bidi tobacco, the results (yield) need to be adjusted for gap effect by proper method like covariance technique.

The period effect as well as interaction effect was not significant for yield.

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REFERENCES

Arceneaux George and I. E. Stockes. 1939. Studies of gaps in sugarcane rows and their effect upon yield under Lousiana conditions. U.S.D.A. Cire 521 : 1-20.

Buch M. J. and N. M. Patel. 1978. Gap effect and its adjustment in bidi tobacco field experiments. *Tob. Res.* **4** : 23-30.

Crews, J. W. and G. L. Jones. 1962. Procedure for adjusting yield on the basis of stand in flue cured tobacco experiments. *Tobacco Sci.* **6** : 114-118.

Leng, E. R. and D. E. Finley. 1957. Corn tests, variety performance. *Ill. ARE. Res Bull.* **105** : 1-50.