

INFLUENCE OF PLANTING DATES AND PADDY STRAW MULCHING ON BROWN SPOT DISEASE INCIDENCE IN *MOTIHARI* TOBACCO

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Tobacco is a leading commercial crop in India grown in 0.45 M ha of area (accounting for only 0.27% of net cultivated area in the country) with 750 M kg production (Krishnamurthy and Narashima Rao, 2010). West Bengal occupies an important place in the tobacco map of India. *N. rustica* tobacco popularly known as *Motihari* tobacco is mainly cultivated in Cooch Behar and Jalpaiguri districts, falling under *terai* zone of West Bengal.

Brown spot (*Alternaria alternata* (Fries) Keissler) of tobacco, is a disease of worldwide occurrence and known to cause severe damage in various countries (Lucas, 1975). In North Bengal region it is an important foliar disease of *Motihari* tobacco. The first indication of infection is small water-soaked lesions which enlarge quickly. As the spots enlarge, the centers die and become brown, leaving a sharp line of demarcation between diseased and healthy tissue. In the present study, the influence of planting dates and paddy straw mulching on the incidence of brown spot in *Motihari* tobacco was studied for two crop seasons (2005-06 and 2006-07) at CTRI Research Station farm, Dinhata.

The experiment was laid out in a factorial randomized block design (RBD) with two factors, 2 treatments (Mulching and without mulching) and 3 dates of planting i.e., early (08.11.05 & 06), normal (03.12.05 & 06) and late (28.12.05 & 06) with a plot size of 8.1 sq. m. Four replications were maintained for each treatment. The cultivar used was Dharla. About forty five days old healthy seedlings were transplanted in the main field. Recommended agronomic practices were followed for raising the crop. One day after irrigation, mulching was done at the plant base with paddy straw (10 kg/plot) for plots with mulching.

Observations on the incidence of brown spot disease in mulching and check plots (without mulching) for each planting date were recorded starting from the initiation of the disease. Five randomly selected plants from each replication were considered for scoring the disease. Per cent disease index (PDI) was calculated on the basis of 0-7 scale (Shenoi *et al.*, 2002). Final assessment of the disease was calculated based on the formula of Wheeler (1969). The average of all these observations was taken and were subjected to angular transformation for statistical analysis. Yield parameters were also studied as described by Monga (1988).

Incidence of brown spot in mulched and check plots for different planting dates have been presented in Table 1 (a, b & c). Planting of *Motihari* tobacco in different dates significantly influenced incidence of brown spot during 2005-06 and 2006-07. The effect of mulching on brown spot disease index was found to be non significant. Significant reduction in brown spot disease index was observed when planting was done in late season as compared to early and normal planted crop. The observations corroborate the findings of Monga (1990) who also observed lower disease incidence in late planted crop. The cured and first grade leaf yields of *Motihari* tobacco were lower in late planted crop during both the crop seasons despite lower incidence of brown spot. This may be due to the fact that the late planted crop matured in less time as compared to early planted crop and number of disease cycles of brown spot pathogen might be less in late planted crop leading to lower brown spot index. The result of the present finding also suggested that mulching had no significant effect on reduction of brown spot disease index during both the seasons. The reason attributed to this fact may be due to favourable pre-disposing factors

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Table 1: Effect of mulching and different planting dates on brown spot disease index and yield on Motihari tobacco. (2005-07)**(a) Per cent disease index**

Treatments	Early planting	Normal planting	Late planting
Mulching	20.2 (26.69)	20.3 (26.83)	8.7 (17.18)
Without mulching	20.2 (26.69)	20.6 (27.03)	9.8 (18.25)
Mean	20.2 (26.69)	20.4 (26.85)	9.3 (17.76)
Sources	SEm±	CD (P=0.05)	CV (%)
Date	0.19	0.54	3.18
Date x Treatment	0.27	0.77	

Figures in parentheses indicate angular transformed value

(b) Cured leaf yield (kg/ha)

Treatments	Early planting	Normal planting	Late planting
Mulching	1876	2383	1481
Without mulching	1642	2259	1481
Mean	1759	2321	1481
Sources	SEm±	CD (P=0.05)	CV (%)
Date	34.87	100.30	7.51
Date x Treatment	49.31	141.90	

(c) First grade leaf yield (kg/ha)

Treatments	Early planting	Normal planting	Late planting
Mulching	1222	1543	966
Without mulching	1065	1470	963
Mean	1144	1507	965
Sources	SEm ±	CD at (P=0.05)	CV (%)
Date	22.93	65.98	7.61
Date x Treatment	32.43	93.30	

for rapid build-up and spread of the disease by the pathogen. However, both cured and first grade yields were obtained higher under normal date of planting as compared to early and late planted crops.

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REFERENCES

Krishnamurthy, V. and C.V. Narasimha Rao. 2010. Tobacco: New Dimensions. **Tob. Res.** 36: 1-8.

Lucas, G.B. 1975. *Diseases of Tobacco*. Biological Consulting Associates, Raleigh, North Carolina, Third Ed. pp. 267-95.

Monga, D. 1988. Preliminary investigation on the loss of yield and quality in *Motihari* tobacco (*Nicotiana rustica*) due to brown spot incidence. **Tob. Res.** 14: 64-7.

Monga, D. 1990. Brown spot disease incidence of tobacco as influenced by different varieties and their planting dates. **Tob. Res.** 16: 83-8.

Shenoi, M.M., S.S. Srinivas, K. Karunakaramurthy and S.M. Abdul Wajid. 2002. A new rating scale for assessment of brown spot disease in tobacco. **Tob. Res.** 28: 142-5.

Wheeler, B.E.J. 1969. *An introduction to plant diseases*. John Wiley and Sons Ltd., London. pp. 301.