

Short Communication

Occurrence of pearl millet smut in relation to environmental factors

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Pearlmillet *Pennisetum glaucum* (L)

R. Br. is the staple cereal crop, best suited to the climate of seasonably hot, drought prone and semi arid regions of Africa and Indian subcontinent. Smut caused by *Tolyposporium penicillariae* (Bref) is an important and wide spread disease in India and Western Africa (Rachie and Majumdar, 1980 Thakur and King, 1980). In the western Rajasthan region, this pathogen has established a key position among the pearl millet diseases and has become a major biotic constraint to the full exploitation of high yield potentials of improved hybrids and varieties in these smut sensitive areas. The present investigation was under taken to find out the role of weather parameters on the development of smut sori in pearl millet.

The investigation was carried out during *kharif* season of 1997-98 at Agricultural Research Station, Keshwana, Jalore. A susceptible hybrid HB₃ was sown on four different dates (30th June, 10th July 20th July and 30th July) in a randomized block design rreplicating four times with a plot of 2m x 2m; the distance between row to row and plant to plant was 50 and 10cm respectively. Ten plants from each plot were

tagged at boot leaf stage and under natural conditions the smut severity was recorded on the tagged plants by adopting the severity rating scale as suggested by Thakur and King (1988). Apart from this weather parameters viz. maximum and minimum temperature, relative humidity, total rainfall and sunshine hours were also recorded for forty days i.e. from thirty to seventy days after each sowing date. Correlation between smut severity and weather parameters were worked out.

Results (Table 1) show that the formation of smut sori was positively and significantly influenced by the relative humidity ($r=0.80$), total rainfall ($r=0.78$) number of rainy days ($r=0.82$) and minimum temperature ($r=0.47$). This indicates that smut severity increases with the corresponding increase in these parameters. In contrast, the formation of smut sori was negatively and significantly influenced by the mean air temperature ($r=-0.82$) mean minimum temperature ($r=-0.6$) and number of bright sunshine hours/days ($r=-0.819$) indication that smut severity decreases with the corresponding increase in these parameters. Kaushik *et al.* (1988) reported

Table 1 : Correlation and regression between weather parameters (X) and the development of smut severity (Y)

Sr. No.	Weather parameter	r	Regression equation
1.	Max. temp.	0.82**	$Y = 122.65 - 3.54 X$
2.	Min. temp.	0.47**	$Y = -57.31 + 2.82 X$
3.	Mean temp.	-0.59**	$Y = 195.79 - 6.71 X$
4.	Relative humidity	0.80**	$Y = 43.18 + 0.634X$
5.	Total rainfall	0.78**	$Y = 2.98 + 0.02 X$
6.	No. of rainy days	0.82**	$Y = -2.085 + 0.59 X$
7.	Average sunshine hours	0.82**	$Y = 19.125 - 1.52 X$

** Significant at $p=0.01$

that the temperature, relative humidity and wind speed are the principal environmental factor in influencing production and dispersal of *Tolyposporium penicillariae* sporidia.

Regression equation revealed that the infection and development of smut sori occurs in between 20-35 °C. Regression equation between humidity and smut severity shows that the disease appears only when the average humidity increased above 68% and there after every one per cent increase in humidity will result in increase of smut severity by 0.63 per cent. These finding are supported by Thakur and King (1988), who reported that smut infection and spread are most favoured by the prevalence of high relative humidity (>80%) and optimum temperature (25-30 °C) at the flowering stage of the crop.

REFERENCES

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