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A NOTE ON THE INFLUENCE OF METEOROLOGICAL FACTORS ON EARLY SHOOT-BORER (*CHILOTRAEA INFUSCATELLUS SNELL*) OF SUGARCANE AT PADEGAON (MAHARASHTRA)

The early shoot-borer (*Chilotraea infuscatellus snell*) is one of the serious pests of sugarcane in India and is distributed all over (Atwal 1986). Meteorological parameters like maximum and minimum temperature, bright hours of sunshine, relative humidity percentage and rainfall generally play a significant role in the development of pest population. In view of this, an attempt has been made to explore feasibility of fore-warnings of early shoot-borer attack on sugarcane by investigating the relationship between the intensity of attack and the few meteorological elements during the infestation period.

The entomological data at weekly intervals and the meteorological data recorded daily at 0700 and 1400 LMT at crop weather station, Padegaon (18.12°N, 74.10°E, 556 m asl) in Maharashtra, during 1986-1991, were utilised in this study. The seasonal index of the pest attack was calculated as an average of the weekly incidence reported during the period of infestation similar to the work done by Dubey *et al.* (1988 & 1989).

The seasonal indices were correlated with the weekly means of maximum temperature (T_x), minimum temperature (T_n), bright sunshine hours (SSH), relative humidity (%) at 0700 LMT (RH-I) and at 1400 LMT (RH-II). The correlation coefficients (CC) obtained between the above mentioned elements and mean seasonal indices of the pest infestation were compared. The standard weeks having highest CC values were selected. Student 't' test was applied to check the statistical significance of their correlations. Only parameters having significant correlations at 5% level were retained for further analysis. A regression equation was derived between pest index and parameters of highest CC for the standard weeks corresponding to the favourable growth stage of sugarcane for infestation.

Significant correlation coefficients -0.75, -0.92, -0.93, 0.80 for T_x in standard week 6 (5-11 February), T_n in standard week 19 (7-13 May), RH-I in standard week 9 (26 February - 4 March) and SSH in standard week 7 (12-18 February) observed respectively, indicate that these are main influensive meteorological factors.

The multiple linear regression equation between seasonal indices of infestation and four weather parameters (*i.e.*, T_x , T_n , RH-I and SSH) for which 6 years data were available, was developed and expressed as follows :

$$Y = 114.5429 + 0.837 X_1 - 3.104 X_2 - 0.722 X_3 - 0.433 X_4$$

(1.25) (3.41) (4.57) (0.27)

where,

Y = Estimated value of infestation,

X_1 = Weekly mean value of T_x in 6th standard week,

X_2 = Weekly mean value of T_n in 19th standard week,

X_3 = Weekly mean value of RH-I in 9th standard week, and

X_4 = Weekly mean value of SSH in 7th standard week.

Numbers written in the brackets are 't' values of corresponding parameters.

The multiple correlation coefficient is 0.99 which accounted for nearly 99.6% of total variation in the infestation. It shows that simple correlations (CC) which were negative in case of T_x and positive in case of SSH are making reversed contribution in multiple regression equation when all parameters are acting simultaneously. But they are insignificant according to 't' test.

With the help of this regression equation, it may be possible to estimate the infestation at the station. The above equation was tested for the year 1971. The data for this year was not used in developing this regression equation. The estimated infestation was 19.8% whereas actual reported was 18.7%. The reliability of the results may be increased if the actual quantitative data of the intensity of infestation recorded for more number of years are used.

It is necessary to make similar studies at other stations located in different agroclimatic zones. This may help in spatial and temporal delineation of areas prone to the attack of this pest so that proper forewarning may be issued for the farmers to take precautionary measure.

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References

- Atwal, A.S., 1986, Agricultural pest of India and Southeast Asia.
- Dubey R.C., Biswas, B.C., Ballal, A.S. and Kejare, P.L., 1988, "Influence of meteorological factors on Sugarcane stalk-borer at Shahjahanpur, *Plant Prod. Bull.*, 40, 3 & 4, pp. 27-30.
- Dubey, R.C., Biswas, B.C. and Wadekar, S.N., 1989, "Meteorological aspects of sugarcane stemborer infestation at Rudrur, *Mausam*, 40, 3, pp. 346-347.

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