

AN ANALYSIS OF THE SO-CALLED PERIPHERAL EFFECT DUE TO RICE STEM BORERS IN THE PADDY FIELDS OF LOWER SIND*

ABDUL MATEEN, MOHAMMAD AFZAL and IMTIAZ AHMAD

Department of Zoology, University of Karachi, Karachi

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Abstract. Peripheral effect of Nishida and Torii³ is studied with reference to paddy fields of lower Sind and it is found contrary to the findings of the earlier workers that the borer infestation is more extensive in the peripheral than in the central regions.

Nishida and Torii³ suggested to take into account the peripheral effect through which the peripheral regions of a paddy field are generally less densely infested by rice stem borers. Li and Kamono² also showed that the infestation was light in the periphery. However, Abraham and Khosla¹ showed insignificant variation in the incidence of infestation between peripheral and central regions of paddy fields. In the present work a Z-distribution test between the means of the peripheral samples and the samples taken from the central regions of three test paddy fields of lower Sind are carried out and it is shown that the infestation is more extensive in the peripheral than in the central regions of the paddy fields.

Materials and Methods

Three test fields (farmer's fields) were randomly selected and were arbitrarily divided into peripheral and central regions. Outer 1/4th of a test field represented the peripheral and the rest as central portion. A stratified random sampling procedure was adopted after Cochran,⁴ for the analysis of rice stem borer infestation, keeping a sampling unit 12m with 20 units in each sample. The degree of infestation was recorded by counting the number of bored stem in each sampling unit. Sampling points were randomly selected along the diagonals of the test fields covering peripheral and central regions. All sampling units were analysed regularly from September 13, 1975 to October 19, 1975 with an interval of one week. The test fields and the times of sampling represented the strata.

Results

In Table 1 total number of all peripheral and central samples (N_1 & N_2) are presented along with

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the mean (m_1 & m_2) and variance (S_1 & S_2) of total borer infested rice stems.

Testing the hypothesis $H_0: m_1 = m_2$ with the help of Z-distribution test the value of Z was calculated as 3.47; since the observed value of Z is

TABLE 1. STATISTICS OF THE SAMPLE DISTRIBUTION OF MEANS OF INFESTED RICE STEMS.

Type	Total No. of samples taken	Mean (board stems)	Variance
Peripheral samples	$N_1 = 50$	$m_1 = 18.7$	$S_1 = 370$
Samples beyond the periphery	$N_2 = 110$	$m_2 = 8.3$	$S_2 = 166$

greater than the theoretical value at $\rho = 0.05$ (viz., 1.96), we reject the null hypothesis at 5% level of significance.

Therefore, at $\rho = 0.05$ it can be inferred that infestation is more intense in the peripheral region than in the central region of the paddy fields of lower Sind.

Discussion

Present study has shown that the borer infestation is more extensive in the peripheral than in the central region of the paddy fields of lower Sind. As this result is contrary to the findings of earlier workers (Li and Kamono,² Abraham and Khosla¹, Nishida and Torii³) it is safe to conclude that this effect might show a variation from one geographical region to another.

References

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