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Characterization of relative susceptibility of wheat varieties against rice weevil (*Sitophilus oryzae* Lin.)

Yogesh Patel
B.M. College of Agriculture, J.N.Krishi Vishwa Vidhyalaya, Khandwa -474002 (M.P.) India

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An in vitro studied on the relative susceptibility against Sitophilus oryzae (Lin) was carried out in eighteen verities of wheat. The varieties were screened by no choice and free choice test separately and replicated four times. In free choice test hundred pairs of adults were released in each variety. Number of adult oriented in each variety was counted. Significantly minimum number of adult was oriented in variety HUW-552 (3.1) and significantly higher number in variety HD-2285 (13.6). In no choice test five pairs of adults were inoculated in each variety. Adult emergence, total development period and sex ratio were computed. Total developmental period ranged from 32.2 days in DL- 806 to 37.6 day in Lok-1. The number of adult emerged was significantly ranged from 1.7 (Raj-4000) to 12.0 (PBW-468). The sex ratio male (1): female ranged from 0.75 (Raj-4000) to 1.75 (GW-273). The variety Raj-4000 expressed hindrance to orientation and emergence of pest and took a more time for development of Sitophilus oryzae L and therefore found relatively least susceptible. It was followed by HUW-522 and HI-8381. However, HI-8498 showed relatively susceptible response.

Key words: Sitophilus oryzae *Lin., Susceptibility, Free choice, No choice, Sex ration, Orientation, Emergence, Total developmental period.*

INTRODUCTION

IN spite of the best effort in the improved production technology there occurs several bottlenecks that cause severe losses to the final agricultural produce especially during the post harvest management when food grains remain under storage. A number of insect pests have been reported to be associated with stored grain and their byproduct that causes losses of food energy intended for human and animal health. In wheat, insect pest problem is more serious at the post harvest stage rather than in the field. Among the various insect pest, Rice weevil Sitophilus oryzae (Lin.) is most destructive pest of store grain in wheat (Cotton 1920). It is originated in India and worldwide in distribution (Fletcher, 1914 and Cotton 1920). In Madhya Pradesh Sitophilus oryzae(Lin). and Rhizopartha domnica (Fab.) were the major pest of the stored wheat, where Sitophilus oryzae (Lin.) was most dominating pest of stored wheat (Lal & Shrivastava 1985). Keeping above point in view, a study on the relative susceptibility of eighteen verities of wheat against Sitophilus oryzae(Lin.) was conducted.

MATERIALS AND METHODS

A investigation to assist the effect of wheat varieties on the orientation, development, adult emergence and male: female sex ratio were carried out under the laboratory condition in the Department of Entomology, College of Agriculture, J.N.K.V.V., Gwalior (M.P.). The culture of S.Oryzae was maintained in vitro at 30±5 °C temperature and 75±5 percent relative humidity with the help of incubator and deciccator respectively, and facilitated them for multiplication for utilization of newly emerged adults in experimentation. The studies were conducted in no choice and free choice tests, separately using eighteen varieties of wheat.

In free choice test hundred uninfected conditional grain of each variety were randomly arranged in a glass trough in circle at equi-distance from the center. Small solid glass rods were kept between the varieties to separate them from each other. Hundred pairs of ten-days old adults were released in center of trough and it is covered by muslin cloth. The number of adults oriented in each variety was counted twenty-four, forty-eight and seventy-two hours after their release.

In no choice test, 20 gm conditioned grain of each varieties was kept in separate specimen tube and all the tubes were kept in deciccator at 75±5 % relative humidity which was in turn kept in the incubators at 30±5 °C temperature. After a week, weight of grain was adjusted and five pairs of ten-day old adults were released in each tube and forty-eight hours after release, all the adults were removed in the tube. Fifteen days after inoculation, male and female emerged in each variety were recorded daily. The total development period and sex ratio were determined. Both the experiments were replicated four times. The data were subjected to suitable transformation and were statistically analyzed as per Randomized Block Design.

RESULTS AND DISCUSSION

A. Free choice test

Effect of wheat genotype on orientation of Rice weevil S. oryzae (Lin.)

24 hours after release

Significant differences between the varieties were observed in the present study (Table.1). Significantly minimum number of adult was oriented in variety HI-8381 (3.80), which was at par with varieties HUW-522, HD-2747 and Raj-4000. However, significantly maximum number of adult was emerged in Lok-1 (12.7).

48 hours after release

Significant different were observed between the varieties in the number of adult oriented 48 hours after release. However significantly minimum number of adult was oriented in variety Raj-4000 (2.0) and was at par with HUW-522 and HI-8381 in comparison to maximum adult oriented (13.23) HD-2285.

72 hours after release

Significantly minimum number of adult was oriented in varieties Raj-3999 (2.51), which was at par with Raj-4000, Huw-522, DL-788-2. However, maximum number of adult was oriented in variety HD-2285 (16.5).

Mean Orientation

Data of mean orientation based on the above three observations in free choice test showed that significantly minimum number of adult oriented in variety HUW-552 (3.1), which was at par with