

ASSESSMENT OF NEWLY IMPROVED RICE VARIETIES FOR BROWN PLANTHOPPER (*Nilaparvata lugens*) RESISTANCE

By

K. P. A. P. Kumari

Department of Agricultural Biology, Faculty of Agriculture, Eastern University, Sri Lanka

ABSTRACT

Among the major food crops, rice is the only one that is almost exclusively a human food. It constitutes half of the diet of more than 1.6 billion people. Rice in Sri Lanka has played an important role in the country's functioning and survival for centuries. Rice productivity is adversely impacted by numerous biotic and abiotic factors. Among them Brown Planthopper (BPH), *Nilaparvata lugens* is one of the serious rice pests in Sri Lanka. Several BPH outbreaks were reported in Sri Lanka. Recently, some areas of Batticaloa district were highly affected due to the BPH damage.

A questionnaire survey was carried out in three selected areas (Mandur, Kokkadichoolei and Kaludavali) which were highly affected by BPH. Variety and seed rate were mainly considered in the questionnaire survey. Presently; Bg 94-1, Bg 300, Bg 357, Bg 366 and Bg 374 rice varieties are grown in the Batticaloa district. These varieties were already released and recommended as resistant and moderately resistant varieties to BPH.

The most effective way of BPH management is considered as host plant resistance. The varieties which are resistant to BPH play a significant role in controlling BPH outbreaks in rice cultivation. Varietal resistance is the most economic, least complicated and environmentally friendly approach for the control of BPH. Various evaluation methods were developed to measure response to BPH

in rice varieties. Among them a screening methodology has been developed and widely adopted throughout the world.

The resistance to BPH of rice varieties might have been changed from the time the varieties have been released. Therefore, it is very important to evaluate the current status of these improved varieties for BPH resistance by screening test. This study was carried out to evaluate the nature of BPH resistance in newly improved rice varieties collected from rice research stations in Sri Lanka using standard seed box screening test.

The screening test was conducted at the plant house at the Rice Research and Development Institute, Batalagoda according to the IRRI (International Rice Research Institute) standards. Bg 380 was used as a susceptible check variety and Ptb 33 was used as a resistant check for this test. The BPH population in Batalagoda was maintained in the BPH rearing cages. The available seeds of newly improved rice varieties were collected including Batalagoda, Bombuwala, Labuduuwa and Ambalantota. Rice varieties were established and two week age seedlings were introduced in the galvanized iron trays with hoppers. The plant damages were graded by using the Standard Evaluation System for Rice scale. BPH damage was done by scoring system which was developed by the International Rice Research Institute.

According to the results, comparison of level of resistance between now and past released rice varieties was done. Some varieties shown significant difference in level of resistance for BPH damage.

Among all the tested rice varieties Bg 379/2 was shown Resistant to Moderately resistant level (score 3 - < 3.5) for BPH screening. The selected rice varieties; H-4, H-7, H-10, Bg 745, Bg 38, Bg 407H, Bg 403, Bg 369, Bg 366, Bg 359, Bg 357, Bg 310, Bg 305, Bg 304, Bg 300, Ld 371, At 306, At 309, At 311, At 354, At 405, Bw 267-3 and Bw 453 were shown Moderately Resistant

level (score 3.5 - < 5) for BPH screening. These varieties will be proposed for the areas which were highly affected by Brown Planthopper in Batticaloa district with the further testing.

Supervisor: Dr. (Mrs). N. Rodney Fernando

Department of Agricultural Biology

Faculty of Agriculture

Eastern University, Sri Lanka