

论文

不同水稻品种对褐飞虱的耐虫特性研究

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摘要:

褐飞虱是中国水稻生产上最主要的害虫之一, 以褐飞虱的耐虫性指数和抗生性指数以及F₁代种群繁殖率评价10个水稻品种耐虫特性。结果显示, 在水稻三叶期接入8头褐飞虱低龄(1~2龄)若虫为害时, 品种间的耐虫性差异明显, 汕优63、秀水11、培矮64S/32E、Triveni、Utri Rajapan、嘉育948、ASD7等品种的耐虫指数大于抗生性指数, 尤其是汕优63品种; 而IR64、Rathu Heenati品种的耐虫指数明显小于抗生性指数。若用高龄(3~4龄)若虫为害, 多数品种的耐虫指数上升。同一品种, 成株期的耐虫指数高于苗期。试验进一步表明, 当TN1、秀水11稻株枯死时, 汕优63、培矮64S/E32、嘉育948、Triveni、Utri Rajapan中等受害, ASD7和IR64轻度受害, Rathu Heenati无受害症状。从褐飞虱F₁代数量来看, 汕优63、培矮64S/E32与秀水11、TN1无显著差异, 且均高于其他品种; 嘉育948、Triveni、Utri Rajapan显著高于ASD7, 后者又极显著高于IR64和Rathu Heenati。这些结果表明, 汕优63、秀水11、TN1属感虫品种, 无耐虫性和抗生性, 培矮64S/E32、Triveni、Utri Rajapan属强耐虫性品种, IR64、Rathu Heenati属强抗生性品种, ASD7、嘉育948属耐虫性较强、抗生性较弱的品种。说明利用本文的评价方法基本上可以确定水稻品种的耐虫特性, 这对耐虫品种的选育以及对褐飞虱可持续治理和保持品种抗性的稳定有着重要的现实意义。

关键词: 水稻品种 褐飞虱 耐虫特性 种群参数

Evaluation for Tolerance Characteristics of Different Rice Varieties to Brown Planthopper(BPH), *Nilaparvata lugens* Stal

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Abstract:

Brown planthopper (BPH), *Nilaparvata lugens* Stål, is one of the most serious insect pests of rice in China and other southeast Asia countries. In the paper, tolerance characteristics of 10 different rice varieties was analyzed using tolerance index, antibiosis index, functional plant loss index (FPLI) and population number of BPH F₁ generation at rice seedling and adult stages. The results showed that when plants were infested by eight 1–2 instars and 3–4 instars BPH nymphs at seedling stage, respectively, the plants of different varieties expressed some difference in tolerance levels. Tolerance indexes of these varieties including Shanyou 63, Xiushui 11, Pei'ai 64S/E32, Triveni, Utri Rajapan, ASD7, and Jiayu 948 were greater than their antibiosis indexes, Especially for Shanyou 63. While tolerance index of IR64, Rathu Heenati was obviously less than antibiosis index. When rice plants were infected with 3–4 instar nymphs, its tolerance index increased. For the same variety, tolerance index at adult stage was obviously higher than that at seedling stage. Under the infection by same number of BPH, the plants of varieties Xiushui 11 and TN1 died (9 level), Pei'ai 64S/E32, Shanyou 63, Jiayu 948, Triveni and Utri Rajapan plants expressed middle damage level (3–5 level), ASD7 and IR64 less damage level (<3 level), Rathu Heenati no damage. Population number of BPH on Xiushui 11, Shanyou 63 and Pei'ai 64S/E32 had no obvious difference from that on TN1, and was significantly higher than that on other varieties, with that on Jiayu 948, Triveni, Utri Rajapan > that on ASD7 > that on Rathu Heenati. These results above mentioned indicated that TN1, Shanyou 63 and Xiushui 11 are susceptible, has no tolerance and antibiosis characteristics; Pei'ai 64S/E32, Triveni, Utri Rajapan belongs to the group of stronger tolerance; IR64, Rathu Heenati are of high antibiosis; ASD7 and Jiayu 948 belongs to the group of both tolerance and antibiosis. Therefore, it is concluded that tolerance characteristics of different rice varieties will be determined by the method using in the paper. This will provide a useful screening method in tolerant varieties breeding and be of important significance to sustainable management of BPH.

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