On-Site Research and Hands-On Training on Brown Planthopper-Transmitted Viruses

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To characterize the biological relationship between the brown planthopper (BPH) and the associated viruses prevalent in Vietnam, on-site research and hands-on training on BPH-transmitted viruses were conducted in Southern Regional Plant Protection Center (SRPPC), Tien Giang Province between July and September of 2009. SRPPC was chosen as the hub of virus-related research activities of the IRRI-ADB BPH project in Vietnam. The hands-on training aimed to enable researchers in SRPPC and other institutes in the Mekong Delta to handle detailed experiments to examine the BPH-virus relationship.

The following activities were conducted by researchers of SRPPC and other institutes in the region under instruction of staff from IRRI:

1. Mass rearing of virus-free BPH - This was done to establish and maintain virus-free BPH colonies to be used for virus transmission studies.
2. Preparation of virus sources - This was done to establish pure cultures of rice grassy stunt virus (RGSV) and rice ragged stunt virus (RRSV) as infected rice plants, which are to be used for virus transmission studies (Figure 1), since previous results indicated that many rice plants in fields are mix-infected with these viruses.
3. Determination of minimum/optimum incubation period of RGSV and RRSV in BPH, and in plants - This was particularly important since RGSV and RRSV propagates in BPH before they are transmitted by BPH, and plants are often asymptomatic at the early stage of infection. The experiment was done by serial daily transmission of viruses by BPH in test tubes (Figure 2).
4. Determination of minimum/optimum acquisition access time for viruses RGSV and RRSV transmission by BPH vector
5. Determination of minimum/optimum inoculation access time for viruses RGSV and RRSV transmission by BPH vector
6. Determination of BPH transmission efficiency with stubbles and ratoon as virus source

Experiments for 4 to 6 were conducted to obtain basic data to evaluate the epidemiological characteristics of RGSV and RRSV. The experiments were done by inoculating viruses via BPH in mylar cages (Figure 3).

The experimental data on BPH transmission of RGSV and RRSV to be obtained from the experiments will be used to implement cultural practices which effectively reduce the incidences of RGSV and RRSV.

Figure 1. On-site research and hands-on training on preparation of virus infected plants and detection of viruses in plants by an immunological test

Figure 2. Virus inoculation by BPH in test tubes, and subsequent daily transfer of virus-carrying BPH to healthy seedlings

Figure 3. Virus inoculation by BPH in mylar cages