Co-occurence relationships between Insect Pest and Disease from Farmer's Field Survey Data Revealed by Network Analysis

Sith Jaisong
Plant Disease Management Group, CESD, IRRI
Los Baños, Philippines
s.jaisong@irri.org

Pests are the blocks of the big wall that agronomists have to deal with because of the need to increase crop productivity. Survey data from farmers' fields are the useful sources of information to help us to determine the importance of pests and understand the complex interactions of the agroecosystem. Spearman's rank correlation-based network analysis was conducted to identify the co-occurrence correlations of incidence of insect pests, and diseases from survey data collected from the 450 farmers's fields in lowland rice growing areas across five countries including India, Indonesia, Philippines, Thailand and Vietnam from 2007 to 2010. Network analysis revealed interaction among insect pests and diseases, and strongly indicated the occurrence of their relations. In wet season, incidence of bacterial leaf streak, the damages by whorl maggots, the incidence of silver shoot and the number of brown plant hopper showed strong co-occurrence with other pests, and the incidence of narrow brown spot, the number of brown plant hopper, and white backed plant hopper showed strong co-occurrence in dry season. The strong co-occurrence of selected pests potentially indicated the key pests to control.