

increased grain yield, but yields were significantly less than with 11.2 kg Zn/ha applied to soil. Soil application of 11.2 kg Zn/ha from Zn-EDTA produced the highest grain yield (7.6 t/ha), followed by 11.2 kg Zn/ha from ZnSO₄ (7.1 t/ha).

The yield response curve indicated that 5.6 kg Zn/ha applied through Zn-EDTA produced as much yield as 11.2 kg Zn/ha applied through ZnSO₄. Straw yield patterns were similar. Zn uptake increased with rates of Zn application from both sources.

These results suggest that to correct Zn deficiency in rice soils, application to the soil is better than foliar application and Zn-EDTA is more efficient than ZnSO₄. □

Disease management

Survey of rice virus carriers among brown planthopper (BPH) *Nilaparvata lugens* populations in Laguna, Philippines

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We used a light trap at the center of a 1.6-ha rice farm surrounded by coconut fields in Liliw, Laguna, 1985-88 to capture BPH and determine if they carried rice ragged stunt virus (RSV)

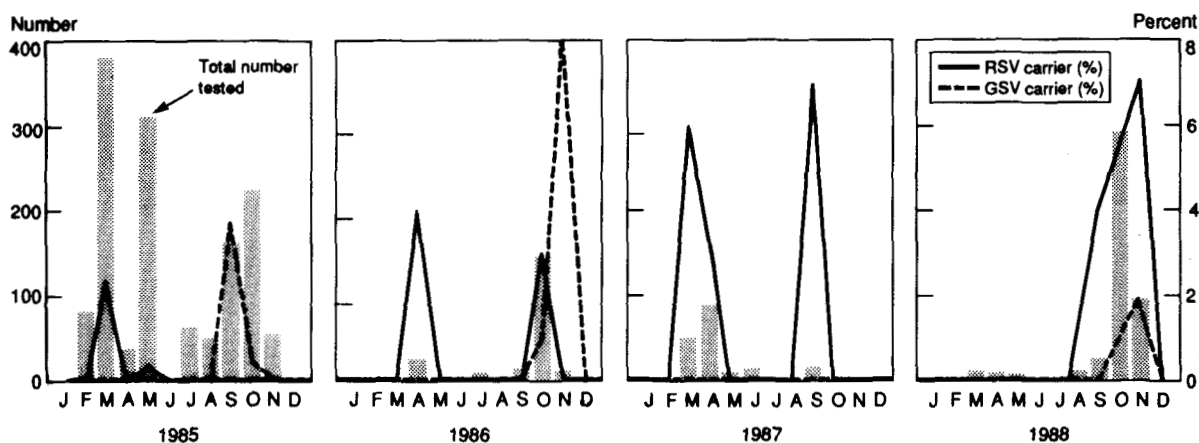
and rice grassy stunt virus (GSV).

The 5-m-high light trap was operated every other day. Trapped BPH were individually homogenized with 0.5 ml of 0.02 M phosphate buffer, pH 6.5, containing 0.15 M NaCl, 0.05% Tween 20, and 2% polyvinylpyrrolidone (MWT - 10,000). The homogenate was assayed separately for presence of GSV and RSV by enzyme-linked immunosorbent assay (ELISA).

Numbers of BPH caught fluctuated considerably across the study

period. Peak catches were in Mar-May and Sep-Nov. Few BPH were trapped in Jun-Jul and Dec-Jan, the periods that are the usual start of the rice cropping season.

Monthly light trap data showed an average 0-8% GSV carriers and 0-7% RSV carriers among vectors tested (see figure). RSV carriers occurred in most crop seasons during 1985-88, but GSV carriers occurred in only a few seasons. Disease surveys reported zero to trace GSV and RSV in Laguna and nearby areas. □



Rice GSV and RSV carriers in trapped BPH in Laguna, Philippines, 1985-88.

Timing rice planting to control tungro (RTV) disease

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Green leafhopper (GLH) fluctuation

and RTV incidence were monitored in Lanrang Substation, Sidrap, in 1977-81. GLH density and RTV incidence were high Jan-Mar and Jul-Sep. Fluctuation patterns of GLH population and RTV incidence showed a fairly uniform trend (Fig. 1).

Recommended planting dates were formulated based on these data and rainfall patterns for different areas.

The recommendation was to plant the wet season (WS) crop in Apr-May, at the peak period of rainfall when GLH populations were very low. The dry season (DS) crop was to be planted in Nov-Dec when GLH density also was very low (Fig. 2). Varieties for irrigated and rainfed areas were recommended depending on duration needed.