Leafhopper and planthopper populations and rice tungro virus (RTV) incidence at the tail end of an irrigation system

A.L. Alviola III and J.A. Litsinger, Entomology Department, IRRI

The tail end of the 100,000 ha Upper Pampanga River Integrated Irrigation System (UPRIIS) in Central Luzon, Philippines, is an endemic area for RTV. Irrigation canals block natural drainageways, converting the west side of Batitang near the tail end of one lateral from a first class rainfed rice area to an uncultivated fallow. In dry season, irrigation water reaches only the east side of Batitang. In wet season, the laterals drain runoff water into Batitang, causing floods. Ricefields east of Batitang near the fallow are planted asynchronously because irrigation releases are undependable. Many farmers have their own pumps.

To measure differences in insect populations in the 1981 wet (WS) and 1982 dry seasons (DS), pairs of kerosene light traps were installed and monitored daily in six villages from the head to the tail end of the canal system. RTV symptoms were determined visually and confirmed by the iodine test. They correlated highly (r = 0.73**) with increasing distance from the head end of the system (Table 1). Staggered planting, measured as the variance in planting date, increased significantly (r = 0.87*) from the head to the tail end.

Three green leafhopper (GLH) species were collected in the light traps. Their numbers also increased from the head to the tail end of the system. *Nephotettix malayanus* was the most abundant species at the tail end, but only *N. virescens* (r = 0.59*) and *N. nigropictus* (r = 0.68*) numbers correlated with RTV incidence. In sweep net samples taken twice a week from 25 ricefields in 1982 DS, less than 3% of the GLH catches were *N. malayanus;* 75-86% were *N. nigropictus* and *N. virescens* (Table 2).

The most abundant planthoppers *Sogatella panicicola* and *Sogatodes pusanus* feed on *Echinochloa* sp. and *Leersia* sp. weed. *Echinochloa glabrescens* (52%) and *Leersia hexandra* (38%) dominated the fallow in weed biomass. Weeds in ricefields east of Batitang were mainly *Echinochloa crus-galli, Cyperus difformis,* and *Monochoria vaginalis.*

FARMCOP suction samples from three fields of IR42 on nine sampling dates during 1982 WS in east Batitang revealed no *N. malayanus* nymphs. Less than 1% of the total GLH adult catch was *N. malayanus*. The GLH nymphal population was split evenly between *N. virescens* and *N. nigropictus.*

Because *N. malayanus* was reared from *E. glabrescens* and *L. hexandra* but not from rice, its role as a vector of RTV is questionable. We conclude that increased RTV incidence is associated more with the increasing incidence of staggered planting than with the nearness of ricefields to uncultivated weedy fallow. However, weedy fallow areas can harbor low numbers of rice leafhoppers and planthoppers. □

Table 1. GLH and RTV incidence in ricefields of 6 villages from head to tail end of UPRIIS, Central Luzon, Philippines, 1981 WS-82 DS.

Village	Distance[a] from head end (km)	Variance of planting date[b]	RTV-infested hills[c] (%)	Light trap collection[d] (no./season per trap)		
				N. virescens	*N. nigropictus*	*N. malayanus*
Ibabaw Bana	0	49	0	128	16	16
Rajal Centro	9	90	0.4	1191	321	215
Marawa	15	217	4.5	486	136	156
Santa Rita	16	241	8.0	1001	238	511
Manaol	17	314	4.0	619	143	507
Batitang	18	429	10.5	2324	931	2788

[a]Measured along length of canal system.[b]Based on a sample of all fields within a 0.5-km radius of the center of a pair of kerosene light traps in each village, 1981 WS.[c]Sample of 125 hills in each of 5 randomly selected fields planted to IR36 or IR42. RTV incidence at reproductive stage was averaged from 1981 WS and 1982 DS. Diagnosis was confirmed by iodine test.[d]A pair of kerosene light traps placed 100 m apart in open ricefields in each village. Values are an average of 1981 WS and 1982 DS catches. Season = 6 mo.

Table 2. Leafhoppers and planthoppers collected by sweep net from abandoned ricefields. Zaragoza, Nueva Ecija, Philippines, Jan-Mar 1982 *DS.*[a]

Species	Collected (X)
Cicadellidae	
Nephotettix malayanus	21
N. nigropictus	12
N. virescens	3
Recilia dorsalis	1
Delphacidae	
Sogatella panicicola	43
Sogatodes pusanus	16
Sogatella kolophon	2
Sogatella furcifera	1
Sogatella longifurcifera	1
Nilaparvata lugens	1
N. bakeri	1

[a] 100 sweeps in each of 3 fields every 10 d for 5 mo. Rice plants were not encountered in 10-m^2 samples in each of 3 fields nor seen in any fields. Weeds, representing 3% dry weight each, were *Paspalum paspalodes, Echinochloa picta, Ipomoea aquatica,* and *Ludwigia adscendens*

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