

planthopper *Sogatella furcifera* recolonized the area after the floods and numbers exploded with the minimal natural enemy pressure. The high numbers collected in the light trap 2 mo after the floods represented 2 generations of hopper buildup. Hopperburn occurred in 30 ha of traditional rice. Spiders recolonized too late to prevent planthopper resurgence. The less migratory green leafhopper

Nephotettix spp. were slow to recolonize. Also decimated by the floods, their numbers did not resurge after flooding.

Yellow stem borer (YSB) *Scirpophaga incertulas* represented 99% of the stem borers (SB) from dissected stems in this flood-prone environment. YSB larvae can survive in rice tillers underwater; larvae of other SB species perish. Maximum numbers of YSB

collected in the light trap near harvest probably represent an emigrant dispersal flight in response to crop senescence and dry fields. YSB does not aestivate during the dry season but recolonizes from tracts of irrigated rice 10 km away. Low numbers of YSB were collected in the light trap throughout the year. ♀

Effect of ratoon rice crop on populations of green leafhopper *Nephotettix virescens*, brown planthopper *Nilaparvata lugens*, whitebacked planthopper *Sogatella furcifera*, and their predators

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A 50- to 60-d-old ratoon rice crop following a 120-d-old transplanted crop extends the effective period of insect pest buildup from 3 to 5 generations. Because insect numbers increase exponentially with each generation, hoppers which are not restricted to specific crop stages might be favored by

a ratoon crop. A ratoon crop also may create a favorable environment for hopper predators after harvest of the main crop because it does not involve habitat-disturbing land preparation.

Two successive field trials were conducted at IRRI to study populations of major hopper species and their predators in the main crop, ratoon crop, and second transplanted crop.

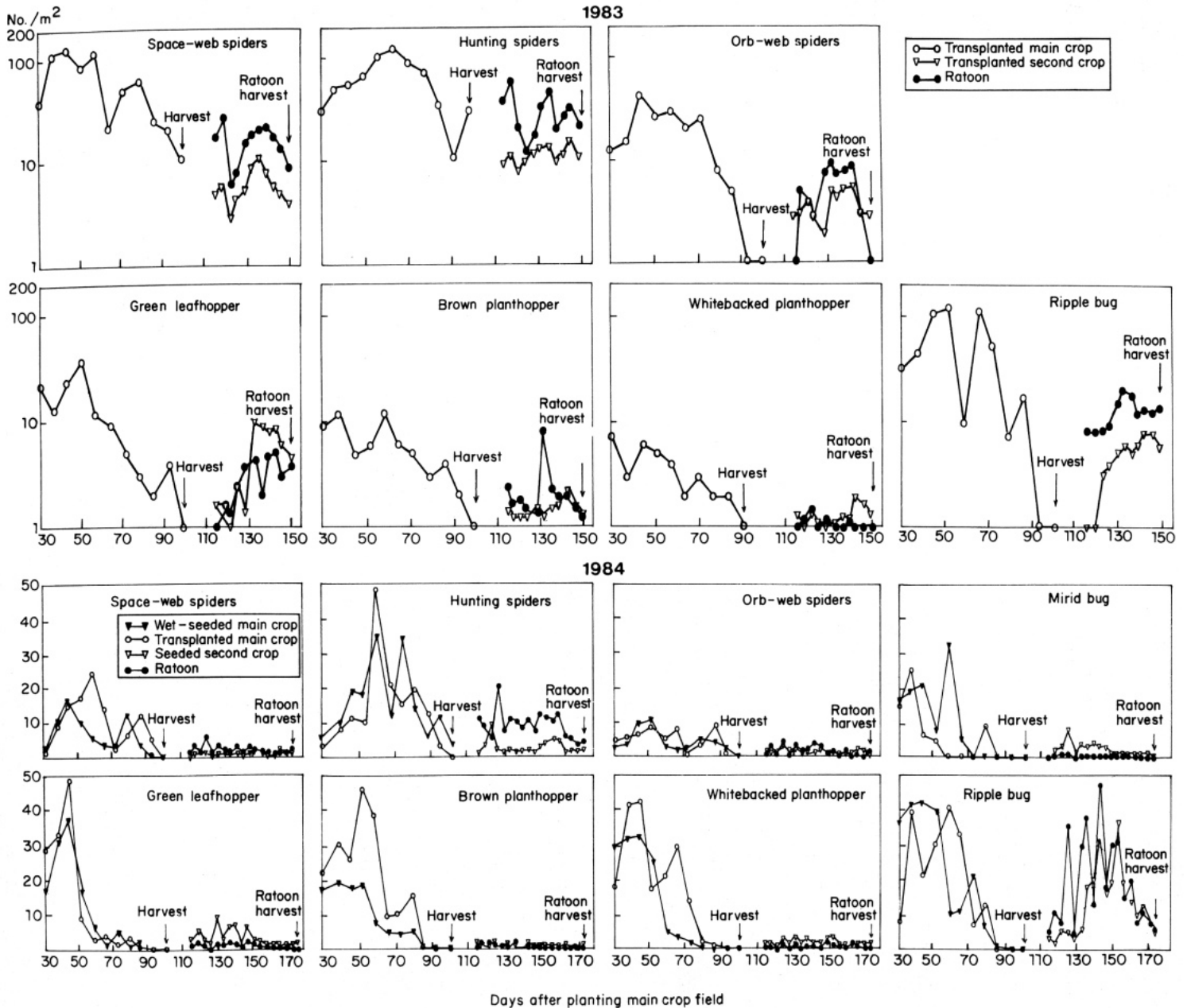
Mature plants of IR1917 (insect-susceptible but rice tungro virus-resistant) were ratooned by cutting stalks 15 cm above the ground. No insecticide was used on any crop, but fertilization, irrigation, and weeding were done as recommended. Hoppers and their predators were sampled

intensively using a FARMCOP suction machine.

As the main crop matured, hopper populations declined naturally because of outward migration and natural enemy activity (see figure). Space-web and hunting spiders were most abundant in the first crop and were more prevalent than orb-web spiders.

On the subsequent ratoon, all spider groups were generally higher than on the second crop. Possibly, the spiders foraged from the ratooned plots to the second transplanted crop, explaining why hopper numbers in general were low in all second crops.

Hunting spiders, dominated by *Lycosa pseudoannulata*, maintained



Population dynamics of hoppers and their predators on the main rice crops, ratoon, and seeded second crops. IRRI, 1983 and 1984 wet seasons.

higher numbers throughout the ratoon crop. Space-web spider *Atypena formosana* numbers declined as the ratoon matured. Because it makes its webs at the base of tillers, *A. formosana* and the highly mobile hunting spider can readily colonize a new crop or remain unaffected during harvest and growth of a ratoon.

Orb-web spiders *Tetragnatha* spp. and *Dyschiriognatha* sp. spin webs in tall foliage. They become abundant

during later growth stages, but decline at main crop harvest when hoppers disperse to colonize younger crops.

Microvelia ripple bug declines with crop age in a first crop but can rapidly colonize newly planted fields.

Microvelia was highly abundant in the first crop and in both ratoon and second transplanted crop.

Cyrtorhinus was not able to rebuild its population, probably because its eggs were removed with the straw at

harvest of the first crop. But it was more abundant in the second transplanted crop than in the ratoon, perhaps in response to higher green leafhopper numbers.

Evidently, ratoon is a refuge for spiders and ripple bugs. These predators were better able to respond to colonizing hoppers. Ratoon cropping may enhance early biocontrol activity. *S*