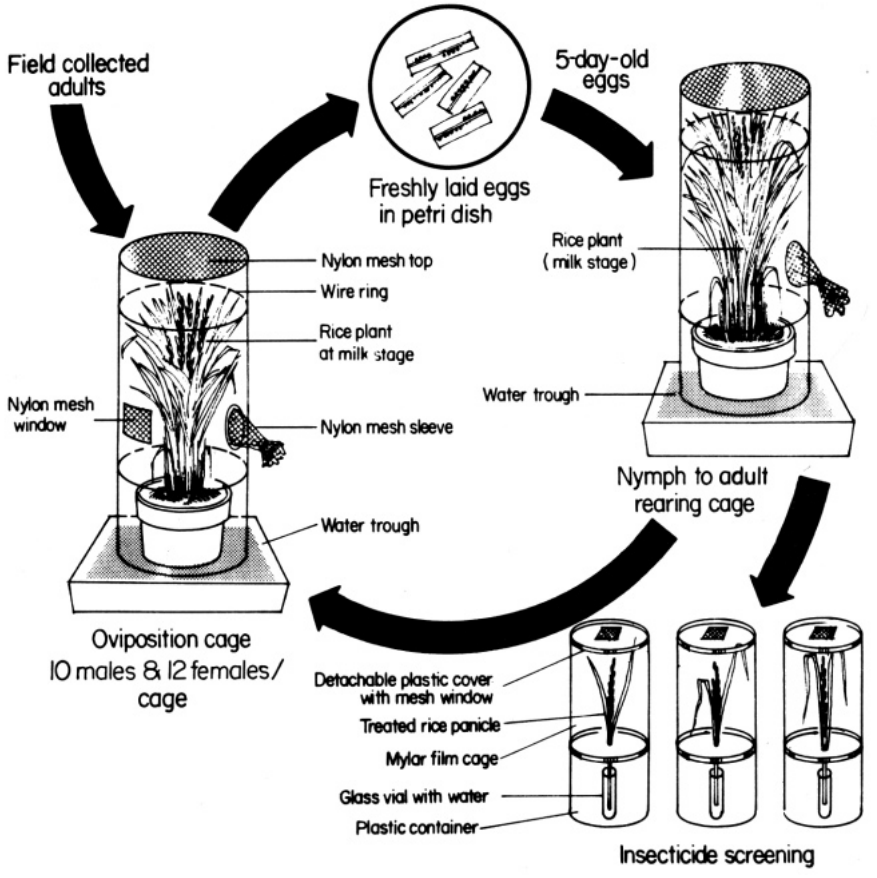
also can be used to supply rice bugs for varietal screening and other studies.

Steps for mass rearing of *L. oratorius* follow:

- Collect adults from the field with a sweep net, verify species and sex.
- Release a group of 10 males and 12 females into an oviposition cage 97 cm tall and 27 cm in diameter (see figure). IRRI's cage consists of mylar film reinforced with two heavy gauge wire rings. The cage rests in a trough containing water to maintain high humidity. Any susceptible rice variety can serve as a food source and substrate on which insects can lay eggs. We use early-maturing variety IR36 to shorten the time required to grow plants to the ripening stage.
- Provide fresh plants in the milk grain stage once a week.
- Collect eggs from the oviposition cage daily by clipping the leaf portion containing the eggs.
- Place leaf pieces in a petri dish containing moist filter paper and store for 5 days at room temperature.
- Five days after oviposition, transfer leaf pieces with eggs to the nymph rearing cage, which is identical to the oviposition cage.
- Clip leaf pieces with eggs to the base of panicles at the milk grain stage of the rice plant in this cage. After hatching, nymphs will move up to the developing grains to feed. Change plants in this cage once a week.



A method for mass rearing *Leptocorisa oratorius* for use in insecticide screening studies. IRRI, 1982.

Depending on the temperature at Los Baños, nymphs become adults in 17-33 days. Transfer some adults to the oviposition cage to maintain the colony.

The excess of 1- and 2-day-old adults can be used for bioassay of insecticides. The 12 females in one oviposition cage will provide sufficient eggs for 2 nymph-to-adult rearing cages, producing about 300 adults/day.

Chemical control of the whitebacked planthopper in Pakistan

Muhammad Akram Zafar, senior subject matter specialist (Plant Protection), adaptive research farm, Sheikhupura, Pakistan

Damage from the whitebacked planthopper (WBPH) *Sogatella furciferaera* (Horvath) is increasing in Pakistan, partitularly to high-tillering rice varieties. The only control that has been applied is minor dusting with BHC or BHC + DDT in seriously infested areas. An experiment was conducted during the 1980 wet season to identify insecticides effective for WBPH control.

The trial on IR6 rice in farmers' fields in Sheikhupura was laid out in completely randomized blocks with three replications and was repeated in two different but climatically and topographically similar fields. Fields were heavily infested with WBPH. MIPC and carbaryl were sprayed at 375 liters/ha, and pyridaphenthion (Ofunack) and BHC +

Insecticide control of whitebacked planthopper in Pakistan.

Treatment	Formulation	Dosage (kg a.i./ha)	Pest density (no./5 sweeps) at		Pest control (%.) after	
			3 days	15 days	3 days	15 days
MIPC	50 WP spray	1.250	2	22	97	70
Carbaryl	85 SP spray	2.125	2	35	98	52
Pyridaphenthion	2% dust	0.750	5	28	93	62
BHC + DDT	10% dust	0.375 + 0.875	11	26	85	64
Control	–	–	69	74	–	–

DDT were dusted at 37.5 and 12.5 kg/ha.

Live insects were collected with 5 sweeps of a net at scattered spots in each plot before and 3 and 15 days after application.

All insecticides gave significant control of WBPH at 3 days, then effectiveness decreased (see table). MIPC and carbaryl gave excellent control at 3 days Evidently, insecticide application should be repeated every 10-15 days.

Control of rice mites

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A trial in 1980 kuruvai season evaluated insecticides for controlling the rice mite *Oligonychus oryzae* (Hirst). A severe infestation on rice variety ADT36 was utilized. Insecticides monocrotophos (Nuvacron), methyl demeton (Metasystox), phosalone (Zolone), phosphamidon (Dimecron), and endosulfan (Corosulfan) were sprayed at 625 liters/ha on 20-m^2 plots. Mite density was observed, 72 hours after treatment, on 1-cm^2 leaf areas or 10 leaves selected randomly from 10 hills/plot.

All insecticides reduced mite density; monocrotophos was most effective (see table).

Effect of insecticides on rice mite density at Tamil Nadu, India.

Insecticide	Formulation	Dosage (kg a.i./ha)	Mite density[a] (no./10cm ^{2} leaf area)	Pest reduction (%)
Monocrotophos	40 EC	0.25	Sa	90
Methyl demeton	25 EC	0.16	15 c	68
Phosalone	35 EC	0.22	22 d	55
Phosphamidon	100 EC	0.63	10 b	78
Endosulfan	35 EC	0.22	10 b	79
Control	–	–	48 e	–

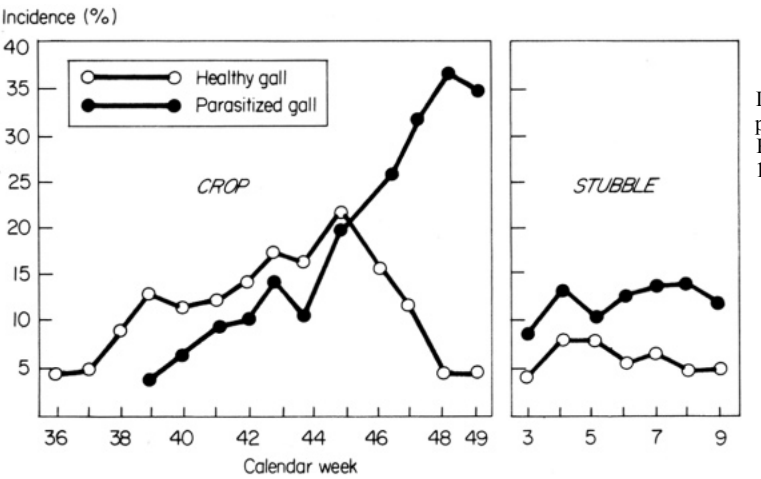
[a] Means followed by a common letter are not significantly different at 0.05% level.

Rice gall midge and its parasites

S. K. Shrivastava, M. P. Rice Research Institute, Raipur, M. P. (India)

The damage caused by the gall midge *Orseolia oryzae* in Madhya Pradesh and adjoining states is influenced by parasites. A trial with the highly susceptible variety TN1 during the 1978 wet season continued on stubble during the dry season. Healthy and parasitized gall midges were recorded weekly on tillers from early September (36th calendar week) 1978 to early December (49th calendar week) and on stubble from mid-January (3d calendar week) 1979 to early March (9th calendar week).

Gall midge infestation started the first week of September, gradually reaching a maximum in the second week of November (see figure). Parasitization started the fourth week of September and reached its highest level the last week of November. In stubble, the gall midge population was 3.4-8.4% and the parasite population was 8.5-15.8%.



Incidence of healthy and parasitized gall midge in Raipur, M.P., India, 1978-79

The data show the role of parasites in minimizing pest pressure.

Evaluation of insecticides for toxicity to brown planthopper eggs and nymphs

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Fourteen insecticides were tested for knockdown effect and persistent toxicity against brown planthopper (BPH) *Nilaparvata lugens* (Stal) nymphs. The insecticides were sprayed on 40-day-old TN1 plants. Insects were caged at regular intervals.

Fenvalerate, cypermethrin, and carbosulfan as 0.05% sprays exhibited quick knockdown effects and persistent toxicity. However, fenvalerate and cypermethrin were less persistent at normally recommended concentrations (0.01 and 0.005%). BPMC showed good knockdown effect but had less persistent toxicity. Isofenphos (EC and WP), bendiocarb, endosulfan, phenthoate, acephate, MIPC, UC51762, phosmet, and phoxim were less toxic.

Contact studies with the Potters