We tested 3 insecticides and their mixtures against GLH populations and RTV infection in 2 separate experiments: buprofezin (6 to 100 g ai/ha) applied alone or in combination with deltamethrin (6 to 13 g ai/ha) or cypermethrin (12.5 to 75 g ai/ha); BPMC was applied at 750 g ai/ ha for comparison.

GLH were collected by FARMCOP suction sampler from 10 hills 1 to 2 d after each insecticide application. RTV infection was recorded 65 d after transplanting (DT).

Significantly fewer GLH adults and nymphs were found on plots treated with buprofezin and deltamethrin alone or in combination (Table 1). Even at 50 + 6 g ai/ha, buprofezin- and deltamethrin-treated plots had fewer GLH. BPMC was effective on both GLH adults and nymphs. Buprofezin + deltamethrin at 6 + 13 g ai/ha was as good as higher rates against GLH and RTV.

Buprofezin- and cypermethrin-treated plots had fewer GLH at increasing rates of combination in both EC and WP formulation (Table 2). RTV infection was significantly lower on treated plots, except for buprofezin + cypermethrin at 25 + 12.5 g ai/ha in both formulations.

Table 2. Effect of mixtures of an insectistatic (buprofezin) and a synthetic pyrethroid (cypermethrin) to control GLH and RTV incidence. IRRI, 1986.

Insecticide[a]	Rate (g ai/ha)	GLH (no./10 hills) at 2 DAT[b]				RTV-infected hills (%) at 65 DT
		1st spraying		2d spraying		
		Adult	Nymph	Adult	Nymph	
Buprofezin + cypermethrin 10 + 5 WP	25 + 12.5	2.8 ab	12.8 ab	12.0 b	3.0 a	41 cd
Buprofezin + cypermethrin 10 + 5 WP	50 + 25.0	0.8 ab	6.8 ab	2.8 a	4.5 a	33 abc
Buprofezin + cypermethrin 10 + 5 WP	100 + 50	1.0 ab	5.0 a	1.8 a	2.3 a	24 a
Buprofezin + cypermethrin 10 + 5 WP	25 + 12.5	3.8 b	19.5 b	4.3 ab	1.5 a	38 bcd
Buprofezin + cypermethrin 10 + 5 WP	50 + 25.0	3.0 ab	7.0 ab	2.8 a	2.8 a	32 ab
Buprofezin + cypermethrin 10 + 5 EC	100 + 50.0	1.3 ab	8.3 ab	1.3 a	0.5 a	28 a
Cypermethrin 5 EC	50	0.3 a	5.0 a	1.3 a	4.3 a	27 a
Buprofezin 25 WP	50	4.0 bc	16.0 ab	12.0 b	2.5 a	30 ab
Control		6.8 c	16.0 ab	26.8 c	40.5 b	42 d

[a]Insecticides were applied at 10, 30, 50, and 70 DT. Spray volume was 300-500 liters/ha. [b]Av of 4 replications. In a column, means followed by a common letter are not significantly different at the 5% level by DMRT. DAT = days after treatment.

Because typhoons during the reproductive stage caused plants to lodge, yield was not considered. □

Orientation of whitebacked planthopper (WBPH) to scentless rice plants

G. Liu and R. M. Wilkins, Agricultural and Environmental Science Department, University of Newcastle upon Tyne, Newcastle upon Tyne NE1 7RU, UK; and R. C. Saxena, Entomology Department, IRRI

Plant odors act as chemical messengers for insect orientation. Attractants in susceptible rice plants and repellents in resistant plants play an important role in an insect's host selection and establishment. We studied WBPH *Sogatella furcifera* orientation when insects were offered rice plants wrapped in parafilm membrane.

Side tillers of 8-wk-old resistant Rathu Heenati and susceptible TN1 plants in pots were cut off. Half the remaining central tillers were left exposed and half wrapped with a 5- × 30-cm piece of stretched parafilm (a waterproof, thermoplastic sealing film). Pairs of exposed and wrapped tillers were inserted into 15- × 30-cm cylindrical mylar cages through small holes in the polystyrene disc that was the common base for the plants. □

Orientation of macropterous *S. furcifera* females to parafilm-wrapped and exposed Rathu Heenati and TN1 rice plants.[a]

Treatment	Oriented females[b] (%) at indicated time after release			
	0.5 h	1 h	2 h	4 h
Wrapped TN1	10 a (3)	16 a (8)	15 a (7)	15 a (7)
Exposed TN1	25 b (18)	42 b (45)	57 b (71)	58 b (71)
Exposed Rathu Heenati		43 a (47)	56 a (69)	50 a (59)
Wrapped TN1		21 b (13)	18 b (10)	18 b (10)
Wrapped Rathu Heenati	8a (3)	27 a (21)	32 a (31)	39 a (40)
Wrapped TN1	10 a (4)	26 b (19)	34 a (31)	40 a (41)

[a] In a column within a pair, means followed by a common letter are not significantly different at P=0.05 (DMRT). [b] Arc sine percentage transformed value. Mean of 5 replications. Figures in parentheses represent actual percentage of females oriented.

Newly emerged macropterous WBPH females were released, 20/polystyrene disc. The females were allowed free choice between parafilm-wrapped TN1 and exposed TN1; exposed Rathu Heenati and parafilm-wrapped TN1; and parafilm-wrapped Rathu Heenati and wrapped TN1, with five replications each treatment. Females settling on each tiller were counted at 0.5, 1, 2, and 4 h after release.

WBPH females clearly preferred exposed TN1 over parafilm-wrapped TN1 plants (see table). Significantly more WBPH settled on exposed resistant Rathu Heenati than on wrapped susceptible TN1. WBPH were oriented nearly equally to wrapped Rathu Heenati and TN1 plants. □

Minimal dosages of buprofezin to control green leafhopper (GLH), whitebacked planthopper (WBPH), and brown planthopper (BPH)

R. F. Macatula, O. Mochida, and J. A. Litsinger, Entomology Department, IRRI

Buprofezin, a slow-acting insectistatic compound, has high activity against nymphs of planthoppers, leafhoppers, whiteflies, and mites. It has no knockdown action; most nymphs die during molting to the next instar. While buprofezin does not kill adult insects, it suppresses egg deposition and egg viability to reduce populations of nymphs and adults in the next generation.

In two experiments, we tested minimum rates of buprofezin for leafhopper and planthopper control.

In both trials, buprofezin was applied at 12.5, 25, and 50 g ai/ha. BPMC and cartap were applied at 750 and 1,000 g ai/ ha, respectively, for comparison.

IR22 seedlings raised under netting were transplanted 21 d after sowing in 5- × 4-m plots (Aug 1985) and 5- × 5.3-m plots (Nov 1985) at 25- × 25cm spacing with 4 replications. Insecticides (300-500 liters/ ha) were sprayed 62 d after transplanting (DT). GLH, BPH, and WBPH adult or nymph populations were sampled using FARMCOP suction machine on 10 hills/plot 1 d before treatment (DBT) and 5-15 d after treatment (DAT).

In general, significantly fewer WBPH, GLH, and BPH adults and nymphs were found on plots treated with buprofezin, BPMC, and cartap (see table). Hopper populations were less with increasing rates of buprofezin in both trials. Buprofezin at 12.5 g ai/ha was as good as higher rates against WBPH, GLH, and BPH nymphs, and comparable to BPMC and cartap at 750 and 1,000 g ai/ha, respectively. □

Field evaluation of minimal dosages of buprofezin to control GLH, BPH, and WBPH. IRRI, 1985.

Chemical[a]	Rate (g ai/ha)	Nymphs[b] (no./10 hills)			
		1 DBT	5 DAT	10 DAT	15 DAT
			BPH		
Buprofezin	12.5	17105 a	1413 ab	137 c	6 ab
	25	24774 a	737 ab	11 a	4 a
	50	16142 a	377 a	3 a	1 a
BPMC	750	21899 a	1146 ab	65 ab	14 bc
Cartap	1000	15053 a	1967 ab	55 ab	16 c
No chemical (check)	–	15356 a	3324 bc	257 c	10 c
			WBPH		
Buprofezin	12.5	812 a	5 a	1 a	24 bc
	25	1092 a	12 ab	0 a	17 bc
	50	508 a	3 a	0 a	3 a
BPMC	750	995 a	11 ab	4 bc	48 c
Cartap	1000	227 a	26 bc	8 c	28 bc
No chemical (check)	–	987 a	32 c	1 a	40 bc
			GLH		
Buprofezin	12.5	103 a	9 ab	6 bc	1 a
	25	122 a	7 a	0 a	0 a
	50	107 a	1 a	1 a	0 a
BPMC	750	107 a	1 a	3 bc	0 a
Cartap	1000	133 a	15 bc	7 bc	1 a
No chemical (check)	–	121 a	23 c	10 c	1 a

[a]Chemicals applied by knapsack sprayer once at 62 DT. Spray volume = 500 liters/ha. [b]Av of 4 replications. In a column for each insect, means followed by a common letter are not significantly different at the 5% level by DMRT.

Predation by sword-tailed cricket *Anaxipha longipennis* (Serville) (Gryllidae) on eggs of three lepidopterous pests of rice

B. L. Canapi, E. G. Rubia, J. A. Litsinger, B. M. Shepard, and L. M. Rueda, IRRI

We studied the predatory ability of *Anaxipha longipennis* (S.) on eggs of leaffolder (LF) *Cnaphalocrocis medinalis,* green hairy caterpillar *Rivula atimeta,* and green horned caterpillar *Melanitis leda ismene* in the laboratory. Adults of the insect pests collected in the field were caged individually with 35-d-

Cumulative number of eggs of LF, green hairy caterpillar, and green horned caterpillar consumed by the cricket *Anaxipha longipennis.*[a] IRRI insectary, 1988.

Insect species	Egg density (no./cage)	Eggs consumed (cumulative no.)		
		24 h	48 h	72 h
Leaffolder	10	8	10	10
	20	15	18	19
	40	34	40	40
Green hairy caterpillar	10	10	10	10
	20	16	19	19
	40	34	39	40
Green horned caterpillar	10	2	2.0	4
	20	4	5	5
	40	6	10	11

[a]AV of 5 replications.