Guidelines and Style for IRRN Contributors

To improve communication and to speed the editonal process. the editors of the *International Rice Research Newsletter (IRRN)* request that contributors use the following style and guidelines.

Style

- Use the metric system in all papers. Avoid national units of measure (such as cavans, rai, etc.).
- Express all yields in tons per hectare (t/ha) or with small-scale studies in grams per pot (g/pot) or grams per row (g/row)
- Define in footnotes or legends and abbreviations or symbols used in a figure or table
- Place the name or denotation of compounds or chemicals near the unit of measure. For example: 60 kg N/ha; not 60 kg/ha N.
- The US dollar is the standard monetary unit for the *IRRN.* Data in other currencies should be convened to US$.
- Abbreviate names of standard units of measure when they follow a number. For example: 20 kg/ha.
- When using abbreviations other than for units of measure, spell out in lull the first time of reference, with abbreviations in parenthesis, then use the abbreviation throughout the remaining text. For example: The efficiency of nitrogen (N) use was tested Three levels of N were . . . *or* Biotypes of the brown planthopper (BPH) differ within Asia. We studied the biotypes of BPH in . . .
- Express time, money, and measurement in numbers, even when the amount is less than 10. For example: 8 years; 3 kg/ha at 2-week intervals, 7%; 4 hours.
- Write out numbers below 10 except in a series containing 10 or some numbers higher and some numbers lower than 10. For example: six parts, seven tractors; four varieties. *But* There were 4 plots in India, 8 plots in Thailand, and 12 plots in Indonesia.
- Write out all numbers that start sentences. For example: Sixty insects were added to each cage: Seventy-five percent of the yield increase is attributed to fertilizer use.

Guidelines

- Contributions to the IRRN should generally be based on results of research on rice or on cropping patterns involving rice.
- Appropriate statistical analyses are required for most data.
- Contributions should not exceed two pages of double-spaced, typewritten text. Two figures (graphs, tables, photos) per contribution are permitted to supplement the text. The editor will return articles that exceed space limitations.
- Results of routine screening of rice cultivars are discouraged. Exceptions will be made only if screening reveals previously unreported information (for example, a new source of genetic resistance to rice pests).
- Announcements of the release of new rice varietles are encouraged.
- Use common — not trade — names for commercial chemicals and, when feasible, equipment.
- Do not include references in IRRN contributions.
- Pest surveys should have quantified data (% infection, degree of severity, etc.).

Genetic evaluation and utilization

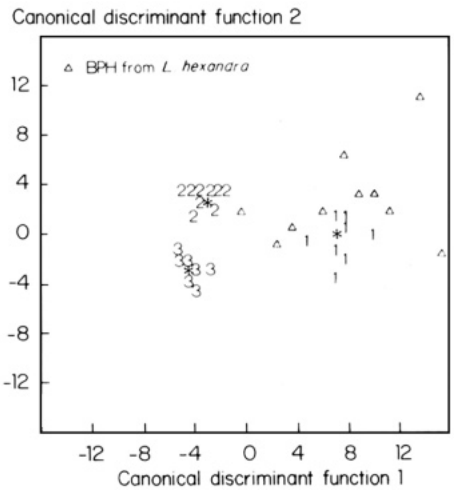
OVERALL PROGRESS

Morphological variations between brown planthopper biotypes on *Leersia hexandra* and rice in the Philippines

R. C. Saxena, principal research scientist, International Centre of Insect Physiology and Ecology, and associate entomologist, IRRI; M. V. Velasco and A. A. Barrion, IRRI

A brown planthopper *Nilaparvata lugens* Stål (BPH) population infesting the weed grass *Leersia hexandra* (Swartz) showed strong host specificity and died if caged on rice plants. Biological characteristics of the grass-infesting BPH population clearly differentiated it from rice-infesting BPH biotype 1, 2, and 3 populations in the Philippines. Morphological and morphometric evaluation of the rostrum, legs, and antennae of both brachypterous and macropterous males and females were made to determine if the grass-infesting BPH is a different biotype.

The scatter plot diagram based on computed discriminant scores of the rostral, leg, and antennal characters of macropterous females of the grass-infesting population and of macropterous females of biotypes 1, 2, and 3 showed distinct segregation (see figure), as was true for other morphs. However, the diffused cluster character of the grass-infesting population indicated it to be a less homogeneous population than either biotype 1, 2, or 3.



Discriminant scores based on rostral, leg, and antennal characters of macropterous females of biotypes of *N. lugens* infesting *Leersia hexandra.* The numbers indicate biotype designation; the asterisk (*) indicates a group centroid. IRRI, 1982.

These findings indicate that the grass-infesting BPH population is distinct from rice-infesting BPH biotypes. Therefore, it is logical to consider it as a primitive, nonvirulent *N.lugens* biotype. □

Morphological variations among three brown planthopper biotypes in the Philippines

R. C. Saxena, principal research scientist, International Centre of Insect Physiology and Ecology, and associate entomologist, IRRI; and L. M. Rueda, University of the Philippines at Los Baños, Philippines

The occurrence and evolution of prolific biotypes of brown planthopper (BPH) *Nilaparvata lugens* (Stål) threatens the stability of resistant rice varieties. These biotypes are identified by observing differential reactions of the host varieties and differential behavioral and physiological responses of the pest. No morphological basis for identifying BPH biotypes has been developed.

Because changes in ecological and physiological traits are frequently followed by subtle changes in morphological characteristics in many organisms, we evaluated morphological and morphometric differences among populations of BPH biotypes 1, 2, and 3 maintained as stock cultures at IRRI. The rostrum, legs, and antennae — body parts that possess receptors for host plant discrimination — were observed.

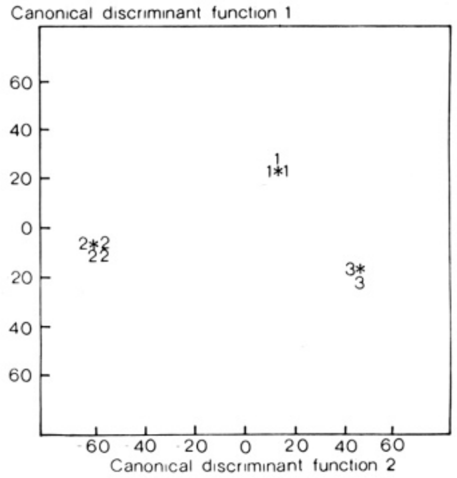
One hundred adults from each biotype population maintained on TN1 (biotype l), Mudgo (biotype 2), and

ASD7 (biotype 3) were prepared for morphological examination as follows: 1) boil in 95% ethanol for about 10 min; 2) macerate in lukewarm 10% NaOH for 10-15 min; 3) wash in 95% ethanol and boil for 15-20 min in chloral-phenol (1:1 part chloral hydrate and phenol crystals); 4) clear in creosote for 10 min; and 5) mount body parts on glass microslides using Hoyer's medium (30 g gum arabic, 50 ml water, 200 g chloral hydrate, 20 ml glycerine). Antennae in glycerol medium were also mounted on slides so they could be moved freely during microscopic examination.

Camera lucida drawings of selected structures were made at 20X objective of a phase contrast microscope. More than 100 morphological characters of the rostrum, including mandibular stylets, legs, and antennae, were measured and evaluated. Characters were examined separately in both sexes and their morphs, i.e., macropterous male, macropterous female, brachypterous male, and brachypterous female.

Multiple discriminant analysis using stepwise selection through Wilk's specification indicated distinct segregation of the three biotypes. The characters of the rostrum, legs, and antennae common to both sexes and their respective morphs contributed to the separation of biotypes. Scatter diagrams, based on computed discriminant scores of the three biotypes, showed a high degree of segregation (see figure). Hoppers classified using leg and antennal characters exhibited a 100% probability of correct morphological identification of the three biotypes.

We are using these criteria to evaluate allopatric populations of BPH biotypes from other geographical areas.



Discriminant scores of three biotypes of N. lugens based on rostral, leg, and antennal characters of brachypterous females. The numbers indicate biotype designation; the asterisk (*) indicates a group centroid. IRRI, 1980.

GENETIC EVALUATION AND UTILIZATION

Agronomic characteristics

Yield response of 10 rices to different nitrogen levels

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TKM9 cultivation is increasing in Tamil Nadu, particularly in the south. During 1981 sornavari (Jun-Jul to Sep-Oct) TKM9, ADT36, CO 41, IET4786, and two prerelease lines, TM3320 and TM3324, were compared for yield performance at different nitrogen application levels.

IR50, IET4786, TM8089, and TM8090 were tested during 1982 navarai (Dec-Jan to Mar-Apr).

Soil at the experimental site had pH 7.6, 0.64% organic carbon, 55 kg available phosphorus/ha, and 368 kg available potassium/ha. Nitrogen was applied at 0, 40, 80, 120, and 160 kg/ha in a strip-plot design with 2 replications.

During sornavari TKM9 yielded higher than other varieties at all nitrogen application levels (Table 1). IR50 yielded highest during navarai (Table 2). Both varieties yielded best at 120 kg N/ha. □

Table 1. Yield performance of rices grown at 5 nitrogen levels, sornavari 1981, Tirur, India.

Nitrogen	Grain yield (t/ha)						
(kg/ha)	TKM9	IET4786	ADT36	CO 41	TM3320	TM3324	Mean
0	4.5	3.3	3.4	3.7	3.1	3.0	3.5
40	5.6	3.5	4.3	4.1	3.5	3.4	4.1
80	6.4	5.2	5.3	4.6	4.5	4.2	5.0
120	7.2	5.3	5.6	5.2	5.0	4.7	5.5
160	6.6	5.9	6.3	5.9	5.5	4.8	5.8
Mean	6.0	4.6	5.0	4.7	4.0	4.0	

	CD
Varieties	0.2**
N levels	0.4**
Interaction	ns

**Significant at 1% level. NS = not significant.

Table 2. Yields of varieties grown at 5 nitrogen levels, navarai 1982, Tirur, India.

Nitrogen	Grain yield (t/ha)				
(kg/ha)	IET4786	IR50	TM8089	TM8090	Mean
0	1.9	3.4	3.1	3.7	3.0
40	3.2	4.9	4.8	4.8	4.4
80	4.1	6.1	5.4	5.7	5.3
120	4.6	7.4	7.0	7.3	6.6
160	4.4	7.3	6.1	6.0	6.0
Mean	3.6	5.8	5.3	5.5	

	CD
Varieties	0.2**
N levels	0.4**
Interaction	
Sub at main	0.3**
Main at sub	0.3**

**Significant at 1% level.