# Guidelines and Style for IRRN Contributors

To improve communication and to speed the editorial process, the editors of the *International Rice Research Newletter (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 any 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 converted 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 full 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 I2 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 varieties 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

## Stigma receptivity of some cytoplasmic male-sterile lines of rice

*S. S. Virmani, IRRI, and Zhong-He Tan, Sichuan Academy of Agricultural Sciences, China*

Success of hybrid .rice breeding programs depends on the extent of natural outcrossing on male-sterile (ms) lines. Individual ms plants of cultivated rice show 20-92% outcrossing. In hybrid rice seed production plots in China, outcrossing on ms lines varies from 15 to 45%, depending on ms line, extent of synchronization in flowering of ms line and pollen parent, and environmental condition. The maximum rate of natural outcrossing on a ms line used in hybrid seed production is 74%. Duration of stigma receptivity is an important floral trait that influences outcrossing.

Duration of stigma receptivity of three cytoplasmic ms lines was estimated at IRRI during 1981 wet season. V41A, Zhen Shan 97A, Yar-Ai-Zhao A were compared with a fertile maintainer line V41B. Seven panicles that had exserted 50% of their total length were selected for each line. Florets that had bloomed were removed. Only those expected to bloom the following day were retained. These florets were clipped and anthers were removed with a vacuum emasculator. Emasculated panicles were immediately covered with glassine bag. One panicle per line was pollinated every day for 7 days using IR9852-39-2 pollen. Percentage seed set on pollinated panicles was recorded 3 weeks after pollination.

Seed set data (see table) show that stigmata of the cytosterile and maintainer lines remained receptive for 6-7 days. The high seed set on panicles of Zhan Shan 97A, Yar-Ai-Zhao A, and V41B, pollinated after 6 days of emasculation, may be due to experimental error. If these data are ignored, effective stigma receptivity (resulting in 40-50% seed set) of ms V41A was 2 days longer than that of maintainer V41B. Effective stigma receptivity of cytosterile Zhan Shan 97A was 2 days shorter than that of the 2 other cytosteriles. Selection of cytosterile lines with longer stigma receptivity duration should help increase yield in hybrid rice seed production.

**Duration of stigma receptivity of male sterile lines, IRRI, 1981 wet season.**

| Line | Seed set (%) on panicles pollinated after | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1d | 2d | 3d | 4d | 5d | 6d | 7d |
| V41A | 79.5 | 77.1 | 84.8 | 76.9 | 51.3 | 12.00 | 4.8 |
| Zhan Shan 97A | 51.1 | 30.3 | 50.0 | 2.7 | 8.7 | 50.00[a] | 0.00 |
| Yar-Ai-Zhao A | 90.0 | 78.8 | 68.2 | 66.7 | 41.1 | 61.8[a] | 0.00 |
| V41B | 70.0 | 59.1 | 48.3 | 17.2 | 15.1 | 37.5[a] | 5.3 |

[a]High seed set may have been caused by experimental error.

## A pseudograin on a cytoplasmic male-sterile rice line

*R. C. Chaudhary, Rajendra Agricultural University Agricultural Research Institute, Mithapur, Patna, India; and S. S. Virmani, G. S. Khush, and B. O. Juliano, IRRI*

Wu 10A, a Chinese cytoplasmic male-sterile line, was found to be sterile when grown in the IRRI phytotron (day-night temperature regimes 26°/18° C, 29°/21° C, 35°/27° C; natural day light, and relative humidity 90%). However, panicles remained green and droopy and had spongy spikelets filled with liquid. In some spikelets filling caused the husk to crack. When dried only a papery kernel, which was called a pseudograin, remained (see figure). Pseudograin frequency was about 70%.

Rice pseudograin on cytoplasmic male-sterile Line Wu 10A.

**Mean level of sugars and amino acids of Wu 10A pseudograins.**

| Property | Mean |
|---|---|
| Caryopsis dry wt (mg) | 0.89 |
| Soluble sugars (µg glucose/grain) | 219 |
| Soluble sugars (% glucose dry basis) | 24.5 |
| Free amino acids (µg leucine/grain) | 54 |
| Free amino acids (% leucine dry basis) | 6.0 |

Pseudograins could not be germinated in the seed germinator or by in vitro culture. Biochemical analysis of freeze-dried pseudograins showed high levels of soluble sugars and free amino acids (see table) comparable to those of a 1-day-old fertile grain. Normal embryo weighs 0.3 mg and a fertile caryopsis 21 mg. Pseudograin weight was less than 1 mg. Whether or not this is a case of parthenocarpy (a type of apomixis) remains to be established.

*The International Rice Research Newsletter (IRRN) invites all scientists to contibute concise summaries of significant rice research for publication. Contributions should be limited to one or two pages and no more than two short tables, figures, or photographs. Contributions are subject to editing and abridgement to meet space limitations. Authors will be identified by name, title, and research organization.*

## Gamma ray-induced semidwarf mutants in Basmati 370

*S. S. Malik, Haryana Agricultural University, Regional Research Station, Uchani, Karnal, India*

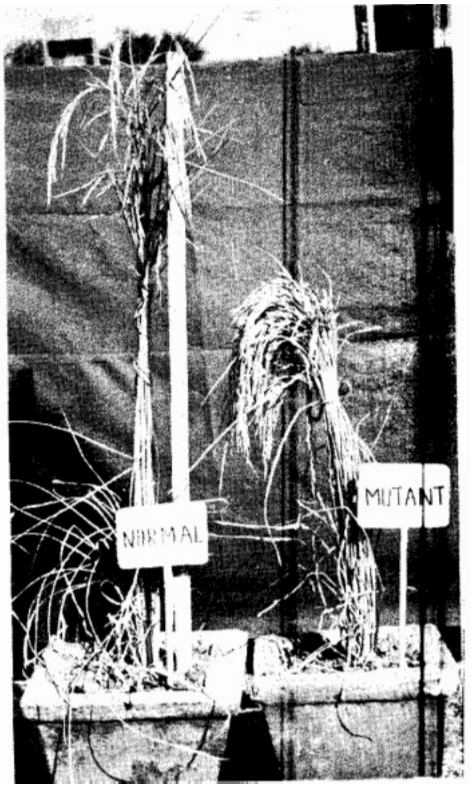
Local, tall, superfine-grained, and scented indica variety Basmati 370 was exposed to 20, 30, and 40 Kr of gamma rays from a $^{60}Co$ source. Several chlorophyll and other morphological mutants were isolated in the $M_2$ and $M_3$ generations.

A highly productive semidwarf mutant, Basmati A54. was recovered from 20 Kr gamma ray-treated material in the $M_2$ generation. It showed high uniformity in the $M_3$ generation (see figure).

This mutant matures 28 days earlier and has agronomic and quality characters superior to those of the original Basmati 370 (see table).

Semidwarf mutant BMS 1 was isolated from the same treatment. It had thin plants, profuse tillering (15-20 tillers/ plant), and reduced panicle and grain size. Its lemma and palea were fully opened and grains were not fully covered with husk. Anthers were small and 35 to 40% pollen sterility was observed in the $M_3$ generation. This mutant showed alternate branching from every node of the stem. Leaves were erect and dark green.

These two mutants can be used directly or indirectly to replace tall variety Basmati 370, which has a low yield potential.




Basmati 370 and mutant Basmati A54 recovered in the $M_3$ generation after exposure to 20 Kr gamma rays at Karnal, India.

**Some agronomic and quality characters of Basmati 370 and its mutant Basmati A54 at Karnal, India.**

| Line | Plant ht (cm) | Maturity (days) | Tillers/ plant (no.) | Grains/ panicle (no.) | 1,000-grain wt (g) | Grain yield/ plant (g) | Grain | | | Scent |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Length (mm) | Breadth (mm) | L:B | |
| Basmati 370 | 125 | 148 | 7.50 | 125 | 20.10 | 9.31 | 6.75 | 1.80 | 3.75 | Yes |
| Basmati A54 (mutant) | 85 | 120 | 12.50 | 130 | 23.80 | 14.72 | 7.45 | 1.85 | 4.02 | No |
| C.D. at 5% | 7.35 | 2.42 | 2.12 | ns | 1.12 | 3.45 | 0.23 | ns | | |