

## Evaluation of new fungicides in controlling blast (B1)

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We evaluated recently introduced emulsifiable concentrates and wettable powders in Oct-Jan 1984-85 for B1 control in a field trial laid out in a randomized block design. The 12 treatments were replicated 4 times; test variety was highly B1-susceptible IR50. The fungicides were applied as foliar

spray during tillering after disease symptoms appeared, at panicle initiation, and at flowering.

Intensity of leaf B1 was scored by the *Standard evaluation system for rice* on 25 randomly selected plants from each plot 10 d after the final fungicide application. Neck infection percentage was assessed on five randomly selected hills from each plot.

Edifenphos, pyroquilon, and isoprothiolane significantly controlled leaf B1 (see table). Plots treated with edifenphos or pyroquilon yielded 80% higher than the check. □

### Effectiveness of selected fungicides in controlling B1. Aduthurai, India.

| Treatment               | Dosage per liter | Leaf B1 intensity (grade) | Neck B1 (%) | Yield (t/ha) |
|-------------------------|------------------|---------------------------|-------------|--------------|
| Edifenphos 50EC         | 1 ml             | 2.6                       | 24          | 4.0          |
| Pyroquilon 50WP         | 1 g              | 3.0                       | 28          | 4.0          |
| Copper oxychloride 50WP | 2.5 g            | 4.5                       | 34          | 2.8          |
| Isoprothiolane 40EC     | 1 ml             | 3.2                       | 22          | 2.7          |
| Propiconazole 25EC      | 1 ml             | 4.6                       | 33          | 2.7          |
| Dithiocarbamate 75WP    | 2.5 g            | 4.7                       | 26          | 2.6          |
| Carbendazim 50WP        | 1 g              | 4.0                       | 29          | 2.3          |
| Thiophanate methyl 70WP | 1 g              | 4.6                       | 29          | 2.2          |
| IBP 48EC                | 1 ml             | 5.0                       | 24          | 2.1          |
| Natural plant product   | 1 ml             | 4.9                       | 32          | 1.9          |
| Captafol 80WP           | 1.25 g           | 5.2                       | 33          | 1.8          |
| Untreated check         | —                | 6.2                       | 31          | 2.2          |
| CD                      |                  | 1.4                       | ns          | 1.0          |

## Identifying tungro viruses by the transmission method

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Tungro spherical virus (RTSV) and tungro bacilliform virus (RTBV) can be identified by electron microscopic studies and by serological methods. It has been reported that the viruses can also be identified by symptomatology and transmission. We tested identification by transmission method.

Twenty 15-d-old Taichung Native 1 (TN1) seedlings in cages were exposed to viruliferous leafhoppers at 1, 2, 3, and 5 leafhoppers/seedling for 24 h. The insects had been confined for 48 h on 45-d-old RTV-infected TN1 plants.

Symptoms were observed 30 d after inoculation.

On plants with symptoms, back inoculation tests were conducted, using virus-free insects. For plants without symptoms, back inoculation tests used insects that had been fed on RTBV-infected plants (identified by serological methods) for 24 h. Those insects were tested for infectivity on 10-d-old TN1 seedlings.

RTV viruses were identified as follows:

1. plants showing severe symptoms back transmissible by non-viruliferous leafhoppers: infected with RTSV + RTBV.
2. plants showing moderate symptoms not back transmissible by nonviruliferous leafhoppers: infected with RTBV.

## Control of rice blast (B1) by fungicide-treated seed

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Foliar fungicides are usually recommended for B1 control. Systemic fungicides also known to control B1 were tested through seed treatment. One kilogram seed of highly susceptible IR50 was soaked in 1 liter 0.2% fungicide solution for 12 h. The treated seeds were sown in raised beds and disease intensity was assessed on the *Standard evaluation system for rice* (SES) scale 40 d after sowing. Leaf area affected (%) also was calculated.

Pyroquilon 50 WP, carbendazim 50 WP, carbendazim 25 SD, and carbendazim 25 SD + thiram 50 WP were equally effective in reducing B1 intensity in the nursery (see table). □

### Controlling rice B1 in the nursery by treating seed with fungicides. Tamil Nadu Rice Research Institute, Aduthurai, India.<sup>a</sup>

| Treatment                        | Disease intensity |                        |
|----------------------------------|-------------------|------------------------|
|                                  | SES               | Leaf area affected (%) |
| Carbendazim 25 SD                | 5.8 a             | 22 a                   |
| Carbendazim 50 WP                | 5.2 a             | 13 a                   |
| Carbendazim 25 SD + thiram 50 WP | 5.2 a             | 13 a                   |
| Pyroquilon 50 WP                 | 5.0 a             | 10 a                   |
| Control                          | 7.1 b             | 53 b                   |

<sup>a</sup>In a column, means followed by a common letter are not significantly different from each other.

3. plants not showing clear symptoms, back transmissible when leafhoppers were given sequential acquisition feeding on the plants and then on RTBV-infected plants: infected with RTSV.
4. plants not showing clear symptoms, not back transmissible when leafhoppers were given sequential acquisition feeding on the plants and then on RTBV-infected plants: uninfected.

Of 80 inoculated plants, 68 showed symptoms. Numbers of plants showing visible symptoms increased with an increase in leafhopper population (see table). Plants containing RTBV + RTSV increased with insect load. There were no clear trends in number of plants containing RTBV or RTSV. All 80 inoculated plants were also serologically tested; serological and transmission identification of RTV virus particles agreed. □

#### Identifying tungro viruses (RTBV and RTSV) by the transmission method with different levels of leafhoppers. Cuttack, India.

| Leafhoppers<br>used for<br>inoculation (no.) | Plants<br>inoculated<br>(no.) | Plants infected (no.) |                     |      |      | Healthy<br>plants<br>(no.) |
|--|-------------------------------|-----------------------|---------------------|------|------|----------------------------|
|  |                               | Visual<br>observation | Transmission method |      |      |                            |
|  |                               |                       | RTBV+RTSV           | RTBV | RTSV |                            |
| 1  | 20                            | 13                    | 12                  | 3    | 2    | 3                          |
| 2  | 20                            | 16                    | 14                  | 3    | 2    | 1                          |
| 3  | 20                            | 19                    | 16                  | 3    | 0    | 1                          |
| 5  | 20                            | 20                    | 18                  | 2    | 0    | 0                          |

#### Effect of coal tar-coated urea on brown spot (BS)

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Nitrogen level can be used to manage BS *Helminthosporium oryzae* Breda de Haan incidence. Its effect varies with level and fertilizer type.

Coal tar-coated and commercial urea at 100 kg N/ha were compared. Urea was mixed with coal tar melted over a low flame and dissolved in kerosene at 1 kg of coal tar and 1.5

#### Effect of coal tar-coated urea on BS incidence, Tamil Nadu, India.

| Treatment            | Disease intensity <sup>a</sup> |       |      | Yield <sup>b</sup> (t/ha) |       |
|----------------------|--------------------------------|-------|------|---------------------------|-------|
|                      | IR20                           | ADT36 | TKM9 | IR20                      | ADT36 |
| Commercial urea      | 4.8                            | 3.3   | 4.5  | 2.6                       | 2.2   |
| Coal tar-coated urea | 1.9                            | 2.7   | 2.2  | 2.8                       | 2.5   |
| No N                 | 4.3                            | 3.3   | 3.3  | 1.3                       | 1.5   |
| CD                   | 0.4                            | 0.5   | 0.7  | 0.1                       | 0.2   |

<sup>a</sup> Assessed using the *Standard evaluation system* for rice 0-9 scale. <sup>b</sup> No yield data could be recorded for TKM9 because of heavy rat damage.

liters kerosene/100 kg urea. All the coal tar-coated urea was applied basally at transplanting; commercial urea was applied in three splits.

Coal tar-coated urea uniformly decreased BS incidence and increased yields of IR20 and ADT36 (see table). □

#### Effect of density on sheath blight (ShB) incidence

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We studied the relation between sowing density (seed rate) and incidence of ShB *Rhizoctonia solani* Kuhn.

The experiment had 3 replications in a randomized complete block design. Plot size was 6 × 3 m. Rice varieties BW100 (samba-type grains) and BG400-1 (long grains) were broadcast at different seeding rates: recommended by the Department of Agriculture (DR), 0.5 × DR, 1.5 × DR, and 2 × DR).

Seven-day-old *R. solani* culture on rice grains were inoculated by evenly

#### ShB incidence and yield at different seeding rates. Bombuwela, Sri Lanka.

| Variety                  | Seeding rate (kg/ha) | Disease incidence <sup>a</sup> (%) |         | Yield (t/ha) |         |
|--------------------------|----------------------|------------------------------------|---------|--------------|---------|
|                          |                      | 1982-83                            | 1983-84 | 1982-83      | 1983-84 |
| BG400-1 (long grain)     | 100 (DR)             | 54.1                               | 54.1    | 3.9          | 3.0     |
|                          | 50                   | 40.2                               | 40.3    | 4.4          | 3.1     |
|                          | 150                  | 57.3                               | 58.0    | 3.8          | 3.3     |
|                          | 200                  | 66.3                               | 65.6    | 4.0          | 2.7     |
| BW100 (samba-type grain) | 15 (DR)              | 55.1                               | 57.1    | 4.1          | 3.0     |
|                          | 31.5                 | 44.8                               | 42.8    | 3.6          | 3.1     |
|                          | 112.5                | 61.9                               | 67.9    | 3.4          | 2.7     |
|                          | 150                  | 11.1                               | 69.4    | 3.5          | 2.6     |

<sup>a</sup> LSD (P = 0.05) = 12.5 for 1982-83 and 5.1 for 1983-84. The correlation between disease incidence and seeding rate was positive and linear in both seasons:  $r = 0.913^{**}$  for BW100 and  $0.719^{**}$  for BG400-1 in 1982-83, and  $0.88^{**}$  for BW100 and  $0.75^{**}$  for BG400-1 in 1983-84.

spreading the grains on the water surface at panicle initiation. Recommended fertilization was applied and standard plant protection measures were taken.

Disease incidence was assessed at harvest. The number of tillers with

infected flag leaf and total number of tillers within a 1-m<sup>2</sup> quadrat from each plot were recorded and the disease incidence percentage was computed:

$$\% \text{ of flag leaf infection} = \frac{\text{no. of tillers with infected flag leaf/m}^2}{\text{total no. of tillers/m}^2} \times 100$$