

Rice Technology Bulletin

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MATATAG LINES: Farmers' Partners in Rice Tungro Disease Management



Rice Technology Bulletin Series

- No. 1 Released Rice Varieties (1968 - 1994)
 - No. 2 Pagpaparami at Pagpupuro ng Binhi sa Sariling Bukid
 - No. 3 Paggawa ng Maligaya Rice Hull Stove
 - No. 4 PhilRice Micromill
 - No. 5 PhilRice Flourmill
 - No. 6 PhilRice Drumseeder
 - No. 7 PhilRice Rototiller
 - No. 8 Rice Food Products
 - No. 9 PhilRice-UAF Batch Dryer
 - No. 10 Integrated Management of the Malayan Black Bug
 - No. 11 SG800 Rice Stripper-Harvester
 - No. 12 Dry-Seeded Rice-Based Cropping Technologies
 - No. 13 Maligaya Rice Hull Stove
 - No. 14 10 Steps in Compost Production
 - No. 15 Rice Tungro Virus Disease
 - No. 16 The Philippine Rice Seed Industry and the National Rice Seed Production Network
 - No. 17 10 Hakbang sa Paggawa ng Kompost
 - No. 18 10 nga Addang ti Panagaramid iti Kompost
 - No. 19 Characteristics of Popular Philippine Rice Varieties
 - No. 20 Rice Stem Borers in the Philippines
 - No. 21 Rice Food Products (revised edition)
 - No. 22 Leaf Color Chart (English)
 - No. 23 Leaf Color Chart (Ilocano)
 - No. 24 Leaf Color Chart (Filipino)
 - No. 25 Equipment for Rice Production and Processing
 - No. 26 Use of 40kg Certified Seeds per Hectare
 - No. 27 Rice Wine
 - No. 28 Management of Field Rats
 - No. 29 Controlled Irrigation: A water-saving technique for transplanted rice
 - No. 30 Minus-one Element Technique: Nutrient deficiency test made easy
 - No. 31 Management of the Rice Black Bug
 - No. 32 Management of Zinc-Deficient Soils
 - No. 33 Management Options for the Golden Apple Snail
 - No. 34 Use of Evaporation Suppressant
 - No. 35 Pagpaparami ng Purong Binhi ng Palay
 - No. 36 Management of Sulfur-Deficient Lowland Rice Soils
 - No. 37 Management of Planthoppers and Leafhoppers
 - No. 38 Management Options for Ricefield Weeds
 - No. 39 Use of Indigo as Green Manure
 - No. 40 Management of Salt-Affected Soils for Rice Production
 - No. 41 Wet-Seeded Rice Production
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FOREWORD

Tungro, the major rice virus disease in the country, can now be controlled using Matatag rice lines. There are eight breeding lines developed by IRRI (1 - 4) and by PhilRice (5 - 8) as stopgap planting materials to reduce tungro disease incidence.

To prolong the usefulness of these lines, the same Matatag lines should not be planted continuously to avoid breakdown of resistance.

Furthermore, the use of these resistant varieties should be complemented with other management measures such as planting in synchrony, avoiding indiscriminate use of insecticide, planting varieties in rotation, and observing a crop-free period for one month between cropping.

These lines can give an average yield of 4.6 t/ha, among which Matatag 6 is the highest yielder at 5.8 t/ha. Matatag lines should be planted when essentially needed to reduce tungro incidence and maintain high crop production.

For our farmers to fully benefit from this technology, this bulletin is produced to disseminate this good news on rice.



LEOCADIO S. SEBASTIAN
Executive Director

What are Matatag Lines?

They are advanced breeding lines with strong resistance to rice tungro. They are primarily developed by IRRI (Matatag 1 - 4) and by PhilRice (Matatag 5 - 8) as stopgap planting materials to drastically reduce the disease incidence in tungro hot spot areas.



Photo courtesy of Alvaro Pamplona, IRRI

Where did Matatag lines derive their resistance?

Matatag 1 - 4 derived their resistance from Utri Merah, an Indonesian variety with resistance to tungro virus. Matatag 5 - 8 got their resistance from ARC 11554, an Indian variety resistant to the tungro virus (RTSV) and the insect vector, green leafhopper. Matatag 1 - 4 were crossed with IR1561-228-3-3 and the others with IR64 to produce high yield and rice grains of good eating qualities.

Why do Matatag lines have low tungro disease incidence?

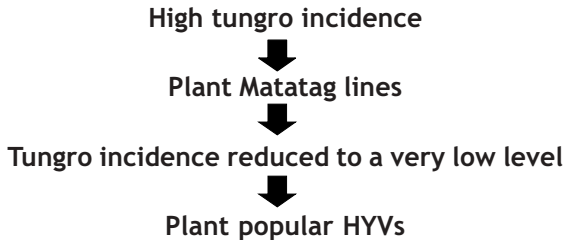
Matatag 1 - 4, although susceptible to the tungro virus and the green leafhopper, have the ability to suppress virus invasion and multiplication; thus, the plant can resist infection.

Matatag 5 - 8 are resistant to the green leafhoppers. The insects that spread the tungro viruses seldom feed and have low reproduction rate on these plants; thus, the plants have very low infection rate. This is further strengthened by its resistance to the virus (RTSV).

* *Taichung native 1*

Who may plant the Matatag lines?

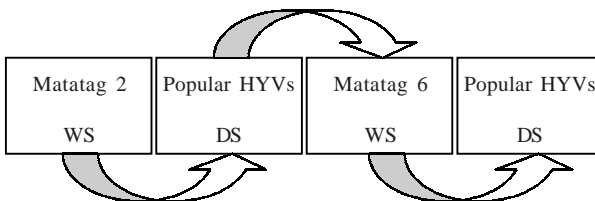
Farmers who experienced tungro at moderate to severe levels in previous cropping have to plant any of these lines to reduce infection to nondamaging level. High yielding varieties (HYVs) can then be planted again when tungro incidence has considerably reduced.



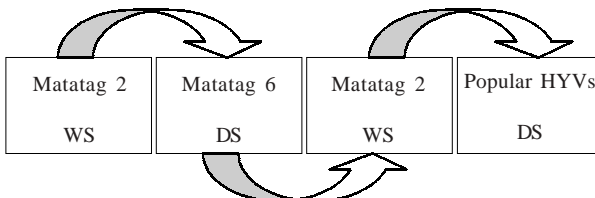
How can we prolong their usefulness?

The same Matatag line should not be planted continuously for three cropping seasons to avoid breakdown of resistance. Instead, plant them in rotation.

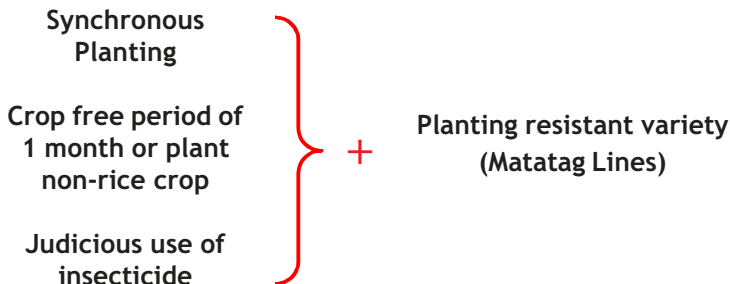
Example 1. Matatag lines can be interposed with the popular HYVs.



Example 2. Planting Matatag lines with different source of resistance



The use of resistant varieties should be complemented with other management measures such as planting in synchrony, avoiding indiscriminate use of insecticide, planting varieties in rotation, and observing a crop-free period of one month between cropping.



Note: *Plant Matatag lines when essentially needed to reduce tungro incidence and maintain high crop production.*

Major Characteristics of Matatag Lines



MATATAG 1

(IR69726-116-1-3)

Ave. yield: **4 t/ha**

Height: **101 cm**

Maturity: **127 DAS**

Milling recovery: **64.87%**

Grain length*: **6.7 mm (L)**

Grain shape*: **3.4 (S)**

Apparent amylose content*: **17.45% (L)**

Parents: IR61009-37-2-1-2///IR1561/Utri Merah//IR156/

MATATAG 2

(IR69726-29-1-2-2-2)

(stop gap for tungro)

Ave. yield: **4.4 t/ha**

Height: **105 cm**

Maturity: **116 DAS**

Milling recovery: **64.6%**

Grain length*: **6.6 mm (L)**

Grain shape*: **3.3 (S)**

Apparent amylose

content*: **25.60% (H)**



Parents: IR61009-37-2-1-2///IR1561/Utri Merah//IR1561

Note: *Matatag 2 (IR 69726-29-1-2-2-2) was accredited by the National Seed Industry Council (NSIC) in 2001.*

VARIETAL EVALUATION

Number of seasons tested: 3 seasons (98WS-99WS)

Test locations: PRRI, UPLB, RTR, BIARC, CPU, WESVIARC

Agro-climatic, seasonal and cultural recommendation: Irrigated lowland, WS and DS, DWSR and TRP, moderate N-response.

MAJOR REASONS FOR RECOMMENDING

- 10.3% and 10.0% yield advantage over PSB Rc28 under transplanted and direct seeded condition, respectively during the DS
- Resistant to RTV modified
- Moderately resistant to stem borer (whitehead) BPH1 and BPh3 and intermediate to GLH, YSB and BPH2
- Highly acceptable than IR72 in cooked form

LIMITATIONS

Under high pressure of tungro disease, yields are below 5 t/ha but under favorable conditions yields reach as high as 7 t/ha.



MATATAG 3

(IR68305-18-1-1)

Ave. yield: 4.4 t/ha

Height: 108 cm

Maturity: 104 DAS

Milling recovery: 65.53%

Grain length*: 6.7 mm (L)

Grain shape*: 3.4 (S)

Apparent amylose content*: 17.48% (L)

Parents: IR1561-228-3-3*2/Utri Merah

Note: Matatag 3 was given temporary accreditation for 2 seasons (2002 WS and DS) for regions 6, 10, 11 & ARMM

MATATAG 4

(IR68305-18-1-2)

Ave. yield: 4.8 t/ha

Height: 112 cm

Maturity: 102 DAS

Milling recovery: 67.51%

Grain length*: 6.5 mm (M)

Grain shape*: 3.3 (S)

Apparent amylose content*: 18.14% (L)



Parents: IR1561-228-3-3*2/Utri Merah



MATATAG 5

(LG-52-5)

Ave. yield: 4 t/ha

Height: 91 cm

Maturity: 107 DAS

Milling recovery: 67.28%

Grain length*: 5.8 mm (M)

Grain shape*: 2.6 (I)

Apparent amylose content*: 19.66% (L)

Parents: ARC 11554/6*TN1//IR64



MATATAG 6

(LF-31-28-1)

Ave. yield: 5.8 t/ha

Height: 90 cm

Maturity: 110 DAS

Milling recovery: 65.06%

Grain length*: 6.6 mm(L)

Grain shape*: 3 (I)

Apparent amylose content*: 17.49% (L)

Parents: ARC 11554/6*TN1//IR64

Note: Matatag 6 was given temporary accreditation for 2 seasons (2002 WS and DS) for regions 6, 10, 11 & ARMM

MATATAG 7

(LG-53-17-1)

Ave. yield: 4.3 t/ha

Height: 93 cm

Maturity: 108 DAS

Milling recovery: 69.88%

Grain length*: 6.7 mm (L)

Grain shape*: 3 (I)

Apparent amylose content*: 19.83% (L)



Parents: ARC 11554/6*TN1//IR64



MATATAG 8

(LF-69-22)

Ave. yield: 4.5 t/ha

Height: 96 cm

Maturity: 115 DAS

Milling recovery: 66.55%

Grain length*: 6.1 mm (L)

Grain shape*: 2.8 (I)

Apparent amylose content*: 22.15% (L)

Parents: ARC 11554/6*TN1//IR64

***Grain length classifications:**

- Extraordinary (EL) **7.5 mm and above**
- Long (L) **6.6 mm - 7.4 mm**
- Medium (M) **5.5 mm - 6.5 mm**
- Short (S) **5.4 mm and below**

***Grain shape classifications:**

- Slender (S) **more than 3**
- Intermediate (I) **2-3**
- Bold (B) **less than 2**

***Apparent amylose content classifications:**

- Waxy/Glutinous (W) **0%-2%**
- Very low (VL) **2.1%-10%**
- Low (L) **10.1%-20%**
- Intermediate (I) **20.1%-25%**
- High (H) **more than 25%**

Where to get the Matatag lines?

Farmers can buy Matatag seeds from the following places:

- In Luzon** Philippine Rice Research Institute,
Central Experiment Station, Maligaya,
Science City of Muñoz, 3119 Nueva Ecija
Phone: (044) 456-0113, -0258, -0277 local 517

- In Visayas** Rice Seed Growers
Pototan, Iloilo

- In Mindanao** PhilRice Midsayap
Bual Norte
Midsayap, 9410 North Cotabato
Phone: (064) 229-8178

Central Mindanao University (CMU)
Experiment Station, Research Department
Musuan, 8710 Bukidnon
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PhilRice

The Philippine Rice Research Institute (PhilRice) is a government-owned and controlled corporation created through Executive Order 1061 approved on Nov. 5, 1985, which was amended by EO 60 dated Nov. 7, 1986 and EO 76 dated March 4, 2002 to help develop high-yielding technologies so that farmers can produce enough rice for all Filipinos. PhilRice accomplishes this mission through research, technology promotion, and policy advocacy, which are implemented through a network that includes 57 agencies and 96 seed centers strategically located nationwide.

Its interdisciplinary programs include the following: (1) direct-seeded and (2) transplanted irrigated lowland rice; (3) hybrid rice; (4) rice for adverse environments; (5) rice-based farming systems; (6) policy research and advocacy; and (7) technology promotion. With these programs, PhilRice aims to develop and promote technologies that are ecosystem-based, location- and problem-specific, and profitable to the Filipino farmers.

*for more information,
write, visit or call:*

The logo for PhilRice features the word "PHILRICE" in a bold, brown, sans-serif font. The letter "I" is stylized to resemble a rice stalk with green leaves and a golden grain. To the right of the text is a small illustration of a rice plant.

Philippine Rice Research Institute

The logo for Unlad Ani features the words "UNLAD ANI" in a bold, brown, sans-serif font. Below the text is a stylized illustration of a blue fish and a yellow bird, with a green rice stalk in the center. The background is a light yellow.The logo for Sangguniyang Trabaho para sa Pilipino features a circular emblem with a blue fish, a yellow bird, and a green rice stalk. The text "Sangguniyang trabaho para sa Pilipino" is written in a curved path around the emblem.The logo for Ginintuang Masaganang Ani features the words "GININTUANG MASAGANANG ANI" in a bold, green, sans-serif font. Below the text is a stylized illustration of a rice stalk with green leaves and a golden grain. The background is a light yellow.

Go Modern Agriculture

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