

What is Tungro?

Tungro is a rice disease (virus) that mainly affects plants during vegetative growth and causes severe stunting and a reduction in the number of tillers. Both the leaf sheath and leaf blade are shortened and affected leaves are often light yellow to orange-yellow. Young leaves are often mottled or have pale green to white stripes of different lengths running parallel to the veins. Symptoms start at the tips of the older leaves. Leaf yellowing is less when older plants are infected. Normally patches of plants are affected across the field. Two species of green leafhopper (GLH) (*Nephotettix malayanus* and *Nephotettix virescens*) are the primary insects that cause the spread of the virus

Why Control Tungro?

Tungro is one of the most destructive diseases in South and Southeast Asia, where epidemics of the disease have occurred since the mid-1960s. Infected panicles rarely produce grain, being short and sterile or only partially filled with discolored grains. Flowering of infected plants is delayed and panicle insertion is often incomplete.

How to Control Tungro?

While identification of tungro is often obvious from field symptoms, antibodies can be used to confirm.

Cultural Control

Resistant varieties Planting resistant varieties is the best way to control tungro. Rotation of varieties is important for reducing the breakdown of resistance.

Plowing under infected stubbles: This is done to reduce sources of the disease and destroy the eggs and breeding sites of green leafhoppers. This is recommended immediately after harvest if the previous crop was diseased. This may be costly to farmers due to the extra water and costs involved.

Roguing (i.e., removal of infected plants): This is recommended unless tungro incidence is already high. If infection is high, then there may be plants that are affected by tungro but which look healthy. Pulling out infected plants may disturb leafhoppers and so increase the spread of the disease.

Direct seeding: Tungro incidence is usually lower in direct seeded rice as the plant population is higher (relative to transplanting). Thus, the GLH tend to find, feed on and infect a lower percentage of plants.

Timing of planting: Plant rice during seasons of low incidences of green leafhoppers and tungro.

Synchrony of planting: Have farmers plant rice at almost the same time. This reduces the subsequent spread of tungro from one field to later planted fields. Such synchronized planting may be difficult if there are limits in water and/or labor availability for crop establishment.

Fallow period or rotation: Continuous cropping of rice leads to increases in the number of GLH. Prevention of tungro is then difficult. Fallow periods or alternate crops reduce both GLH populations and tungro.

Practical Tungro Management Options

- Use resistant varieties, especially if planting is later than farmers in surrounding fields
- Avoid planting susceptible varieties in tungro endemic areas
- After harvest, completely destroy stubble in tungro-affected fields by plowing and harrowing



The green leafhopper (GLH), both adult and nymphs, is considered as the most efficient in transmitting tungro.



Rice plants affected by tungro exhibit yellow-orange discoloration of the leaves.

For more information:

For more information on rice and diseases, visit the Rice Knowledge Bank <http://www.knowledgebank.irri.org>. To diagnose problems in the field, visit RiceDoctor at <http://www.knowledgebank.irri.org/riceDoctor.htm>.

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