

How can land preparation help reduce weedy rice?

- An important long-term approach for management of fields infested with weedy rice is to ensure that the “soil seed bank” is reduced by good land preparation.
- **Stale-seedbed** practices during land preparation involve encouraging the germination of weedy rice by irrigation or awaiting rainfall before destroying seedlings by shallow tillage or nonselective herbicide. The process can then be repeated to incrementally deplete the soil seed bank of weedy rice.

What other interventions against weedy rice are available?

- **Water seeding** can be a valuable means for controlling weedy rice and other weed species. Water seeding can be practiced where irrigation water is readily available, where infiltration rates are low, and where fields are level. For water seeding, floodwater is retained in the field after final puddling and, after the mud has settled and the water cleared, pregerminated rice seeds are sown into water about 5-10 cm deep. By this method, pregerminated rice seeds will emerge, while weedy rice seeds in the soil will largely remain dormant.
- Manual or mechanical **transplanting**, where the field can be immediately flooded, will enable better control of weedy rice than is usually possible in direct seeding.
- **Crop rotation** could be a suitable alternative method to control weedy rice, particularly where an upland crop such as soybean or maize is grown. Upland crops would allow alternative herbicide treatments and cultivation to suppress weedy rice.
- Burning of rice straw in dry rice fields can help destroy weedy rice seeds on the soil surface.
- The application of pretilachlor with fenclorim during the final land preparation/leveling has been shown to reduce weedy rice
- Higher seeding rates of >150 kg ha⁻¹ have been reported to help suppress weedy rice but may also increase risk of crop lodging.

Manual weeding/roguing

Remove weedy rice panicles by hand. At the heading/flowering stages, cut them and leave them in the field. At later stages, remove them from the field.



Remove weedy rice to reduce future infestations.

Land preparation for weedy rice control—examples from Malaysia



Uniformly distribute rice straw (a) and burn straw (b) to destroy weedy rice seeds on the soil surface.



Promote germination of weedy rice from the seed bank.



Use preplant herbicide (a) or tillage (b) to destroy weedy rice seedlings.

Wet tillage destroys weedy rice seedlings and promotes new emergence. Final tillage and land leveling result in more even water depth with flooding and help limit germination and emergence of weedy rice seedlings.



For further information, contact

Azmi bin Man

MARDI Seberang Perai
Peti Surat 203
13200 Kepala Batas
Malaysia
azmiman@mardi.my

or

David Johnson

International Rice Research Institute
Los Baños, Philippines
d.johnson@cgiar.org

www.irri.org/IRRC
www.knowledgebank.irri.org



Be aware of weedy rice in Asia



Weedy rice is closely related to cultivated rice and is a serious threat in direct-seeded rice. Once fields are infested, the costs of control can be very high. At present, no single management technique can effectively control weedy rice. Preventive measures are essential and this leaflet is intended to improve awareness of this problem weed.

What does weedy rice look like?

Weedy rice is variable in height, panicle form, grain size, awn length, flag leaf, and growth duration. Weedy rice can be a serious problem because it is very competitive with cultivated rice, its seeds have dormancy, and its grains shatter easily.

Weedy rice shatters easily

Gripping a nearly ripe panicle of weedy rice will cause many of the grains to fall (shatter).



At harvest, many weedy rice seeds are left on the soil surface (a) and these germinate when conditions are favorable (b).

Appearance of weedy rice



Weedy rice can be taller (a) or shorter than or as tall as cultivated rice (b).



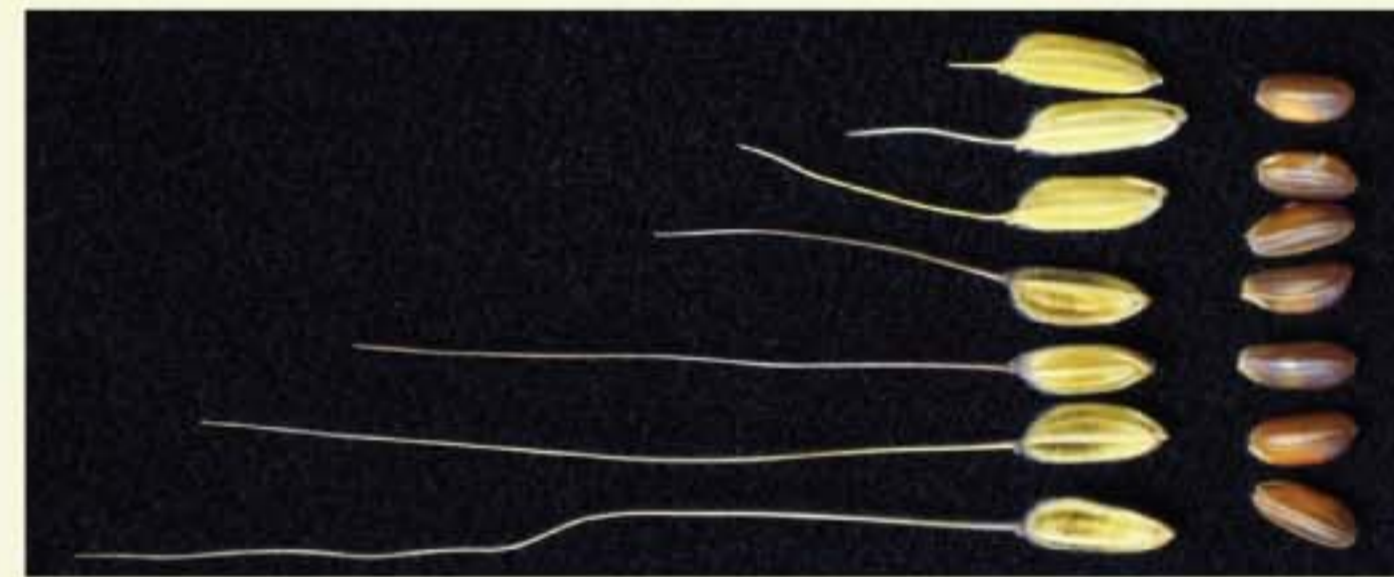
Weedy rice can have closed (a) or open (b) panicles.



Flag leaves can be erect (a) or droopy (b).



Awns can be absent, short (a) or long (b).



Weedy rice seeds before and after being milled.

Note: the glumes (husks) may be dark to light colored, and the grain may be red to cream.

What is weedy rice?

These are forms of *Oryza* species that are variable in appearance and occur in all major rice-growing areas of the tropics: America, the Caribbean, Africa, and Asia. The origin of weedy rice in Asia is as yet unclear though it is thought that they are natural hybrids of cultivated (*O. sativa*) and wild rice species (*O. rufipogon* and *O. nivara*). Characteristics enabling weedy rice to become a weed are seed shattering, seed dormancy, and competitiveness with cultivated rice.

What are its other characteristics?

- Weedy rice tends to have vigorous vegetative growth, comparatively early maturity, easy shattering, and, in some variants, the grains have long awns and the grain (pericarp) color after milling is red.
- Weedy rice has variable seed dormancy, but commonly a large proportion of the seeds will germinate within 3 months of shedding. This can lead to severe problems in a subsequent crop where rice is double-cropped.

Weedy rice is known by different names in different countries. Examples are "Padi Angin" in Malaysia, "Lua Lon" in Vietnam, "Lutao" in China, "Akamai" in Japan, "Sharei" in Korea, "Khao Pa" in Laos, "Khao Nok" in Thailand, and "Jhora Dhan" in Bangladesh.

What problems does weedy rice cause?

- Weedy rice competes with cultivated rice and reduces crop yield. Farmers cannot harvest the grain of weedy rice as it tends to mature earlier and to shatter readily.
- Where 35% of a crop is composed of weedy rice plants, grain yield losses can reach 50-60% and total crop loss can result from greater infestations.
- Weedy rice in a harvested crop can reduce the market value because of contamination with red grain.



Serious infestations of weedy rice can result in total crop loss because of competition and crop lodging.

How can we prevent weedy rice?

It is very important to prevent weedy rice seeds from being introduced into uncontaminated fields.

- It is important to avoid using rice seeds contaminated with weedy rice. Use "clean seed" from a "known source" or certified seeds.
- Weedy rice seeds can be introduced by combine harvesters or in mud on tractors or field implements. Take care to thoroughly clean machinery if it is coming from infested fields.
- Weedy rice seeds may also be introduced into irrigation water, particularly if canals are infested. Canals should therefore be cleared of infestations.

Manual weeding is effective for reducing initial infestations of weedy rice. Removal of weedy rice plants when the weed first infests a field can help prevent more serious infestations in future crops.