How to manage pests and diseases

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Farmers lose an estimated average of 37% of their rice crop to pests and diseases every year. In addition to good crop management, timely and accurate diagnosis can significantly reduce losses. If you are facing a problem in your crop and need help with diagnosis, seek advice from a professional or use the Rice Doctor.

If you have a problem in your field and you're not sure what it is, go to the Rice Doctor

Crop problems can be caused by other living organisms, like rats and fungus, or by non-living factors, such as wind, water, temperature, radiation, and soil acidity.

The best control for pests and disease problems is prevention. **To limit pest and disease damage:**

STEP 1 Practice good cleaning of equipment and field between seasons

Diseases can be spread between fields or between seasons if you do not take proper precautions. After harvest, be sure to clean the harvesting equipment to prevent the spread of infected plants.

Some diseases can live on the stubble between seasons and infect a healthy planted crop. In general, plowing after harvest removes stubble that serves as remaining food and shelter for pests, especially insects. In cases where your field was infested, you should remove all stubble from the previous season (see disease section for more details).

Clean the bunds and patch all rat holes on bunds and around your field. If there are nearby fallow fields or forested areas, you may want to have a community rat control effort or put up trap barriers to keep rats from damaging your crop (see rat section for more details).

Ratooning (allowing your crop to sprout and continue growing after harvest) is not recommended because diseases and insect hosts can be sustained from season to season. It is best to clean the field of any crop and leave it fallow for a few weeks to a few months before planting again.

STEP 2 Use clean seeds and resistant varieties

Certified seed is recommended but if you can't get certified seed, use clean seed that does not have any discolored seeds, weed seeds or other rice varieties mixed in.

Read: Choosing quality seed

Many varieties have been developed with resistance to different diseases. You should check with your local extension agent or a nearby seed dealer to find out which resistant varieties they carry.

Use short-duration and resistant cultivars to decrease insect pest populations. In short-duration cultivars, insects cannot compete as many generations, so populations may not reach damaging levels. Resistant varieties experience less feeding damage on their leaves and stems, which means less entry points for bacteria and fungal diseases.

IRRI has a major responsibility to develop rice varieties for the benefit of rice farmers and consumers.

STEP 3 Plant at the same time as your neighbors

Planting at the same time (or within a 2 week window) as the neighboring fields can help to minimize insect, disease, bird, and rat pressure on individual fields.

STEP 4 Do not over apply fertilizer

High nitrogen can increase susceptibility to certain pests and diseases that is why specific fertilizer recommendations is very important.

STEP 5 Encourage natural pest enemies

Overuse of pesticide is common among farmers and can actually lead to pest outbreaks. Natural insect enemies of the rice pests are also killed when pesticides are applied and this can lead to an outbreak of other rice insect pests. Other ways to encourage natural pest enemies are to allow plants on the bunds and between fields to flower (yellow and white flowers attract natural enemies).

STEP 6 Do not apply pesticide within 40 days of planting

Generally, a rice crop can recover from early damage without affecting yield. The diseases section show the information on specific diseases that require early management.

STEP 7 Properly store grain

Store grain at moisture content below 13-14%, preferably in an airtight container. Clean the grain before storing so it is free of dust, chaff, and excessive broken grains. The storage area should be clean and have a dampproof floor and waterproof walls and roofs. Ideally, the storage area should be sealed to keep out rats and birds and to allow for fumigation if necessary. Stack bags on a pallett with at least 50cm of space on every side of the stack.

Do not store grain for more than 6 months. Do not store new grain next to old grain that is infested with insects. Store grain as paddy or rough rice because it is less prone to insect attack than milled rice. Parboiled rice is also less susceptible to damage than raw rice.

Read: Storage

Rats

In Asia, rats cause an average of 5−10% loss in rice yield every year. Rats breed at an alarming rate when food is abundant. One female rat can produce 35 rats in a season. Rat management is critical before the breeding cycle, otherwise, the population can explode and yields will be greatly reduced.
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Diseases

Insects

More than 100 species of insects are considered pests in rice production systems globally, but only about 20 species cause significant economic damage. The recommended control of insect pests is to develop and follow an Integrated Pest Management plan.
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Golden Apple Snail

Disease damage to rice can greatly reduce yield. They are mainly caused by bacteria, viruses, or fungi. Planting a resistant variety is the simplest and, often, the most cost effective management for diseases.
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The golden apple snail was introduced into Asia during the 1980s from South America as a potential food for people. Unfortunately, the golden apple snail has become a major pest of rice having spread to the Philippines, Cambodia, Thailand, and Vietnam.
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Birds

Birds are considered to be a pest of rice but little is known about exactly how much damage is caused by birds. Only a few species of birds are grain eaters and others eat insects, worms, or snails.
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Nematodes

Nematodes such as the root-knot nematode infect plant roots, causing root knot galls that drains the plant's photosynthate and nutrients. It can even cause complete yield loss.
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