



Storage Insect Pest: Rice Weevil *Sitophilus oryzae* (Linn): Its Damage Symptoms and Management

(*Mood Suguna¹, Suriya S², Arunima Tiwari¹ and Ashish Pal¹)

¹Ph.D. Scholar (Dept. of Entomology), Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut, UP, India

²Division of Entomology, Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir, Srinagar-190025, India

*Corresponding Author's email: moodsuguna13@gmail.com

In India, post-harvest losses due to moisture, rodents, microorganisms, and insects are estimated to account for 10 percent of the total food grain production. A global survey conducted by the FAO indicated that about 5 percent of cereals are lost annually during storage. Insect pests are the most significant cause of storage losses, particularly in developing countries. These pests mostly belong to the orders Coleoptera (beetles and weevils) and Lepidoptera (moths). Among them, the rice weevil, an internal feeder, is especially destructive in cereals and has now extended its host range to include pulses. The following sections discuss the morphology and management of the rice weevil in detail.

Rice weevil: *Sitophilus oryzae* (Linn.)

Coleoptera : Curculionidae

Host range: Rice, sorghum, wheat, barley, maize, and other food grains.

Morphology of rice weevil: The adult beetle is small in size, reddish brown, cylindrical weevil, and about 3.5 mm long. Its snout is about one-third of the length of its body and projecting downward. Male rice weevils have rostrums with irregular punctures and females have rostrums with regular punctures. Its elytra bear 4 prominent yellow-brown or light reddish patches. The female lays eggs after 4-5 days of emergence as adults and each individual lays 300 -400 eggs. It makes a cavity and deposits eggs inside the cavity and then the cavity is covered with secreted material from the ovipositor. Under favorable conditions, eggs hatch in about 4- 5 days. The larval form of weevil is called a grub (legless), the larval period is 19 - 34 days, and pupation takes place within the grain (3 -6 days). The total life cycle is completed in 30 days. The adults live for 3-5 months. Rice weevil completes 5 generations in a year.

Nature of damage: Both grub and adult cause damage by breaking and hollowing the grains. The grubs are more destructive than the adults. It causes damage in field and storage conditions. In case of severe infestation, only fragments of pericarp with frass are left behind. This grain is unfit for consumption and seed purposes. This causes both qualitative and quantitative loss.

Management: Prophylactic measures: Hygiene and sanitation:

- Threshing yards and floors should be thoroughly cleaned and kept free from any signs of pest infestation before use.

- Transport vehicles such as trucks, trolleys, or bullock carts must be properly cleaned prior to their use for transporting grains.
- All webs, dirt, debris, and sweepings should be cleared from the storage area, followed by a whitewash of the structure.
- Any cracks, holes, or crevices in the walls and ceilings of storage godowns should be permanently sealed with cement.
- Only insect-free, brand-new gunny bags should be used for grain storage.
- Since storage bags can harbor infestations, they should be treated with insecticides to prevent pests.
- Disinfesting storage containers, structures, and warehouses is crucial to destroy hidden pests and to stop cross-contamination from other storage areas or bags.
- Apply insecticides such as malathion (50 EC) or fenitrothion (50 EC) to the inner surfaces of storage structures and walls, using a mixture of 5 ml insecticide per liter of water.

Curative measures

- This approach involves various methods including ecological, cultural, physical, biological, mechanical, botanical, and chemical techniques.
- The effectiveness of grain storage protection from insect pests is largely influenced by factors such as storage temperature, moisture content, and the availability of oxygen.
- Fumigation, one of the most practical curative methods, involves exposing infested grains to toxic fumes or gases within a sealed chamber or room for a specific period.
- Controlled atmosphere technology, one of the safest disinfestation methods, works by altering the levels of gases like carbon dioxide, oxygen, and nitrogen to create an environment hostile to pests.

Mechanical method

- An entoleter is a device that spins infested grains and other food products at a speed of 3000–4000 RPM, effectively destroying insects by causing the centrifugation of their haemolymph, this is effective for milled products is effective.
- Various protective devices such as the TNAU insect probe trap, automatic insect removal bin, and light traps are also employed to manage insect infestations.



Larvae of rice weevil



Adults of rice weevil

References

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