

Integrated Pest Management

RAT



Crop losses caused by rats often exceed the combined losses from all other pests. Aside from farm crop losses, they are also problems in warehouses. They consume and contaminate stored food in homes and are vectors of several diseases to humans and domestic animals. The continuous availability of susceptible crops provides the basic requirements of rats such as abundant food, water and shelter. Field rats are present in all places at all times, although rat populations are lower at certain times of the year such as the end of the dry season.

The characteristics of field rats

- Poor vision but sensitive to motion.
- Sensitive sense of smell, taste, touch, and hearing.
- Nocturnal – active by night.
- Good climbers
- Good swimmers
- Can jump fairly high
- Has chisel-like teeth/incisors.
- Continually chews to sharpen their teeth
- Has long whiskers and guard tails to guide them when they travel

- Engages in cannibalism when food is scarce
- Exhibits temporary fear when there is a change in an otherwise familiar condition, protecting them from consequences of curiosity
- High reproductive potentials; few males can mate with almost all the females in the area.

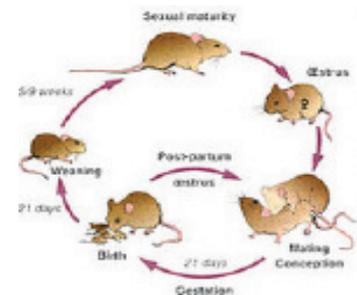
Food preference and feeding habits of field rats

- Primary foods are rice, green corn, and other grains.
- Secondary foods are cassava, coconut, sugarcane, shelled corn, etc.
- Also feeds on insects, snails, dried fish, fowl and weaker members of the group when food is scarce.

Burrows and harborage preferred by field rats

- Typical burrows have a principal entrance with one or more exits.
- 1-5 ft long, and curves underground to as deep as 2 ft.
- With sections for storing food and delivery; it also has a section for giving birth.

The life cycle of field rats



- Rats can live up to 3-4 years in the laboratory but the average lifespan is from six months to more than one year in the field conditions.
- Pregnancy lasts for 3 weeks.
- A female rat produces a litter of up to 21 pups (average of 6-8 pups) and can give birth 3-4 times a year.
- Pups are born blind and helpless up to 21 days.
- Pups grow rapidly and are ready to breed at 6 weeks of age.
- A pair of rats with their offspring can produce more than 500 rats in one year if food and other conditions are favorable.

Symptoms/damage caused by field rats

- Missing germinated plants.
- Missing hills.
- Chopped young seedlings
- Irregular cutting of stem.
- Chewed developing buds or ripening grains.
- Tillers cut near the base at a 45° angle
- Retillering of stems.
- Delayed grain maturity.
- Missing grains or panicles.



Control methods in effective field rat management

A. Cultural methods

- Practice proper sanitation by removing weeds and straw piles in the paddies.
- Practice synchronous planting.



- Minimize size of leaves to 15 cm wide x 20 cm high to avoid rat burrows.

B. Physical/Mechanical methods

- Trapping** – sometimes practiced to capture rats that have caused localized damage in the field.
- Destroying burrows** – Rats are killed with men armed with sticks, usually done in the absence of crops to minimize the places where rats can escape or hide.
- Use of flame throwers** – attack rat burrows with torches or flame throwers. The nozzle with flame is placed into the opening of one rat burrow while other burrows are closed to suffocate the rats.
- Blanketing method** – a group of men surround the rats' hiding places, forcing them to come out and eventually clubbing them to death.
- Rat proofing** – the utilization of concrete walls, floors and rat-proof doors in warehouses.
- Trap barrier system (TBS).**
 - Using the TBS. for every 10 hectares contiguous rice area.
 - Plant rice in a 20 x 20 m area one month before the normal planting time.
 - Use aromatic or good eating quality rice variety as bait
 - Fence the area with 24.5 inch high plastic sheets (similar to the material used to cover books).

- a.4 Use bamboo stakes to erect the plastic material.
The stakes should be inside the plastic fence.
- a.5 The trap is made of metal screen wire (rectangular in shape), having a cone-shaped inclined entrance tunnel narrowing to the end with bent metal wire. Rats are caught in the traps while trying to enter the trap barrier system.

b. Advantages of the TBS

- b.1 Environment-friendly and relatively a lowcost technology.
- b.2 The TBS capitalizes on the rat's behavior of entering holes and running along sides of the rice paddy in search of food.
- b.3 TBS is more effective when adopted as a community-wide action to control rats.
- b.4 Rat control using TBS should start at the seedbed to protect the seedlings.
- b.5 Requires P2700* (P1900 for plastic, P600 for four rat traps, and P200 for labor) to control rats in a 10 ha rice field.
(*subject to change)

C. Chemical methods

1. Acute rodenticide is a quick acting poison, a single dose is enough to cause death. Death occurs shortly after ingestion.
2. Chronic rodenticide is a slow acting poison, requiring multiple dose feeding, resulting to death from internal bleeding.

The procedures in baiting.

- a. Apply acute rodenticides in areas where pre-baiting was successful to avoid the establishment of a new rat population in the

- same area. This will increase chances of killing them by about 70%.
- b. Two weeks after transplanting, install 5 initial baiting stations per hectare. Place chronic baits in the baiting stations per hectare. Place chronic baits in the baiting stations to further reduce the remaining 30% population.
 - c. Use locally available materials such as bamboo, oil cans, coconut husks, etc as bait holders.
 - d. Mix 1kg of rodenticide with 19kg of milled or broken rice.
 - e. Deposit 6 tbsp of mixed bait per baiting station.
 - f. Place baiting stations along rats' breeding places, such as irrigation dikes, uncultivated areas in addition to those placed along rice fields.
 - g. Inspect all baiting station every day and replace consumed baits
 - h. For every station visited by the rats, add 1-2 baiting stations 10 meters apart from the original baiting station.
 - i. Increase the amount of mixed baits to 8 tbsp per baiting station. Replace spoiled baits with new ones.
 - j. Before harvest time, collect all baits. Clean, repair, and keep them for the next cropping season.

1. Pre baiting. Distribute the baits (without the poison) 3-5 days prior to massive acute baiting to familiarize the rats with bait before the toxic bait is used. This is also used to minimize bait shyness. This should be done before seeding and before trans-planting to target the rats that attack the seedbed.
2. Bait shyness – the reduction in the effectiveness of acute poisons after repeated use in the same locality or area when more and more rats realize the sub-lethal effects of the poison.

Source:

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