Farm Structures
FACTSHEET

BRITISH COLUMBIA
Ministry of Agriculture, Food and Fisheries

Order No. 384.200-6
Agdex: 710
October 1996

CONTROL OF RATS AND MICE ON POULTRY FARMS

ECONOMIC DAMAGE FROM RATS AND MICE

A few rats and mice can very quickly multiply into several hundred in a few months. Rats produce 6 to 7 litters per year, have 8 to 10 young per litter, and reach sexual maturity in 2.5 to 4 months. The gestation period is 21 to 23 days. Mice reach sexual maturity at 6 weeks of age, have a gestation period of 16 to 18 days and bear 5 to 8 young per litter.

Rats and mice cause major economic damage to poultry operations. Losses include damage to wiring that may result in fires, malfunctioning equipment and alarms, and damage to buildings and doors. A rat eats 10-20 kgs of feed a year, while a pair of mice eat 2 kgs. Rodent control is particularly important when feed prices are high. Rats and mice spread many diseases including dysentery, ratbite fever, Leptospirosis, Salmonellosis, Hantavirus, Mareks Disease, and Pasteurella.

TYPES OF RODENTS ON FARMS

The Norway Rat is a large, aggressive, burrowing rat found around dumps, sewers and buildings, close to food and water. The rat has a travelling range of approximately 30 to 50 metres.

The Roof Rat is a smaller, agile climber, who lives in the upper floors of buildings, but sometimes in sewers. It also has a travelling range of around 30 metres.

The House Mouse is found in buildings, nesting in walls, cabinets and furniture. It has a travelling range of 3 to 10 metres.

EVALUATING THE RODENT POPULATION ON A FARM

There are several indicators of a rodent population on a farm:

a) Seeing: Rodents are nocturnal, their absence from view is not indicative that a farm is free of them.

b) Sound: By standing quietly in the barn you may hear gnawing, scratching or running in the walls.

c) Droppings: This is one of the best indicators of rodent populations. The number of rodents can be determined by the amount of fresh droppings. The greatest quantity of droppings will appear on runways, near harborage sites, in secluded corners and near food supplies. Norway rat droppings are 19 mm long and 6 mm in diameter. Roof rat droppings are smaller and more regular in form. Mouse droppings are generally 3 mm in diameter. Fresh droppings are black and moist; old droppings, dry, fragile and grey. Old droppings are not indicative of present infestations. A rat produces in excess of 4 droppings per day.

d) Runways, tracks and rub marks: Rats and mice use the same path over and over. They develop paths 5-8 cm wide in soil areas. In dusty areas, tracks and a wavy line resulting from a dragged tail can sometimes be seen. The age of a rat or mouse run gives you more important information. A fresh run over earth will generally be hard packed and free of dirt and litter. Heavy use may give it a shiny appearance. Cobwebs across a path indicate the run is no longer in use. Baby powder up to 3 mm deep placed on a suspected path will allow you to determine if the path is in active use.

Tracks can be seen around mud puddles and by shining a flashlight along a dusty floor in seldom used rooms. Rat tracks are 1.9 cm to 4 cm long. The

front imprint is 4 toed while the back imprint is 5 toed.

Rats and mice also leave rub marks on objects or entrances they pass regularly. Rub marks are often found around gnawed holes, along pipes and beams, on the edges of stairs and along walls. Rub marks made by rats passing under floor joists along a beam indicate the presence of roof rats. Norway rat runs are more often near the floor. House mouse runs may be anywhere. Search behind vertical pipes near walls for evidence of rub marks. Small vertical pipes and columns are a favorite means by which rats and mice change floors. Fresh rub marks are indicative of present infestation and are soft when scratched. Old marks are brittle and flake off and may not be indicative of the presence of rodents.

e) Gnawing: Recent gnawings through wood appear light colored and small chewed pieces or cuttings may be observed in the vicinity. As the opening ages, the edges get smoother as the rodents remove the sharp edges which offend them as they pass by.

f) Burrows: Norway rats live in burrows in the ground around buildings, embankments, and under heavy brush and plant growth. Rat burrows are around 7.5 cm in diameter. Dirt pushed out in a fan shape indicates recent use. Burrows are shallow and complex and often have several entrances. Mice usually live in buildings but will burrow in fields. Their burrows are smaller with 3.5 cm entrance holes.

g) Nests: Rat and mice nests are often found concealed in piles of debris or stored material, between double walls, under floors, or in hollow trees. The roof rat will build a ball shaped nest in a tree or dense bush. Unless young are present or the rats are seen coming and going, nests generally are a poor method of determining current infestations.

h) Feeding locations: Rats will drag food scraps to the entrance of the burrows and other locations where they feed. Gnawed bones, food wrappers, and other debris will be evident at these locations.

STRATEGIES FOR RODENT PREVENTION

Strategies for rodent prevention include: removal of feed sources, reducing the harborage (housing available) and preventing entrance.

a) Removal of feed source: Store all feed in rodent proof containers where possible. Household garbage and food refuse should be kept in rodent proof containers. Rodent proof bird feeders, keep dog and cat food where rodents can't access it and clean up old vegetable material from gardens in the fall. Separate out edible from non-edible garbage before disposal and do not dispose of edible garbage in open composts. Bagged feed should be at least 0.5 metres from the walls and floor with 0.6 metres or more between pallets. All bins and self feeders should be on concrete pads.

b) Harborage reduction: Rodents need shelter and housing in order to reproduce. Destroy all nesting places, remove rubbish and old machinery from around buildings, store wood at least a half a metre off the ground and away from buildings, cut grass around the buildings, reduce availability of water in and around the buildings.

c) Rodent proofing: All places where feed and grain are kept, used, or mixed should be sealed to prevent rodents from entering. Rats must wear down 10-15 cm of teeth per year in order to maintain use of their teeth and they are capable of exerting pressures of 0.1-0.2 tonnes per square cm when biting. This makes it possible for rats to easily enter buildings and damage materials in the process.

Use metal flashing if the building siding is vertical to stop rats and mice from entering the ends of the siding. Doors and windows should have 0.3 cm or less clearance to prevent rodents from entering. Doors should be fitted with metal kick plates to prevent rats from gnawing in. Drain cover holes should be less than 6 mm in size to stop rodents from entering through the drain holes. Also seal the areas where utilities enter the buildings. Concrete floors in poultry operations are a must to prevent rodent infestations.

Inside the building fill any potential nesting holes 6 mm in size or larger with mortar, concrete or metal flashing. You can attach metal sheeting 0.5 metres wide 1 metre up from the floor on any rough climbable surface. Fill the openings around utilities, conduits, pipes, etc. with masonry, sheet metal or hardware cloth. Drains and pump out ports should be covered and screened.

Rodent proofing is more successful if appropriate building materials are used: sheet metal should be galvanized and of minimum thickness 0.46 mm (26 gauge); galvanized hardware cloth used alongside footings, and for soffits or hole covers should be at least 1.07 mm (19 gauge) thick and have a mesh opening size equal to 13 mm or smaller for rats and 6 mm or smaller for mice; mortar for sealing holes should have a cement-sand ratio of 1:3 or higher; ready-mix concrete should be at least 20 MPa (3000 psi) in strength; and site-mixed concrete should be prepared with a mix of 1 part cement to 2 parts sand to 4 parts aggregate by volume, or stronger. The

water:cement ratio should not be greater than 0.65 to ensure a 20 MPa strength.

DESTRUCTION OF RODENTS

Rodents can be controlled through a variety of means including snaptraps, multiple catch traps, glueboards and rodenticides.

a) Snap traps: Place in dark corners, behind objects placed next to walls and wherever mice and rats are located. Mouse traps should be placed at 2 to 4 metre intervals, rat traps at 5 to 6 metre intervals. Place traps at right angles to the runway with the trigger mechanism on the runway and attach the traps via wire to the wall to avoid loss of traps. Bait can be attached to the trigger using fine cord like dental floss. A little peanut butter placed on the bait will increase its attractiveness to rodents. A box placed a few inches from the wall, with a trap placed perpendicular to the wall at the entrance and exit of the tunnel that has been formed between the box and the wall, will prove effective in guiding the rodent to the trap.

b) Multiple catch traps: One kind of multiple trap flips the mice into a holding tank and another operates with a trap door. The wind up trap should be placed perpendicular to the wall while the trap door trap should be place parallel with the wall right along the wall. The multiple mouse traps can be baited with peanut butter. These traps should be serviced regularly as heavy infestations can result in several mice being caught in an evening. It is important to dispose of caught rodents in a humane way, on a regular basis.

Traps are safe and have the advantage of containing the rodents after they are caught, which reduces the possibility of odors and fly problems associated with rodent carcasses, and further contamination of the facilities with rodent manure. Multiple catch traps may not work well for a few days after they are first installed but the number of rodents trapped will likely increase over time as the traps gain a mousy smell left by previously caught mice. Place multiple traps close to walls or other vertical surfaces, in darkened corners, runways along pallets and behind objects next to the wall. Also place multiple catch traps around exterior doors and other openings in the outside walls such as utility openings.

c) Glueboards: Glueboards catch and hold rodents in a manner similar to the way flypaper catches flies. Place bait in the center of the board and place the boards along the runways. The glueboards should be attached to the floor or wall and disposed of in a sanitary manner. They should not be used in areas where children have access. Glueboards are ineffective in very dusty areas.

d) Rodenticides:

Rodenticides are of several types:

- **Multi-dose anticoagulants:** Numerous feedings over 8-20 days results in internal bleeding and death. Generic examples include: warfarin, coumafuryl, chlorophacinone, and diaphacinone. A break in feeding will allow the rodent to survive.
- **Single feeding anticoagulants:** A single feeding by rats or mice will result in death within days. Generic examples include bromadiolone and brodifacoum.
- **Acute Poisons – An example is Cholecalciferol:** Results in death due to impact on the heart.

BAITS AND THEIR USE

Commercial baits can be purchased in several forms including pellets, loose meal, packet baits and wax blocks. Pelleted baits are resistant to moisture but can be easily picked up and cached by rodents. Loose meal is less susceptible to being carried off but more susceptible to moisture and will spoil more quickly. Packet baits may be pelleted or loose. It is easily placed in walls and attics and if the package is breached the presence of rats is evident. Packets are more expensive than bulk baits but also can be labor saving. Paraffin blocks can be used in damp locations where meal or pellet grain baits would become damp and unattractive to rodents.

It is advisable to maintain strict management over the use of rodenticides. The use of bait stations is highly recommended. A bait station comprised of 3.6 cm PVC tube made into a “T” placed upside down along the wall will allow filling from the top, attachment to the wall and will provide a tunnel which the rats will feel safe in when feeding. Bait can be placed in a number of these tubes placed about every 6 metres along the wall. Do not underbait as failure to get a kill with an acute toxicant can lead to bait shyness which will be difficult to overcome.

When bait packets are used, bait should be kept in its original labeled bag and attached with string, staples or wire to a wall or large object in the area. This prevents bait from being taken away and cached, allows for reinspection to determine consumption, and permits proper removal of uneaten baits.

Bait packets must not be indiscriminately thrown into the manure pits. Randomly placed bait packets with no means of removal prior to removing manure from the farm for spreading can be a serious problem to pets, birds, and wild animals. Remember that you can be

held responsible for the impact of rodenticides that have left your farm in the manure. ***Children, wildlife, valuable non-target domestic animals including breeding horses, cattle, dogs and children can be poisoned by packets left in the manure and spread on land.***

Prebaiting is the process of providing some food without poison in it for a few days prior to adding the poison. Rats will sample the new food and eat the same food with confidence later on when it has rat poison in it. This results in an effective kill.

Liquid baits are more effective if no other sources of water are available.

Bait trays are inexpensive but they fail to provide seclusion for the rodent while eating and may expose rodenticide to consumption by other animals. Tamper-proof bait boxes are ideal because they provide undisturbed seclusion for the rodent encouraging him to eat longer and protect non-target animals and humans. Trays also contain the bait and protect the bait. Bait boxes should be properly labelled and placed out of reach of children.

When baiting mice, rather than rats, use a large number of placements with small amounts of bait rather than a few placements with large amounts of bait. Place mouse baits 3 to 4 metres apart and move them every once in a while. Bait in three dimensions to catch mice moving in ceiling spaces and along wall ledges. Use different formulations for mice as sometimes mice will take preference to certain foods.

SAFE USE OF RODENTICIDES

When using rodenticides always keep the phone number of the poison control center (1-800-567-8911)and the rodenticide manufacturer hot line readily available at the site of baiting, in the farm house and in your vehicle, should an emergency arise. Records should be kept of all bait placements, including location, amount and dates, placed and replaced. Only approved rodenticides should be used and should be applied according to the label instructions. Simple labels on bait stations such as “Rodent Bait-Poison-Do Not Touch” help to communicate danger to other people. Follow the label instructions of the manufacturer and ensure that all government regulations pertaining to the use and application of these materials are adhered to. Do not place bait stations where they may be knocked over. Inventory rodenticides should be locked up and kept safely away from children, unauthorized personnel and animals. Rodenticides and poisoned animals should not be handled with bare hands; use rubber gloves.

REFERENCES:

Rodent Control in British Columbia ; H. A. Kluge; BCMAFF; 1949.

Rat Control on the Prairies; D. A. Harvey; Saskatchewan Agriculture; 1985.

Biosecurity of Poultry Facilities; J. F. Prochaska, J. B. Carey and J. S. Jeffrey; Texas A&M; 1996.

What’s Old and New in Rat Control; D. Wilkins; Country Guide; January 1991.

Pest Management on Poultry Farms; M. J. Darre and J. S. Rock; Poultry Digest; October 1995.

Sanitation for Food Processing Plants; A. Guite and S. Andersen; Agriculture Canada;1990

Anticoagulants; Agriculture Canada.

FOR FURTHER INFORMATION, CONTACT:
Brian Scott, Environmental Technician Phone: (604) 556-3107
Email: brscott@gems8.gov.bc.ca
Stu Paulson, P.Ag., Poultry Industry Specialist Phone: (604) 556-3083
Email: spaulson@gems8.gov.bc.ca

ABBOTSFORD AGRICULTURE CENTRE
Ministry of Agriculture, Food and Fisheries
1767 Angus Campbell Road
Abbotsford, BC
CANADA V3G 2M3