

A Special Case for Roof Rat Control

Mike Stringham, Extension Entomologist
N. C. State University, Raleigh, NC

The roof rat (*Rattus rattus*) has been with us for as long as the more familiar Norway rat (*Rattus norvegicus*). Fortunately, neither rodent has been a particularly serious pest on North Carolina turkey farms. Roof rats, however, seem to have become more prevalent than they once were in some areas. Evidence to that effect is circumstantial, but my experiences in recent years on all types of poultry and hog farms have involved a number of roof rat problems. Today I offer a primer on how to identify and manage roof rat infestation.

Biology and Behavior:

Roof rats are largely confined to coastal states, but their range extends a considerable distance inland. A map of their estimated range covers all but the far western edge of North Carolina. At 14 – 16 inches long, these rodents are about the same length as Norway rats. Half of that length, however, is in their tails. Roof rats have the general appearance of a very large mouse, with prominent eyes, large ears and a more slender body build than the Norway. They weigh less than Norway rats at 5 – 10 ounces, and fur color varies from brown to nearly black. The long tail is hairless. Roof rats are clearly omnivorous, eating a wide variety of food from fruit, to grain and feed, to insects and even slugs. They begin breeding at about 3 months of age, and gestation is 21 – 23 days, with peak breeding periods in the spring and fall. Each female roof rat produces 4 – 5 litters of 5 – 8 offspring per year.

Like many rodents, roof rats are nocturnal, sleeping in secluded nesting sites during the day. Those sites are most often inside the building since roof rats seldom dig ground burrows. Attic spaces, drop ceilings, and wall voids are favorite harborages. Even where ceiling areas are open, roof rats will nest among the rafters or in ridge and eave vents. These rodents are also remarkably shy, remaining well hidden during the day and scurrying for cover long before an observer gets close. Roof rats are also the most acrobatic rodent of those that infest poultry houses. Adults are said to jump 36 inches vertically. Roof rats easily scurry along conduits, wiring and water lines, often seeming to prefer such routes over others more easily taken. They are



also able to run up walls (even when clad in metal siding), supports and door frames. In short, once roof rats move into a building, they pretty much have the run of the place.

Management:

The basic principles of roof rat management are the same. Frequent **scouting** is necessary to detect activity and pinpoint areas where rodent traffic is heaviest. Attention should be focused overhead for roof rats. Look for damage to plastic sheeting in drop ceilings and insulation board in open ceiling structures. Where ceilings are open use a bright beam flashlight to closely examine roof ridges for damage and lurking rats. Use a ladder to look along high sills for droppings (roof rat pellets are $\frac{1}{4}$ to $\frac{3}{8}$ inches long, often with slightly pointed ends) and tail marks in the dust. Also look for dark smudges where rafters rest on sills. These "rub marks" are created as the rats slip around the rafter along sill runways and are characteristic of roof rat activity. Check around fan housings as well. Spaces between the box and fan wall are often used as nesting sites.

Scouting becomes more difficult if the structure has a drop ceiling. Look for holes (even small ones) in the plastic sheeting, especially where conduits come down from the ceiling or overhead water lines are attached. In new structures especially, keep track of where holes occur and watch those areas carefully to see if new holes appear for no apparent reason. Keep a sharp eye open for bits of insulation raining down from the ceiling. It is also helpful to have entry points down the length of the house, both to inspect the overhead space from time to time and provide a way to introduce baits into these overhead areas. As with open structures, a good strong flashlight is essential to adequately inspect these overhead spaces.

Control of roof rats is generally a matter of getting a rodenticide into those areas where the rats hide and along the routes they travel to reach food and water. Block baits are often the most versatile since they can be nailed or wired to rafters and sills, support posts and trusses, and along conduits and water lines. Tracking powders along sills may also prove useful. Obviously, it may not be possible to place baits way up in the rafters, but remember that the roof rats must come down for food and water. Bait placement should coincide with identified routes to and from overhead nesting areas.

Drop ceilings offer special challenges and opportunities. As noted, access to areas above the drop ceiling is essential. Here, stations filled with rodenticide-laced water may prove quite effective since the rats will readily recruit to what they view as a convenient source of water. A bit of plywood adjacent to an entry point makes a perfect platform for such a watering station. Similarly, the platform may also be used as a feed tray where block baits may be wired or nailed. Six to eight such stations down the length of the house should be adequate to keep attic spaces relatively free of roof rats.

The variety of available active ingredients and formulations offer a lot of rodenticide options. Single dose rodenticides include the acute toxins, bromethalin and zinc phosphide, several anti-coagulants (brodifacoum, bromadiolone, and difethialone), and cholecalciferol. Multiple dose rodenticides (chlorophacinone, diphacinone and warfarin)

provide the best options for tracking powders and concentrates that may be mixed for use in watering stations. Of these, diphacinone is most commonly formulated as a tracking powder and a water soluble concentrate.

Other control options include snap traps and glue boards. Though not as efficient and more labor intensive, these devices are useful where rodenticides might be unacceptable, or the infestation is isolated in a small area. Rat-sized traps and glue boards may be wired or nailed to overhead areas in much the same way as block baits. Snap traps may be baited with fruit or peanut butter; glue boards placed in rodent runways. Both devices must be inspected and reset or replaced every few days to be effective. One ingenious method involves attachment of a length of twine or wire to a snap trap and carefully placing it on a sill or rafter. The thought behind this approach is that a trapped rodent will thrash around before expiring and knock the trap off its perch. Sprung traps, and presumably their caught rats, will then be easy to spot hanging from the sills or rafters.