Control of Rats and Mice

effectiveness requires continuous application of proven methods

Tracy I. Storer

The following article is a condensation of a portion of Circular 142 "Control of Rats and Mice" published by the California Agriculture Extension Service. The complete, illustrated circular may be obtained without cost from the local Farm Advisor or by addressing Publications Office, College of Agriculture, University of California, Berkeley 4, California.

Exclusion and sanitation are the surest ways to control rats and mice.

Exclusion means to leave no opening more than three-eights inch in width into a building and to protect all food supplies from these animals.

In practice, rodent exclusion requires:

1. Concrete floors and exterior curtain walls around foundations;
2. Solid exterior walls with no holes or large cracks;
3. Elevation of small buildings 12 or 18 inches above ground;
4. Screens over all openings, both at the ground level and above, or hardware cloth of one-third or one-fourth inch mesh, or metal grille with equally small apertures;
5. Cement or metal sheathing around all holes where pipes or conduits pass through walls;
6. Tight-fitting doors and window screens.

Concrete, masonry or sheet metal walls will exclude rats. Wooden walls can be kept rodent proof if knotholes are covered, cracks battened tightly and the bottom boards nailed down securely. The lower edge should be sheathed with strips of light weight galvanized sheeting. For outbuildings and farm structures of frame construction on wooden studs, single walls are preferred.

Sanitation involves protection of livestock and human food from contamination by rats and mice.

Large supplies of livestock feed in piled sacks offer both food and shelter for rats and mice. Whenever possible, sacked materials should be stored in narrow piles with lanes between, and an alleyway between the outermost tiers and exterior walls. Damage then will be lessened and any rodents present can be controlled more readily.

Smaller stocks of feed for poultry can be kept in large clean garbage cans covered with close-fitting lids.

In homes and in store rooms adjacent to farm kitchens the same means may be used. Covered tin cans, glass bottles, two- to 10-gallon crocks and even small garbage cans are useful for flour, cereals, dried fruits, nuts, etc.

Home and farm yards and the alleys behind both homes and stores often have irregular heaps of boxes, lumber or trash. The open garbage cans provide food and the piles of debris offer shelter.

The practice on many farms of throwing all table scraps into pens for chickens or hogs helps to support both rodents and flies, particularly if the pens are seldom or never cleaned. To keep down rodents, refuse should be disposed of promptly and properly.

Empty boxes and stocks of lumber should be piled compactly and neatly on trestles or other supports that keep the bottom 12 to 18 inches above ground. Trash piles, brush heaps, old prunings from fruit trees and all such litter should be burned. Large piles of firewood, if not in separate tiers, may give shelter for rats.

Trapping

Trapping is the preferred method of control in homes and office buildings and is most useful in places where there are few rats and mice.

The small breakback and choker-loop traps are used where there are signs of mice—tracks, droppings, holes or damage. In buildings, place the traps along the wall, with trigger end toward the baseboard, or against boxes or other objects at intervals of two or three feet.

Rolled oats are almost always effective as mice bait, while cheese is not.

Almost any trap will catch rats but experience proves that the ordinary spring snap trap is best and cheapest.

Results depend more on the number of traps used and on the way in which they are placed than on the type of trap used.

The wooden-based spring trap is generally used, but some trappers employ the No. 0 steel trap. Best results will be had if the traps are placed and baited, but left unset for three to five nights, then baited and set. This practice overcomes the rats' fear of new objects.

Traps should be spaced at intervals of six feet or more, with the trigger ends close to the wall. Each trap should be fastened to some nearby object by a cord or light wire about two feet long.

Rats that ignore an exposed trap may be caught if a board or box is placed to shield the trap, leaving a space for them to enter and for the trap spring to operate.

Rat baits may be of almost any human food. Rolled oats and other cereals, corn meal, and bread crumbs may find favor; ground meat, bacon, fish, apples and raisins also are used.

Poisons

The chief method of routine control by all government agencies, commercial pest control operators and many others is use of poisoned foods or baits. The principal poisons are red squill, zinc phosphide and ANTU, although arsenic, barium carbonate, phosphorus and strychnine have been used. Thallium sulfate and Compound 1080 are both effective poisons, but they are too dangerous to be used by the general public.

Except for red squill, all these poisons are dangerous to man, pets and domestic animals. Extreme care must be used in handling and placing unused baits and in the disposal of poisoned animals.

Prebaiting is a new and improved poisoning technique. Small piles of clean, unpoisoned baits are placed at selected sites or in special bait containers for several nights, the supply being replenished whenever the rats take the material.

The prebait is then replaced by poisoned food of the same kind.

Baits may be put directly into rat burrows, in rat-infested spaces under buildings, or in crevices about foundations or walls. It is important to distribute enough baits so that all rats will have access to one or more.

If the first poisoning is successful, it need not be followed by another for about three months, depending on the amount of new sign of rats that appears. When the number remaining is small, trapping, with a new bait, may be tried.

Should one campaign fail to kill enough rats, a follow-up campaign may be started about two weeks later using a new bait and a new poison.

Gases

Many rats in burrows and other enclosures can be killed by poisonous gases. Any careful person may use this method out of doors, but within buildings the gas is more dangerous and should be used

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2,4-D

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oil deposited was not influenced by the presence of 2,4-D.

Time of Application

Application of 2,4-D should be avoided from one month before bloom to one month after bloom and, of course, oil sprays usually are not applied during this period. When spraying lemons this caution may not be so important. In any case the established practices under local conditions with respect to timing, grade of oil, dosage, temperature, etc., should be followed, unless applications coincide with the bloom period.

Application of 2,4-D in oil even at the low concentration of four p.p.m. in the finished oil spray mixture may cause leaf curling when applied on young, actively growing shoots. Data thus far obtained indicate no decrease in fruit quality or production as a result of the curl. The leaf curl may be minimized by spraying with 2,4-D between leaf growth flushes.

The vigorous, rapidly growing whips or sucker-shoots of lemons are very sensitive to 2,4-D and may be killed at the tip by its application. Subsequent to the killing, however, these suckers have been observed to produce short lateral fruiting branches.

In orchard practice the tips of these suckers are often mechanically cut off to accomplish this same purpose.

There is no information available on the effect of two applications of 2,4-D per year. It is not anticipated difficulties would arise in this regard provided the bloom period were avoided.

Spray rigs previously used for 2,4-D weed spraying should be thoroughly cleaned before applying oil sprays on citrus. Flush the tank several times with a strong alkaline water solution—soda ash, etc.—and rinse with clean water. If the rig was previously used with weed-oil, and 2,4-D, rinse out the oil residue with kerosene or some similar petroleum solvent before using the alkali solution.

W. S. Stewart is Associate Plant Physiologist in the Experiment Station, Riverside.

L. A. Riehl is Assistant Entomologist in the Experiment Station, Riverside

AVOCADO

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Virtually every horticultural practice has been tried to correct the alternate bearing behavior of the Fuerte avocado variety. Among these are orchard fertilization, fruit-thinning and pruning.

Of all the practices tried, only one worked, but unfortunately it is not applicable to commercial practices.

That was very early harvesting—as soon as the fruit attains horticultural maturity—coupled with girdling. When these were done it was possible on individual limbs to produce two good crops in succession and to change the stride of alternation so that limbs on the same tree were in opposite stride.

Early harvesting without girdling did not accomplish the desired result.

The conclusion has been reached that there are really only two solutions to the problem of alternate bearing in the avocado.

One of them is finding strains or seedlings of Fuerte that are less subject to the factors that cause alternate bearing. Evidence exists that there are at least two strains and one that is somewhat better than the other has been isolated. The better strain seems to be less sensitive to unfavorable temperatures during the fruit-setting period, and its alternation is more regular and perhaps not quite so wide in amplitude as that of the other strain.

The other solution—upon which work was started several years ago—is the breeding of varieties that have the desirable market and other qualities of Fuerte but are less subject to the alternate bearing habit.

There is some hope in the picture because there are some varieties that don't alternate much. Perhaps by using them as parents in a breeding program their desirable characters in this respect can be converted to their progeny, and at the same time the desirable characters of Fuerte can be brought into the progeny. If so, the resulting product will be better than anything produced now.

Robert W. Hodgson is Assistant Dean of the College of Agriculture at Los Angeles, Professor of Subtropical Horticulture and Subtropical Horticulturist in the Experiment Station, Los Angeles.

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only by a trained official. All of the gases used are poisonous to man and domestic animals.

Calcium cyanide is the commonest material used in gassing. It is available both in granular form and as a dust. The dust is applied with a special pump and a hose for insertion inside the burrow. Granular cyanide is applied directly inside the burrow.

Other gases which are effective include carbon disulfide, sulfur dioxide, and methyl bromide.

A simply administered gas is carbon monoxide from an automobile exhaust which can be forced through a hose into rat burrows. This gas may be used for burrows under cement farm buildings where cyanide would be dangerous to livestock.

Poisonous dusts are effective in some cases. ANTU—up to 20%—when mixed in flour, pyrophyllite, or talc, may be dusted heavily on rat runs and entrances to burrows for control of Norway rats.

In areas where murine typhus is a hazard, DDT dust—5% to 10%—is placed on runways to catch on the feet and fur of passing rats and kill many of their fleas. Any of these dusts can be applied with a sifter can.

When rat burrows are numerous in fields, the burrows may be destroyed by plowing to a depth of 18 inches with a subsoiler or chisel.

Rats may sometimes be killed by flooding their burrows, especially on poultry farms.

Since fleas and mites will leave dead rats and may get onto people, the trapper should handle dead rats as little as possible and should wear gloves.

Dead rats and mice should be burned out-of-doors, or buried at a depth of not less than two feet.

Tracy I. Storer is Professor of Zoölogy, and Zoölogist in the Experiment Station, and Lecturer in Public Health, Davis.

SULFA

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moving the bacteria which were harbored in the organs of the birds.

Data concerning the effect of the sulfa drugs upon reactors and carriers indicate that the present drugs cannot be relied upon to remove carriers of organisms which cause fowl chlorea, pullorum and typhoid disease of poultry. At best the drugs may be used in acute outbreaks in the hope of salvaging as many birds as possible. It is strongly recommended, however, that the salvaged birds not be used as breeders.

R. A. Bankowski is Assistant Professor of Veterinary Science and Assistant Veterinarian in the Experiment Station, Berkeley.

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