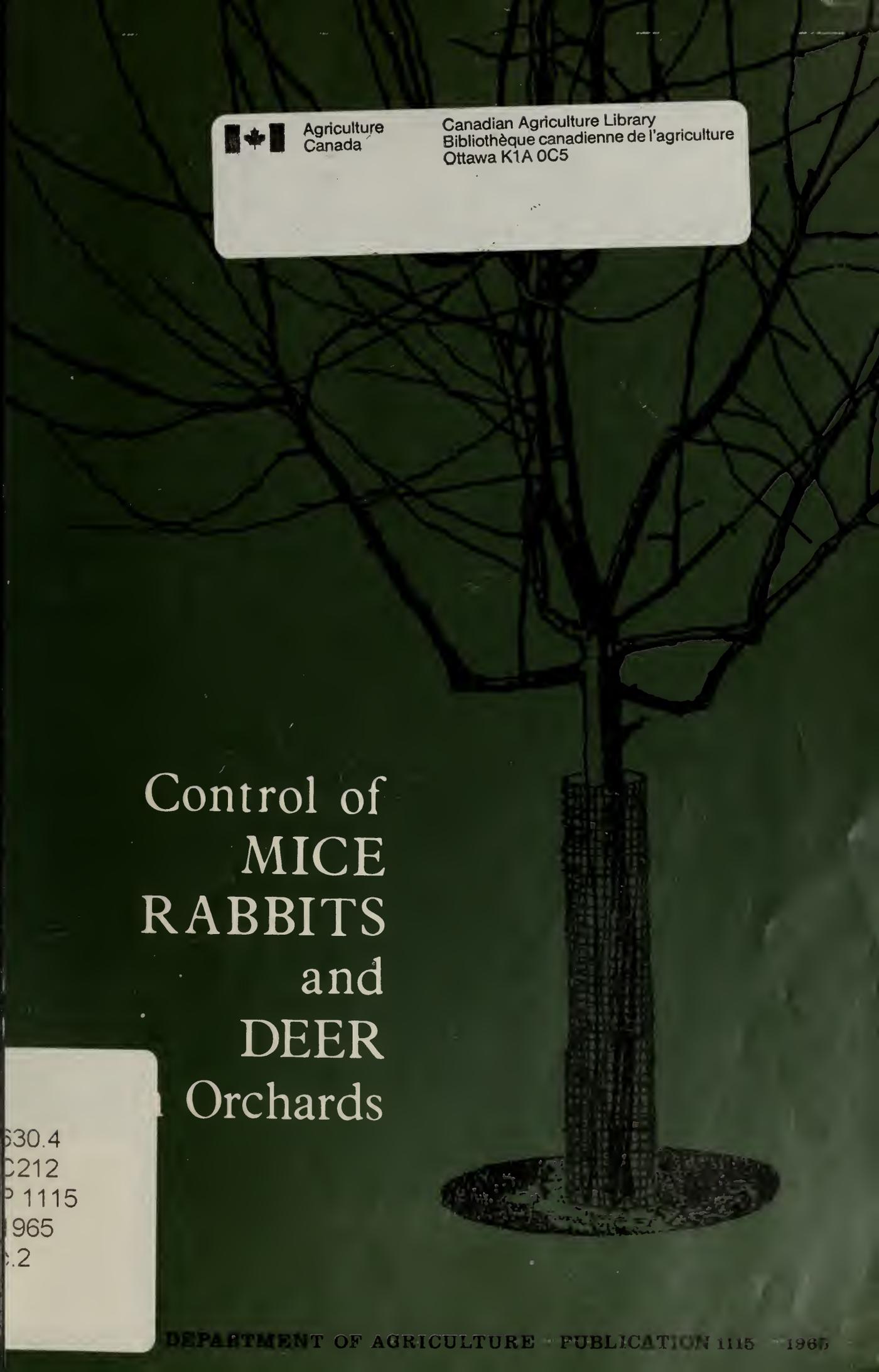




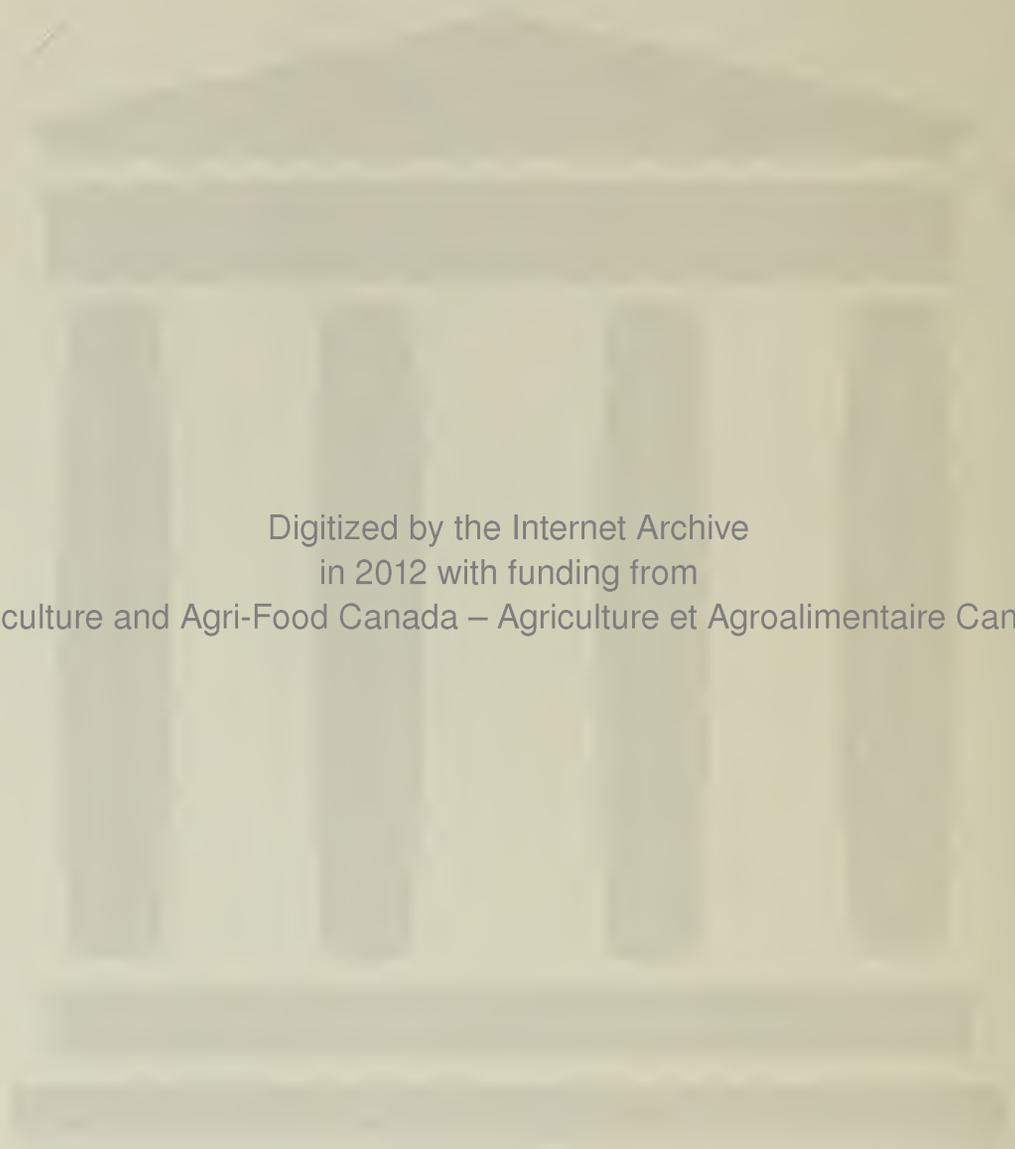
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Control of
MICE
RABBITS
and
DEER
Orchards

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To prevent damage by mice, rabbits, and deer in orchards the following practices are effective:

For mice:

- Don't kill their predators.
- Mow the ground cover or cultivate the orchard frequently.
- Keep the orchard and the surrounding area free of brush, tree prunings and weeds.
- In the fall, wrap the trunks, especially of young trees, with ¼-inch wire mesh, aluminum foil, or other protective material.
- Inspect the orchard carefully in the fall. If mice are numerous, pick up all fallen apples and set out poisoned baits. Anticoagulant-paraffin blocks are very effective.
- Conceal dangerous baits in bait stations.
- Pitfalls and spring traps are also useful.

For rabbits:

- Enclose small orchards with poultry netting.
- In late fall, wrap the trunks (above mouse guards) and lower limbs with burlap. Remove the burlap in the spring.
- Late in the fall, paint or spray the trees with a commercial or home-prepared repellent. Apply it when the temperature is above freezing.
- Tie small bunches of strychnine-treated clover to branches or stakes about a foot above the ground or snow throughout the orchard.
- After the first snowfall, set snares and humane types of traps in runways.

For deer:

- Enclose the orchard with an eight-foot woven-wire fence, if practical.
- In late fall, while the temperature is above freezing, apply thiram, Z.I.P., or other effective repellent.

Protect domestic animals and wildlife from the poisons you apply.

CONTROL OF MICE

There are practical means for controlling mice and rabbits in orchards; control of deer is more difficult. The simplest and least expensive of all controls is natural control. Do not kill predators in the vicinity of the orchard unless you have to. Foxes, skunks, weasels, hawks, owls, and snakes don't keep orchards free of rabbits and mice but they help appreciably. Dogs and barn cats also help.

You may get the best results by using both mechanical and chemical methods to supplement natural control.

Mice and most rabbits vary greatly in numbers from year to year. In the late summer, watch for signs that mice are plentiful. During the winter, inspect your orchard regularly for rabbit damage.

MICE

Mice are usually numerous every three or four years.

The meadow mouse causes most of the damage done by mice in orchards, but in some areas of southwestern Ontario, and possibly in southwestern Quebec, the pine mouse may also be harmful. It burrows more than the meadow mouse and damages tree roots more. You may not be aware of it until trees appear unhealthy. A mature meadow mouse may be seven inches

long. It is dark grayish brown, and its tail is usually twice as long as its hind foot. The pine mouse is somewhat smaller and reddish brown, and its tail is about as long as its hind foot.

The white-footed mouse, the pocket mouse, and the house mouse also cause damage, but are less important.

Usually, mice gnaw the bark off or girdle the trunks, at or slightly below ground level. The meadow mouse usually eats grass, herbs, seeds, and bulbs in spring and summer, but during fall and winter it often eats bark. It makes shallow runways and seldom causes much damage below the soil surface. The pine mouse burrows deep and feeds mainly underground; it eats rootlets and may strip the bark from large roots. Its damage is often, mistakenly, blamed on moles.

Prevention

To keep mice from becoming numerous in the orchard and to protect the trees:

- Mow sod orchards often during the growing season. Thoroughly cultivate young orchards, especially in late summer and fall. The more ground you mow or cultivate, the less the damage by mice.

- Don't let brush and tree prunings accumulate. Clean up trash at the bot-

RABBITS, AND DEER IN ORCHARDS

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tom of fences around the orchard.

- Keep the ground clean within two feet of tree trunks. A herbicide helps.

- Protect trees, especially young ones, with quarter-inch galvanized wire mesh (hardware cloth) two or more feet high so that it will be above snow level. Bend a piece of mesh around the tree, leaving room for several years' growth. Fasten the edges by bending over the cut wires. Bury the lower edge at least three inches in the soil. Wood veneer, aluminum foil, light-colored building paper, plastic "snap-on" bands, and burlap are used but are less satisfactory than wire mesh and don't last as long.

Warning: Be sure to remove close wrappings in the spring, to avoid damage by mold or other diseases. Never use tar paper or roofing paper; they may damage trees by lowering their cold-hardiness or favoring disease.

Although mechanical guards and clean cultivation may protect trees from meadow mice, they are of little value against pine mice.

¹ Scientific Information Section, Research Branch.

Poisons

Inspect your orchard carefully from August to September for signs of mice. Watch for surface runways, nests, nibbled fruits, signs of predators, and mice that your pets catch. Look for deep burrows under unhealthy trees. If the signs are numerous you may need to control the mice with poisons in baits or ground sprays.

DDT, endrin, and toxaphene are highly effective in sprays on vegetation, but they are very toxic to wildlife and fish and should be used only as a last resort. Follow the recommendations of your agricultural representative or other extension specialist.

Before setting out baits, gather up all fallen fruit in the orchard. When placing poisonous baits, hide them as well as possible from children, domestic animals, and beneficial wildlife. Small piles of hay or grass, hamper covers, pieces of tar paper, and the like make attractive shelters for mice, especially pine mice. They are ideal places for the bait.

Place baits on a warm, sunny day as late in the fall as weather will permit. If you bait too early, the mice may move in from the surrounding area after the first group has been destroyed.

Grain baits are more effective than

CAUTIONS

If possible, avoid using poisons to control mice, rabbits and deer. Other means of control are safer for you, other people, domestic animals, and beneficial wildlife. In some provinces it is illegal to use strychnine and various other poisons to protect orchards. Before using a poison, check your provincial regulations with an agricultural representative or other extension specialist.

When you use a poison, follow closely all the cautions given on the container, especially those on handling it, breathing the fumes or dust, getting it on your skin, and keeping it away from children and domestic animals.

Some of the chemicals may not be applied to trees after the fruit has set. Take note of this to avoid residues that would make the fruit unfit for sale.

Burn or bury all unused poisoned baits except anticoagulants.

Mark all bait containers *poison*. Preferably mix and apply baits in utensils kept for that purpose only. If you do use them for anything else, thoroughly clean and rinse them.

Keep animals out of baited orchards. Dogs, cats, and wildlife may become sick or die if they catch poisoned mice or rabbits, or eat partly decayed carcasses. Therefore, bury or burn all the carcasses that you can find.

apple baits when the temperature is below freezing.

Anticoagulants

Anticoagulants are effective against mice and are much less dangerous than the other poisons in baits. When mixed with grain and paraffin wax in bait blocks, they are easy to distribute, need no protection against the weather, and seldom attract anything except mice. The blocks attract birds somewhat but are not likely to harm them. Also, the grain cannot cake or mold. Mice need to eat the poison several times in a few days to be killed.

Anticoagulants are sold under such names as warfarin, pindone, fumarin, diphacinone and Prolin, an improvement of warfarin. You may buy the poison mixed with grain, or treated grain in paraffin blocks. Or you may buy the anticoagulant and mix it with a suitable grain, such as whole oats, rolled oats, or rolled barley. Also, you may put the bait in paraffin blocks.

To mix the poison with grain:

- With warfarin, pindone, or fumarin use one part of 0.5 percent anticoagulant with 14 parts of grain (by weight). With diphacinone use one part of 0.5 percent anticoagulant with 29 parts of grain. With other materials, follow the directions on the containers.

- Mix the anticoagulants thoroughly into the grain. A little corn oil, peanut oil, or mineral oil helps it to stick to the grain.

You may place the treated grain in small plastic bags, about a cupful in each bag, near the bases of the trees or in bait stations.

To prepare the bait in paraffin blocks:

- Melt paraffin wax in the top of a double boiler.

- Stir treated rolled oats or rolled barley into the melted paraffin to make a thick but flowable mixture (1 to 2 pounds of grain to 1 pound of paraffin, according to the type of grain used).

- Pour the mixture into waxed milk cartons, fruit or vegetable tins, paper cups, or similar containers. Suit the container size to your needs. Filled cartons may be sawed into small blocks, one to two inches thick.

Place the paraffin blocks at the bases of trees (one or two per tree), in runways or under mouse shelters. It is not necessary to conceal them.

Whole grain may separate from the paraffin before it sets if mixed as described above. For better results, place the treated whole grain in small containers or pie plates, and pour hot paraffin over it. Or heat the paraffin in pie plates (aluminum will do) over boiling water, add the grain, and stir as it cools.

Zinc Phosphide

You may use zinc phosphide in apple bait or in cracked corn bait. If zinc phosphide is not available, use arsenic trioxide in a fine powder.

In apple bait — For about 125 baits, cut 1 quart of apples of a firm variety into half-inch cubes, without peeling or coring. Spread the cubes in an enamel pan and dust over them 1 level teaspoon of zinc phosphide. Stir constantly with a paddle while adding the poison.

Set the bait out, two or three cubes

per tree, on a warm day. Use a sharp stick or fork to place single cubes in concealed runways or bait stations. The latter may be field tile, tin cans (open at both ends), or shelters such as small piles of hay or grass or pieces of tar paper.

You may get better results by putting untreated bait in the bait stations for a week or two before using the poisoned bait.

Burn unused bait and mix fresh bait when needed.

In cracked corn bait — To treat 25 acres, mix half an ounce of methyl green dye with 2 pounds of zinc phosphide. Add 1 or 2 quarts of vegetable oil and stir well. Pour this over 100 pounds of cracked corn in a large metal tub. Use a hoe to mix the material until all the grain is coated. The green dye may warn humans that the grain is dangerous, and discourage birds from eating it.

To treat 1 acre, use ½ gram of dye, 36 grams of zinc phosphide, 3 fluid ounces of oil and 4 pounds of corn.

You may place the bait in bait stations, using about a tablespoon for each station. Or drop it in a line, inside of the tree drip line, along each side of a row of trees at 10 to 15 grains per linear foot, or about four pounds per acre. The bait is less dangerous to wildlife when placed in bait stations.

Strychnine

Strychnine is used in commercial mouse seed or may be mixed with crushed oats.

In mouse seed — Place the mouse seed in bait stations — one at the base

of each tree or under an attractive mouse shelter.

In crushed oats bait — For 4 acres of orchard, mix 1 tablespoon of laundry starch in $\frac{1}{4}$ cup of cold water. Stir this into $\frac{3}{4}$ pint of boiling water to make a clear paste. Mix 1 ounce of strychnine sulphate with 1 ounce of baking soda and stir into the hot starch paste. Then stir in $\frac{1}{4}$ pint of corn syrup and 1 tablespoon of mineral oil and mix well. Pour the mixture over 8 quarts of crushed oats and stir thoroughly.

Place the bait in bait stations as for zinc phosphide bait, using about a tablespoon of material for each bait.

Pitfalls

Sunken cans make effective, safe pitfalls. Use empty cans (fruit juice, oil, etc.) 4 inches in diameter and 7 inches deep. Punch several holes in the sides from the middle to the top. Set the cans in the soil to ground level and fill them with water to the lowest holes. No bait is necessary.

Place the pitfalls around the area to be protected: near the bases of the trees, under mouse shelters, or on mouse runways. Mark them with stakes so that you can find them. Occasionally empty the cans and refill them with water. If there is no natural cover for the mice, place a board an inch or so above each can.

Spring Traps

You may get rid of many mice in an orchard with spring traps.

Bait them with a doughlike mixture of peanut butter, oatmeal, raisins,

and bacon and place three to a tree. Tend them daily, rebaiting when necessary. Or place them in runways without bait, at right angles to the runway so that the mouse will run over the trigger pan.

RABBITS

Cottontail rabbits and hares often severely damage trees in young orchards and may cause serious losses in nurseries. They may kill young trees by debarking the trunks. They may also clip off terminal and side shoots on young trees, and on old ones when the snow is deep. Cottontails vary in numbers from one year to the next. Hares may vary in numbers in fairly regular cycles, usually of about 10 years.

Prevention

Fences

Fences are a practical means of control for small areas of valuable trees. Use 36-inch poultry netting with $1\frac{1}{2}$ -inch mesh. Keep the lower edge on the ground surface or, better still, bury it a few inches in the ground or hill soil up against it. Watch the snow depth in winter and, if necessary, add more netting on temporary posts driven into the snow. The fence lasts much longer if you roll it up and store it during the summer.

Wrapping Young Trees

In late fall, wrap the trunks of young trees (above the mouse guards) and the lower limbs with burlap. Tie very young trees to stakes to prevent

snow and ice from breaking them. Remove the wrappings in the spring to avoid damage by mold or other diseases.

Repellents

You may use a commercial rabbit repellent or prepare a repellent from one of the following formulas.

Paint or spray the repellent on dry trees in late fall when the temperature is above freezing. Apply it as high as necessary for protection when the snow is as deep as in any previous year.

Formula 1 — Mix 1 part of thiram or 1 part of 40 percent nicotine sulphate with 10 parts of water-emulsible asphalt and paint on trees.

Formula 2 — Dissolve 9 pounds of finely powdered resin in 1 gallon of denatured alcohol. Keep in a warm place for 24 hours, stirring occasionally to dissolve the resin. For spraying, thin with 1 gallon of denatured alcohol to each gallon of the solution. Alcohol is inflammable, so keep it and the solution away from heat and flame.

Rain or snow turns treated trees white, but this does not affect either the repellent or the trees.

Formula 3 — Add 1 quart of 40 percent nicotine sulphate to the following mixture: 1 gallon of water-emulsible asphalt, 1½ gallons of water, and 1 pound of household detergent. Paint on trees full strength. For spraying, add 1 gallon of water and 1 pint of nicotine sulphate and use 50-mesh strainers and a nozzle with a 0.5-millimeter or larger opening. Spraying is sometimes difficult because of clogging.

Poison

Strychnine

Strychnine is effective on hay as a bait, but use it only where livestock or household animals may not stray.

Dissolve 1 ounce of strychnine sulphate in 1½ gallons of boiling water. Mix 4 tablespoons of laundry starch in ½ pint of cold water, in another container. Add this to the first solution and boil until it clears. Pour or spray this over alfalfa or clover hay and let it soak well. Tie small bunches to branches or stakes so that the hay will be about a foot above the ground or snow when distributed in the orchard.

Traps and Snares

Several humane types of traps are now on the market. A body-gripping type, one of the best, retails for about two dollars. Leg-hold traps are cruel and often only cripple the animal. Old-fashioned box traps are effective but cumbersome.

Snares are cheap, catch few other animals and are highly effective against cottontail rabbits and American varying hares.

Before you use snares, check your provincial game regulations with a game warden.

Cats and small dogs may get caught in snares, but usually they don't struggle or get strangled when the snare is fastened to a fixed support. Tend snares daily.

Set snares where trails pass under logs, brush piles, or other obstructions, where possible. Begin snaring after the first few snowfalls when trails

become visible. Tend the snares once or twice a day.

Try to avoid catching natural predators in traps and snares.

To make a snare, use a two-foot piece of snare wire. Make a small loop on one end and run the other through it to form a noose about four inches in diameter. Fasten the free end of the wire to a supporting stick above a trail so that the noose is about three inches from the stick and about 1½ inches from the ground. The stick should be directly across the trail, about nine inches above it, or stuck into the ground or snow at the side of the trail and slanted over it. Do not use a spring pole.

DEER

Deer injure fruit trees by browsing on buds and terminal twigs. They make young trees almost useless for future production, and reduce the production of older trees greatly.

Fences and repellents are useful but, in general, protection against deer is complicated, costly, and difficult.

Prevention

Fences

To help keep deer out, put up a fence of woven wire 8 feet high, using strong posts.

An electric fence is useful and less costly but is less reliable. In the growing season a two-wire electric fence may keep deer out. Have the outer wire three feet high and the second three feet inside the first and five feet high. In the winter an electric fence requires a lot of maintenance to pre-

vent shorting by snow and to adjust it to the snow level.

Repellents

Of the many commercial repellents, thiram and Z.I.P. are among the most effective. These repel deer when they taste treated vegetation.

Thiram — Thiram weathers well when properly prepared and applied to dormant trees. It may not be used during the growing season. It is not practical to prepare the repellent yourself but several commercial products are available.

Z.I.P. — Repellents containing Z.I.P. have been improved recently so that they weather better and have a wider range of use. During the growing season they may be applied only before the fruit sets.

Application — To protect against damage in winter, spray the trees as late in the fall as weather and ground conditions permit. Spray them in dry weather, above freezing, using only moderate pressure. On mature trees, cover only the outer twigs to a height of 7 feet above the highest level that the snow has been in any year. Cover young trees completely.

Dilute growing-season sprays much more than dormant sprays.

REPAIRING DAMAGE

During fall and winter, inspect your trees carefully. Treat damaged trunks and large limbs immediately with a tree-wound dressing. For instructions on repair, see *Budding and Grafting Fruit Trees*, Canada Department of Agriculture Publication 1063.

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Some brand names are used in this publication because the chemical names are difficult for general use and there are no official common names for the active ingredients.

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Ottawa

ROGER DUHAMEL, F.R.S.C.
QUEEN'S PRINTER AND CONTROLLER OF STATIONERY
OTTAWA, 1965

Cat. No. A43-1115