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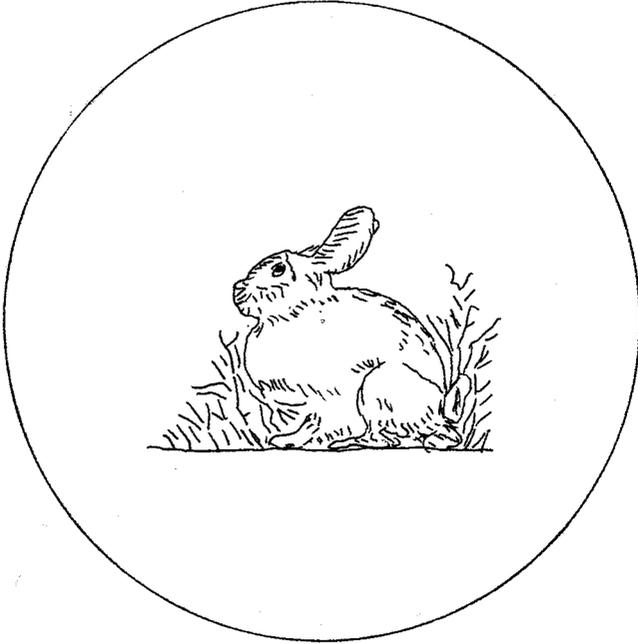
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COLLEGE OF AGRICULTURE
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JACKRABBIT AND COTTONTAIL CONTROL

O. S. Bare



Nebraska
COOPERATIVE EXTENSION WORK
IN AGRICULTURE AND HOME ECONOMICS
U. of N. Agr. College & U. S. Dept. of Agr. Cooperating
W. H. Brokaw, Director, Lincoln

JACKRABBIT AND COTTONTAIL CONTROL

By Extension Entomologist O. S. Bare

Rabbits often do much damage to plantings of young trees, and some farm and garden crops, and may, sometimes, completely destroy them. In the western two-thirds of Nebraska the greater part of the damage is done by jackrabbits, which have proved to be particularly destructive to "shelterbelt" plantings. In eastern Nebraska both jackrabbits and cottontails cause considerable damage, cottontails being the most destructive to young orchards. While no control measures are completely effective in eliminating damage either by jackrabbits or by cottontails, a combination of measures is effective in reducing damage under nearly all circumstances, and will, under favorable conditions, practically eliminate it.

TYPES OF RABBIT CONTROL MEASURES

I. Hunts and Drives

These have proved to be very effective against jackrabbits in prairie regions where they can be used and have been recommended by the U. S. Fish and Wildlife Service. For these drives, a round woven wire enclosure at least 50 feet in diameter and about 4 feet high is built, with a 10 foot opening in one side. From the sides of this opening temporary woven wire fences, at least a quarter of a mile long and not less than 3 feet high, are built to form a wide mouthed V. An area of from 1 to 4 sections is then surrounded by hunters and the jackrabbits are driven or "herded" into the enclosure, where they may be captured or destroyed. In many instances several thousand rabbits have been killed in a single drive. Firearms are barred from such drives, both because of the dangers involved, and because shooting so excites the rabbits that many are likely to break through the lines of drivers.

Several western Nebraska counties have found that hunts patterned after the old fashioned wolf hunts are effective. In such hunts firearms other than shotguns are barred, but even then, great care is necessary to avoid accidents. Carcasses and hides of jackrabbits killed in these hunts usually bring enough to pay for the shotgun shells used. A weakness of these hunts lies in the tendency of some hunters to shoot pheasants or other game and birds, often in violation of state laws.

II. Poisoned Baits

These have in many cases proved to be quite satisfactory. A number of different formulae have been used successfully. Strychnine is generally used as the killing agent, but the kind of bait used depends much on local conditions. As cottontails must be classed as game animals and are protected to some extent by state laws, poisoning of them is not recommended except in cases of emergency, or where other control methods are not sufficient to cope with the situation. Following are a number of formulae for poison baits, with directions for their preparation and use:

1. Poisoned oats. This formula, which is known as Colorado Formula No. 46, has given excellent results against jackrabbits in that state.

Heavy clean whole oats	16 qts.
Powdered strychnine alkaloid	1 oz.
Baking soda	1 oz.
Saccharine	1/8 oz.
Fine salt	1/2 pt.
Mineral oil	1/4 pt.
Water	1 pt.
Flour	to thicken to a creamy paste.

Dissolve the strychnine in a half pint of cold water and then add a half pint of hot water. Stir in the soda and saccharine, and add the salt and oil. Place over a fire and heat until the salt is dissolved, stirring constantly. Remove from the fire, and stir in enough flour to make a creamy paste. Pour the paste over the grain and mix very thoroughly, then spread it to dry.

In using this bait, place piles of about a tablespoonful a few feet apart along runways, and wherever the rabbits congregate. It should always be placed on a fairly smooth hard surface. Best kills are secured when green food is not plentiful, and particularly when heavy snows are on the ground. Prepared poisoned oats, such as is distributed by the U. S. Department of the Interior, Fish and Wildlife Service, (former Biological Survey), for prairie dog control, has been used for poisoning jackrabbits with fairly satisfactory results.

2. Poisoned ear corn prepared according to the following formula was found by the former U. S. Biological Survey to be an effective jack rabbit poison, that if properly used was less dangerous to other wildlife and livestock than was poisoned small grains.

Powdered strychnine alkaloid	5 oz.
Laundry starch	10 oz.
Mineral oil	4 oz.
Corn syrup	3 lbs.
Water	5 gal.

Dissolve the starch in enough cold water to make a thin paste. Bring the rest of the water to a boil, and add the starch paste. Then add the syrup and strychnine alkaloid, stirring thoroughly. Next add the mineral oil and again stir thoroughly.

The mixture should be kept hot while treating the corn. Ear corn should be submerged in the poison solution for ten or fifteen minutes, then removed and placed on some kind of draining rack. The drippings may be caught and used over again. This is repeated until the solution has all been used. The treatment leaves a thin coating of poison on the outside of the kernels, and this coating is weather-resistant enough to last in most cases until the kernels have all been taken. When the ears are dry, they are distributed where the rabbits will find them, but where livestock cannot get to them. As the cobs absorb a considerable amount of poison, they should be gathered up and burned after the rabbits have taken the kernels.

As a safety measure where livestock may accidentally gain access to areas where the poisoned ear corn is being used, the ears may be protected from both weather and livestock by being exposed in an elevated inverted trough. To do this, cut 1 x 4 inch boards into 1 foot lengths, and in each length drill 2 small holes at equal distances from the edges as shown in Figure 1. Then nail 2 pieces together to form a V as in Figure 2. A lath stake is then nailed to the trough as shown in Figure 3, and an ear of poisoned corn is wired into the trough by means of the drilled holes. The stake is then pushed or driven into the soil until the ear of corn is eight or ten inches from the ground. The corn is readily accessible to jackrabbits, but is out of reach of livestock, and is well protected from rains. In alfalfa fields exceptionally good results are obtained by setting the stakes in old pocket gopher mounds.

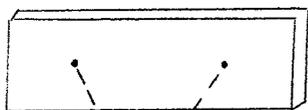


Figure I.
drill holes

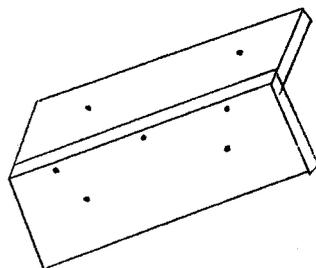


Figure II.

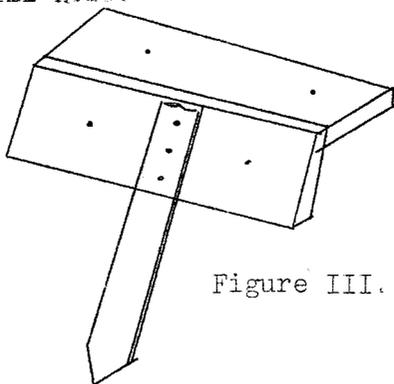


Figure III.

3. Strychnine salt mixtures with cornmeal or alfalfa meal have proved very valuable in late fall and throughout the winter, and have also given fair results in hot dry weather when supplies of water have been placed near the bait. Formula No. 1 follows:

Powdered strychnine alkaloid	1 oz.
Salt	1 lb.
Cornmeal	3 lbs.

Mix the ingredients thoroughly. Take a piece of 2 x 4 inch timber and bore several $1\frac{1}{2}$ inch holes about half way through it on the 4 inch face, with the holes spaced 6 or 8 inches apart. The holes should be filled nearly full of the poisoned mixture, and the piece placed along or on a jackrabbit trail, or other place where they gather to feed. In cold, snowy weather, rabbits are likely to feed heavily around alfalfa stacks,

and such locations are good places to expose poison mixtures. A spike driven through each end of the 2 x 4 timber will hold it firmly in place and prevent spilling and wastage of poison.

Formula No. 2 has been used quite successfully by the U. S. Forest Service to protect shelter-belt plantings. It gives especially good results when the ground is snow-covered, and is less dangerous than some others. This formula is as follows:

Powdered strychnine alkaloid.....	1 oz.
Fine table salt	3 lbs.
Fine alfalfa meal	1 lb.
Wheat flour	2 oz.

Thoroughly mix the ingredients while dry by shaking vigorously in a container with a tight lid. Then mix in just enough water to hold the mixture together. Pack it into wooden 2 x 4 inch blocks with a hole in the center about $1\frac{1}{2}$ inches in diameter and $\frac{5}{8}$ inch deep. The blocks should be nailed to lath stakes driven into the soil until the block is from 4 to 6 inches above the ground.

4. Poisoned alfalfa leaves. The Oregon Experiment Station has found this poisoned bait to be very good. Oregon Extension Bulletin 512 gives the following formula and directions:

"Dissolve 1 ounce of strychnine sulphate in 1 gallon of hot water and sprinkle over 10 pounds of dry alfalfa leaves. Well-formed leaves free from dust and sticks should be used. They should be mixed thoroughly until all the moisture is absorbed. The poisoned leaves should be distributed in small handfuls, in lines a few feet apart, across the portions of the field where observations show the rabbits to be feeding. Stock should be excluded."

5. Poisoned twigs or orchard prunings.

Watersprouts or fresh green prunings are very attractive to both jackrabbits and cottontails during the winter months. To prepare such a bait use the following formula:

Powdered strychnine alkaloid	1 oz.
Baking soda	1 oz.
Saccharine	1/8 oz.
Laundry starch	1 tbsp.
Water	1 qt.

Dissolve the starch in $\frac{1}{2}$ pint cold water. Empty this into $1\frac{1}{2}$ pints boiling water and boil until it becomes clear. Mix the strychnine, soda and saccharine together and sift it into the hot starch, stirring until it forms a smooth paste. Dip the green twigs or prunings into this paste, remove, and dry. Distribute the poisoned twigs in the orchards or tree plantings where the rabbits will find them. This bait is less likely to be eaten by domestic animals than is poisoned grain.

6. Strychnine-starch-glycerine tree paint.

This paint protects orchards and other young tree plantings quite effectively against attacks of both jackrabbits and cottontails. The formula follows:

Strychnine sulphate	1 oz.
Laundry starch	$\frac{1}{2}$ lb.
Glycerine	6 oz.
Water	$3\frac{1}{2}$ qts.

Dissolve the strychnine in 3 quarts boiling water. Dissolve the starch in 1 pint cold water. Pour the starch solution into the strychnine solution and boil until it becomes clear. Add the glycerine and stir well. When it has cooled, this paint may be applied to the tree trunk and lower branches with a paint brush. It sticks well, and forms a thin coating that usually kills any rabbit eating it, before much damage has been done to the tree.

Caution! Caution! Caution!

All of the foregoing poisoned baits and washes depend upon strychnine as their killing agent. Strychnine is an extremely dangerous poison to persons and all warm blooded animals, and to some kinds of poultry and other birds. Such baits and washes must be used with great care. They are very dangerous, and even the rabbits that have been poisoned by them have been reported as killing dogs and cats that ate them.

III. Repellents

Young trees may be protected from rabbit damage under most conditions by applying repellent substances to the trunk and lower limbs. The entire tree should not be treated, but the repellent should be applied to reach at least a foot to 15 inches above the snow line. No repellent has been found that is 100% effective, as in times of extreme food shortage, rabbits will feed on decidedly repellent substances rather than starve. Nevertheless, repellents, under most conditions, furnish one of our most effective means of preventing damage to young trees by rabbits. A large number of materials have been used with more or less success. Those that have proved most practical and effective are given below.

1. Dry lime sulphur paint. Mix dry lime-sulphur into sufficient water to make a thin paint. Apply to trunk and lower branches with a paint brush or a rag swab on a stick. The first application should be made in the fall, and two or three more may be required through the winter. The addition of a pound of cheap commercial glue, dissolved in warm water, to each gallon of the paint will make it stick better and last much longer.

2. Hog lard or axle grease with sulphur. Melt hog lard or axle grease and stir in sulphur until the mixture is yellow. This may be applied to the trees with a brush or swab, but a very handy method is to wear a cloth mitten, dip it in the material and pull it up over the trunk and lower branches.

3. Resin-fish oil-copper soap repellent. This has been thoroughly tried by several states and has given excellent protection to young trees.

Take 7 parts resin, 3 parts fish oil, and 3 parts copper soap, all by weight. Melt the resin over a slow fire. Add the fish oil and soap, and when the mixture has melted, stir until it is smooth. Apply a thin coating to the trunk and lower branches with a paint brush. In cold weather the mixture must be warmed until it flows freely from the brush. One application made in the fall should last until spring. While this repellent has proved to be one of the best, copper soap may not be available in many places. However, at least one commercial concern is making and distributing the complete repellent.

4. Other repellents. Many other substances have been tried successfully and are recommended by various users. A diluted asphalt emulsion, made by thoroughly mixing 3 pounds of commercial asphalt emulsion in eight quarts of water and then stirring in 2 pounds of copper carbonate, gives considerable protection to young conifers when applied as a spray. Reducing the amount of water to 2 quarts makes it a quite satisfactory paint for deciduous trees. Fresh blood painted on the trunk and lower branches has given fine results in many cases, and rubbing the trunk and exposed branches with fresh hog liver also has been highly recommended.

Sulphurized oil, if made at right temperatures, has been quite effective in many cases, but home preparation of it is not usually satisfactory. However, several concerns have placed the factory-prepared product on the market. Sulphur, when dusted on garden crops that rabbits are attacking has a decidedly repellent effect and may give complete protection. One orchardist reported good protection and no tree injury by smearing the trunks and lower branches of young trees very lightly with pine tar.

IV. Mechanical Protectors

1. Strips of screen wire about 9 x 36 inches, placed around the tree and fastened by strings, hog rings, or other means give excellent protection, and will last for several years. The cost should be about 6 cents each. However, when such guards are placed around small trees, wind-whipping may rub the trunk on the upper edge of the wire and badly damage the tree. In such cases the tree trunk should be wrapped with some protective material where it comes in contact with the edge of the wire.

2. Paper protectors are cheap, and if properly used, give good protection. Tar paper, building paper, or several thicknesses of newspaper or wrapping paper may be used. All give good protection if wrapped carefully, and fastened securely but not too tightly with twine.

3. Other protectors. Fine mesh poultry netting and hardware cloth are excellent protectors, but the netting must be so fastened as to prevent rabbits pushing it against the tree and gnawing through the meshes. Cornstalks and strips of wood veneer tied around the tree are good, but should be removed in the spring, to avoid furnishing harbors for insects. Gunny sack wrappings are good if well fastened.

V. Other Means of Protection

1. Clean cultivation of the orchard or shelterbelt is helpful as it reduces the number of rabbit harbors. It probably is of more value against cottontails than against jackrabbits, as jackrabbits are more inclined to travel long distances for food.

2. Traps and snares. Tile or box traps are quite effective in controlling limited numbers of cottontails, but are useless against jackrabbits. A few such traps around small orchards often furnish all needed protection. Snares also are quite useful. Directions for making rabbit traps and snares may be found in U. S. D. A. Farmers' Bulletin 702.

3. Guns and dogs. A good dog and a shotgun judiciously used will often furnish sufficient protection for small orchards and tree plantings where rabbits are present in moderate numbers, but are totally insufficient for large scale work. Nevertheless, they are valuable in preventing infestations from building up in the vicinity of orchards and shelterbelts.

4. Feeding is sometimes valuable where it is less trouble or expense to feed rabbits than to fight them, or where rabbits are protected by law. A few feeding stations stocked with corn and alfalfa, in or about a shelterbelt or orchard often will avoid much damage by jackrabbits. Cottontails are partial to green foods also such as cabbage, turnips, and fresh orchard prunings scattered where they feed.

5. Rabbit proof fences furnish ideal protection where they are practical, but their cost renders them prohibitive on any large scale. Nevertheless they often are the best and cheapest protection for gardens, small orchards and small tree plantings. Fences of 1 inch mesh are necessary to exclude cottontails but larger meshes are fully effective against jackrabbits.