



Reducing rabbit damage in Connecticut

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Rabbit damage can be a nuisance and also the cause of significant economic losses. Rabbits damage flower and vegetable crops during spring and summer before transitioning to woody plants throughout fall and winter. For the backyard gardener, rabbit damage can be extremely frustrating.

Eastern cottontail rabbits (*Sylvilagus floridanus*) are not native to Connecticut. In the 1930's, they were introduced into New England on a massive scale by State environmental agencies and hunting clubs. Eastern cottontails now range over the entire United States east of the Rockies, south into Mexico, Central America, and northern South America.



Eastern Cottontail Rabbit

Like many small mammal species, eastern cottontail populations follow a “boom and bust” cycle where populations are high when weather and food availability are favorable,

and then crash when they become locally overabundant and are preyed upon.

Like our native white-tailed deer (*Odocoileus virginianus*), rabbits in general are endearing and have been personified in animation and story by the likes of the Velveteen Rabbit, Bugs Bunny, Peter Cottontail, and Thumper - one of Bambi's numerous woodland friends. As a result, many people feel an emotional connection to rabbits and find lethal control an undesirable solution to homeowner garden damage. Rabbit repellents are an option for gardeners who want to prevent rabbit damage without harming them.

A repellent trial was conducted, in part, to help gardeners discern which repellent formulations are effective. We tested the ability of eight different repellents to protect plants commonly damaged by rabbits.

It should be noted that most repellents are not labeled for use on produce meant for human consumption. However, we assumed that if repellents were capable of protecting plants that are highly susceptible to rabbit damage, they should perform similarly in protecting a broad spectrum of garden plants with varying degrees of susceptibility.

In spring 2012, we constructed a rabbit enclosure measuring 24 by 48 feet at The Connecticut Agricultural Experiment Station's Lockwood Farm in Hamden. In early May, we trapped two juvenile and one

adult eastern cottontail and relocated them into the enclosure.

The addition of the three rabbits to the enclosure resulted in a rabbit density of 113 rabbits/acre. For comparison, biologists recommend a density of one rabbit/acre in the wild to maintain a healthy population. The choice of using highly preferred vegetation and an unnaturally high rabbit density certainly put repellent performance to the test.



Enclosure built at Lockwood Farm in Hamden CT.

The repellents tested included:

- Bobbex-R Animal Repellent® from concentrate
- Bobbex Deer Repellent® Canada formulation from concentrate
- Bobbex Deer Repellent® Canada ready-to-use (RTU) formulation
- Bonide Deer & Rabbit Repellent® from concentrate
- Bonide Repels All® from concentrate
- Liquid Fence® Deer & Rabbit Repellent from concentrate
- Plantskydd® soluble powder
- Rabbit Stopper® ready-to-use (RTU) formulation

We conducted six two-week trials over the growing season to compare the effectiveness of the eight different repellent formulations to physical exclusion (fence) and no treatment (control) for three different plant types (lettuce, Johnny jump-ups, alfalfa).

An effectiveness index was used to score the eight repellents. We used formulas from previous research to calculate daily caloric demand for the three rabbits based on body mass and average ambient temperature. To determine an overall effectiveness index for repellent formulations, uneaten biomass values were adjusted by estimated caloric demand and the adjusted scores were ranked. The results are shown in the table below.

Treatment	Adj. Score	Rank	Dilution
Fenced Control	5728	1	-
Plantskydd	5342	2	8 cups/8 quarts
Bobbex-R	3872	3	1 : 8
Bobbex Deer Repellent Canada RTU	3409	4	N/A
Bobbex Deer Repellent Canada	3107	5	1 : 5
Bonide Repels All	1402	6	1 : 7
Rabbit Stopper RTU	1293	7	N/A
Liquid Fence Deer & Rabbit Repellent	1186	8	1 : 15
Bonide Deer & Rabbit Repellent	680	9	1 : 15

Plantskydd performed the best among repellents. This product consists of dehydrated porcine and/or bovine blood that needs to be hydrated by mixing in a watering can. The Bobbex and Liquid Fence products initially had slightly unpleasant odors that quickly dissipated after drying. Rabbit Stopper and the Bonide products had a rather pleasant odor. In

general, all repellent formulations were comparable in price.



The lettuce on the left was heavily browsed by the rabbits while the lettuce on the right was untouched.

Clearly the best protection for any garden is a fence. If a fence is not a workable solution for rabbit damage, gardeners should select a repellent first by performance and secondly by aesthetics and odor. A combination of fencing and repellents may be best suited to many homeowners.

Other considerations for controlling rabbit damage. Fencing:

Our study found fencing is the best method for reducing rabbit damage in the home garden. A rabbit-proof fence should be at least three feet tall. Rabbits cannot jump very high and they do not climb. The mesh at the bottom 1-foot should be small enough that a baby rabbit cannot squeeze through the openings. A section of chicken wire with 1-inch openings will suffice. Bury a portion of the chicken wire to prevent rabbits from digging under the fence. Although rabbits are not strong diggers, they may attempt to dig under a fence to get to the garden.

A two-wire electric fence would deter rabbits from entering a garden. If a rabbit touches both wires at the same time a circuit

is closed and the rabbit will get a shock. Charges can be set low as to only scare the rabbit away.

Fences can be unsightly in the landscape. Short of fencing off an entire garden or flower bed, individual plants can be caged to protect them from rabbits. Many plants favorable to rabbits, such as beans and peas will eventually grow above the height that rabbits can reach and only need to be protected until that stage.

Scare Devices:

Rabbits are cautious and skittish. Scare devices like scarecrows and plastic owls will only work for a short time until the rabbits realize that they are not a threat. Motion activated noise makers or water spray devices may work, but can be quite expensive to install.

Habitat:

Rabbits prefer grass and clover, so damage can be reduced by keeping your lawn trimmed and garden beds weeded. Removing brush and lawn debris piles will prevent rabbits from nesting or hiding there. Rabbits will also seek cover under decks, sheds, or porches. Access to these locations should be minimized, especially if they are near the garden. Any existing burrows should be filled in to dissuade rabbits from using them. Dogs and cats are useful at keeping rabbits away from a property, as are natural predators such as hawks, owls, snakes and foxes.

Plant Selection:

When deciding what to grow in your garden, consider growing plants rabbits do not prefer. There are many lists of plants rabbits do not prefer, but a hungry rabbit may not be a very discerning eater. Instead of not growing what you want because of rabbits, grow a “decoy” garden with plants that

rabbits prefer. Plant the decoy garden well away from your main garden.

Examine chewed plants. Rabbits have both upper and lower incisors that create a clean cut, as if the plants were cut with clippers. If plants disappear overnight, especially young tender shoots, presume a rabbit got in your garden.



Pansy flowers eaten by rabbits. Note the clean cut as if from clippers.

disfigure expensive landscape plantings. Rabbits will girdle stems by scraping off the bark of small trees when food is scarce. Girdling kills trees or shrubs by limiting nutrient flow to the upper branches. To protect trees from rabbit girdling, cage the base of the tree with hardware cloth. The hardware cloth should have openings of about one quarter inch. It should cover the tree from the ground to eighteen inches up, and be about 2-4 inches from the bark.

Trapping:

Trapping is not recommended, as rabbits can injure themselves even in a live trap. A rabbit or other animal may suffer needlessly if traps are not checked regularly. Humane or live traps look like a cage and are designed to lure a rabbit into and kept until

Winter Damage:

When there are no young tender shoots of vegetables for rabbits to eat in winter, they will eat twigs and bark. They will peel bark off twigs and eat the buds of low lying shrubs. This browsing can damage and

relocation. Rabbits are considered a game species and moving them is subjected to regulations set forth by the Connecticut Department of Energy and Environmental Protection. Many municipalities also have regulations concerning relocating wildlife.



Winter damage caused by rabbits.

To read the complete rabbit repellent trial, please follow this [link](#).

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The mention of a product is not necessarily an endorsement by The Connecticut Agricultural Experiment Station. Rabbit trapping and handling protocols followed guidelines set forth by the American Society of Mammalogists for the use of wild animals in research and were approved both by the Wildlife Division of the Connecticut Department of Energy and Environmental Protection (#1213002) and the Connecticut Agricultural Experiment Station's Institutional Animal Care and Use Committee (P16-12). All rabbits were released at the conclusion of this study.