

## Repelling Animals Using Commercial Animal Repellants

Damage inflicted by animals to plants growing in the garden and in the landscape is a problem that persists, and in some areas is increasing. Deer, squirrels, woodchucks, and rabbits are among the most damaging and annoying of these pests. Exclusion of animals with mesh fences, electric fences, and other devices to prevent animals from getting at plants is often the most satisfactory solution. However, fences may be expensive, aesthetically unappealing or impractical, especially if one chooses to protect plants in the landscape. Some home owners do not grow yews, apple trees, and other plants and some excellent garden sites are abandoned due to a history of animal damage.

There is considerable evidence to suggest that wild animals judiciously avoid feeding on some species of cultivated plants including daffodils, iris (bearded), catnip, and peppermint. Presumably these plants produce substances that wildlife find offensive to eat. The identity of these naturally occurring repellants is unknown.

There are a number of natural animal repellants on the market that are intended to be sprayed on plants to stop or reduce feeding damage caused by wildlife. Frequently their effect is unknown, other than the promotional information that may appear on the product label. Recently Professor Stanley Ries in the Department of Horticulture at Michigan State University published a research paper in *HortTechnology* 11(2):302-307, 2001 where he and his colleagues compared the efficacy of several commercial repellants and plant extracts prepared in his laboratory on the feeding activity of several animal species. This article summarizes some of the interesting results reported in that scientific publication and compares the efficacy of some commercially available animal repellants.

The names of several animal repellants and their active ingredients are listed in *Table 1*. In addition, Professor Ries made an experimental formulation containing extracts from daffodil, pepper, and catnip that he tested in this comparison as MSU-7. All repellants were prepared and used according to label directions. In his experiments, corn was sprayed with these repellants and then the treated material was taken to Baldwin, Michigan where there was a dense population of deer, rabbits and squirrels. Treated corn was placed in a scientifically designed and randomized manner in this area. The portion of corn consumed by the deer, rabbits and squirrels in one day was determined and this was the basis for evaluating the relative effects of the repellants in the test.

Repellants differed widely in their ability to deter animal feeding (*Table 2*). The control received no treatment and should be considered the amount of feeding that would occur under natural conditions. Deer-Away\* and Ro-Pel\* were ineffective in deterring feeding of deer and squirrels. Feeding on corn treated with coyote urine, Bobbex\*, and Hinder\* was significantly reduced. Interestingly, the repellant prepared at Michigan State which contained the extract of daffodil bulbs, pepper and catnip effectively deterred feeding by deer and squirrels (both daffodil bulbs and leaves may be used, though extracts from the bulbs may burn foliage). A major goal of the research was to find an additive that would enhance the persistence of the natural extracts. Kaolin clay (Surround WP, Englehard Corp., Iselin, NJ) was used in combination with MSU-7 and enhanced its persistence even with exposure to rain and

snow.

**Table 1. Sources and active ingredients in commercial animal repellents.**

<b>Product</b>	<b>Source</b>	<b>Active ingredients</b>
<i>Bobbex</i>	Bobbex, Inc., Newtown, CT	Garlic oil and dried blood
<i>Deer Away</i>	IntAgra, Inc., Minneapolis, MN	Putrescent whole egg solids
<i>Foggy Mountain Coyote Urine</i>	J&C Marketing, Inc., Hampden, ME	Coyote ( <i>Canis latrans</i> ) urine
<i>Get Away</i>	IntAgra, Inc., Minneapolis, MN	Oil of mustard, capsaicin, vegetable oil and lemon extract
<i>Hinder</i>	Pace International, Seattle, WA	Ammonium soaps of higher fatty acids
<i>Hot Sauce</i>	Miller Chemical and Fertilizer Corp., Hanover, PA	Capsaicin (oleoresin of capsicum)
<i>Ro-Pel</i>	Burlington Scientific Corp., Farmingdale, NY	Benzyl diethyl ammonium saccharide and thymol
<i>Tree Guard</i>	NorTech Forest Technologies, St. Louis Pk., MN	Denatonium benzoate or bitrex

The damage to plants in the garden and shrubs and trees in the landscape is a function of animal pressure. When animals are very hungry they will eat plants, even if they do not taste good. However, when they have a choice, they will eat the more desirable vegetation. The results of this study do indicate that under moderate animal pressure, some commercially available products may be effective at deterring feeding. In this study coyote urine, Bobbex\* and Hinder\* were the most effective commercial products. Work is continuing in the laboratory of Professor Ries to identify naturally produced compounds that will help protect plants from animal feeding.

**Table 2. Comparison of repellent activity of commercial repellents applied at recommended rates and a Michigan State extract on feeding activity of deer and squirrels on corn.**

<i>Treatment</i>	<i>Proportion Consumed (%)</i>
Control (untreated)	67
Deer-Away (A)*	53
Get-Away (B)*	43
Coyote Urine	3**
Ro-Pel	100
Bobbex	0**
Hinder	0**
Tree Guard	23
MSU-7 <sup>1</sup>	0**

<sup>1</sup> *Extract from daffodils, pepper, and catnip.*

\* *There are two formulations of Deer Away: “A” contains putrescent whole egg solids and “B” contains mustard oil, capsaicin and lemon extract.*

\*\**Significantly different from untreated control and other treatment at odds of 1:100.*

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