Appendix E: Repellents & Scare Devices

Repellents are products that are meant to disrupt and reduce deer browsing. However, deer are very adaptable. Therefore, the effectiveness of repellents will depend on a number of factors:

- Seasonal changes in plant palatability

- Local deer taste preferences

- Availability of alternative foods

- Time of year

- Deer density

- Type of repellent and concentration of active ingredients

- Durability of the repellent and how often it is applied

Plants are most vulnerable in winter when snow cover or extreme cold reduces food availability, and in early spring when young, succulent spring growth on ornamentals may occur before native plants. In addition, most repellents require reapplication at regular 2-3 week intervals and after heavy rains. This is why people may consider repellents to be labor-intensive and not always cost-effective, particularly over larger acreage. On the more positive side, repellents are easy to apply and invisible, thus having much aesthetic appeal.

WHAT MAKES SOME REPELLENTS MORE EFFECTIVE THAN OTHERS?

Odor-Based Repellents: The most effective deer repellents tend to be those that produce sulfurous odors and are considered "fear-inducing." These repellents depend completely on detection through odor. It is believed that deer associate a sulphur smell with the presence (or carnage) of a predator or spoiled food. Not all sulphurous odors are equally effective, however. For example, compounds containing garlic seem to be less effective than sulphur compounds in urine.

Aside from fear-inducing odors, repellents use other modes of action (some repellents combine several modes of action) which include:

- **Taste:** These include bitter ingredients that presumably create a bad flavor. Taste receptors in deer are different from those in humans; some compounds which are very bitter to people don't bother deer at all. Taste-based repellents must be continually applied to the growing parts of plants. Taste-based repellents seem to have a shorter duration of effectiveness than odor-based. This may be due to the lack of an associated odor cue, so deer repeatedly sample growing plants and quickly notice if the hot pepper flavor is absent from any plant parts.

- **Pain:** these include ingredients like hot pepper (capsaicin) or ammonia, which cause irritation on contact with the mucous membranes, eyes, mouth, nose or gut.

- **Conditioned aversion:** these products cause animals to form an association between the treated item and a feeling of sickness, usually gastrointestinal.

TIPS FOR SUCCESSFUL REPELLENT APPLICATION:

1. All repellents work best if applied before the deer's feeding pattern becomes established. This means applying repellents before bud-break and as new growth appears. The goal is not to break a browsing habit, but rather to prevent one from forming!

2. Repellents need to be reapplied after heavy rains. Routine reapplication every 2-3 weeks is vital so that new, growing plant parts are protected as well.

3. Deer may become accustomed to the same repellent and ignore it over time. Alternating repellents may help to keep the deer confused and more wary.

4. At the height of growing season, choose an odor repellent over a taste-based one. Taste-based repellents need to be constantly applied to any new growth to keep the whole plant tasting bad.

HOW DO I CHOOSE A REPELLENT?

Many repellents are stocked by local garden, farm supply or hardware store, and it's a good idea to ask what seems to be working best in your area.

NON-COMMERCIAL REPELLENTS:

Soap Bars: Hanging a bar of soap from a bush or tree will help protect it. Be sure to leave the soap wrapper ON and drill a hole through the center of the soap and suspend it with a string. The brand of soap must be high in tallow fatty acid, like Irish Spring. Glycerin and coconut-based fatty acid soaps do NOT seem to repel deer well. Disadvantage: the sphere of protection is limited to the immediate area around the tree/bush. Be sure to hang the soap bars no more than 3 feet apart, up to a height of 6 feet, all around the tree/bush.

Human Hair: Although hanging sachets of human hair costs very little, it does not consistently repel deer. Hair can be obtained from beauty salons and barbershops quite easily, however. Hair should be bagged in 1/8-inch mesh bags or nylon stockings, and contain at least 2 handfuls of hair apiece. Bags should be hung at least 3 feet apart from each other and up to a height of 6 feet if the tree/bush to be protected has a wide diameter. Refresh the bags monthly with fresh hair.

HOMEMADE SOLUTIONS:

- Mix 3 eggs well in a blender. Mix with 1 gallon of water. Spray on plants. Reapply after heavy rains. Disadvantage: this solution may clog sprayer.

- Mix 4 eggs, 2 oz. red pepper sauce, 2 oz. chopped garlic. Blend with enough water to make 1 quart. Strain and apply with spray can.

A SAMPLING OF COMMERCIAL REPELLENTS:

Deer Away Big Game Repellent (BGR): This product comes in both a powder and liquid) and has scored well in repellent studies. BGR is an odor-based repellent comprised mostly of putrescent egg solids. It is usually available in garden stores.

Miller's Hot Sauce and **Deer Away Deer and Rabbit Repellent:** Both of these products rely on trigeminal nerve irritation in the mouth caused by the hot pepper sensation. The effectiveness of any capsaicin-based (hot

pepper) product appears to depend largely on the concentration of capsaicin used and that the product be reapplied every 2-3 weeks (or less) so that any new plant growth is covered.

Hinder: This is an odor deterrent, based on ammonium soaps high in fatty acid. This is one of the few products that can be used on garden vegetables. It is usually available in garden stores.

Milorganite: This human sewage-based fertilizer is primarily an odor deterrent, available at most garden stores. Recommendation: Spread in a wide band around the perimeter of a garden, reapply as directed and after heavy rains. It is usually available in garden stores.

SCARE DEVICES:

Another way to deter deer is to scare them. However, deer tend to habituate to most scare devices over time. Their initial fear of a device that looks, moves, or sounds strangely may even result in curiosity followed by rapid habituation as the deer learns that the device is not harmful. Here are some examples but this list is not all-inclusive:

- **Scarecrow Motion Activated Sprinkler:** This is a motion sensor combined with a sprinkler that attaches to a spray hose. When a deer comes into its adjustable, motion detecting range, a sharp burst of water is sprayed at the animal. By combining a physical sensation with a startling stimulus, this device appears to be more effective than other devices that rely on sights or sounds alone. This device reportedly is effective for other mammals that may come into gardens.

- **Havahart #5250 "Electronic Deer Repellent":** This highly portable "repellent" consists of 3 stake-like devices, cotton and a scent lure and is aesthetically colored to blend into the environment. The deer are attracted to the lure and receive a mild electric shock when they reach it. The concept is to train them, through aversive conditioning, to stay away from gardens. This 3-post device covers 1200 square feet of garden, according to the company. The current produced by this device has very low amperage and duration of only a few milliseconds.

- **Ultrasonic Devices:** There are several devices which are intended to repel wildlife by producing high-frequency, short-wave ultrasonic sounds that are inaudible to people but are heard by the target animals. While ultrasonic devices placed in yards and other outdoor areas can be effective for keeping deer away, devices like "deer whistles" meant to be affixed to car bumpers to prevent deer-auto collisions have not been shown to be effective.