

Effectiveness of Commercially Available Deer Repellents

Animal browsing is a serious problem in many forest and conservation nurseries and seems to be getting worse each year. Deer are a particularly serious pest. We presented some information on chemical repellents in the July 2000 issue of FNN, but actual data on feeding damage was unavailable.

A recent publication by the Missoula Technology and Development Center evaluates 20 commercially available deer repellents. (See #113 in New Nursery Literature Section). Western red cedar (*Thuja plicata*) seedlings, a preferred browse species, were planted in fenced pastures at the Olympia, WA Field Station of the USDA Animal and Plant Health Inspection Service, Wildlife Service National Wildlife Research Center. Seedlings were planted in the winter of 1999 and immediately treated with deer repellents. Five or six captive black-tailed deer were then brought in for taste testing! For 18 weeks thereafter, seedlings were assessed weekly for the number of deer bites taken out of each seedling. The maximum number of bites a seedling could sustain before it was considered defoliated was twenty-five.

Table 1 – Effectiveness of chemical repellents for reducing black-tailed deer damage to western red cedar seedlings during the winter

| Product | Manufacturer | Active Ingredient |
|---|--|--|
| Most Effective | | |
| Bye Deer | Security Products Co., Phoenix, AZ | Sodium salts of mixed fatty acids |
| Deerbuster's Deer Repellent Sachets | Trident Enterprises, Frederick, MD | Meat meal & red pepper |
| Get Away Deer and Rabbit Repellent | DRR, IntAgra, Inc., Minneapolis, MN | Capsaicin & isothiocyanate |
| Deer Away Big Game Repellent Powder | IntAgra, Inc., Minneapolis, MN | Putrescent whole egg solids |
| Moderately Effective | | |
| Deer Away Big Game Repellent Spray | IntAgra, Inc., Minneapolis, MN | Putrescent whole egg solids |
| Plantskydd | Tree World, Lackawanna, NY | Edible animal protein |
| Deer Stopper | Landscape Plus, Chester, NJ | Thiram, capsaicin, egg solids |
| Tree Guard | Nortech Forest Technologies, Inc., St. Paul, MN | Denatonium benzoate |
| Not Tonight Deer | Not Tonight Deer, Mendocino, CA | Dehydrated whole egg solids, Montock pepper |
| Deerburster's Coyote Urine Sachet | Trident Enterprises, Frederick, MD | Coyote urine |
| N.I.M.B.Y | DMX Industries, St. Louis, MO | Capsaicin and capsaicinoid product, castor oil |
| Dr. T's Deer Blocker | Dr. T's Nature Products, Inc., Pelham, GA | Putrescent whole eggs, capsaicin, garlic |
| Least Effective | | |
| Hot Sauce | Miller Chemical and Fertilizer Corp. Hanover, PA | Capsaicin and related compounds |
| Plant Pro-Tec | Plant Pro-tec, LLC, Palo Cedro, CA | Oil of garlic, capsaicin |
| Detour | Sudbury Consumer Products Co., Phoenix, AZ | Thiram |
| Hinder | Pace International LP, Kirkland | Ammonium soaps of higher fatty acids |
| Wolfin | Pro Cell Bioteknik, Horefors, Sweden | Di (N-alkyl)sulfides |
| Deerburster's Deer and Insect Repellent | Trident Enterprises, Frederick, MD | Garlic juice |
| Ropel | Burlington Scientific Corp., Farminton, NY | Denatonium benzoate, thymol |
| Orange TKO | FKO Industries, Calgary, Alberta, Canada | D-limonene |

The results indicate that the most effective repellents are those that emit sulfurous odors such as egg or slaughterhouse waste (Table 1). Repellents that use bittering agents to repel have proven ineffective while those containing active ingredients causing pain or irritation are probably not at concentrations high enough to be effective.

The most effective products generally eliminate browsing for a month and can provide good protection for 2 to 3 months, but their effectiveness can be expected to decline significantly after 3 to 4 months (**Figure 1**).

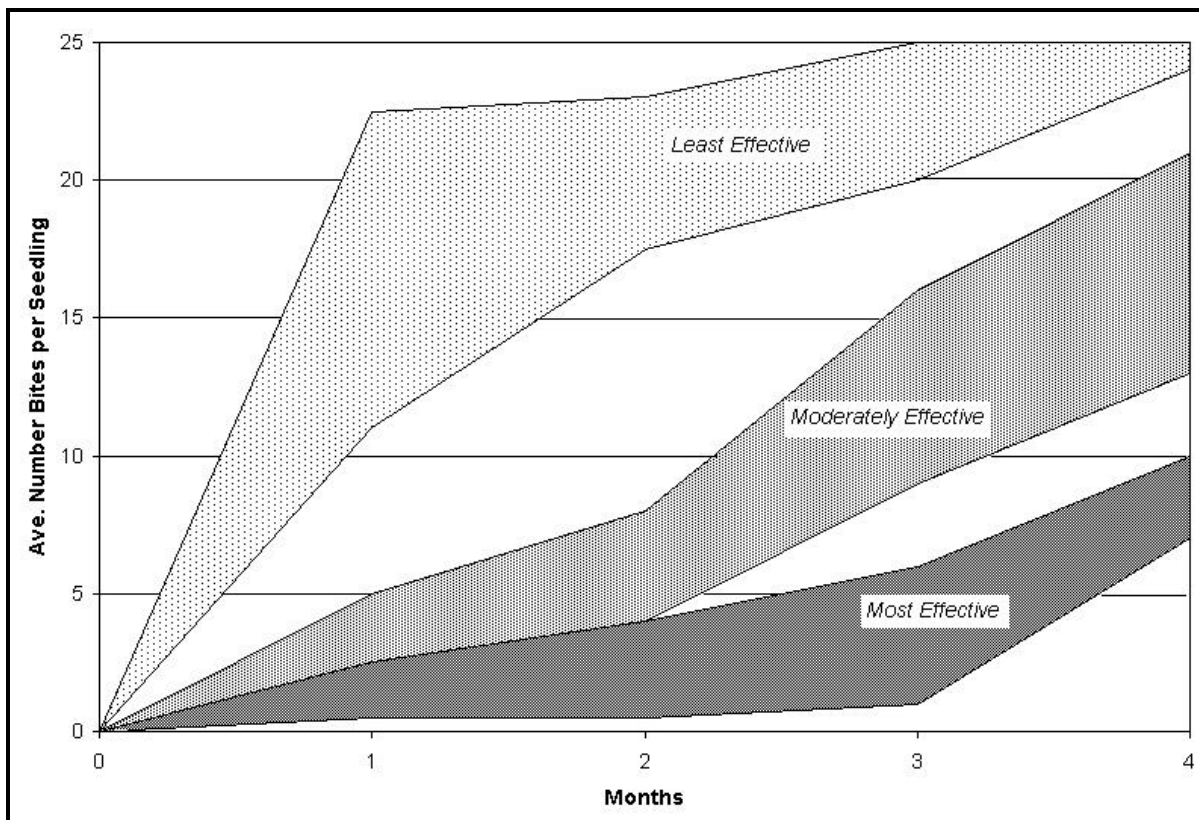


Figure 1 – Duration of protection for three categories of deer repellent chemicals during the winter (See Table 1 for repellents in each category.) Graph adapted from Trent, Nolte and Wagner, 2001

This study was conducted again in the spring 1999, but *none of the repellents provided complete protection after the first month*. This second test emphasizes that the efficacy of chemical repellents can change with the season, so growers should also consider other controls such as fencing or netting.

Summary

If you decide to use a game repellent, their effectiveness depends on other factors and especially the season. Several repellents were effective for up to 3 months during the winter but none provided extended protection during the spring. The most effective game repellent in both winter and spring testing was the Deer Away Big Game Repellent Powder. Other factors including deer population density, palatability of species, weather conditions, and availability of alternative food sources must also be considered. Under extreme deer predation, other IPM strategies including exclusion fencing and netting might be a more effective option.

Sources

Trent, A., Nolte, D., and Wagner, K. Comparison of Commercial Deer Repellents. 2001. Tech Tip 0124-2331-MTDC. USDA Forest Service, Technology & Development Program, Missoula Technology and Development Center. 6p.