

A Few Ideas for Managing Deer Browse on Tree Plantings

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Richland County CRP plantation. Note the heavily browsed hardwood seedlings located between the conifer rows.

A 2005 reforestation survey of DNR Foresters identified deer browse as the most significant barrier to successful tree planting in Wisconsin. A 2006 survey of Conservation Reserve Program hardwood plantings confirmed that deer browse is significantly impacting the growth and survival of hardwood seedlings. Deer populations in Wisconsin have continued to increase well above management goals since the 1980's, resulting in significant reported losses to both natural and artificial regeneration.

So what is a landowner to do when faced with this beast? There are just about as many reported methods to stop deer browse as there are diet schemes. Landowners must sort through fact from fiction to keep from losing their seedlings and their pocketbooks. Another complication is that deer populations and feeding habits vary across the state, so a method that is effective in one area may not work in another. What we have learned is that no matter where you are in Wisconsin, deer will play a significant role in the success of your tree plantings. Foresters and landowners must assess the local deer browse risk and plan for appropriate preventative measures in their tree plantings. This article will review a few approaches that are currently being used in Wisconsin to successfully limit or stop deer browse. Each method has advantages and disadvantages. These are certainly not the only ways to manage deer browse, so if you have a great idea, please share it!

PHYSICAL BARRIERS

Tree Shelters – The pros and cons of this barrier device have been discussed by foresters and landowners since tree shelters were introduced in the 1970's, so I am not going to cover a lot of detail on tree shelters in this article. There are many good research papers looking at the benefits (e.g., deer browse and rub protection, rapid juvenile growth, lower moisture stress, ease of herbicide application) and short-comings (e.g., cost, maintenance, stem dieback, light blockage, rodent dens,

bluebird mortality) of using tree shelters. Tree shelters can protect hardwoods in areas with severe deer browse and are a good option for some landowners. Cost and maintenance problems have prevented their widespread acceptance and use.

One interesting side-note, a DNR tree shelter study in Green County was recently remeasured after 12 growing seasons. The survival rate of the sheltered trees actually decreased by 5% compared to unsheltered trees. After 12 years, the plastic shelters had not completely deteriorated and were girdling trees or acting as habitat for bark insects. In addition, there was no significant height difference between the sheltered and unsheltered trees. The juvenile height growth advantage of the sheltered trees was lost once the trees emerged from their shelter.

Polypropylene Fencing – Polypropylene fencing is a temporary alternative to woven-wire or other permanent forms of fencing. It is constructed from a high-density polypropylene mesh that is UV treated. The fencing is usually 7.5 feet tall and comes in rolls 100 to 330 feet long. The fence is attached with hog ring staples to a high-tension wire. The bottom of the fence is either staked to the ground or attached to another high-tension wire to prevent deer from running underneath. The tension wire can be strung from 8' posts or from existing trees if protecting a forested opening.



Tree Improvement crew installing deer fence in Crawford County.

The DNR Tree Improvement Program has been using this type of fencing for the past three years to protect some of our progeny tests. It is fairly easy to install and has done a good job of keeping out the deer. To give you an idea of cost, we recently paid approximately \$1.50 per foot for materials. This included a heavy-duty version of the fence called Cintoflex P, high tension wire, 10' metal t-posts at a

20' spacing, staples and wire tensioners. For comparison purposes, it would cost you \$3,960 in materials to fence in 10 acres, while it would cost you approximately \$4,400 to place tree shelters on 100 trees per acre over that same area. The main limiting factor for this fencing

method will still be cost. Perhaps the cost factor can be reduced if fence materials can be utilized twice; however we have yet to discover the longevity of the polypropylene.

Bud Caps – A variety of different materials are used to protect a tree’s terminal bud during the dormant season. Index cards, envelopes, waterproof paper, tinfoil, balloons and plastic mesh are just a few examples. Commercial bud caps are available, but many landowners prefer to make their own to save money. Bud caps are mostly used on conifers since deer eat conifer seedlings primarily during the late fall and early spring when bud caps can easily be installed without interfering with tree growth. Hardwoods can also be bud capped during the dormant season, however they typically get browsed during the early growing season when the new vegetative shoots are emerging and bud capping is not possible.



Bud caps on a white pine progeny test in Oneida County.

The Tree Improvement Program has been bud capping white pine progeny tests in Oneida and Jackson Counties for the past five years. We have used small waxed paper envelopes that were originally designed for corn pollination bags. The bag is placed over the terminal bud and stapled to the needles. The caps have worked well in both plantations, although deer browse pressure has been modest. Bud caps may not be enough of a deterrent in areas with very heavy browse pressure. Here are some tips we have learned through this experience; placing a slit or air hole in the top of the envelope promotes good air circulation and helps prevent damage to the bud, keeping the

terminal bud completely hidden seems to discourage curious deer (if the deer can see the bud, they try to eat it), our average bud capping rate is about 250

trees/hour/person (we have also removed the bud caps each spring, but this is a much faster operation).

REPELLENTS

Many commercial deer repellents are now available and heavily marketed to landowners. But are these repellents effective? As one USDA study

states, “(repellent) efficacy varies greatly.” In other words, some work, some do not work, and results may vary. Several foresters that I have spoken with in Wisconsin and Minnesota believe these products can be effective and they encourage landowners to give them a try.

A 2001 study conducted by the USDA Animal and Plant Health Inspection Service, Wildlife Services and National Wildlife Research Center evaluated the effectiveness of 20 commercially available repellents on a captive deer herd. This study concluded that fear-inducing repellents (i.e., those emitting a sulfurous odor from compounds such as meat protein or egg) were the most effective. Products like Deer Away Big Game Repellent, Bye Deer Sachets, Deerbuster’s Sachet and Plantskydd performed the best. Taste repellents, which are commonly used here in Wisconsin, were much less effective in this study (Trent, Andy; Nolte, Dale; Wagner, Kimberly. 2001. Comparison of Commercial Deer Repellents. Tech Tip 0124-2331-MTDC. USDA Forest Service, Missoula Technology and Development Center).



Jack pine seedling treated with repellent (left) and untreated control (right) at the Brule River State Forest.

The Hayward State Nursery conducted a series of commercial deer repellent trials on the Governor Knowles State Forest in 2003, the Vilas County Forest in 2004, and the Brule River State Forest in 2005. Jack pine seedlings were treated with five commercial repellents in fall and

then evaluated for deer browse the following spring. All the repellents tested reduced deer

browse damage relative to the control trees. Similar to the USDA study, the fear-inducing repellents, such as Plantskydd and Deer Off, generally performed the best. Taste repellents, such as Tree Guard and Hinder, generally were less effective. Gordy Christians, Hayward State Nursery Supervisor, says these are just preliminary trials and that more testing is needed in Wisconsin.

Repellents appear to be an effective option to reduce deer browse, however expect variation in your results depending on factors like local deer density, deer eating habits, tree species and weather conditions.

Repellents must be reapplied to maintain effectiveness. The USDA study found that repellents could protect for several weeks, but expect shorter protection periods during the growing season when new foliage is emerging and heavy rains may be frequent. Although deer browse may occur year-round, timing repellent applications to critical browse periods can improve your success. Conifer seedlings need special protection during the late fall and early winter prior to snowfall and again in early spring after snowmelt. Hardwood seedlings may need to be treated multiple times during the summer (May through August) to protect each new flush of growth. Finally, remember that the Department of Agriculture, Trade and Consumer Protection (DATCP) considers all deer repellents a form of pesticide and therefore, commercial applicators must be certified.

ALL OPTIONS ON THE TABLE!

Managing deer browse on tree plantings is a critical aspect of reforestation success. It requires continued hunting pressure to control deer populations, good plantation design and often times the use of physical barriers and repellents. There may be no single solution, so an integrated (and creative) approach is often the best. Tree shelters can be costly and high-maintenance; however they may effectively protect critical areas, such as travel corridors where browse pressure is high. Plastic fencing is also costly, but may be an excellent way to protect high-value hardwood plantings. Bud capping is a simple but effective method, especially for conifer protection from fall till spring. Several commercial repellents have been shown effective in field trials and offer a way to treat large areas of trees for less money.

Whatever methods you choose, I believe that our reforestation practices (especially for hardwoods) must become more intensive to combat the deer browse challenge. But the good news is that better methods of protecting tree seedlings are available and new methods continue to be developed. For a list of product suppliers, check out our new “Reforestation Supplies” vendor list on the nursery web page (<http://www.dnr.state.wi.us/org/land/forestry/Nursery/GeneralInfo/supplies.htm>).

Note – References to products in this article are not intended to be an endorsement to the exclusion of others, which may be similar.