

# Reducing Deer Damage: *Putting together the right package*

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It has been five years since my last article about deer in the Limbs & Needles. We have put out a lot of trials and counted thousands of bites since then. Here, I would like to review some of our current research and discuss some practical applications for reducing the impact of deer on young trees. With current tools at hand, growers have the ability to minimize browsing injury to their trees.

When a herd of deer browse on Fraser fir seedlings, the results are often devastating. Some NC growers have reset acres of Fraser fir seedlings where only "pencil sticks" are left after a winter of heavy browsing. Lighter damage is more common where deer randomly pluck terminal buds off of tops, laterals, and side branches. Such trees can still be set back two or more years. Repeated browsing over several years gives surviving trees irregular "stovepipe" profiles that are hard to correct. Growers pay for replanting seedlings, for deer control treatments, for extra corrective pruning, for additional years in production, and still have lower quality trees to sell. For growers with a severe deer problem, economic impact can easily run into thousands of dollars per acre.

Problems such as these are the reason the NCCTA research committee has funded deer research in 2003, 2006, and 2007. Research projects have evaluated integrated fencing and repellent systems, both commercial and alternative deer repellents, and different application techniques. Fences have included plastic mesh and the double-slant electric system. Seven different commercial repellents have been tested as well as two food-grade materials. Repellent application techniques have included backpack sprayers, use of the "Plotsaver" repellent fencing system, and mist blower sprayers. Fencing and repellents both worked alone but worked better together.

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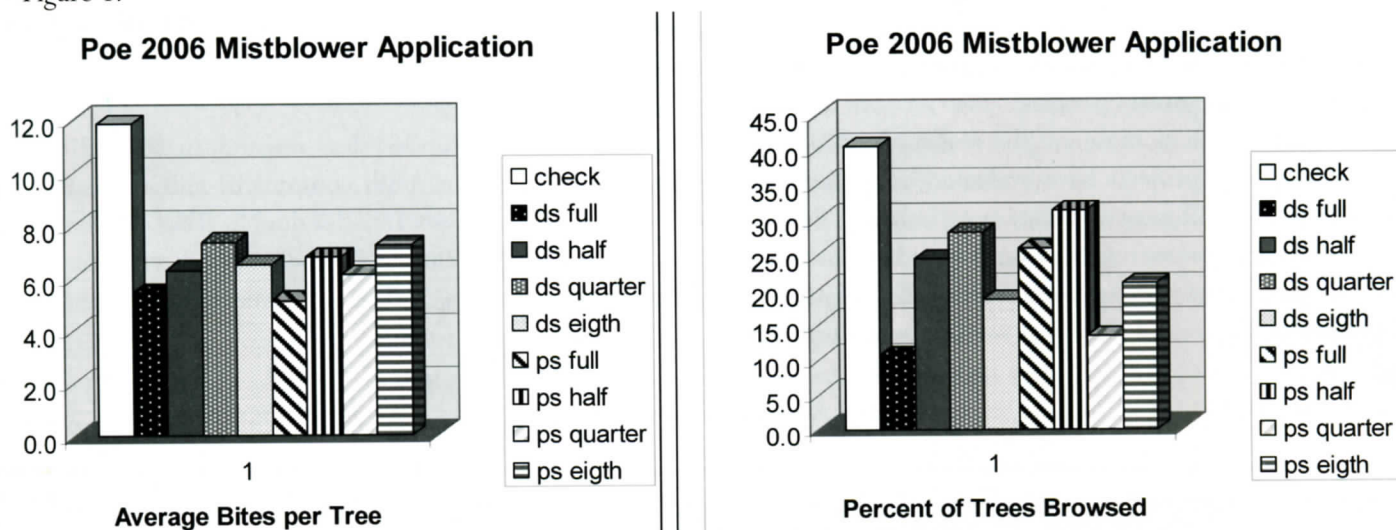
## Current Research

Mistblower repellent treatments were replicated by four different growers over the winter of 2006 - 07. At three sites, Plantskydd and DeerStopper were applied at full, half, quarter, and eighth rates across 15 to 20 rows. At the last site, only Plantskydd was applied at the four rates. Extensive deer damage resumed so soon after treatment at two of these sites that salvage repellent treatments were applied using conventional backpack sprayer applications. Of the remaining sites, one incurred very low deer feeding pressure with minimal damage across treatments and checks.

The Poe farm incurred heavy deer browsing during harvest before the first treatment but still yielded measurable results (figure 1). Average number of bites per tree sprayed with repellents was about half of that observed in the check plots with slightly better control under the full rate than any of the reduced rates. While the repellent treatments did reduce the percent of trees browsed compared to check plots, control was marginal.

Considered along with the failures at the two sites where follow-up backpack treatments were necessary, the 2006 mistblower applications were not a great success. When the concentration of repellent on the trees is compared to a conventional backpack treatment, the broadcast rate from a mistblower is only about five percent of the full labeled rate. These broadcast mistblower applications could undermine repellent effectiveness as deer become accustomed to the diluted taste.

Figure 1.



However at another farm, a grower used his mistblower successfully by using higher rates of repellent and by concentrating the spray on about 4 rows instead of trying to cover 10 or more rows. The grower made multiple passes within the block of trees to provide uniform coverage, but this method could also be used as a border spray to reinforce fencing. To be successful, mistblower sprayers may need to be used in a very different fashion from conventional applications.

Work in 2007 will focus more on different methods of mechanization than on mistblower repellent rates. Mistblower treatments will include concentrated sprays using multiple passes through the field, concentrated field border sprays, and conventional whole field application. In addition, banded spray and wick applications from a small tractor or ATV will be pursued. These last techniques could maintain higher repellent concentrations without the high cost of broadcast coverage.

### 2006 Deer Repellents

- Plantskydd (blood meal)
- DeerStopper (mint, putrescent egg, & garlic)
- Deer Away BGR (putrescent egg)
- Deer Off (putrescent egg, garlic, & pepper)
- Liquid Fence (garlic & putrescent egg)
- Treeguard (Bitrex)
- DeerBusters Systemic pellets (Bitrex)
- Whole egg powder (food grade)
- Casien (food grade)

This past winter alternative repellents were applied at three locations yielding somewhat mixed results from site to site. The materials were all applied with a backpack sprayer at 60 day intervals beginning in November of 2006. Care was taken to insure that all treatment blocks had about the same access to field edges where deer were coming in from. One site incurred no browsing even on the checks. At the other two sites, all treatments generally reduced the number of trees browsed and the



3 year old heavily browsed cull

number of bites per tree compared to the check plots. Casein, liquid fence, and Deer Away exhibited fewer bites per tree (less than two bites) than other treatments but also exhibited higher percentages of trees browsed. These materials may have tasted worse when bitten but exhibited less odor to deter bites before they happen. In any case, these alternative repellent results justify additional work.

The Plotsaver repellent fencing system was installed at two farms and tested with different repellents. Perimeter fences were established in plots of about one quarter acre with shared dividing fences between plots. Repellents were applied to the tape on about a monthly rotation. The single strand fence worked very well at two sites but partially failed at a site where it was installed for the second year. As a single strand fence, deer can easily learn to cross it. As a stand-alone treatment, the Plotsaver repellent fence poses high risk of failure. If this very inexpensive treatment can be used in conjunction with other strategies it may still be a cost-effective deterrent.



*Bryan Davis applying repellent to tape fence*

### Apply Integrated Strategies

Research is usually confined to a limited number of variables that can be controlled at the same time. Our research has focused on fencing and repellents primarily. However, as growers have adopted these strategies on their farms, they have been encouraged to implement several different strategies at once to further confound deer. Since most of the less expensive techniques influence behavior rather than eliminating all deer and they only work as long as the deer are confounded by them, an integrated strategy has a better chance of maintaining treatment effectiveness longer. Growers are using repellents, fencing, food plots, and hunting together to minimize the impact of deer on their trees. They are rotating to different repellents from one treatment to the next or from one year to the next.

Several of the integrated grower treatments that we will follow in 2008 involve combinations of the Plotsaver fence and multiple repellent applications. Some growers will put up and treat the tape fence and backpack treat a portion of their trees with the same repellent. Some plan to treat all their trees first, but only reinforce the initial "training" with a border treatment in subsequent treatments. Several other growers will use their mistblowers to spray a concentrated field border to

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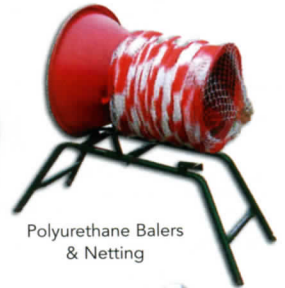
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reinforce their tape fence.

Other growers are using remote food and salt block plots to help pull the deer away from paths through the tree fields. The hope is that habitual herd travel circuits can be shifted before food is scarce and maybe fewer deer will be in the trees to browse. However, 2007 was a difficult year to establish food plots that still have food in winter.

Perhaps the most important strategy to integrate with other treatments is hunting. Of course, many growers have leased land to hunt clubs. But, removing horned bucks puts only a slight dent in deer populations. Doe removal – and especially mature doe removal – is critical to reducing both population and the amount of browsing. It is the mature does that teach the fawns to eat Fraser fir. Targeted removal of aged does can break the cycle of Christmas tree browsing. In a recent workshop, David Isner indicated that head length was the easiest age characteristic to identify through the scope on a rifle.

Hunting is a vital component to long-term management of deer populations and should be a central strategy for a grower with deer problems. However, to expect hunting to stand alone in protecting your trees is a costly mistake many growers continue to make. Deer browse when no hunter is out-of-doors - when snow is falling - when conditions are miserable! Many tree fields have had dozens of animals shot in season, but still incurred heavy browsing. Yes, hunting can be used to reduce the population, but strategies like fencing and repellents must be used to protect the trees.

Thankfully, deer are not as serious for all growers as they are for some. When we have growers abandon farms because of deer browsing, this pest has the potential to be as serious as Phytophthora root rot. Unlike any disease or insect, however, deer have the potential to learn new behaviors. They are truly a moving target. To be smarter than a deer we have to overwhelm their senses and to keep them too scared to be comfortable in our trees. The shock of an electric fence or the vibration of the Plotsaver fence, the putrescent stink of a repellent, the memory of recent hunting – together they send the message of danger. Just as with other pests, the challenge is to find the economic threshold where what you spend protecting your trees does not exceed the impact deer have on your trees. 🌲



*Conventional mistblower application failed*

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