

Management Strategies for Invasive Plants in the Sugarbush

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This is Part II: Identification of Invasive Plants Common in the Sugarbush appeared in the March Maple Syrup Digest.

Control of interfering plants in the sugarbush is guided by the principles of Forest Vegetation Management (FVM). FVM includes:

- (1) statement of the desired outcome of the effort;
- (2) positive identification of the interfering plant species and understanding its biology;
- (3) inspection for the abundance of co-occurring desirable species that should be retained;
- (4) consideration of any current or planned management activities, deer impacts and site conditions that might enhance or complicate restoration;
- (5) an evaluation of the costs and logistics for all feasible treatment methods and modes (described below); and
- (6) a selection and strategy for those plants desired on the site after treatment. Webinars about FVM are archived at <http://www.youtube.com/ForestConnect>.

For maple producers, the objective of FVM efforts might some combination of improved access to the woods,

clearing along mainline and lateral lines for leak detection, or broad-scale clearing for hardwood regeneration. Clearing along tubing systems and for access is less onerous because the only need is to limit what is currently present. Regeneration requires limiting the invasive species abundance and ensuring desired species become established.

Many species of invasive plants are described as limiting forest regeneration, or the establishment of new plants of desired species. In some cases, invasive plants can limit desired plants by shading, providing cover for seed predators, changing soil chemistry, or causing dense root mats. In most situations, insufficient regeneration is the result of excessive deer browse impacts, and it is the deer that actually limit the successful regeneration of desired tree species. Deer, to the misfortune of maple producers, browse desired hardwood species while avoiding invasive plants. Because of the incessant browsing by deer on desired species, the invasive plants are favored and can dominate the sugarbush. Seldom is there a plant problem without there also being a deer problem.

If deer browsing is occurring, efforts that only control the invasive plants will fail to establish desired species. A simple field method to assess deer im-

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pacts was developed at Cornell University and is called AVID, or Assessing the Vegetative Impacts of Deer (<http://AVIDdeer.com>, plus on iPhone and Android app stores). Basically, producers put a numbered tag on 30 seedlings of desired species scattered in six clusters and annually measure their height. When average height growth of annually measured tagged seedlings is less than 10%, deer impacts are a potential concern (in addition to shade, soil compaction and other factors). Average annual height growth greater than 20%



Figure 9. The sugar maple seedling pictured was repeatedly browsed by deer. Annual height growth of regularly browse sugar maple is often less than 0.25 inches (1mm), resulting eventually in seedling death.

has less or no deer impact, or the species selected is not preferred by deer. Deer impact is possible even in areas with low hunter success or infrequent sighting of deer (Figure 9). Several methods of limiting deer impacts are possible, and recreational hunting is seldom sufficient.

As described below, there are multiple approaches to treat or otherwise kill invasive plants that that the maple producer wants to control. The best treatment in one situation may not be best in another situation. The owner must consider whether they are willing to use herbicides. Organic-certified maple producers may not have that option. Producers seeking more information about the use of herbicides in the forest should look at the Forest Vegetation Management Handbook by Penn State University (<https://extension.psu.edu/herbicides-and-forest-vegetation-management>). Then, determine the number, species, presence of desirable species, time of year, equipment, finances and more. Because treatment options will change, maple producers should contact a local natural resource professional or Cooperative Extension, or search the internet for “manage invasive plants” for the current recommendations of control. Following are general principles.

Methods of treatment are typically either mechanical

(i.e., organic) or chemical. Both methods have advantages and disadvantages depending on the circumstances. Modes of treatment are either single-stem or broadcast. Single-stem treatments will isolate and treat a single stem of the interfering species. Broadcast treatments are applied to an area and all stems of all species present are affected (Figure 10). All treatments can be described by a method and mode, or an integration of methods and mode. For example, hand pulling is single-stem mechanical, and cut-stump is integrated because it involves cutting (mechanical) followed by an herbicide (chemical) treatment to the freshly cut stump.

A third method is biological. No forest invasive plants have approved biocontrol agents, for example a predatory insect on a plant. However, some woodland owners have been successful using carefully managed intensive rotational grazing with cows, goats or sheep. While livestock might offer a single-use short duration treatment, it can also be integrated into the production of the property as silvopasture. Silvopasture is beneficial, but is not the historic practice of “putting cows in the woods” in that it requires considerable effort and expertise.

The selection of a broadcast versus single-stem treatment mode for woody



Figure 10. Broadcast treatments, either chemical or mechanical, impact all plants in the area of the treatment. The choice for broadcast versus single-stem treatments depends on specific details of the property.

interfering species depends on the number of stems per acre, plant height and the abundance of desirable species. If a relatively low number of desirable species are intermixed with the interfering species less than about 6 feet tall, or if the total number of stems to be treated requires too much labor, a broadcast treatment may be more appropriate. Many of the treatments described below will include specific product information, none of which should be considered to imply an endorsement.

Herbicides can be an efficient and effective tool, but involve additional considerations. The use of herbicides in New York requires that the name of the target plant species be explicitly included on the product label. Other states may be less restrictive. Chemical treatments are complicated by the fact that invasive species have only rela-

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tively recently been recognized in New York, and only a few herbicides list these species on the label. Fortunately, many labels are being adjusted to address invasive plants. Also, home remedies and off-label applications of an herbicide should not be used because they are unproven, have unknown environmental effects and are illegal. Herbicide treatments in general require extra care because it involves the use of a chemical, and specifically for species such as glossy buckthorn to ensure there is not movement of the herbicide into nearby classified wetlands. Research data is scant, but movement to wetlands would typically result from a saturating rain within 12 to 24 hours of the herbicide application.

Because of differences between states, no specific information on which herbicides to use is included here. The US EPA assigns authority of pesticide

management to state natural resource agencies. Similar Canadian authorities exist. Each pesticide has a label which is a legal contract with the user. Each state provides access to pesticide labels for legal products. For example, in NY the labels can be obtained at <http://www.dec.ny.gov/nyspad/products>. The label is the law, and users are expected to have read and understand the label for the product approved for their state or province.

Broadcast chemical: A limited number of herbicides are appropriate or legal for broadcast spraying. Broadcast chemical treatments are typically a low dose applied to foliage during the growing season, but avoiding droughty conditions. All plants with exposed foliage are potentially impacted, so this treatment is appropriate only when undesired plants dominate and prospects for survival of any desired plant species are low.



Figure 11. Basal bark and injection treatments leave standing dead trees. This reduces the immediate debris, but the dead trees eventually fall.

Broadcast mechanical: Large equipment with rotary cutting heads are used for broadcast mechanical treatments. Examples include brushhogs, Fecon and Loftness Timber ax. Fecon and Loftness use a horizontal drum with grinder teeth (Fecon) or slicing blades (Loftness). These are useful to reduce the height of shrubby and low-

stature plants quickly and organically. However, most of those plants will sprout without additional treatment. Livestock with management-intensive rotational grazing can contain some sprouting, or a single-stem herbicide to stumps that sprout.

Single-stem chemical: Single-stem chemicals are either applied to a wound in the stem or in a solution that penetrates the bark and chemically girdles the tree. Hack-and-squirt and injection use a hatchet or cordless drill to expose wood inside the bark. The frequency of wounds depends on the concentration of the herbicide. Basal bark treatments use a chemical that mixes in either a petroleum or vegetable-base oil that carries the herbicide through the bark and then kills the vascular cambium and phloem tissue (Figure 11). Single-stem chemical treatments usually leave behind a standing dead tree that will fall at some point. An integrated variation of single-stem chemical is to cut the

tree and then apply an appropriate herbicide to the freshly cut stump, known as “cut-stump” treatment.

Single-stem mechanical: This is any non-chemical treatment of individual stems. It might be pulling, grubbing, flame, brush saw, or chainsaw. An important feature of this type of treatment is to ensure safety for the operator, and to monitor the treated stems for resprouting. Note that pulling and grubbing can disturb the soil and may provide favorable seed germination conditions for other invasive plant species.

A fact sheet is available to help maple producers identify the variety of treatment options they can consider. The fact sheet can be found with an internet search for “Cornell Forest Vegetation Management Matrix.”

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