

Application Methods for Managing Tree Problems

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What do we apply to trees and why do we do it?

For a golf course superintendent, managing pest problems on trees may not be a high priority on your "TO DO" list. Ensuring the course's greens, fairways and tees are free of pest problems consumes most of a typical golf course superintendent's time and maintenance budget. Despite this, trees provide numerous benefits and play a vital role on many golf courses. In addition to shade, beauty, and habitat for wildlife, trees provide a majestic backdrop to the turf and allow the golfer to enjoy a natural wooded area as they play. In deed trees can be a valuable asset to a golf course, however, as is the case with turfgrass, trees require special care and maintenance as well.

Tree care practices are commonly categorized as "Pruning and Removal" or "Plant Health Care." According to the International Society of Arboriculture's (ISA) consumer tree care website (www.treesaregood.com) the objective of a Plant Health Care (PHC) program is "to maintain or improve the landscape's appearance, vitality and-in the case of trees-safety, using the most cost-effective and environmentally sensitive practices and treatments available." Plant Health Care involves monitoring and using preventive and or therapeutic treatments to improve the health of your course's trees. This may involve applications of PHC products like insecticides, fungicides, growth regulators, fertilizers, etc. This article will discuss the methods in which PHC products are commonly applied to trees and the pros and cons associated with each method.

Before deciding what products and application methods to use, you should decide if your course will utilize in-house staff or use the services of a reputable commercial tree care company to manage the health of your course's trees. Hiring a reputable ISA (International Society of Arboriculture) Certified tree care company is great way to ensure your trees receive proper care and attention, but not all golf

courses can afford to contract out these services. Furthermore some golf courses use commercial companies for some of their tree care needs such as pruning large trees or for problems that require specialized tree injection equipment. While there are benefits to hiring a company, it is important to note that many PHC applications on trees can be easily performed when armed with the proper training.

Consider these questions when determining if you should hire a company or do the work yourself.

- Do I have someone on staff with treecare knowledge who can effectively

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diagnose tree problems

- Do I have staff that can properly apply tree health care products
- Will I need specialized application equipment to manage the problem
- Do I have access to a reputable tree care product vendor who will provide tree specific application training and support
- What is my budget for tree care related services

This article will not discuss specific active ingredients or formulations, but it is important to note that some active ingredients commonly used on trees can be applied using numerous application methods while others can be applied using only a single method. For example, the insecticide active ingredient imidacloprid is formulated in numerous products and can be applied using soil, foliar or tree injection methods. Golf course superintendents should become familiar with all the ways a particular active ingredient may be applied.

Whether you want to hire a professional company or perform the PHC services in-house, consider addressing the follow-



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ing questions to determine what product and application method to use.

- What is the target pest?
 - What is application window to manage this pest?
 - Is the problem a concern for the long term health of the tree or an aesthetic problem only?
 - Is the tree currently infected/ infested by the disease or insect?
 - Are their multiple factors causing the problem?
 - What active ingredient should be considered?
 - Which formulation should we use?
 - What length of residual will I need to control the pest?
 - What will the control strategy cost to hire out or to do in-house?
 - How many trees are involved?
 - How long will it take to do?
- Answering the above questions will lead you to the application method you should use.

Virtually all tree care products are applied to one of three areas: the soil near the tree or in the drip line, the woody parts of the tree, or the foliage.

In general, there are three categories of application methods commonly used for managing tree problems. These include:

- Spray Application
- Soil Application
- Tree Injection

The remainder of this article briefly describes a variety of application methods that golf course superintendents can use to control many common insect and disease problems.

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Application Methods

Spray Application

Spraying can be applied to the leaves or to the woody (trunk and limbs) parts of the plant.

Spray applications are widely used for numerous tree care applications. Foliar sprays provide the most effective way to treat foliar diseases such as apple scab, rust and powdery mildew. Sprays are also commonly applied to the trunk and limbs of trees to prevent attack by wood-boring insects such as clear-winged borers, ambrosia beetles and pine bark beetles.

Advantages:

- Fast efficacy, often spray insecticide formulations are "knock-downs."
- Non-invasive and does not wound the tree.
- Low product cost as they are diluted in large volumes of water.
- Small ornamental trees can be sprayed with relative ease with a motorized back pack system.
- Application equipment can be used to apply multiple foliar spray products (Many superintendents have equipment to apply foliar applications).

Disadvantages:

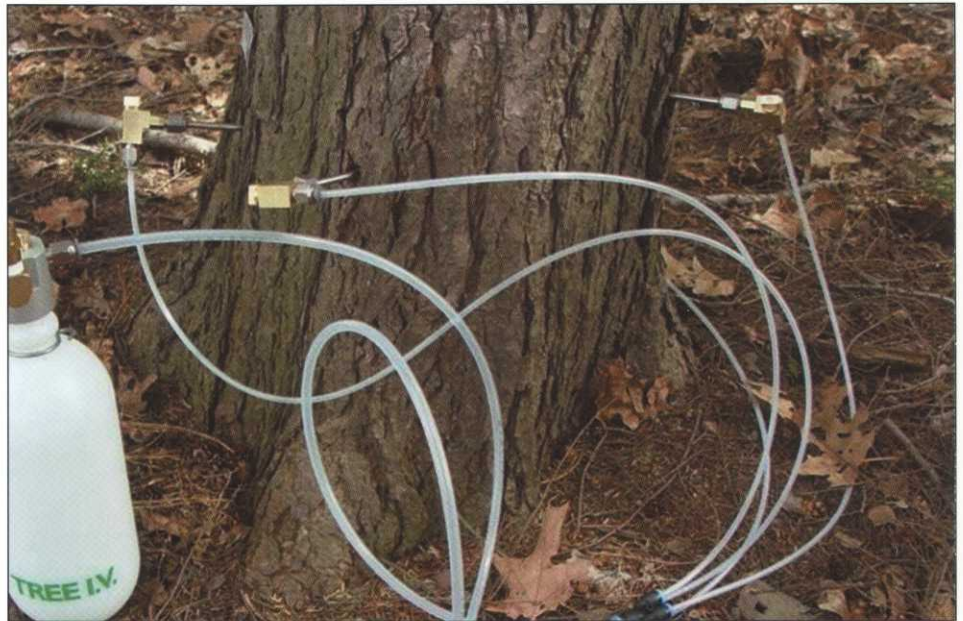
- Broad spectrum products can impact non-target species.
- Potential for drift and applicator exposure.
- Difficult to obtain uniform spray coverage on large trees.
- Short residual, applications must be reapplied often.
- Weather can impede operational efficiency.

Soil Application

Systemic products applied to the soil are amongst the most operationally efficient available to the practitioner. These can be applied at the base of the tree using either basal drench or soil injection. Soil applied insecticides are used to manage numerous key pests on trees and shrubs. Common pests controlled include Japanese beetle, aphids, adelgids, emerald ash borer, scales, sawflies, bronze birch borer, two-lined chestnut borer and birch leaf miner. Tree growth regulators, fertilizers and soil amendments are also applied using soil techniques.

Advantages:

- Applications are quick (minutes).
- Non-invasive and does not wound the tree.
- Predictable treatment/operations, not dependent on having calm weather and not dependent on the tree's uptake system.
- More flexible treatment period, applications with some products can be made during dormancy prior to soils freezing.



Tree injections

- Equipment may be used to apply multiple products.
- Minimal exposure to applicators.

Disadvantages:

- May not be viable for highly mobile active ingredients.
- Longer time to enter into and move throughout the tree before full protection is achieved.

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- Require annual applications.
- Soil injection requires specialized equipment.
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Tree Injection

Tree injection delivers the chemical directly into the tree's vascular system. This process requires the drilling of holes into the root flares. There are a number of tree injection devices and products being sold for management of tree problems. Tree injection treatments are categorized as macro-infusion or micro-infusion. Macro-infusion delivers a high volume of dilute chemical solution into the tree while micro-infusion delivers a low volume of highly concentrated solution into the tree. Macro-infusion fungicide treatments are commonly used to manage vas-

cular wilt diseases such as oak wilt and Dutch elm disease, while micro-infusions are commonly used for insect pests.

Advantages:

- Reduced lag time between treatment and full protection.
- Reduces applicator exposure .
- Can be used in environmentally sensitive areas where spraying or soil treatments are not feasible.
- Provide faster results as therapeutic treatments on infested trees.
- Some products provide multi-year control.
- In some cases, the only method available to treat a problem.

Disadvantages:

- Invasive technique that requires wounding.
- Time required for application. Speed of application is dependent upon how quickly the tree is able to take up the product or solution.



Basal drench

- Limited application window, optimal uptake occurs only during the growing season.

- Specialized equipment and higher product costs.

All of the above application methods have a role in plant healthcare management. Understanding the pros and cons of each will help you decide which methods will be best suited for your problems and operational needs.



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