



North Carolina
Forest Service

FORESTRY

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Using Herbicides for Managing Forests

Applying herbicides in a controlled manner can be an effective and low-cost treatment to eliminate or control unwanted vegetation. Situations where vegetation can be controlled with herbicides include:

- Site preparation for regenerating new tree seedlings (also referred to as “chemical site prep”)
- Eliminating competing vegetation alongside newly-established tree seedlings (called a “release”)
- Reducing understory vegetation in an established stand of timber
- Controlling invasive, noxious or exotic plants

Controlling unwanted vegetation with herbicides can accomplish several forest management goals. These goals can complement your forestland use objectives and provide multiple benefits. For example:

1. Using herbicides for chemical site prep or for a seedling release can significantly improve survival and growth of new tree seedlings. Weeds, grasses, vines and other vegetation can severely inhibit tree seedlings during the early years after establishment. By using herbicides your tree seedlings will essentially be given a jump-start on growth, which can accelerate the return on your financial investment of owning and managing the forestland. On cleanly-logged sites, a chemical site prep prescription may offer an alternative to, or supplement, the use of tractors or bulldozers that mechanically clear and remove leftover trees and shrubs. The use of mechanical site prep methods may still be needed to till the soil and improve soil drainage prior to planting seedlings.
2. By applying herbicides to reduce understory vegetation in an existing stand of timber the growth of the remaining trees can increase, as they have more sunlight, growing space and soil nutrients available. In addition, the wildfire hazard may be reduced after eliminating potential fuel loading once the treated vegetation breaks down. The reduction of understory trees or shrubs also allows sunlight to more easily reach the ground surface and promote the growth of low-growing succulent vegetation that can offer a greater abundance or diversity of food, forage and cover for wildlife.

In most situations for forestry use, herbicides are not intended to completely denude the landscape of vegetation forever. Rather, herbicides temporarily control or suppress unwanted vegetation, allowing the desirable tree seedlings a better opportunity to establish, grow and obtain soil nutrients and/or sunlight.

Before conducting herbicide work on your forest, take note of these important considerations:

1. Herbicide prescriptions can only be made by a licensed professional -- see note below.
2. Individuals who apply herbicides, called applicators, must be licensed -- see note below.
3. Herbicide chemicals must be approved for forestry-use (known as having a “forestry label”).
4. The handling and application procedures described on the product’s label must be followed.
5. Comply with the appropriate water quality regulations, and use Best Management Practices (BMPs).

NOTE: A landowner is not required to have a herbicide applicator’s license for prescribing or applying herbicide to his or her own land. A license is required for an individual who prescribes the use of or applies herbicide on another person’s land.

Herbaceous Weed Control

The term “herbaceous weed control” is often used when making herbicide prescriptions for forestry, and you may see it abbreviated as HWC. This term refers to the use of herbicides to control and/or eliminate weeds, grasses and other non-woody vegetation. Usually HWC is one component of a chemical site prep prescription, or is the desired outcome when conducting a seedling release prescription. Implementing HWC is especially vital for the successful establishment and survival of tree seedlings on old fields or pastures.

Woody Control (or Release)

This term refers to the use of herbicide to control competing woody-stemmed trees and shrubs that inhibit the growth of young, desirable tree seedlings. This use of herbicide therefore “releases” the seedlings from the surrounding competing vegetation.

Herbicide Categories

Herbicides generally fall within one of two categories:

Pre-Emergent: A pre-emergent herbicide is applied to the soil before the unwanted vegetation can germinate. The herbicide is formulated to disrupt the germination process or kill the vegetation as it germinates from its seed.

Post-Emergent: A post-emergent herbicide is applied to the foliage and/or the soil, and is used when unwanted vegetation already exists on the tract.

Some herbicides can function as a pre-emergent or post-emergent herbicide.

Herbicide Activation

Herbicides are activated in vegetation by one of two main pathways. Some herbicides can be activated through both foliar and soil pathways.

Foliar activated: Herbicide must make direct contact with the foliage to be activated.

Soil activated: Herbicide can be applied to the soil so the plant’s roots can uptake the herbicide.

Herbicide Treatments

There are different herbicide treatment methods used in forest management:

Broadcast: Herbicide is applied to the entire area that is being treated.

Banded: A type of broadcast treatment in which herbicide is only applied within a narrow band, usually immediately along where tree seedlings are going to be, or have been, established.

Injection: Herbicide is injected directly into standing trees using special hand tools.

Hack & Squirt: A hatchet or other tool is used to scrape off a tree’s bark and encircle the tree trunk.

Herbicide is then sprayed directly upon the exposed tree trunk, in the area where the bark has been scraped or hacked away (this method is similar to “frill & spray”).

Cut Surface: Herbicide is applied directly to a freshly cut stump or onto a severed stem of a tree.

Streamline: A thin, directed stream of herbicide is applied to the outer bark of a small diameter tree.

Herbicide Application Methods

Aerial: Applied by a helicopter.

Ground: Applied by equipment that is mounted upon a tractor, crawler-dozer, ATV, or log-skidder.

Hand: Applied by individuals through the use of back-pack tanks, spray bottles, or hand-held tanks.

To learn how to apply herbicides using hand-held equipment, refer to publication #AG-530, entitled “*Accomplishing Forest Stewardship with Hand-Applied Herbicides*,” available from the N.C. Cooperative Extension Service through its Extension Forestry Department Web site: www.ces.ncsu.edu/nreos/forest.

Types and Examples of Herbicides

There are several types of herbicides that can be used for managing forests. Herbicide manufacturers are always seeking to improve their products and create new formulations based upon customer feedback and their product's performance. Herbicides can be referred to by either of two names: their common name or their trade name. The common name relates to the chemical compound of the herbicide, while the trade name is a unique trademarked brand-name that is manufactured and/or sold by a specific company.

For some herbicides, more than one company may produce their own trade name product that contains the same basic common name herbicide compound. For example, table salt is a common product that you can purchase in any grocery store. However, there are many different companies that package and sell table salt under their own corporate brand name. A list of some forestry herbicides is provided below for reference*:

<u>Common Name</u>	<u>Forestry Trade Name</u>	<u>Herbicide Company</u>
Aminopyralid	Milestone [®]	Dow AgroSciences
Glyphosate	Accord [®]	Dow AgroSciences
Hexazinone	Velpar [®]	DuPont
Imazapyr	Arsenal [®] or Chopper [®]	BASF
Metsulfuron	Escort [®]	DuPont
Picloram	Tordon [®]	Dow AgroSciences
Sulfometuron	Oust [®]	DuPont
Triclopyr	Garlon [®]	Dow AgroSciences

*This list is not complete. There are other herbicides available for forestry applications. The trade names provided in this leaflet are not intended to endorse any particular brand or company's product. The names are used only for comparison purposes to help familiarize you with different brands of forestry-labeled herbicides. Seek professional advice before using herbicides.

Frequency, Amounts, and Timing of Herbicide Application

In forestry, herbicide can be applied prior to and/or after tree seedlings are established. Herbicides are rarely applied annually to the same stand of trees, or 'on the same acre' for the purposes of forest management, unlike the management of agricultural or horticultural crops (including Christmas trees) which usually demand frequent or annual herbicide use. However, in specific situations herbicide applications may be needed for two or more successive years following tree planting, especially if the competing vegetation is extremely vigorous such as when converting a former pasture or agricultural field to a forest.

A follow-up herbicide application may be warranted once every 10 to 15 years for an individual stand of trees, depending on the landowner's management objectives and the density of competing vegetation.

When using herbicides, the old saying 'more is better' does not hold true. Herbicides can be effective to control vegetation even when used in small quantities. In some situations, only a few ounces of herbicide, when properly mixed in a solution, are needed to effectively treat 1 acre of land. The herbicide label may provide guidance on the amount of herbicide that should be applied.

Timing of application is vital to assure that the herbicide has optimal control effect on the unwanted vegetation. While some herbicides can be applied any time of the year, many herbicides have a specific season in which it is most effective on the tree or plant that is being targeted for control:

- Soil activated herbicides are most effective when applied during late winter or during the spring.
- Foliar activated herbicides are most effective when applied during the late summer and early fall. In general, foliar activated herbicides will have minimal effect if applied during the early spring.

Consult with a forestry or herbicide professional for more detailed information about the proper frequency, amount, and timing of your specific herbicide application needs.

Developing a Herbicide Prescription

Unless a landowner is expertly knowledgeable about herbicides and their potential effects on vegetation, a herbicide prescription should be developed by a forestry or herbicide professional who has expertise on the use and application of herbicides. Many factors go into developing a herbicide prescription, such as:

- The species, density, size and layout of vegetation that is to be treated.
- The presence or absence of trees or plants that are to remain intact afterwards.
- The soil type and soil conditions at time of desired herbicide application.
- The type of herbicide that is to be applied, the treatment and application method.

Herbicide Application Plan

A herbicide application plan (HAP) is a form used by the N.C. Forest Service on those tracts in which a landowner receives cost-share for the application of herbicide. The HAP describes the specific herbicide formulation and amount that is to be applied as well as details about the tract, including what stream buffers are needed. Even if you not receiving cost-share for herbicide work, you may obtain and complete a HAP form to use as a record of the herbicide treatment that was implemented if questions arise in the future about the management of your forest.

If you are receiving cost-share assistance for the herbicide treatment, the N.C. Forest Service must review and approve the HAP prior to the herbicide work being performed. Therefore, you will need to deliver a copy of the HAP, with all pertinent information completed, to your local N.C. Forest Service office before the work begins. Don't wait until the last minute!

Herbicide (Pesticide) Licensing

For a person to prescribe a herbicide's use or apply herbicide on another's property, they must be licensed by the state of North Carolina. The N.C. Department of Agriculture and Consumer Services Pesticide Section and the N.C. Pesticide Board manage the licensing process. More information, including a list of licensed herbicide professionals, is available at this Web site: www.ncagr.gov/SPCAP/pesticides/index.

Additional Reference Information

Herbicide Prescription Manual for Southern Pine Management. November 2002. Publication #EC-659. Clemson University Extension and American Forest & Paper Association.
(www.clemson.edu/extension/natural_resources/forestry/veg_mgmt/herbicide_manual.pdf)

North Carolina Forestry BMP Manual. September 2006. [Chapter 7 - Forest Management Chemicals](#). N.C. Forest Service.



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