Clemson Cooperative Extension

CU IN THE WOODS

CHEMICAL RELEASE OF PLANTED PINES

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In pine plantations, competition for available resources such as water, nutrients, and growing space can slow growth and decrease survival. Often, a chemical release is needed to help remove competing vegetation for your pines to thrive. There are several herbicides approved for forestry use that are available for pine seedling release. The selection of a herbicide (or combination of herbicides) and application rates depends on several factors. Some of the main ones to consider are soil conditions, plant species to be controlled, and pine species being released.

Soil conditions, including texture, pH, and drainage, should all be assessed when selecting a herbicide. Landowners can properly identify the soils on their property by referencing their forest management plan or by visiting the Natural Resources Conservation Service's (NRCS) Web Soil Survey website. If one has difficulty using this site, a visit to the local NRCS office may be beneficial. Soil types will directly determine application rates. A general rule of thumb regarding application rates: the coarser the soil type and less organic matter, the lower the per acre application rate. On the flip side, these soils will likely experience a short time of weed control post application when soil residual herbicides are used. For pine seedling release, soil residual active ingredients are found in several herbicides including metsulfuron (Escort XP®, MSM 60®, and others), sulfometuron (Oust XP®, SFM 75, and others), hexazinone (Velpar® products, Velossa®), picloram (Tordon® products), and imazapyr (Arsenal AC®, Polaris AC®, and others).

Soils having higher pH (alkaline) or low pH (strongly acidic) can inhibit the effectiveness of certain herbicides. Also, soil activity of some herbicides can increase with pH changes, resulting in damage to crop trees. This is often a factor in old agricultural fields, especially those that have been heavily limed. A soil test is recommended before a herbicide application is made on these sites. Standing water or poorly drained soils can reduce herbicide success as well. Application rates in association with various soil factors are addressed in the herbicide product label. Always reference the herbicide label during the selection process and application process. The label will list use and site restrictions and by the way, the label is the law!

Plant identification is also critical when determining the type of herbicide to utilize. Fortunately, technology has come to the land manager's rescue to ease the "what is that plant" burden. Once you identify the plants you need to control, you can check the herbicide label to ensure the active ingredient can achieve adequate control. If a particular plant is not listed on the label, a different herbicide will be required. A diversity of plant species may require the use of a tank mix consisting of two (perhaps three) herbicides. Be sure to read the label to ensure the differing herbicides are compatible with one another. Mixing non-compatible herbicide can be dangerous and may even render the solution ineffective or reduce the success of vegetation control. Post-planting release rates are typically lower compared to what is utilized for chemical site preparation treatments.

Another thing to address is the pine species being released and its potential sensitivity to a particular active ingredient. This is particularly true when attempting vegetation management within longleaf or slash pine plantations. For example, notice the excerpt taken from the label of Arsenal AC® (figure 1). The application rates for both longleaf and slash pine are lower than the commonly planted loblolly pine. You must read the label completely because the last paragraph in Figure 1 specifically addresses a time restriction, lack of surfactant, and lower rates on specific soils for longleaf and slash pine. A costly mistake can be made if one does not adhere to the label.

With late winter/early spring typically being the prime time for seedling release applications (sixty days or more after planting in most cases), the weather is an important factor to consider. High temperature, high humidity, rainfall (absorption time), inversion layers, wind, and freezing temperatures can impact herbicide effectiveness. The product label also addresses potential issues related to weather conditions. This allows the user to understand potential negative impacts due to various weather variables.

If cost is an issue, there are potential cost share funding opportunities from both the NRCS and the South Carolina Forestry Commission. Pine seedling release with a herbicide application can be an effective tool for controlling competing vegetation. It is important to read the label multiple times and make sure all aspects are understood by the applicator. Understanding the label fully will reduce the potential harm to the pine seedlings and increase the effectiveness of the competing vegetation control. Always remember, the label is the law.

Use broadcast applications of ARSENAL herbicide APPLICATORS CONCENTRATE for release of the following conifers from hardwood competition:

Crop Species	Rate (fl. oz./Acre)
Loblolly Pine *(Pinus taeda)*[3]	12 - 20
Loblolly X Pitch Hybrid[3]	12 - 20
Virginia Pine *(Pinus virginiana)*[3]	12 - 20
Longleaf Pine *(Pinus palustris)*	12 - 16
Pitch Pine *(Pinus rigida)*	12 - 16
Shortleaf Pine *(Pinus echinata)*	12 - 16
Slash Pine *(Pinus elliottii)*	12 - 16
White Pine *(Pinus strobus)*[1]	8 - 16
California Red Fir *(Abies magnifica)*	8 - 12
California White Fir *(Abies concolor)*	8 - 12
Lodgepole Pine *(Pinus contorta)*[2]	8 - 12
Douglas-Fir *(Pseudotsuga menziesii)*[2]	8 - 12
Jack Pine *(Pinus banksiana)*[2]	6 - 12
Black Spruce *(Picea mariana)*[2]	6 - 12
Red Spruce *(Picea rubens)*[2]	6 - 12
White Spruce *(Picea glauca)*[2]	6 - 12

[1]DO NOT make applications to white pine stands younger than three years old. To minimize potential white pine injury, release treatments should not be made prior to July 15.

[2]Applications should be made after formation of final conifer resting buds in the fall or height growth inhibition may occur.

[3]Mid-rotation release: For broadcast applications below the pine canopy in established stands of loblolly pine, loblolly X pitch hybrid, and Virginia pine use 16-32 oz product per acre. For mid-rotation release of other species use rates listed above.

For slash pine and longleaf pine, broadcast release treatments over the top of pines for the purpose of woody plant control must be made after August 15 and only in stands 2 through 5 years old. For applications over the top of slash pine and longleaf pine, do not add surfactant and use lower labeled rates on sandy soils.

Figure 1. Excerpt taken from the label of Arsenal AC®

Resources:

NRCS Web Soil Survey
https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm

References:

South Carolina Forestry Commission. Forest Management Facts. www.state.sc.us/forest/refmgt.htm

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https://www.clemson.edu/extension/forestry/newsletter/newsletter_files/2020-spring-forestry-newsletter

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