

Herbicides to Enhance Pine Straw Production by Minimizing Competition in Longleaf Pine Stands after the Establishment Phase

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INTRODUCTION - HERBICIDES for LONGLEAF PINE

Before you purchase a herbicide the herbicide purchaser and applicator need to look closely at the herbicide label to make sure that the herbicide product is: (a) labeled for the particular use site (e.g. “for use in forest sites”, “for use in conifer plantations”, etc.) (b) labeled for the pine crop species (or genus in some cases), and (c) labeled for the particular application (“herbaceous weed control in pine plantations”, “herbaceous release”, etc.). Herbicide products, even those with the same trade name (such as “Roundup”), may have different amounts of the active ingredient per gallon, so always follow the rates specified on the label of the particular container being used.

Herbicides for herbaceous weed control early post-plant (age 1 – 3 years old) for longleaf pine can be found in papers on <http://www.bugwood.org/weeds.html> by Moorhead, Minogue, and Dickens. To find a current herbicide label, use the following URL: <http://www.cdms.net/Label-Database> and search for the product brand name. Each label will state pine species the herbicide can be safely used on, what particular application, and what woody, herbaceous, grasses, and vines plants the product will control.

HERBICIDE TREATMENTS - PRODUCTS, DOSAGE, and TIMING

I. INDIVIDUAL HARDWOOD PLANT TREATMENTS

Generally individual hardwood treatments are best when woody competition is sparse (low stem count per acre) in a pine stand. Hack and squirt, cut stump, basal bark treatments are mostly used on individual woody plants that are too large (greater than 3-4 inch diameter) and/or too tall (greater than 12 feet) to spray, whereas spot foliar treatments are used when woody vegetation are less than 10-12 feet tall. All of these treatments are directed at unwanted, competing woody vegetation, keeping these herbicides off pine foliage (for foliar active herbicides) or off the soil near pine trees (for soil active herbicides).

A. Hack & Squirt Treatments

If woody vegetation is too tall or large (diameters greater than 3-4 inches measured at 4.5 above groundline or over 20 feet tall) to properly cover with a foliage active herbicide, then a hack & squirt treatment from Summer to early-February will work on most hardwood species. Avoid periods of heavy sap flow (March – early May in GA).

Products

Arsenal® AC Apply at 20% with water (active ingredient 54% imazapyr) using wide-spaced injection. To minimize damage to surrounding trees do not get solution on soil. See <http://www.bugwood.org/weeds/arsenal.html> for detailed treatment information.

Accord® XRT Apply undiluted or 50:50 in water (active ingredient 41% or 54% glyphosate). Glyphosate has no soil activity, so it is a good product to use around sensitive trees.

Supplies – chemical resistant spray bottle, a hatchet or brush ax, herbicide dye.

Mixing herbicide and water when using Arsenal or Accord XRT – add ½ of spray bottle with water, add the proper amount of herbicide, recommended amount of dye then fill the bottle to the top with water, stir thoroughly (if large spray apparatus) or close top tightly and shake.

Application – Make cuts (hacks) through the bark into the cambium (tissue just inside the bark) at spacings recommended on the label. Spray 1ml herbicide solution into each cut. Inexpensive dose cups graduated in milliliters are available at drugstores and pharmacies that can be used to check calibration.

B. Cut Stump

Like hack & squirt, this is used with low stem numbers per acre when woody competition is too tall to foliar spray. Cut the stump with a brush saw, chainsaw or hand saw (be careful with saws and use proper safety equipment) and immediately treat the cut stump with one of the following herbicides applying the herbicide over the cut surface of the cambium area just inside the bark. Cut stump herbicide treatments should be made from May to early-February in Georgia. Add a herbicide dye to the mixes to keep track of treated stumps.

Accord® XRT Apply to freshly cut stumps at 50% with water (active ingredient 41% or 54% Glyphosate). Glyphosate has no soil activity so is a good product to use around sensitive trees.

Pathfinder® II Apply undiluted to freshly cut stumps (active ingredient 13.6% Triclopyr). Triclopyr has no soil activity so it is a good product to use around sensitive trees.

Forestry Garlon® XRT Apply at 15% to 20% with water and 5% to 10% crop oil to freshly cut stumps at (active ingredient 83.9% Triclopyr). Triclopyr has no soil activity so it is a good product to use around sensitive trees. Frequent agitation is needed with this crop oil, water and Garlon mix.

Supplies – (1) a 3-4 inch wide paint brush and herbicide solution container with top or (2) a 3 - 4 gallon backpack hand pump sprayer or (3) a small spray bottle.

C. Basal Bark Treatments

Basal bark treatments are used on hardwoods that are less than 4 inches dbh for thick bark species or less than 6 inches dbh for thin or smooth barked species. Basal bark treatments are used when stem counts per acre are relatively low making other control options less attractive.

Basal bark treatments are done applying the herbicide solution completely around the lower 16-18 inches of the stem to the root-collar. This treatment is done from May to early February (before bud swell) in Georgia.

Pathfinder® II (active ingredient 13.6% triclopyr) Apply undiluted product to bark as described above.

Forestry Garlon® XRT (active ingredient 83.9% triclopyr). Apply at 35% to 50% with basal bark or bark penetration oil to the bark.

D. Spot Treatments

Spot treatments are used mostly where unwanted woody vegetation is scattered, stem densities are low, stem diameters are small (less than 2-3 inches), and vegetation heights are less than 10-12 feet tall. This is a direct spray application applying the labeled herbicides on the unwanted hardwood and other woody vegetation, keeping these foliar active herbicides OFF the pine foliage. Best application timing in Georgia is mid-July to mid-October (prior to first frost) for the Glyphosate products and from mid-September to late-October for the Triclopyr products (temperatures in the upper 80's and higher can lead to volatilization of the ester formulations of Triclopyr, which may damage sensitive plants and agronomic crops adjacent to the treatment area. The following herbicides can be used for direct spray spot treatments to control unwanted woody, most vines and broadleaf weeds vegetation:

Accord® XRT Apply to competing vegetation foliage 3% to 5% with water for complete crown coverage (from top to bottom of each crown) and 6% to 10% for partial foliage coverage. The active ingredient is 53.6% glyphosate, a foliar active herbicide.

Forestry Garlon® XRT Apply at 2% to 4% with water for complete crown coverage (from top to bottom of each crown) and 5% to 8% for partial foliage coverage. The active ingredient is 83.9% triclopyr, a foliar active herbicide.

Supplies – A 3 to 4 gallon hand pump backpack sprayer or an ATV or tractor mounted 12 volt or PTO driven 15 to 100 gallon sprayer.

II. BROADCAST HARDWOOD CONTROL TREATMENTS;

Using soil and soil + foliar active herbicides

A. Spring Soil Active Herbicides Use

Primarily soil active herbicides such as Velpar® L and Velpar® DF (active ingredient is hexazinone) are used mostly in the Coastal Plain and Sand Hills on loamy sands, sandy loams and sandy well to excessively well drained soils to control primarily oak species.

Velpar L (liquid) and DF (dry flowable powder) can be used in loblolly, longleaf and slash pine stands after age 4-years-old on coarse textured soils to control hardwoods. This primarily soil active herbicide is best used when hardwood leaves are in half to full leaf expansion, typically from late February into early May in Georgia. Velpar rates are listed below:

Velpar L (25% hexazinone) – Apply 2 – 3 quarts mixed thoroughly with water per acre (15 to 25 gallons per acre; GPA) on loamy sands and sandy loam soils. Use the lower rate on sandy soils.

Velpar DF (75% hexazinone) – Mix thoroughly with water, agitating frequently and apply at 1 1/3 to 2 pounds per acre on loamy sands and sandy loam soils. Use the lower rate on sandy soils.

Equipment to apply Velpar – (1) An ATV with a 15 to 25 gallon 12-volt operated boom or boomless sprayer with some ATV speed control device or (2) a tractor and PTO driven or 12-volt powered 50 to 100 gallon tank keeping the tractor in a constant range, gear and engine RPM to keep constant speed. Velpar can be slow to show visible symptoms in hardwoods and will take two years or more to kill some hardwoods. Velpar is weak on yellow poplar and sassafras. DO NOT add surfactant to Velpar L and DF in applications over the top of conifers. Crop injury may occur when Velpar L or DF are used on trees that show poor vigor, insect damage, disease, winter injury, or other stress conditions (drought), on any soil containing less than 1% organic matter, loamy sands or sandy loams with less than 2% organic matter, and on conifer foliage after conifer bud break.

B. Mid-Summer into Fall Soil and Foliar Active Herbicides Use

Arsenal (53% imazapyr) is both soil and foliar active and is very effective in controlling a wide variety of woody, herbaceous and vine plants and can be used (1) in slash and longleaf stands when applied over-the-top at age 2 through 5 years-old after 15 August and (2) in loblolly stands after 15 July of the first growing season. Arsenal can be used in slash and longleaf stands after age 5 years-old when using ground equipment and care is taken to keep the product off pine foliage.

Longleaf stands – Arsenal can be applied over-the-top of these stands at 12-16 ounces per acre with NO surfactant after 15 August in stands age 2 through 5 years-old only. Arsenal can be applied in these stands after age 5 years-old with ground equipment at 12-16 ounces per acre to control many hardwood species, herbaceous weeds, grasses and vines.

Arsenal's label does state "to prevent the possibility of conifer injury, DO NOT apply Arsenal herbicide AC when conifers are under stress from drought, animal or winter injury, or other stress reducing conifer vigor." "Some minor conifer growth inhibition may be observed when release treatments are made during periods of active conifer growth." "To minimize potential conifer height growth inhibition, broadcast release treatments may be made late in the growing season." Arsenal does not control most legumes (including wisteria, kudzu) and blackberry and is weak on the composite family plants (ragweed).

***It is important to not over apply soil active herbicides. This includes not overlapping spray on spray application passes or going slower in the treated area than the speed used to calibrate the sprayer. It is best to calibrate the sprayer in the stand that will be treated using water in the tank only. Proper sprayer calibration, keeping a constant speed, and spacing between application rows is very important to prevent over-application.

III. HARDWOOD CONTROL TREATMENTS; DIRECT SPRAY – Using foliar active herbicides

Mid-summer into fall Foliar Active Herbicide Use as DIRECTED Spray to control hardwoods, shrubs, herbaceous plants and vines

Two major foliar active herbicides are most frequently used in cleaning up pine stands for pine straw harvesting. These two herbicides; glyphosate and triclopyr need to be directed to the foliage of unwanted vegetation foliage and NOT to pine foliage. These two herbicides, do not soil activity, so there is no worry about spray overlap or slower application speeds.

The key to effective application is to have pine stands with the lower crown (lowest live branches) above the boom, or boomless nozzle, spray height. This lower live crown height occurs in longleaf stands at about age 10-12 years-old. The herbicides that follow list the dosages, timing and other factors.

Accord® XRT Apply as a DIRECT spray to competing vegetation foliage 3% to 5% with water for complete crown coverage (from top to bottom of each crown) and 6% to 10% for partial foliage coverage. The active ingredient is commonly 41% to 54% glyphosate, a foliar active herbicide. Apply at 15 to 25 GPA in mid-July to late October in Georgia. Keep this foliar active herbicide OFF pine foliage (lower pine live crowns should be above the boom or boomless nozzle height).

Forestry Garlon® XRT Apply at 2% to 4% with water for complete crown coverage (from top to bottom of each crown) and 5% to 8% for partial foliage coverage. The active ingredient is 83.9% triclopyr, an all foliar active herbicide. Apply at 15 to 25 GPA in mid-September to late October in Georgia when air temperature is less than 86 degrees F. Keep this foliar active herbicide OFF pine foliage (lower pine live crowns should be above the boom or boomless nozzle height).

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