

SCFC's SPB Program's Guide to Herbicide Site Prep and Seedling Survival and Controlling Natural Pine Regeneration

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Herbicide Site Prep and Seedling Survival

Maximizing seedling quality and survival is more of a priority since you are planting fewer seedlings per acre. Recent research indicates that the **Imazapyr** herbicide, which is the base ingredient in 98% of herbicide site preps within the SPB Program, can have negative effects on loblolly and longleaf seedling survival when planted too soon after application. However, these effects can be significantly decreased if you wait to plant at the correct time after application. Below are tables indicating the earliest recommended plant date based on Herbicide Formulation (2# or 4#), Herbicide Rate, Time of Application, Soil Type, and Type of Pine Seedlings Planted: Loblolly, or Longleaf and Slash.

Table 1: Earliest recommended planting dates based on application dates of common Imazapyr rates @ 2# formulation.

Planting Date	Herbicide Site Prep Treatment Date**			
	May – June	July – August	September	October
2# Herbicide product rates per acre*				
Loblolly Pine				
October	48 oz	40 oz	NO	NO
November	52 oz	44 oz	40 oz	36 oz (NO)***
Dec-Jan	56 oz	48 oz	44 oz	40 oz
Feb-Mar	64 oz	56 oz	52 oz	48 oz
Longleaf and Slash Pine				
October	44 oz	36 oz	NO	NO
November	48 oz	40 oz	36 oz	32 oz (NO)***
Dec-Jan	52 oz	44 oz	40 oz	36 oz
Feb-Mar	60 oz	52 oz	48 oz	44 oz

*Imazapyr product formulations containing 2 lb acid equivalent imazapyr per gallon such as: trade names (manufacturer): Chopper, Chopper Gen2 (BASF Specialty Products), Polaris SP (NuFarm), and Rotary 2SL (Alligare LLC).

**Do not plant within 60 days of a 48 oz/acre or greater (2 lbs ae/gallon) imazapyr herbicide application.

*** Do not plant within 45 days of a 32 or 36 oz/ac imazapyr rate when rainfall amounts for the area are lower than normal, soil moisture is not adequate for planting, and competing vegetation is less than 1 foot tall.

Table 2: Earliest recommended planting dates based on application dates of common Imazapyr rates @ 4# formulation.

Planting Date	Herbicide Site Prep Treatment Date**			
	May – June	July – August	September	October
4# Herbicide product rates per acre*				
Loblolly Pine				
October	24 oz	20 oz	NO	NO
November	26 oz	22 oz	20 oz	18 oz (NO)***
Dec-Jan	28 oz	24 oz	22 oz	20 oz
Feb-Mar	32oz	28 oz	26 oz	24 oz
Longleaf and Slash Pine				
October	22 oz	18 oz	NO	NO
November	24 oz	20 oz	18 oz	16 oz (NO)***
Dec-Jan	26 oz	22 oz	20 oz	18 oz
Feb-Mar	30 oz	26 oz	24 oz	22 oz

*Imazapyr product formulations containing 4 lb acid equivalent imazapyr per gallon: trade names (manufacturer): Arsenal AC (BASF Specialty Products), Polaris AC Complete (NuFarm), and Imazapyr 4SL (Alligare LLC).

**Do not plant within 60 days of a 24 oz/acre or greater (4 lbs ae/gallon) imazapyr herbicide application.

***Do not plant within 45 days of a 16 or 18 oz/ac imazapyr rate when rainfall amounts for the area are lower than normal, soil moisture is not adequate for planting, and competing vegetation is less than 1 foot tall.

If the site has a sandy, loamy sand, or sandy loam surface soil texture, is moderately well, well to excessively well drained, and has an organic matter content < 2%, then the time interval between application and planting may be increased by one month (Tables 1 and 2). Another option is to reduce the herbicide product rate applied by 2 oz for 4 lb ae/gal imazapyr products and by 4 oz for 2 lb ae/gal product formulations.

The above tables and guidelines are from **A Guide to Using Imazapyr for Chemical Site Preparation in Southern Pine Plantation Establishment**, August 3, 2012: David Dickens, UGA; David Moorhead, UGA; and Pat Minogue, UF. www.bugwood.org/Imazapyr_Site_Prep_4-2012.pdf

Controlling Natural Pine Regeneration

The SPB Program requires you to control natural pine regeneration prior to planting. If not controlled during site prep, natural pine regeneration may amount to 500-4,000 seedlings per acre at the time of planting. Over the course of the stand's rotation, this can result in increased insect activity and associated pine loss, reducing pine growth and ROR on investment, and correcting it after planting may require a precommercial thinning between years 5-9 for an additional cost of \$125-200/acre. Unless the site preparation includes mechanical practices such as shearing and raking, or disking, controlling the natural pine regeneration should be a priority by default, regardless of program guidelines. Exceptions would be determining natural pine regeneration to be less than 10% of the required planting density through an adequate survey prior to herbicide site preparation. Because of patchy fuels, prescribed burning is not a viable means of controlling natural pine regeneration.

Below are recommended herbicide tank mixes for controlling natural pine regeneration during herbicide site preparation.

1. Residual Pine & Hardwood Control
 - 7 oz/acre Milestone + 6-7 qts/acre Accord XRT II + 16-24 oz 4# Imazapyr
 - 8-16 oz/ acre non-ionic surfactant
 - Timing: May 15- July 31
 - Target Species: 1-3 year old pine seedlings and light larger residuals including loblolly, slash, and shortleaf and hardwood and blackberry control
2. Residual Pine & Hardwood Control (late growing season application)
 - 7 oz/acre Milestone + 5-7 qts/acre Accord XRT II + 21-32 oz/acre Forestry Garlon XRT + 16-24 oz 4# Imazapyr
 - 16 oz/ acre non-ionic surfactant
 - Timing: August 1- October 15
 - Target Species: 1-3 year old pine seedlings and light larger residuals including loblolly, slash, and shortleaf and hardwood and blackberry control
3. Virginia Pine and Hardwood Control (different Garlon 3A rates based on timing)
 - 7 oz/acre Milestone + 6-7 qts/acre Accord XRT II + 16 oz/acre Garlon 3A + 16-24 oz 4# Imazapyr
 - 8-16 oz/ acre non-ionic surfactant
 - Timing: May 15 – July 15
 - 7 oz/acre Milestone + 6-7 qts/acre Accord XRT II + 32 oz/acre Garlon 3A + 16-24 oz 4# Imazapyr
 - 8-16 oz/ acre non-ionic surfactant
 - Timing: July 16- September 30
 - Target Species: Loblolly, Virginia, slash and shortleaf pine. Virginia and Shortleaf pine main targets.

If one of the above tank mixes or another viable tank mix does not control the natural pine regeneration, then consider a using a drum roller-chop across the whole stand or V-blade strips along the planting rows if the density allows. As a last resort, pulling seedlings by hand or spraying individual seedlings with a backpack sprayer can be employed. Cutting is not a viable option since resprouting usually occurs while in the seedling stage, regardless of species.

The above tank mixes were presented by Dow AgroSciences' herbicide representative Travis Rogers to Longleaf Alliance's 201 Class, Columbia, SC, June 11- 13, 2013.