

Herbaceous Weed Control Recommendations for Planted Longleaf Sites

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- ◆ Read the herbicide label prior to (1) the purchase (to verify that the herbicide is labeled for the intended use, including for (a) conifer use (preferably down to the pine species), (b) the phase and (c) the environment, (2) needed protective clothing, (3) the herbicide use (mixing, rate, dosage, timing, and other specifics), (4) the herbicide storage and (5) the herbicide container disposal.
- ◆ Herbicide labels are periodically updated and wording changes may cause the herbicide to be used in a different matter (direct spraying avoiding contact with pine foliage vs spraying over the top of pine seedlings).
- ◆ Herbaceous weed control (HWC) during the spring following planting longleaf can be critical to growth and survival on old-field, pasture, hayfield, and cut-over sites, particularly in droughty years.
- ◆ HWC can increase percentage of seedlings out of the grass stage by the 2nd year.
- ◆ A four to six foot wide band is often as effective as a broadcast treatment.
- ◆ Wait at least 2 months and with 1 to 2 inches of new feeder root growth from 2 to 3 or more lateral roots to spray herbicides over-the-top of longleaf after planting.

HERBICIDES FOR CONTROL OF BROADLEAF WEEDS AND GRASSES

(All treatments applied over-the-top of pines unless noted otherwise. DO NOT add a surfactant unless specifically recommended by the label)

ARSENAL® (BASF; 53% imazapyr; 4 lb per gal)

- ◆ Very effective on perennial grasses, including difficult to control species like:

- ◆ Bermudagrass, seedling Johnsongrass and Panicums
- ◆ Weak on broadleaf weeds in the composite group (see Oust XP®) and legumes
- ◆ Effective on established weeds
- ◆ Apply 4 – 6 fluid oz product per acre
- ◆ Do not add surfactant
- ◆ Optimum timing: early post to post emergence of weeds (April - May)
- ◆ Grass and broadleaf weed control including, but not limited to: bahiagrass, barnyardgrass, bluegrass (annual, Kentucky), Bermudagrass, crabgrass, fescue, foxtail, Italian ryegrass, Johnsongrass, lovegrass, panicum (fall), sandbur, smooth brome, wild barley, wild oats, witchgrass, camphorweed, carpetweed, chickweed, clovers, cocklebur, dandelion, dogfennel, horseweed, goldenrod, knotweed, lambsquarters, milkweed, ragweed (common, giant), pepperweed, pigweed, plantain, pokeweed, purslane, pusley (Florida), shepard's purse, stinging nettle, sowthistle, annual spurge, sunflower, tansymustard, wild carrot, wild parsnip, wild turnip

OUST® XP® (DuPont prior to 1 January 2015, thereafter Bayer; 75 % sulfometuron methyl)

- ◆ Very effect on a broad spectrum of broadleaf weeds, including composites
- ◆ Weak on perennial grass including Bermudagrass, broomsedge, and some Panicums (see Arsenal AC®)
- ◆ 1st Year plantings: apply 2-4 oz Oust product per acre
- ◆ Optimum timing: pre-emergence (March-April)
- ◆ Do not use Oust when soil pH > 6.2
- ◆ Grass & broadleaf control including, but not limited to: chickweed, crabgrass, dogfennel, fescue, fireweed (willowweed), goldenrod, horseweed, Kentucky bluegrass, nutsedge (yellow), Panicum (broadleaf), pokeweed, ragweed, shepherd's purse, white snakeroot, yellow sweetclover, annual bluegrass, barnyardgrass, foxtail barley, foxtail fescue, Italian ryegrass, jointed goatgrass, bromes (red, ripgut), reed canarygrass, signalgrass, yellow foxtail, mustard, pepperweed, pigweed, sunflower, vetch, wild carrot, wild oats

OUST XP (prior to 1 January 2015 DuPont, thereafter Bayer; 75% sulfometuron methyl) + **VELPAR L®** (Bayer; 25% hexazinone)

- ◆ Broad spectrum weed control of broadleaf weeds and most grasses, weak on Bermudagrass and broomsedge
- ◆ Hexazinone may cause pine seedling mortality on sandy sites and on sites with low organic matter (old-field sites), ensure proper calibration and follow label directions regarding appropriate rates for various soil types
- ◆ Do not use Oust when soil pH > 6.2
- ◆ Apply 2-4 oz Oust product + VELPAR L 2 - 3 pints (or Velpar DF 10 – 16 oz product) per acre depending on soil texture (see product label)
- ◆ Optimum timing: pre to early post emergence of weeds (March - early May)
- ◆ Use low rate of Oust + Velpar L or Velpar DF on coarse textured (sand, loamy sand, and sandy loam) soils and where soils are low in organic matter (see label)

- ◆ Grass & broadleaf control including, but not limited to: chickweed, crabgrass, dogfennel, fescue, fireweed (willowweed), goldenrod, horseweed, Kentucky bluegrass, nutsedge (yellow), Panicum (broadleaf), pokeweed, ragweed, shepherd's purse, white snakeroot, yellow sweetclover. annual bluegrass, barnyardgrass, foxtail barley, foxtail fescue, Italian ryegrass, jointed goatgrass, bromes (red, rigput), reed canarygrass, signalgrass, yellow foxtail, mustard, pepperweed, pigweed, sunflower, vetch, wild carrot, wild oats, asters, brackenfern, fleabane

OUSTAR® (prior to 1 January 2015 DuPont, thereafter Bayer; 11.8% sulfometuron methyl and 63.2% hexazinone)

- ◆ Similar to Oust XP + Velpar products as above, but in a packaged mixture
- ◆ The ratio of active ingredients is set; hexazinone rate tend to be too high on sandy and low soil organic matter sites
- ◆ 1st Year weed control application product rates per acre:
 - ◆ 10-12 oz Course textured soils (sand, loamy sand, sandy loam)
 - ◆ 12-16 oz Medium textured soils (loam, sandy clay loam, silt loam)
 - ◆ 16-19 oz Fine textured soils (clay loam, sandy clay, silty clay loam, silty clay)
- ◆ After 1st year weed control application product rates per acre:
 - ◆ 12-16 oz Course textured soils
 - ◆ 16-19 oz Medium textured soils
 - ◆ 18-24 oz Fine textured soils
- ◆ Do not use Oustar when soil pH > 6.2
- ◆ Optimum timing: pre to early post emergence (March - early May)
- ◆ Grass & broadleaf control including, but not limited to: chickweed, crabgrass, dogfennel, fescue, fireweed (willowweed), goldenrod, horseweed, Kentucky bluegrass, nutsedge (yellow), Panicum (broadleaf), pokeweed, ragweed, shepherd's purse, white snakeroot, yellow sweetclover, blackberry (dewberry)

VELPAR DF (DuPont prior to 1 January 2015), **VELPAR DF VU** (Bayer as of 1 January 2015; 75% hexazinone)

- ◆ May cause mortality where excessive rates are applied on sandy soils, ensure proper sprayer calibration to apply precise herbicide rate per acre, following label recommendations regarding specific herbicide rates for various soil types
- ◆ 1st Year weed control application product rates per acre (the same amounts can be applied in years 2, 3, and 4):
 - ◆ 1 1/3 lb Course textured soils (loamy sand, sandy loam)
 - ◆ 1 1/3 – 1 1/2 lb Medium textured soils (loam, sandy clay loam, silt, silt loam)
 - ◆ 1 1/2 - 1 4/5 lb Fine textured soils (sandy clay, silty clay loam, silty clay, clay, clay loam)
- ◆ Weed control application product rates per acre for established trees (≥ 4-yrs-old):
 - ◆ 1 1/3 – 1 2/3 lb Course textured soils
 - ◆ 1 2/3 – 2 1/3 lb Medium textured soils

- ◆ 2 1/3 – 2 2/3 lb Fine textured soils
- ◆ Optimum timing: pre to early post emergence (March – early May)
- ◆ Grass & broadleaf control including, but not limited to: asters, barnyardgrass, annual bluegrass, brackenfern, bromegrass, fleabane, foxtail, horseweed, ragweed, ryegrass, blackberry (dewberry)

VELPAR L (prior to 1 January 2015 DuPont) **VELPAR L VU** (as of 1 January 2015 Bayer; 25% Hexazinone)

- ◆ May cause mortality where excessive rates are applied on sandy soils and/or soils with low organic matter, ensure proper sprayer calibration to apply precise herbicide rate per acre, following label recommendations regarding specific herbicide rates for various soil types
- ◆ 1st Year weed control application product rates per acre (the same amounts can be applied in years 2, 3, and 4):
 - ◆ 21 to 32 oz Course textured soils (loamy sand, sandy loam)
 - ◆ 24 to 40 oz Medium textured soils (loam, sandy clay loam, silt, silt loam)
 - ◆ 28 to 48 oz Fine textured soils (clay, clay loam, sandy clay, silty clay loam, silty clay)
- ◆ After 4th year weed control application product rates per acre:
 - ◆ 21 to 40 oz Course textured soils
 - ◆ 28 to 56 oz Medium textured soils
 - ◆ 36 to 64 oz Fine textured soils
- ◆ Optimum timing: pre to early post emergence (March - early May)
- ◆ Grass & broadleaf control including, but not limited to: asters, barnyardgrass, annual bluegrass, brackenfern, bromegrass, fleabane, foxtail, horseweed, ragweed ryegrass, blackberry (dewberry)

MILESTONE (DowAgroSciences; 40.6% aminopyralid)

- ◆ Apply to trees in the first to third year. May cause some transient needle curling, twisting or droop
- ◆ Use caution with applications to varying stages of longleaf growth as seedlings with exposed or elongated terminal buds may be injured
- ◆ Broadcast applications can be applied using up to 7 fl. oz. of Milestone alone or in a tank mix with 5 fl. oz. Arsenal AC (or equivalent imazapyr product) per acre.
- ◆ Applications should be made when target weeds are actively growing with healthy and abundant foliage
- ◆ Controls blackberry, clover, coffeeweed, kudzu, marehail/horseweed, morning glory, partridge pea, pigweed spp., ragweed, sicklepod, vetch, wisteria
- ◆ Do not add a surfactant

TRANSLINE (Dow AgroSciences; 40.9% clopyralid)

- ◆ Release treatments may be made any time during the growing season. Some needle/leaf curling may occur if applied during active tree growth
- ◆ Treatments may be made broadcast over trees of any age
- ◆ Broadcast applications can be applied using 11 to 21 fl. oz. per acre of Transline
- ◆ Controls clover, coffeeweed, cocklebur, kudzu, marestalk/horsweed, morning glory, partridge pea, ragweed, sicklepod, vetch, wisteria
- ◆ Do not apply if weeds are in drought stress

Also consider:

(1) The herbicide purchaser and applicator need to look closely at the herbicide label to make sure that the herbicide product used 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.

(2) Remember rates are per acre treated. Here are two examples of calculating the herbicide needed for a banded herbicide application using 10 oz Oustar product per acre treated, assuming 12 feet between the rows: (a) spraying a 4 foot wide band, 10 oz Oustar will take care of 3 acres total land area. In effect, one acre is banded and two acres are untreated, so herbicide is applied to one-third of the area. A total of 400 oz (25 lbs) of Oustar would be needed for a 120 acre field where one-third the area is treated in bands. (b) When spraying a 6 foot wide band on rows 12 feet apart, 10 oz Oustar will take care of 2 acres total land area. One acre is banded and one acre is untreated, so herbicide is applied to half the area. A total of 600 oz (37.5 lbs) of Oustar would be needed for a 120 acre field where herbicide is applied to one-half the area in bands.

(3) There are generics for some of the above listed herbicides and various product labels for the same active ingredient do vary. Read the product labels to make sure that your intended use is consistent with labeling.

Please read and follow all label recommendations. Inclusion of a product trade name or a company name in this publication does not constitute an endorsement of a product or a company, as other products manufactured by different companies might be equally suited for the intended herbicide use.

HERBICIDES FOR CONTROL OF ANNUAL & PERENNIAL GRASSES ONLY

- (1) When restoring native grasses concurrently to establishing longleaf pine, be careful not to apply the following “grass herbicides” in the Warm Season Native Grass (WSNG) planting area after grasses have emerged.
- (2) All grass control herbicides listed below are post emergence, foliar active herbicides.
- (3) Best control for all grass species is obtained when grasses are in an early growth stage. For Texas panicum, apply when the grass is less than 4 inches tall. For Bermudagrass two applications are usually needed; the first when less than 6 inches tall and a second

when re-growth is less than 4 inches. Multiple applications are also needed for Johnsongrass.

- (4) Herbicides in this group generally do not mix well with other herbicide products. However, it is very important to add surfactants (wetting agents) to improve plant uptake. See information below and product labels for details.
- (5) Herbicide spray solution (water) volumes are typically between 10 to 20 gallons per sprayed acre (GPA) with a range 5-40 GPA; read label for specifics.
- (6) Do not apply herbicides when pine seedlings and desirable grasses are under drought or other stress
- (7) Do not apply herbicides when rainfall is expected within one hour.

ENVOY® PLUS (Valent; 12.6% clethodim, 0.97 lb clethodim per gallon, contains petroleum distillates)

- ◆ Apply 9 to 16 fluid oz per acre for annual grasses, 12 to 32 oz/acre for perennial grasses
- ◆ Add crop oil concentrate which contains at least 15% emulsifier at 1% volume/volume (1 qt per 25 gallons spray solution, but no less than 1 pint per acre) or non-ionic surfactant at 0.25% volume/volume (1 qt per 100 gallons)
- ◆ Apply in 10 to 40 gallons of water per acre

FUSILADE® DX (Syngenta; 24.5% fluazifop-P-butyl, 2 lb per gallon fluazifop-P-butyl)

- ◆ Apply 16-24 fluid oz product per acre per application
- ◆ Use a lower dose for annual grasses, a higher dose for perennial grasses
- ◆ Add 1% crop oil concentrate (1 quart per 25 gal) or 0.25% nonionic surfactant (1 quart per 100 gal)
- ◆ Do not apply more than 72 fluid oz Fusilade DX per acre, per season

Avoid contact of spray with foliage and terminal bud by using directed sprays

ARROW® 2EC (Makhteshim Agan of North America (MANA); 26.4% clethodim, 2.0 lbs clethodim per gallon, contains petroleum distillates)

- ◆ Apply 6 to 8 fluid oz product per acre for annual grasses and 8 to 16 oz/acre for perennial grasses
- ◆ Add crop oil concentrate which contains at least 15% emulsifier at 1% volume/volume (1 qt per 25 gallons spray solution, but no less than 1 pint per acre) or non-ionic surfactant at 0.25% volume/volume (1 qt per 100 gallons)

WEED TOLERANCE TO SELECTED HERBICIDES

Herbicide	Weeds
ARSENAL	sicklepod, tropic croton, blackberry, most legumes
ARROW 2EC, ENVOY, ENVOY Plus	All broadleaf weeds
FUSILADE DX	All broadleaf weeds
OUST	bermudagrass, croton, Johnsongrass, trumpetcreeper, broomsedge
VELPAR	bermudagrass, broomsedge, cocklebur, Johnsongrass, sicklepod, trumpetcreeper, morningglory

GRASS WEED RESPONSE TO HERBICIDES

WEED	^a Fluazifop-P-butyl	^b Clethodim
Perennial Grasses bermudagrass	G - E	G - E
Bahiagrass	G	
Johnsongrass (rhizome)	E	E
tall fescue	F	
nutsedge	P	P
Annual Grasses broadleaf signalgrass	E	E
crowfootgrass	F	G
crabgrass	F	G
fall panicum	G	G
goosegrass	F - G	F - G
Johnsongrass (seedling)	G - E	E
sandbur	G	G - E
Texas panicum	G - E	G

E=Excellent (>90% control); G=Good(80-89% control); F=Fair(70-79% control); P=Poor(<70%). Citations: Guillebeau, P. (ed). 2005 & 2008. Georgia Pest Mgmt. Handbook. Special Bulletin 28. UGA Coop. Ext. Service. Athens, GA 30602. pp. 112, 156-57, 198-99. ^aFluazifop-P-butyl rating based on Fusilade DX trials, ^bClethodim ratings based on Select® and Arrow® trials.

Old-field non-scalped post-plant herbaceous weed control timing considerations for the Georgia Coastal Plain and Central to Northern Florida

Soil drainage class	Pre- to early post emergence herbicide	Early post to post emergence herbicide
Somewhat excessively to excessively well	March	March to early April
Moderately well to well	March to early April	mid-March to mid-April
Poorly to somewhat poorly	April to early May	mid-April to mid-May

* Do not apply herbicides over longleaf for at least 2 months after planting and when there is 1 to 2 inches of new feeder root growth off 2 or more lateral roots and wait at least 1 to preferably 2 months after planting for slash pine.
 ** For scalped sites, herbicides applied from mid-April into mid- to late May have given good survival and growth results based on recent studies as long as seedlings are not under stress (especially drought stress).

Organization of GA (FL, AL, and SC in some cases) Coastal Plain Soil Series in Management Groups (Larry Morris "Forest soils and management decisions" workshop)

2005)	Subsoil Type:	None (Sandy to loamy sand)	Loamy	Clayey	Spodic	
Drainage	Surface Depth (inches)				+ Arg	- Arg.
Very poorly		Rutledge	Torhunta Surrency	Bayboro		Murville Wesconnet
Poorly to Somewhat Poorly	0-10	Chiple Osier Scranton	Rains Lynchburg	Bladen Coxville Grady	Rigdon	Ridgeland
	10-20		Pelham		Nanhunta	Mascotte Sapelo
	20-40			Albany Plummer		Kanapaha
	40-80					
Moderately Well to Well Drained	0-10	Resota Pactolus Ortega	Goldsboro Tifton Dothan	Faceville Nankin Greenville	Onslow	
	10-20		Lucy Fuquay Stilson		Seagate	Baymeade
	20-40			Bonifay		Echaw
	40-80					
Somewhat to Excess. Well	40-80	Lakeland Kershaw	Troup			Rimini Kureb

Citation: Minogue, P. D.J. Moorhead, and E.D. Dickens. 2016 (Revised). Herbaceous weed control for planted longleaf sites. www.forestproductivity.net 9 p.

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