



Herbaceous Weed Control Recommendations for Planted Loblolly Pine Sites

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INTRODUCTION

Herbaceous weed control (HWC) during the early spring following planting loblolly pine seedlings can be critical to growth and survival on old-field, pasture, hayfield, and cut-over sites, particularly in droughty years. Herbaceous weeds include grasses, sedges, and broadleaf weeds that compete with planted pines for soil moisture, nutrients, and growing space. Many studies have shown that limiting the competitive influences of these weeds, particularly in the first year after planting, improves planting survival and accelerated stand growth leads to earlier harvest. In most cases a 4-6 ft wide banded herbicide application centered overtop of seedlings can be just as effective as overtop broadcast HWC applications, except where grass sod or abundant vines are present. Do not make HWC applications where seedlings are stressed (e.g. drought, winter injury, insects, etc.), they do not have a sufficient root system (at least five lateral roots originating from the taproot), or have not begun active root growth after planting (typically one month for loblolly pine).

The purpose of this paper is to provide readers with the most up-to-date application information and product availability on herbicides that are labeled for loblolly pine HWC. Always read the herbicide label prior to purchase to verify that the herbicide is labeled for the intended use.

HERBICIDES FOR CONTROL OF BROADLEAF WEEDS AND GRASSES

*****These treatments are all applied overtop of pines unless noted otherwise.*****

Recommended timings in this paper are for north Florida and the Georgia Coastal Plain latitudes (30.0 – 32.5 degrees N). Latitudes north of the Georgia Coastal Plain should add one or more week to the timings suggested in this paper. After planting, pay close attention to local weather conditions during late winter and early spring in your area as the onset of spring often varies from year to year. The optimal stage of weed growth for HWC application is generally as an early post emergence timing (as the site “greens up” in the spring to when weeds are ankle high), but Arsenal, Velpar, and Transline are also effective on established weeds (post-emergent application timing). The “grass herbicides” Envoy, Fusilade, and Segment II are effective only on emerged grasses. April and May have historically been the two driest months during the first half of the year in Georgia and most herbicides should be applied BEFORE newly planted pine seedlings are under drought stress.

ARSENAL® Applicators Concentrate (often abbreviated Arsenal® AC) (BASF; active ingredient 53% imazapyr; 4 lb acid equivalent per gallon (ae) with no surfactant in the product formulation)

- This herbicide is very effective on perennial grasses, including difficult-to-control species like Johnsongrass and panicum species.
- Weak on broadleaf weeds in the composite group (see Oust® XP).
- Effective on established weeds
- Apply 6-10 fluid ounces per acre.
- Do not add surfactant.
- Optimum timing: Early post to post emergence of weeds (April to May).
- Grass and broadleaf weed control including, but not limited to: bahiagrass, barnyardgrass, bluegrass (annual, Kentucky), Bermudagrass, crabgrass, fescue, foxtail, Italian ryegrass, Johnsongrass, lovegrass, panicums, sandbur, 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, sowthistle, stinging nettle, annual spurge, sunflower, tansymustard, wild carrot, wild parsnip, and wild turnip

OUST® XP (Bayer; active ingredient 75% sulfometuron methyl)

- This herbicide is very effective on a broad spectrum of broadleaf weeds, including composites.
- Weak on perennial grasses including Bermudagrass, some panicums, and broomsedge species (see Arsenal® AC).
- First year plantings: apply 2-4.25 oz Oust product per acre.
- Optimum timing: Pre-emergence to early post emergence (March-April)
- Do not use Oust® XP when soil pH > 6.2 or seedling damage may occur.
- Grass & broadleaf control including, but not limited to: chickweed, crabgrass, dogfennel, fescue, fireweed (willowweed), goldenrod, horseweed, Kentucky bluegrass, nutsedge (yellow), panicum (broadleaf), pokeweed, ragweed, shepard'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, and wild oats

Oust® XP (Bayer; 75% sulfometuron methyl) + **Arsenal® AC** (BASF; 53% imazapyr, 4 lb ae/gal)

- Common tank mixture where both perennial grasses and broadleaf weeds are to be controlled.
- Apply 2 oz Oust® XP product + 4 oz Arsenal AC product per acre.
- Do not add surfactant.
- Optimum timing is early post-emergent (March – April).
- Do not use when soil pH is greater than 6.2.
- See weeds controlled in Arsenal® AC and Oust® XP sections above.

Oust® XP (Bayer; active ingredients 75% sulfometuron methyl) + **VELPAR® L VU** (Bayer; active ingredients 25% hexazinone, 2 lb ai/gal) or **OUST® XP + VELPAR® DF VU** (Bayer; active ingredient 75% hexazinone)

- Broad spectrum weed control of broadleaf weeds and most grasses, weak on Bermudagrass, some panicums, and broomsedge.
- Hexazinone may cause pine seedling mortality on sandy sites, ensure proper calibration and follow label directions regarding appropriate rates for various soil types.
- Apply 2-4 oz Oust® XP product + Velpar® L VU 1.5 - 3 pints (or Velpar® DF VU 8 – 16 oz product) per acre depending on soil texture (see product label).
- Optimum timing: Pre to early post emergence of weeds (March - early May).
- Do not use Oust® XP when soil pH > 6.2 or seedling damage may occur.
- Use low rate of Oust® XP + Velpar® L VU or Velpar® DF VU 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, ripgut), reed canarygrass, signalgrass, yellow foxtail, mustard, pepperweed, pigweed, sunflower, vetch, wild carrot, wild oats, asters, brackenfern and fleabane

OUSTAR® (Bayer; active ingredients 11.8% sulfometuron methyl and 63.2% hexazinone). Product is no longer produced by Bayer, but this product may still be for sale from some vendors.

- Similar to Oust® XP + Velpar® products as above, but in a packaged mixture.

The ratio of active ingredients is set; hexazinone rate tends to be too high on sandy sites.

- First 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 first 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, and yellow sweetclover

ATRAZINE 90 DF (Drexel®; active ingredient 88.4% atrazine by weight)

- Provides control of annual broadleaf or grass weeds such as annual ragweed, barnyardgrass, black nightshade, cocklebur, downy brome, fall panicum, field pennycress, giant foxtail, lambsquarters, marestalk, pigweed, and prickly lettuce after transplanting or in established conifers including loblolly pine
- Apply 2.2-4.4 lbs in a minimum of 10 gallons of water per acre.
- Apply before weeds reach 1.5" tall.
- Rainfall is required to activate this product.
- Restricted-use herbicide

OUST® EXTRA (Bayer; active ingredient 56.25 % sulfometuron methyl + 15% metsulfuron methyl)

- Apply 2 2/3 to 3 oz Oust® Extra product per acre.
- Early pre- to post-emergence
- Note Escort® XP + Oust® XP labels for plants controlled.

ESCORT® XP (Bayer; active ingredient 60% metsulfuron methyl)

- Apply 1/3 - 2 oz Escort® XP product per acre.
- Early post- to post-emergence
- Blackberry control + broadleaf weeds & grasses: annual sowthistle, aster, bahiagrass, beebalm, bittercress, bitter sneezeweed, blackberry, blackeyed-susan, blue mustard, bull thistle, buttercup, chicory, cocklebur, common chickweed, common groundsel, common purslane, common yarrow, common sunflower, conical catchfly, corn cockle, crown vetch, curly dock, dandelion, dewberry, dogfennel, false chamomile, fiddleneck tarweed, field pennycress, garlic mustard, goldenrod, henbit, honeysuckle, multiflora rose and other wild roses, lambsquarters, lettuce (miners, wild), marestail/horseweed*, maximilian sunflower, mustard (transy-, treacle, wild), oxeye daisy, Pennsylvania smartweed, plantain, pigweed (redstem, smooth), plumeless thistle, prostate knotweed, redstem filaree, sericea lespedeza, sheperd's purse, silky crazyweed (locoweed), false flax, sweet clover, tansey ragwort, teasel, wild carrot, wild garlic, woolly croton, wood sorrel, and yankeeweed with the use of Escort® XP.

OUST® EXTRA + ARSENAL® AC

- Apply 2 oz Oust® Extra + 4 oz Arsenal product per acre.
- Early post to post emergence
- Refer to list of plants controlled for Escort® XP, Oust® XP and Arsenal®.

ESCORT® XP + VELPAR® L VU or VELPAR® DF VU

- Apply 1/2 - 1.0 oz Escort® XP product + Velpar® L VU or Velpar® DF VU product (see label for specific Velpar® rates) per acre.
- Early post to post emergence
- Blackberry control + broadleaf weeds and grasses (refer to Escort® XP and Velpar® for lists of plants controlled)

ESCORT® XP + ARSENAL® AC

- Apply 1/2 to 1 oz Escort® XP product + 4 oz Arsenal® product per acre.
- Early post to post-emergence
- Refer to list of plants controlled for Escort® XP and Arsenal®.

VEPLAR® DF VU (Bayer; active ingredient 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, brome grass, fleabane, foxtail, horseweed, ragweed, ryegrass, blackberry (dewberry)

VELPAR® L VU (Bayer; active ingredient 25% 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):
 - 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, brome grass, fleabane, foxtail, horseweed, ragweed, ryegrass and blackberry (dewberry)

TRANSLINE® (Corteva™ Agrscience; active ingredient 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.
- Applications may be broadcast over trees of any age.
- Broadcast applications can be applied using 11 to 21 oz per acre of Transline®.
- Controls clover, coffeeweed, cocklebur, hairy indigo, kudzu, maretail/horsesweed, morning glory, partridge pea, ragweed, red sorrel, sicklepod, vetch, wisteria
- Can provide control of leguminous weeds with applications throughout the growing season.
- Do not apply if weeds are in drought stress.
- Product NOT labeled in Florida

PENDULUM® 2G (BASF; active ingredient pendimethalin 2.0%, 40 lbs contains 0.8 lb of pendimethalin)

- Preemergent granular herbicide; rain activation within 30 days of application is required for improved control. This herbicide may be applied at planting for early season herbaceous weed control.
- Provides short-term herbaceous weed control (2-4 months) at an application rate of 100 lbs per acre; long-term herbaceous weed control (6 to 8 months) is achieved with an application rate of 200 lbs per acre.
- When applying to newly planted seedlings, be sure that seedling planting slits are closed to prevent the herbicide from directly contacting tree roots or from being washed into the root zone via the planting slit. Root stunting can occur if the herbicide contacts roots of newly planted seedlings.
- Grass & broadleaf control including, but not limited to: barnyardgrass, bluegrass, crabgrass, burweed, carpetweed, chickweed, clovers, crowfootgrass, cudweed, evening primrose, filaree, foxtail, goosegrass, henbit, itchgrass, Johnsongrass (from seed), knotweed, lambsquarters, junglerice, lovegrass (from seed), panicum, pigweed, purslane, pusley (Florida), sandbur, shepherd's-purse, signalgrass, smartweed, speedwell, sprangletop, spurge, velvetleaf, witchgrass, and woodsorrel

ESPLANADE® F (Bayer; active ingredient indaziflam 19.05%, contains 1.67 lbs per gallon)

- Selective, preemergent herbicide for control of broadleaf weeds and grasses in conifer (including loblolly pine) production areas.
- Apply 3.5-7 oz product per acre as an overtop or broadcast application.
- Herbicide will not control germinated weeds; apply soon after planting.
- Herbicide is rain activated and performs best if it contacts mineral soil.
- Do not use surfactant.
- Controls or suppresses bittercress, carpetweed, chickweed, corn speedwell cudweed, clover, dandelion, eclipta, evening primrose, filaree, fleabane, Florida pusley, gromwell, groundsel (common), fleabane, horseweed, lambsquarters, lawn burweed, little mallow, long-stalk Phyllanthus (Mascarene Island leaf flower), panicle willowweed, plantain spp., prostrate pigweed, prostrate spurge, purslane, ragweed, shepherd's purse, sowthistle, swinecress, velvetleaf, wild buckwheat (seedlings), wild mustard, yellow starthistle, annual bromegrass, barnyardgrass, crabgrass, cheatgrass, downy brome, foxtail spp., goosegrass, lovegrass, sprangletop, ryegrass, annual sedge, and tufted lovegrass

HERBICIDES FOR CONTROL OF ANNUAL & PERENNIAL GRASSES ONLY

- All grass control herbicides listed below are postemergence, foliar active herbicides.
- 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 stems are less than 6 inches tall and a second when re-growth is less than 4 inches. Multiple applications are also needed for Johnsongrass.
- 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.
- 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.
- Do not apply herbicides when pine seedlings and desirable grasses are under drought or other stress
- Do not apply herbicides when rainfall is expected within one hour.

ENVOY® PLUS (Valent; active ingredient 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
- Do not apply more than 64 oz/ac per season, make a minimum 14-day interval between applications, do not apply more than 32 oz/ac per application

FUSILADE® DX (Syngenta; active ingredient 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. Do not apply overtop of seedlings or damage may occur.

ARROW® 2EC (Makhteshim Agan of North America (MANA); active ingredient 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 a 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)

SEGMENT® II (BASF; 18.0% sethoxydim, 1.5 lbs sethoxydim per gallon, contains petroleum distillates)

- Apply 1.5 pints per acre for annual and perennial grasses up to 6 inches tall
- Apply in 20 gallons of water per acre
- Use crop oil concentrate at 2.0 pints per acre or methylated seed oil at no less than 1.5 pints per acre
- Apply during spring after 4 to 6 inches of new growth but prior to seedhead formation. Apply before conifer bud-break or conifer injury is possible.
- Repeat applications may be necessary. Poor grass control may occur if grass is stressed.

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 desired 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 concentrations or formulations 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 amount of herbicide needed for a banded herbicide application using 2 oz Oust® XP + 1.5 pints of Velpar® L VU products per acre treated, assuming 12 feet between the rows: (a) spraying a 4-foot-wide band, 2 oz Oust + 1.5 pints Velpar® L VU per acre will treat three 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 66.67 oz (4.17 lbs) of Oust® XP and 33.33 pints (4.17 gallons) Velpar® L VU would be needed for a 100-acre field where one-third of the area is treated in 4-foot bands. (b) When spraying a 6-foot-wide band on rows 12 feet apart, 2 oz Oust® XP and 24 oz Velpar® L VU per acre will treat two acres total land area. One acre is banded and one acre is untreated, so herbicide is applied to half the area. A total of 100 oz (6.25 lbs) of Oust® XP and 75 pints (9.38 gallons) Velpar® L VU would be needed for a 100-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.

Table 1: WEED TOLERANCE TO SELECTED HERBICIDES

Herbicide	Weeds tolerant to the herbicide listed
ARSENAL	sicklepod, tropic croton, blackberry, most legumes
AATREX	Bermudagrass, lespedeza, Johnsongrass, broomsedge, blackberry
ARROW 2EC, ENVOY PLUS, SELECT II	All broadleaf weeds
ESPLANADE F	Bermudagrass, tropic croton, broomsedge, Johnsongrass, lespedeza, blackberry
FUSILADE DX	All broadleaf weeds
OUST XP	Bermudagrass, croton, Johnsongrass, trumpetcreeper, broomsedge
PENDULUM 2G	Bermudagrass, morningglory spp., croton, broomsedge, blackberry, most legumes
VELPAR L VU, VELPAR DF VU	Bermudagrass, broomsedge, cocklebur, Johnsongrass, sicklepod, trumpetcreeper, morningglory spp.

Table 2: GRASS WEED RESPONSE TO HERBICIDES

WEED	Post Emergence Chemical		
	FUSILADE	SEGMENT II	ENVOY
Perennial Grasses			
Bermudagrass	G - E	F - G	G - E
bahiagrass	G	F	
Johnsongrass (rhizome)	E	G	E
tall fescue	F	G	
nutsedge	P	P	P
Annual Grasses			
broadleaf signalgrass	E	E	E
crowfootgrass	F	G	G
crabgrass	F	G - E	G
fall panicum	G	G	G
foxtail		E	
goosegrass	F - G	F - G	F - G
Johnsongrass (seedling)	G - E	G - E	E
sandbur	G	G	G - E
Texas panicum	G - E	E	E
Italian ryegrass		E	

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, Sethoxydim (Segment II) ratings based on Poast trials.

APPENDICES

Table 3: Old-field, non-scalped post-plant herbaceous weed control timing considerations for the Georgia Coastal Plain and central to northern Florida.

*For scalped sites, herbicides applied from mid-April into mid- to late May have given good survival and growth results based on previous studies as long as seedlings are not under stress (especially drought stress).

Soil Drainage Class	Pre- to Early Post Emergence Herbicide Application Timing	Early Post to Post Emergence Herbicide Application Timing
Somewhat Excessively to Ex- cessively Well-Drained	March	March to early April
Moderately Well to Well- Drained	March to early April	Mid-March to mid-April
Poorly to Somewhat Poorly Drained	April to early May	Mid-April to mid-May

Table 4: 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	Leon Mandarin
	20-40		Albany Plummer	Kanapaha		Hurricane Pottsburg
	40-80					
Moderately Well to Well Drained	0-10	Resota Pactolus Ortega	Goldsboro Tifton Dothan	Faceville Nankin Greenville	Onslow	
	10-20				Seagate	Baymeade
	20-40		Lucy Fuquay Stilson			Echaw
	40-80		Bomifay			
Somewhat to Excess. Well	40-80	Lakeland Kershaw	Troup			Rimini Kureb

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