Vegetation Management in Forestry and Transmission Line ROWs

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Objectives of Forest Vegetation Management

2 ½ Year old loblolly

- Re-allocate available resources
- Improve forest productivity
- Improve aesthetics
- Reduce wildfire hazard
- Enhance wildlife habitat

Vegetation Management Tools

- Machinery
- Herbicides
- Fire

Drum chopper

Silvicultural Herbicide Uses

- Site Preparation
- Herbaceous Weed Control
- Pine Release
- Habitat Management
- Ecosystem Restoration

Longleaf ecosystem restoration.

Herbicide Site Preparation

"Get to the root of the problem"

- Manage brush and herbaceous weeds
- Options **with and without burning**
- Hand planting is typical
- Spring, summer, and fall treatment options
- Combined with mechanical treatments on poorly drained sites

Before

After

Site Prep Herbicides- Most Common

Common Name	Trade Name	Manufacturer
Glyphosate	**Accord®** XRT II, **Accord®** Conc. **Razor** Pro, **Foresters'**	Dow AgroSciences NuFarm
Hexazinone	**Velpar®** DF, **Velpar®** L	DuPont
Imazapyr	**Chopper®** Gen2, **Arsenal®** AC **Polaris** AC	BASF NuFarm
Triclopyr	**Garlon®** 4 Ultra **Tahoe®** 4E	Dow AgroSciences NuFarm
Metsulfuron	**Escort®** XP **MSM 60 DF**	DuPont Alligare
Sulfometuron	**Oust® XP** **SFM 75**	DuPont Alligare

Most Common Site Prep Treatments

- Spring Site Prep with Velpar®
- Upland Foliar Sprays
- Flatwoods Foliar Sprays

Herbicide Site Preparation

Spring treatment with Velpar® (hexazinone)

- Ideal for ***sandy soils, mostly oaks***
- Soil active herbicide, root uptake
- Requires rainfall to activate

Aerial

Ground

Herbicide Site Preparation

Foliar sprays in summer and early fall

- ***Upland sites:***

Broad species spectrum

40 oz **Chopper®** Gen 2

+ 3 qts **Accord®** XRT II

Aerial

- ***Flatwoods:***

Gallberry, Saw palmetto

40 oz **Chopper®** Gen 2

+ 1.5 qts **Garlon®4** Ultra

Ground

Pre-plant spraying on bedded sites

- Form beds on poorly drained sites in early summer.
- Spray pre + post-emergence herbicides at 6-12 weeks after bedding.
- 16 oz **Arsenal® AC**

(OR 32 oz **Chopper®**)

+ 2-3 oz **Oust®** XP is a common treatment.

Flatwoods sites are poorly drained, spodosols.

Herbaceous Weed Control

in newly established pine plantations

- Widely adopted in the 1980's
- **Spring** application (Feb.-May)
- **6-foot wide band** over rows
- Broadcast where rows are not present or have vines, tall weeds, difficult access
- Wait **at least 1 month** after planting for best tolerance

Herbaceous Weed Control Herbicides for Forestry Sites

Common Name	Trade Name	Manufacturer
Atrazine	**Aatrex**®	Syngenta
Hexazinone	**Velpar**® L	DuPont
Hexazinone	**Velpar**® DF	DuPont
Imazapyr	**Arsenal**® AC	BASF
Metsulfuron	**Escort**® XP	DuPont
Sulfometuron	**Oust**® XP	DuPont
Sulfometuron (12%) + Hexazinone (63%)	**Oustar**®	DuPont

Herbaceous Weed Control

Slash Pine

- Apply **February to mid-April**
- 2 oz **Oust® XP+ 4 oz Arsenal® AC**
- 2 oz **Oust® XP + 24 oz Velpar®** L
- 2 oz **Oust® XP + 8 oz Velpar® DF**

- **Arsenal®** AC is most effective on sites with heavy perennial grasses
- Use lower labeled rates of **Velpar® on sandy soils**

End of first growing season

Herbaceous Weed Control

Loblolly Pine

- Apply February to mid-April
- 2 oz **Oust® XP+ 6** oz **Arsenal® AC**

- 2 oz **Oust® XP + 24** oz **Velpar®** L
- 2 oz **Oust® XP +8** oz **Velpar®DF**

- **Loblolly is most tolerant to Arsenal®**

Herbaceous Weed Control

Longleaf Pine

- Apply **mid-April to mid-May**
- 2 **Oust®** XP + 24 oz **Velpar® L**
- 2 oz **Oust®** + 10 oz **Velpar® DF**
- 10 oz **Oustar®**

Pasture Conversion

- 4 oz **Arsenal®** + 2 oz **Oust®** XP applied mid-may
- ***Bermudagrass***- Site prep first!

Check for new roots

Pine Release: Selective control of shrubs and hardwood trees

- ***Selective*** herbicides, pines are ***tolerant***
- ***Shift*** **species composition**

Pine Release

Selective control of brush in young pines

- **2–5** Year-old pine stands
- [***Velpar®* *ULW*** in Spring]???
- ***Arsenal®* *AC*** in September

Pines need full-sunlight.

Respond to herbaceous weed control too!

Selective Pine Release Herbicides

Common Name	Trade Name	Manufacturer
Imazapyr	**Arsenal®** AC	BASF
Hexazinone	**Velpar®** L	DuPont
Hexazinone	**Velpar®** DF	DuPont
Metsulfuron methyl	**Escort® XP**	DuPont

Pine Release – *Velpar® DF*

- ***Loblolly, longleaf, slash, shortleaf, Virginia pine***
- **April-May** applications optimum
- Used for oak control on sandy sites, longleaf release
- Poplar, sassafras are tolerant
- Rate of herbicide is **soil dependent**

Lb Velpar® ULW/Acre	Soil Texture
1 - 2	Sand, Loamy sand, Sandy loam
2 - 3	Loam, Sandy clay loam, Silt loam
3 - 4	Clay loam, Sandy clay, Silty clay loam, Silty clay, Clay

Pine Release – *Arsenal® AC*

- ***Loblolly pine*** **12-20 oz/A**
- ***Virginia pine*** **12-20**
- ***Shortleaf pine*** **12-16**
- ***Slash pine*** **12-16**
- ***Longleaf pine*** **12-16**

- **Mid-August to mid-October** best timing
- Slash and longleaf pine ages 2-5 only, no surfactant
- Very broad spectrum hardwood control
- Elm, redbud, locust, blackberry not controlled

Pine Release Tank Mixes:

- **8-16** oz ***Arsenal***® AC Plus:
  - **0.5-1.0** oz ***Escort***® XP® to improve control of **blackberry**, **mimosa**, **locust**, will control legumes
  - **1-2** qts ***Accord***® ***Concentrate*** to improve control of **locust**, **redbud**, **elm** or to reduce treatment costs

Habitat Management

- Promote desired mast species for wildlife
  - Red + White Oaks
  - Persimmon
- Native warm season grasses are tolerant to Oust® and Velpar®
- Legumes are tolerant to Arsenal®, Chopper®

Hand Application Techniques

"Do it yourself" approaches

- Backpack foliar sprays
- Hack and squirt
- Cut stump
- Basal stem
- Soil basal spot

Pine straw production

Photo: Pat Minogue

Vegetation Management on Electrical Power Lines

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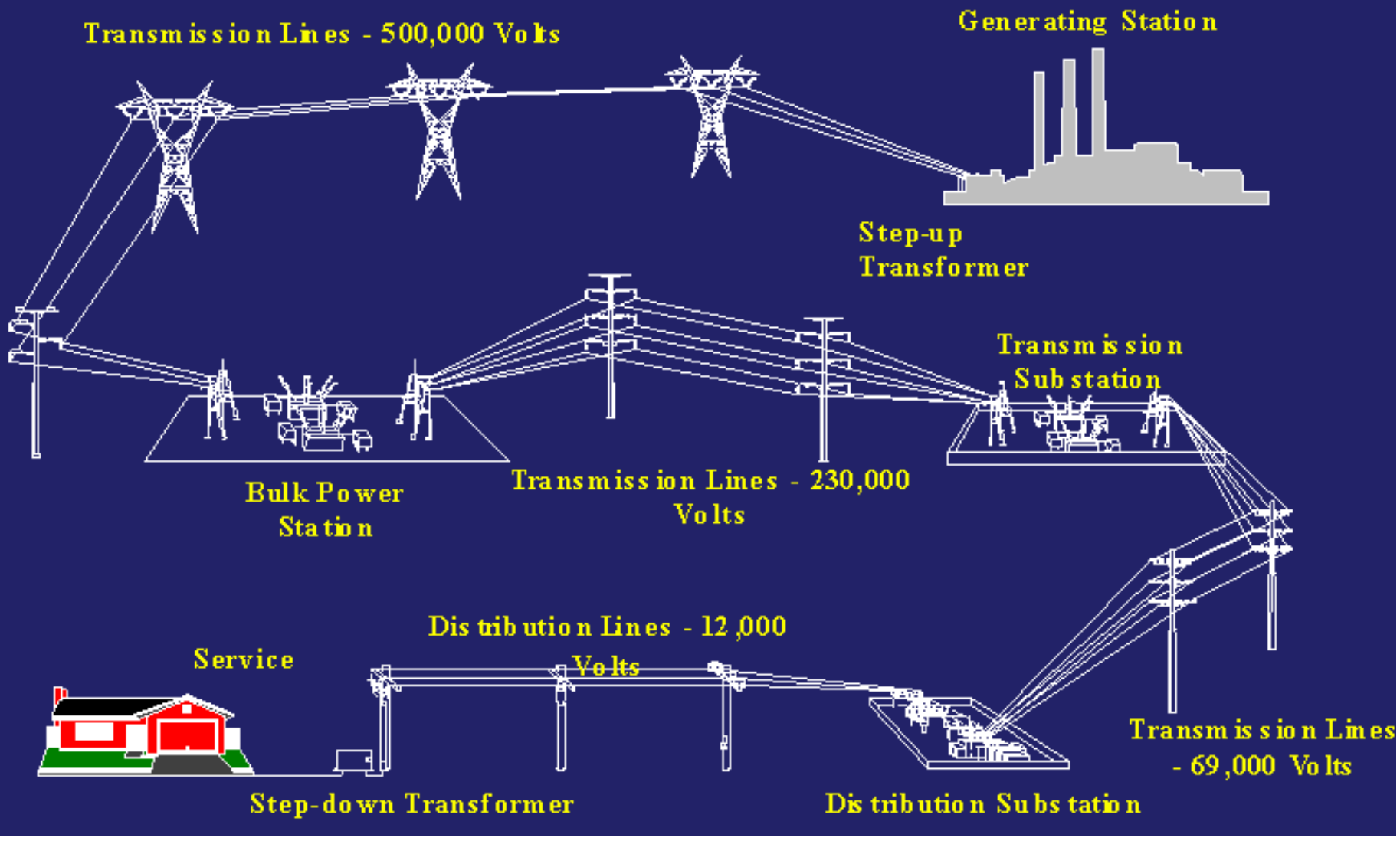
IFAS Extension

Generation - Transmission - Distribution System



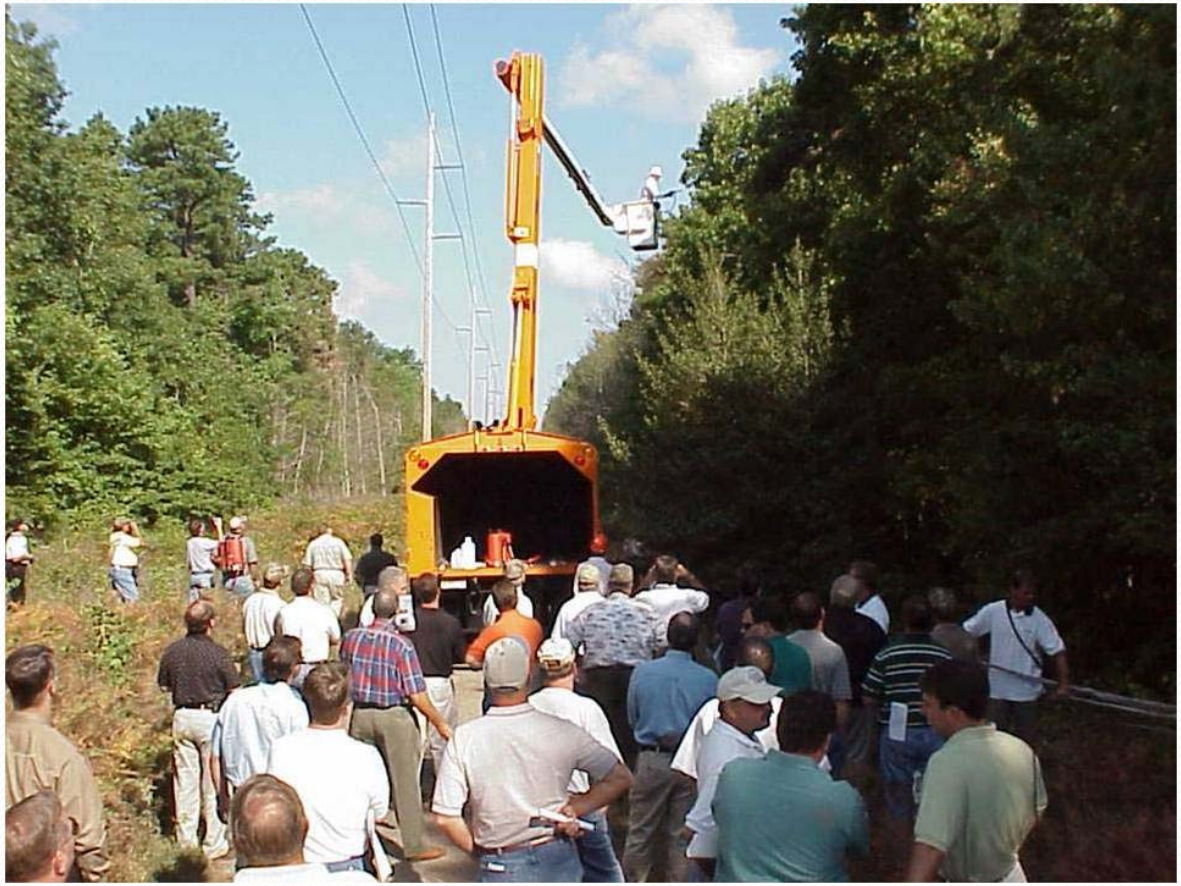
Vegetation Management Objectives

- ***Safety***: protect power lines, guard against **wildfire**
- Stable, **low-growing grass and forb community** for lane/wire zone or full width of right of way
- **Shrub and brush zone** from lane to forest edge
- Aquatic & Wetland **Protection**
- Wildlife Habitat
- Environmental **Stewardship**

Stable community of low-growing forbs and grasses

Vegetation Management Tools

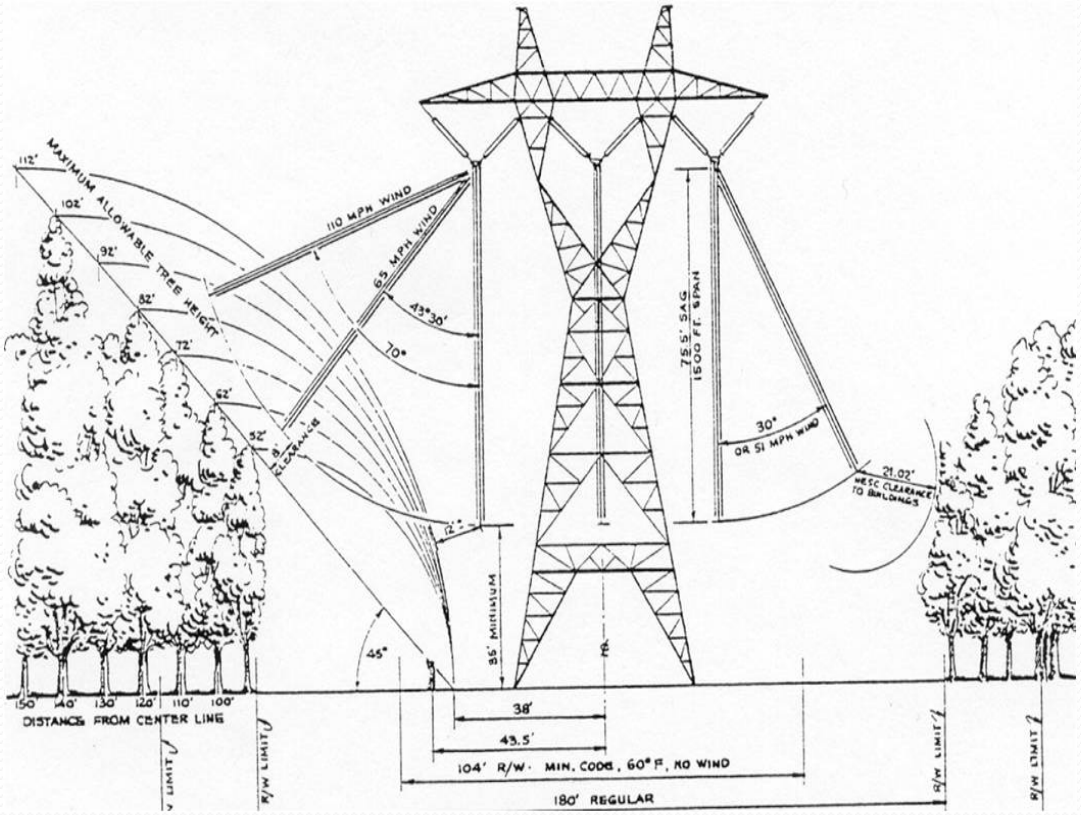
- **Hand Clearing**
- **Machinery**
- **Herbicides**



Pre-treatment Reconnaissance

Manage risks, protect the environment, get good results

- Lane width specifications
- Structure needs
- Brush density and height
- Aquatic & Wetland sites
- Species; *desirable* and *undesirable* plants
- Sensitive sites; residences, farms, gardens, schools



Use of Herbicides In and Around Water

The herbicide label is the law!

Bodies of Water

Incidental Water

- **Water use restrictions vary by product, read "Environmental Precautions" on product labels.**

Hand Application Methods

- Low-Volume Backpack Foliar
- Basal Stem Treatment
- Cut Stump
- Hack & Squirt
- Soil Spot

Low-Volume Backpack Foliar

- Use on **low brush**, up to 5 feet tall
- Cover at least 2/3 of the crown

Common Herbicide Products	Common Name and Formulation	Characteristics
Accord® XRT II Roundup® Pro Rodeo® (Aquatic)	glyphosate, DMA salt glyphosate, IPA salt glyphosate, IPA salt	• Broad weed spectrum • No soil activity • Translocates readily
Arsenal®Powerline Stalker® Habitat® (Aquatic)	Imazapyr, IPA salt	• Very broad spectrum • Soil active • Persistent
Garlon® 3A Garlon® 4 Ultra Renovate® 3 (Aquatic)	triclopyr, TEA salt triclopyr, ester triclopyr, TEA salt	• Amine lower volatility • Waxy-leaved species • No soil activity
DMA® 4 IVM (Aquatic)	2,4-D, DMA salt	• Tends to re-sprout • No soil activity

Basal Stem Treatment

- Spray bark of **small diameter stems** (< 4 inches diameter)
- May be applied in dormant season
- Apply from ground to 12-15 inches high on stem
- Use with "basal oil" or oil emulsion carrier
- **Garlon ®4 Ultra** (*tryclopyr*) at 20-30% in oil
  - Best on thin-barked species
  - Concerns with **volatility**
- **Stalker®** (*imazapyr*)
  - Very broad spectrum
  - Concerns with **soil activity**

Cut Stump

- Spray just the **cambium**
- Best on freshly cut stumps
- Treat all the stumps!

- ***Stalker***® 8-16 oz/gal in water, penetrating oil, diesel
- ***Garlon***® ***4 Ultra*** 20-30% in oil
- ***Garlon 3A*** Use undiluted
- ***Pathfinder II*** Ready to use
- ***Accord***® ***XRT II*** 40-100%
- ***Roundup***® 50-100% in water

Hack & Squirt (Cut Stem)

- Used on **taller vegetation**, greater than 4”” diameter
- Make cuts at a downward angle around the tree
- See labels regarding solution concentration, spacing between “hacks”
- Generally apply 1 ml/hack, about the same as 1 pull on a squirt bottle

- ***Arsenal® Powerline, Stalker®, Habitat®*** (imazapyr)
- ***Garlon® 3A*** (triclopyr)
- ***Roundup®*** (glyphosate)
- ***Accord® XRT II*** (glyphosate)

Hatchet & squirt bottle

Soil Basal Treatments

Spring applications

- Undiluted ***Velpar® L***
- Exact delivery handgun application to the soil at the base of woody vegetation
- For ***trees*** use 2-4 ml product **per inch** of stem diameter at breast height.
- For **brush** apply 2-4 ml product **per 3 feet** canopy width.

Use of Machinery & Aircraft

- Ground Sprayers
- Aerial Application
- Cut-Stubble
- Side Trimming

Ground Sprayer Application

- Broadcast applications where there is **dense brush** or the herbaceous community is being manipulated.
- Uses **higher volumes** of spray preparation per acre, 25-100 gal
- Normally use **combinations of herbicides**, tailored to site conditions and plant species.

- Use (***Roundup®, Accord®*** (glyphosate), ***Garlon®*** (triclopyr), ***Arsenal® Power Line*** (imazapyr), ***Milestone®*** (iminopyralid), ***Krenite®*** (fosamine ammonium), others

Aerial Application

- Most common in remote areas, where very dense or tall brush is present, and away from sensitive areas.

Cut-Stubble

- Herbicides may be applied after mowing or in the same pass.
- Limited to “mow-able” vegetation size
- Low aesthetic impact
- High production
- Clears fuels
- Use ***Stalker***®(imazapyr), ***Garlon® 4 Ultra*** (triclopyr)

Side Trimming

- **Chemical pruning** with non-translocating herbicides.
- ***Krenite***® kills buds, new growth from treated branches
- Effective on hardwoods and pines

Pine Control – *for Best Results:*

- Treat in **spring** during active growth
- Use **high application volumes** (25 GPA min.)
- Easier to control small pines (less than 3ft tall)
- Requires relatively high herbicide use rates
- Use ***Roundup***®, ***Accord***® (glyphosate) or ***Krenite***® (fosamine ammonium)

Vegetation Management Considerations for Transmission Line Rights of Way - ***Summary***

- **Avoid drift** with foliar sprays, apply during calm conditions, use low pressures and controlled droplet size application equipment.
- **Combinations** of hand-held treatment techniques can be prescribed to adjust to varying conditions.
- Use of **soil active** herbicides is a concern and increases risk of off-right of way damage. Be aware of the rates per acre being applied and recognize that with individual stem treatments, **amounts applied increase with increasing stem density**.
- When feasible, use herbicide combinations including **more than one mode of action** to mitigate herbicide resistance.

Sources of Additional Information

- **Southern Regional Extension Forestry: http://www.sref.info/**

- **The University of Florida Weed Science Website http://weedext.ifas.ufl.edu/**
- **Forest Vegetation Management Website http://nfrec.ifas.ufl.edu/Forest_Vegetation_Management/**

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