Use of Herbicides in Pine Silviculture

Site Preparation, Herbaceous Weed Control, Pine Release, and Timber Stand Improvement

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Assistant Professor of Silviculture
Objectives of Forest Vegetation Management

2 ½ Year old loblolly

- Re-allocate available resources
- Increase timber value
- Improve aesthetics
- Reduce wildfire hazard
- Enhance wildlife habitat
Vegetation Management Tools

- Hand Clearing
- Machinery
- Herbicides
- Fire
- Grazing

Drum Chopper
Silvicultural Herbicide Uses

- Site Preparation
- Herbaceous Weed Control
- Pine Release
- Mid-rotation Release
- Timber Stand Improvement

Photo: Pat Minogue
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
# Site Prep Herbicides - Most Common

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Trade Name</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glyphosate</td>
<td>Accord® XRT II, Accord® Conc.</td>
<td>Dow AgroSciences NuFarm</td>
</tr>
<tr>
<td></td>
<td>Razor® Pro, Foresters’®</td>
<td></td>
</tr>
<tr>
<td>Hexazinone</td>
<td>Velpar® ULW, Velpar® L Pronone®</td>
<td>DuPont ProServe</td>
</tr>
<tr>
<td>Imazapyr</td>
<td>Chopper® Gen2, Arsenal® AC Polaris® AC</td>
<td>BASF NuFarm</td>
</tr>
<tr>
<td>Triclopyr</td>
<td>Garlon® 4 Ultra Tahoe® 4E</td>
<td>Dow AgroSciences NuFarm</td>
</tr>
<tr>
<td>Metsulfuron</td>
<td>Escort® XP</td>
<td>DuPont</td>
</tr>
</tbody>
</table>
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
- Enhanced growth with spring timing
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

- **Flatwoods:**
  Gallberry, Saw palmetto
  32 oz Chopper® Gen 2
  + 3 qts Garlon® 4 Ultra
Special Situations in Site Prep

- **Blackberry Control**
  Add 32 oz Garlon 4

- **Pine Control**
  Add 2-3 qts Krenite®

- **Sand Blackberry**
  5 qts Accord® + 3 qts Krenite®

-Jim Miller
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.
- 12-16 oz Arsenal® AC OR 24-32 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

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Trade Name</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atrazine</td>
<td>Aatrex®</td>
<td>Syngenta</td>
</tr>
<tr>
<td>Hexazinone</td>
<td>Velpar® L</td>
<td>DuPont</td>
</tr>
<tr>
<td>Hexazinone</td>
<td>Velpar® DF</td>
<td>DuPont</td>
</tr>
<tr>
<td>Imazapyr</td>
<td>Arsenal® AC</td>
<td>BASF</td>
</tr>
<tr>
<td>Metsulfuron</td>
<td>Escort® XP</td>
<td>DuPont</td>
</tr>
<tr>
<td>Sulfometuron</td>
<td>Oust® XP</td>
<td>DuPont</td>
</tr>
<tr>
<td>Sulfometuron (12%) + Hexazinone (63%)</td>
<td>Oustar®</td>
<td>DuPont</td>
</tr>
</tbody>
</table>
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
- Do not add surfactant
- 2 Oust® XP + 24 oz Velpar® L
- 2 oz Oust® + 10 oz Velpar® DF
- 12 oz Oustar®

Pasture Conversion

- 4 oz Arsenal® + 2 oz Oust® XP applied mid-May
- *Bermuda*- 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
- Mid-rotation release
- Timber stand improvement

Photo: Pat Minogue
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!

Photo: Pat Minogue
## Selective Pine Release Herbicides

<table>
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<tr>
<th>Common Name</th>
<th>Trade Name</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,4-DP</td>
<td>Weedone® 2,4DP</td>
<td>Syngenta</td>
</tr>
<tr>
<td>Glyphosate</td>
<td>Accord® Conc.</td>
<td>Dow AgroSciences</td>
</tr>
<tr>
<td>Imazapyr</td>
<td>Arsenal® AC</td>
<td>BASF</td>
</tr>
<tr>
<td>Hexazinone</td>
<td>Velpar® L</td>
<td>DuPont</td>
</tr>
<tr>
<td>Hexazinone</td>
<td>Velpar® DF</td>
<td>DuPont</td>
</tr>
<tr>
<td>Hexazinone</td>
<td>Velpar® ULW</td>
<td>DuPont</td>
</tr>
<tr>
<td>Hexazinone</td>
<td>Pronone®</td>
<td>Proserve</td>
</tr>
</tbody>
</table>
Pine Release – *Velpar® ULW*

- *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**

<table>
<thead>
<tr>
<th>Lb Velpar® ULW/Acre</th>
<th>Soil Texture</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 2</td>
<td>Sand, Loamy sand, Sandy loam</td>
</tr>
<tr>
<td>2 - 3</td>
<td>Loam, Sandy clay loam, Silt loam</td>
</tr>
<tr>
<td>3 - 4</td>
<td>Clay loam, Sandy clay, Silty clay loam, Silty clay, Clay</td>
</tr>
</tbody>
</table>
# Pine Release – *Arsenal® AC*

<table>
<thead>
<tr>
<th>Pine Type</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loblolly pine</td>
<td>12-20 oz/A</td>
</tr>
<tr>
<td>Virginia pine</td>
<td>12-20</td>
</tr>
<tr>
<td>Shortleaf pine</td>
<td>12-16</td>
</tr>
<tr>
<td>Slash pine</td>
<td>12-16</td>
</tr>
<tr>
<td>Longleaf pine</td>
<td>12-16</td>
</tr>
<tr>
<td>Mid-August to mid-October best timing</td>
<td></td>
</tr>
<tr>
<td>Slash and longleaf pine ages 2-5 only, no surfactant</td>
<td></td>
</tr>
<tr>
<td>Very broad spectrum hardwood control</td>
<td></td>
</tr>
<tr>
<td>Elm, redbud, locust, blackberry not controlled</td>
<td></td>
</tr>
</tbody>
</table>

Jim Miller
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
Mid-Rotation Release – Aerial, Selective
Favors pine diameter growth

- 10-20 Year old stands
- Selective control of hardwoods in older pine stands
- Good return on investment in many situations
- Spring: *Velpar® ULW*
- Late summer, fall: *Arsenal® AC*

*Re-allocate available resources*
Understory shrub and brush control – Flatwoods sites

- Broadcast treatments made below the pine canopy of older stands
- 2-4 qts Garlon® 4 Ultra
- 2-4 qts Garlon® 4 Ultra plus 16 oz Arsenal AC OR 32 oz Chopper Gen 2 for control of fetterbush, staggerbush, titi, maple

Saw Palmetto, longleaf

Gallberry
Timber Stand Improvement

- Remove diseased trees, those of poor form
- Provides dead wood for wildlife
- Promote desired species for wildlife
  - Red + White Oaks
  - Persimmon
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
Sources of Additional Information

- Southern Regional Extension Forestry: http://www.sref.info/
- Integrated Forest Vegetation Management Website http://ifvm.ufl.edu/

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