



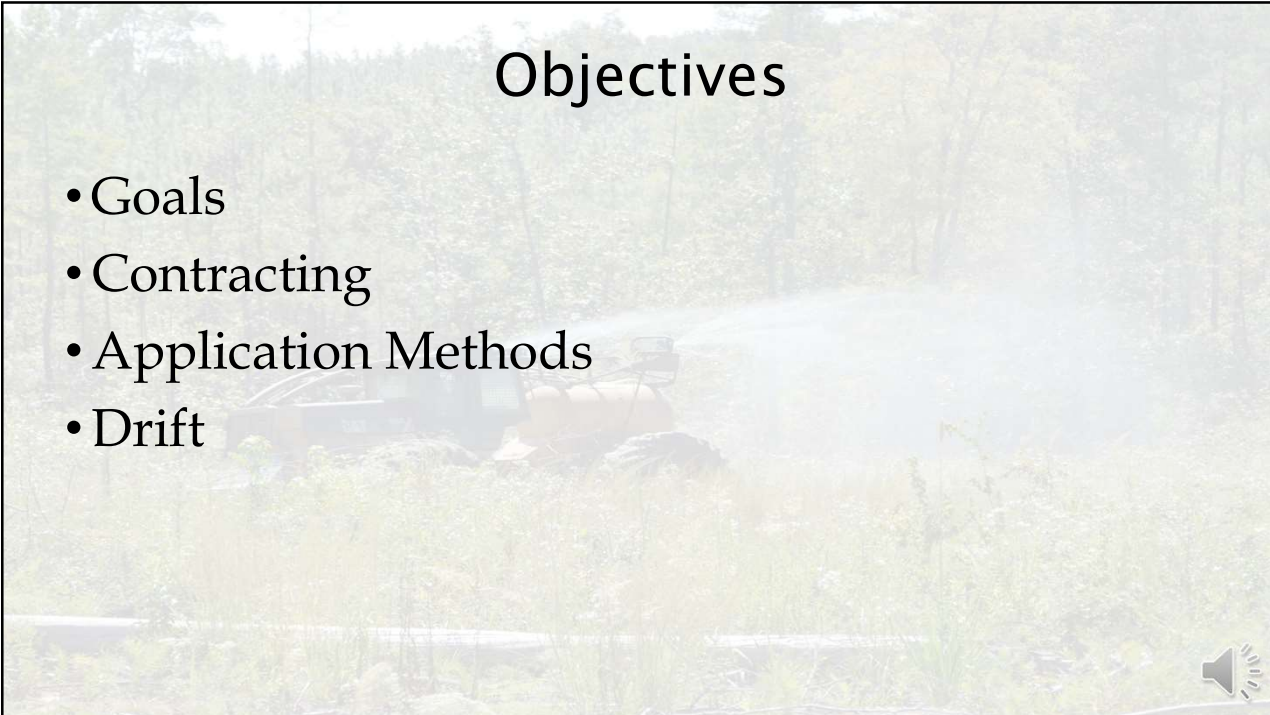
Herbicide Application Techniques

extension
ALABAMA A&M & AUBURN UNIVERSITIES

Ryan Mitchell




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Objectives

- Goals
- Contracting
- Application Methods
- Drift



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Goals of Herbicide Application

- Safety
- Keep herbicide on site and on target
- Use least amount of time possible per acre
- Maximize exposure to target plants
- Minimize exposure or susceptibility of desired plants



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Selection of Method

- Landowner Objectives
- Sensitive areas within application area
- Sensitive areas outside of application area
- Terrain
- Site Accessibility
- Cost of Application
- Availability of Applicators



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Pre-Application Meeting

- Site Reviews
 - Check maps/shape files for accuracy
 - Check prescriptions
 - Note sensitive/exclusion zones/buffers
- Technique Review
 - Spray swath coverage
 - Ground application
 - GPS guided lines (min feet/side)
 - Drift control where sensitive areas exist
- Establish Environmental Tolerances
 - Wind
 - Aerial Applications - 3-8 mph, Gusts less than 5 mph
 - Ground Applications - 7-12 mph, Gusts less than 8 mph

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Application

- Quality Control
 - Daily equipment inspection (nozzle config., filter inspections, etc...)
 - Minimum weekly calibration checks
 - Minimum daily swath checks
 - Real time calibration checks for gross errors (quantity applied per unit area)
 - Documentation
- Rain
 - Recognize rainfall patterns -prevent wash off (Rainfast times on labels)
 - After rain or heavy dew - wait for no drip off
 - Use additional caution when applying to poorly drained sites and standing water

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Application Techniques



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Aerial Application

- Poor harvest utilization
- Steep topography
- Limited access



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Aerial Application

- Relatively flat area approx. 50 yds.x100 yds.
- Relatively open with no tall trees in the way
- Good access road going into area. Logging decks generally work well
- Helicopters do not take off vertically with a load. High elevation points on tract are generally the best location for a heliport



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Ground Application



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Ground Application

- Skidder/Tractor
 - Irregular shaped tracts
 - Sensitive areas
 - Bedded areas
 - More water
 - Pine spacing



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ATV Mounted Sprayers



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Wick/Wipe/Roller Applicators



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Forest Service, Bugwood.org



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Application Methods for Small Acreages



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Sizes of woody plants that can be treated most effectively by hand

Method	Effective size of Target Stems
directed foliar sprays	up to 6 ft tall
streamline basal sprays	up to 2 inches d.b.h.
soil spots by grid	up to 10 inches d.b.h.
basal soil spots	all sizes
injection	all sizes greater than 1 inch d.b.h.
stump sprays	all sizes



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Backpack Application

- Backpack
 - Light competition
 - Sensitive areas
- Equipment
 - Prefer the piston pump style
 - Flat Fan 8003 to 8005



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Low Volume Foliar

- A selective application method for spotty or low-density weeds and brush.
- Calibrate for 5-25 GPA
- Cover 70-80% of leaf surface with special attention to the growing points
- Consider the height and density of the vegetation
- Heights less than 6 to 8 feet
- Use surfactants
- Spray to wet



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Directed Foliar

- Direct the spray on to the target foliage
- Be sure to cover the growing tips of target
- Keep it off conifer terminal shoots and needles
- Do NOT directly spray conifers
- Herbicides particularly damaging to pines
 - Glyphosate
 - Triclopyr
 - Imazapyr



UGA2307257

James H. Miller, USDA
Forest Service, Bugwood.org

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What's Wrong with this?



UGA1148137

USDA APHIS PPQ - Oxford, North Carolina, USDA APHIS PPQ, Bugwood.org

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Spot and Band Spraying



UGA0016317

UGA1217103

Dave Moorhead, UGA, Bugwood.org



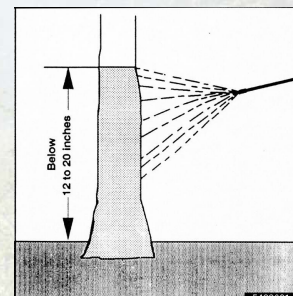
UGA0016371

USDA Forest Service, USDA Forest Service, Bugwood.org

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Basal Bark Application

- Bark oils
- Year-round usage
- Need low density of stems
- Low volume wand to minimize drip
- Coverage of the entire stem circumference is key to success (lower 12-15 inches)
- On root suckering species, make sure collar area is covered, treat root flares, or exposed roots
- Avoid treatment when bark is wet
- Combine with hack and squirt when diameters reach 4-6 inches or above



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Soil Application - Spot

- Use an exact-delivery spotgun applicator
- Direct spray at the soil within 2 feet of the target plant root collar
- Spotgun dispenses measured volume with each trigger pull



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Soil Application - Grid

- Applied in grid patterns
- Labeled crop pines for release are our 4 Southern pines
- Release only ≥ 3 years old plantations
- Severe damage to seedlings with extensive root growth and poor hardiness
- Soil Texture



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Cut Stump Treatment

- Water carrier
- Spray on cut stumps ASAP
- Does translocate downward
- Spray outer 2 inches of stump surface.
- Spray entire surface of small stumps is treated
- Treatment is effective on all sizes of stumps
- Do not use this treatment when stumps and nearby desirable trees are the same species

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Hack-N-Squirt - (Frill Girdle)

- Use hatchet to make frill or downward angle cut
- Cut should penetrate into cambium tissue
- Make one incision per inch of DBH spaced evenly around the stems
- Apply 1.0 milliliters (ml) of solution per incision
- Treatment is applicable to stems ≥ 2.0 inch DBH



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Forest Service, Bugwood.org

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Hack and Squirt - Cut Stump



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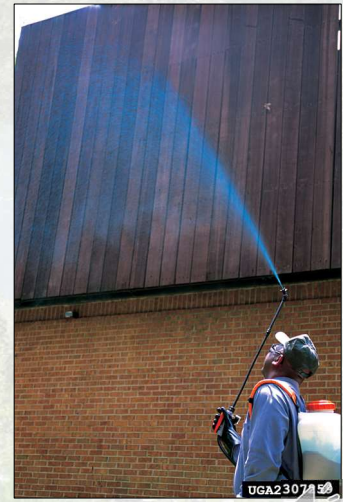
Herbicide Application Techniques for Woody Plant Control

SS-AGR-260

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Drift

- Movement of a pesticide through air, during or after application, to a site other than the intended site of application



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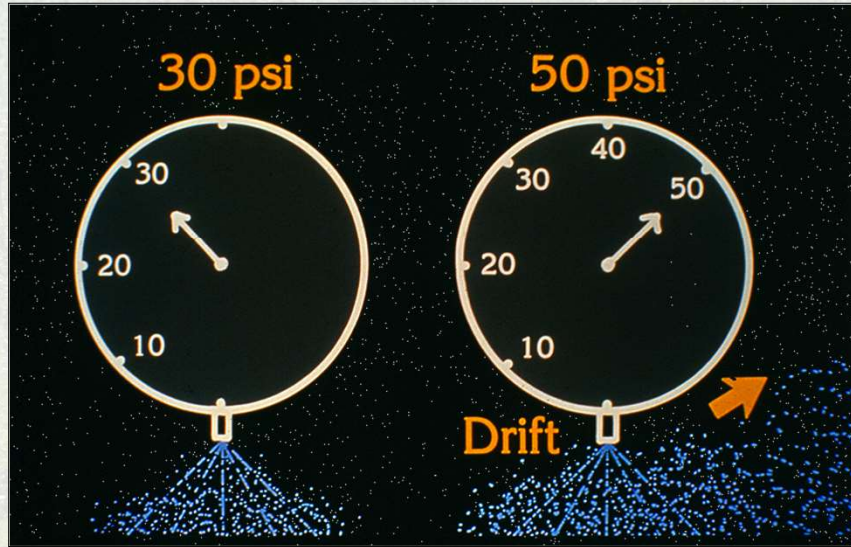
Drift

- Nozzle selection
- Sprayer boom height
- Sprayer pressure



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Increase Pressure, Increase Drift



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Drift

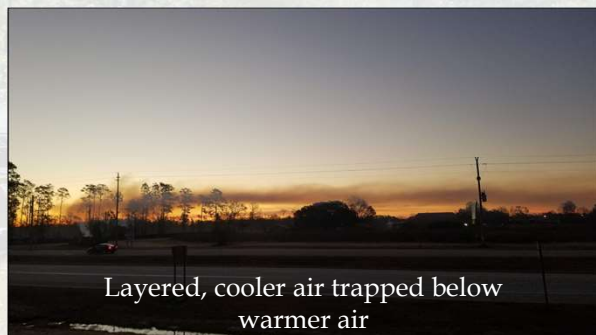
- Nozzle selection
- Sprayer boom height
- Sprayer pressure
- Wind speed and direction
- Temperature inversions



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Surface Temperature Inversion

- When air at ground level is cooler than air above
- Previous clear skies with little or no wind
- Usually occurs between sunset and sunrise
- Indicators are ground fog, hanging dust or smoke, presence of dew or frost



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Drift

- Nozzle selection
- Sprayer boom height
- Sprayer pressure
- Wind speed and direction
- Temperature inversions
- Drift control agents
- Buffers



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Review

- Prepare the site with landowner objectives in mind.
- Utilize an application method that will deliver the correct amount of product to the target species while minimizing the impact on desirable species.
- Follow the steps to minimize drift. It is your herbicide wherever it goes.

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Please direct questions to:

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