Using Herbicides Effectively

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ALABAMA INVASIVE PLANT COUNCIL 2017
Partner/Participation

- The cost of the application or the value after application.

- Sustainable Solutions – part of the Bayer VM mission statement.

- What are our objectives with a herbicide application?
Discovery to Market

- 1 active ingredient out of 100,000 reach the shelf for sale.
- About 9 years of compound reviews to bring a new pesticide product.
- No adverse risks to humans or the environment.
- $300 - $350 million in investment per active.
Application Considerations

- **Is the product labeled for the site I want to apply it on?**
  - Forestry
  - Aquatic
  - Residential

- **Maximum rates per acre.**

- **What PPE is required for the products or combination of products I am using?**
Species Composition

80% Sweetgum 20% Other Upland Species Primarily Oak

60% Yaupon 25% Waxy Oaks 5% Bay 10% Other

90% Pine 10% Other Mixed Upland Species

90% Sweetgum 5% Pine 5% Other mostly Elm

70% Sweetgum 20% Maple 10% Other mostly Sumac
Herbicide Resistance

- Applying herbicides with multiple mechanisms of action?

- Or alternating products in alternate years?
Application Considerations

- Coverage is as important as product selection.
- Nozzle tip size?
- Interior of the plant or just exterior?
- Spraying away from sensitive areas.
- Does surfactant or other adjuvant selection make a difference?
- Post-emerge, pre-emerge, or both.
Nozzle Configuration

X3 Adjustable cone

4004 turned vertical
Metsulfuron-methyl

Max use rate 4 oz/ac

PPE - long sleeved shirt, shoes plus socks

Great on trees, brush, and vines

Primarily post-emerge
Indaziflam + Glyphosate + Diquat

Max use rate 5.4 gal/ac/yr

Great product for bare ground in landscape areas, fence rows, and driveways

Both post and pre-emerge

Esplanade 200SC

Esplanade F
Dermal exposure can be reduced by 99% simply by chemical resistant gloves and a long-sleeve shirt.
Application Accuracy

- Select the proper people.
- Select the proper equipment.
- Calibrate equipment periodically.
- Read and Follow product labeling.
- Maintain detailed spray records.
- Perform a pre-work survey of the area.
Physical Drift

64% are directly Controlled by the Applicator.

Dr. Jay Ferrell, UF
Rate Per Acre

- Measure specific width and distance.
- Calculate acres.
- Time application of water over area.
- Capture water in container for same time.
- Measure the amount of water collected.
- Calculate rate per acre.
Rate per Acre Example

- 20’ X 100’ = 2,000 sq. ft./43,560 sq. ft./ac
- 0.046 acres
- Applied 1.5 gallons of water to this area.

- 1.5 gal/0.046 acres = 32.6 gallons per acre
IPT applications – area of the ground where the plant is located or coverage of the leaf surface area on the plant.
Percent by Volume Example

- 4 gallons of Rodeo
- 2 quarts surfactant
- 95.5 gallons of water
- Spray-to-wet brush application
Water tank and Per Acre

- I have a 15 gallon tank on the back of my 4-wheeler, how much Escort XP do I add to get 2 oz./ac?

- This is a typical application question phone call we will receive?
Answer

- How are you applying the spray?
  - Boom
  - Boom less
  - Hand gun
  - Back pack

- What is your water volume application rate per acre?
It varies based on equipment and applicator.

If you are putting out 20 gpa with the 4-wheeler, then:

- 15 gallon tank/20 gpa = 0.75
- \((0.75)(2 \text{ oz/ac}) = 1.5 \text{ oz Escort XP per 15 gallon tank}\)
• I think I am putting out 20 gpa, but I am actually applying 30 gpa?
  ○ Then too high of a rate will be applied (or 2.67 oz/ac rate) (33% more water applied)

• I think I am putting out 20 gpa, but I am actually applying 10 gpa?
  ○ Then too low of a rate will be applied (or 1.0 oz/ac rate) (50% less water applied)
Mixing Procedures

- Escort XP Label (dry product)
  - Fill tank ¼ to 1/3 full of water
  - With agitator running, add the proper amount of Escort XP
  - Add other herbicides
  - Add the proper amount of spray adjuvants
  - Add remaining water
Measuring Herbicides

- Liquid volume measurements
- Dry weights
- What about water volume measurements in the tank?
Where is the 3 gallon mark?
Surfactant Rates & Types

Old School – ¼% - NIS
Recent – 1% MSO or OS/MSO Blend
Why?
Other Thoughts on Surfactants

Never exceed labeled rate of the most restrictive product....might be the herbicide label might be the adjuvant label – consult both
Applicators Should...

- Have product information
  - Labels, manufacturer literature
  - SDS
- Respond to public inquiries
- Be professional
  - be polite, overall appearance
## Acute Oral Toxicity of Some Herbicides Compared to Common Chemicals

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Oral LD₅₀ (Rats)</th>
<th>Human In Active</th>
<th>Human In Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sugar</td>
<td>30,000 mg/kg</td>
<td>About 84 oz</td>
<td>About 84 dry oz</td>
</tr>
<tr>
<td>KRENITE S</td>
<td>24,400 mg/kg</td>
<td>About 68 oz</td>
<td>About 2.1 gal.</td>
</tr>
<tr>
<td>Arsenal AC</td>
<td>&gt;5,000 mg/kg</td>
<td>About 14 oz</td>
<td>About 28 oz.</td>
</tr>
<tr>
<td>OUST® XP</td>
<td>&gt;5,000 mg/kg</td>
<td>About 14 oz</td>
<td>About 19 dry oz.</td>
</tr>
<tr>
<td>ESCORT® XP</td>
<td>&gt;5,000 MG/KG</td>
<td>About 14 oz</td>
<td>About 23 dry oz.</td>
</tr>
<tr>
<td>Glyphosate (4 lb)</td>
<td>4,320 mg/kg</td>
<td>About 12 oz</td>
<td>About 24 oz</td>
</tr>
<tr>
<td>Table salt</td>
<td>3,750 mg/kg</td>
<td>About 10.5 oz</td>
<td>About 10.5 oz</td>
</tr>
<tr>
<td>Aspirin</td>
<td>1,700 mg/kg</td>
<td>About 4.75 oz</td>
<td>About 4.75 oz</td>
</tr>
<tr>
<td>VELPAR® DF</td>
<td>1,690 mg/kg</td>
<td>About 4.75 oz</td>
<td>About 6.4 dry oz</td>
</tr>
<tr>
<td>Garlon 3A</td>
<td>630 mg/kg</td>
<td>About 1.75 oz</td>
<td>About 4.7 oz</td>
</tr>
<tr>
<td>2,4-D (4 lb)</td>
<td>375 mg/kg</td>
<td>About 1.0 oz</td>
<td>About 2 oz</td>
</tr>
<tr>
<td>Caffeine</td>
<td>200 mg/kg</td>
<td>About .6 oz.</td>
<td>About 320 cups of coffee</td>
</tr>
<tr>
<td>Gramoxone SL</td>
<td>95 mg/kg</td>
<td>About .25 oz</td>
<td>Less than 1 oz</td>
</tr>
</tbody>
</table>

**Yellow jacket venom 3.5 mg/kg**

Source: Karl V. Miller, University of Georgia
Herbicide Label

- The Label is the law.
- Always read and follow the Label.
- Ask questions if you do not understand.
FIFRA – Section 2 (ee)

- Use at any dosage, concentration, or frequency less than specified on the labeling.
- Use against any target pest not specified on the labeling (make sure you are on the correct site).
- Methods of application not prohibited on the labeling.
- Mixtures with fertilizer, unless prohibited on the labeling.
Spill Clean-up
Thank You Kindly

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