USE PATTERNS FOR AMINOCYCLOPYRACHLOR

Brent Sellers and Sarah Lancaster
Range Cattle Research & Education Center
Outline

1. Aminocyclopyrachlor overview

2. Application methods, rates

3. Species of concern controlled

4. Results of ACP research

5. Use considerations
Aminocyclopyrachlor

- MAT 28
- MAT
- AMCP
- ACPC
- ACP

WHAT'S IN A NAME?

THAT WHICH WE CALL A ROSE BY ANY OTHER NAME WOULD SMELL AS SWEET

WILLIAM SHAKESPEARE
Aminocyclopyrachlor

- New class of herbicides
  - Pyrimidine carboxylic acid

- Control of broadleaf weeds, trees and brush, vines, and some grasses in rights of ways, natural areas

- Low use rates

- Moderate persistence in environment
  - Low toxicity to mammals, birds, fish
Aminocyclopyrachlor Products

Perspective®
premix with chlorsulfuron

Streamline®
premix with metsulfuron

Viewpoint®
premix with metsulfuron and imazapyr
Other products

- Plainview
  - Non-crop market
  - Premix with chlorsulfuron and suflometuron

- Range and pasture products
  - Perspective R&P
    - Premix with chlorsulfuron
  - Invora
    - Premix with triclopyr
  - Rejuvra
    - Premix with metsulfuron
Other products

- Imprelis
  - Professional turfgrass market
  - Recently removed from the market due to tree sensitivity issues

- Considered ester formulations
Synthetic auxin herbicides

- Oldest synthetic organic herbicides
- Foliar and root absorption
- Affects plant growth regulation
  - Multiple targets within plant
- Moderate risk of resistance
- Symptoms in days
- Limited grass activity
ALS-inhibiting herbicides

- Relatively new herbicide family
- Foliar and root absorption
- Affects amino acid production
  - Reduces enzyme activity
- High risk of resistance
- Symptoms in 1-2 weeks
- Selectivity varies by chemical
Allowable uses

- Terrestrial sites
  - Uncultivated areas
    - agricultural and non-agricultural
  - Industrial sites
  - Natural areas
## Targeted uses

<table>
<thead>
<tr>
<th>Product</th>
<th>Targeted use areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perspective</td>
<td>roadside rights of way</td>
</tr>
<tr>
<td></td>
<td>native grass restoration</td>
</tr>
<tr>
<td>Streamline</td>
<td>utility and roadside rights of way</td>
</tr>
<tr>
<td>Viewpoint</td>
<td>utility rights of way</td>
</tr>
</tbody>
</table>
Turfgrass tolerance of Perspective

- Rate dependent tolerance:
  - Bahiagrass
  - Bermudagrass

- No tolerance
  - St. Augustine
Application methods

- Foliar application
  - Ground equipment – low and high volume
  - Helicopter (in rights of way only) – 15-25 GPA

- Cut stubble application

- Spot application
## Use rates

<table>
<thead>
<tr>
<th>Product</th>
<th>Minimum use rate</th>
<th>Maximum use rate</th>
</tr>
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<tbody>
<tr>
<td><strong>Perspective</strong></td>
<td>1.75 ounces per acre</td>
<td>11.0 ounces per acre</td>
</tr>
<tr>
<td>39.5% aminocyclopyrachlor + 15.8% chlorsulfuron</td>
<td>0.35 ounces per 5 gal</td>
<td>2.2 ounces per 5 gal</td>
</tr>
<tr>
<td><strong>Streamline</strong></td>
<td>1.75 ounces per acre</td>
<td>11.5 ounces per acre</td>
</tr>
<tr>
<td>39.5% aminocyclopyrachlor + 12.6% metsulfuron-methyl</td>
<td>0.35 ounces per 5 gal</td>
<td>2.3 ounces per 5 gal</td>
</tr>
<tr>
<td><strong>Viewpoint</strong></td>
<td>13 ounces per acre</td>
<td>20 ounces per acre</td>
</tr>
<tr>
<td>31.6% imazapyr +</td>
<td>2.6 ounces per 5 gal</td>
<td>4.0 ounces per 5 gal</td>
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<tr>
<td>22.8% aminocyclopyrachlor + 7.3% metsulfuron</td>
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</table>
Adjuvants

- **MSO**
  - 0.5-1.0% v/v

- **NIS**
  - 0.25-0.5% v/v (Perspective)
  - 0.25-1.0% v/v

- **COC**
  - 1.0-2.0% v/v (Perspective and Streamline)
Labeled Species Perspective

scouring rush
bull thistle
Scotch thistle
cogongrass – seedhead suppression
Labeled Species

Streamline

bull thistle
dogfennel/yankeeweed
poison ivy
firewheel
Old World climbing fern
Scotch thistle
scouringrush
St. Johnswort
bahiagrass
**Labeled Species Viewpoint**

<table>
<thead>
<tr>
<th>blackberry</th>
<th>Scotch thistle</th>
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<tr>
<td>bull thistle</td>
<td>scouringrush</td>
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<tr>
<td><strong>Chinese tallow</strong></td>
<td>sowthistle</td>
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<tr>
<td>dogfennel/yankeeweed</td>
<td>St. Johnswort</td>
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<tr>
<td>poison ivy</td>
<td>bahiagrass</td>
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<tr>
<td><strong>Japanese honeysuckle</strong></td>
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<td>Kudzu</td>
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<tr>
<td>Old world climbing fern</td>
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</table>
RESEARCH RESULTS
Bahiagrass Tolerance

Stand reduction (%)

- Perspective 2.4 oz
- Perspective 4.75 oz
- Perspective 9.5 oz

Data from J. Ferrell
Perspective 9.5 oz/a 60 DAT
Climbing fern 30 DAT

* Similar letters indicate similar means (P ≤ 0.05)
* Similar letters indicate similar means (*P* ≤ 0.05)
Australian pine 120 DAT

Streamline 7.5 oz/A

Viewpoint 13 oz/A
Brazilian pepper 90 DAT

* Similar letters indicate similar means (P ≤ 0.05)
Brazilian pepper 90 DAT

Streamline 11.5 oz/A  Viewpoint 20.0 oz/A
Melaleuca 90 DAT

* Similar letters indicate similar means (P ≤ 0.05)
Sweetgum 12 MAT - Spot Spray

Control (%)

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<th>20</th>
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<td>Roundup 4 qt</td>
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</table>

* Data from J. Ferrell
Oak 12 MAT

* Data from J. Ferrell
* Data from J. Ferrell
# Lantana

<table>
<thead>
<tr>
<th>Herbicide</th>
<th>Rate</th>
<th>6 months</th>
<th>12 months</th>
<th>% control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vista (fall)</td>
<td>2.6 pt</td>
<td>65</td>
<td>30</td>
<td>65</td>
</tr>
<tr>
<td>Vista (fall/spring)</td>
<td>2.6 pt</td>
<td>50</td>
<td>80</td>
<td>50</td>
</tr>
<tr>
<td>Vista + Milestone (fall)</td>
<td>2.6 pt + 7 fl oz</td>
<td>50</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td>Vista + Milestone (fall/spring)</td>
<td>2.6 pt + 7 fl oz</td>
<td>70</td>
<td>95</td>
<td>70</td>
</tr>
<tr>
<td>Perspective (fall)</td>
<td>7.7 oz</td>
<td>98</td>
<td>93</td>
<td>98</td>
</tr>
<tr>
<td>Perspective (fall/spring)</td>
<td>7.7 oz</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

* Data from J. Ferrell
8 MAT

Perspective 7.7 oz/a fall

Perspective 7.7 oz/a fall + spring
Spanish needle 4 MAT

* Data from J. Ferrell
Matchstick weed 4 MAT

Control (%)

- 2.5 oz
- Perspective 4.8 oz
- Milestone 3 fl oz
- Milestone 5 fl oz
- 2,4-D 1 qt

* Data from J. Ferrell
Perspective 4.75 oz 60 DAT
Cogongrass 92 WAT

*Similar letters indicate similar means (P ≤ 0.05)*

Data from A. Greis
## Invasive grasses

### Greenhouse*

<table>
<thead>
<tr>
<th>Species</th>
<th>$I_{50}$</th>
<th>$I_{90}$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(lbs ACP/acre)</td>
<td>(lbs ACP/acre)</td>
</tr>
<tr>
<td>Paragrass</td>
<td>0.1</td>
<td>&gt; Max label rate</td>
</tr>
<tr>
<td>West Indian marshgrass</td>
<td>&gt; Max label rate</td>
<td>&gt; Max label rate</td>
</tr>
<tr>
<td>Torpedograss</td>
<td>&gt; Max label rate</td>
<td>&gt; Max label rate</td>
</tr>
<tr>
<td>Cogongrass</td>
<td>0.08</td>
<td>0.2</td>
</tr>
</tbody>
</table>

0.2 lb ACP/acre = 8 oz/A of Perspective or Streamline

*Based on dry weight of plant regrowth 4 weeks after clipping (8 weeks after treatment).

Data from A. Greis
## Suggested Plant Back Restrictions

<table>
<thead>
<tr>
<th>Species</th>
<th>$I_{50}$</th>
<th>Plant Back Time*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lb ACP/acre</td>
<td>days</td>
</tr>
<tr>
<td>Chalky bluestem</td>
<td>**</td>
<td>0</td>
</tr>
<tr>
<td>Spreading panicum</td>
<td>0.09</td>
<td>139</td>
</tr>
<tr>
<td>Purple lovegrass</td>
<td>0.06</td>
<td>176</td>
</tr>
<tr>
<td>Longleaf pine</td>
<td>0.06</td>
<td>178</td>
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<tr>
<td>Wiregrass</td>
<td>0.06</td>
<td>194</td>
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<tr>
<td>Live oak</td>
<td>0.02</td>
<td>319</td>
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<tr>
<td>Goldenrod</td>
<td>0.008</td>
<td>&gt;365</td>
</tr>
<tr>
<td>Blazing star</td>
<td>***</td>
<td>&gt;365</td>
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</tbody>
</table>

*Based on 90 day half life of ACP applied at 0.25 lb/a
** no injury observed
*** injury observed at all rates evaluated

*Data from A. Greis
SPECIAL CONSIDERATIONS
Not labeled for aquatic applications!

ENVIRONMENTAL HAZARDS

Do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters or rinsate.

This herbicide is injurious to plants at extremely low concentrations. Nontarget plants may be adversely effected from drift and run-off.
Herbicide drift
Herbicide drift

- Restrictions listed on label
  - Coarse droplets
  - Low nozzle height
  - Winds less than 10 MPH
Movement in soil

- Heavy rainfall
- Wet soils
- Root uptake by non-target plants
A new herbicide chemistry

- Plant growth regulating mode of action

- Three premixed products
  - Perspective, Streamline, Viewpoint
  - Labeled for use in non-cropland
Controls broadleaf weeds and brush

- Oak, palmetto, lantana – good control ≥ 1 YAT

- Climbing fern, Brazilian pepper, melaleuca, Australian pine – early results promising

- Expect transient injury to bermudagrass and bahiagrass
Cautions

- Take care to avoid drift!