Chemical Weed Control in Alfalfa – 2019

Bill McCloskey
Extension Weed Science
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Adapted from Orloff & Tickes, 2014 – California Alfalfa Conference
Alfalfa Herbicide Use Tulare County, CA 2002 versus 2012

Adapted from Orloff & Tickes, 2014 – California Alfalfa Conference
Alfalfa Herbicide Use Imperial County, CA 2002 versus 2012

Adapted from Orloff & Tickes, 2014 – California Alfalfa Conference
# Alfalfa Herbicide Timeline

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Adapted from Orloff & Tickes, 2014 – California Alfalfa Conference
Arizona Alfalfa Production Challenges

• The usual winter and summer desert weeds

• Few acres of Roundup Ready Alfalfa
  – Lack of export market for GMO RR alfalfa
  – Lack of non-dormant varieties
  – Lack of heat tolerance

• Glyphosate & ALS resistant Palmer amaranth
  – ALS inhibitors = Raptor, Pursuit, Staple, Envoke, Sandea
Glyphosate resistant Palmer amaranth in Buckeye, AZ cotton fields - 2012
Glyphosate Resistant Palmer Amaranth in Marana (2017)
Cochise County center pivot (2014)
RR corn, post-season tillage & monsoon rainfall
Sprayed with glyphosate
Cochise County center pivot (2014)
RR corn, post-season tillage & monsoon rainfall
Sprayed with glyphosate
Cochise County center pivot (2014)
RR corn, post-season tillage & monsoon rainfall
Sprayed with glyphosate
Palmer amaranth on field edge of silage crop
Palmer amaranth on berms in alfalfa field, Flood versus drip irrigation
Glyphosate resistant Palmer amaranth in Arizona
A common sight when driving Interstate-10

- Parker – alfalfa
- Buckeye – cotton (GH: Roundup & Raptor, Staple)
- Maricopa – corn, cotton
- Coolidge – cotton
- Red Rock – pecans
- Marana – cotton
- Pearce – corn, cotton
- Safford – ditch bank, cotton
- San Simon – pecans
Also hairy fleabane
Sahuarita (top) & Buckeye (bottom) Palmer amaranth response to Pyrithiobac-Na 22 DAT
Palmer amaranth Growth Inhibition 22 DAT with Staple (pyrithiobac-Na)
Central Arizona
San Tan Valley alfalfa field sprayed with Raptor and Pursuit – Fall 2013
Palmer amaranth differential response to Raptor and Pursuit – Fall 2013
Loss of alfalfa density and 1st harvest problems due to Palmer amaranth escapes following Raptor & Pursuit application in summer planted fields.
Sahuarita Palmer amaranth response to Raptor 22 DAT

0.05 kg/ha

0.05 kg ai/ha ~ 6 fl. oz./A
Gantzel (San Tan Valley) Palmer amaranth response to Raptor

0.05 kg/ha ~ 6 fl. oz./A
Selected Alfalfa Herbicides (Palmer?)

- **Preemergence** *(Preplant Balan not recommended)*
  - Treflan TR10, Triap 10G (PREE) – grasses, broadleaves
  - Prowl H₂O, Treflan
  - Eptam 7E & 20G (PPI & PREE) – grasses, broadleaves, nutsedge
  - Chateau, Velpar AlfaMax Gold (diuron+hexazinone), Solicam (all PREE) – grasses, broadleaves

- **Postemergence**
  - Buctril – broadleaves only
  - 2,4-DB – broadleaves only
  - Pursuit – mostly broadleaves
  - Raptor – broadleaves, grasses
  - Poast & Select Max – grasses only
  - Glyphosate (Roundup) – grasses, broadleaves, nutsedge
Alfalfa Herbicide Use Tulare County, CA
2002 versus 2012

Adapted from Orloff & Tickes, 2014 – California Alfalfa Conference
Alfalfa Herbicide Use Imperial County, CA 2002 versus 2012

Adapted from Orloff & Tickes, 2014 – California Alfalfa Conference
Arizona Alfalfa Production Challenges

- Low acres of Roundup Ready Alfalfa
  - Lack of export market for GMO – RR alfalfa
  - Lack of non-dormant varieties
  - Lack of heat tolerance

- Glyphosate & ALS resistant Palmer amaranth
  - ALS inhibitors = Raptor, Pursuit, Staple, Envoke, Sandea

- Commonly used and new herbicides

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<thead>
<tr>
<th>Major</th>
<th>Minor</th>
<th>New</th>
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<tr>
<td>2,4-DB</td>
<td>Treflan</td>
<td>Diuron</td>
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<tr>
<td>Pursuit</td>
<td>Prowl</td>
<td>Velpar (hexazinone)</td>
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<tr>
<td>Raptor</td>
<td>Select</td>
<td>Gramoxone</td>
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<tr>
<td></td>
<td>Chateau</td>
<td>Warrant</td>
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Alfalfa Seedling Weed Control

• Roundup Ready alfalfa
  – Flexible rate 22 to 44 oz/A (4.5 lb a.e./gallon)
  – Flexible application timing (3 to 9 trifoliate leaf)
    – AMS at 8 to 17 lb/100 gal H₂O

• Avoid poor performance at low (and high) temp.
Alfalfa Seedling Weed Control

• Seedling alfalfa – never harvested
  – Pursuit – 3 to 6 oz/A – mostly broadleaves
  – Raptor – 4 to 6 oz/A – broadleaves & grasses
  – Pursuit 3 oz/A + Raptor 3 oz/A
    – NIS or COC (0.25-0.5% v/v or 1% v/v)
      UAN32 or AMS (2.5 gal or 12-15 lb/100 gal H₂O)
      – Apply at 2nd trifoliate leaf, Weeds 1 – 3 inches
  – Prowl H₂O – 1.1 to 2.1 pints/A
    – Seedlings 2nd trifoliate leaf to 6 inches tall
    – Will not control emerged weeds
Established Alfalfa (after the 1\textsuperscript{st} cutting)

- Before weeds emerge – spring, summer:
  - Triflualin 10G granules – 2 lb ai/A, 20 lb/A (21 day PHI)
  - Prowl H\textsubscript{2}O – 1.1-4.2 qt/A (2-3 lb ai/A), chemigation (14 day PHI)
  - Treflan – 2 qt/A (2 lb ai/A), chemigation (21 day PHI)
  - Solicam – spray or chemigation (28 day PHI)
    - After 5 months: 1.25 lb/A fb 1.25 lb/A
    - 2\textsuperscript{nd} year 1.25 to 2.5 lb/A
    - Nutsedge or spot treatment for problem weeds such as bermudagrass and field sandbur

- Herbicide sprayed on alfalfa leaves is retained on foliage and does not stop weed seed germination in the soil.
  - Large carrier volume & large droplets or chemigation
Established Alfalfa - Winter

• Before weeds emerge (winter):
  – Velpar Alfamax Gold – 1 to 2.2 to 3.2 lb/A (30 day PHI)
  – Chateau – 4 oz/A (8 oz per year) (25 day PHI)
  – Solicam – 1.25 + 1.25, 2.5 lb/A (2.5 lb/year) (28 day PHI)

• No surfactant

• After green-chop, sheeping, etc.

• Regrowth < 2” to 6”
Established Alfalfa

- After the weeds emerge:
  - RR alfalfa only: Roundup PowerMax
    - 22 to 44 oz/A + AMS; maximum of 132 oz/year
    - 5 times-26 oz/A; 4 times-33 oz/A; 3 times-44 oz/A
  - Conventional alfalfa:
    - Pursuit – 3 to 6 oz/A but long soil residual
    - Raptor – 4 to 6 oz/A broadleaves, grasses +NIS or COC+AMS
      spray when alfalfa has minimal regrowth, No PHI
    - Poast – 1 .5 to 2.5 pt/A + COC + AMS or UAN
      PHI= 14 days; 6.5 pt/A per season
    - Select Max – 16 to 32 oz/A + COC, + AMS
      PHI=15 days; 64 oz/A per season
    - Sandea – stunting & yield loss, rescue situations, summer slump
Saflufenacil (Sharpen)

- Sharpen – recent experiments/label
  - Spray right after cutting and removal of bales,
  - 1 to 2 fl. oz./A + Methylated Seed Oil (MSO) + AMS,
  - water back 2 to 3 days after spraying
  - Label says use on dormant alfalfa
  - PHI: 28 days
  - 1 application per year
  - *Will look ugly initially!*

- Better burndown than other chemistries
  - Paraquat (broad spectrum), Aim (broadleaves only)
Acetochlor (Warrant)

- **Warrant** – see 24c label (newest registration)
  - 1.25 to 2 qt./A depending on soil type & OM
  - Seedling alfalfa: emergence to 4 trifoliate leaf
  - Seedling year: after 1\textsuperscript{st} or 2\textsuperscript{nd} cutting
  - Established: max of 3 applications per season
  - Maximum of 4 quarts per year
  - Apply within 7 days of cutting
  - Do not harvest or graze for 20 days
- Ground application only
A=4 trifoliate leaf

B=After 1st cutting

Rates=lb ai/A

<table>
<thead>
<tr>
<th>Control</th>
<th>Warrant A (2.25)</th>
<th>Warrant B (2.25)</th>
<th>Warrant A (1.13) + Raptor (0.047)</th>
</tr>
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Alfalfa Yield

MAC – 2017 B90

Warrant tank mixed with Roundup

"B" applications made after this harvest

DATE OF HARVEST

6/12/2017, 7/7/2017, 8/8/2017
A=4 trifoliate leaf
B=after 1st cutting

Rates=lb ai/A

**Palmer amaranth Control**
MAC – 2017 B90

- Control
- Warrant A (2.25)
- Warrant B (2.25)
- Warrant A (1.13) + Raptor (0.047)
- Warrant A (1.13)
- Warrant B (1.13)
- Select A (0.091) + Raptor (0.047)

Warrant tank mixed with Roundup

"B" applications made on 6/15/2017

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<th>DATE OF RATING</th>
<th>4/24/2017</th>
<th>5/8/2017</th>
<th>8/8/2017</th>
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<tr>
<td>PALMER CONTROL (%)</td>
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A=4 trifoliate leaf
B=after 1\textsuperscript{st} cutting

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**Morningglory Control**
MAC – 2017 B90

- **Warrant tank mixed with Roundup**
- **Mac – 2017 B90**

**Legend:**
- Control
- Warrant A (2.25)
- Warrant B (2.25)
- Warrant A (1.13) + Raptor (0.047)
- Warrant A (1.13)
- Select A (0.091) + Raptor (0.047)

**Graph:**
- X-axis: Date of Rating
  - 4/24/2017
  - 5/8/2017
- Y-axis: Morning Glory Control (%)
- Data points:
  - "B" applications made on 6/15/2017

**Note:**
- "B" applications made on 6/15/2017
Managing Weed Populations for Sustainable Control

• Proactive weed management

• Managing weed seed banks
  – Sanitation
  – Zero tolerance for seed production
  – Across crop rotation sequences

• Product stewardship
  – Diversity in herbicide MOA (tank mixtures) & other tactics

• Sustainable weed control = keeping weed populations susceptible to herbicides