Evaluation of Sharpen Herbicide in Dormant Alfalfa

Alfalfa and Forage Meeting
September 12, 2014

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Why we need weed control in alfalfa:

- Stand development
- Yield
- TDN
- Palatability
- Poisonous
- Off-flavoring

Cheeseweed
Dodder
Fiddleneck
Groundsel
Hairy fleabane
Henbit
Horseweed
Junglerice
Knotweed
Nettle
Nightshade
Sprangletop
Swinecress
Nutsedge
Yellow foxtail
Herbicides are usually needed during the dormant period:

Weed growth before dormant herbicide(s) applied

After dormant herbicide application
Previous work in dormant alfalfa:

The untreated treatment had annual sowthistle, chickweed, burning nettle, malva, annual bluegrass.

Canevari; UCCE Emeritus
ALFALFA SHARPEN TOLERANCE BETWEEN CUTTINGS - 2013

TONS/ACRE

Appl. A = 5/28/13; Sharpen @ 0.0445 lba/A.; All additives @ 1.0% V/V; All treatments AmmoSulfate @ 8.5lb/100gal
We conducted a field trial in 2013/14 to evaluate the effect of dormant treatments of saflufenacil (Sharpen) on alfalfa growth response.

Note: Sharpen was not registered in alfalfa in California at the time of this trial.
Basic trial information:

- Location: UC KARE in Parlier, CA
- Alfalfa: 3-yr old stand (Roundup Ready)
- Split-plot design with 4 replications:
  - Main plot was treatment timing (Dec 13, Jan 14, Feb 14)
  - Sub-plot was herbicide (Unt., Sharpen 2 & 4 oz, Gramoxone 32 oz)
- Sub-plots were 14 feet wide and 25 feet long
- CO2 back-pack sprayer; TT11002 (4); 2 passes/plot
- Spray volume of 23.8 gpa at 40 psi
- Evaluations included:
  - crop recovery, stem count, height, and yield, plant composition, weed control
Results:

Effect of application timing on alfalfa regrowth

Regrowth rating

- 7 Dat
- 14 Dat
- 30 Dat
- Harvest

Dec-13  Jan-14  Feb-14
Results:

Effect of herbicide on alfalfa regrowth

- Untreated
- Sharpen at 2 oz
- Sharpen at 4 oz
- Gramoxone at 32 oz
Alfalfa recovery
(Treated with Sharpen; 2 weeks after Feb app.):

Treated Dec 2013
Treated Jan 2014
Treated Feb 2014
Alfalfa recovery
(2 weeks after Feb application):

No herbicide

Sharpen at 2 fl oz/A

Sharpen at 4 fl oz/A

Gramoxone Inteon at 32 fl oz/A
Alfalfa recovery
(2 weeks before harvest):

Treated Dec 2013
Treated Jan 2014
Treated Feb 2014
Alfalfa recovery
(prior to 2nd cutting):

Treated Feb 2014
## Results:

### Effect of application timing on alfalfa stem count, height, and yield

<table>
<thead>
<tr>
<th>Timing</th>
<th>Stem count(^1) (at harvest)</th>
<th>Harvest(^2) weight (lbs)</th>
<th>Crop height(^3) (2(^{nd}) cutting)</th>
<th>Crop height(^3) (3(^{rd}) cutting)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. A (Dec 13)</td>
<td>43.8 a</td>
<td>41.1</td>
<td>22.8 a</td>
<td>31.5</td>
</tr>
<tr>
<td>2. B (Jan 14)</td>
<td>44.1 a</td>
<td>40.8</td>
<td>21.8 a</td>
<td>31.2</td>
</tr>
<tr>
<td>3. C (Feb 14)</td>
<td>40.9 b</td>
<td>37.5</td>
<td>20.0 b</td>
<td>30.9</td>
</tr>
<tr>
<td>CV (%)</td>
<td>8.58</td>
<td>13.70</td>
<td>8.97</td>
<td>6.26</td>
</tr>
<tr>
<td>LSD (p=0.05)</td>
<td>2.65</td>
<td>n.s.</td>
<td>1.39</td>
<td>n.s.</td>
</tr>
</tbody>
</table>

\(^1\) Number green, productive stems in a 1 ft\(^2\) area, and based on three samples per sub-plot.

\(^2\) Wet weight in pounds, using a Cater plot harvester, swath 6 ft wide by 25 ft long.

\(^3\) Measured in inches from soil line to top of plant, and based on three samples per sub-plot.
### Results:

**Effect of herbicide on alfalfa stem count, height, and yield**

<table>
<thead>
<tr>
<th>Herbicide</th>
<th>Rate/A</th>
<th>Stem count(^2) (at harvest)</th>
<th>Harvest(^3) weight (lbs)</th>
<th>Crop height(^4) (2(^{nd}) cutting)</th>
<th>Crop height(^4) (3(^{rd}) cutting)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. No herbicide</td>
<td>0</td>
<td>44.5 a</td>
<td>43.6 a</td>
<td>22.8</td>
<td>30.1</td>
</tr>
<tr>
<td>2. Sharpen(^1)</td>
<td>2 fl oz</td>
<td>44.0 a</td>
<td>39.4 ab</td>
<td>21.2</td>
<td>31.5</td>
</tr>
<tr>
<td>3. Sharpen(^1)</td>
<td>4 fl oz</td>
<td>40.1 b</td>
<td>39.6 ab</td>
<td>21.1</td>
<td>32.0</td>
</tr>
<tr>
<td>4. Gramoxone(^1)</td>
<td>32 fl oz</td>
<td>43.2 ab</td>
<td>36.7 b</td>
<td>21.0</td>
<td>31.2</td>
</tr>
<tr>
<td>CV (%)</td>
<td></td>
<td>8.58</td>
<td>13.70</td>
<td>8.97</td>
<td>6.26</td>
</tr>
<tr>
<td>LSD (p=0.05)</td>
<td></td>
<td>3.06</td>
<td>4.53</td>
<td>n.s.</td>
<td>n.s.</td>
</tr>
</tbody>
</table>

\(^1\) AMS added at 8.5 lb/100 gal + MSO at 1% v/v.

\(^2\) Number green, productive stems in a 1 ft\(^2\) area, and based on three samples per sub-plot.

\(^3\) Wet weight in pounds, using a Cater plot harvester, swath 6 ft wide by 25 ft long.

\(^4\) Measured in inches from soil line to top of plant, and based on three samples per sub-plot.
# Results:

**Effect of app timing and herbicide on weed control and plant composition**

<table>
<thead>
<tr>
<th>Herbicide</th>
<th>Rate/A</th>
<th>Timing</th>
<th>Weed cntrl 30 DAT</th>
<th>Weed cntr at harvest</th>
<th>Alfalfa DW (%)</th>
<th>Weed DW (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. No herbicide</td>
<td>0</td>
<td>A (Dec-13)</td>
<td>0.0 b</td>
<td>0.0 b</td>
<td>96.10</td>
<td>3.90</td>
</tr>
<tr>
<td>2. Sharpen</td>
<td>2 fl oz</td>
<td>A (Dec-13)</td>
<td>10.0 a</td>
<td>10.0 a</td>
<td>100.00</td>
<td>0.00</td>
</tr>
<tr>
<td>3. Sharpen</td>
<td>4 fl oz</td>
<td>A (Dec-13)</td>
<td>9.9 a</td>
<td>9.8 a</td>
<td>99.56</td>
<td>0.44</td>
</tr>
<tr>
<td>4. Gramoxone</td>
<td>32 fl oz</td>
<td>A (Dec-13)</td>
<td>9.9 a</td>
<td>9.8 a</td>
<td>99.83</td>
<td>0.17</td>
</tr>
<tr>
<td>5. No herbicide</td>
<td>0</td>
<td>B (Jan-14)</td>
<td>0.0 b</td>
<td>0.0 b</td>
<td>97.47</td>
<td>2.53</td>
</tr>
<tr>
<td>6. Sharpen</td>
<td>2 fl oz</td>
<td>B (Jan-14)</td>
<td>9.9 a</td>
<td>9.9 a</td>
<td>99.82</td>
<td>0.18</td>
</tr>
<tr>
<td>7. Sharpen</td>
<td>4 fl oz</td>
<td>B (Jan-14)</td>
<td>9.9 a</td>
<td>9.8 a</td>
<td>99.82</td>
<td>0.18</td>
</tr>
<tr>
<td>8. Gramoxone</td>
<td>32 fl oz</td>
<td>B (Jan-14)</td>
<td>9.9 a</td>
<td>9.9 a</td>
<td>100.00</td>
<td>0.00</td>
</tr>
<tr>
<td>9. No herbicide</td>
<td>0</td>
<td>C (Feb-14)</td>
<td>0.0 b</td>
<td>0.0 b</td>
<td>99.37</td>
<td>0.63</td>
</tr>
<tr>
<td>10. Sharpen</td>
<td>2 fl oz</td>
<td>C (Feb-14)</td>
<td>10.0 a</td>
<td>10.0 a</td>
<td>100.00</td>
<td>0.00</td>
</tr>
<tr>
<td>11. Sharpen</td>
<td>4 fl oz</td>
<td>C (Feb-14)</td>
<td>10.0 a</td>
<td>9.9 a</td>
<td>100.00</td>
<td>0.00</td>
</tr>
<tr>
<td>12. Gramoxone</td>
<td>32 fl oz</td>
<td>C (Feb-14)</td>
<td>9.9 a</td>
<td>9.9 a</td>
<td>99.89</td>
<td>0.11</td>
</tr>
</tbody>
</table>

**Statistical notation**

<table>
<thead>
<tr>
<th>CV (%)</th>
<th>LSD (p=0.05)</th>
<th>n.s.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.02</td>
<td>0.13</td>
<td>0.28</td>
</tr>
<tr>
<td>2.22</td>
<td>1.25</td>
<td>n.s.</td>
</tr>
<tr>
<td>182.68</td>
<td>n.s.</td>
<td></td>
</tr>
</tbody>
</table>
Weed control (after Jan treatment):

No herbicide

Sharpen at 2 fl oz/acre
Summary

► Alfalfa regrowth was reduced 24-38% at 30 DAT when treated in Jan and Feb, while only the Feb treatment timing continued to reduce regrowth (11%) at 1st cutting.

► Sharpen-treated plots reduced regrowth by 50% at 30 DAT and by 11% at 1st cutting.

► Stem counts were lower in Feb-treated plots or where Sharpen was used at the highest rate tested (4 fl oz).

► Herbicide timing or herbicide type did not appear to result in reduced yields.

► All herbicides tested gave excellent weed control under a “lower-than-normal” rainfall year.

► Applying Sharpen to dormant alfalfa later than December in the southern San Joaquin Valley delays alfalfa recovery and may be too risky to use that time of year. Treating with Sharpen after final cutting or clipping (no later than Dec) would be safer.
I want to acknowledge James Schaeffer (SRA) who did most of the heavy lifting in this trial.
Weed Management

About my Program

Crop and non-crop areas alike are impacted by weed growth to one degree or another. Weeds affect crop production in several ways; weeds delay or reduce stand establishment, affect crop growth and development, reduce food quality and yield, compete for resources like water and soil nutrients, reduce irrigation uniformity and efficiency, harbor rodents and other destructive pests, increase the risk of frost hazard in temperature sensitive crops, and increase the cost of production. In non-crop settings, weeds may be poisonous to people and livestock, interfere with water recreation and water transport, cause potential traffic hazards, pose a fire hazard, are unsightly, and reduce land values.

To effectively manage weeds, one must be able to correctly identify the weeds present, develop a broad understanding of weed growth and survival, become familiar with the tools (both chemical and non-chemical) available, and implement a strategy that is both economically and environmentally sound. This is sometimes referred to as "Integrated Weed Management".