Onion Weed Control Timing and Materials

Preplant
Metam
Paraquat
Roundup
Shark
Scythe

Post plant
Dacthal
Prefar
preemergence to weeds

Postemergence 2nd true leaf
Goal
Buctril
Prowl
Select Max
Poast
Fusilade
Goal 2XL
1 pint = 0.25 lb a.i.

Goal 4F
0.5 pint = 0.25 lb a.i.
1\textsuperscript{st} true leaf

2\textsuperscript{nd} true leaf
Shepherds Purse

1st true leaf

2nd true leaf
Goal Tender
Weed Burn Down
Goal Tender weed burn down and regrowth if weed is too big at time of application
# Goal Formulation and Timing
## 2005 Evaluations

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Timing</th>
<th>Total Weeds per 20 ft²</th>
<th>Hours/A to Weed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal Tender</td>
<td>1&lt;sup&gt;st&lt;/sup&gt;</td>
<td>2.5</td>
<td>2.4</td>
</tr>
<tr>
<td>Goal Tender</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt;</td>
<td>10.0</td>
<td>4.1</td>
</tr>
<tr>
<td>Goal 2XL</td>
<td>1&lt;sup&gt;st&lt;/sup&gt;</td>
<td>1.8</td>
<td>2.4</td>
</tr>
<tr>
<td>Goal 2XL</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt;</td>
<td>6.3</td>
<td>3.3</td>
</tr>
<tr>
<td>Untreated</td>
<td>---</td>
<td>81.8</td>
<td>20.7</td>
</tr>
</tbody>
</table>
### Onion Yield - Goal Tender vs Goal 2XL

<table>
<thead>
<tr>
<th>Treatments</th>
<th>True Leaves</th>
<th>2003 T/A</th>
<th>2004 T/A</th>
<th>2005 T/A</th>
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<tbody>
<tr>
<td>Goal Tender</td>
<td>1&lt;sup&gt;st&lt;/sup&gt;</td>
<td>31.9</td>
<td>49.7</td>
<td>61.3</td>
</tr>
<tr>
<td>Goal 2XL</td>
<td>1&lt;sup&gt;st&lt;/sup&gt;</td>
<td>28.8</td>
<td>44.8</td>
<td>60.6</td>
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<tr>
<td>Goal Tender</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt;</td>
<td>32.2</td>
<td>49.9</td>
<td>62.7</td>
</tr>
<tr>
<td>Goal 2XL</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt;</td>
<td>30.4</td>
<td>49.3</td>
<td>62.9</td>
</tr>
</tbody>
</table>

All treatments @ 0.25 lb a.i./A
Loop Stage Prowl H2O Applications
# 2006 Onion Weed Evaluations

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Rate</th>
<th>Total Weeds 4 ft²</th>
<th>Weed Time Hrs/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Untreated</td>
<td>----</td>
<td>36.0</td>
<td>97.3</td>
</tr>
<tr>
<td>Prowl H2O Loop</td>
<td>24 oz</td>
<td>16.3</td>
<td>16.3</td>
</tr>
<tr>
<td>Prowl H2O Loop</td>
<td>24 oz</td>
<td>0.3</td>
<td>2.3</td>
</tr>
<tr>
<td>FB Goal Tender 1st</td>
<td>4 oz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dacthal</td>
<td>10.5</td>
<td>3.3</td>
<td></td>
</tr>
<tr>
<td>FB Goal 2XL 2nd</td>
<td>8 oz</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## 2006 Onion Weed Evaluations

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Rate</th>
<th>Bulbs 1000’s/A</th>
<th>Bulbs T/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Untreated</td>
<td>----</td>
<td>97.0</td>
<td>42.0</td>
</tr>
<tr>
<td>Prowl H2O Loop</td>
<td>24 oz</td>
<td>116.0</td>
<td>49.1</td>
</tr>
<tr>
<td>Prowl H2O Loop FB Goal Tender 1st</td>
<td>24 oz</td>
<td>110.7</td>
<td>50.7</td>
</tr>
<tr>
<td>Dacthal</td>
<td>10.5</td>
<td>83.9</td>
<td>43.4</td>
</tr>
<tr>
<td>FB Goal 2XL 2nd</td>
<td>8 oz</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2007 Onion Weed Screen
2007 Weed Control Screen
Total Weeds
2007 Weed Control Screen
Total Weeds

![Graph showing weed control comparisons]
2007 Weed Control Screen
Hours per Acre to Weed
Summary Weed Screen

• Low ultra rates of Goal and Chateau used as a preemergence provided weed control and safety to the onions

• Prowl H2O at the loop stage followed by Goal Tender at the 1st true leaf stage continued to look very good

• Scythe as an over-the-top use on onions was a bit dicey, but did provide good weed control at 3.0%
2007 Season

Metam
Paraquat
Roundup
Shark
Scythe

Dacthal
Prefar
preemergence
to weeds

1st true leaf
Loop
Prowl H20
Goal Tender

2nd true leaf
Goal
Buctril
Prowl
Select Max
Poast
Fusilade

Outlook
Background Nutsedge
Nutlet forming at end of rhizome
• Once the plant has developed more than 5 leaves it begins to form nutlets
• Nutsedge does not tolerate shade
• Unfortunately onions do not provide sufficient shade to inhibit the growth of nutsedge
Background on Outlook

- It is a chloroacetamide and has similarities to Dual Magnum
- It needs to be applied prior to the emergence of nutsedge as it has no postemergence activity
- Registered for use at the 2nd true leaf stage
- It can delay tuber sprouting and kill shoots of yellow nutsedge
- It can cause tuber mortality
Nutsedge Control in Onions

- The spring weather was wetter and cooler in 2006 and the nutsedge emerged slowly.
- As a result, applying Outlook + Goal at the 2nd true leaf stage caught the nutsedge at an earlier growth stage.
- Outlook applications at the 2nd true leaf stage were effective.
Number of Young Nutsedge - 2006

Rates of Outlook

23-May
13-Jun
• Later applications when the nutsedge was established were not effective
2007 Nutsedge Trials

• In 2007 Outlook (Dimethenamid-p) was registered for the first time in California for use on onions

• It is registered for use at the 2nd true leaf stage
2007 Nutsedge Trials

• However, the weather was dry in the spring and nutsedge emerged prior to the 2nd true leaf stage in most cases

• As a result, we looked for ways to work with the situation and try to make the Outlook work

• Strategies tested:
  – 1) 1st true leaf applications
  – 2) Burn back nutsedge with acid fertilizer then apply Outlook
• Nutsedge emerged more quickly in 2007
• By the time we were at the 2\textsuperscript{nd} true leaf stage the nutsedge was well developed
<table>
<thead>
<tr>
<th>Treatment</th>
<th>Material/A</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-7-0-7</td>
<td>35 gallons</td>
<td>1st True Leaf</td>
</tr>
<tr>
<td>Fb Outlook 6.0</td>
<td>7.0 oz</td>
<td></td>
</tr>
<tr>
<td>Fb Outlook 6.0</td>
<td>7.0 oz</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1st True Leaf</td>
<td></td>
</tr>
<tr>
<td>7-7-0-7</td>
<td>35 gallons</td>
<td>1st True Leaf</td>
</tr>
<tr>
<td>Fb Outlook 6.0</td>
<td>14.0 oz</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1st True Leaf</td>
<td></td>
</tr>
<tr>
<td>7-7-0-7</td>
<td>35 gallons</td>
<td>2nd True Leaf</td>
</tr>
<tr>
<td>Fb Outlook 6.0</td>
<td>7.0 oz</td>
<td></td>
</tr>
<tr>
<td>Fb Outlook 6.0</td>
<td>7.0 oz</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2nd True Leaf</td>
<td></td>
</tr>
<tr>
<td>7-7-0-7</td>
<td>35 gallons</td>
<td>2nd True Leaf</td>
</tr>
<tr>
<td>Fb Outlook 6.0</td>
<td>14.0 oz</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2nd True Leaf</td>
<td></td>
</tr>
<tr>
<td>Untreated</td>
<td>----</td>
<td>----</td>
</tr>
</tbody>
</table>
Weed Control
Outlook After Acid Fertilizer

April 23 and May 4

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1st true leaf</th>
<th>2nd true leaf</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outlook 7.0+7.0 oz</td>
<td>April 4</td>
<td>April 11</td>
</tr>
<tr>
<td>Outlook 14.0 oz</td>
<td>April 4</td>
<td>April 11</td>
</tr>
<tr>
<td>untreated</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*1st true leaf April 4; 2nd true leaf April 11*
Weed Control Outlook After Acid Fertilizer

April 23; May 4; June 1; and August 9

<table>
<thead>
<tr>
<th></th>
<th>1st true</th>
<th>2nd true</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outlook 7.0+7.0 oz</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Outlook 14.0 oz</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>Outlook 7.0+7.0 oz</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td>Outlook 14.0 oz</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td>untreated</td>
<td>9</td>
<td>9</td>
</tr>
</tbody>
</table>
Untreated

Outlook 14.0 oz
1st true leaf
after 7-7-0-7
Onion Trial Heavy Infestation
With 7-7-0-7
Yield - Mean Head Wt (lbs)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Yield (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outlook 7.0+7.0 oz 1st true</td>
<td>0.8</td>
</tr>
<tr>
<td>Outlook 14.0 oz 1st true</td>
<td>0.8</td>
</tr>
<tr>
<td>Outlook 7.0+7.0 oz 2nd true</td>
<td>0.8</td>
</tr>
<tr>
<td>Outlook 14.0 oz 2nd true</td>
<td>0.8</td>
</tr>
<tr>
<td>untreated</td>
<td>*</td>
</tr>
</tbody>
</table>
Onion Trial Heavy Infestation
With 7-7-0-7
Yield – Tons/A
Onion Trial Light Infestation
No 7-7-0-7

Yield - Mean Head Wt (lbs)

Outlook 7.0+7.0 oz 1st true
Outlook 14.0 oz 1st true
Outlook 7.0+7.0 oz 2nd true
Outlook 14.0 oz 2nd true
untreated

7.0+7.0 oz       14.0 oz 7.0+7.0 oz       14.0 oz
1st true            1st true            2nd true             2nd true
Onion Trial Light Infestation
No 7-7-0-7
Yield – Tons/A

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outlook 7.0+7.0 oz 1st true</td>
<td>56</td>
</tr>
<tr>
<td>Outlook 14.0 oz 1st true</td>
<td>54</td>
</tr>
<tr>
<td>Outlook 7.0+7.0 oz 2nd true</td>
<td>58</td>
</tr>
<tr>
<td>Outlook 14.0 oz 2nd true</td>
<td>60</td>
</tr>
</tbody>
</table>

Outlook untreated yield:
- First true: 7.0 oz
- Second true: 14.0 oz
Comparison of Light vs Heavy Yield – Mean Head Wt (lbs)

Outlook with 7.0+7.0 oz:
- 1st true: >50% reduction
- 2nd true: >50% reduction

Outlook with 14.0 oz:
- 1st true: >50% reduction
- 2nd true: >50% reduction

Outlook untreated:
- 1st true: >50% reduction
Comparison of Light vs Heavy Yield – Tons/A

- Outlook 7.0+7.0 oz 1st true
- Outlook 14.0 oz 1st true
- Outlook 7.0+7.0 oz 2nd true
- Outlook 14.0 oz 2nd true
- untreated
Nutsedge Nutlets in Soil Following Outlook Treatments
Nutsedge Tubers Per 1000 cm³ of Soil

<table>
<thead>
<tr>
<th>Treatment</th>
<th>2nd True</th>
<th>1st True</th>
<th>14.0 oz 1st True</th>
<th>7.0+7.0 oz 1st True</th>
<th>7.0+7.0 oz 2nd True</th>
</tr>
</thead>
<tbody>
<tr>
<td>untreated</td>
<td>290</td>
<td>120</td>
<td>70</td>
<td>150</td>
<td>80</td>
</tr>
</tbody>
</table>
Nutsedge Tubers Weight (grams) Per 1000 cm³ of Soil
Mean Nutsedge Plant Weight per Pot

- Outlook 7.0+7.0 oz 1st true
- Outlook 14.0 oz 1st true
- Outlook 7.0+7.0 oz 2nd true
- Outlook 14.0 oz 2nd true
- untreated
Summary

• Burning back nutsedge with acid fertilizer provides an opportunity to make Outlook work if nutsedge is emerged by the 2nd true leaf stage
• There may be a yield reduction, but less than letting the nutsedge go uncontrolled
• We will pursue the first true leaf registration
2008 Season

• Nortron (Bayer Corp) will be registered in 2008

• We have little experience with this material on onions in California

• One piece of research indicated that it was phytotoxic on sandy soils
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