Crop Profile for Onions in Oregon

Prepared November 9, 1999

General Production Information

- Oregon is second in the nation in production of dry or storage onions.
- Onion farmers in the state produce 15.4% of the U.S. onion crop.
- In 1997, growers harvested 19,691 acres, which produced 10,981,000 hundred-pound sacks (CWT) valued at $86,568,000 with a value of $70,532,000. Onions ranked 10th in sale value for Oregon agricultural commodities in 1996 but dropped to 12th in 1997.
- Production cost for Malheur County onions is $2,985.32 per acre.
- Most Oregon onions are cured for storage and sold as fresh onions out of storage, but some are dehydrated or sold fresh to the early market in late May and June.

Production Regions

Oregon onions grow in muck soils and mineral soils. Eastern and western growers plant in mineral soils; western Oregon’s Willamette Valley growers plant in muck soils (3).

Eastern Oregon’s Malheur County is the state’s leading onion producer with 12,110 acres of the crop. Other significant onion-growing areas are Morrow and Umatilla Counties (which boarder the Columbia River) and Marion, Washington, and Yamhill Counties in the Willamette Valley (7).

Cultural Practices

Mineral soils support either fall or spring-planted onions. Mineral soils used for onion production must have good internal drainage. Growers plant by the direct-seed method in these areas. In the Willamette Valley muck soils, onion growers plant only in the spring. They transplant some of the later varieties but grow others from seed (3).

Spring seeding begins as soon as growers can prepare the land. It takes 3 to 6 months for an onion bulb to develop fully. The type of onion crop, length of day, temperature conditions, soil type, and amount of moisture determine harvest times. Growers irrigate all Oregon onions (3, 8, 9).

Insect Pests

Mites, cutworms, armyworms, onion maggots, thrips, leafminers, and wireworms are insects that feed on Oregon onions (10).
Chemical controls:
Oregon growers use these insecticides on onions: chlorpyrifos (Lorsban), cypermethrin (Ammo), diazinon, lambda-cyhalothrin (Karate), oxamyl (Vydate), and permethrin (Ambush/Pounce) (11).

Soil fumigation can control bulb mites; however, mites are not usually a problem (10).

Onion growers applied insecticides to 95% of the onion fields in 1996, using 27,400 pounds of chemicals (12).

In 1998, Oregon farmers reported use of the following insecticides (13):

<table>
<thead>
<tr>
<th>Insecticide</th>
<th>Brand name</th>
<th>Area treated (%)</th>
<th>Number of applications</th>
<th>Pounds per acre per application</th>
<th>Pounds per acre per crop year</th>
<th>Total application (by 1,000 lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>chlorpyrifos</td>
<td>Lorsban</td>
<td>78</td>
<td>1.0</td>
<td>0.96</td>
<td>0.97</td>
<td>14.9</td>
</tr>
<tr>
<td>diazinon</td>
<td>Diazinon</td>
<td>12</td>
<td>1.1</td>
<td>0.60</td>
<td>0.67</td>
<td>1.6</td>
</tr>
<tr>
<td>lambda-cyhalothrin</td>
<td>Karate</td>
<td>91</td>
<td>2.7</td>
<td>0.03</td>
<td>0.08</td>
<td>1.4</td>
</tr>
<tr>
<td>malathion</td>
<td>Cythion</td>
<td>21</td>
<td>1.3</td>
<td>1.31</td>
<td>1.78</td>
<td>7.2</td>
</tr>
<tr>
<td>methomyl</td>
<td>Lannate</td>
<td>19</td>
<td>1.1</td>
<td>0.63</td>
<td>0.74</td>
<td>2.8</td>
</tr>
<tr>
<td>methyl parathion</td>
<td>Penncap</td>
<td>28</td>
<td>1.6</td>
<td>0.49</td>
<td>0.80</td>
<td>4.5</td>
</tr>
<tr>
<td>oxamyl</td>
<td>Vydate</td>
<td>16</td>
<td>1.7</td>
<td>0.97</td>
<td>1.69</td>
<td>5.4</td>
</tr>
<tr>
<td>zeta-cypermethrin</td>
<td>Fury</td>
<td>7</td>
<td>1.4</td>
<td>0.04</td>
<td>0.06</td>
<td>0.1</td>
</tr>
</tbody>
</table>

For more details on insect control in Oregon onions, see the 1999 PNW Insect Control Handbook, pages 79–80. (Go to http://eesc.orst.edu/agcomwebfile/edmat/ for ordering information.)

Cultural controls:
Growers rotate onion crops whenever possible to provide at least 0.5 miles of separation between new seeding and previous crops. They also remove harvest culls from their fields. These practices help reduce some pest populations and are essential parts of the current insect control program (14, 15).

Diseases
Several kinds of rot, mold, blight, mildew, rust, blotch, smut, and pink root attack onions. Although some bacteria and
yeast cause onion disease, fungi cause most of the injury in most fields. Substantial losses caused principally by bacterial diseases do occur. The fungi that cause smut and white rot can live in the soil for years, causing long-term problems for growers (21).

**Chemical controls:**
In 1993, farmers applied chlorothalonil (Bravo), copper, maneb, mancozeb (Dithane), metalaxyl (Ridomil), vinclozolin (Ronilan), and zineb to onions for disease control. Both eastern and western Oregon growers used mancozeb in the greatest quantities (11).

In 1997, growers applied fungicides to 79% of Oregon onions—a total of 64,100 pounds (12).

In 1998, Oregon farmers reported use of the following fungicides (13):

<table>
<thead>
<tr>
<th>Fungicide</th>
<th>Brand name</th>
<th>Area treated (%)</th>
<th>Number of applications</th>
<th>Pounds per acre per application</th>
<th>Pounds per acre per crop year</th>
<th>Total application (by 1,000 lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>chlorothalonil</td>
<td>Bravo</td>
<td>62</td>
<td>1.8</td>
<td>1.32</td>
<td>2.45</td>
<td>30.2</td>
</tr>
<tr>
<td>copper hydroxide</td>
<td>Kocide</td>
<td>58</td>
<td>2.3</td>
<td>0.65</td>
<td>1.52</td>
<td>17.6</td>
</tr>
<tr>
<td>mancozeb</td>
<td>Dithane</td>
<td>88</td>
<td>2.5</td>
<td>1.57</td>
<td>4.02</td>
<td>70.3</td>
</tr>
<tr>
<td>maneb</td>
<td>Maneb</td>
<td>12</td>
<td>2.3</td>
<td>1.15</td>
<td>2.70</td>
<td>6.3</td>
</tr>
<tr>
<td>mefenoxam</td>
<td>Ridomil Gold</td>
<td>3</td>
<td>1.</td>
<td>0.20</td>
<td>0.30</td>
<td>0.2</td>
</tr>
<tr>
<td>metalaxyl</td>
<td>Ridomil</td>
<td>53</td>
<td>1.5</td>
<td>0.18</td>
<td>0.28</td>
<td>2.9</td>
</tr>
</tbody>
</table>


**Cultural controls:**
Employing these cultural controls will help limit disease (21):

- Plant resistant cultivars
- Use crop rotations
- Protect plants from insect, fertilizer, and mechanical injury
- Store bulbs at proper temperature and humidity and with adequate ventilation
- Promptly and adequately dry bulbs after harvest
- Get rid of cull piles and debris
- Avoid extended overhead irrigation; reduce hours of leaf wetness
- Allow tops to mature before harvest
- Avoid poorly-drained soil
- Eradicate unwanted plants
- Use appropriate levels of nitrogen fertilizer and irrigation
- Use treated seed
- Plant only disease-free material in disease-free soil
- Wash equipment after use
Remove infected plants and soil if practical

Nematodes

Stubby-root nematodes overwinter in soil and cause the most problems during a cool, damp spring (21).

Chemical controls:
Fumigating soils with 1,3-dichlorpropene (Telone) and applying oxamyl (Vydate) are chemical means of controlling stubby-root nematodes (21).


Cultural controls:
Avoid planting onions after a mint crop (21).

Other:
Onions intended for long-term storage should be treated with maleic hydrazide (MH-30) to inhibit sprouting. Untreated onions in common storage cannot be held after early January. They will hold in cold storage for 6–8 months (3).

Growers applied 855,800 pounds of other chemicals to 53% of the Oregon onions in 1997 (12).

In 1998, Oregon farmers reported use of the following other pesticides (13):

<table>
<thead>
<tr>
<th>Pesticide</th>
<th>Brand name</th>
<th>Area treated (%)</th>
<th>Number of applications</th>
<th>Pounds per acre per application</th>
<th>Pounds per acre per crop year</th>
<th>Total application (by 1,000 lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>maleic hydrazide</td>
<td>Royal MH-30</td>
<td>41</td>
<td>1.0</td>
<td>1.78</td>
<td>1.78</td>
<td>14.5</td>
</tr>
<tr>
<td>metam-sodium</td>
<td>Vapam</td>
<td>27</td>
<td>1.0</td>
<td>110.53</td>
<td>110.73</td>
<td>592.2</td>
</tr>
</tbody>
</table>

For Malheur Experiment Station reports and other information about Oregon onions, go to Onion Links at http://www.primenet.com/~mesosu/crops/onionlinks.htm (23).

Weeds

A number of weeds in Oregon onions are not adequately controlled despite growers’ control efforts. These weeds may interfere with crop production, yield, crop quality, or harvest efficiency. Troublesome weeds in onions include
bluegrass, mallow, purslane, horsetail, kochia, lambsquarters, quackgrass, spurge, dodder, barnyardgrass, yellow foxtail, and nutsedge (15, 16).

**Chemical controls:**
Farmers use glyphosate (Roundup) for ground preparation. Herbicides used for weed control include bensulide (Prefar), bromoxynil (Buctril) (east of the Cascades only), fluazifop-butyl (Fusilade), metolachlor (Dual), oxyfluorfen (Goal), paraquat (Gramoxone), pendimethalin (Prowl), sethoxydim (Poast), and trifluralin (Treflan). Onion growers apply oxyfluorfen to 66% of the acres. DCPA (Dacthal) is no longer registered, but growers applied it frequently before registration was lost (11, 16, 17).

Growers applied 330,500 pounds of herbicides to Oregon onions in 1996, treating 96% of the acres (12).

The detection of nitrate in the groundwater above 10 ppm led the Oregon Department of Environmental Quality to designate northeast Malheur County as the first Groundwater Management Area in Oregon under the 1989 Oregon Groundwater Quality Protection Act. The detection of the diacid residue of DCPA (Dacthal) was another issue of concern at that time, but the detected level was below established public health risks for drinking water. Since scientists first reported the results of groundwater monitoring, growers, scientists, and field personnel have made a concerted effort to develop pesticide uses and irrigation practices that will prevent further contamination. The levels of DCPA residues have dropped from 111 ppb to 43 ppb in the most affected area (15, 18).

In 1998, Oregon farmers reported use of the following herbicides (13):

<table>
<thead>
<tr>
<th>Herbicide</th>
<th>Brand name</th>
<th>Area treated (%)</th>
<th>Number of applications</th>
<th>Pounds per acre per application</th>
<th>Pounds per acre per crop year</th>
<th>Total application (by 1,000 lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>bromoxynil</td>
<td>Buctril</td>
<td>78</td>
<td>1.9</td>
<td>0.13</td>
<td>0.25</td>
<td>3.9</td>
</tr>
<tr>
<td>clethodim</td>
<td>Select</td>
<td>5</td>
<td>1.0</td>
<td>0.15</td>
<td>0.15</td>
<td>0.2</td>
</tr>
<tr>
<td>DCPA</td>
<td>Dacthal</td>
<td>9</td>
<td>1.0</td>
<td>4.34</td>
<td>4.61</td>
<td>8.4</td>
</tr>
<tr>
<td>fluazifop-P-butyl</td>
<td>Fusilade</td>
<td>20</td>
<td>1.0</td>
<td>0.29</td>
<td>0.31</td>
<td>1.2</td>
</tr>
<tr>
<td>glyphosate</td>
<td>Roundup</td>
<td>52</td>
<td>1.0</td>
<td>0.55</td>
<td>0.57</td>
<td>6.0</td>
</tr>
<tr>
<td>oxyfluorfen</td>
<td>Goal</td>
<td>67</td>
<td>2.2</td>
<td>0.07</td>
<td>0.15</td>
<td>2.0</td>
</tr>
<tr>
<td>pendimethalin</td>
<td>Prowl</td>
<td>84</td>
<td>1.4</td>
<td>0.86</td>
<td>1.20</td>
<td>19.8</td>
</tr>
<tr>
<td>sethoxydim</td>
<td>Poast</td>
<td>13</td>
<td>1.4</td>
<td>0.18</td>
<td>0.26</td>
<td>0.7</td>
</tr>
<tr>
<td>trifluralin</td>
<td>Treflan</td>
<td>7</td>
<td>1.0</td>
<td>0.55</td>
<td>0.55</td>
<td>0.7</td>
</tr>
</tbody>
</table>

For more details on weed control in Oregon onions, see Onion Herbicides at http://www.orst.edu/dept/hort/weeds/onions.htm (19).

**Alternatives:**
Some onion farmers have tried applying large quantities of monocarbamide dihydrogensulfate/AMADS (Enquik) as a nitrogen fertilizer, which provides weed control. This material has a limited registration. Growers apply it to onions grown in both mineral and muck soils (11, 17, 20).

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References


15. Shock, C. Malheur Experiment Station, Ontario, OR. Personal communication, April 29, 1999.


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