### Commercial Grape Insect and Disease Control — 2022

Becky Carroll  
Associate Extension Specialist, Fruit & Pecans

Jennifer Olson  
Associate Extension Specialist

Aaron Essary  
Assistant Extension Specialist, Viticulture and Enology

Brenda R. Sanders  
Horticultural Communications

<table>
<thead>
<tr>
<th>Timing</th>
<th>Pest/Problem</th>
<th>Material</th>
<th>MOA Group*</th>
<th>Rate/Acre</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>DORMANT</td>
<td>Phomopsis</td>
<td>Brandt Lime Sulfur</td>
<td>M02</td>
<td>4 - 10 gal.</td>
<td>The dormant application is aimed at reducing overwintering inoculum on canes if there has been a history of phomopsis, powdery mildew or mealybugs in the vineyard. Powdery mildew and mealybugs. Phomopsis</td>
</tr>
<tr>
<td></td>
<td>Powdery mildew</td>
<td></td>
<td></td>
<td>15 - 20 gal.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mealybugs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Trunk disease, Eutypa</td>
<td>Topsin M 70WSB</td>
<td>1</td>
<td>3.2 oz. in 1 gal. water. OR 1.5 lbs. in 50 gpa.</td>
<td>Apply as a paint to wounded surfaces after pruning and before the next rain. Apply as directed spray to wounded surfaces after pruning and before the next rain. Applicators must have a copy of the FIFRA 24(c) Special Local Need Label when applying Topsin M. Apply as spray within 24 hours after pruning.</td>
</tr>
<tr>
<td></td>
<td>Canker Diseases</td>
<td>Mettle 125ME</td>
<td>3</td>
<td>5 oz.</td>
<td></td>
</tr>
<tr>
<td>DELAYED DORMANT TO BUD SWELL</td>
<td>Anthracnose</td>
<td>Sulforix</td>
<td>M02</td>
<td>1 - 2 gal.</td>
<td>Aimed at reducing overwintering inoculum on canes if there has been a history of anthracnose in vineyard. Scout for insects at least twice weekly as bud swell occurs. Only spray for insects if present.</td>
</tr>
<tr>
<td></td>
<td>European red mite, mealybug, scale insects</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Flea beetle and climbing cutworms</td>
<td>Baythroid XL</td>
<td>3A</td>
<td>2.4 - 3.2 fl. oz.</td>
<td>Do not exceed 12.8 oz per acre per year. Can be used for mealybugs. Use lower rate for flea beetles, and higher rate for cutworms. Can also be used for mites. See label for specific application instructions for climbing cutworms. Use lower rate for flea beetles, and higher rate for cutworms. See bee precautions below.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Danitol 2.4EC</td>
<td>3A</td>
<td>5.3 - 21.3 fl. oz.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sevin XLR Plus</td>
<td>1A</td>
<td>1 - 2 qt.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Flea beetle</td>
<td>Imidan 70W</td>
<td>1B</td>
<td>1.3 - 2.1 lb.</td>
<td>Do not exceed 6.5 lbs./acre per year. See bee precautions below.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Scorpion 35SL</td>
<td>4A</td>
<td>2 - 5 fl. oz.</td>
<td></td>
</tr>
<tr>
<td>Timing</td>
<td>Pest/Problem</td>
<td>Material</td>
<td>MOA Group*</td>
<td>Rate/Acre</td>
<td>Comments</td>
</tr>
<tr>
<td>--------</td>
<td>--------------</td>
<td>-------------------</td>
<td>------------</td>
<td>---------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Climbing cutworms</td>
<td>AltaCor</td>
<td>28</td>
<td>3 - 4.5 oz.</td>
<td>Do not exceed four applications per year.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Brigade 2EC</td>
<td>3A</td>
<td>3.2 - 6.4 fl. oz.</td>
<td>Do not exceed 6.4 oz./acre/season.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Delegate WG</td>
<td>5</td>
<td>3 - 5 oz.</td>
<td>Do not exceed 19.5 oz./acre/year.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DiPel DFORM</td>
<td>11A</td>
<td>0.5 - 2 lb.</td>
<td>Do not exceed 23 oz. or more than five applications per year. Works best against young larvae.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Entrust SCOMINI</td>
<td>5</td>
<td>4 - 8 fl. oz.</td>
<td>Do not use if using later for root borer application.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lorsban Advanced</td>
<td>1B</td>
<td>1 qt.</td>
<td>Do not exceed one application of Lorsban/year.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mustang Maxx</td>
<td>3A</td>
<td>2 – 4 fl. oz.</td>
<td>Do not apply more than 24 fl. oz./acre/season.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BUD BREAK TO PRE-BLOOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black rot</td>
</tr>
<tr>
<td>Phomopsis cane and leaf spot</td>
</tr>
<tr>
<td>Downy mildew</td>
</tr>
<tr>
<td>Abound Flowable 11</td>
</tr>
<tr>
<td>Captain 50WP M04</td>
</tr>
<tr>
<td>Captain 80WDG M04</td>
</tr>
<tr>
<td>Dithane DF, M-45 M03</td>
</tr>
<tr>
<td>Dithane F-45 M03</td>
</tr>
<tr>
<td>Flint 11</td>
</tr>
<tr>
<td>Luna Experience 7+3</td>
</tr>
<tr>
<td>Manzate Flowable M03</td>
</tr>
<tr>
<td>Manzate Max M03</td>
</tr>
<tr>
<td>Mettle 125ME 3</td>
</tr>
<tr>
<td>Pristine 11+7</td>
</tr>
<tr>
<td>Rally 40WSP 3</td>
</tr>
<tr>
<td>Sovran 11</td>
</tr>
<tr>
<td>Ziram 76DF M03</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Powdery mildew</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abound Flowable 11</td>
</tr>
<tr>
<td>Endura 7</td>
</tr>
<tr>
<td>Flint 11</td>
</tr>
<tr>
<td>KaligreenOMRI NC</td>
</tr>
<tr>
<td>Kenja 400SC 7</td>
</tr>
<tr>
<td>Luna Experience 7+3</td>
</tr>
<tr>
<td>Mettle 125ME 3</td>
</tr>
<tr>
<td>Pristine 11+7</td>
</tr>
<tr>
<td>Timing</td>
</tr>
<tr>
<td>------------------------</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>FOUR- TO TEN-INCH SHOOTS</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>PRE-BLOOM THROUGH BLOOM</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Just before bloom through the bloom period. Since bees do not pollinate grapes there is no danger to bees at this time unless they are working other blooming plants in the area being sprayed. See bee precautions below. Important sprays. Same as Grape Bud Break to Pre-bloom. Pay attention to pre-harvest intervals.
<table>
<thead>
<tr>
<th>Timing</th>
<th>Pest/Problem</th>
<th>Material</th>
<th>MOA Group*</th>
<th>Rate/Acre</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>BLOOM</td>
<td>Black rot</td>
<td>Same as bud break to pre-bloom</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Phomopsis cane and leaf spot</td>
<td>Same as bud break to pre-bloom</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Powdery mildew</td>
<td>Same as bud break to pre-bloom</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Botrytis bunch rot</td>
<td>Same as bud break to pre-bloom</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Downy mildew</td>
<td>Same as bud break to pre-bloom</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rose chafer</td>
<td>Same as for 4- to 10-inch shoot spray (if needed)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Flea beetle larvae</td>
<td>Same as for 4- to 10-inch shoot spray (if needed)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Redbanded leafroller</td>
<td>Same as for 4- to 10-inch shoot spray (if needed)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Grape berry moth</td>
<td>Same as for 4- to 10-inch shoot spray (if needed)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Grape scale</td>
<td>Same as for 4- to 10-inch shoot spray</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Grape phylloxera (leaf form)</td>
<td>Same as for 4- to 10-inch shoot spray</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Assail 30SG</td>
<td>4A</td>
<td>2.5 - 5.3 oz.</td>
<td>Apply at pre-bloom and repeat 10-14 days later. Do not exceed 12.5 oz. per acre per year.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Danitol 2.4EC</td>
<td>3A</td>
<td>10.7 - 21.33 fl. oz.</td>
<td>Apply at pre-bloom and repeat 10 to 14 days later. See label regarding adjuvants. Allow 30 days between applications. Do not exceed 12.5 oz./acre per year.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Movento</td>
<td>23</td>
<td>6.0 – 8.0 fl. oz.</td>
<td>See label regarding adjuvants. Allow 30 days between applications. Do not exceed 12.5 oz./acre per year.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Platinum</td>
<td>4A</td>
<td>8.0 - 17.0 fl. oz.</td>
<td>Soil-applied. Do not exceed 17 oz./acre per year. 60 day PHI.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Platinum SG</td>
<td>4A</td>
<td>2.67 – 5.67 oz.</td>
<td>Soil applied. Do not exceed 5.67 oz./acre/year. 60 day PHI.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Scorpion 35SL</td>
<td>4A</td>
<td>2.0 - 5.0 fl. oz.</td>
<td>Foliar application. (1 day PHI)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>9.0 - 10.5 fl. oz.</td>
<td>Soil application (28 day PHI) Do not exceed 20.25 fl. oz./acre per year. See bee precautions below.</td>
<td></td>
</tr>
</tbody>
</table>

**Insects are often a problem in vineyards at this stage. The use of pheromone traps for grape berry moth and redbanded leafroller will indicate their presence and help determine the need for control.**

Control the root gall form of grape phylloxera by using rootstocks derived from American grapes. Native American grapes (Eastern U.S.) are nearly immune to this pest.

**Bloom**

When caps begin to fall.

If wet weather persists during bloom, a fungicide application at mid-bloom (7 to 10 days after caps begin to fall) will be necessary. See Comments at end.

While botrytis bunch rot (BBR) may not be a problem every year in Oklahoma vineyards, this spray is critical in those vineyards that have a history of BBR. It will typically be more severe on tight clustered varieties such as Vinifera and French hybrid grapes.

Apply no more than 3lb./acre/season. 0-day PHI. Powdery mildew, botrytis, and anthracnose.

Do not apply more than 34 fl. oz./acre/year. Rate and number of applications depend on type of grape. Rate is 18 fl. oz. by itself, 9 fl. oz. if tank mixed.

Also registered for control of sour rot.

Apply at first bloom (no later than 5% bloom). Use 5 to 10 oz. for tank mix.

See comments at end regarding use of strobilurins.

Do not apply more than 12 lb. ai. Of Captan 50WP or 175 lb. ai. of Captan 80WDG/season. Check label for timing and interactions with oils and sulfur if using.

Do not exceed 30 fl. oz./acre or five applications/season. Do not apply Pristine to Concord, Noiret or other American grape types as injury may occur.

Test for varietal sensitivity before using.

Test for varietal sensitivity before using.

Do not use any surfactant for grapes.

Do not apply to Concord or Thomcord.
<table>
<thead>
<tr>
<th>Timing Pest/Problem</th>
<th>Material</th>
<th>MOA Group*</th>
<th>Rate/Acre</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Downy mildew (cont'd)</td>
<td>Ridomil Gold Copper 4+M01</td>
<td>2 lb.</td>
<td>42 day PHI.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ridomil Gold MZ 4+M03</td>
<td>2.5 lb.</td>
<td>66 day PHI.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sovran 11</td>
<td>4.0 - 6.4 oz.</td>
<td>See comments on strobilurins at end.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Zampro 45+40 M03</td>
<td>11 - 14 fl. oz.</td>
<td>Do not exceed 2 applications per season.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ziram</td>
<td>3 - 4 lb.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FRUIT SET</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black rot</td>
<td>Same as bud break to pre-bloom.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Powdery mildew</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Downy mildew</td>
<td>Same as bloom.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grape berry moth</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leafhopper</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rose chafer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grape mealybug</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grape rootworm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Redbanded leafroller</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Japanese beetle</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Altacor 28</td>
<td>2 - 4.5 oz.</td>
<td>Grape berry moth, Japanese beetle (3 to 4.5 oz. rate).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Baythroid XL 3A 2.4 - 3.2 fl. oz.</td>
<td></td>
<td>Grape berry moth, leafhopper, mealybug, leafroller.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Brigade 2EC 3A 3.2 - 6.4 fl. oz.</td>
<td></td>
<td>Leafhopper, grape berry moth, Japanese beetle and two-spotted spider mite (higher rate for spider mite).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Danitol 2.4EC 3A 5.3 - 10.7 fl. oz.</td>
<td>(10.7 - 21.3 fl. oz.)</td>
<td>Leathophper, grape berry moth, Japanese beetles, rose chafer, redbanded leafroller and mites. Higher rates to 21.3 fl. oz. may be used to control the latter four pests.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Deliver 11A 0.5 - 2.0 lb.</td>
<td></td>
<td>B.t. product for caterpillar pests only.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ecozin Plus UN 4 - 30 oz.</td>
<td></td>
<td>See label.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Entrust SC 5 4 - 8 fl. oz.</td>
<td></td>
<td>Grape berry moth, redbanded leafroller. Works best against young larvae.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Grandevo 1B 1.33 - 2.13 lb.</td>
<td></td>
<td>Grape berry moth, leafhopper, rose chafer, mealybugs, and redbanded leafroller. Do not apply more than 6.5 lbs./acre/year. REI is 14 days. PHI is 7.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Intrepid 2F 18 8 - 16 fl. oz.</td>
<td></td>
<td>Caterpillar pests only – grape berry moth, leafrollers. For both 2F &amp; Edge, PHI varies (21-30) depending on rate.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Intrepid Edge 18+5 6 - 12 fl. oz.</td>
<td></td>
<td>Grape berry moth, leafhopper and Japanese beetle.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mustang-Maxx 3A 4 fl. oz.</td>
<td></td>
<td>Nexter and Nexter SC are labeled for use against leathophper and mites.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nexter 21A 4.4 - 10.67 oz.</td>
<td></td>
<td>Leathophper, Japanese beetle, mealybugs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nexter SC 21A 7.5 - 17 oz.</td>
<td></td>
<td>Sevin formulations – Leafhopper, rose chafer, Japanese beetle. Higher rate for grape berry moth, redbanded leafroller. Greater REI for grape girdling and cane turning. See bee precautions below.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pyganic 5% EC 3A 4.5 - 17 fl. oz.</td>
<td></td>
<td>For caterpillar pests only.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sevin XLR 1A 1 - 2 qt.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SpinTor 2 SC 5 4 - 8 fl. oz.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mites</td>
<td>Abacuc 6 8.0 - 16.0 fl. oz.</td>
<td></td>
<td>Plus a nonionic surfactant.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Acramite 50WS 20D 0.75 - 1.0 lb.</td>
<td></td>
<td>Plus a nonionic surfactant. Only one spray per season.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Agri-Mek SC 6 1.75 - 3.5 fl. oz.</td>
<td></td>
<td>Must use a nonionic surfactant.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Envidor 2SC 23 16 - 34 fl. oz.</td>
<td></td>
<td>Do not exceed one application/year.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Grandevo 20B 2 - 3 lb.</td>
<td></td>
<td>Do not use in tank mix.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Kanemite 15SC 21A 21 - 31 fl. oz.</td>
<td></td>
<td>Do not exceed two applications/year.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nealta 25A 13.7 fl. oz.</td>
<td></td>
<td>Do not exceed two applications/year.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nexter 21A 4.4 - 10.67 oz.</td>
<td></td>
<td>Do not exceed one application/year.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Onager 10A 12 - 24 oz.</td>
<td></td>
<td>Do not exceed 2 pt./acre/year.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Vendex 50WP 12B 1 - 2.5 lb.</td>
<td></td>
<td>One application per season.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Zeal 10B 2.0 - 3.0 oz.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Timing</td>
<td>Pest/Problem</td>
<td>Material</td>
<td>MOA Group*</td>
<td>Rate/Acre</td>
</tr>
<tr>
<td>--------</td>
<td>--------------</td>
<td>----------</td>
<td>------------</td>
<td>-----------</td>
</tr>
<tr>
<td><strong>GRAPE FRUIT SET TO VERAISON</strong></td>
<td>Black rot</td>
<td>Same as bud break to pre-bloom.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Powdery mildew</td>
<td>Same as bud break to pre-bloom.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Downy mildew</td>
<td>Same as bud break to pre-bloom.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Grape berry moth</td>
<td>Same as grape shatter sprays.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rose chafer</td>
<td>Same as grape shatter sprays.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Leafhopper</td>
<td>Same as grape shatter sprays.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Redbanded leafroller</td>
<td>Same as grape shatter sprays.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Grape rootworm</td>
<td>Same as grape shatter sprays.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Grape mealybug</td>
<td>Same as grape shatter sprays.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mites</td>
<td>Same as grape shatter sprays.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>VERAISON TO HARVEST</strong></td>
<td>Black rot</td>
<td>Same as bud break to pre-bloom.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Powdery mildew</td>
<td>Same as bud break to pre-bloom.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Downy mildew</td>
<td>Same as bud break to pre-bloom.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Botrytis bunch rot</td>
<td>Same as bloom.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ripe rot</td>
<td>Pristine 11+7</td>
<td>8.0 - 12.5 oz.</td>
<td>Do not apply Pristine to Concord, Noiret, or other American grape types as injury may occur.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Viathon P07+3</td>
<td>4 pts.</td>
<td>Check label.</td>
</tr>
<tr>
<td></td>
<td>Sour rot complex</td>
<td>OxiDate 2.0</td>
<td>1:400 dilution</td>
<td>Mix OxiDate in a 1:400 dilution and apply at 30 to 100 gal./acre.</td>
</tr>
<tr>
<td></td>
<td>Grape berry moth</td>
<td>Same as grape shatter sprays.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Grape leafhopper</td>
<td>See recommendations at end of section.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Japanese beetle</td>
<td>Same as grape shatter sprays.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Green June beetle</td>
<td>Sevin XLR 1A</td>
<td>2 qt.</td>
<td>Do not concentrate spray on the bunch or visible residues may result. See bee precautions below.</td>
</tr>
<tr>
<td></td>
<td>Stink bugs</td>
<td>Danitol 2.4EC 3A</td>
<td>10.7 - 21.3 fl. oz.</td>
<td>21-day PHI.</td>
</tr>
<tr>
<td></td>
<td>Mites</td>
<td>Same as grape shatter sprays.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>POST HARVEST</strong></td>
<td>Downy mildew</td>
<td>ProPhyt 33</td>
<td>2 – 4 pts.</td>
<td>To eliminate premature defoliation and decrease inoculum for next season. Phosphorus acid. Other formulations exist such as Phostrol and Viathon. See labels.</td>
</tr>
<tr>
<td></td>
<td>Powdery mildew</td>
<td>OxiDate 2.0</td>
<td>1:200 – 1:400 Dilution</td>
<td>Dithane, Manzate</td>
</tr>
<tr>
<td></td>
<td>Preventative</td>
<td>Mancozeb M03</td>
<td>1.4 - 4 lbs.</td>
<td>After harvest, Mancozeb products can again be applied. Do not apply more than 19.2 lb. ai. Per season.</td>
</tr>
<tr>
<td></td>
<td>Dithane DF, M-45</td>
<td>1.2 - 3.2 qt.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dithane F-45</td>
<td>1.2 - 3.2 qt.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Manzate Max</td>
<td>M03</td>
<td>1.2 - 3.2 qt.</td>
<td></td>
</tr>
</tbody>
</table>
Bee Precautions

Several insecticides listed are toxic to bees. Mow the vineyard floor before application if weeds or cover crops are blooming. Read individual labels for specific bee protection measures for each product.

Grape Root Borer

This pest is not common in Oklahoma. It is generally difficult to evaluate damage from grape root borer. Injury is most often associated with a slow decline of vineyards, when it can be associated at all. If grape root borer is not a problem, there is no reason to risk destroying natural enemies (i.e., predators, parasites, pathogens). Therefore, treat with an insecticide only if necessary. Sampling is critical for several reasons: 1) The control program is relatively expensive; and 2) Use of an insecticide can create as well as solve problems. If you believe that this insect is affecting your vineyard’s performance, you may wish to begin the following program:

Immediately After Harvest

Sample - 10 vines per acre (but not less than 50 vines). Examine - A circular site (3 feet in diameter) around the base of each plant, concentrating on the inner 1 foot, looking for shed pupal skins of the grape root borer moth. If pupal skins are found beneath 5% of the vines examined, apply an insecticide next year.

35 Days Before Harvest

If previous year’s sample indicates a need to spray, apply Lorsban 4E, following label instructions. Older vines are more likely to be infested. Apply an insecticide as late as the label permits, but before harvest.

Green June Beetle, Japanese Beetle and Rose Chafer

As the crop reaches maturity, these beetle pests may become more of a problem, particularly feeding on ripened fruit. When soil conditions are moist before or slightly after veraison, and organic matter in the surrounding area is high then these beetles can be quite common and difficult to control. Careful attention to beetle infestation one month prior to harvest should be given to keep populations in check. Start treatment when first noticed. Use of Danitol up to 21 days before harvest can decrease populations. Rotation to Sevin insecticide up to seven days before harvest will further aid in control.

Grasshoppers

Grasshopper control can and should be concentrated very early in the season before populations migrate into vineyard borders. Young, flightless nymphs may cause severe defoliation of border plants and progress into vineyards if left unchecked. If treatment is directed outside the vineyard, in pasture areas, then applications of Dimilin early in the season can prevent buildup of populations. When controlling grasshoppers inside the vineyard, then careful use of labeled compounds is the only recourse. Some level of effective control has been obtained using NOLO® Bait, a biological control agent containing tiny protozoan spores. This product is slow acting and does not store well, so use it early and often enough to be effective and to deplete your supply.

Botrytis Bunch Rot

Botrytis bunch rot is most commonly a problem on tight-clustered French hybrid and Vitis vinifera cultivars. Fungicide application should be timed to occur right before the berries enlarge to tighten clusters. Proper timing and thorough spray coverage are essential for good control. Direct the spray toward the fruit, and use a minimum of 100 gal/A of water. Include a spreader-sticker with Rovral, especially at the 1.5 lb. rate. **NOTE:** Removal of leaves around clusters on mid- or low-wire cordon-trained vines before bunch closing has been shown to reduce losses caused by Botrytis.

Strobilurins

Abound Flowable

Abound is in the same general class of chemistry as Sovran, Flint and Pristine (strobilurin) and is registered for control of black rot, downy mildew, powdery mildew and Phomopsis cane and leaf spot. (The active ingredient of Abound is azoxystrobin and there are several labeled products with the same ai. These include Aframe, AzoxyStar, Azteroid, Acadia 2SC, Satori and Trevo). Abound is excellent for control of black rot and downy mildew and provides good control of powdery mildew. Abound is recommended at the rate of 10.0 to 15.5 fl. oz. per acre. In University tests, the rate of 11 to 12 fl. oz. provided good control of the above mentioned diseases. **NOTE:** Abound Flowable is very phytotoxic to apples of the variety McIntosh or varieties related to McIntosh. Do not use the same sprayer to apply Abound to grapes that will be used to apply other materials to apples. Do not allow spray to drift from grapes to apples.
**Resistance Management**

**For Strobilurin Fungicides**

Strobilurin fungicides are highly susceptible to resistance development. Do not apply sequential sprays of Abound (or other labeled products with an ai. of azoxystrobin), Sovran, Flint or Pristine before alternating with a fungicide that has a different mode of action. Apply according to the label and no more than two times per year. Always read the label.

**Important Note on Powdery Mildew:**

In some locations, the powdery mildew fungus has developed resistance to the sterol-inhibiting fungicides such as Procure and the strobilurin fungicides (Abound, Sovran and Flint). All of these materials were highly effective for control of powdery mildew when they were first introduced, however in vineyards where these materials have been used for several years, reduced sensitivity or resistance may be present. For this reason, it is recommended that these materials not be used alone when powdery mildew needs to be controlled. To provide adequate control of powdery mildew, they should be mixed with sulfur, SuffOil-X, Quintec, Endura or potassium salts. Pristine is a combination of a strobilurin fungicide plus Endura; therefore, it can be used alone. Sulfur is an inexpensive and very effective fungicide for powdery mildew control. Unfortunately, some varieties are extremely sensitive to sulfur. On sulfur tolerant varieties, the use of sulfur should be considered.

**Sulfur**

There are many formulations of sulfur labeled for use on grapes with several options that are OMRI listed for use in organic growing. Sulfur is available in dry flowable (DF) and flowable (F) formulations, as well as wettable powder (WP) and dusts (D). The dry flowable and flowable formulations greatly reduce the applicator’s exposure as compared to wettable powders and dusts. Use rates are different for different formulations as well as time of application. See the label for specific use rates. Some grape varieties, such as Concord and other Labrusca (American) types, are extremely sensitive to sulfur. Any product with calcium polysulfide or sulfur should never be applied to Chambourcin or Norton once it has broken bud. For other varieties, you can apply sulfur products to foliage at appropriate rate but temperatures need to remain below 85°F during or immediately following application or scorching may occur. Consult label for best time of day to apply. Sulfur loses efficacy for powdery mildew control at temperatures below 65°F. If using Captan, check label for sulfur interaction issues.

**Sovran**

Sovran is in the same general class of chemistry as Abound, Flint, and Pristine (strobilurin). It is registered for control of black rot, powdery mildew, Phomopsis cane and leaf spot, and downy mildew. The Sovran label gives different use rates for control of different diseases. For black rot and Phomopsis cane and leaf spot the rate is 3.2 to 4.8 oz./A; for powdery mildew the rate is 3.2 to 4.8 oz./A and for downy mildew the rate is 4.0 to 6.4 oz./A. Sovran is excellent for control of black rot and powdery mildew, but is less effective than Abound for downy mildew control. Under heavy disease pressure, Sovran may not provide adequate control of downy mildew even at the higher rate. Unlike Abound, Sovran is not phytotoxic on certain apple varieties. Sovran has a 14 day PHI. See label for further information and certain use restrictions.

**Flint**

Flint is in the same general class of chemistry as Abound, Sovran and Pristine (strobilurin). It is registered for control of black rot, powdery mildew and downy mildew. The Flint label provides different use rates for control of different diseases. For powdery mildew the rate is 1.5 to 2.0 oz./A; for black rot the rate is 2.0 oz./A and for downy mildew suppression, the rate is 4.0 oz./A. Flint is excellent for control of black rot and powdery mildew, but is not highly effective against downy mildew, and is not recommended for control of downy mildew. Unlike Abound, Flint is not phytotoxic to certain apple varieties; however, Flint is very phytotoxic to Concord grapes. The label states “Do not apply Flint to Concord grapes or crop injury may occur.” See label for further information and certain use restrictions.

**Pristine**

Pristine contains a combination of two active ingredients (pyraclostrobin, 12.8% and boscalid, 25.2%). Pyraclostrobin is in the same general class of chemistry as Abound, Sovran and Flint (strobilurin). Boscalid has excellent activity against powdery mildew and good activity against Botrytis. With increasing resistance in powdery mildew to the sterol inhibiting fungicides and the strobilurin fungicides (Abound, Sovran and Flint). Pristine is an additional component in our resistance management programs for powdery mildew. Pristine is registered for control of anthracnose, black rot, downy mildew, powdery mildew and Phomopsis cane and leaf spot, with “suppression only” of Botrytis gray mold. A maximum of five applications may be made per season. Do not make more than two sequential applications of Pristine before alternating to a labeled fungicide with a different mode of action. The label also states “DO NOT use on Concord or Noiret due to foliar injury. Possible foliar injury could occur to Worden, Fredonia, Niagara, Steuben, Rougeon or related grape varieties.”
## Additional Pesticide Information

<table>
<thead>
<tr>
<th>Insecticides</th>
<th>MOA</th>
<th>Chemical Name</th>
<th>REI</th>
<th>PHI</th>
<th>Signal Word</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abacus’</td>
<td>6</td>
<td>Abamectin</td>
<td>12 hours/4 days</td>
<td>28 days</td>
<td>Warning</td>
</tr>
<tr>
<td>Acramite 50WS</td>
<td>20D</td>
<td>Bifenazate</td>
<td>12 hours</td>
<td>14 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Agri-Mek SC’</td>
<td>6</td>
<td>Abamectin</td>
<td>12 hrs/4 days</td>
<td>28 days</td>
<td>Warning</td>
</tr>
<tr>
<td>Altacor</td>
<td>28</td>
<td>Chlorantraniliprole</td>
<td>4 hours</td>
<td>14 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Assail 30SG</td>
<td>4A</td>
<td>Acetamiprid</td>
<td>12 hours</td>
<td>3 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Baythroid XL’</td>
<td>3A</td>
<td>Cyfluthrin</td>
<td>12 hours</td>
<td>3 days</td>
<td>Warning</td>
</tr>
<tr>
<td>Brigade 2EC’</td>
<td>3A</td>
<td>Bifenthrin</td>
<td>12 hours</td>
<td>30 days</td>
<td>Warning</td>
</tr>
<tr>
<td>Danitol 2.4EC’</td>
<td>3A</td>
<td>Fenpropathrin</td>
<td>24 hours</td>
<td>21 days</td>
<td>Warning</td>
</tr>
<tr>
<td>Delegate WG</td>
<td>5</td>
<td>Spinetorom</td>
<td>4 hours</td>
<td>7 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Delive&lt;OMRI&gt;</td>
<td>11A</td>
<td><em>Bt</em> ssp. <em>Kurstaki</em></td>
<td>4 hours</td>
<td>0 days</td>
<td>Caution</td>
</tr>
<tr>
<td>DiPel DF&lt;OMRI&gt;</td>
<td>11A</td>
<td><em>Bt</em> ssp. <em>Kurstaki</em></td>
<td>4 hours</td>
<td>0 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Ecozin Plus&lt;OMRI&gt;</td>
<td>UN</td>
<td>Azadirachtin</td>
<td>4 hours</td>
<td>0 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Entrust SC&lt;OMRI&gt;</td>
<td>5</td>
<td>Spinosad</td>
<td>4 hours</td>
<td>7 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Envidor 2 SC</td>
<td>23</td>
<td>Spirodiclofen</td>
<td>12 hours</td>
<td>14 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Grandev&lt;OMRI&gt;</td>
<td></td>
<td>Chromobacterium</td>
<td>4 hours</td>
<td>0 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Imidan 70-W</td>
<td>1B</td>
<td>Phosmet</td>
<td>14 days</td>
<td>14 days</td>
<td>Warning</td>
</tr>
<tr>
<td>Intrepid 2F</td>
<td>18</td>
<td>Methoxyfenozide</td>
<td>4 hours</td>
<td>30 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Intrepid Edge</td>
<td>18+5</td>
<td>Methoxyfenozide, Spinetoram</td>
<td>4 hours</td>
<td>30/21 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Kanemite 15 SC</td>
<td>20B</td>
<td>Acequinocyl</td>
<td>12 hours</td>
<td>7 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Lorsban 4E’</td>
<td>1B</td>
<td>Chlorpyrifos</td>
<td>24 hours</td>
<td>35 days</td>
<td>Warning</td>
</tr>
<tr>
<td>Lorsban Advanced’</td>
<td>1B</td>
<td>Chlorpyrifos</td>
<td>24 hours</td>
<td>35 days</td>
<td>Warning</td>
</tr>
<tr>
<td>Movento</td>
<td>23</td>
<td>Spirotetramat</td>
<td>24 hours</td>
<td>7 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Mustang-Maxx’</td>
<td>3A</td>
<td>Zeta-cypermethrin</td>
<td>12 hours</td>
<td>1 day</td>
<td>Warning</td>
</tr>
<tr>
<td>Nealta</td>
<td>25A</td>
<td>Cyflumetofen</td>
<td>12 hours</td>
<td>14 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Nexter</td>
<td>21A</td>
<td>Pyridaben</td>
<td>12 hours</td>
<td>7 days</td>
<td>Warning</td>
</tr>
<tr>
<td>Nexter SC</td>
<td>21A</td>
<td>Pyridaben</td>
<td>12 hours</td>
<td>7 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Onager</td>
<td>10A</td>
<td>Hexythiazox</td>
<td>12 hours</td>
<td>7 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Pasada 1.6F</td>
<td>4A</td>
<td>Imidacloprid</td>
<td>12 hours</td>
<td>0 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Platinum, Platinum SG</td>
<td>4A</td>
<td>Thiamethoxam</td>
<td>12 hours</td>
<td>60 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Portal XLO</td>
<td>21A</td>
<td>Fenpyroximate</td>
<td>12 hours</td>
<td>14 days</td>
<td>Warning</td>
</tr>
<tr>
<td>Provado 1.6 F</td>
<td>4A</td>
<td>Imidacloprid</td>
<td>12 hours</td>
<td>0 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Pyganic EC 1.4&lt;OMRI&gt;</td>
<td>3A</td>
<td>Pyrethrins</td>
<td>12 hours</td>
<td>0 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Sevin 4F, XLR Plus</td>
<td>1A</td>
<td>Carbaryl</td>
<td>12 hours</td>
<td>7 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Scorpio 35SL</td>
<td>4A</td>
<td>Dinotefuran</td>
<td>12 hours</td>
<td>1 day</td>
<td>Caution</td>
</tr>
<tr>
<td>Superior Oil</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SpinTor 2SC&lt;OMRI&gt;</td>
<td>5</td>
<td>Spinosad</td>
<td>4 hours</td>
<td>7 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Vendex 50WP’</td>
<td>12B</td>
<td>Fenbutatine-oxide</td>
<td>48 hours</td>
<td>28 days</td>
<td>Danger</td>
</tr>
<tr>
<td>Zeal Miticide-1</td>
<td>10B</td>
<td>Etoxazole</td>
<td>12 hours</td>
<td>14 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Fungicides</td>
<td>MOA</td>
<td>Chemical Name</td>
<td>REI</td>
<td>PHI</td>
<td>Signal Word</td>
</tr>
<tr>
<td>---------------------</td>
<td>-----</td>
<td>--------------------------------</td>
<td>----------</td>
<td>----------</td>
<td>-------------</td>
</tr>
<tr>
<td>Abound Flowable</td>
<td>11</td>
<td>Azoxyostrobin</td>
<td>4 hours</td>
<td>14 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Captan 50WP 80WDG</td>
<td>M04</td>
<td>Captan</td>
<td>48/72 hours</td>
<td>0 days</td>
<td>Warning</td>
</tr>
<tr>
<td>Elevate 50 WDG</td>
<td>17</td>
<td>Fenhexamid</td>
<td>12 hours</td>
<td>0 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Endura</td>
<td>7</td>
<td>Boscalid</td>
<td>12 hours</td>
<td>14 days</td>
<td>Warning</td>
</tr>
<tr>
<td>Flint</td>
<td>11</td>
<td>Trifloxystrobin</td>
<td>12 hours</td>
<td>14 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Forum</td>
<td>40</td>
<td>Dimethomorph</td>
<td>12 hours</td>
<td>14 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Kaligreen&lt;sup&gt;OMRI&lt;/sup&gt;</td>
<td>NC</td>
<td>Potassium bicarbonate</td>
<td>4 hours</td>
<td>1 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Kenja 400SC</td>
<td>7</td>
<td>Isofetamid</td>
<td>12 hours</td>
<td>14 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Lime Sulfur</td>
<td>M02</td>
<td></td>
<td>48 hours</td>
<td>0 days</td>
<td>Danger</td>
</tr>
<tr>
<td>Luna Experience</td>
<td>7+3</td>
<td>Fluopyram, Tebuconazole</td>
<td>12 hours</td>
<td>14 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Mancozeb</td>
<td>M03</td>
<td>Mancozeb</td>
<td>24 hours</td>
<td>66 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Dithane, Manzate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mettle 125 ME</td>
<td>3</td>
<td>Tetraconazole</td>
<td>12 hours</td>
<td>14 days</td>
<td>Caution</td>
</tr>
<tr>
<td>OxiDate 2.0&lt;sup&gt;OMRI&lt;/sup&gt;</td>
<td></td>
<td></td>
<td>1 hour</td>
<td>0 days</td>
<td>Danger</td>
</tr>
<tr>
<td>Phostrol</td>
<td>P07</td>
<td>Phosphorous acid</td>
<td>4 hours</td>
<td>0 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Pristine</td>
<td>11+7</td>
<td>Pyraclostrobin, Boscalid</td>
<td>12 hours</td>
<td>14 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Procure 480SC</td>
<td>3</td>
<td>Trifluimazole</td>
<td>12 hours</td>
<td>7 days</td>
<td>Caution</td>
</tr>
<tr>
<td>ProPhyt</td>
<td>P07</td>
<td>Phosphorous acid</td>
<td>4 hours</td>
<td>0 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Quintec</td>
<td>13</td>
<td>Quinoxylfen</td>
<td>12 hours</td>
<td>21 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Rally 40WSP</td>
<td>3</td>
<td>Myclobutanol</td>
<td>24 hours</td>
<td>14 days</td>
<td>Warning</td>
</tr>
<tr>
<td>Ranman 400 SC</td>
<td>21</td>
<td>Cyazofamid</td>
<td>12 hours</td>
<td>30 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Reason 500 SC</td>
<td>11</td>
<td>Fenamidone</td>
<td>12 hours</td>
<td>30 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Revus Top</td>
<td>40+3</td>
<td>Mandipropamid, Difenconazole</td>
<td>12 hours</td>
<td>14 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Ridomil Gold Copper</td>
<td>4+M01</td>
<td>Mefenoxam, Copper hydroxide</td>
<td>48 hours</td>
<td>42 days</td>
<td>Danger</td>
</tr>
<tr>
<td>Ridomil Gold MZ WG</td>
<td>4+M03</td>
<td>Mefenoxam, Mancozeb</td>
<td>48 hours</td>
<td>66 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Rovral 4F</td>
<td>2</td>
<td>Iprodione</td>
<td>48 hours</td>
<td>7 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Scala SC</td>
<td>9</td>
<td>Pyrimethanil</td>
<td>12 hours</td>
<td>7 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Sovran</td>
<td>11</td>
<td>Kresoxim-methyl</td>
<td>12 hours</td>
<td>14 days</td>
<td>Caution</td>
</tr>
<tr>
<td>SuffOil-X&lt;sup&gt;OMRI&lt;/sup&gt;</td>
<td>NC</td>
<td>Mineral Oil</td>
<td>4 hours</td>
<td>14 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Sulfur&lt;sup&gt;OMRI&lt;/sup&gt;</td>
<td>M02</td>
<td></td>
<td>24 hours</td>
<td>14 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Switch 62.5 WG</td>
<td>9+12</td>
<td>Cyprodinil, Fludioxonil</td>
<td>12 hours</td>
<td>7 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Topsin M 70 WSB</td>
<td>1</td>
<td>Thiophanate-methyl</td>
<td>2 days</td>
<td>7 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Torino</td>
<td>U6</td>
<td>Cyflufenamid</td>
<td>4 hours</td>
<td>3 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Vangard WG</td>
<td>9</td>
<td>Cyprodinil</td>
<td>12 hours</td>
<td>7 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Viathon</td>
<td>P07+3</td>
<td>Potassium phosphate, Tebuconazole</td>
<td>12 hours</td>
<td>14 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Vivando</td>
<td>50</td>
<td>Metrafenone</td>
<td>12 hours</td>
<td>14 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Zampro</td>
<td>45+40</td>
<td>Ametoctradin, Dimethomorph</td>
<td>12 hours</td>
<td>14 days</td>
<td>Caution</td>
</tr>
<tr>
<td>Ziram 76DF</td>
<td>M03</td>
<td>Ziram</td>
<td>48 hours</td>
<td>21 days</td>
<td>Danger</td>
</tr>
</tbody>
</table>
The Cooperative Extension Service is the largest, most successful informal educational organization in the world. It is a nationwide system funded and guided by a partnership of federal, state, and local governments that delivers information to help people help themselves through the land-grant university system.

Extension carries out programs in the broad categories of agriculture, natural resources and environment; family and consumer sciences; 4-H and other youth; and community resource development. Extension staff members live and work among the people they serve to help stimulate and educate Americans to plan ahead and cope with their problems.

Some characteristics of the Cooperative Extension system are:

- The federal, state, and local governments cooperatively share in its financial support and program direction.
- It is administered by the land-grant university as designated by the state legislature through an Extension director.
- Extension programs are nonpolitical, objective, and research-based information.
- It provides practical, problem-oriented education for people of all ages. It is designated to take the knowledge of the university to those persons who do not or cannot participate in the formal classroom instruction of the university.
- It utilizes research from university, government, and other sources to help people make their own decisions.
- More than a million volunteers help multiply the impact of the Extension professional staff.
- It dispenses no funds to the public.
- It is not a regulatory agency, but it does inform people of regulations and of their options in meeting them.
- Local programs are developed and carried out in full recognition of national problems and goals.
- The Extension staff educates people through personal contacts, meetings, demonstrations, and the mass media.
- Extension has the built-in flexibility to adjust its programs and subject matter to meet new needs. Activities shift from year to year as citizen groups and Extension workers close to the problems advise changes.