1979 Missouri Commercial Grape Spray Schedule

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Extension Division
MP 263 1/79 2M

These recommendations are intended to serve as guidelines for commercial grape growers in Missouri. The pesticides and application rates listed for any given pest problem are based on their effectiveness, economy, safety and general integration into control programs for other pests present at or about the same time. The choice of which chemicals to use, when to use them, and how they are applied must be made by the individual grower relative to his own experience, equipment, and special problems associated with his vineyards. The effective and efficient use of all pesticides requires careful selection of the most appropriate material and the rate required, critical timing of the application(s), and uniform, thorough coverage of the vines.

PESTICIDE SAFETY

Responsible use of pesticides also includes their safe storage and handling. Most pesticides are poisonous to people and animals. Handle them with care. Store them only in their original, labeled containers in a dry, locked location out of the reach of children and animals.

READ THE LABEL. Understand it. Know the toxicity of the material you are using and wear the appropriate protective clothing. The greatest hazard with most pesticides occurs during the loading operation before the spray is applied. With highly toxic wettable powder (WP) formulations, empty containers carefully into the tank to avoid undue exposure to the dust; with liquid formulations, avoid splashing and spillage while measuring or making additions to the spray tank.

Avoid contaminating lakes, streams or ponds with any pesticide. Do not clean spraying equipment in bodies of water. Avoid depositing any material in areas where it will contaminate any crop used for forage or feed. Follow directions on labels and in these recommendations carefully.

RECOMMENDED RATES OF APPLICATION

The correct amount of pesticide required for control in any given vineyard is that amount contained in a volume of the recommended dilute mixture which, when applied as a foliar spray is sufficient to allow some run-off. Amounts applied in excess of this volume are wasted and volumes of dilute spray less than that required for run-off commonly result in reduced pest control.

The dilute rates listed in these recommendations are based on a standard application of 200 gallons per acre to mature vineyards in full leaf (approximately 540 vines per acre). Thus, for a pesticide recommended for use at a concentration of 1 lb per 100 gallons of dilute spray, 2 lbs of the material should be applied per acre of standard vineyard as described above. Newly planted vineyards generally have a lower dilute spray requirement for run-off and, thus, the amount of material needed for control will be proportionately less.

Experience has shown that the same amount of chemicals normally applied as a dilute spray can be applied as a low-volume (LV) spray using 1/3 or less the normal dilute volume. However, since six or more sprays are applied in LV applications, less total chemical should be applied per acre than in dilute sprays in order to avoid deposits in excess of that needed for control. LV rates are general recommendations and are generally calculated with some exceptions by multiplying the dilute rate by the gallons per acre of dilute spray required and then subtracting 25% to adjust for the lack of run-off.

Excess run-off in dilute spraying and deposits in excess of that needed for control of a given volume are both economically and ecologically unsound.

PESTICIDE CERTIFICATION FOR GROWERS

Missouri's pesticide law went into effect October 21, 1976. This law requires certification for commercial and private applicators to purchase and apply restricted use pesticides as defined by the Environmental Protection Agency. Since several pesticides used routinely by fruit growers are potential restricted use pesticides, it is highly desirable that each grower become certified.

Commercial applicators who apply pesticides for hire must pass an examination administered by the Missouri State Department of Agriculture. Private applicators are required to attend a training program, but are not required to pass examinations. Training sessions are offered to both commercial and private applicators by the University of Missouri Cooperative Extension Service. Contact your local Extension Specialist for further information.

Timing & Major Pests Involved

<table>
<thead>
<tr>
<th>Materials To Use</th>
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<tbody>
<tr>
<td>Dilute Rate Per 100 Gals.</td>
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<tr>
<td>Low Volume Rate Per Acre</td>
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<tr>
<td>Comments and Special Precautions</td>
</tr>
</tbody>
</table>

### PRE-BLOOM SPRAYS

**Flea Beetles**

CARBARYL 50W

2 lb 2 lb Apply when buds are swelling, but only if grape flea beetles and/or cutworms are present.

Downy Mildew

FERBAM 76W + FOLPET 50W

1 lb 1 lb Begin applications when most of the new shoots are 1 to 2 inches long and repeat at 7 day intervals until bloom.

Black Rot

MANCOZEB 80W

1 1/2 lb 2 lb MALATHION should be included only for early outbreaks of mealy bugs and late flea beetle infestations (adults and larvae)—otherwise, not needed.

**Flea Beetles**

MALATHION 25W

2 lb 3 lb

**Mealy Bugs**

BENOMYL 50W

1/4 lb 1/4 lb

See back of page for special notes on Powdery Mildew & Bunch Rot control.

### BLOOM SPRAYS

**Downy Mildew**

FERBAM 76W + FOLPET 50W

1 lb 1 lb Apply as blossoming begins and repeat at 7 day intervals to end of bloom period.

MANCOZEB 80W

1 1/2 lb 2 lb

**Black Rot**

MALATHION 25W

2 lb 3 lb

**Bunch Rot**

BENOMYL 50W

1/4 lb 1/4 lb

### POST-BLOOM SPRAYS

**Downy Mildew**

USE SAME FUNGICIDES AS IN THE PRE-BLOOM SPRAYS

(DZANON 50W (see note on use of MANCOZEB)

1 lb 1 lb

**Mealy Bugs**

PARATHION 15W

1 lb 1 lb

**Scale**

GUTHION 50W

1 lb 1 lb

**Leafhoppers**

MALATHION 25W

2 lb 3 lb

**Bunch Rot**

CARBARYL 50W

2 lb 3 lb

Fungicide applications (including those for powdery mildew control) should be applied to 10 day intervals until early July and at 10 to 14 day intervals thereafter. DO NOT use MANCOZEB within 86 days of harvest. Insecticide applications need only be applied at 10 to 14 day intervals during this period. DO NOT use GUTHION more than 3 times per season. Remember to check the tolerance and interval chart for all pesticides used at this time to avoid applying materials later than the approved intervals before harvest.

### SPECIAL PRE-HARVEST SPRAY

**Bunch Rot**

BENOMYL 50W

1/4 lb 1/4 lb

Use only on varieties susceptible to bunch rot and powdery mildew. Do not use more than 2 sprays at 10-14 day intervals and do not use within 7 days of harvest.
POWDERY MILDEW AND BUNCH ROT (BOTRYTIS) CONTROL

Certain American, French hybrid, and V. vinifera cultivars are highly susceptible to Botrytis or bunch rot and to powdery mildew diseases. Powdery mildew is becoming more frequent in Concord vineyards than in the past, especially where more susceptible hybrids or certain wild grapes are growing nearby. BENOMYL fungicide is effective in controlling both of these diseases. As a precaution against the development of BENOMYL tolerance by the fungi which cause these diseases we recommend that it be used not more than 4 to 5 times per season.

For Bunch Rot: Apply BENOMYL, in addition to regular fungicides(s) as recommended at first bloom (not later than 5 percent bloom) and repeat in 7 days. Where bloom is extended beyond 21 days or in years with excessive rainfall during and immediately after bloom, a third application can be used. Two pre-harvest sprays of BENOMYL at a 10 to 14 day interval should also be made. Apply first pre-harvest spray at 6-10 Brix (sugar). Apply a second BENOMYL spray 10 days later. Do not use BENOMYL within 7 days of harvest.

For Powdery Mildew: Apply BENOMYL at bloom as indicated above for bunch rot control. Thereafter, use SULFUR 95 percent mfw at 2 pounds per 100 gallons of dilute spray (3 pounds/acre for low volume applications) or KARATHANE WD at ½ pound per 100 gallons or ½ pound per acre for low volume applications, in addition to the regular spray schedule for black rot and downy mildew. Where BENOMYL is used as special pre-harvest sprays for bunch rot, SULFUR or KARATHANE is not needed. Caution: SULFUR can be phytotoxic to some varieties (Concord, Ives, Foch). SULFUR can be used safely on Catawba, Delaware, Elvira, Missouri Riesling, Moone’s Diamond, and Niagara varieties.

GRAPE PESTICIDE TOLERANCES, DAYS TO HARVEST, AND OTHER LABEL RESTRICTIONS

<table>
<thead>
<tr>
<th>Compound</th>
<th>Tolerance(1)</th>
<th>Interval(2)</th>
<th>Compound</th>
<th>Tolerance(1)</th>
<th>Interval(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benomyl</td>
<td>10</td>
<td>7</td>
<td>Guthion (4.5)</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Carbaryl</td>
<td>10</td>
<td>NTL</td>
<td>Karathane</td>
<td>0.1</td>
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<tr>
<td>Diazinon</td>
<td>0.75</td>
<td>10</td>
<td>Mancobez</td>
<td>7</td>
<td>66</td>
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<tr>
<td>Ferbam</td>
<td>7</td>
<td>7</td>
<td>Malathion</td>
<td>8</td>
<td>3</td>
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<tr>
<td>Folpet</td>
<td>25</td>
<td>NTL</td>
<td>Parathon (4)</td>
<td>0.05</td>
<td>14</td>
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<tr>
<td>Zineb</td>
<td></td>
<td>7</td>
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(1) All references are for use on grapes only. Many compounds have different limitations on other crops. READ THE LABEL!
(2) Allowable residue at harvest expressed in parts per million (ppm). Copper is exempt from a tolerance.
(3) Time in days between last application and harvest. NTL = no time limitation.
(4) Do not permit workers to re-enter vineyard within 24 hrs after applications of GUTHION or 48 hr after application of PARATHION unless they wear protective clothing. For all other pesticides, no unprotected farm worker re-entry until the spray dries or the dust settles.
(5) Do apply GUTHION more than 3 times per season.

Missouri Poison Control Centers*

<table>
<thead>
<tr>
<th>City</th>
<th>Poison Control Center</th>
<th>Telephone</th>
<th>City</th>
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<th>Telephone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cape Girardeau</td>
<td>St. Francis Hospital 825 Good Hope Street 63701</td>
<td>(314)338-1251 Ext. 217</td>
<td>Rolla</td>
<td>Phelps Co. Memorial Hospital 1000 W. 10th Street 65401</td>
<td>(316)364-3100 Ext. 126</td>
</tr>
<tr>
<td>Columbia</td>
<td>University of Missouri Medical Center 807 Stadium Road 65201</td>
<td>(314)882-8091</td>
<td>Springfield</td>
<td>Lester E. Cox Medical Center 1423 N. Jefferson St. 65602</td>
<td>(417)836-3193</td>
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<tr>
<td>Hannibal</td>
<td>St. Elizabeth’s Hospital 109 Virginia Street 63401</td>
<td>(314)221-0414 Ext. 183</td>
<td>St. John’s Hospital 1235 East Cherokee 65804</td>
<td></td>
<td>(417)881-8811 Ext. Rm.</td>
</tr>
<tr>
<td>Joplin</td>
<td>St. John’s Hospital 2277 McClintock Blvd 64401</td>
<td>(314)781-2727 Ext. 393</td>
<td>St. Joseph</td>
<td>Methodist Hospital and Medical Center 8th &amp; Faraon Streets 64511</td>
<td>(816)271-7580</td>
</tr>
<tr>
<td>Kansas City</td>
<td>Children’s Mercy Hospital 24th &amp; Gillham Road 61408</td>
<td>(816)471-9626 Emer. Rm.</td>
<td>St. Louis</td>
<td>Cardinal Glennon Children’s Memorial Hospital 1465 S. Grant Avenue 63104</td>
<td>(314)772-5200</td>
</tr>
<tr>
<td>Kirksville</td>
<td>Kansas City General Hospital and Medical Center 23rd &amp; Cherry Streets 64108</td>
<td>(816)556-3106</td>
<td>St. Louis Children’s Memorial Hospital 500 S. Kingshighway 63110</td>
<td></td>
<td>(314)367-2034</td>
</tr>
<tr>
<td>Poplar Bluff</td>
<td>Kirksville Osteopathic Hospital 800 W. Jefferson St. 63301</td>
<td>(816)626-2121</td>
<td>West Plains</td>
<td>West Plains Memorial Hospital 1103 Alaska Avenue 65775</td>
<td>(417)256-9111 Ext. 36</td>
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*In the case of accidental poisoning involving a pesticide, follow the first aid directions printed on the label of the container and consult your physician immediately. Additional information concerning treatment and course of action can be obtained from your nearest poison control center.

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