

1967 SUGGESTIONS FOR SPRAYING COMMERCIAL GRAPE VINEYARDS

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QUANTITY OF SPRAY TO APPLY

The best guide to a good job of spraying is to so set the nozzles and to drive slow enough that all new growth can be reached and sprayed until dripping begins. Spraying to the point of run-off is the only way to insure the application of an adequate quantity of material. This applies to both regular nozzle equipment and to air flow equipment at regular dosage rates of the spray chemicals. It does not apply to concentrate spraying.

THE PROGRAM *

SPECIAL SPRAY

When buds are swelling.
For control of flea beetles and climbing cutworms, if present; otherwise not needed.

USE: DDT 2 lbs. of 50 percent wettable-100 gallons

FIRST REGULAR SPRAY

When most of the new shoots are 3 to 4 inches long.

USE: Ferbam 2 lbs.-100 gallons for black rot control

OR

Ferbam 1 lb. plus folpet (Phaltan) 1 lb.-100 gallons.

SECOND PREBLOOM SPRAY

Apply in a normal season about 10 days after the First Regular Spray.

USE: Ferbam 2 lbs.-100 gallons for black rot control.

OR

Ferbam 1 lb. plus folpet (Phaltan) 1 lb.-100 gallons.

For early outbreaks of mealybugs where examination has disclosed them in abundance, apply malathion at 2 lbs. 25% wettable powder in 100 gallons.

Caution: Several brands of malathion have been tested which do not mix properly with ferbam. If an extensive black layer (not foam) separates out in a malathion-ferbam combination, discard the mixture and apply the malathion and ferbam separately until information can be obtained as to the mixing compatibility of the brands in question.

JUST BEFORE OR AS BLOOMING BEGINS

For black rot and berry moth control and sometimes downy mildew. For best black rot control, this spray should be applied early in the bloom period.

Where mildew is not a problem

USE: Ferbam 2 lbs.-100 gallons plus 2 lbs. DDT 50 percent wettable for control of black rot and berry moth.

OR

Ferbam 1 lb.-100 gallons plus folpet (Phaltan) 1 lb. plus 2 lbs. DDT 50 percent wettable for control of black rot and berry moth.

On mildew susceptible varieties such as Catawba, Niagara, Herbert and Fredonia and on Concord if mildew has developed recently on this variety.

USE: The folpet (Phaltan) - ferbam - DDT combination.

OR

Ferbam 1 lb. plus zineb 1 lb. plus 2 lbs. DDT 50 percent wettable.

*Fungicidal dosage rates refer to wettable powders (76% ferbam; 75% zineb; 50% folpet)

News Letter: The "Weekly Report to Fruit Growers" will be sent free to any fruit grower in Missouri requesting it. Requests may be addressed to the authors care of Department of Horticulture, University of Missouri, Columbia.

NEAR END OF BLOOM PERIOD

Or, not later than 10 days after the last spray. For control of black rot, mildew, mealybug and berry moth.

Where mildew is not a problem.

USE: Ferbam 2 lbs.-100 gallons plus 2 lbs. carbaryl (Sevin) 50 percent wettable powder.

OR

Ferbam 1 lb.-100 gallons plus folpet (Phaltan) 1 lb. plus 2 lbs. carbaryl (Sevin) 50 percent wettable powder.

On mildew-susceptible varieties or where mildew has developed recently on Concords.

USE: The folpet (Phaltan) - ferbam - carbaryl (Sevin) combination.

OR

Ferbam 1 lb.-100 gallons plus zineb 1 lb. plus 2 lbs. carbaryl (Sevin) 50 percent wettable powder.

Note: The folpet (Phaltan) - ferbam combination is more effective against black rot than the ferbam - zineb combination.

Note: The use of carbaryl (Sevin) beginning at this time appears necessary for the control of mealybugs. If the use of carbaryl is delayed until later in the season, it may not give satisfactory control of this pest.

Also, repeated applications of carbaryl will aid materially in controlling grape scale where this insect is a problem.

ABOUT 10 TO 12 DAYS AFTER THE LAST SPRAY

Usually this is about mid-June in central Missouri. For control of black rot, mildew, berry moth, leafhopper and mealybug.

USE: Ferbam 1 lb.-100 gallons plus zineb 1 lb. plus carbaryl (Sevin) 2 lbs. 50 percent wettable powder.

Caution: Do not use folpet (Phaltan) later than the 15th of June. Later applications may cause foliage injury which can be severe, especially with hot dry weather.

FIRST WEEK IN JULY (CENTRAL MISSOURI)

For control of black rot, mildew, berry moth, leafhopper, and for mealybugs in areas where this pest has built up. Growers should examine their

vineyards closely at this time to determine whether mealybug movement has started.

USE: Ferbam 1 lb.-100 gallons plus zineb 1 lb. plus carbaryl (Sevin) 2 lbs. 50 percent wettable powder. Add malathion 2 lbs. 25 percent wettable powder if mealybugs are numerous.

OR

If there is considerable mildew use zineb as follows:

2 lbs.-100 gallons up to 200 gallons per acre.
1 1/2 lbs.-100 gallons for 200 to 250 gallons per acre.

1 1/4 lbs.-100 gallons for 250 to 300 gallons per acre.

Plus carbaryl (Sevin) 2 lbs.-100 gallons of 50 percent wettable powder up to 300 gallons per acre.

Plus malathion 2 lbs.-100 gallons of 25 percent wettable powder if mealybugs are numerous.

LAST WEEK OF JULY

For control of berry moth, leafhopper, leaf folder, and mealybug.

USE: Carbaryl (Sevin) 2 lbs.-100 gallons of 50 percent wettable powder up to 300 gallons of spray per acre. Add malathion 2 lbs. 25 percent wettable powder if mealybugs are present.

Remarks: With wet weather or if black rot is a problem add ferbam 1 lb.-100 gallons plus zineb 1 lb.-100 gallons.

OR

If mildew is a problem add zineb only as follows:

2 lbs.-100 gallons up to 200 gallons per acre.
1 1/2 lbs.-100 gallons for 200 to 250 gallons per acre.

1 1/4 lbs.-100 gallons for 250 to 300 gallons per acre.

MIDDLE OF AUGUST

For control of berry moth, leafhopper, leaf folder and mealybug.

USE: Carbaryl (Sevin) 2 lbs.-100 gallons of 50 percent wettable powder up to 300 gallons per acre. Add 2 lbs. of 25 percent wettable malathion if mealybugs are present.

APPROVED RATES AND INTERVALS

The following table lists the official rates, intervals, and tolerances of these pesticides on grapes as of January 1, 1967. Such tolerances and intervals are subject to change. Tolerances are given in parts per million (ppm). Always be careful to follow directions on the pesticide container with regard to rate, dosage, and time of application.

Chemical	Lbs. Actual per Acre	Approved Interval	Tolerance
Bordeaux Mixture-----	2.8 -----	No time limitation -----	exempt
Captan-----	5 -----	No time limitation -----	100 ppm
Carbophenothion ----- (Trithion)	0.5 -----	30 days -----	0.8 ppm
Carbaryl (Sevin) -----	3 -----	No time limitations -----	10 ppm
DDT -----	5 -----	40 days -----	7 ppm
Diazinon -----	1 -----	10 days -----	0.75 ppm
Dieldrin -----	0.25 -----	14 days -----	0.1 ppm
EPN -----	0.75 -----	21 days -----	3 ppm
Ferbam -----	4.6 -----	7 days -----	7 ppm
Folpet (Phaltan) -----	3.0 -----	No time limitation -----	50 ppm
Guthion -----	1.5 -----	28 days--no more than 3 applications per season. -----	5 ppm
Kelthane -----	1.2 -----	7 days -----	5 ppm
Lead Arsenate-----	15 -----	Do not apply after edible parts begin to form. -----	7 ppm
Malathion -----	2.75 -----	3 days -----	8 ppm
Methoxychlor-----	6 -----	14 days -----	14 ppm
Parathion -----	1.5 -----	14 days -----	1 ppm
Tetradifon (Tedion) -----	1 -----	No more than 3 applications dur- ing fruiting season. -----	5 ppm
Zineb-----	3 -----	7 days -----	7 ppm

GENERAL PEST INFORMATION

BLACK ROT

Primary infections may occur on young leaves and stems any time after shoot growth begins in the spring. These constitute a source of infection of the fruit later in the season. Fruit infections usually are the heaviest from blooming time until the latter part of June or early July. However, with suitable moisture conditions, black rot of the fruit may continue to develop into the ripening period.

Because of primary infection of the leaves and stems early in the season, the application of protective sprays should begin shortly after the buds break and be continued at regular intervals until the middle or later part of June. If leaves, stems and berries are kept free of black rot until this time there is little risk of any appreciable infection later.

DOWNY MILDEW

All parts of a vine actively growing above ground are subject to downy mildew. Early in the season flower clusters and young fruits may be destroyed, but later in the season the fruit becomes somewhat resistant. The greatest economic loss is usually the result of damage to the leaves. Summer infection of the leaves can lead to uneven ripening of the fruit, lowered sugar content and loss in production the following year.

Downy mildew first appears as light yellow irregularly shaped spots on the upper surface of the younger leaves. Later a white frost-like moldy growth becomes evident on the lower surfaces of the leaves.

Among varieties that are quite susceptible to downy mildew are Fredonia, Catawba, Herbert, Lindley and Niagara. With these varieties considerable crop loss can result from early season infection of flower clusters and young fruits. Concord is less susceptible and direct crop loss from flower cluster and fruit infection is seldom great. Summer leaf infection, however, can result in heavy indirect crop losses.

The use of mildew fungicides usually can be delayed on Concord in Missouri until the first after bloom spray and in some seasons may not be needed at all. The application of mildew effective fungicides should be made as soon as an occasional mildew spot develops. With wet weather, downy mildew can spread at a tremendous rate.

On the more mildew susceptible varieties the use of mildew fungicide such as zineb is advisable beginning with the spray immediately preceding blooming.

GRAPE BERRY MOTH

This insect can be taken for granted as a pest each year. In Missouri there are usually three broods, although in some seasons they overlap so that there seems to be only one brood extending through the entire season. Proper timing, correct dosage, and thorough coverage are extremely important in control.

MEALYBUGS

In recent years, grape mealybugs have become of considerable importance in Missouri. Usually the infestations vary from year to year and from vineyard to vineyard, sometimes even within the same vineyard. Damage is caused not so much by injury to

the vine as by the honeydew which is excreted onto foliage and berries and on which a sooty fungus grows which ruins the fruit for market or juice. Best control is usually obtained by waiting until the insects have moved up onto the foliage and fruit before applying sprays. The organic phosphate insecticides are most efficient for control. Extremely good coverage is essential to obtain control.

GRAPE SCALE INSECTS

One of the most serious pests of grapes is the grape scale insect because it does not affect fruit or foliage but attacks the entire vine and may kill it in a short time. Entire vineyards may be killed where this insect is not controlled. There appear to be two generations each year under Missouri conditions. Best control is obtained by using one of the more potent organic phosphates in two sprays at the time when the crawlers appear, usually in early to mid-June. Fortunately, most vineyards in Missouri are free of this pest.

GRAPE ROOT BORER

This is potentially the most dangerous insect pest of grapes because a single borer is capable of killing an entire vine. The borers are caterpillars of a moth which, in the adult stage, looks very much like one of the common paper wasps that are a nuisance in vineyards at harvest time. The caterpillars bore in the roots and at the base of the trunk of grape vines. Even if the vine is not killed outright, severe wilting results and the fruit is lost. As many as 20 or more borers may be found in a single vine. The borers require two or more years to complete their development. Adults emerge usually in early to mid-July and continue to emerge until late August. Egg laying begins a few days after emergence. Each female produces from 200 to 500 eggs. At present, no satisfactory insecticidal control has been developed. However, cultural controls are worth serious consideration. This includes keeping the vineyard free of weeds, especially in the row, and thorough, frequent (2-week intervals) disking and hoeing during the period of emergence. This destroys the adults before they can emerge from the cocoons in the soil and helps destroy any eggs which are laid by moths coming in from other vineyards or which escaped the hoeing and disking operation. A grape hoe should be of value in getting under the vines. The most important operation is to keep the soil under the vines in the row thoroughly hoed or disked.



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