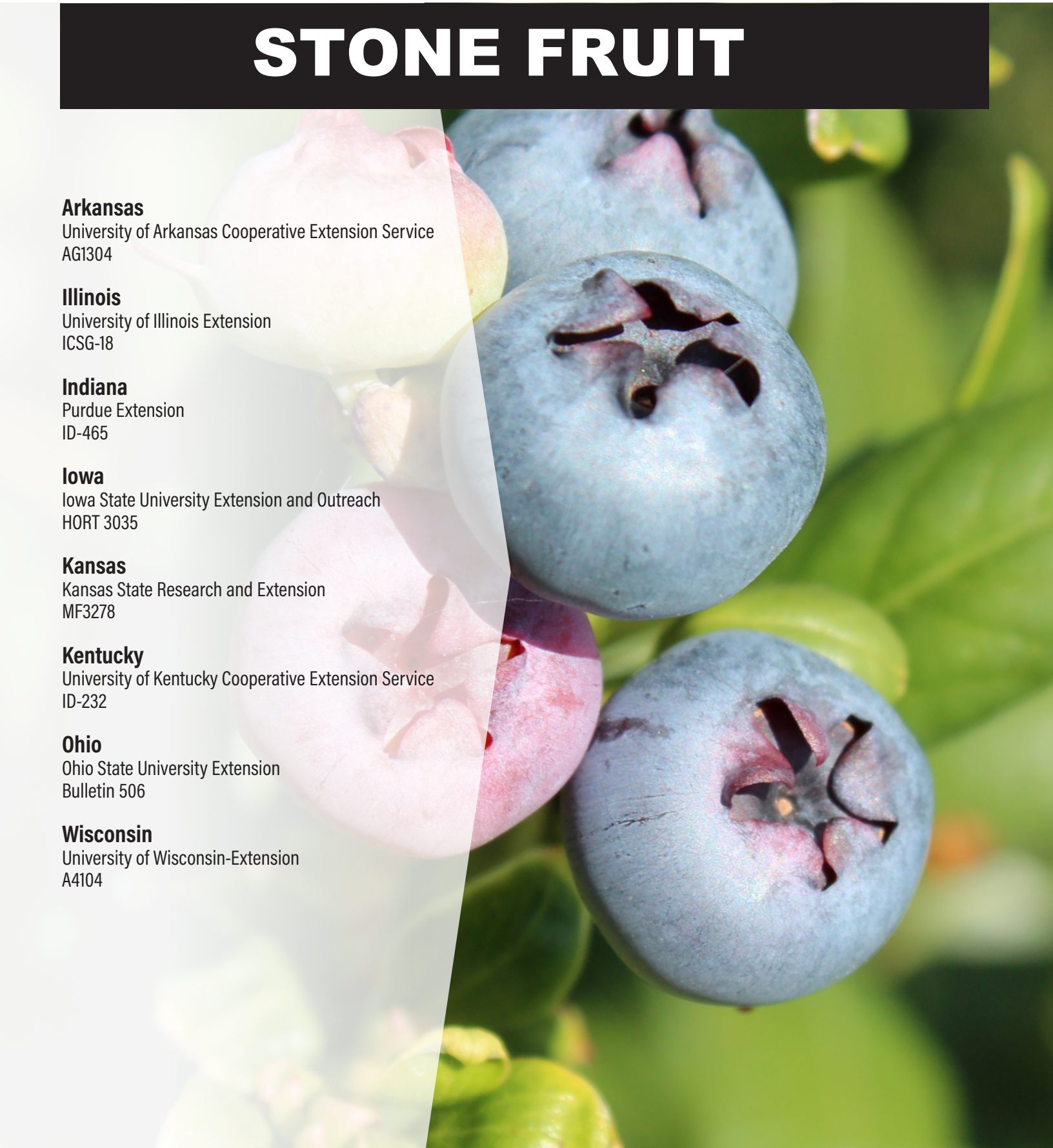
Midwest Fruit Pest Management Guide

2026-2027

STONE FRUIT



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Contributors

University of Arkansas
Entomology: Neelendra Joshi

University of Illinois
Entomology: Kacie Athey*
Horticulture: Elizabeth Wahle*, James Santiago*
Plant Pathology: Mohammed Babadoost*

Iowa State University
Horticulture: Randall Vos*, Suzanne Slack

Kansas State University
Entomology: Raymond Cloyd

University of Kentucky
Entomology: Ric Bessin*
Horticulture: Shawn Wright*, Brent Arnoldussen*, Elayna Stirn
Plant Pathology: Nicole Gauthier*, Kim Leonberger*

University of Minnesota
Horticulture: Madeline Wimmer*

Ohio State University
Entomology: Ashley Leach*
Horticulture: Ram Yadav*
Plant Pathology: Melanie Ivey*

Purdue University
Entomology: Elizabeth Long*
Horticulture: Stephen Meyer, Miranda Purcell

University of Wisconsin
Plant Pathology: Leslie Holland*

*Section Editor

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Foreword

Commercial fruit production has become a highly skilled, technical profession. Concerns about pesticide residues, operator risks, and the environment dictate that all fruit growers exercise extreme caution in the use of all pesticides, and indeed, all chemicals. Growers who use these must be certified as private applicators.

Certification requires that applicators understand the following: labels and labeling, safety factors, potential environmental concerns, identification of common pests encountered, pesticides and their use, proper equipment use, application techniques, and applicable state and federal regulations. Training programs are offered to help you in certification. Contact your county Extension office for information.

The pest management recommendations in this guide have been formulated to provide growers with up-to-date information about pesticides and their applicability to problems. We suggest that growers use this information to set up individualized spray programs. Always keep accurate records of materials used, application dates, areas treated, growth stages, and weather conditions. A sample record sheet is on page 285. In case of questions, nothing beats a good set of records. The EPA requires records for restricted use pesticide applications. Some states may require records for general use pesticides (e.g., Kentucky has this requirement).

Handling Pesticides

1. Know the pesticide toxicity and read and follow all label instructions, as well as any websites directed by the label.
2. When mixing pesticides, do not breathe the dust, powder, or vapor. Always mix outdoors.
3. Do not use tobacco, eat, or drink when handling or applying pesticides.
4. Stay out of drift from spray or dust.
5. Rinse liquid containers with water at least three times and pour rinsate into spray tank as it is being filled. Punch holes in metal and plastic containers and crush. Dispose of these and all other pesticide containers where no contamination of crops or water supply can occur. Do not reuse pesticide containers.
6. Use all personal protective equipment as required by the label. If a respirator is rquired, a medical exam and fit test is needed for some types of respirators.
7. Have a "buddy" around when using acutely toxic organophosphates, just in case.
8. If working with cholinesterase inhibitor insecticides, get an appropriate blood test before the season starts and test periodically during the season.
9. Consult a doctor immediately if you develop unusual symptoms during or after spraying. Symptoms such as blurred vision, nausea, headaches, chest pains, weakness, diarrhea, or cramps indicate possible pesticide poisoning.
10. Wash hands thoroughly before eating, drinking, chewing gum, using tobacco, or using the toilet.
11. Bathe and change clothes daily, and wash contaminated clothing separate from other laundry.
12. Always store pesticides in their original container, never in an unmarked container. Never trust your memory.
13. Always store pesticides under lock and key and keep them away from children.
14. Always use an anti-siphon device when filling the spray tank from a domestic water source.
15. The label is the law. Read and follow all label instructions carefully.
16. Never allow someone under the age of 18 to handle or use pesticides.
17. Train workers according to worker protection standards (WPS). This is required for all workers who will enter areas treated with a pesticide within 30 days after the last application.
18. Suspend applications while people are within the Application Exclusion Zone (AEZ). Application may be resumed when they exit the AEZ.

Management Tips for Safety

1. Maintain accurate spray records. Show application rates, pesticides used, total gallonage, area treated, stage of plant development, and weather data.
2. Be prepared to show your records to the EPA or state regulatory officials if necessary.
3. Do not contaminate forage crops or pastures.
4. Do not allow animals to graze fruit plantings.
5. Prevent excess drift.
6. Maintain equipment in top condition.
7. Protect children, pets, livestock, and the environment from pesticide contamination.
8. Follow all label instructions on re-entry times for pesticides. Regulations mandate re-entry times for all pesticides. Check labels for posting and notification requirements to protect workers. Re-entry times and the required protective clothing for early entry are listed on product.
9. Inform all workers of re-entry restrictions and information on safe pesticide use and/or training to meet WPS requirements.
10. Comply with the Right-To-Know law. Have complete product labels readily available for workers to see. Have the Safety Data Sheet (SDS) for each product you use available for workers to see and for rescue or fire personnel to use in case of emergency.
11. Provide pesticide safety training for pesticide handlers and other workers to comply with Worker Protection Standards (WPS). Training content must comply with WPS requirements.
12. Provide necessary PPE for your workers and regularly inspect and maintain PPE used when applying pesticides.

Pesticide Use and the Law

Pesticides are developed by manufacturers, registered with EPA, and sold to the public with the assumption that users read, understand, and follow instructions on product labels. Pesticide labels include specific information about use, personal protective equipment, environmental precautions, and storage and disposal. The label's purpose is to provide clear directions to allow maximum product benefit while minimizing risks to human health and the environment.

Every pesticide label includes the following statement: "It is a violation of federal law to use this product in a manner inconsistent with its labeling." This language obliges purchasers or users of any pesticide to assume all legal responsibilities for the product's use. Further, courts and regulators recognize that pesticide labels are binding contracts that require those using the products to do so exactly as directed. Terms such as

"must," "shall," "do not," and "shall not" are mandatory statements, users are responsible for specific actions when applying or handling a given product; any departure from such directions is, in the eyes of the law, an illegal use of the pesticide.

"Use" means more than just applying the pesticide. Federal and state regulations define pesticide use to include handling, mixing, loading, storing, transporting, and disposing, as well as human and environmental exposure. This all-encompassing definition covers every activity that involves a pesticide — from purchase to container disposal.

The pesticide label is more than just a piece of paper. It serves a dual function: the label instructs users how to use the product safely and effectively, and it serves as a legal measuring stick. Many statements on the label result from rigorous scientific investigations and governmental regulatory decisions. Pesticide users should read, understand, and follow pesticide label directions to ensure effective pest control, personal safety, environmental protection, and legal compliance.

Pesticide labels include two important statements:

Re-entry or restricted entry interval (REI) statements contain re-entry precautions and state a time interval during which entry into a pesticide-treated site is prohibited. The statement indicates the length of time that must elapse after the pesticide application before individuals may enter the treated area without personal protective clothing and equipment (PPE).

Pre-harvest interval (PHI) statements indicate the time interval that must elapse after the pesticide application before the crop may be harvested. Harvesting prior to the PHI may result in dangerous and illegal pesticide residues on the crop.

Pesticide Use in Greenhouses and High Tunnels

Fruit and vegetable production in greenhouses and high tunnels have increased dramatically in the Midwest in the past few years. Although greenhouse or high tunnel environments may change the composition of the pest complex, using pesticides is often necessary to maintain the adequate levels of control needed to produce a profitable and marketable crop.

Pesticide regulatory agencies in the Midwest vary in their interpretation of whether a high tunnel is a type of greenhouse. For example, most states considers a high tunnel to be a form of greenhouse. That means the pesticides one selects for high tunnel use must be appropriate for greenhouse use. Other states (not covered by this guide) consider high tunnels to be the same as fields when it comes to pesticide use. Still other states, like Missouri, take an intermediate approach: they call a high tunnel a greenhouse when the sides are closed but call it a field when the sides are open.

It is important to determine how your state views high tunnels. Pesticide labels address greenhouse applications in one of three ways:

- Pesticide labels can clearly state that the products may be used in greenhouses. These products may be used according to label directions. Pesticide labels that have different instructions for greenhouse use. These products also may be used in high tunnels according to label instructions.
- Pesticide labels may clearly prohibit greenhouse use. Obviously, these products cannot be used in a greenhouse under any circumstances.
- Many pesticide labels don't specify whether the product can be used in a greenhouse or not. When labels don't expressly prohibit greenhouse use, most state regulatory agencies interpret that to mean the product can be used in a greenhouse as long as the treated crop is on the label and the product is used according to label directions.

Determining Spray Volume and Rate

Producers spray fruit plantings with insecticides, fungicides, growth regulators, and nutrient solutions in many different formulations and concentrations and at various stages of plant development. The principal targets may be the foliage, flowers, fruit, woody surfaces, or entire plants. The equipment and methods used for such a diverse spray program must be versatile, and the equipment must be properly calibrated for each type of application.

Dilute Spraying

The objective of spraying is to distribute the spray material uniformly over plants or plant parts. Pesticide recommendations are based on the amount of dilute spray needed to wet plants thoroughly, to the point just "prior to runoff." For example, in typical blueberry, raspberry, or grape plantings with plants 5 to 7 feet tall and 3 to 5 feet wide and set in rows 9 to 10 feet apart, and in most strawberry plantings, 100 gallons of water per acre has been established as a standard dilute spray volume for fungicide and insecticide application. This dilute rate is considered a 1x concentration.

In a standard apple or pear orchard, with trees approximately 20 feet tall, 22 feet wide, and set on rows 35 feet apart, 400 gallons of water per acre is a standard dilute spray for fungicide and insecticide application. Recommendations may be made per 100 gallons or per acre. Dilute is considered 1x concentration. For cherry, peach, and plum, 300 gallons of water per acre is the standard dilute spray volume for full-size trees.

Amount of Dilute Spray per Acre Required for Equivalent Coverage of Plants

The table on page 6 lists the gallons of dilute spray per acre required to provide equivalent coverage for mature trees of different sizes and spacings.

Growth regulators may be applied by high-volume hand-gun or air-blast sprayers, in either dilute or low-volume applications. Low-volume application may be riskier because any mistakes in concentration are magnified. Read the growth regulator label for suggestions about application methods. Some labels suggest dilute sprays with full coverage, and others suggest a specific amount of chemical in a specific amount of water per acre.

Amount of Dilute Spray Per Acre Required For Equivalent Coverage Of Plants

Distance Between Rows (Feet)	Plant Height (Feet)	Plant Width (Feet)	Maximum Plant Volume/ Acre (1000 Cu Ft[1])	Minimum Dilute Spray (Gallons/Acre[2])
30	20	15	436	300
26	16	12	354	225
24	14	10	254	180
22	14	10	272	200
20	12	10	261	185
18	10	10	242	175
16	8	8	174	125
14	6	6	149	105
12	6	6	131	90
10	6	4	105	74
10	4	4	70	49

[1]Maximum plant volume/acre = plant width x plant height x running feet or row per acre. Running feet of row per acre = 43,560 divided by the distance between rows.
[2]Minimum dilute gallons per acre = approximately 0.7 gallon /1,000 cubic feet of plant volume.

Low-volume Spraying

Low-volume, or concentrate, spraying is the practice of using less water per acre to apply pesticides. In low-volume spraying, the volume of water applied per acre is reduced in proportion to the increased concentration of pesticide used by 2x, 3x, 4x, or more. Thus, a 3x rate uses a 3x concentration of pesticide in only one-third the water per acre that would be used in dilute spraying.

Growers must apply low-volume sprays with air-assisted sprayers that use a high-velocity airstream to distribute the spray mixture. Most conventional air-assisted sprayers can be used to apply spray mixtures up to 6x concentration. Sprayers specifically designed for ultra-low-volume application should be used for applications up to 6x.

Using low-volume sprays requires less labor, less water, less time, and fewer refills than 1x or dilute mixtures. However, low volume sprays have disadvantages. Savings in gallonage and application costs decrease most rapidly to about 50 gallons of water per acre (on tree fruit). Below that, the savings may not be worth the additional risk of improper application and wind drift.

When making low-volume pesticide applications:

1. Use extreme care in calibrating the sprayer and maintaining a constant sprayer speed. As gallonage decreases, errors become much more critical.
2. Choose calm winds with good drying conditions for spraying. This may mean spraying at night or early in the morning. Good coverage cannot be achieved in windy conditions (more than 5 mph).
3. Prune plants to create an open canopy for spray penetration. Spray droplets will not penetrate dense foliage.
4. Choose pesticide formulations that will mix satisfactorily. Pay careful attention to increased operator hazards and drift problems.

Gallons Of Spray Per Acre (Approximate) For Various Concentrates

	1x	2x	3x	4x	5x	6x
Apples	400	200	132	100	80	64
Peaches	300	150	100	75	60	50
Percent water savings over dilute		50%	67%	75%	80%	84%
		Greatest savings	Diminished savings			

Tree Row Volume Spraying

Tree row volume (TRV) is a method originally used with orchard crops to determine the dilute (1x) volume of spray solution necessary to cover the entire plant surface for any given fruit planting. TRV is an objective method for determining the spray volume required for plants of different sizes, and for changes in canopy size as plants develop during the season.

With the TRV method, growers can easily calculate the volume of dilute spray needed per acre for each planting based on plant size and canopy density. To determine the TRV, growers must accurately measure the between-row spacing, maximum plant height, and cross-row plant spread. See the step-by-step procedure below.

Calculate Tree Row Volume Gallonage

Step 1. Calculate feet of row/acre.

$$\frac{\text{43,560 sq ft/acre}}{\text{between-row spacing (ft)}} = \text{feet of row/acre}$$

Step 2. Calculate cu ft of TRV/acre.
Feet of row/acre (from Step 1) x plant height (ft) x cross-row plant spread (ft) = cu ft of TRV/acre.

Step 3. Select density factor.
Select one of the following numbers that best indicates the canopy density of each separate planting.

0.70 gal/1,000 cu ft: Plants extremely open, light visible through entire canopy.

0.80 gal/1,000 cu ft: Plants well pruned, with moderate vigor, adequate light penetration into canopy, many holes in foliage where light can be seen through plant.

0.90 gal/1,000 cu ft: Plants pruned minimally, or with high vigor, poor light penetration into canopy, very few holes where light can be seen through plant.

1.00 gal/1,000 cu ft: Plants unpruned, extremely dense, no light visible anywhere through canopy

Step 4. Calculate TRV gallonage/acre.

$$\frac{\text{cu ft of TRV/acre (from Step 2)} \times \text{density (from Step 3}}{\text{1,000}}$$

= gallons of dilute solution to be applied per acre

= TRV gal/acre

Example 1

A vineyard has rows spaced 10 feet apart, the canopy height is 6 feet, and the cross row spread is 4 feet at full canopy. The density factor is 0.90.

Step 1 43,560 sq ft ÷ 10 ft = 4,356 ft of row/acre

Step 2 4,356 x 6 ft x 4 ft = 104,544 cu ft TRV/acre

Step 3 Density has been chosen as 0.90.

Step 4 [104,544 x .90] ÷ 1,000 = 94 TRV gal/acre

Example 2

An apple orchard on dwarfing rootstock has rows spaced 15 feet apart, the canopy height is 12 feet, and the cross row spread is 8 feet at full canopy. The density factor is 0.90.

Step 1 43,560 sq ft ÷ 15 ft = 2,904 ft of row/acre

Step 2 2,904 x 12 ft x 8 ft = 278,784 cu ft TRV/acre

Step 3 Density has been chosen as 0.90.

Step 4 [278,784 x .90] ÷ 1,000 = 251 TRV gal/acre

Spraying Small Volumes

In some cases growers may wish to apply small volumes of pesticides with backpack or hand-held sprayers or wipers. The following table helps convert from the rate per 100 gallons to the rate per gallon. Take care to measure pesticide amounts accurately, because errors are magnified at small volumes. (See Approximate Dilutions for Small Volumes of Spray Mixes table on page 8).

Calibrating Single Nozzle and Boom Sprayers

Calibration is an essential step for using any application equipment. Early spring, when preparing sprayers for early season operations, is a good time to calibrate. Be sure all fittings are tight and there are no leaks. Take the nozzles apart, clean them, and check for worn nozzle tips.

Using wettable powder sprays enlarges nozzle openings, so calibrating each nozzle is essential. Start the season with a calibrated sprayer, and depending on the number of gallons typically sprayed, calibrate the

sprayer again according to intervals specified in the owner's manual (or no later than halfway through the spray season). Follow the procedure below to calibrate a single nozzle boom sprayer.

Approximate Dilutions for Small Volumes of Spray Mixes

Equivalent Rates For Different Quantities Of Water				
Formulation	**100 Gallons**	**5 Gallons**	**3 Gallons**	**1 Gallon**
Wettable Powder, Dry Flowable, etc.	5 lb.	15 tbsp.	9 tbsp.	3 tbsp.
	4 lb.	13 tbsp.	8 tbsp.	8 tsp.
	3 lb.	10 tbsp.	6 tbsp	2 tbsp.
	2 lb.	8 tbsp.	4 tbsp.	4 tsp.
	1 lb.	3 tbsp.	6 tsp.	2 tsp.
	1/2 lb. (8 oz.)	5 tsp.	1 tbsp.	1 tsp.
Emulsifiable Concentrate, Liquid	5 gal.	1 qt.	1 1/4 pt.	13 tbsp.
	4 gal.	1 1/2 pt.	1 pt.	10 tbsp.
	3 gal.	1 1/4 pt.	3/4 pt.	8 tbsp.
	2 gal.	3/4 pt.	1/2 pt.	5 tbsp.
	1 gal.	1/2 pt.	8 tbsp.	3 tbsp.
	1 qt.	3 tbsp.	2 tbsp.	2 tsp.
	1 pt.	5 tsp.	1 tbsp.	1 tsp.

These approximations are based on average weights of various pesticide products as described in Dry Pesticide Rates for Hand-held Sprayers (University of Kentucky Extension publication HO-83, https://www.uky.edu/Ag/Horticulture/masabni/Publications/HO-83.pdf).

Step 1. Check tractor/sprayer speed.
Attach the sprayer to the tractor and make test runs to determine the tractor speeds (mph) in different gears. Run the tractor at the PTO speed used when operating the sprayer. Travel a test course and record time needed to travel a measured distance. Run the test on the same type surface in the planting (sod, not pavement or gravel)

Formula

$$\text{MPH} = \frac{\text{feet traveled}}{\text{seconds}} \times \frac{60}{88}$$

Your tractor sprayer speed

$$\text{MPH} = \frac{\text{feet traveled}}{\text{seconds}} \times \frac{60}{88} = \_\_\_\_\_$$

Note: *The recommended tractor speed for most applications with single nozzle boom sprayers is 2-3 mph. Traveling faster may lead to poor coverage. A convenient method is to set up a calibration course in multiples of 88 feet (88 feet per minute=1 mile per hour). Set markers at 176 feet or 264 feet to correspond to 2 mph and 3 mph when the tractor speed is adjusted (gear and rpm) to cover the distance in 60 seconds (1 minute).*

Step 2. Record the sprayer inputs.

	Your Figures	Example
Nozzle type (all nozzles should be identical)	_____	110˚ 04 flat fan
Recommended application volume (from manufacturer's label)	_____	20 GPA
Measured sprayer speed	_____	3 MPH
Nozzle spacing/band width (in inches)	_____	20 inches

Step 3. Calculate the required nozzle output.

Formula

$$\text{GPM (per nozzle)} = \frac{\text{GPA x MPH x W}}{\text{5,940 (constant)}}$$

Where

GPM = required output per nozzle in gallons per minute.

GPA = desired total carrier volume in gallons per acre.

MPH = desired ground speed in miles per hour.

W = inches between nozzles (or band width if making band applications).

Example

$$\text{GPM} = \frac{\text{20 GPA x 3 MPH x 20 in}}{5940} = \frac{1{,}200}{5{,}940} = 0.20 \text{ GPM}$$

Your figures

$$\text{GPM} = \frac{\qquad\qquad}{5{,}940} = \frac{\quad}{5{,}940} = \text{GPM}$$

Step 4. Operate the sprayer.
Set the correct pressure at the gauge using the pressure-regulating valve. Note that recommendations for flat fan nozzles are 15-30 psi (not more than 40 psi for spraying weeds).

Collect and measure the output of each nozzle for one minute.

The output of each nozzle should be the approximately the same as calculated in Step 3 above. There are 128 fluid ounces in one gallon. If you calculate the output at 0.20 GPM, multiply 0.20 by 128, which equals 25.6 fluid ounces in one minute.

If the nozzle output is slightly off from your target, change the pressure. If the nozzle output is significantly off, change the speed or nozzle size.

Compare nozzle output on multiple nozzle booms. Replace all nozzle tips that are more than 10 percent inaccurate. Consistent spray patterns require that outputs from individual nozzles within 10 percent.

Calibration of Air-blast Sprayers

Accurate calibration is the only way to ensure that a sprayer is applying the intended amount of chemical. Applicators must know the amount of water that will be applied per unit of area to make a proper spray mix. Failing to calibrate the sprayer can injure the crop, create a hazardous situation, and waste money. Frequent calibration identifies worn nozzles and keeps applicators aware of factors that can affect the application rate, including travel speed, pressure, and type of nozzle in use.

Pre-calibration Check

Before calibrating, check the sprayer carefully. Be sure the nozzle tips are clean. Replace all worn or damaged nozzles. Check all hoses and fittings for leaks and aging. Make sure the pressure is constant and the tank is free of dirt and debris.

Determining Sprayer Speed

To determine travel speed needed to travel to properly distribute the spray within the canopy by placing water-sensitive spray paper at various locations within the canopy. For proper pesticide application, the air within the canopy must be completely replaced with spray-laden air from the sprayer. In general, a travel speed of 1 to 3 miles per hour is usually satisfactory, depending on the size and density of the canopy, and capacity of the sprayer.

Before sprayer calibration, applicators must determine the travel speed in miles per hour (mph). To determine travel speed, load the sprayer with clear water and make a test run in the fruit planting. Always make the test run in the fruit planting or on similar ground, because tractor speeds change dramatically from soft to firm surfaces. Set the tractor throttle at a level sufficient to operate the sprayer (PTO speed) and select an appropriate gear. Remember or mark these settings.

Calculate travel speed by measuring the time required to travel any measured distance. A good conversion factor to remember is that 1 mph=88 feet/min. A convenient test length is 176 feet because it is a multiple (2x) of 88. Use the following formula to determine travel speed:

$$\text{Speed (MPH)} = \frac{\text{distance (ft) x 60}}{\text{time (sec) x 88}}$$

For example, if it requires 60 seconds to travel a measured distance of 176 feet, the travel speed is:

$$\text{MPH} = \frac{176 \times 60}{60 \times 88} = \frac{10{,}560}{5{,}280} = 2 \text{ MPH}$$

Determining Nozzle Flow Rate

To select the correct nozzle and whirlplate sizes, first determine the total gallons per minute (gpm) of output for each particular application.

To determine gpm, you must know the travel speed of the sprayer (mph), the gallons per acre (gpa) to be applied, and the spacing (W) between the rows of plants. These variables will be used, to calculate the gpm. Note: This equation is for one side of the sprayer manifold only; double the calculated answer if using both sides of the sprayer. Use the same size nozzles and whirlplates on both sides of the sprayer.

Step 1. Calculate the total gpm required per side:

$$\text{GPM (per side)} = \frac{\text{GPA x MPH x W}}{1{,}000}$$

GPM = gallons per minute (per side)

GPA = gallons per acre

MPH = speed (in miles per hour)

W = spacing between rows (in feet)

Example: To apply 70 gpm while traveling 2 mph, with row spacing of 10 feet apart the gpm per side is:

$$\text{GPM} = \frac{70 \times 2 \times 10}{1{,}000} = \frac{1{,}400}{1{,}000} = 1.4 \text{ GPM}$$

Step 2. Select the correct nozzle-whirlplate combination and operating pressure. Air-blast sprayers normally use disk-core-type cone spray tips. Select the correct size nozzles and whirlplates by using a table that indicates the nozzle size and gallons per minute output at various pressures using specific whirlplates. You can find these tables in the sprayer manufacturer's literature or in nozzle catalogs.

Arrange nozzles in the sprayer manifold so approximately *two-thirds of the total flow comes from nozzles in the upper half* of the manifold, and *one-third of the total flow comes from nozzles in the lower half*. Adjust nozzles this way to provide uniform coverage throughout the canopy. It should adequately penetrate to the top and center of the canopy while avoiding excess application in the lower outside areas.

Step 3. Install the nozzles in their proper outlets. Inspect and clean all nozzles and outlets and determine that the sprayer is operating correctly. Nozzles are an important part of the sprayer; if the nozzles show any defects or wear, replace them.

Step 4. Measure the total gpm from all the nozzles selected in Step 2. Fill the sprayer tank at least half full. Prime the sprayer system and check all the nozzles to make sure none are clogged or partially clogged. Record the exact level of water in the spray tank. Bring the sprayer up to the desired pressure and turn the nozzles on. Use a stopwatch to record how long the sprayer is running. You should operate the sprayer for at least three minutes. Record the new level in the tank or measure the amount of water needed to refill the tank to the original level.

Example: The spray tank is filled to the 100-gallon level. It was predetermined from the manufacturer's tables that the nozzles selected would give a total output of 4 gpm. The sprayer was operated for five minutes at 150 psi on the gauge. After the five minutes, the sight gauge read 75 gal The actual output was:

100 gal (start) - 75 gal (stop) = 25 gal per 5 min. = 5 gpm

The theoretical output from table information, however, was 4 gpm.

When actual output differs from the calculated output, adjust by changing the pressure (when the difference is small) or changing the nozzle sizes (when the difference is large). Experiment with the pressure to see if the output can be fine-tuned. Refer to manufacturer's tables for recommended operating pressures for nozzles. Never operate above or below recommended pressures.

Repeat these calibration procedures whenever you change the speed, gallons per acre, or row spacing. Periodically check the output from the nozzles during the spraying season. The effectiveness of the spray material directly depends on your skill as an operator.

Field test to confirm calculations:

$$\text{GPA (gallons per acre)} = \frac{\text{gal sprayed} \times 43{,}560 \text{ ft}^2}{\text{distance traveled (ft)}}$$

Example: A field test is run in which 10 rows, each 200 feet long, with row spacing of 10 feet and it took 35 gallons to refill the sprayer to the original level, the gpa is:

$$\frac{35 \text{ gal} \times 43{,}560 \text{ ft}^2}{2{,}000 \text{ ft} \times 10 \text{ ft}} = 76 \text{ GPA}$$

Spray Water pH

Several pesticides break down rapidly in alkaline water (pH above 7.0). Both well and pond water in the Midwest tend to be alkaline. In a matter of hours — or, in extreme instances, only minutes — 50 percent or more of the active ingredient may be hydrolyzed to yield a less active compound. Captan, Dimethoate, Imidan, and Malathion are examples of compounds especially vulnerable to alkaline hydrolysis.

To ensure the maximum effectiveness of pesticide applications, check the pH of spray mixes in the spray tank and add buffering agents if necessary to adjust the pH to neutral (7.0). Many commercial buffering agents are available. Most adjuvants (see definition in the next section) are multipurpose adjuvants, serving as spreaders, activators, etc. Read the labels of both the pesticide and adjuvant before use. Granulated food grade citric acid may be the most convenient and inexpensive acidifying material. Two ounces per 100 gallons has been shown to reduce the pH of tap water from 8.3 to 5.4. Convenient granulated food grade citric acid measures are:

per 100 gal	1/4 cup, slightly rounded
per 300 gal	3/4 cup, rounded
per 500 gal	1 1/3 cups

Granulated food grade citric acid is available in 50-pound bags from suppliers that handle food grade chemicals. Do not try to acidify solutions containing phosphorous acid, Bordeaux mixture, fixed copper, or other copper compounds.

Spray Adjuvants

Several types of additives are available to improve the effectiveness of spray applications. Collectively, these products are called adjuvants. Here are some adjuvants and their functions:

Activators increase a pesticide's efficacy by increasing the penetration of a spray solution through leaf hairs or waxy cuticle and into a leaf or fruit.

Acidifiers lower the pH of alkaline spray water to reduce the potential breakdown of certain pesticides in the spray tank.

Buffers change the pH of spray water, then hold it at the desired degree of acidity.

De-foamers, when added to the spray tank, break down or prevent the formation of foam.

Elasticizers or drift control agents reduce the breakup of spray droplets into very fine particles and thereby minimize drift.

Surfactants, spreaders, and wetting agents are different names for products that reduce the surface tension around spray droplets, allowing them to spread out more evenly on the surface of leaves or fruit. Caution: Some surfactants used in combination with certain pesticides can function as activators, which can injure plants. Consult labels or chemical suppliers for more information.

Stickers cause a pesticide to stick to the surface after the spray dries, thereby reducing the potential for loss from rain or overhead irrigation.

Spreader-stickers is a term commonly misused when referring to a surfactant or spreader. A true spreader-sticker combines the characteristics of a surfactant with that of a sticker.

Caution: Do not use an adjuvant with any pesticide without first consulting the specific pesticide label. Improper selection or use can injure crops or reduce effectiveness, particularly when adjuvants are mixed with emulsifiable concentrates.

Pesticide Compatibility

Because of the complex nature of pest management in fruit crops, multiple fungicides and insecticides may need to be tank-mixed together and applied at once. Pesticide compatibility in the spray tank is usually not a problem with newer pesticides. The compatibility of some materials may depend on solvents and emulsifiers within the formulation. Emulsifiable concentrate formulations are more likely to cause compatibility problems than wettable powders. Mixing wettable powders with emulsifiable concentrates may result in incompatibility issues. Compatibility problems are often noted when applicators use lime, copper (Bordeaux), or oil products in a mix. Be aware of spray tank pH as noted above.

Read the comments section in this spray guide for notes about compatibility problems, and read pesticide labels before tank mixing products. Most pesticide labels give instructions for loading, tank mixes, etc., and we recommend that growers follow the label directions closely to avoid problems.

Making Tank Mixes

Adding the components of a mixture in the order the label specifies is critical; whether some pesticides are physically compatible or not depends on the order in which they are added to the tank. This is especially true for pesticides packaged in water-soluble packets. A mistake in mixing order could prevent the package from dissolving completely, thus preventing uniform distribution of the pesticide in the spray tank. Labels provides mixing instructions for all registered tank mixes. Unless the label states otherwise, never apply any pesticide in the mixture at a rate higher than the label allows for when the pesticide is used alone for the same purpose.

Some pesticide labels do not provide adequate mixing order directions. The usual method for tank mixing is as follows.

First, fill the tank one-quarter to one-half full with the carrier (water) and begin agitation. If a compatibility, buffering or defoaming agent is needed, these products should be added before the other products. If using a drift reduction additive, always consult the label; some are added in the mixing sequence.

Next, slowly add and thoroughly mix the pesticide products, one at a time, beginning with those hardest to mix (such as suspension-forming formulations). Generally, wettable powder (WP) and dry flowable or water-dispersible granule (DF, WDG) products should be added first, followed by flowable (F, FL) and microencapsulated (ME) products. Add emulsifiable concentrates (EC) next, followed by any solution (S) or soluble powder (SP) products. Other spray modifiers (penetrants and surfactants) should be added last. Dry formulations should be preslurried (mixed with a little water) before adding them to the spray tank; this is also a good idea (even with ECs) when using liquid fertilizers as the carrier. Finally, continue adding the carrier to the desired level.

To assure a uniform spray mixture at all times, keep the mixture agitated during the entire application and until the tank is empty. Avoid letting the mixture stand overnight, if possible, without agitation. If you do end up with a physically incompatible spray mix, call the manufacturer of each product to see if you can rejuvenate the mix. Adding a compatibility agent may return the mix to a sprayable form. If you cannot rejuvenate the mix, treat it as pesticide waste.

Tank Mixing Order

1. Fill tank 1/4 to 1/2 full with carrier (water)
2. Begin agitation
3. Utility agents (if needed)
4. Suspension products
   a. Dry (Pre-mix): WP, DF, WDG,
   b. Wet F, FL, ME
5. Emulsifiable products (EC)
6. Solution products (S, SP)
7. Spray modifiers (if needed)
8. Finish filling the tank with carrier

From: Illinois Pesticide Applicator Training Manual SP39: General Standards. University of Illinois Extension Pesticide Safety Education Program.

Summary

Pesticide recommendations are confusing because there are so many options for materials to use for certain diseases or insect pests. Additional references may be needed.

With fungicides in particular, a single material may control one or more diseases, but not all. So when several diseases threaten, growers may need to combine materials to achieve control. Insect pests also may appear at the same time, so a tank mix multiple fungicides and insecticides may be applied together. However, not all pesticides are compatible, so applicators should test for compatibility before tank mixing any products.

Certain fungicides and insecticides may be phytotoxic (cause foliar damage) to certain crops and/or cultivars. For example, many grape cultivars are sensitive to sulfur and/or copper. The **Relative Disease Susceptibility and Chemical Sensitivity among Grape Cultivars** table on page 163 lists cultivar sensitivity to these materials. Additionally, some grape cultivars are sensitive to certain strobilurin fungicides, and some strawberry cultivars are sensitive to Sinbar herbicide. Several apple cultivars are sensitive to azoxystrobin, the active ingredient in Abound, Quilt, and Quadris Top fungicides. Always read the comments associated with the materials in this guide.

Pesticide choices can be limited by cultivar, disease or insect pressure, and other factors. Grower preference, experience with materials, and price often influence decisions as well. Pest management in fruit crops is relatively easy as long as growers understand the pests, critical periods for control, proper selection of control materials, and proper application procedures.

Always read the entire pesticide label. If you have any questions about the proper use of a pesticide, refer to other sources, such as the *Midwest Small Fruit Pest Management Handbook* or *Midwest Tree Fruit Pest Management Handbook.* If you still have questions, contact the manufacturer or your state Extension specialist for clarification.

3. CHERRY

Cherry Spray Schedule

The shaded/colored boxes represent the crop stages where common pests in the Midwest are active. Scouting and/or preventative sprays may be necessary or recommended. Weather and degree day accumulation will impact the exact timing of pest appearance in the orchard.

Stage							
Dormant	Early To Full Bloom	Petal Shuck Fall	First Cover	Second Cover	Additional Cover	Pre-Harvest	Post-Harvest
					Borers		
			Cherry Fruit Fly				
		Plum Curculio					
							Japanese Beetle
							Periodical Cicada
						Spotted-wing Drosophila	
European Red Mite				European Red Mite			
			Periodical Cicada				

How to read the spray schedule tables

Every cherry growth stage has important notes on disease or insect management. In some cases, the reader will be directed to the special problems section at the end of the section or chapter. Please make sure to read thoroughly and contact your state Extension specialist with any specific questions.

Key to tables

E = excellent control
G = good control
F = fair control
[r] = fungicide/insecticide resistance possible
s = suppression only
i = ineffective
u = unknown efficacy
x = pest not on the label

[1] Efficacy data in this publication are based on trials conducted across various regions and does not necessarily reflect local efficacy differences or changes over time. Growers should contact their Extension specialist for the most recent or for state-specific information. The information on this publication is only a guide; the authors and their institutions assume no liability for practices implemented based on this information. Always read and follow pesticide labels. The label is the law. Product registration may vary by state.

[2] FRAC/IRAC code represents the mode of action of the fungicide/insecticide.

[3] PHI refers to the pre-harvest interval, which is the number of days before harvest that the product may not be applied.

[4] All fungicides/insecticides have a Restricted-Entry Interval (REI). The restricted-entry interval is the time immediately after a pesticide application when entry into the treated area is limited. Check labels for REI. Restrictions in REI may prohibit the use of certain pesticides during harvest.

Applicators must abide by both maximum amount of product per season AND maximum number of applications.

[5] Max amt refers to the product's maximum amount/acre/year.

[6] Max app refers to the product's maximum number of applications per year.

RUP refers to restricted use pesticide.

Cherry Dormant – Diseases

Before buds break in the spring.

Notes on disease management

- **Bacterial canker:** Bacterial canker is generally more serious on sweet than tart cherry. Dormant copper sprays are an effective method for control of bacterial canker. All stone fruit, including cherry, are extremely sensitive to copper. Sprays must be timed to reduce *Pseudomonas syringae* inoculum without causing phytotoxicity. Tart cherries may require continued protection through bloom.
- Application of copper for bacterial canker at this time may reduce the overwintering inoculum of the cherry leaf spot pathogen.
- Make first application before fall rains and a second at late dormant.
- **Phytophthora:** See Phytophthora Disease Management of Stone Fruit on page 153.

Table 3-1. Cherry Diseases - Dormant[1]

Product And Formulation Active Ingredient	FRAC Code[2]	Bacterial Canker	Cherry Leaf Spot Dormant	REI[3] PHI[4]	Max Amt[5] Max App[6]
Badge SC	M	3.5-14 pt.	3.5-14 pt.	24h	63.4 pt.
copper sulfate + oxychloride		P-G	F	0d	NA
C-O-C-S WDG	M	x	8-15 lb.	48h	35 lb.
copper oxychloride		x	F	21d	3
Cuprofix Ultra 40 Disperss	M	5-8 lb.	5-8 lb.	48h	45 lb.
copper sulfate		P-G	P-G	120d	NA
Kocide 3000	M	x	2.2-3.5 lb.	48h	60 lb.
copper hydroxide		x	G	0d	4

Footnotes: See how to read the spray schedule tables section at the beginning of the chapter.

Cherry Late Dormant to Prebloom – Insects

Notes on insect management

- **European red mite:** If European red mites have been a problem in the past, apply superior oil or Envidor 2SC during the dormant stage to control mite eggs. Other miticides will be more effective if delayed until eggs are hatching (petal-fall). Oil applied by late dormant will also control aphid eggs. When spraying oil, check labels for temperature restrictions (e.g., only when temperatures are above 40F° or never during freezing weather).
- **San Jose scale:** Generally controlled dormant to delayed dormant where they have been a problem. Do not use Imidan 70W on sweet cherries.

Table 3-2. Cherry Insects - Dormant Through Prebloom[1]

Product And Formulation Active Ingredient	IRAC Code[2]	Aphid	European Red Mite	San Jose Scale	REI[3] PHI[4]	Max Amt[5] Max App[6]
Acramite 50WS	20D	x	1 lb.	x	12h	1 lb.
bifenazate		x	G	x	3d	1
Actara (25WDG)	4A	3-4 oz.	x	x	12h	11 oz.
thiamethoxam		E	x	x	14d	NA
Agri-Mek SC (0.7SC) **(RUP)**	6	x	2.25-4.25 fl. oz.	x	12h	8.5 fl. oz.
abamectin		x	G	x	21d	2
Apta (1.34SC)	21A	17-21 fl. oz.	x	x	12h	53.5 fl. oz.
tolfenpyrad		u	x	x	14d	2

(Continued)

Table 3-2. Cherry Insects - Dormant Through Prebloom[1] *(continued)*

Product And Formulation Active Ingredient	IRAC Code[2]	Aphid	European Red Mite	San Jose Scale	REI[3] PHI[4]	Max Amt[5] Max App[6]
Apollo SC (1SC)	10A	x	2-8 fl. oz.	x	12h	NA
clofentezine		x	E	x	21d	1
Asana XL (0.66EC) **(RUP)**	3A	4.8-14.5 fl. oz.	x	x	12h	72.5 fl. oz.
esfenvalerate		u	x	x	14d	NA
Assail 30SC	4A	2.1-4.5 fl. oz.	x	4.5-6.7 fl. oz.	12h	32 oz.
acetamiprid		E	x	F	7d	4
Baythroid XL (1EC) **(RUP)**	3A	2.4-2.8 fl. oz.	x	x	12h	5.6 fl. oz.
beta-cyfluthrin		E	x	x	7d	NA
Beleaf 50SG	29	2-2.8 oz.	x	x	12h	8.4 fl. oz.
flonicamid		E	x	x	14d	3
Centaur WDG (70WDG)	16	x	x	34.5 oz.	12h	69 oz.
buprofezin		x	x	E	14d	2
Danitol 2.4EC **(RUP)**	3A	10.3-21.3 fl. oz.	10.3-21.3 fl. oz.	x	24h	42.7 fl. oz.
fenpropathrin		u	F	x	3d	NA
Diazinon AG600 WBC **(RUP)**	1B	12.75 fl. oz./100 gal.	6.5-12.25 fl. oz./100 gal.	x	4d	102 fl. oz.
diazinon		u	u	x	21d	2
Envidor 2SC	23	x	16-18 fl. oz.	x	12h	18 fl. oz.
spirodiclofen		x	E	x	7d	1
Esteem 35WP	7C	x	x	4-5 oz.	12h	15 oz.
pyriproxyfen		x	x	E	14d	3
Exirel (0.83SE)	28	13.5-20.5 fl. oz.	x	x	12h	61.5 fl. oz.
cyantraniliprole		E	x	x	3d	3
Imidan 70W	1B	x	x	2.13-4.25 lb.	7/14d	13 lb.
phosmet		x	x	E	7d	NA
Malathion 5EC	1B	2.8 pt.	x	x	12h	NA
malathion		G	x	x	3d	4
Mustang Maxx (0.83EC) **(RUP)**	3A	1.28-4 fl. oz.	x	x	12h	24 fl. oz.
zeta-cypermethrin		u	x	x	3d	6
Nealta	25	x	13.7	x	12h	27.4
cyflumetofen		x	u	x	7d	2
Neemix 4.5	UN	5-7 fl. oz.	x	x	4h	NA
azadirachtin		F	x	x	0d	NA
Nexter (75WP)	21	x	4.4-10.7 oz.	x	12h	21.3 oz.
pyridaben		x	G	x	7d	2
Oil (superior)	UN	x	see label	see label	4h	NA
mineral oil		x	E	G	0d	NA
Onager Optek (1EC)	10A	x	12-24 oz.	x	12h	24 fl. oz.
hexythiazox		x	E	x	7d	1

(Continued)

Table 3-2. Cherry Insects - Dormant Through Prebloom[1] *(continued)*

Product And Formulation Active Ingredient	IRAC Code[2]	Aphid	European Red Mite	San Jose Scale	REI[3] PHI[4]	Max Amt[5] Max App[6]
Portal XLO (0.4EC)	21A	x	2 pt.	x	12h	4 pt.
fenpyroximate		x	E	x	7d	2
PQZ (1.87SC)	9B	2.4-3.2 fl. oz.	x	x	12h	4.8 fl. oz.
pyrifluquinazon		E	x	x	7h	2
Pyganic 5EC	3A	4.5-15.6 fl. oz.	4.5-15.6 fl. oz.	4.5-15.6 fl. oz.	12h	NA
pyrethrins		u	u	u	0d	10
Savey 50DF	10A	x	3-6 oz.	x	12h	6 oz.
hexythiazox		x	E	x	28d	1
Sevin XLR Plus (4F)	1A	2-3 qt.	x	4-5 qt.	12h	14 qt.
carbaryl		u	x	u	3d	3
Sivanto Prime (1.67SC)	4D	7-14 fl. oz.	x	10.5-14 fl. oz.	4h	28 fl. oz.
flupyradifurone		E	x	G	14d	NA
Transform 75 WG	4C	0.75-1.5 oz.	x	2.75 oz.		8.5 oz.
sulfoxaflor		E	x	x	7d	4
Vendex 50WP **(RUP)**	12B	x	1-2 lb.	x	2d	3 lb.
fenbutatin-oxide		x	G	x	14d	2
Versys Inscalis (0.83DC)	9D	1.5 fl. oz.	x	x	12h	3 fl. oz.
afidopyropen		G	x	x	7d	NA
Warrior II (2.08CS) **(RUP)**	3A	1.2-2.5 fl. oz.	x	x	24h	12.8 fl. oz.
lambda-cyhalothrin		u	x	x	14d	NA
Zeal (72WP)	10B	x	2-3 oz.	x	12h	3 oz.
etoxazole		x	E	x	7d	1

Footnotes: See how to read the spray schedule tables section at the beginning of the chapter.

Cherry Early Bloom To Petal Fall And Shuck Split – Diseases

Early bloom is also referred to as popcorn or white bud, followed by bloom. Petal fall describes when flower petals are dropping. Shuck split describes when the shucks fall from expanding fruit.

Disease management notes

The two major diseases of concern are brown rot and leaf spot. Many fungicides are labeled for disease management at this time.

- Rovral is recommended early, as use after petal fall is prohibited.
- Vanguard is only labeled for tart cherries. Make the second and final application at full bloom.
- Bravo may not be used after shuck split.

Brown rot: Infection is rare at early bloom but may occur if brown rot cankers and mummies are present coupled with warm (above 60F°), wet weather. It continues to be a risk throughout bloom, and whenever weather is warm and wet.

Cherry leaf spot

- Cherry leaf spot management begins at early bloom for tart cherries; for sweet cherries, it begins at petal fall.
- Syllit F is labeled for use west of the Mississippi River.

Bacterial canker: For sour cherries only: Badge SC one to two times after petal fall, using lower to moderate rates. Do not apply to sweet cherry or the English Morello variety as severe injury may result.

Table 3-3. Cherry Diseases - Early Bloom Through Petal Fall And Shuck Split[1]

Product And Formulation Active Ingredient	FRAC Code[2]	Brown Rot	Cherry Leaf Spot	REI[3] PHI[4]	Max Amt[5] Max App[6]
Abound (SC)	11	12-15.5 fl. oz.	12-15 fl. oz.	4h	90 fl. oz.
azoxystrobin		G[r]	G[r]	0d	5
Badge SC	M	3.5-5 pt.	1.5-5 pt.	24h	63.4 pt.
copper sulfate + oxychloride		F	F-G	0d	NA
Bravo Weather Stik	M5	3-4 pt.	3-4 pt.	12h	20.5 pt.
chlorothalonil		F-G	E	thru SS	NA
C-O-C-S WDG	M	1-2.9 lb.	1-2.9 lb.	48h	35 lb.
copper oxychloride		F	F	21d	3
Cabrio EG (20EG)	11	9.5 oz.	9.5 oz.	12h	47.5 oz.
pyraclostrobin		F-E	G [r]	0d	5
Captan 80WDG	M	2.5 lb.	2.5 lb.	24h	17.5 lb.
captan		G	F-G	0d	NA
Cevya	3	3-5 fl. oz.	3-5 fl. oz.	12h	NA
mefentrifluconazole		E	E	0d	see label
Elevate 50WDG	17	1-1.5 lb.	x	12h	6 lb.
fenhexamid		G-E	x	0d	NA
Elite 45DF	3	4-8 fl. oz.	4-8 oz.	12h	3 lb.
tebuconazole		E[r]	G-E[r]	0d	NA
Flint Extra	11	2.5-3.8 fl. oz.	2.5-3.8 fl. oz.	12h	15.2 fl. oz.
trifloxystrobin		E	E	1d	4
Fontelis (SC)	7	14-20 fl. oz.	14-20 fl. oz.	12h	61 fl. oz.
penthiopyrad		E	F-G	0d	NA
Indar 2F	3	6 fl. oz.	6 fl. oz.	12h	48 fl. oz.
fenbuconazole		E[r]	E[r]	0d	8
Inspire Super (EW)	3+9	16-20 fl. oz.	x	12h	80 fl. oz.
difenoconazole + cyprodinil		E	x	2d	4
Kenja 400SC	7	12.5 fl. oz.	x	12	37.5 fl. oz.
isofetamid		E	x	1d	3
Luna Experience (SC)	7+3	6-10 fl. oz.	6-10 fl. oz.	12h	34 fl. oz.
fluopyram + tebuconazol		G-E	x	0d	NA
Luna Privilege	7	4-6.8 fl. oz.	6.8 fl. oz.	12h	13.7 fl. oz.
fluopyram		G-E	s	0d	NA
Luna Sensation (SC)	7+11	5-5.6 fl. oz.	5-6 fl. oz.	12h	27.1 fl. oz.
fluopyram + trifloxystrobin		E	E-G	1d	4
Merivon	7+11	4-6.7 fl. oz.	4-6.7 fl. oz.	12h	20.1 fl. oz.
fluxapyroxad + pyraclostrobin		E	G-E[r]	0d	3
Pristine	7+11	10.5-14.5 oz.	10.5-14.5 oz.	12h	72.5 oz.
pyaclostrobin + boscalid		G	E	0d	5
Procure 480SC	3	10-16 fl. oz.	10-16 fl. oz.	12h	56 fl. oz.
triflumizole		G[r]	G[r]	1d	4

(Continued)

Table 3-3. Table 3-3. Cherry Diseases - Early Bloom Through Petal Fall And Shuck Split[1] *(continued)*

Product And Formulation Active Ingredient	FRAC Code[2]	Brown Rot	Cherry Leaf Spot	REI[3] PHI[4]	Max Amt[5] Max App[6]
Quadris Top	11+3	12-14 fl. oz.	x	12h	56 fl. oz.
azoxystrobin + difenoconazole		E	x	0d	NA
Quash	3	2.5-4 oz.	4 oz.	12h	10.5-12 oz.
metconazole		G[r]	G[r]	14d	3
Quilt Xcel	11+3	14 fl. oz.	14 fl. oz.	12h	70 fl. oz.
azoxystrobin + propiconazole		E	G	0d	5
Rally 40WSP	3	2.5-6 oz.	2.5-6 oz.	24h	3.2 lb.
myclobutanil		E	E[r]	0d	NA
Rovral 4F	2	1-2 pt.	x	24h	4 pt.
iprodione		E	x	60d	2
Sulfur, Microthiol Disperss	M2	18 lb.	x	24h	NA
sulfur		F	x	NA	NA
Syllit F	U12	3 pt.	1.5-3 pt.	48h	12 pt.
dodine		s	G	7d	6
Tilt (EC)	3	4 fl. oz.	4 fl. oz.	12h	20 fl. oz.
propiconazole		G	G[r]	0d	5
Topguard EQ	3+11	6-8 oz.	x	6-8 oz.	12h
flutriafol + azoxystrobin		G	x	E	7d
Topguard Specialty Crop	3	14 fl. oz.	14 fl. oz.	12h	56 fl. oz.
flutriafol		E	G	7d	4
Topsin M WSB	1	1-1.5 lb.	1.5 lb.	48h	4 lb.
thiophanate-methyl		G	F-G	1d	NA
Vangard WG (75WG)	9	5 oz.	x	12h	30 oz.
cyprodinil		G	x	2d	4
Ziram 76DF	M3	5-6 lb.	5-6 lb.	48hr	24.2 lb.
ziram		F-i	F-i	14d	4

Footnotes: See how to read the spray schedule tables section at the beginning of the chapter.

Cherry Full Bloom – Insects

Insect management notes

- ***Save the bees! Do not apply insecticides during bloom.***

Cherry Petal Fall To Shuck Split – Insects

When petals are shed from bloom through shucks split, with shucks falling from expanding fruit.

Insect management notes

- **Plum curculio:** Do not use Imidan 70W on sweet cherries.
- **European red mites:** Agri-Mek SC, Apollo SC, or Zeal miticides may be applied to suppress developing populations of European red mites.

Table 3-4. Cherry Insects - Petal Fall Through Shuck Split[1]

Product And Formulation Active Ingredient	IRAC Code[2]	Black Cherry Aphid	European Red Mite	Leafroller	Plum Curculio	San Jose Scale	REI[3] PHI[4]	Max Amt[5] Max App[6]
Acramite 50WS	20	x	0.75-1 lb.	x	x	x	12h	NA
bifenazate		x	E	x	x	x	3d	1
Actara (25WDG)	4A	3-4 fl. oz.	x	x	4.5-5.5 oz.	x	12h	11 oz.
thiamethoxam		G-E	x	x	G	x	14d	NA
Admire Pro (4.6F)	4A	1.4-2.8 fl. oz.	x	x	2.8 fl. oz.	1.4-2.8 fl. oz.	12h	10.5/14 fl. oz.
imidacloprid		G-E	x	x	s	G	7-21d	NA
Agri-Mek SC (0.7SC) **(RUP)**	6	x	2.25-4.25 fl. oz.	x	x	x	12h	8.5 fl. oz.
abamectin		x	G	x	x	x	21d	2
Apollo SC (1SC)	10A	x	2-8 fl. oz.	x	x	x	12h	NA
clofentezine		x	E	x	x	x	21d	1
Apta (1.34SC)	21A	17-27 fl. oz.	x	21-27 fl. oz.	21-27 fl. oz.	x	12h	53.5 fl. oz.
tolfenpyrad		u	x	G	G	x	14d	2
Asana XL (0.66EC) **(RUP)**	3A	x	x	x	4.8-14.5 fl. oz.	x	12h	72.5 fl. oz.
esfenvalerate		x	x	x	G	x	14d	NA
Assail 30SC	4A	2.1-4.5 fl. oz.	x	x	4.5-6.7 fl. oz.	4.5-6.7 fl. oz.	12h	26.9 fl. oz.
acetamiprid		G-E	x	x	G	G	7d	4
Avaunt eVo (30WDG)	22A	x	x	x	5-6 oz.	x	12h	24 oz.
indoxacarb		x	x	x	E	x	14d	4
Baythroid XL (1EC) **(RUP)**	3A	x	x	4.8-14.5 fl. oz.	2.4-2.8 fl. oz.	x	12h	5.6 fl. oz.
beta-cyfluthrin		x	x	E	G	x	7d	NA
Beleaf 50SG	29	2.0-2.8 fl. oz.	x	x	x	x	12h	8.4 fl. oz.
flonicamid		G-E	x	x	x	x	14d	3
Centaur WDG	16	x	x	x	x	34.5 oz.	12h	69 oz.
buprofezin		x	x	x	x	E	14d	2
Danitol 2.4EC **(RUP)**	3A	x	x	10.6-21.3 fl. oz.	10.6-21.3 fl. oz.	x	24h	42.7 fl. oz.
fenpropathrin		x	x	G	G	x	3d	NA
Delegate WG (25WG)	5	x	x	4.5-7 oz.	6-7 oz.	x	4h	28 oz.
spinetoram		x	x	E	s	x	7d	4
Envidor 2SC	23	x	16-18 fl. oz.	x	x	x	12h	18 fl. oz.
spirodiclofen		x	E	x	x	x	7d	1
Entrust	5	x	x	4-6 fl. oz.	x	x	4h	29 fl. oz.
spinosad		x	x	G	x	x	7d	3
Esteem	7C	x	x	x	x	4-5 fl. oz.	12h	15 oz.
pyriproxyfen		x	x	x	x	E	14d	3
Exirel (0.83SE)	28	13.5-20.5 fl. oz.	x	10-20.5 fl. oz.	13.5-20.5 fl. oz.	x	12h	61.5 fl. oz.
cyantraniliprole		G	x	E	G	x	3d	3
Imidan 70W	1B	x	x	2.12-4.25 lb.	2.12 lb.	x	72h	7.5 lb.
phosmet		x	x	E	G	x	7/14d	NA

(Continued)

Table 3-4. Cherry Insects - Petal Fall Through Shuck Split[1] *(continued)*

Product And Formulation Active Ingredient	IRAC Code[2]	Black Cherry Aphid	European Red Mite	Leafroller	Plum Curculio	San Jose Scale	REI[3] PHI[4]	Max Amt[5] Max App[6]
Intrepid	18	x	x	8-16 fl. oz.	x	x	24h	25.6 fl. oz.
		x	x	G-E	x	x	14d	NA
Magister SC (1.7SC)	21A	x	32-36 fl. oz.	x	x	x	12h	36 fl. oz.
fenazaquin		x	u	x	x	x	3d	1
Movento MPC	23	10-14 fl. oz.	10-14 fl. oz.	x	x	10-14 fl. oz.	24h	24 fl. oz.
spirotetramat		G-E	s	x	x	G-E	7d	NA
Mustang Maxx (0.83EC) **(RUP)**	3A	x	x	1.2-4 fl. oz.	1.2-4 fl. oz.	x	12h	24 fl. oz.
zeta-cypermethrin		x	x	E	G	x	3d	6
Nexter (75WP)	21	x	4.4-10.6 oz.	x	x	x	12h	21.3 oz.
pyridaben		x	u	x	x	x	300d	2
Nexter SC (3.75SC)	21A	x	7.5-17 fl. oz.	x	x	x	12h	NA
pyridaben		x	u	x	x	x	300d	2
Oil (superior)	UN	x	see label	see label	x	x	4h	UN
mineral oil		x	u	u	x	x	dormant	NA
Onager Optek (1EC)	10	x	12-24 fl. oz.	x	x	x	12h	24 fl. oz.
hexythiazox		x	u	x	x	x	7d	1
Portal XLO (0.4EC)	21A	x	2 pts.	x	x	x	12h	4 pt.
fenpyroximate		x	u	x	x	x	7d	2
Pounce 25WP	3A	x	x	x	6.4-12.8 oz.	x	12h	38.4 oz.
permethrin		x	x	x	G	x	3d	3
Pyganic 5EC	3A	4.5-15.6 fl. oz.	x	4.5-15.6 fl. oz.	x	4.5-15.6 fl. oz.	12h	NA
pyrethrins		F	x	F	G	F	0d	10
Rimon 0.83 EC	15	x	x	20-50 fl. oz.	x	x	12d	150 fl. oz.
novaluron		x	x	G-E	x	x	8d	NA
Savey 50DF	10A	x	3-6 oz.	x	x	x	12h	6 oz.
hexythiazox		x	E	x	x	x	28d	1
Sevin XLR Plus (4F)	1A	x	x	2-3 qt.	2-3 qt.	x	12h	14 qt.
carbaryl		x	x	F	F	x	3d	3
Surround WP (95WP)	UN	25-50 lb.	x	25-50 lb.	25-50 lb.	x	4h	NA
kaolin		s	x	u	s	x	0d	NA
Vendex 50WP **(RUP)**	12B	x	1.5-3 lb.	x	x	x	48h	4.5 lb.
fenbutatin-oxide		x	G	x	x	x	14d	2
Verdepryn 100SL	28	x	x	5.5-11 fl. oz.	5.5-11 fl. oz.	x	4h	33 fl. oz.
cyclaniliprole		x	x	E	u	x	7d	3
Warrior II (2.08CS) **(RUP)**	3A	x	x	1.2-2.5 fl. oz.	1.2-2.5 fl. oz.	x	24h	12.8 fl. oz.
lambda-cyhalothrin		x	x	u	G	x	14d	NA
Zeal (72WP)	10B	x	2-3 oz.	x	x	x	12h	3 oz.
etoxazole		x	E	x	x	x	7d	1

Footnotes: See how to read the spray schedule tables section at the beginning of the chapter.

Cherry Shuck Split To First Cover – Insects

Insect management notes

- Do not use Imidan 70W on sweet cherries.

Table 3-5. Cherry Insects - Shuck Split Through First Cover[1]

Product And Formulation Active Ingredient	IRAC Code[2]	Cherry Fruit Fly	Japanese Beetle	Plum Curculio	REI[3] PHI[4]	Max Amt[5] Max App[6]
Admire Pro (4.6F)	4A	2-2.8 fl. oz.	1.4-2.8 fl. oz.	2.8 fl. oz.	12h	10.5/14 fl. oz.
imidacloprid		G	F	s	7/21d	NA
Apta (1.34SC)	21A	14-27 fl. oz.	x	21-27 fl. oz.	12h	53.5 fl. oz.
tolfenpyrad		u	x	G	14d	2
Asana XL 30SC	3A	4.5-6.7 fl. oz.	4.5-6.7 fl. oz.	4.5-6.7 fl. oz.	12h	26.9 fl. oz.
esfenvalerate		G	x	G	14d	NA
Assail 30SG	4A	5.3-8 oz.	5.3-8 oz.	5.3-8 oz.	12h	32 oz.
acetamiprid		G	G	G	7d	4
Avaunt eVo (30WDG)	22	x	x	5-6 oz.	12h	24 oz.
indoxacarb		x	x	E	14d	4
Baythroid XL (1EC) **(RUP)**	3A	2.4-2.8 fl. oz.	x	2.4-2.8 fl. oz.	12h	5.6 fl. oz.
beta-cyfluthrin		G	x	G	7d	NA
Danitol 2.4EC **(RUP)**	3A	16-21.3 fl. oz.	10.7-21.3 fl. oz.	10.7-21.3 fl. oz.	24h	42.7 fl. oz.
fenpropathrin		u	E	G	3d	NA
Delegate WG (25WG)	5	6-7 oz.	x	6-7 oz.	4h	28 oz.
spinetoram		s	x	s	7d	4
Exirel (0.83SE)	28	10-17 fl. oz.	13.5-20.5 fl. oz.	13.5-20.5 fl. oz.	12h	61.5 fl. oz.
cyantraniliprole		E	G	G	3d	3
Imidan 70W	1B	2.1 lb.	2.1 lb.	2.1 lb.	72h	7.5 lb.
phosmet		E	G	G	7/14d	NA
Malathion 5EC	1B	2.8 pt.	2.8 pt.	x	12h	NA
malathion		G	G	x	3d	4
Mustang Maxx (0.83EC) **(RUP)**	3A	1.28-4 fl. oz.	x	1.28-4 fl. oz.	12h	24 fl. oz.
zeta-cypermethrin		F	x	G	3d	6
Pounce 25WP	3A	x	x	6.4-12.8 oz.	12h	38.4 oz.
permethrin		x	x	G	3d	3
Pyganic 5EC	3A	4.5-15.6 fl. oz.	4.5-15.6 fl. oz.	x	12h	NA
pyrethrins		i	F	x	0d	10
Sevin XLR Plus (4F)	1A	2-3 qt.	2-3 qt.	2-3 qt.	12h	14 qt.
carbaryl		G	E	F	3d	3
Surround WP (95WP)	UN	25-50 lb.	25-50 lb.	25-50 lb.	4h	NA
kaolin		s	F	s	0d	NA
Verdepryn 100SL	28	5.5-11 fl. oz.	5.5-11 fl. oz.	5.5-11 fl. oz.	4h	33 fl. oz.
cyclaniliprole		G	u	u	7d	3
Warrior II (2.08CS) **(RUP)**	3A	1.2-2.5 fl. oz.	1.2-2.5 fl. oz.	1.2-2.5 fl. oz.	24h	12.8 fl. oz.
lambda-cyhalothrin		G	E	G	14d	NA

Footnotes: See how to read the spray schedule tables section at the beginning of the chapter.

Cherry Summer Cover To Harvest Sprays – Diseases

Applications begin 10-14 days after shuck split as needed through harvest.

Notes on disease management

- **Leaf spot:** Syllit is labeled for use west of the Mississippi River.

Table 3-6. Cherry Diseases - Summer Cover Through Harvest[1]

Product And Formulation Active Ingredient	FRAC Code[2]	Brown Rot	Cherry Leaf Spot	REI[3] PHI[4]	Max Amt[5] Max App[6]
Abound (SC)	11	12-15.5 fl. oz.	12-15 fl. oz.	4h	90 fl. oz.
azoxystrobin		G[r]	G[r]	0d	5
Badge SC	M	3.5-5 pt.	1.5-5 pt.	24h	63.4 pt.
copper sulfate + oxychloride		F	F-G	0d	NA
C-O-C-S WDG	M	1-2.9 lb.	1-2.9 lb.	48h	35 lb.
copper oxychloride		F	F	21d	3
Cabrio EG (20EG)	11	9.5 oz.	9.5 oz.	12h	47.5 oz.
pyraclostrobin		F-E	G[r]	0d	5
Captan 80WDG	M	2.5 lb.	2.5 lb.	24h	17.5 lb.
captan		G	F-G	0d	NA
CaptEvate 68WDG	M+17	3.7 lb.	3.75 lb.	24h	18.7 lb.
captan + fenhexamid		E	G	0d	NA
Cevya	3	3-5 fl. oz.	3-5 fl. oz.	12h	NA
mefentrifluconazole		E	E	0d	see label
Elevate 50WDG	17	1-1.5 lb.	x	12h	6 lb.
fenhexamid		G-E	x	0d	NA
Elite 45DF	3	4-8 fl. oz.	4-8 oz.	12h	3 lb.
tebuconazole		E [r]	E-G[r]	0d	NA
Flint Extra	11	2.5-3.8 fl. oz.	2.5-3.8 fl. oz.	12h	15.2 oz.
trifloxystrobin		E	E	1d	4
Fontelis (SC)	7	14-20 fl. oz.	14-20 fl. oz.	12h	61 fl. oz.
penthiopyrad		E	F-G	0d	NA
Indar 2F	3	6 fl. oz.	6 fl. oz.	12h	48 fl. oz.
fenbuconazole		E[r]	E[r]	0d	8
Inspire Super (EW)	3+9	16-20 fl. oz.	x	12h	80 fl. oz.
difenoconazole + cyprodinil		E	x	2d	4
Kenja 400SC	7	12.5 fl. oz.	x	12	37.5 fl. oz.
isofetamid		E	x	1d	3
Luna Experience (SC)	7+3	6-10 fl. oz.	6-10 fl. oz.	12h	34 fl. oz.
fluopyram + tebuconazol		G-E	x	0d	NA
Luna Privilege	7	4-6.8 fl. oz.	6.8 fl. oz.	12h	13.7 fl. oz.
fluopyram		G-E	s	0d	NA
Luna Sensation (SC)	7+11	5-5.6 fl. oz.	5-6 fl. oz.	12h	27.1 fl. oz.
fluopyram + trifloxystrobin		E	E-G	1d	4

(Continued)

Table 3-6. Cherry Diseases - Summer Cover Through Harvest[1] *(continued)*

Product And Formulation Active Ingredient	FRAC Code[2]	Brown Rot	Cherry Leaf Spot	REI[3] PHI[4]	Max Amt[5] Max App[6]
Merivon XBF	7+11	4-6.7 fl. oz.	4-6.7 fl. oz.	12h	20.1 fl. oz.
fluxapyroxad + pyraclostrobin		E	E-G	0d	3
Pristine	7+11	10.5-14.5 oz.	10.5-14.5 oz.	12h	72.5 oz.
pyaclostrobin + boscalid		G	E	0d	5
Procure 480SC	3	10-16 fl. oz.	10-16 fl. oz.	12h	56 fl. oz.
triflumizole		G[r]	G[r]	1d	4
Quadris Top	11+3	12-14 fl. oz.	x	12h	56 fl. oz.
azoxystrobin + difenoconazole		E	x	0d	NA
Quash	3	2.5-4 oz.	4 oz.	12h	10.5-12 oz.
metconazole		G[r]	G[r]	14d	3
Quilt Xcel	11+3	14 fl. oz.	x	12h	70 fl. oz.
azoxystrobin + propiconazole		E	G	0d	5
Rally 40WSP	3	2.5-6 oz.	2.5-6 oz.	24h	3.2 lb.
myclobutanil		E	E[r]	0d	NA
Sulfur, Microthiol Disperss	M2	18 lb.	x	24h	NA
sulfur		F	x	NA	NA
Syllit F	U12	3 pt.	1.5-3 pt.	48h	12 pt.
dodine		s	G	7d	6
Tilt (EC)	3	4 fl. oz.	4 fl. oz.	12h	20 fl. oz.
propiconazole		G	G[r]	0d	5
Topguard EQ	3+11	6-8 oz.	x	6-8 oz.	12h
flutriafol + azoxystrobin		G	x	E	7d
Topguard Specialty Crop	3	14 fl. oz.	14 fl. oz.	12h	56 fl. oz.
flutriafol		E	G	7d	4
Topsin M WSB	1	1-1.5 lb.	1.5 lb.	48h	4 lb.
thiophanate-methyl		G	F-G	1d	NA
Vangard WG (75WG)	9	5 oz.	x	12h	30 oz.
cyprodinil		G	x	2d	4
Ziram 76DF	M3	5-6 lb.	x	48hr	24.2 lb.
ziram		F	x	14d	4

Footnotes: See how to read the spray schedule tables section at the beginning of the chapter.

Additional Summer Cover Sprays To Harvest – Insects

Insect management notes

- Imidan 70W: Do not use on sweet cherries.
- **Lesser peachtree borer:** Control of the first generation of lesser peachtree borer with trunk sprays is during the time of peak moth flight, generally from early May to early June, depending on latitude and spring temperatures. See Borers of Peach, Cherry, and Plum Trees, page 152.
- **Spotted-wing Drosophila:** Can begin to attack fruit when they change color and soften before harvest.

Table 3-7. Cherry Insects - Summer Cover Through Harvest[1]

Product And Formulation Active Ingredient	IRAC Code[2]	Cherry Fruit Fly	Japanese Beetle	Borers	Spotted-Wing Drosophila	REI[3] PHI[4]	Max Amt[5] Max App[6]
Actara (25WDG)	4A	4.5-5.5 oz.	x	x	x	12h	11 oz.
thiamethoxam		G	x	x	x	14d	NA
Admire Pro (4.6F)	4A	2-2.8 fl. oz.	1.4-2.8 fl. oz.	x	x	12h	10.5/14 fl. oz.
imidacloprid		G	F	x	x	7/21d	NA
Altacor eVo (35WDG)	28	1.5-2.2 fl. oz.	x	x	x	4h	4.6 fl. oz.
chlorantraniliprole		s	x	x	x	10d	3
Apta (1.34SC)	21A	14-27 fl. oz.	x	x	21-27 fl. oz.	12h	53.5 fl. oz.
tolfenpyrad		u	x	x	s	14d	2
Asana XL (0.66EC) **(RUP)**	3A	4.8-14.5 fl. oz.	x	4.8-14.5 fl. oz.	see label	12h	72.5 fl. oz.
esfenvalerate		G	x	G	x	14d	NA
Assail 30SG	4A	4.5-6.7 fl. oz.	4.5-6.7 fl. oz.	x	x	12h	26.9 fl. oz.
acetamiprid		G	G	x	x	7d	4
Baythroid XL (1EC) **(RUP)**	3A	2.4-2.8 fl. oz.	x	1.4-2 fl. oz.	see label	12h	5.6 fl. oz.
beta-cyfluthrin		G	x	G	G	7d	NA
Danitol 2.4EC (RUP)	3A	16-21.3 fl. oz.	10.6-21.3 fl. oz.	x	10.6-21.3 fl. oz.	24h	42.7 fl. oz.
fenpropathrin		u	E	x	E	3d	NA
Delegate WG (25WG)	5	6-7 fl. oz.	x	x	4.5-7 oz.	4h	28 oz.
spinetoram		s	x	x	G	7d	4
Diazinon AG 600WBC **(RUP)**	1B	6.5-12.7 fl. oz./ 100 gal.	x	x	x	96h	102 fl. oz.
diazinon		G	x	x	x	21d	2
Entrust SC (2SC)	5	4-8 fl. oz.	x	x	4-8 fl. oz.	4h	29 fl. oz.
spinosad		F	x	x	G-E	7d	3
Exirel (0.83SE)	28	10-17 fl. oz.	13.5-20.5 fl. oz.	x	13.5-20.5 fl. oz.	12h	61.5 fl. oz.
cyantraniliprole		E	G	x	E	3d	3
Imidan 70W	1B	2.12 lb.	2.12 lb.	x	2.1 lb.	72h	7.5 lb.
phosmet		E	G	x	E	7/14d	NA
Malathion 5EC	1B	2.8 pt.	2.8 pt.	x	see label	12h	NA
malathion		G	G	x	G	3d	4
Movento MPC	23	10-14 fl. oz.	x	x	10-14 fl. oz.	24h	24 fl. oz.
spirotetramat		u	x	x	G	7d	NA
Mustang Maxx (0.83EC) **(RUP)**	3A	1.28-4 fl. oz.	x	1.28-4 fl. oz.	4 fl. oz.	12h	24 fl. oz.
zeta-cypermethrin		F	x	G	E	3d	6
Pounce 25WP	3A	x	x	6.4-12.8 fl. oz.	see label	12h	38.4 oz.
permethrin		x	x	F	u	3d	3
Pyganic 5EC	3A	4.5-15.6 fl. oz.	4.5-15.6 fl. oz.	x	4.5-15.6 fl. oz.	12h	NA
pyrethrins		i	F	x	F	0d	10
Rimon 0.83EC	15	20-40 fl. oz.	x	20 fl. oz.	20-40 fl. oz.	12h	150 fl. oz.
novaluron		u	x	u	G	8d	NA

(Continued)

Table 3-7. Cherry Insects - Summer Cover Through Harvest[1] *(continued)*

Product And Formulation Active Ingredient	IRAC Code[2]	Cherry Fruit Fly	Japanese Beetle	Borers	Spotted-Wing Drosophila	REI[3] PHI[4]	Max Amt[5] Max App[6]
Sevin XLR Plus (4F)	1A	2-3 qt.	2-3 qt.	2-3 qt.	x	12h	14 qt.
carbaryl		G	E	u	x	3d	3
Surround WP (95WP)	UN	25-50 lb.	25-50 lb.	x	x	4h	NA
kaolin		s	F	x	x	0d	NA
Verdepryn 100SL	28	5.5-11 fl. oz.	5.5-11 fl. oz.	5.5-11 fl. oz.	5.5-11 fl. oz.	4h	33 fl. oz.
cyclaniliprole		G	u	u	u	7d	3
Warrior II (2.08CS) **(RUP)**	3A	1.2-2.5 fl. oz.	1.2-2.5 fl. oz.	1.28-2.56 fl. oz.	see label	24h	12.8 fl. oz.
lambda-cyhalothrin		G	E	G	E	14d	NA

Footnotes: See how to read the spray schedule tables section at the beginning of the chapter.

Cherry Postharvest – Disease

Disease management notes

- The goal is to keep trees from defoliating without driving fungicide resistance. Rely on Bravo, coppers and sulfur for disease management at this time.

Table 3-8. Cherry Diseases - Postharvest[1]

Product And Formulation Active Ingredient	FRAC Code[2]	Cherry Leaf Spot	Powdery Mildew	REI[3] PHI[4]	Max Amt[5] Max app[6]
Badge SC	M	1.5-5 pt.	x	24h	63.4 pt.
copper sulfate + oxychloride		F-G	x	0d	NA
Bravo Weather Stik	M5	3-4 pt.	x	12h	20.5 pt.
chlorothalonil		E	x	through shuck split	NA
C-O-C-S WDG	M	1-2.9 lb.	x	48h	35 lb.
copper oxychloride		F	x	21d	3
Captan 80WDG	M	2.5 lb.	x	24h	17.5 lb.
captan		F-G	x	0d	NA
Cuprofix Ultra 40 Disperss	M	3.75 lb.	x	48h	45 lb.
copper sulfate		P-G	x	120d	NA
Sulfur, Microthiol Disperss	M2	x	10-30 lb.	24h	NA
sulfur		x	G	NA	NA
Syllit F	U12	1.5-3 pt.	x	48h	12 pt.
dodine		G	x	7d	6
Ziram 76DF	M3	x	x	48hr	24.2 lb.
ziram		F-i	x	14d	4

Footnotes: See how to read the spray schedule tables section at the beginning of the chapter.

Cherry Postharvest – Insects (see Summer Covers)

Insect management notes

Japanese beetle

- Damage by adult beetles feeding on leaves is sporadic and transient in July to August in most of the region.
- Leaves are skeletonized and may turn brown and fall. Defoliation is not fatal but may be stressful.

Special Comments on Cherry Schedule

Pro-Gibb on cherries

The active ingredient in Pro-Gibb is a natural plant hormone, gibberellin A3. You can use it to maintain and extend high fruiting capacity of bearing tart cherry trees and to reduce the occurrence of "blind" nodes by stimulating lateral vegetative buds and a more productive balance of lateral shoots and spurs.

Apply 4 to 18 fl. oz. of Pro-Gibb 4% per acre from 14 to 28 days after bloom when 1-3 inches of terminal shoot extension has occurred in sufficient water to provide uniform coverage Application rate depends on tree age and vigor. See label.

Since Pro-Gibb acts on buds that will flower the following growing year, responses will not begin to be visible until the year after application. Shoot, spur and flower changes will be evident two or three years after the program is started.

Applications must be applied annually to promote spur development and yield improvement.

Prohexidione-calcium (Pro-Ca) for vegetative control

Pro-Ca products are labeled for vegetative control on sweet cherry. These include Apogee, Cryova, Kudos, and generics. Refer to labels for registration and use information.

Fungicides for Phytophthora root rot management

See page 133 for Phytophthora Management on Bearing and Non-bearing Stone Fruit.

4. PEACH

Peach Insect Pests

The shaded boxes represent the crop stages where common pests in the Midwest are active; scouting and preventative sprays may be necessary/recommended. Weather and degree day accumulation will impact the exact timing of pest appearance in the orchard. **MD= mating disruption and pheromone traps.**

Dormant	Pink	Full Bloom	Petal Fall	Shuck Split	First Cover	Second Cover	Additional Covers	Pre-Harvest
							Green June Beetle	
							Japanese Beetle	
	PTB MD				Peachtree Borer			Peachtree Borer
	FM MD		Oriental Fruit Moth					
			Plum Curculio					
	Stink Bugs		Stink Bugs					
San Jose Scale					San Jose Scale			
				European Red Mite				
				Green Peach Aphid				
								Spotted-Wing Drosophilia
Tarnished Plant Bug			Tarnished Plant Bug					
				Two-Spotted Spider Mite				

Peach Spray Schedule

How to read the spray schedule tables

Every peach growth stage has important notes on disease or insect management. In some cases, the reader will be directed to the special problems section at the end of the section or chapter. Please make sure to read thoroughly and contact your state Extension specialist with any specific questions.

Key to tables

E = excellent control
G = good control
F = fair control
[r] = fungicide/insecticide resistance possible
s = suppression only
i = ineffective
u = unknown efficacy
x = pest not on the label

[1] Efficacy data in this publication are based on trials conducted across various regions and does not necessarily reflect local efficacy differences or changes over time. Growers should contact their Extension specialist for the most recent or for state-specific information. The information on this publication is only a guide; the authors and their institutions assume no liability for practices implemented based on this information. Always read and follow pesticide labels. The label is the law. Product registration may vary by state.

[2] FRAC/IRAC code represents the mode of action of the fungicide/insecticide.

[3] PHI refers to the pre-harvest interval, which is the number of days before harvest that the product may not be applied.

[4] All fungicides/insecticides have a Restricted-Entry Interval (REI). The restricted-entry interval is the time immediately after a pesticide application when entry

into the treated area is limited. Check labels for REI. Restrictions in REI may prohibit the use of certain pesticides during harvest.

Applicators must abide by both maximum amount of product per season AND maximum number of applications.

[5] Max amt refers to the product's maximum amount/acre/year.

[6] Max app refers to the product's maximum number of applications per year.

RUP refers to restricted use pesticide.

Peach Dormant To Delayed Dormant – Diseases

After leaves drop in the fall or as buds swell in spring.

Notes on disease management

Peach leaf curl

- To effectively control peach leaf curl, fungicides must be applied before bud swell. Best control is achieved by applying in late autumn at 50% leaf fall and again at delayed dormant in late winter before floral buds begin to open; second best time is in early spring prior to bud break.

Bacterial diseases (bacterial canker and shot hole)

- Copper pesticides: Using copper at the dormant stage may reduce the overwintering inoculum of the bacteria that cause bacterial infection. As season progresses, reduce the rate of copper applied to reduce the risk of phytotoxicity. Copper applied using tank mixes with a pH of less than 6.5 may result in phytotoxicity issues.
- Be sure to incorporate oxytetracycline compounds to reduce the risk of bacterial pathogens evolving resistance to copper products.
- The addition of 1 to 3 pounds of hydrated lime per copper application may reduce crop injury.

Table 4-1. Peach Diseases - Dormant Through Delayed Dormant[1]

Product And Formulation Active Ingredient	FRAC Code[2]	Bacterial Canker	Bacterial Spot Dormant	Peach Leaf Curl	Phytophthora Crown, Collar And Root Rot	REI[3] PHI[4]	Max Amt[5] Max App[6]
Badge SC	M	3.5-14 pt.	3.5-14 pt.	3.5-14 pt.	x	24h	63.4 pt.
copper sulfate + oxychloride		x	F-G	F-G	x	0d	NA
Bravo Weather Stik	M3	x	x	3.1-4.1 pt.	x	12h	20.5 pt.
chlorothalonil		x	x	G	x	shuck-split	NA
C-O-C-S WDG	M	12-15.6 lb.	12-15.6 lb.	1-2.9 lb.	x	48h	35 lb.
copper oxychloride		G	F-G	F-G	x	21d	3
Cuprofix Ultra 40 disperss	M	5-7.5 lb.	5-7.5 lb.	5-7.5 lb.	x	12h	45 lb.
copper hydroxide		G	F-G	F-G	x	120d	NA
Ferbam Granuflo	M	x	x	4.5 lb.	x	24h	3.4 lb.
ferbam		x	x	G-E	x	21d	3
Kocide 3000	M	3.5-7 lb.	3.5-7 lb.	3.5-7 lb.	x	48h	60 lb.
copper hydroxide		G	F-G	F-G	x	0d	NA
Ridomil Gold SL	4	x	x	x	2 qt./A or 1.5 oz. per 1000 sq. ft.	48	1.5 gal.
mefenoxam		x	x	x	E	NA	3
Thiram Granuflo	M3	x	x	3.5 lb.	x	24h	21.2 lb.
thiram		x	x	G	x	7d	NA
Ziram 76DF	M3	x	x	3.75-8 lb.	x	48h	48.2 lb.
ziram		x	x	E	x	30d	6

Footnotes: See how to read the spray schedule tables section at the beginning of the chapter.

Peach Dormant – Insects

After leaves drop in the fall or before buds swell in spring.

Notes on insect management

- **Mites and San Jose scale:** When spraying superior oil, check labels for temperature restrictions (e.g., only when temperatures are above 40F° or never during freezing weather).

Table 4-2. Peach Insects - Dormant[1]

Product And Formulation Active Ingredient	IRAC Code[2]	San Jose Scale	REI[3] PHI[4]	Max Amt[5] Max App[6]
Assail 30SG	4A	5.3-8 oz.	12h	32 oz.
acetamiprid		F	7d	4
Belay (2.13SC)	4A	6 fl. oz.	12h	12 fl. oz.
clothianidin		G	21d	NA
Centaur WDG (70WDG)	16	34.5 oz.	12h	69 oz.
buprofezin		E	14d	2
Diazinon AG 600WBC **(RUP)**	1B	12.75 fl. oz./100 gal.	4d	51 fl. oz.
diazinon		F	21d	2
Esteem 35WP	7C	4-5 oz.	12h	15 oz.
pyriproxyfen		E	14d	3
Imidan 70W	1B	2.1-4.25 lb.	4d	17 lb.
phosmet		E	14d	NA
Neemix 4.5 (0.39L)	UN	7-16 fl. oz.	4h	NA
azadirachtin		G	0d	NA
Damoil	UN	0.25-0.67%	4h	NA
mineral oil		G	NA	NA
Pyganic 5EC	3A	4.5-15.6 fl. oz.	12h	15.6 fl. oz.
pyrethrins		u	0d	1
Sevin XLR Plus (4F)	1A	4-5 qt.	12h	14 qt.
carbaryl		u	3d	3
Sivanto Prime	4D	10.5-14 fl. oz.	4h	28 fl. oz.
flupyradifurone		G	14d	NA

Footnotes: See how to read the spray schedule tables section at the beginning of the chapter.

Peach Pink – Diseases

Notes on disease management

Copper pesticides: Copper rates are tied to crop development, with rates reduced as the season progresses to minimize the risk of phytotoxicity. When using coppers post-bloom, do not apply during extended dews or foggy conditions. Spotting of leaves and defoliation may occur from copper use after bud swell. Generally, 2-2.5 lb. cu/A at early bud break; 1-2 lb. cu/A at pink bud; 1 lb. cu/A at blossoms opening; 0.5 lb. cu/A at petal fall; and 0.10-0.25 lb. cu/A + Mycoshield at shuck-split. The recommended amount is copper (not the commercial compound), so depends on the formulation amount of commercial compound would be different. The addition of 1 to 3 pounds of hydrated lime at blossom opening may reduce crop injury.

- Under severe disease pressure, use the Ziram 76DF higher rate.
- Fungicides with the FRAC code 3, 7, or 11 are not recommended at this time, unless disease pressures are particularly high. They are better deployed later in the season.
- Using Bravo Weather Stik (BWS) plus copper plus Fontelis alternated at 7-day intervals with BWS plus copper plus Inspire Super from pink to full bloom stages has been reported very effective against diseases during this period.

Table 4-3. Peach Diseases - Pink[1]

Product And Formulation Active Ingredient	FRAC Code[2]	Bacterial Spot/Shot Hole	Brown Rot	Peach Leaf Curl	REI[3] PHI[4]	Max Amt[5] Max App[6]
Abound (SC)	11	x	12-15.5 fl. oz.	x	4h	90 fl. oz.
azoxystrobin		x	F-E[r]	x	0d	See label
Badge SC	M	0.5-2 pt.	3.5–5.25 pt.	3.5–5.25 pt.	24h	63.4 pt.
copper sulfate + oxychloride		F-G	F	F-G	0d	NA
Bravo Weather Stik	M3	x	3.1-4.1 pt.	3.1-4.1 pt.	12h	20.5 pt.
chlorothalonil		x	G	G	shuck-split	NA
Captan	M4	x	2.5-5 lb.	x	24h	40 lb.
captan		x	G	x	0d	NA
Cevya	3	x	3-5 fl. oz.	x	12h	15 fl. oz.
mefentrifluconazole		x	E	x	0d	See label
C-O-C-S WDG	M	1-2.9 lb.	1-2.9 lb.	1-2.9 lb.	48h	35 lb.
copper oxychloride		F-G	F	F-G	21d	3
Cuprofix Ultra 40 disperss	M	1.5 lb.	1.5 lb.	1.5 lb.	12h	45 lb.
copper hydroxide		F-G	F	F-G	120d	NA
Elevate 50 WDG	17	x	1-1.5 lb.	x	12h	6 lb.
fenhexamid		x	G-E	x	0d	NA
Elite 45DF	3	x	4-8 oz.	x	12h	3 lb.
tebuconazole		x	E	x	0d	NA
Ferbam Granuflo	M	x	x	4.5 lb.	24h	3.4 lb.
ferbam		x	x	G-E	21d	3
Flint Extra	11	x	2.5-3.8 fl. oz.	x	12h	15.2 fl. oz.
trifloxystrobin		x	s (G)	E	1d	4
Fontelis (SC)	7	x	14-20 fl. oz.	x	12h	61 fl. oz.
penthiopyrad		x	G-E	x	0d	NA
Indar 2F	3	x	6 fl. oz.	x	12h	48 fl. oz.
fenbuconazole		x	E[r]	x	0d	8
Inspire Super (EW)	3+9	x	16-20 fl. oz.	x	12h	80 fl. oz.
difenoconazole + cyprodinil		x	E	x	2d	4
Kenja 400 SC	7	x	12.5 fl. oz.	x	12h	37.5 fl. oz.
isofetamid		x	E	x	1d	3
Kocide 3000	M	3.5-5 lb.	3-5 lb.	3.5-5 lb.	48h	60 lb.
copper hydroxide		F-G	F	F-G	0d	NA
Luna Experience (SC)	7+3	x	6-10 fl. oz.	6-10 fl. oz.	12h	34 fl. oz.
fluopyram + tebuconazol		x	G-E	G-E	0d	NA
Luna Privilege	7	x	4-6.8 fl. oz.	x	12h	13.7 fl. oz.
fluopyram		x	E	x	0d	NA
Luna Sensation (SC)	7+11	x	5-7.6 fl. oz.	5-7.6 fl. oz.	12h	27.1 fl. oz.
fluopyram + trifloxystrobin		x	E	G-E	1d	4
Merivon XBF	7+11	x	4-6.7 fl. oz.	x	12h	20.1 fl. oz.
fluxapyroxad + pyraclostrobin		x	E	x	0d	3

(Continued)

Table 4-3. Peach Diseases - Pink[1] *(continued)*

Product And Formulation Active Ingredient	FRAC Code[2]	Bacterial Spot/Shot Hole	Brown Rot	Peach Leaf Curl	REI[3] PHI[4]	Max Amt[5] Max App[6]
Microthiol Disperss	M	x	10-20 lb.	10-20 lb.	24h	NA
sulfur		x	F-P	G-E	0d	NA
Miravis	7	x	3.4-5.1 fl. oz.	x	4h	20.4 fl. oz.
pydiflumetofen		x	E	x	0d	4
Ph-D	19	x	x	x	4h	NA
polyoxin D		x	x	x	0h	NA
Pristine	7+11	x	10.5-14.5 oz.	10.5-14.5 oz.	12h	72.5 oz.
pyaclostrobin + boscalid		x	G[r]	s(G)	0d	5
Quadris Top	11+3	x	12-14 fl. oz.	x	12h	56 fl. oz.
azoxystrobin + difenoconazole		x	E	x	0d	4
Quash	3	x	2.5-3.5 fl. oz.	x	12h	12 fl. oz.
metconazole		x	G-E	x	14d	3
Quilt Xcel	11+3	x	14 fl. oz.	x	12h	70 fl. oz.
azoxystrobin + propiconazole		x	E	x	0d	5
Rally 40WSP	3	x	2.5-6 oz.	x	24h	3.25 lb.
myclobutanil		x	G	x	0h	NA
Rovral 4F	2	x	1-2 pt.	x	24h	4 pt.
iprodione		x	E	x	PF	2
Scala (SC)	9	x	9-18 fl. oz.	x	12h	54 fl. oz.
pyrimethanil		x	G-E	x	2d	3
Syllit F	U12	x	3 pt.	3 pt.	48h	9 pt.
dodine		x	s	E	petal fall	3
Thiram Granuflo	M3	x	3.5 lb.	3.5 lb.	24h	21.2 lb.
thiram		x	G	G	7d	NA
Tilt (EC)	3	x	4 fl. oz.	x	12h	20 fl. oz.
propiconazole		x	E	x	0d	5
Topguard EQ	3+11	x	6-8 fl. oz	x	12h	NA
flutriafol + azoxystrobin		x	G	x	7d	4
Topguard Specialty Crop	3	x	14 fl. oz.	14 fl. oz.	12h	56 fl. oz.
flutriafol		x	E	G	7d	4
Topsin M WSB	1	x	1-1.5 lb.	x	48h	4 lb.
thiophanate-methyl		x	E[r]	x	1d	NA
Vangard WG (75WG)	9	x	5 oz.	x	12h	30 oz.
cyprodinil		x	G-E	x	2d	4
Ziram 76DF	M3	x	4.5-8 lb.	3.75-8 lb.	48h	48.2 lb.
ziram		x	G	E	30d	6

Footnotes: See how to read the spray schedule tables section at the beginning of the chapter.

Peach Pink – Insects

Notes on insect management

- **Oriental fruit moth monitoring:** Put pheromone traps to monitor Oriental fruit moth in place now to determine the need for sprays at petal fall. **For mating disruption, see Mating Disruption for Peach Pests, page 153.**
- **Peachtree borers:** Pheromone traps should be deployed pre bloom. For mating disruption, see Mating Disruption for Peach Pests page 153.
- **Tarnished plant bug, stink bugs:** Apply insecticides before any blooms open.

Table 4-4. Peach Insects - Pink[1]

Product And Formulation Active Ingredient	IRAC Code[2]	Plant Bug/Stink Bug	REI[3] PHI[4]	Max Amt[5] Max App[6]
Asana XL (0.66EC) **(RUP)**	3A	4.8-14.5 fl. oz.	12h	72.5 fl. oz.
esfenvalerate		G	14d	NA
Assail 30SG	4A	5.3-8 oz.	12h	32 oz.
acetamiprid		F	7d	4
Baythroid XL (1EC) **(RUP)**	3A	2-2.4 fl. oz.	12h	5.6 fl. oz.
beta-cyfluthrin		E	7d	NA
Belay (2.13SC)	4A	6 fl. oz.	12h	12 fl. oz.
clothianidin		E	21d	NA
Beleaf 50SG	29	2-2.8 oz.	12h	8.4 oz.
flonicamid		G	14d	3
Danitol 2.4EC **(RUP)**	3A	10.7-21.3 fl. oz.	24h	42.7 fl. oz.
fenpropathrin		E	3d	NA
Lannate LV	1A	3 pt.	4d	18 pt.
methomyl		G	4d	6
Mustang Maxx (0.83EC) **(RUP)**	3A	1.28-4 fl. oz.	12h	24 fl. oz.
zeta-cypermethrin		E	14d	NA
Neemix 4.5 (0.39L)	UN	7-16 fl. oz.	4h	NA
azadirachtin		E	0d	NA
Pyganic 5EC	3A	4.5-15.6 fl. oz.	12h	15.6 fl. oz.
pyrethrins		u	0d	1
Rimon 0.83EC	15	20-40 fl. oz.	12h	150 fl. oz.
novaluron		u	8d	NA
Scorpion 35SL	4A	5.25-7 fl. oz.	12h	14.25 fl. oz.
dinotefuran		E	3/21d	NA
Sevin XLR Plus (4F)	1A	2-3 qt.	12h	14 qt.
carbaryl		F	3d	3
Venom (70SG)	4A	3-4 oz.	12h	6 oz.
dinotefuran		E	3d	NA
Warrior II (2.08CS) **(RUP)**	3A	1.2-2.5 fl. oz.	24h	12.8 fl. oz.
lambda-cyhalothrin		E	14d	NA

Footnotes: See how to read the spray schedule tables section at the beginning of the chapter.

(Continued)

Peach Full Bloom – Diseases

Notes on disease management

- Use 12 oz. of Mycoshield/100 gallons of water (=150 ppm), varying volume depending upon tree size and foliar development.
- Quadris Top and Quilt Xcel contain azoxystrobin, which is known to be phytotoxic to certain apple varieties. Do not use where drift might affect apples.
- Application of Captan or Bravo as a tank mix is not recommended at this time due to the risk of phytotoxicity.
- The use of copper is not recommended during bloom to reduce phytotoxicity and protect pollinators.

Check with your local Extension Specialist for using copper during bloom.

Table 4-5. Peach Diseases - Full Bloom[1]

Product And Formulation Active Ingredient	FRAC Code[2]	Brown Rot	REI[3] PHI[4]	Max Amt[5] Max App[6]
Abound (SC)	11	12-15.5 fl. oz.	4h	90 fl. oz.
azoxystrobin		F-G[r]	0d	See label
Bravo Weather Stik	M3	3.1-4.1 pt.	12h	20.5 pt.
chlorothalonil		G	shuck-split	NA
Captan	M4	2.5-5 lb.	24h	40 lb.
captan		G	0d	NA
Cevya	3	3-5 fl. oz.	12h	15 fl. oz.
mefentrifluconazole		E	0d	See label
Elevate 50 WDG	17	1-1.5 lb.	12h	6 lb.
fenhexamid		G-E	0d	NA
Elite 45DF	3	4-8 oz.	12h	3 lb.
tebuconazole		E	0d	NA
Flint Extra	11	2.5-3.8 fl. oz.	12h	15.2 fl. oz.
trifloxystrobin		s (G)	1d	4
Fontelis (SC)	7	14-20 fl. oz.	12h	61 fl. oz.
penthiopyrad		E	0d	NA
Indar 2F	3	6 fl. oz.	12h	48 fl. oz.
fenbuconazole		E[r]	0d	8
Inspire Super (EW)	3+9	16-20 fl. oz.	12h	80 fl. oz.
difenoconazole + cyprodinil		E	2d	4
Kenja 400 SC	7	12.5 fl. oz.	12h	37.5 fl. oz.
isofetamid		E	1d	3
Luna Experience (SC)	7+3	6-10 fl. oz.	12h	34 fl. oz.
fluopyram + tebuconazol		G-E	0d	NA
Luna Privilege	7	4-6.8 fl. oz.	12h	13.7 fl. oz.
fluopyram		E	0d	NA
Luna Sensation (SC)	7+11	5-7.6 fl. oz.	12h	27.1 fl. oz.
fluopyram + trifloxystrobin		E	1d	4
Merivon XBF	7+11	4-6.7 fl. oz.	12h	20.1 fl. oz.
fluxapyroxad + pyraclostrobin		E	0d	3

(Continued)

Table 4-5. Peach Diseases - Full Bloom[1] *(continued)*

Product And Formulation Active Ingredient	FRAC Code[2]	Brown Rot	REI[3] PHI[4]	Max Amt[5] Max App[6]
Microthiol Disperss	M	10-20 lb.	24h	NA
sulfur		F-P	0d	NA
Miravis	7	3.4-5.1 fl. oz.	4h	20.4 fl. oz.
pydiflumetofen		E	0d	4
Mycoshield	41	x	12h	12 lb.
oxytetracyline		x	21d	8
Ph-D	19	6.2 oz.	4h	NA
polyoxin D		x	0h	NA
Pristine	7+11	10.5-14.5 oz.	12h	72.5 oz.
pyaclostrobin + boscalid		E-G[r]	0d	5
Quadris Top	11+3	12-14 fl. oz.	12h	56 fl. oz.
azoxystrobin + difenoconazole		G-E	0d	4
Quash	3	2.5-3.5 fl. oz.	12h	12 fl. oz.
metconazole		G-E	14d	3
Quilt Xcel	11+3	14 fl. oz.	12h	70 fl. oz.
azoxystrobin + propiconazole		E	0d	5
Rally 40WSP	3	2.5-6 oz.	24h	3.25 lb.
myclobutanil		G	0h	NA
Rovral 4F	2	1-2 pt.	24h	4 pt.
iprodione		E	PF	2
Scala (SC)	9	9-18 fl. oz.	12h	54 fl. oz.
pyrimethanil		E-G	2d	3
Thiram Granuflo	M3	3.5 lb.	24h	21.2 lb.
thiram		G	7d	NA
Tilt (EC)	3	4 fl. oz.	12h	20 fl. oz.
propiconazole		E	0d	5
Topguard EQ	3+11	6-8 fl. oz.	12h	NA
flutriafol + azoxystrobin		G	7d	4
Topguard Specialty Crop	3	14 fl. oz.	12h	56 fl. oz.
flutriafol		E	7d	4
Topsin M WSB	1	1-1.5 lb.	48h	4 lb.
thiophanate-methyl		G[r]	1d	NA
Vangard WG (75WG)	9	5 oz.	12h	30 oz.
cyprodinil		G-E	2d	4
Ziram 76DF	M3	4.5-8 lb.	48h	48.2 lb.
ziram		G	30d	6

Footnotes: See how to read the spray schedule tables section at the beginning of the chapter.

Peach Full Bloom – Insects

Save the bees! *Insecticide use for insects or mites is not recommended at this time.*

Peach Petal Fall To Shuck Split – Diseases

Brown rot

- Last application for Rovral (iprodione) at petal fall. Do not apply Rovral after petal fall.
- Last application of Bravo or chlorothalonil product for control of brown rot and scab at shuck split.

Bacterial spot management:

- Some labels specify shuck-split, first and /or second cover sprays for application timings. Carefully read the label whenever using copper products to avoid phytotoxicity.
- If bacterial spot has been a problem, apply at 7-day intervals from petal fall (<5% shuck split) through first cover.
- For control of bacterial spot, reduce the rate of copper as the season progresses to reduce the risk of phytotoxicity. Do not apply under extended wet or humid conditions.
- Application of Bravo Weather Stik (BWS) plus Fontelis plus Mycoshield alternated at 7-day intervals with BWS plus Inspire Super plus Mycoshield from petal fall through shuck-split has been reported effective in controlling fungal and bacterial diseases during this period.

Peach scab applications begin now and are critical from shuck split through second-third cover.

Table 4-6. Peach Diseases - Petal Fall Through Shuck Split[1]

Product And Formulation Active Ingredient	FRAC Code[2]	Bacterial Spot/Shot Hole	Brown Rot	Peach Scab	Powdery Mildew/Peach Rusty Spot	REI[3] PHI[4]	Max Amt[5] Max App[6]
Abound (SC)	11	x	12-15.5 fl. oz.	12-15.5 fl. oz.	12-15.5 fl. oz.	4h	90 fl. oz.
azoxystrobin		x	F-G[r]	G	F-G	0d	See label
Badge SC	M	0.5–2 pt.	x	x	x	24h	63.4 pt.
copper sulfate + oxychloride		F-G	x	x	x	0d	NA
Bravo Weather Stik	M3	x	3.1-4.1 pt.	3.1-4.1 pt.	3.1-4.1 pt.	12h	20.5 pt.
chlorothalonil		x	G	G	x	shuck-split	NA
Captan	M4	x	2.5-5 lb.	2.5-5 lb.	2.5-5 lb.	24h	40 lb.
captan		x	G	G	F	0d	NA
Cevya	3	x	3-5 fl. oz.	3-5 fl. oz.	4-5 fl. oz.	12h	15 fl. oz.
mefentrifluconazole		x	E	E	E	0d	See label
C-O-C-S WDG	M	1-2.9 lb.	1-2.9 lb.	x	x	48h	35 lb.
copper oxychloride		F-G	F	x	x	21d	3
Cuprofix Ultra 40 disperss	M	1 lb.	1 lb.	x	x	12h	45 lb.
copper hydroxide		G-F	F	x	x	120d	NA
Elevate 50 WDG	17	x	1-1.5 lb.	x	x	12h	6 lb
fenhexamid		x	G-E	x	x	0d	NA
Elite 45DF	3	x	4-8 oz.	x	4-8 oz.	12h	3 lb.
tebuconazole		x	E	x	E	0d	NA
Flint Extra	11	x	2.5-3.8 fl. oz.	2.5-3.8 fl. oz.	2.5-3.8 fl. oz.	12h	15.2 fl. oz.
trifloxystrobin		x	s (G)	E	E	1d	4
Fontelis (SC)	7	x	14-20 fl. oz.	14-20 fl. oz.	14-20 fl. oz.	12h	61 fl. oz.
penthiopyrad		x	G-E	F-G	F-G	0d	NA
Indar 2F	3	x	6 fl. oz.	6 fl. oz.	x	12h	48 fl. oz.
fenbuconazole		x	E[r]	F	x	0d	8

(Continued)

Table 4-6. Peach Diseases - Petal Fall Through Shuck Split[1] *(continued)*

Product And Formulation Active Ingredient	FRAC Code[2]	Bacterial Spot/Shot Hole	Brown Rot	Peach Scab	Powdery Mildew/Peach Rusty Spot	REI[3] PHI[4]	Max Amt[5] Max App[6]
Inspire Super (EW)	3+9	x	16-20 fl. oz.	16-20 fl. oz.	16-20 fl. oz.	12h	80 fl. oz.
difenoconazole + cyprodinil		x	E	F-G	F-G	2d	4
Kenja 400 SC	7	x	12.5 fl. oz.	12.5 fl. oz.	x	12h	37.5 fl. oz.
isofetamid		x	E	G	x	1d	3
Kocide 3000	M	02.5-0.5 lb.	x	x	x	48h	60 lb
copper hydroxide		G-F	x	x	x	0d	NA
Luna Experience (SC)	7+3	x	6-10 fl. oz.	8-10 fl. oz.	6-10 fl. oz.	12h	34 fl. oz.
fluopyram + tebuconazol		x	G-E	E	G	0d	NA
Luna Privilege	7	x	4-6.8 fl. oz.	4.8-6.8 fl. oz.	4-6.84 fl. oz	12h	13.7 fl. oz.
fluopyram		x	E	F	G	0d	NA
Luna Sensation (SC)	7+11	x	5-7.6 fl. oz.	5-7.6 fl. oz.	5-7.6 fl. oz.	12h	27.1 fl. oz.
fluopyram + trifloxystrobin		x	E	F	G-E	1d	4
Merivon XBF	7+11	x	4-6.7 fl. oz.	4-6.7 fl. oz.	4-6.7fl. oz.	12h	20.1 fl. oz.
fluxapyroxad + pyraclostrobin		x	E	G-E	G-E	0d	3
Microthiol Disperss	M	x	10-20 lb.	x	10-20 lb.	24h	NA
sulfur		x	F-P	x	F-P	0d	NA
Miravis	7	x	3.4-5.1 fl. oz.	3.4-5.1 fl. oz.	3.4-5.1 fl. oz.	4h	20.4 fl. oz.
pydiflumetofen		x	E	E-G	E-G	0d	4
Mycoshield	41	12 oz./100 g.	x	x	x	12h	12 lb.
oxytetracyline		E[r]	x	x	x	21d	8
Ph-D	19	x	x	6.2 oz.	6.2 oz.	4h	NA
polyoxin D		x	x	G	u	0h	NA
Pristine	7+11	x	10.5-14.5 oz.	10.5-14.5 oz.	10.5-14.5 oz.	12h	72.5 oz.
pyaclostrobin + boscalid		x	E-G[r]	E-G	E[r]	0d	5
Quadris Top	11+3	x	12-14 fl. oz.	12-14 fl. oz.	12-14 fl. oz.	12h	56 fl. oz.
azoxystrobin + difenoconazole		x	E	u	G	0d	4
Quash	3	x	2.5-3.5 fl. oz.	2.5-3.5 fl. oz.	3.5-4 fl. oz.	12h	12 fl. oz.
metconazole		x	G-E	G	E	14d	3
Quilt Xcel	11+3	x	14 fl. oz.	14 fl. oz.	14 fl. oz.	12h	70 fl. oz.
azoxystrobin + propiconazole		x	E	G	G	0d	5
Quintec	13	x	x	x	7 fl. oz.	12h	28 fl. oz.
quinoxyfen		x	x	x	E	7d	4
Rally 40WSP	3	x	2.5-6 oz.	x	2.5-6 oz.	24h	3.25 lb.
myclobutanil		x	G	x	G-E	0h	NA
Rovral 4F	2	x	1-2 pt.	1-2 qt.	x	24h	4 pt.
iprodione		x	E	u	x	PF	2
Scala (SC)	9	x	9-18 fl. oz.	x	x	12h	54 fl. oz.
pyrimethanil		x	G-E	x	x	2d	3

(Continued)

Table 4-6. Peach Diseases - Petal Fall Through Shuck Split[1] *(continued)*

Product And Formulation Active Ingredient	FRAC Code[2]	Bacterial Spot/Shot Hole	Brown Rot	Peach Scab	Powdery Mildew/Peach Rusty Spot	REI[3] PHI[4]	Max Amt[5] Max App[6]
Syllit F	U12	x	3 pt.	3 pt.	x	48h	9 pt.
dodine		x	s	F	x	petal fall	3
Thiram Granuflo	M3	x	3.5 lb.	3.5 lb.	x	24h	21.2 lb.
thiram		x	G	G	x	7d	NA
Tilt (EC)	3	x	4 fl. oz.	x	4 fl. oz.	12h	20 fl. oz.
propiconazole		x	E	x	G	0d	5
Topguard EQ	3+11	x	6-8 fl. oz.	6-8 fl. oz.	6-8 fl. oz.	12h	NA
flutriafol + azoxystrobin		x	G	u	E	7d	4
Topguard Specialty Crop	3	x	14 fl. oz.	14 fl. oz.	14 fl. oz.	12h	56 fl. oz.
flutriafol		x	E	s(G)	G	7d	4
Topsin M WSB	1	x	1-1.5 lb.	1-1.5 lb.	1-1.5 lb.	48h	4 lb.
thiophanate-methyl		x	G[r]	G	G[r]	1d	NA
Vangard WG (75WG)	9	x	5 oz.	x	x	12h	30 oz.
cyprodinil		x	G-E	x	x	2d	4
Ziram 76DF	M3	x	4.5-8 lb.	4.5-8 lb.	x	48h	48.2 lb.
ziram		x	G	G	x	30d	6

Footnotes: See how to read the spray schedule tables section at the beginning of the chapter.

Peach Petal Fall To Shuck Split – Insects

Table 4-7. Peach Insects - Petal Fall Through Shuck Split[1]

Product And Formulation Active Ingredient	IRAC Code[2]	Borers	Cherry Fruit Fly	European Red Mite	Green Peach Aphid	Japanese Beetle	Oriental Fruit Moth	Plant Bug / Stink Bug	Plum Curculio	San Jose Scale	Spotted-Wing Drosophila	REI[3] PHI[4]	Max Amt[5] Max App[6]
Acramite 50WS	25	x	x	1 lb.	x	x	x	x	x	x	x	12h	NA
bifenazate		x	x	E	x	x	x	x	x	x	x	3h	1
Actara (25WDG)	4A	x	4.5-5.5 oz.	x	3-4 oz.	x	x	4.5-5.5 oz.	4.5-5.5 oz.	x	x	12h	11 oz.
thiamethoxam		x	F	x	E	x	x	G	G	x	x	14d	NA
Admire Pro (4.6F)	4A	x	2-2.8 fl. oz.	x	1.4-2.8 fl. oz.	1.4-2.8 fl. oz.	x	2.8 fl. oz.	2.8 fl. oz.	1.4-2.8 fl. oz.	x	12h	8.4 fl. oz.
imidacloprid		x	F	x	E	G	x	s	s	F	x	0d	NA
Altacor eVo	28	1.5-2.2 oz.	1.5-2.2 oz.	x	x	x	1.5-2.2 oz.	x	x	x	x	4h	4.6 oz.
chlorantraniliprole		u	s	x	x	x	E	x	x	x	x	10d	3
Apta (1.34SC)	21A	x	14-27 fl. oz.	x	17-27 fl. oz.	x	x	21-27 fl. oz.	21-27 fl. oz.	x	21-27 fl. oz.	12h	53.5 fl. oz.
tolfenpyrad		x	u	x	G	x	x	S	G	x	s	14d	2

(Continued)

Table 4-7. Peach Insects - Petal Fall Through Shuck Split[1] *(continued)*

Product And Formulation Active Ingredient	IRAC Code[2]	Borers	Cherry Fruit Fly	European Red Mite	Green Peach Aphid	Japanese Beetle	Oriental Fruit Moth	Plant Bug/ Stink Bug	Plum Curculio	San Jose Scale	Spotted-Wing Drosophila	REI[3] PHI[4]	Max Amt[5] Max App[6]
Asana XL (0.66EC) **(RUP)**	3A	4.8-14.5 fl. oz.	4.8-14.5 fl. oz.	x	x	x	4.8-14.5 fl. oz.	4.8-14.5 fl. oz.	4.8-14.5 fl. oz.	x	x	12h	72.5 fl. oz.
esfenvalerate		G	G	x	x	x	E[r]	G	G	x	x	14d	NA
Assail 30SG	4A	5.3-8 oz.	5.3-8 oz.	x	2.5-5.3 oz.	5.3-8 oz.	5.3-8 oz.	5.3-8 oz.	5.3-8 oz.	5.3-8 oz.	x	12h	32 oz.
acetamiprid		G	F	x	E	G	E	F	G	F	x	7d	4
Avaunt eVo (30WDG)	22A	x	x	x	x	x	6 oz.	x	5-6 oz.	x	x	12h	24 oz.
indoxacarb		x	x	x	x	x	G	x	E	x	x	14d	4
Baythroid XL (1EC) **(RUP)**	3A	1.4-2 fl. oz.	2.4-2.8 fl. oz.	x	x	x	2-2.4 fl. oz.	2-2.4 fl. oz.	2.4-2.8 fl. oz.	x	x	12h	5.6 fl. oz.
beta-cyfluthrin		G	G	x	x	x	E[r]	E	G	x	x	7d	NA
Belay (2.13SC)	4A	x	x	x	3 - 6 fl. oz.	x	x	6 fl. oz.	6 fl. oz.	6 fl. oz.	x	12h	12 fl. oz.
clothianidin		x	x	x	E	x	x	E	G	G	x	21d	NA
Beleaf 50SG	29	x	x	x	2-2.8 oz.	x	x	2-2.8 oz.	x	x	x	12h	8.4 oz.
flonicamid		x	x	x	E	x	x	G	x	x	x	14d	3
Danitol 2.4EC **(RUP)**	3A	x	16-21.3 fl. oz.	10.7-21.3 fl. oz.	10.7-21.3 fl. oz.	10.7-21.3 fl. oz.	10.7-21.3 fl. oz.	10.7-21.3 fl. oz.	10.7-21.3 fl. oz.	x	10.7-21.3 fl. oz.	24h	42.7 fl. oz.
fenpropathrin		x	G	i	F	E	E[r]	E	G	x	E	3d	NA
Delegate WG (25WG)	5	x	6-7 oz.	x	x	x	6-7 oz.	x	6-7 oz.	x	4.5-7 oz.	4h	28 oz.
spinetoram		x	s	x	x	x	E	x	s	x	G	1d	4
Diazinon AG 600WBC **(RUP)**	1B	x	x	12.75 fl. oz./100 gal.	12.75 fl. oz./100 gal.	x	12.75 fl. oz./100 gal.	x	x	12.75 fl. oz./100 gal.	x	4d	51 fl. oz.
diazinon		x	x	i	G	x	G	x	x	F	x	21d	2
Dimilin 2L **(RUP)**	15	x	x	x	x	x	8-16 fl. oz.	x	8-16 fl. oz.	x	x	12h	32 fl. oz.
		x	x	x	x	x	x	x	u	x	x	14d	2
Entrust SC (2SC)	5	x	4-8 fl. oz.	x	x	x	4-8 fl. oz.	x	x	x	4-8 fl. oz.	4h	29 fl. oz.
spinosad		x	F	x	x	x	F	x	x	x	G-E	7d	3
Esteem 35WP	7C	x	x	x	x	x	4-5 oz.	x	x	4-5 oz.	x	12h	15 oz.
pyriproxyfen		x	x	x	x	x	s	x	x	E	x	14d	3
Exirel (0.83SE)	28	x	10-17 fl. oz.	x	x	13.5-20.5 fl. oz.	10-20.5 fl. oz.	x	13.5-20.5 fl. oz.	x	13.5-20.5 fl. oz.	12h	61.5 fl. oz.
cyantraniliprole		x	E	x	x	G	E	x	G	x	E	3d	3

(Continued)

Table 4-7. Peach Insects - Petal Fall Through Shuck Split[1] *(continued)*

Product And Formulation Active Ingredient	IRAC Code[2]	Borers	Cherry Fruit Fly	European Red Mite	Green Peach Aphid	Japanese Beetle	Oriental Fruit Moth	Plant Bug/ Stink Bug	Plum Curculio	San Jose Scale	Spotted-Wing Drosophila	REI[3] PHI[4]	Max Amt[5] Max App[6]
Imidan 70W	1B	x	2.1-2.5 lb.	x	x	2.1-4.25 lb.	2.13-4.25 lb.	x	2.1-4.25 lb.	2.1-4.25 lb.	2.1-4.25 lb.	4d	17 lb.
phosmet		x	G	x	x	G	E[r]	x	G	E	E	14d	NA
Intrepid 2F	18	x	x	x	x	x	10-16 fl. oz.	x	x	x	x	4h	64 fl. oz.
methoxyfenozide		x	x	x	x	x	G	x	x	x	x	7d	NA
Lannate LV	1A	x	x	x	3 pt.	x	3 pt.	3 pt.	x	x	x	4d	18 pt.
methomyl		x	x	x	G	x	F	G	x	x	x	4d	6
Malathion 5EC	1B	x	x	2.5-4.8 pt.	2.5-4.8 pt.	2.5-4.8 pt.	4.8 pt.	x	4.8 pt.	x	x	24h	4.8 pt.
malathion				u	u	u	u		u			7d	3
Mustang Maxx (0.83EC) **(RUP)**	3A	1.28-4 fl. oz.	1.28-4 fl. oz.	x	x	x	1.2-4 fl. oz.	1.2-4 fl. oz.	1.2-4 fl. oz.	x	4 fl. oz.	12h	24 fl. oz.
zeta-cypermethrin		G	F	x	x	x	E[r]	E	G	x	E	14d	NA
Neemix 4.5 (0.39L)	UN	7-16 fl. oz.	7-16 fl. oz.	x	5-7 fl. oz.	x	7-16 fl. oz.	7-16 fl. oz.	x	7-16 fl. oz.	x	4h	NA
azadirachtin		F	u	x	G	x	u	E	i	G	x	0d	NA
Nexter SC (3.755C)	21	x	x	7.5-17 fl. oz.	x	x	x	x	x	x	x	12h	34 fl. oz.
pyridaben		x	x	u	x	x	x	x	x	x	x	7d	2
Pounce 25WP	3A	6.4-16 oz.	x	x	x	x	6.4-16 oz.	x	6.4-16 oz.	x	x	12h	48 oz.
permethrin		F	x	x	x	x	E[r]	x	G	x	x	14d	NA
Pyganic 5EC	3A	4.5-15.6 fl. oz.	4.5-15.6 fl. oz.	4.5-15.6 fl. oz.	4.5-15.6 fl. oz.	4.5-15.6 fl. oz.	x	4.5-15.6 fl. oz.	x	4.5-15.6 fl. oz.	4.5-15.6 fl. oz.	12h	15.6 fl. oz.
pyrethrins		u	i	u	G	u	x	u	x	u	F	0d	1
Rimon 0.83EC	15	20 fl. oz.	20-40 fl. oz.	x	x	x	20-40 fl. oz.	20-40 fl. oz.	x	x	20-40 fl. oz.	12h	150 fl. oz.
novaluron		u	u	x	x	x	E	u	x	x	G	8d	NA
Scorpion 35SL	4A	5.25-7 fl. oz.	x	x	3.5-7 fl. oz.	x	x	5.25-7 fl. oz.	5.25-7 fl. oz.	x	x	12h	14.25 fl. oz.
dinotefuran		s	x	x	s	x	x	E	s	x	x	3/21d	NA
Sevin XLR Plus (4F)	1A	2-3 qt.	2-3 qt.	x	x	2-3 qt.	2-3 qt.	2-3 qt.	2-3 qt.	4-5 qt.	x	12h	14 qt.
carbaryl		u	G	x	x	E	F	F	F	u	x	3d	3
Surround WP (95WP)	UN	x	25-50 lb.	x	x	25-50 lb.	25-50 lb.	x	25-50 lb.	x	x	4h	NA
kaolin		x	s	x	x	s	s	x	s	x	x	0d	NA

(Continued)

Table 4-7. Peach Insects - Petal Fall Through Shuck Split[1] *(continued)*

Product And Formulation Active Ingredient	IRAC Code[2]	Borers	Cherry Fruit Fly	European Red Mite	Green Peach Aphid	Japanese Beetle	Oriental Fruit Moth	Plant Bug/ Stink Bug	Plum Curculio	San Jose Scale	Spotted-Wing Drosophila	REI[3] PHI[4]	Max Amt[5] Max App[6]
Venom (70SG)	4A	3-4 oz.	x	x	2-4 oz.	x	x	3-4 oz.	3-4 oz.	x	x	12h	.
dinotefuran		u	x	x	s	x	x	E	u	x	x	3d	NA
Verdepryn 100SL (0.83SL)	28	x	5.5-11 fl. oz.	x	5.5-11 fl. oz.	x	5.5-11 fl. oz.	5.5-11 fl. oz.	5.5-11 fl. oz.	x	5.5-11 fl. oz.	4h	33 fl. oz.
cyclaniliprole		x	G	x	E	x	E	s	u	x	u	7d	3
Warrior II (2.08CS) **(RUP)**	3A	1.2-2.5 fl. oz.	1.2-2.5 fl. oz.	x	x	1.2-2.5 fl. oz.	1.2-2.5 fl. oz.	1.2-2.5 fl. oz.	1.2-2.5 fl. oz.	x	x	24h	12.8 fl. oz.
lambda-cyhalothrin		G	G	x	x	E	G[r]	E	G	x	x	14d	NA

Footnotes: See how to read the spray schedule tables section at the beginning of the chapter.

Peach First Cover – Diseases

7-10 days after shuck split.

Table 4-8. Peach Diseases - First Cover[1]

Product And Formulation Active Ingredient	FRAC Code[2]	Bacterial Spot/ Shot Hole	Brown Rot	Peach Scab	Powdery Mildew/ Peach Rusty Spot	REI[3] PHI[4]	Max Amt[5] Max App[6]
Abound (SC)	11	x	12-15.5 fl. oz.	9-15.5 fl. oz.	12-15.5 fl. oz.	4h	90 fl. oz.
azoxystrobin		x	F-G[r]	G	F	0d	See label
Badge SC	M	0.5–2 pt.	x	x	x	24h	63.4 pt.
copper sulfate + oxychloride		F-G	x	x	x	0d	NA
Captan	M4	x	2.5-5 lb.	2.5-5 lb.	2.5-5 lb.	24h	40 lb.
captan		x	G	G	F	0d	NA
Cevya	3	x	3-5 fl. oz.	3-5 fl. oz.	4-5 fl. oz.	12h	15 fl. oz.
mefentrifluconazole		x	E	E	E	0d	See label
Elevate 50 WDG	17	x	1-1.5 lb.	x	x	12h	6 lb.
fenhexamid		x	G-E	x	x	0d	NA
Elite 45DF	3	x	4-8 oz.	x	4-8 oz.	12h	3 lb.
tebuconazole		x	E	x	E	0d	NA
Flint Extra	11	x	2.5-3.8 fl. oz.	2.5-3.8 fl. oz.	2.5-3.8 fl. oz.	12h	15.2 fl. oz.
trifloxystrobin		x	s (G)	E	E	1d	4
Fontelis (SC)	7	x	14-20 fl. oz.	14-20 fl. oz.	14-20 fl. oz.	12h	61 fl. oz.
penthiopyrad		x	G-E	F-G	F-G	0d	NA
Indar 2F	3	x	6 fl. oz.	6 fl. oz.	x	12h	48 fl. oz.
fenbuconazole		x	E[r]	F	x	0d	8

(Continued)

Table 4-8. Peach Diseases - First Cover[1] *(continued)*

Product And Formulation Active Ingredient	FRAC Code[2]	Bacterial Spot/ Shot Hole	Brown Rot	Peach Scab	Powdery Mildew/ Peach Rusty Spot	REI[3] PHI[4]	Max Amt[5] Max App[6]
Inspire Super (EW)	3+9	x	16-20 fl. oz.	16-20 fl. oz.	16-20 fl. oz.	12h	80 fl. oz.
difenoconazole + cyprodinil		x	E	F-G	F-G	2d	4
Kenja 400 SC	7	x	12.5 fl. oz.	12.5 fl. oz.	x	12h	37.5 fl. oz.
isofetamid		x	E	G	x	1d	3
Kocide 3000	M	0.25-0.5 lb.	x	x	x	48h	60 lb.
copper hydroxide		G-F	x	x	x	0d	NA
Luna Experience (SC)	7+3	x	6-10 fl. oz.	8-10 fl. oz.	6-10 fl. oz.	12h	34 fl. oz.
fluopyram + tebuconazol		x	G-E	E	G	0d	NA
Luna Privilege	7	x	4-6.8 fl. oz.	4.8-6.8 fl. oz.	4-6.8 fl. oz.	12h	13.7 fl. oz.
fluopyram		x	E	F	G	0d	NA
Luna Sensation (SC)	7+11	x	5-7.6 fl. oz.	5-7.6 fl. oz.	5-7.6 fl. oz.	12h	27.1 fl. oz.
fluopyram + trifloxystrobin		x	E	F	G-E	1d	4
Merivon XBF	7+11	x	4-6.7 fl. oz.	4-6.7 fl. oz.	4-6.7 fl. oz.	12h	20.1 fl. oz.
fluxapyroxad + pyraclostrobin		x	E	G-E	G-E	0d	3
Microthiol Disperss	M	x	10-20 lb.	x	10-20 lb.	24h	NA
sulfur		x	F-P	x	F-P	0d	NA
Miravis	7	x	3.4-5.1 fl. oz.	3.4-5.1 fl. oz.	3.4-5.1 fl. oz.	4h	20.4 fl. oz.
pydiflumetofen		x	E	G-E	G-E	0d	4
Mycoshield	41	12 oz./100 g.	x	x	x	12h	12 lb.
oxytetracyline		E[r]	x	x	x	21d	8
Ph-D	19	x	x	6.2 oz.	6.2 oz.	4h	NA
polyoxin D		x	x	G	u	0h	NA
Pristine	7+11	x	10.5-14.5 oz.	10.5-14.5 oz.	10.5-14.5 oz.	12h	72.5 oz.
pyaclostrobin + boscalid		x	G[r]	G-E	E[r]	0d	5
Quadris Top	11+3	x	12-14 fl. oz.	12-14 fl. oz.	12-14 fl. oz.	12h	56 fl. oz.
azoxystrobin + difenoconazole		x	E	u	G	0d	4
Quash	3	x	2.5-3.5 fl. oz.	2.5-3.5 fl. oz.	3.5-4 fl. oz.	12h	12 fl. oz.
metconazole		x	G-E	G	E	14d	3
Quilt Xcel	11+3	x	14 fl. oz.	14 fl. oz.	14 fl. oz.	12h	70 fl. oz.
azoxystrobin + propiconazole		x	E	G	G	0d	5
Quintec	13	x	x	x	7 fl. oz.	12h	28 fl. oz.
quinoxyfen		x	x	x	E	7d	4
Rally 40WSP	3	x	2.5-6 oz.	x	2.5-6 oz.	24h	3.25 lb.
myclobutanil		x	G	x	G-E	0h	NA
Scala (SC)	9	x	9-18 fl. oz.	x	x	12h	54 fl. oz.
pyrimethanil		x	G-E	x	x	2d	3
Thiram Granuflo	M3	x	3.5 lb.	3.5 lb.	x	24h	21.2 lb.
thiram		x	G	G	x	7d	NA

(Continued)

Table 4-8. Peach Diseases - First Cover[1] *(continued)*

Product And Formulation Active Ingredient	FRAC Code[2]	Bacterial Spot/ Shot Hole	Brown Rot	Peach Scab	Powdery Mildew/ Peach Rusty Spot	REI[3] PHI[4]	Max Amt[5] Max App[6]
Tilt (EC)	3	x	4 fl. oz.	x	4 fl. oz.	12h	20 fl. oz.
propiconazole		x	E	x	G	0d	5
Topguard EQ	3+11	x	6-8 fl. oz.	6-8 fl. oz.	6-8 fl. oz.	12h	NA
flutriafol + azoxystrobin		x	G	u	E	7d	4
Topguard Specialty Crop	3	x	14 fl. oz.	x	14 fl. oz.	12h	56 fl. oz.
flutriafol		x	E	s(G)	G	7d	4
Topsin M WSB	1	x	1-1.5 lb.	1-1.5 lb.	1-1.5 lb.	48h	4 lb.
thiophanate-methyl		x	G[r]	G	G[r]	1d	NA
Vangard WG (75WG)	9	x	5 oz.	x	x	12h	30 oz.
cyprodinil		x	G-E	x	x	2d	4
Ziram 76DF	M3	x	4.5-8 lb.	4.5-8 lb.	x	48h	48.2 lb.
ziram		x	G	G	x	30d	6

Footnotes: See how to read the spray schedule tables section at the beginning of the chapter.

Peach First To Second Cover – Insects

7-10 days after shuck split. Second cover occurs 7-14 days after first cover.

Notes on insect management

San Jose scale

- Movento 2SC, must be tank mixed with a spray adjuvant.

Lesser peachtree borer

- Control of the first generation of lesser peachtree borer with trunk sprays is during the time of peak moth flight, generally from early May to early June, depending on latitude and spring temperatures. See Borers of Peach, Cherry, and Plum Trees, page 152.

Table 4-9. Peach Insects - First Through Second Cover[1]

Product And Formulation Active Ingredient	IRAC Code[2]	Borers	Oriental Fruit Moth	Plant Bug/ Stink Bug	Plum Curculio	San Jose Scale	REI[3] PHI[4]	Max Amt[5] Max App[6]
Actara (25WDG)	4A	x	x	4.5-5.5 oz.	4.5-5.5 oz.	x	12h	11 oz.
thiamethoxam		x	x	G	G	x	14d	NA
Admire Pro (4.6F)	4A	x	x	2.8 fl. oz.	2.8 fl. oz.	1.4-2.8 fl. oz.	12h	8.4 fl. oz.
imidacloprid		x	x	s	s	F	0d	NA
Altacor eVo	28	1.5-2.2 oz.	1.5-2.2 oz.	x	x	x	4h	4.6 oz.
chlorantraniliprole		u	E	x	x	x	10d	3
Apta (1.34SC)	21A	x	x	21-27 fl. oz.	21-27 fl. oz.	x	12h	53.5 fl. oz.
tolfenpyrad		x	x	s	G	x	14d	2
Asana XL (0.66EC) **(RUP)**	3A	4.8-14.5 fl. oz.	4.8-14.5 fl. oz.	4.8-14.5 fl. oz.	4.8-14.5 fl. oz.	x	12h	72.5 fl. oz.
esfenvalerate		G	E[r]	G	G	x	14d	NA

(Continued)

Table 4-9. Peach Insects - First Through Second Cover[1] *(continued)*

Product And Formulation Active Ingredient	IRAC Code[2]	Borers	Oriental Fruit Moth	Plant Bug/ Stink Bug	Plum Curculio	San Jose Scale	REI[3] PHI[4]	Max Amt[5] Max App[6]
Assail 30SG	4A	x	5.3-8 oz.	5.3-8 oz.	5.3-8 oz.	5.3-8 oz.	12h	32 oz.
acetamiprid		x	E	F	G	F	7d	4
Avaunt eVo (30WDG)	22	x	5.6 oz.	x	5-6 oz.	x	12h	24 oz.
indoxacarb		x	G	x	E	x	14d	4
Baythroid XL (1EC) **(RUP)**	3A	1.4-2 fl. oz.	2-2.4 fl. oz.	2-2.4 fl. oz.	2.4-2.8 fl. oz.	x	12h	5.6 fl. oz.
beta-cyfluthrin		G	E[r]	E	G	x	7d	NA
Belay (2.13SC)	4A	x	x	6 fl. oz.	6 fl. oz.	6 fl. oz.	12h	12 fl. oz.
clothianidin		x	x	E	G	G	21d	NA
Beleaf 50SG	29	x	x	2-2.8 oz.	x	x	12h	8.4 oz.
flonicamid		x	x	G	x	x	14d	3
Centaur WDG (70WDG)	16	x	x	x	x	34.5 oz.	12h	69 oz.
buprofezin		x	x	x	x	E	14d	2
Danitol 2.4EC **(RUP)**	3A	x	10.7-21.3 fl. oz.	10.7-21.3 fl. oz.	10.7-21.3 fl. oz.	x	24h	42.7 fl. oz.
fenpropathrin		x	E[r]	E	G	x	3d	NA
Delegate WG (25WG)	5	x	6-7 oz.	x	6-7 oz.	x	4h	28 oz.
spinetoram		x	E	x	s	x	1d	4
Diazinon AG 600WBC **(RUP)**	1B	x	12.75 fl. oz./100 gal.	x	x	12.75 fl. oz./100 gal.	4d	51 fl. oz.
diazinon		x	G	x	x	F	21d	2
Dimilin 2L **(RUP)**	15	x	8-16 fl. oz.	x	8-16 fl. oz.	x	12h	32 fl. oz.
diflubenzuron		x	u	x	u	x	14d	2
Entrust SC (2SC)	5	x	4-8 fl. oz.	x	x	x	4h	29 fl. oz.
spinosad		x	F	x	x	x	7d	3
Esteem 35WP	7C	x	4-5 oz.	x	x	4-5 oz.	12h	15 oz.
pyriproxyfen		x	s	x	x	E	14d	3
Exirel (0.83SE)	28	x	10-20.5 fl. oz.	x	13.5-20.5 fl. oz.	x	12h	61.5 fl. oz.
cyantraniliprole		x	E	x	G	x	3d	3
Imidan 70W	1B	x	2.13-4.25 lb.	x	2.1-4.25 lb.	2.1-4.25 lb.	4d	17 lb.
phosmet		x	E[r]	x	G	E	14d	NA
Intrepid 2F	18	x	10-16 fl. oz.	x	x	x	4h	64 fl. oz.
methoxyfenozide		x	G	x	x	x	7d	NA
Lannate LV	1A	x	3 pt.	3 pt.	x	x	4d	18 pt.
methomyl		x	F	G	x	x	4d	6
Malathion 5EC (8EC)	1B	x	4.8 pt.	x	4.8 pt.	x	24h	4.8 pt.
malathion		x	u	x	u	x	7d	3

(Continued)

Table 4-9. Peach Insects - First Through Second Cover[1] *(continued)*

Product And Formulation Active Ingredient	IRAC Code[2]	Borers	Oriental Fruit Moth	Plant Bug/ Stink Bug	Plum Curculio	San Jose Scale	REI[3] PHI[4]	Max Amt[5] Max App[6]
Movento (2SC)	23	x	x	x	x	6-9 fl. oz.	24h	15.3 fl. oz.
spirotetramat		x	x	x	x	G	7d	NA
Mustang Maxx (0.83EC) **(RUP)**	3A	1.2-4 fl. oz.	1.2-4 fl. oz.	1.2-4 fl. oz.	1.2-4 fl. oz.	x	12h	24 fl. oz.
zeta-cypermethrin		G	E[r]	E	G	x	14d	NA
Neemix 4.5 (0.39L)	UN	7-16 fl. oz.	7-16 fl. oz.	7-16 fl. oz.	x	7-16 fl. oz.	4h	NA
azadirachtin		F	u	E	i	G	0d	NA
Pounce 25WP	3A	6.4-16 oz.	6.4-16 oz.	x	6.4-16 oz.	x	12h	48 fl. oz.
permethrin		F	E[r]	x	G	x	14d	NA
Pyganic 5EC	3A	4.5-15.6 fl. oz.	x	4.5-15.6 fl. oz.	x	4.5-15.6 fl. oz.	12h	15.6 fl. oz.
pyrethrins		u	x	u	x	u	0d	1
Rimon 0.83EC	15	20 fl. oz.	20-40 fl. oz.	20-40 fl. oz.	x	x	12h	150 fl. oz.
novaluron		u	E	u	x	x	8d	NA
Scorpion 35SL	4A	5.25-7 fl. oz.	x	5.25-7 fl. oz.	5.25-7 fl. oz.	x	12h	14.25 fl. oz.
dinotefuran		s	x	E	s	x	3/21d	NA
Sevin XLR Plus (4F)	1A	2-3 qt.	2-3 qt.	2-3 qt.	2-3 qt.	2-3 qt.	12h	14 qt.
carbaryl		u	F	F	F	u	3d	3
Sivanto Prime (1.67 SL)	4D	x	x	x	x	10.5-14 fl. oz.	4h	28 fl. oz.
flupyradifurone		x	x	x	x	G	14d	NA
Surround WP (95WP)	UN	25-50 lb.	25-50 lb.	x	25-50 lb.	x	4h	NA
kaolin		x	s	x	s	x	0d	NA
Venom (70SG)	4A	3-4 oz.	x	3-4 oz.	3-4 oz.	x	12h	6 oz.
dinotefuran		u	x	E	u	x	3d	NA
Verdepryn 100SL (0.83SL)	28	x	5.5-11 fl. oz.	5.5-11 fl. oz.	5.5-11 fl. oz.	x	4h	33 fl. oz.
cyclaniliprole		x	E	s	u	x	7d	3
Warrior II (2.08CS) **(RUP)**	3A	1.2-2.5 fl. oz.	1.2-2.5 fl. oz.	1.2-2.5 fl. oz.	1.2-2.5 fl. oz.	x	24h	12.8 fl. oz.
lambda-cyhalothrin		G	G[r]	E	G	x	14d	NA

Footnotes: See how to read the spray schedule tables section at the beginning of the chapter.

Peach Summer Cover Sprays – Diseases

10 days after first cover. Until ~3 weeks prior to harvest

- Be aware of PHI when applying fungicides to early harvested varieties.
- Remember application limits when applying coppers to control bacterial spot.
- PHI of Mycoshield is 21 days.
- When environmental conditions are conducive for brown rot, scab or powdery mildew, maintain fungicide schedule every 7-14 days.

Table 4-10. Peach Diseases - Summer Cover[1]

Product And Formulation Active Ingredient	FRAC Code[2]	Bacterial Spot/Shot Hole	Brown Rot	Peach Scab	Powdery Mildew/Peach Rusty Spot	REI[3] PHI[4]	Max Amt[5] Max App[6]
Abound (SC)	11	x	12-15.5 fl. oz.	9-15.5 fl. oz.	12-15.5 fl. oz.	4h	90 fl. oz.
azoxystrobin		x	F-G[r]	G	F	0d	See label
Badge SC	M	0.5–2 pt.	x	x	x	24h	63.4 pt.
copper sulfate + oxychloride		F-G	x	x	x	0d	NA
Captan	M4	x	2.5-5 lb.	2.5-5 lb.	2.5-5 lb.	24h	40 lb.
captan		x	G	G	F	0d	NA
Cevya	3	x	3-5 fl. oz.	3-5 fl. oz.	4-5 fl. oz.	12h	15 fl. oz.
mefentrifluconazole		x	E	E	E	0d	See label
Elevate 50 WDG	17	x	1-1.5 lb.	x	x	12h	6 lb.
fenhexamid		x	G-E	x	x	0d	NA
Elite 45DF	3	x	4-8 oz.	x	4-8 oz.	12h	3 lb.
tebuconazole		x	E	x	E	0d	NA
Flint Extra	11	x	2.5-3.8 fl. oz.	2.5-3.8 fl. oz.	2.5-3.8 fl. oz.	12h	15.2 fl. oz.
trifloxystrobin		x	s (G)	E	E	1d	4
Fontelis (SC)	7	x	14-20 fl. oz.	14-20 fl. oz.	14-20 fl. oz.	12h	61 fl. oz.
penthiopyrad		x	G-E	F-G	F-G	0d	NA
Indar 2F	3	x	6 fl. oz.	6 fl. oz.	x	12h	48 fl. oz.
fenbuconazole		x	E[r]	F	x	0d	8
Inspire Super (EW)	3+9	x	16-20 fl. oz.	16-20 fl. oz.	16-20 fl. oz.	12h	80 fl. oz.
difenoconazole + cyprodinil		x	E	F-G	F-G	2d	4
Kenja 400 SC	7	x	12.5 fl. oz.	12.5 fl. oz.	x	12h	37.5 fl. oz.
isofetamid		x	E	G	x	1d	3
Kocide 3000	M	02.5-0.5 lb.	x	x	x	48h	60 lb.
copper hydroxide		G-F	x	x	x	0d	NA
Luna Experience (SC)	7+3	x	6-10 fl. oz.	8-10 fl. oz.	6-10 fl. oz.	12h	34 fl. oz.
fluopyram + tebuconazol		x	G-E	E	G	0d	NA
Luna Privilege	7	x	4-6.8 fl. oz.	4.8-6.8 fl. oz.	4-6.8 fl. oz.	12h	13.7 fl. oz.
fluopyram		x	E	F	G	0d	NA
Luna Sensation (SC)	7+11	x	5-7.6 fl. oz.	5-7.6 fl. oz.	5-7.6 fl. oz.	12h	27.1 fl. oz.
fluopyram + trifloxystrobin		x	E	F	G-E	1d	4
Merivon XBF	7+11	x	4-6.7 fl. oz.	4-6.7 fl. oz.	4-6.7 fl. oz.	12h	20.1 fl. oz.
fluxapyroxad + pyraclostrobin		x	E	G-E	G-E	0d	3
Microthiol Disperss	M	x	10-20 lb.	x	10-20 lb.	24h	NA
sulfur		x	F-P	x	F-P	0d	NA
Miravis	7	x	3.4-5.1 fl. oz.	3.4-5.1 fl. oz.	3.4-5.1 fl. oz.	4h	20.4 fl. oz.
pydiflumetofen		x	E	E-G	E-G	0d	4
Mycoshield	41	12 oz./100 g.	x	x	x	12h	12 lb.
oxytetracyline		E[r]	x	x	x	21d	8
Ph-D	19	x	x	6.2 oz.	6.2 oz.	4h	NA
polyoxin D		x	x	G	u	0d	NA

(Continued)

Table 4-10. Peach Diseases - Summer Cover[1] *(continued)*

Product And Formulation Active Ingredient	FRAC Code[2]	Bacterial Spot/Shot Hole	Brown Rot	Peach Scab	Powdery Mildew/Peach Rusty Spot	REI[3] PHI[4]	Max Amt[5] Max App[6]
Pristine	7+11	x	10.5-14.5 oz.	10.5-14.5 oz.	10.5-14.5 oz.	12h	72.5 oz.
pyaclostrobin + boscalid		x	G[r]	G-E	E[r]	0d	5
Quadris Top	11+3	x	12-14 fl. oz.	12-14 fl. oz.	12-14 fl. oz.	12h	56 fl. oz.
azoxystrobin + difenoconazole		x	E	u	G	0d	4
Quash	3	x	2.5-3.5 fl. oz.	2.5-3.5 fl. oz.	3.5-4 fl. oz.	12h	12 fl. oz.
metconazole		x	G-E	G	E	14d	3
Quilt Xcel	11+3	x	14 fl. oz.	14 fl. oz.	14 fl. oz.	12h	70 fl. oz.
azoxystrobin + propiconazole		x	E	G	G	0d	5
Quintec	13	x	x	x	7 fl. oz.	12h	28 fl. oz.
quinoxyfen		x	x	x	E	7d	4
Rally 40WSP	3	x	2.5-6 oz.	x	2.5-6 oz.	24h	3.25 lb.
myclobutanil		x	G	x	G-E	0h	NA
Scala (SC)	9	x	9-18 fl. oz.	x	x	12h	54 fl. oz.
pyrimethanil		x	G-E	x	x	2d	3
Thiram Granuflo	M3	x	3.5 lb.	3.5 lb.	x	24h	21.2 lb.
thiram		x	G	G	x	7d	NA
Tilt (EC)	3	x	4 fl. oz.	x	4 fl. oz.	12h	20 fl. oz.
propiconazole		x	E	x	G	0d	5
Topguard EQ	3+11	x	6-8 fl. oz.	6-8 fl. oz.	6-8 fl. oz.	12h	NA
flutriafol + azoxystrobin		x	G	u	E	7d	4
Topguard Specialty Crop	3	x	14 fl. oz.	x	14 fl. oz.	12h	56 fl. oz.
flutriafol		x	E	s(G)	G	7d	4
Topsin M WSB	1	x	1-1.5 lb.	1-1.5 lb.	1-1.5 lb.	48h	4 lb.
thiophanate-methyl		x	G[r]	G	G[r]	1d	NA
Vangard WG (75WG)	9	x	5 oz.	x	x	12h	30 oz.
cyprodinil		x	G-E	x	x	2d	4
Ziram 76DF	M3	x	4.5-8 lb.	4.5-8 lb.	x	48h	48.2 lb.
ziram		x	G	G	x	30d	6

Footnotes: See how to read the spray schedule tables section at the beginning of the chapter.

Peach Summer Covers – Insects

Apply at 10- to 14-day intervals.

Table 4-11. Peach Insects Summer Cover[1]

Product And Formulation Active Ingredient	IRAC Code[2]	Green June Beetle	Japanese Beetle	Oriental Fruit Moth	Plant Bug/ Stink Bug	REI[3] PHI[4]	Max Amt[5] Max App[6]
Actara (25WDG)	4A	x	x	x	4.5-5.5 oz.	12h	11 oz.
thiamethoxam		x	x	x	G	14d	NA
Admire Pro (4.6F)	4A	1.4-2.8 fl. oz.	1.4-2.8 fl. oz.	x	2.8 fl. oz.	12h	8.4 fl. oz.
imidacloprid		G	G	x	s	0d	NA

(Continued)

Table 4-11. Peach Insects - Summer Cover[1] *(continued)*

Product And Formulation Active Ingredient	IRAC Code[2]	Green June Beetle	Japanese Beetle	Oriental Fruit Moth	Plant Bug/ Stink Bug	REI[3] PHI[4]	Max Amt[5] Max App[6]
Altacor eVo	28	x	x	1.5-2.2 oz.	x	4h	4.6 oz.
chlorantraniliprole		x	x	E	x	10d	3
Asana XL (0.66EC) **(RUP)**	3A	x	x	4.8-14.5 fl. oz.	4.8-14.5 fl. oz.	12h	72.5 fl. oz.
esfenvalerate		x	x	E[r]	G	14d	NA
Assail 30SG	4A	x	5.3-8 oz.	5.3 - 8 oz.	5.3-8 oz.	12h	32 oz.
acetamiprid		x	G	E	F	7d	4
Avaunt eVo (30WDG)	22	x	x	6 oz.	x	12h	24 oz.
indoxacarb		x	x	G	x	14d	4
Baythroid XL (1EC) **(RUP)**	3A	x	x	2-2.4 fl. oz.	2-2.4 fl. oz.	12h	5.6 fl. oz.
beta-cyfluthrin		x	x	E[r]	E	7d	NA
BeetleGone!	11	1-17.5 lb.	1-17.5 lb.	x	x	4h	NA
B. thuringiensis		G	G	x	x	0d	NA
Belay (2.13SC)	4A	x	x	x	6 fl. oz.	12h	12 fl. oz.
clothianidin		x	x	x	E	21d	NA
Beleaf 50SG	29	x	x	x	2-2.8 oz.	12h	8.4 oz.
flonicamid		x	x	x	G	14d	3
Danitol 2.4EC **(RUP)**	3A	x	10.7-21.3 fl. oz	10.7-21.3 fl. oz.	10.7-21.3 fl. oz.	24h	42.7 fl. oz.
fenpropathrin		x	E	E[r]	E	3d	NA
Delegate WG (25WG)	5	x	x	6-7 oz.	x	4h	28 oz.
spinetoram		x	x	E	x	1d	4
Diazinon AG 600WBC **(RUP)**	1B	x	x	12.75 fl. oz./100 gal.	x	4d	51 fl. oz.
diazinon		x	x	G	x	21d	2
Dimilin 2L **(RUP)**	15	x	x	8-16 fl. oz.	x	12h	32 fl. oz.
diflubenzuron		x	x	u	x	14d	2
Entrust SC (2SC)	5	x	x	4-8 fl. oz.	x	4h	29 fl. oz.
spinosad		x	x	F	x	7d	3
Esteem 35WP	7C	x	x	4-5 oz.	x	12h	15 oz.
pyriproxyfen		x	x	s	x	14d	3
Exirel (0.83SE)	28	x	13.5-20.5 fl. oz.	10-20.5 fl. oz.	x	12h	61.5 fl. oz.
cyantraniliprole		x	G	E	x	3d	3
Imidan 70W	1B	x	2.1-4.25 lb.	2.1-4.25 lb.	x	4d	17 lb.
phosmet		x	G	E[r]	x	14d	NA
Intrepid 2F	18	x	x	10-16 fl. oz.	x	4h	64 fl. oz.
methoxyfenozide		x	x	G	x	7d	NA
Lannate LV	1A	x	x	3 pt.	3 pt.	4d	18 pt.
methomyl		x	x	F	G	4d	6
Malathion 5EC	1B	x	2.5-4.8 pt.	4.8 pt.	x	24h	4.8 pt.
malathion		x	x	u	x	7d	3

(Continued)

Table 4-11. Peach Insects - Summer Cover[1] *(continued)*

Product And Formulation Active Ingredient	IRAC Code[2]	Green June Beetle	Japanese Beetle	Oriental Fruit Moth	Plant Bug/ Stink Bug	REI[3] PHI[4]	Max Amt[5] Max App[6]
Mustang Maxx (0.83EC) **(RUP)**	3A	x	x	1.28-4 fl. oz.	1.28-4 fl. oz.	12h	24 fl. oz.
zeta-cypermethrin		x	x	E[r]	E	14d	NA
Neemix 4.5 (0.39L)	UN	x	x	7-16 fl. oz.	7-16 fl. oz.	4h	NA
azadirachtin		x	x	u	E	0d	NA
Pounce 25WP	3A	x	x	6.4-16 oz.	x	12h	48 oz.
permethrin		x	x	E[r]	x	14d	NA
Pyganic 5EC	3A	x	4.5-15.6 fl. oz.	x	4.5-15.6 fl. oz.	12h	15.6 fl. oz.
pyrethrins		x	u	x	u	0d	1
Rimon 0.83EC	15	x	x	20-40 fl. oz.	20-40 fl. oz.	12h	150 fl. oz.
novaluron		x	x	E	u	8d	NA
Scorpion 35SL	4A	x	x	x	5.25-7 fl. oz.	12h	14.25 fl. oz.
dinotefuran		x	x	x	E	3/21d	NA
Sevin XLR Plus (4F)	1A	x	2-3 qt.	2-3 qt.	2-3 qt.	12h	14 qt.
carbaryl		x	E	F	F	3d	3
Surround WP (95WP)	UN	x	25-50 lb.	25-50 lb.	x	4h	NA
kaolin		x	s	s	x	0d	NA
Venom (70SG)	4A	x	x	x	3-4 oz.	12h	6 oz.
dinotefuran		x	x	x	E	3d	NA
Verdepryn 100SL (0.83SL)	28	x	x	5.5-11 fl. oz.	5.5-11 fl. oz.	4h	33 fl. oz.
cyclaniliprole		x	x	E	s	7d	3
Warrior II (2.08CS) **(RUP)**	3A	1.2-2.5 fl. oz.	1.2-2.5 fl. oz.	1.2-2.5 fl. oz.	1.2-2.5 fl. oz.	24h	12.8 fl. oz.
lambda-cyhalothrin		E	E	G[r]	E	14d	NA

Footnotes: See how to read the spray schedule tables section at the beginning of the chapter.

Peach Preharvest – Diseases

Apply according to label directions beginning three weeks before harvest.

- Continued applications of fungicides may be necessary in orchards with moderate to high disease pressure (due to cultivar susceptibility, rainfall and/ or fungicide resistance).
- Be aware of PHI of fungicides and bactericides (e.g., Mycoshield with PHI of 21 days).

Table 4-12. Peach Diseases - Preharvest[1]

Product And Formulation Active Ingredient	FRAC Code[2]	Brown Rot	Peach Scab	Powdery Mildew/ Peach Rusty Spot	REI[3] PHI[4]	Max Amt[5] Max App[6]
Abound (SC)	11	12-15.5 fl. oz.	9-15.5 fl. oz.	12-15.5 fl. oz.	4h	90 fl. oz.
azoxystrobin		F-G[r]	G	F	0d	See label
Captan	M4	2.5-5 lb.	2.5-5 lb.	2.5-5 lb.	24h	40 lb.
captan		G	G	F	0d	NA
Cevya	3	3-5 fl. oz.	3-5 fl. oz.	4-5 fl. oz.	12h	15 fl. oz.
mefentrifluconazole		E	E	E	0d	See label

(Continued)

Table 4-12. Peach Diseases - Preharvest[1] *(continued)*

Product And Formulation Active Ingredient	FRAC Code[2]	Brown Rot	Peach Scab	Powdery Mildew/ Peach Rusty Spot	REI[3] PHI[4]	Max Amt[5] Max App[6]
Elevate 50 WDG	17	1-1.5 lb.	x	x	12h	6 lb.
fenhexamid		G-E	x	x	0d	NA
Elite 45DF	3	4-8 oz.	x	4-8 oz.	12h	3 lb.
tebuconazole		E	x	E	0d	NA
Flint Extra	11	2.5-3.8 fl. oz.	2.5-3.8 fl. oz.	2.5-3.8 fl. oz.	12h	15.2 fl. oz.
trifloxystrobin		s (G)	E	E	1d	4
Fontelis (SC)	7	14-20 fl. oz.	14-20 fl. oz.	14-20 fl. oz.	12h	61 fl. oz.
penthiopyrad		G-E	F-G	F-G	0d	NA
Indar 2F	3	6 fl. oz.	6 fl. oz.	x	12h	48 fl. oz.
fenbuconazole		E[r]	F	x	0d	8
Inspire Super (EW)	3+9	16-20 fl. oz.	16-20 fl. oz.	16-20 fl. oz.	12h	80 fl. oz.
difenoconazole + cyprodinil		E	F-G	F-G	2d	4
Kenja 400 SC	7	12.5 fl. oz.	12.5 fl. oz.	x	12h	37.5 fl. oz.
isofetamid		E	G	x	1d	3
Kocide 3000	M	3-5 lb.	x	x	48h	60 lb.
copper hydroxide		F	x	x	0d	NA
Luna Experience (SC)	7+3	6-10 fl. oz.	8-10 fl. oz.	6-10 fl. oz.	12h	34 fl. oz.
fluopyram + tebuconazol		G-E	E	G	0d	NA
Luna Privilege	7	4-6.8 fl. oz.	4.8-6.8 fl. oz.	4-6.84 fl. oz.	12h	13.7 fl. oz.
fluopyram		E	F	G	0d	NA
Luna Sensation (SC)	7+11	5-7.6 fl. oz.	5-7.6 fl. oz.	5-7.6 fl. oz.	12h	27.1 fl. oz.
fluopyram + trifloxystrobin		E	F	E-G	1d	4
Merivon XBF	7+11	4-6.7 fl. oz.	4-6.7 fl. oz.	4-6.7 fl. oz.	12h	20.1 fl. oz.
fluxapyroxad + pyraclostrobin		E	E-G	E-G	0d	3
Microthiol Disperss	M	10-20 lb.	x	10-20 lb.	24h	NA
sulfur		F-P	x	F-P	0d	NA
Miravis	7	3.4-5.1 fl. oz.	3.4-5.1 fl. oz.	3.4-5.1 fl. oz.	4h	20.4 fl. oz.
pydiflumetofen		E	G-E	G-E	0d	4
Ph-D	19	x	6.2 oz.	6.2 oz.	4h	NA
polyoxin D		x	G	u	0d	NA
Pristine	7+11	10.5-14.5 oz.	10.5-14.5 oz.	10.5-14.5 oz.	12h	72.5 oz.
pyaclostrobin + boscalid		G[r]	G-E	E[r]	0d	5
Quadris Top	11+3	12-14 fl. oz.	12-14 fl. oz.	12-14 fl. oz.	12h	56 fl. oz.
azoxystrobin + difenoconazole		E	u	G	0d	4
Quash	3	2.5-3.5 fl. oz.	2.5-3.5 fl. oz.	3.5-4 fl. oz.	12h	12 fl. oz.
metconazole		E-G	G	E	14d	3
Quilt Xcel	11+3	14 fl. oz.	14 fl. oz.	14 fl. oz.	12h	70 fl. oz.
azoxystrobin + propiconazole		E	G	G	0d	5
Quintec	13	x	x	7 fl. oz.	12h	28 fl. oz.
quinoxyfen		x	x	E	7d	4

(Continued)

Table 4-12. Peach Diseases - Preharvest[1] *(continued)*

Product And Formulation Active Ingredient	FRAC Code[2]	Brown Rot	Peach Scab	Powdery Mildew/ Peach Rusty Spot	REI[3] PHI[4]	Max Amt[5] Max App[6]
Rally 40WSP	3	2.5-6 oz.	x	2.5-6 oz.	24h	3.25 lb.
myclobutanil		G	x	E-G	0d	NA
Scala (SC)	9	9-18 fl. oz.	x	x	12h	54 fl. oz.
pyrimethanil		G-E	x	x	2d	3
Thiram Granuflo	M3	3.5 lb.	3.5 lb.	x	24h	21.2 lb.
thiram		G	G	x	7d	NA
Tilt (EC)	3	4 fl. oz.	x	4 fl. oz.	12h	20 fl. oz.
propiconazole		E	x	G	0d	5
Topguard EQ	3+11	6-8 fl. oz.	6-8 fl. oz.	6-8 fl. oz.	12h	NA
flutriafol + azoxystrobin		G	u	E	7d	4
Topguard Specialty Crop	3	14 fl. oz.	x	14 fl. oz.	12h	56 fl. oz.
flutriafol		E	s(G)	G	7d	4
Topsin M WSB	1	1-1.5 lb.	1-1.5 lb.	1-1.5 lb.	48h	4 lb.
thiophanate-methyl		G[r]	G	G[r]	1d	NA
Vangard WG (75WG)	9	5 oz	x	x	12h	30 oz.
cyprodinil		G-E	x	x	2d	4
Ziram 76DF	M3	4.5-8 lb.	4.5-8 lb.	x	48h	48.2 lb.
ziram		G	G	x	30d	6

Footnotes: See how to read the spray schedule tables section at the beginning of the chapter.

Peach Preharvest – Insects

Apply any insecticides according to label directions beginning three weeks before harvest.

- If not using peachtree borer mating disruption, peach tree borer is best controlled by a trunk drench at the time of peak moth flight, usually in early August. See Borers of Peach, Cherry, and Plum Trees, page 152.

Table 4-13. Peach Insects - Preharvest[1]

Product And Formulation Active Ingredient	IRAC Code[2]	Borers	Japanese Beetle	Oriental Fruit Moth	Spotted-Wing Drosophila	REI[3] PHI[4]	Max Amt[5] Max App[6]
Admire Pro (4.6F)	4A	x	1.4-2.8 fl. oz.	x	x	12h	8.4 fl. oz.
imidacloprid		x	G	x	x	0d	NA
Altacor eVo	28	1.5-2.2 oz.	x	1.5-2.2 oz.	x	4h	4.6 oz.
chlorantraniliprole		u	x	E	x	10d	3
Asana XL (0.66EC) **(RUP)**	3A	4.8-14.5 fl. oz.	x	4.8-14.5 fl. oz.	x	12h	72.5 fl. oz.
esfenvalerate		G	x	E[r]	x	14d	NA
Assail 30SG	4A	5.3-8 oz.	5.3-8 oz.	5.3-8 oz.	x	12h	32 oz.
acetamiprid		G	G	E	x	7d	4

(Continued)

Table 4-13. Peach Insects - Preharvest[1] *(continued)*

Product And Formulation Active Ingredient	IRAC Code[2]	Borers	Japanese Beetle	Oriental Fruit Moth	Spotted-Wing Drosophila	REI[3] PHI[4]	Max Amt[5] Max App[6]
Avaunt eVo (30WDG)	22	x	x	6 oz.	x	12h	24 oz.
indoxacarb		x	x	G	x	14d	4
Baythroid XL (1EC) **(RUP)**	3A	1.4-2 fl. oz.	x	2-2.4 fl. oz.	x	12h	5.6 fl. oz.
beta-cyfluthrin		G	x	E[r]	x	7d	NA
BeetleGone!	11	x	1-17.5 lb.	x	x	4h	NA
B. thuringiensis		x	G	x	x	0d	NA
Danitol 2.4EC **(RUP)**	3A	x	10.7-21.3 fl. oz.	10.7-21.3 fl. oz.	10.7-21.3 fl. oz.	24h	42.7 fl. oz.
fenpropathrin		x	E	E[r]	E	3d	NA
Delegate WG (25WG)	5	x	x	6-7 oz.	4.5-7 oz.	4h	28 oz.
spinetoram		x	x	E	G	1d	4
Dimilin 2L **(RUP)**	15	x	x	8-16 fl. oz.	x	12h	32 fl. oz.
diflubenzuron		x	x	u	x	14d	2
Entrust SC (2SC)	5	x	x	4-8 fl. oz.	x	4h	29 fl. oz.
spinosad		x	x	F	x	7d	3
Esteem 35WP	7C	x	x	4-5 oz.	x	12h	15 oz.
pyriproxyfen		x	x	s	x	14d	3
Exirel (0.83SE)	28	x	13.5-20.5 fl. oz.	10-20.5 fl. oz.	13.5-20.5 fl. oz.	12h	61.5 fl. oz.
cyantraniliprole		x	G	E	E	3d	3
Imidan 70W	1B	x	2.1-4.25 lb.	2.1-4.25 lb.	2.1-4.25 lb.	4d	17 lb.
phosmet		x	G	E[r]	E	14d	NA
Intrepid 2F	18	x	x	10-16 fl. oz.	x	4h	64 fl. oz.
methoxyfenozide		x	x	G	x	7d	NA
Lannate LV	1A	x	x	3 pt.	x	4d	18 pt.
methomyl		x	x	F	x	4d	6
Malathion 5EC	1B	x	2.5-4.8 pt.	4.8 pt.	x	24h	4.8 pt.
malathion		x	u	u	x	7d	3
Movento (2SC)	23	x	x	x	6-9 fl. oz.	24h	15.3 fl. oz.
spirotetramat		x	x	x	s	7d	NA
Mustang Maxx (0.83EC) **(RUP)**	3A	1.28-4 fl. oz.	x	1.28-4 fl. oz.	4 fl. oz.	12h	24 fl. oz.
zeta-cypermethrin		G	x	E[r]	E	14d	NA
Neemix 4.5 (0.39L)	UN	7-16 fl. oz.	x	7-16 fl. oz.	x	4h	NA
azadirachtin		F	x	u	x	0d	NA
Pounce 25WP	3A	6.4-16 oz.	x	6.4-16 oz.	x	12h	48 oz.
permethrin		F	x	E[r]	x	14d	NA
Pyganic 5EC	3A	4.5-15.6 fl. oz.	4.5-15.6 fl. oz.	x	4.5-15.6 fl. oz.	12h	15.6 fl. oz.
pyrethrins		u	u	x	F	0d	1
Rimon 0.83EC	15	20 fl. oz.	x	20-40 fl. oz.	20-40 fl. oz.	12h	150 fl. oz.
novaluron		u	x	E	G	8d	NA

(Continued)

Table 4-13. Peach Insects - Preharvest[1] *(continued)*

Product And Formulation Active Ingredient	IRAC Code[2]	Borers	Japanese Beetle	Oriental Fruit Moth	Spotted-Wing Drosophila	REI[3] PHI[4]	Max Amt[5] Max App[6]
Sevin XLR Plus (4F)	1A	2-3 qt.	2-3 qt.	2-3 qt.	x	12h	14 qt.
carbaryl		u	E	F	x	3d	3
Surround WP (95WP)	UN	x	25-50 lb.	25-50 lb.	x	4h	NA
kaolin		x	s	s	x	0d	NA
Venom (70SG)	4A	3-4 oz.	x	x	x	12h	6 oz.
dinotefuran		u	x	x	x	3d	NA
Verdepryn 100SL (0.83SL)	28	x	x	5.5-11 fl. oz.	5.5-11 fl. oz.	4h	33 fl. oz.
cyclaniliprole		x	x	E	u	7d	3
Warrior II (2.08CS) **(RUP)**	3A	1.2-2.5 fl. oz.	1.2-2.5 fl. oz.	1.2-2.5 fl. oz.	x	24h	12.8 fl. oz.
lambda-cyhalothrin		G	E	G[r]	x	14d	NA

Footnotes: See how to read the spray schedule tables section at the beginning of the chapter.

Special Notes on Peach Schedule

Spotted lanternfly

The spotted lanternfly is an invasive planthopper that has spread throughout the Midwest. This insect feeds on plant sap, causing wilting, dieback and even death. Currently spotted lanternfly is believed to pose the greatest threat to the blueberry, grape, hops, stone fruit and hardwood industries. Know how to identify this pest and remain vigilant for its appearance in your orchard and vineyard systems.

5. PLUM

Plum Insect Pests

The shaded boxes represent the crop stages where common pests in the Midwest are active and action (scouting and preventative sprays) may be necessary/recommended. Weather and degree day accumulation will impact the exact timing of pest appearance in the orchard.

Dormant	Pre-bloom	Full Bloom	Petal Fall	Shuck Split	First Cover	Second And Additional Cover	Pre-Harvest
						Japanese Beetle	
	OFM-MD		Oriental Fruit Moth (OFM)				
	PTB-MD			Peachtree Borer			
			Plum Curculio				
European Red Mite							
					Periodical Cicada		
San Jose Scale							
							Spotted Wing Drosophila (SWD)

Plum Spray Schedule

How to read the spray schedule tables

Every plum growth stage has important notes on disease or insect management. In some cases, the reader will be directed to the special problems section at the end of the section or chapter. Please make sure to read thoroughly and contact your state Extension specialist with any specific questions.

Key to tables

E = excellent control
G = good control
F = fair control
[r] = fungicide/insecticide resistance possible
s = suppression only
i = ineffective
u = unknown efficacy
x = pest not on the label

[1] Efficacy data in this publication are based on trials conducted across various regions and does not necessarily reflect local efficacy differences or changes over time. Growers should contact their Extension specialist for the most recent or for state-specific information. The information on this publication is only a guide; the authors and their institutions assume no liability for practices implemented based on this information. Always read and follow pesticide labels. The label is the law. Product registration may vary by state.

[2] FRAC/IRAC code represents the mode of action of the fungicide/insecticide.

[3] PHI refers to the pre-harvest interval, which is the number of days before harvest that the product may not be applied.

[4] All fungicides/insecticides have a Restricted-Entry Interval (REI). The restricted-entry interval is the time immediately after a pesticide application when entry into the treated area is limited. Check labels for REI. Restrictions in REI may prohibit the use of certain pesticides during harvest.

Applicators must abide by both maximum amount of product per season AND maximum number of applications.

[5] Max amt refers to the product's maximum amount/acre/year.

[6] Max app refers to the product's maximum number of applications per year.

RUP refers to restricted use pesticide.

Plum Dormant – Diseases

Notes on disease management

- **Bacterial spot and copper pesticides:** Plum is on most, but not all, copper fungicide labels. Check label before use. Using copper at the dormant stage may also reduce the overwintering inoculum of the bacterium that cause bacterial canker, but have limited efficacy in suppressing bacterial spot, plum pockets and black knot. As season progresses, reduce the rate of copper applied to reduce the risk of phytotoxicity. Copper applied with tanks having a pH of less than 6.5 may cause phytotoxicity issues.
- **Black knot:** Prune out and destroy knots during the dormant season with pruning cuts at least 8" below knots. Continue knot removal all season long, whenever they are observed. Remove nearby wild plums and cherry seedlings.
- **Cytospora canker:** Paint trunks with whitewash to prevent winter injury and sunscald.
- **Plum pockets (leaf curl):** Autumn application during leaf fall is the best time for application, followed by spring application at budswell. Unless disease pressure is severe, Luna Experience and Luna Sensation are better deployed later in the season for control of brown rot and powdery mildew.

Table 5-1. Plum Diseases - Dormant[1]

Product And Formulation Active Ingredient	FRAC Code[2]	Bacterial Spot	Black Knot	Plum Pockets	REI[3] PHI[4]	Max Amt[5] Max App[6]
Badge SC	M	1.5-5 pt.	1.5-5 pt.	1.5-5 pt.	24h	18 lb.
copper sulfate + oxychloride		F-G	x	s	0d	NA
Bravo Weather Stik	M3	3-4 pt.	3-4 pt.	3-4 pt.	12h	18.8 lb.
chlorothalonil		G	G	G	shuck-split	NA
C-O-C-S WDG	M	1-2.9 lb.	x	1-2.9 lb.	48h	35 lb.
copper oxychloride		F-G	x	G	21d	3
Champ FL	M	5.3-8 pt.	x	5.3-8 pt.	48 h	49.6 pt.
copper hydroxide		s	x	s	NA	NA
Cuprofix Ultra 40 disperss	M	5-8 lb.	3-3.75	5-7.5 lb.	48h	45 lb.
copper sulfate		F-G	F	G	120d	NA
Kocide 3000	M	3.5-7 lb.	1.75-3.5 lb.	1.75-3.5 lb.	48h	60 lb.
copper hydroxide		F-G	F	F-G	0d	4

Footnotes: See how to read the spray schedule tables section at the beginning of the chapter.

Plum Dormant – Insects

Notes on insect management

- **European red mite and scale insects:** Apply dormant oil at a rate of 2 gal. per 100 gals. (2%). Check labels
  carefully for temperature restrictions (e.g., when temperatures are above 40F° or never during freezing weather).

Plum Pre-bloom – Diseases

Notes on disease management

- Copper pesticides: Copper rates are tied to crop development, with rates reduced as the season progresses to minimize the risk of phytotoxicity. Do not apply during cooler conditions with extended dews or fog.
  Note: Copper has limited efficacy for control of bacterial spot. For more information see Bacterial Spot of Peach, Nectarine and Plum on pages 152-153.

Table 5-2. Plum Diseases Bloom[1]

Product And Formulation Active Ingredient	FRAC Code[2]	Bacterial Spot	Black Knot	Plum Pockets	REI[3] PHI[4]	Max Amt[5] Max App[6]
Badge SC	M	1.5-5 pt.	1.5-5 pt.	1.5-5 pt.	24h	18 lb.
copper sulfate + oxychloride		F-G	F	s	0d	NA
Bravo Weather Stik	M3	3-4 pt.	3-4 pt.	3-4 pt.	12h	18.8 lb.
chlorothalonil		G	G	G	shuck-split	NA
C-O-C-S WDG	M	1-2.9 lb.	x	x	48h	35 lb.
copper oxychloride		F-G	x	x	21d	3
Captan 80WDG	M	x	3.75 lb.	3.75 lb.	24h	40 lb.
captan		x	s	F	0d	NA
Champ FL	M	4.2 pt.	x	x	48 h	49.6 pt.
copper hydroxide		s	x	S	NA	NA
Cuprofix Ultra 40 disperss	M	1-2.5 lb.	3-3.75	5-7.5 lb.	48h	45 lb.
copper sulfate		F-G	F	G	120d	NA
Kocide 3000	M	0.25-0.5 lb.	1.75-3.5 lb.	1.75-3.5 lb.	48h	60 lb.
copper hydroxide		F-G	F	F-G	0d	4
Luna Experience (SC)	7+3	x	x	6-10 fl. oz.	12 h	34 fl. oz.
fluopyram + tebuconazol		x	x	u	1d	varies
Luna Sensation (SC)	7+11	x	x	5 to 7.6 fl. oz.	12h	27.1 fl. oz.
fluopyram + trifloxystrobin		x	x	E	1d	4
Pristine	7+11	x	x	10.5-14.5 oz.	12h	72.5 oz.
pyaclostrobin + boscalid		x	x	s	0d	9
Topguard Specialty Crop	3	x	x	13 fl. oz.	12h	56 fl. oz.
flutriafol		x	x	G	7d	4

Footnotes: See how to read the spray schedule tables section at the beginning of the chapter.

Plum Pre-bloom – Insects

Notes on insect management

- **Oriental fruit moth and peachtree borer:** Pheromone traps for oriental fruit moth and peachtree borer should be deployed pre bloom. For mating disruption, see Mating Disruption for Peach Pests page 153.

Table 5-3. Plum Insects - Prebloom[1]

Product And Formulation Active Ingredient	IRAC Code[2]	Aphids	European Red Mite	Leafroller	San Jose Scale	REI[3] PHI[4]	Max Amt[5] Max App[6]
Acramite 50WS	20D	x	1 lb.	x	x	12h	1 lb.
bifenazate		x	G	x	x	3d	1
Actara (25WDG)	4A	3-4 oz.	x	x	x	12h	11 oz.
thiamethoxam		E	x	x	x	14d	NA
Agri-Mek SC (0.7SC) **(RUP)**	6	x	2.25-4.25 fl. oz.	x	x	12h	8.5 fl. oz.
abamectin		x	G	x	x	21d	2

(Continued)

Table 5-3. Plum Insects - Prebloom[1] *(continued)*

Product And Formulation Active Ingredient	IRAC Code[2]	Aphids	European Red Mite	Leafroller	San Jose Scale	REI[3] PHI[4]	Max Amt[5] Max App[6]
Altacor (35WDG)	28	x	x	3-4.5 oz.	x	4h	9 oz.
chlorantraniliprole		x	x	E	x	10d	NA
Apta (1.34SC)	21A	17-21 fl. oz.	x	21-27 fl. oz.	x	12h	53.5 fl. oz.
tolfenpyrad		u	x	G	x	14d	2
Asana XL (0.66EC) **(RUP)**	3A	4.8-14.5 fl. oz.	x	4.8-14.5 fl. oz.	x	12h	72.5 fl. oz.
esfenvalerate		u	x	E	x	14d	NA
Assail 30SG	4A	2.5-5.3 oz.	x	x	5.3-8 oz.	12h	32 oz.
acetamiprid		E	x	x	F	7d	4
Bacillus thuringiensis (B.t.) (Dipel DF, etc.)	11A	x	x	0.5-2 lb.	x	4h	NA
Bacillus thuringiensis		x	x	u	x	0d	NA
Baythroid XL (1EC) **(RUP)**	3A	2.4-2.8 fl. oz.	x	2.4-2.8 fl. oz.	x	12h	5.6 fl. oz.
beta-cyfluthrin		E	x	u	x	7d	NA
Beleaf 50SG	29	2-2.8 oz.	x	x	x	12h	8.4 fl. oz.
flonicamid		E	x	x	x	14d	3
Centaur WDG (70WDG)	16	x	x	x	34.5 oz.	12h	69 oz.
buprofezin		x	x	x	E	14d	2
Closer SC (2SC)	4C	1.5-2.75 fl. oz.	x	x	5.7 fl. oz.	12h	17 fl. oz.
sulfoxaflor		E	x	x	s	7d	4
Danitol 2.4EC **(RUP)**	3A	10.3-21.3 fl. oz.	10.3-21.3 fl. oz.	10.3-21.3 fl. oz.	x	24h	42.7 fl. oz.
fenpropathrin		u	F	u	x	3d	NA
Delegate WG (25WG)	5	x	x	4.5-7 oz.	x	4h	28 oz.
spinetoram		x	x	E	x	1d	4
Diazinon AG600 WBC **(RUP)**	1B	12.75 fl. oz./100 gal.	6.5-12.25 fl. oz./100 gal.	x	12.75 fl. oz./100 gal.	4d	102 fl. oz.
diazinon		u	u	x	F	21d	2
Dimilin 2L **(RUP)**	15	x	x	8-16 fl. oz.	x	12h	32 fl. oz.
diflubenzuron		x	x	u	x	14d	2
Entrust SC (2SC)	5	x	x	4-8 fl. oz.	x	4h	29 fl. oz.
spinosad		x	x	u	x	1d	3
Envidor 2SC	23	x	16-18 fl. oz.	x	x	12h	18 fl. oz.
spirodiclofen		x	E	x	x	7d	1
Esteem 35WP	7C	x	x	x	4-5 oz.	12h	15 oz.
pyriproxyfen		x	x	x	E	14d	3
Exirel (0.83SE)	28	13.5-20.5 fl. oz.	x	10-20.5 fl. oz.	x	12h	61.5 fl. oz.
cyantraniliprole		E	x	E	x	3d	3
Imidan 70W	1B	x	x	2.13-4.25 lb.	2.13-4.25 lb.	7d	13 lb.
phosmet		x	x	E	E	7d	NA
Intrepid 2F	18	x	x	8-16 fl. oz.	x	4h	64 fl. oz.
methoxyfenozide		x	x	E	x	7d	NA

(Continued)

Table 5-3. Plum Insects - Prebloom[1] *(continued)*

Product And Formulation Active Ingredient	IRAC Code[2]	Aphids	European Red Mite	Leafroller	San Jose Scale	REI[3] PHI[4]	Max Amt[5] Max App[6]
Magister SC (1.7SC)	21A	x	32-36 fl. oz.	x	x	12h	36 fl. oz.
fenazaquin		x	E	x	x	3d	1
Mustang Maxx (0.83EC) **(RUP)**	3A	x	x	1.28-4 fl. oz.	x	12h	24 fl. oz.
zeta-cypermethrin		x	x	E	x	14d	NA
Nexter (75WP)	21	x	4.4-5.2 oz.	x	x	12h	21.3 oz.
pyridaben		x	G	x	x	7d	2
Oil (superior)	UN	x	1.5-2%	x	1.5-2%	4h	NA
mineral oil		x	E	x	G	0d	NA
Onager (1EC)	10A	x	12-24 oz.	x	x	12h	24 fl. oz.
hexythiazox		x	E	x	x	7d	1
Portal XLO (0.4EC)	21A	x	2 pt.	x	x	12h	4 pt.
fenpyroximate		x	E	x	x	7d	2
PQZ (1.87SC)	9B	2.4-3.2 fl. oz.	x	x	x	12h	4.8 fl. oz.
pyrifluquinazon		E	x	x	x	7h	2
Proaxis (0.5EC) **(RUP)**	3A	2.5-5.1 fl. oz.	x	2.5-5.1 fl. oz.	x	24h	1.6 pt.
gamma-cyhalothrin		u	x	E	x	14d	NA
Pyganic 5EC	3A	4.5-15.6 fl. oz.	4.5-15.6 fl. oz.	4.5-15.6 fl. oz.	4.5-15.6 fl. oz.	12h	NA
pyrethrins		u	u	u	u	0d	10
Rimon 0.83EC	15	x	x	20-50 fl. oz.	x	12h	150 fl. oz.
novaluron		x	x	E	x	8d	NA
Savey 50DF	10A	x	3-6 oz.	x	x	12h	6 oz.
hexythiazox		x	E	x	x	28d	1
Sevin XLR Plus (4F)	1A	2-3 qt.	x	2-3 qt.	4-5 qt.	12h	14 qt.
carbaryl		u	x	F	u	3d	3
Sivanto Prime (1.67SC)	4D	7-14 fl. oz.	x	x	10.5-14 fl. oz.	4h	28 fl. oz.
flupyradifurone		E	x	x	G	14d	NA
Surround WP (95WP)	UN	x	x	25-50 lb.	x	4h	NA
kaolin		x	x	u	x	0d	NA
Vendex 50WP **(RUP)**	12B	x	1-2 lb.	x	x	2d	3 lb.
fenbutatin-oxide		x	G	x	x	14d	2
Verdepryn 100SL (0.83SL)	28	x	x	5.5-11 fl. oz.	x	4h	33 fl. oz.
cyclaniliprole		x	x	E	x	7d	3
Versys Inscalis (0.83DC)	9D	1.5 fl. oz.	x	x	x	12h	3 fl. oz.
afidopyropen		G	x	x	x	7d	NA
Warrior II (2.08CS) **(RUP)**	3A	1.2-2.5 fl. oz.	x	1.2-2.5 fl. oz.	x	24h	12.8 fl. oz.
lambda-cyhalothrin		u	x	u	x	14d	NA
Zeal (72WP)	10B	x	2-3 oz.	x	x	12h	3 oz.
etoxazole		x	E	x	x	7d	1

Footnotes: See how to read the spray schedule tables section at the beginning of the chapter.

Plum Full Bloom – Diseases

Notes on disease management

- Copper pesticides: Copper is not recommended after early bloom, to protect both flowers and bees.

Table 5-4. Plum Diseases - Full Bloom[1]

Product And Formulation Active Ingredient	FRAC Code[2]	Brown Rot	Bacterial Spot	Black Knot	REI[3] PHI4	Max Amt[5] Max App[6]
Abound (SC)	11	12-15.5 fl. oz.	x	x	4h	92.3 fl. oz.
azoxystrobin		F-E[r]	x	x	0d	15
Badge SC	M	3.5-5 pt.	1.5-5 pt.	1.5-5 pt.	24h	18 lb.
copper sulfate + oxychloride		F	F-G	s	0d	NA
Bravo Weather Stik	M3	3.1-4.1 pt.	x	3-4 pt.	12h	18.8 lb.
chlorothalonil		G	G	G	shuck split	NA
C-O-C-S WDG	M	1-2.9 lb.	1-2.9 lb.	x	48h	35 lb.
copper oxychloride		F	F-G	x	21d	3
Captan 80WDG	M	3.7 lb.	x	x	24h	40 lb.
captan		G	x	s	0d	NA
Cevya	3	5 oz.	x	x	12h	15 fl. oz.
mefentrifluconazole		E	x	x	0d	5
Champ FL	M	4.2 pt.	4.2 pt.	4.2 pt.	48 h	49.6 pt.
copper hydroxide		F	s	s	NA	NA
Cuprofix Ultra 40 Disperss	M	3.75 lb.	1-2.5 lb.	3-3.75	48h	45 lb.
copper sulfate		F	F-G	F	120d	NA
Elevate 50 WDG	17	1-1.5 lb.	x	x	12h	6 lb.
fenhexamid		G-E	x	x	0d	NA
Elite 45DF	3	2 oz.	x	x	12h	3 lb.
tebuconazole		E	x	x	0d	NA
Flint Extra	11	2.5-3.8 oz.	x	x	12h	15.2 fl. oz.
trifloxystrobin		G-E	x	x	1d	3
Fontelis (SC)	7	14-20 fl. oz.	x	x	12h	61 fl. oz.
penthiopyrad		E-G	x	x	0d	4
Indar 2F	3	6 fl. oz.	x	x	12h	48 fl. oz.
fenbuconazole		E[r]	x	x	0d	NA
Inspire Super (EW)	3+9	16-20 fl. oz.	x	x	12h	80 fl. oz.
difenoconazole + cyprodinil		E	x	x	2d	8
Kenja 400 SC	7	12.5 fl. oz.	x	x	12h	37.5 fl. oz.
isofetamid		E	x	x	1 day	3
Kocide 3000	M	3.5-5 lb.	0.25-0.5 lb.	1.75-3.5 lb.	48h	60 lb.
copper hydroxide		F	F-G	s	0d	4
Luna Experience (SC)	7+3	6-10 oz.	x	x	12h	34 fl. oz.
fluopyram + tebuconazol		G-E	x	x	1d	varies

(Continued)

Table 5-4. Plum Diseases - Full Bloom[1] *(continued)*

Product And Formulation Active Ingredient	FRAC Code[2]	Brown Rot	Bacterial Spot	Black Knot	REI[3] PHI4	Max Amt[5] Max App[6]
Luna Privilege	7	4-6.8 fl. oz.	x	x	12h	13.7 fl. oz.
fluopyram		E	x	x	0d	6
Luna Sensation (SC)	7+11	6-10 fl. oz.	x	x	12h	27.1 fl. oz.
fluopyram + trifloxystrobin		E	x	x	1d	4
Merivon XBF	7+11	4-6.7 fl. oz.	x	x	12h	20.1 fl. oz.
fluxapyroxad + pyraclostrobin		E	x	x	0d	4
Microthiol Disperss	M	10-20 lb.	x	x	24h	NA
sulfur		F	x	x	0d	3
Miravis	7	3.4-5.1 fl. oz.	x	x	4 hr	20.4 fl. oz.
pydiflumetofen		G-E	x	x	0d	4
Ph-D	19	6.2 oz.	x	x	0d	NA
polyoxin D		G	x	x	NA	NA
Pristine	7+11	10.5-14.5 oz.	x	x	12h	72.5 oz.
pyaclostrobin + boscalid		G-E[r]	x	x	0d	9
Quadris Top	11+3	12-14 fl. oz.	x	x	12h	56 fl. oz.
azoxystrobin + difenoconazole		E	x	x	0d	5
Quash	3	2.5-3.5 oz.	x	x	12h	12 oz.
metconazole		E-G	x	x	14d	3
Quilt Xcel	11+3	14 fl. oz.	x	x	12h	70 fl. oz.
azoxystrobin + propiconazole		E	x	x	0d	5
Rally 40WSP	3	2.5-6 oz.	x	x	24h	2.75 lb.
myclobutanil		G	x	x	1d	NA
Rovral 4F	2	1-2 pt.	x	x	24h	4 pt.
iprodione		E	x	x	N/A	NA
Scala (SC)	9	9-18 fl. oz.	x	x	12h	54 fl. oz.
pyrimethanil		G-E	x	x	2d	2
Tilt (EC)	3	4 fl. oz.	x	x	12h	20 fl. oz.
propiconazole		E	x	x	0d	5
Topguard EQ	3+11	6-8 oz.	x	x	12h	NA
flutriafol + azoxystrobin		G	x	x	7d	4
Topguard Specialty Crop	3	13 fl. oz.	x	x	12h	56 fl. oz.
flutriafol		E	x	x	7d	4
Topsin M WSB	1	1-1.5 lb.	x	1-1.5 lb.	48h	4 lb.
thiophanate-methyl		E[r]	x	E[r]	1d	NA
Vanguard WG (75WG)	9	5 oz.	x	x	12h	30 oz.
cyprodinil		G-E	x	x	2d	4

Footnotes: See how to read the spray schedule tables section at the beginning of the chapter.

Plum Full Bloom – Insects

Notes on insect management

- **Protect pollinators! Do not apply insecticides during bloom.**

Plum Petal Fall To Shuck Split – Diseases

Notes on disease management

Brown rot

- Failure to control plum curculio and/or brown marmorated stink bug may result in an increase in brown rot.
- When using coppers or captan post-bloom, drying conditions should be excellent to minimize the risk of phytotoxicity. Applications of captan from shuck split through early July can cause shot-holing of leaves and spotting of fruit of some European and Japanese plums.
- Rovral cannot be applied after petal fall.
- The last application of Bravo is at shuck split.

Table 5-5. Plum Diseases - Petal Fall Through Shuck Split[1]

Product And Formulation Active Ingredient	FRAC Code[2]	Brown Rot	Bacterial Spot	Black Knot	REI[3] PHI[4]	Max Amt[5] Max App[6]
Abound (SC)	11	12-15.5 fl. oz.	x	x	4h	92.3 fl. oz.
azoxystrobin		F-E[r]	x	x	0d	15
Bravo Weather Stik	M3	3.1-4.1 pt.	x	3-4 pt.	12h	18.8 lb.
chlorothalonil		G	G	G	shuck split	NA
Captan 80WDG	M	3.7 lb.	x	x	24h	40 lb.
captan		G	x	x	0d	NA
Cevya	3	5 oz.	x	x	12h	15 fl. oz.
mefentrifluconazole		E	x	x	0d	5
Elevate 50 WDG	17	1-1.5 lb.	x	x	12h	6 lb.
fenhexamid		G-E	x	x	0d	NA
Elite 45DF	3	2 oz.	x	x	12h	3 lb.
tebuconazole		E	x	x	0d	NA
Flint Extra	11	2.5-3.8 fl. oz.	x	x	12h	15.2 fl. oz.
trifloxystrobin		G-E	x	x	1d	3
Fontelis (SC)	7	14-20 fl. oz.	x	x	12h	61 fl. oz.
penthiopyrad		E-G	x	x	0d	4
Indar 2F	3	6 fl. oz.	x	x	12h	48 fl. oz.
fenbuconazole		E[r]	x	x	0d	NA
Inspire Super (EW)	3+9	16-20 fl. oz.	x	x	12h	80 fl. oz.
difenoconazole + cyprodinil		E	x	x	2d	8
Kenja 400 SC	7	12.5 fl. oz.	x	x	12h	37.5 fl. oz.
isofetamid		E	x	x	1 day	3
Luna Experience (SC)	7+3	6-10 fl. oz.	x	x	12h	34 fl. oz.
fluopyram + tebuconazol		G-E	x	x	1d	NA
Luna Privilege	7	4-6.8 fl. oz.	x	x	12h	13.7 fl. oz.
fluopyram		E	x	x	0d	6

(Continued)

Table 5-5. Plum Diseases - Petal Fall Through Shuck Split[1] *(continued)*

Product And Formulation Active Ingredient	FRAC Code[2]	Brown Rot	Bacterial Spot	Black Knot	REI[3] PHI[4]	Max Amt[5] Max App[6]
Luna Sensation (SC)	7+11	6-10 fl. oz.	x	x	12h	27.1 fl. oz.
fluopyram + trifloxystrobin		E	x	x	1d	4
Merivon XBF	7+11	4-6.7 fl. oz.	x	x	12h	20.1 fl. oz.
fluxapyroxad + pyraclostrobin		E	x	x	0d	4
Microthiol Disperss	M	10-20 lb.	x	x	24h	NA
sulfur		F	x	x	0d	3
Miravis	7	3.4-5.1 fl. oz.	x	x	4 hr	20.4 fl. oz.
pydiflumetofen		E-G	x	x	0d	4
Ph-D	19	6.2 oz.	x	x	0d	NA
polyoxin D		G	x	x	NA	NA
Pristine	7+11	10.5-14.5 oz.	x	x	12h	72.5 oz.
pyaclostrobin + boscalid		G-E[r]	x	x	0d	9
Quadris Top	11+3	12-14 fl. oz.	x	x	12h	56 fl. oz.
azoxystrobin + difenoconazole		E	x	x	0d	5
Quash	3	2.5-3.5 oz.	x	x	12h	12 oz.
metconazole		E-G	x	x	14d	3
Quilt Xcel	11+3	14 fl. oz.	x	x	12h	70 fl. oz.
azoxystrobin + propiconazole		E	x	x	0d	5
Rally 40WSP	3	2.5-6 oz.	x	x	24h	2.75 lb.
myclobutanil		G	x	x	1d	NA
Rovral 4F	2	1-2 pt.	x	x	24h	4 pt.
iprodione		E	x	x	N/A	NA
Scala (SC)	9	9-18 fl. oz.	x	x	12h	54 fl. oz.
pyrimethanil		G-E	x	x	2d	2
Tilt (EC)	3	4 fl. oz.	x	x	12h	20 fl. oz.
propiconazole		E	x	x	0d	5
Topguard EQ	3+11	6-8 oz.	x	x	12h	NA
flutriafol + azoxystrobin		G	x	x	7d	4
Topguard Specialty Crop	3	13 fl. oz.	x	x	12h	56 fl. oz.
flutriafol		E	x	x	7d	4
Topsin M WSB	1	1-1.5 lb.	x	1-1.5 lb.	48h	4 lb.
thiophanate-methyl		E[r]	x	E[r]	1d	NA
Vanguard WG (75WG)	9	5 oz.	x	x	12h	30 oz.
cyprodinil		G-E	x	x	2d	4

Footnotes: See how to read the spray schedule tables section at the beginning of the chapter.

Plum Petal Fall To Second Cover – Insects

Notes on insect management

- **San Jose scale:** Insecticides are best applied when scale crawler nymphs are active.
  - Do not apply Movento until PF is complete.
- **Lesser peachtree borer:** Control of the first generation of lesser peachtree borer with trunk sprays is during the time of peak moth flight, generally from early May to early June, See Borers of Peach, Cherry, and Plum, page 152.

Table 5-6. Plum Insects - Petal Fall Through Second Cover[1]

Product And Formulation Active Ingredient	IRAC Code[2]	European Red Mite	Plum Curculio	Japanese Beetle	San Jose Scale	Leaf-Roller	Oriental Fruit Moth	Peach Tree Borers	Periodical Cicada	REI[3] PHI[4]	Max Amt[5] Max App[6]
Acramite 50WS	20D	1 lb.	x	x	x	x	x	x	x	12h	1 lb.
bifenazate		G	x	x	x	x	x	x	x	3d	1
Actara (25WDG)	4A	x	4.5-5.5 oz.	x	x	x	x	x	x	12h	11 oz.
thiamethoxam		x	G	x	x	x	x	x	x	14d	NA
Admire Pro (4.6F)	4A	x	2.8 fl. oz.	1.4-2.8 fl. oz.	1.4-2.8 fl. oz.	x	x	x	x	12h	10.5/14 fl. oz.
imidacloprid		x	s	G	F	x	x	x	x	0-21d	NA
Agri-Mek SC (0.7SC) **(RUP)**	6	2.25-4.25 fl. oz.	x	x	x	x	x	x	x	12h	8.5 fl. oz.
abamectin		G	x	x	x	x	x	x	x	21d	2
Altacor (35WDG)	28	x	x	x	x	3-4.5 oz.	3-4.5 oz.	x	x	4h	9 oz.
chlorantraniliprole		x	x	x	x	E	E	x	x	10d	NA
Apta (1.34SC)	21A	x	21-27 fl. oz.	x	x	21-27 fl. oz.	x	x	x	12h	53.5 fl. oz.
tolfenpyrad		x	G	x	x	G	x	x	x	14d	2
Asana XL (0.66EC) **(RUP)**	3A	x	4.8-14.5 fl. oz.	x	x	4.8-14.5 fl. oz.	4.8-14.5 fl. oz.	4.8-14.5 fl. oz.	4.8-14.5 fl. oz.	12h	72.5 fl. oz.
esfenvalerate		x	G	x	x	E	E	G	E	14d	NA
Assail 30SG	4A	x	5-8 oz.	5.3-8 oz.	5.3-8 oz.	x	5.3-8 oz.	x	x	12h	32 oz.
acetamiprid		x	E	F	F	x	E	x	x	7d	4
Avaunt (30WDG)	22	x	5-6 oz.	x	x	x	6 oz.	x	x	12h	24 oz.
indoxacarb		x	G	x	x	x	F	x	x	14d	4
Bacillus thruingiensis (B.t.) (Dipel DF, etc)	11A	x	x	x	x	0.5-2 lb.	0.5-2 lb.	x	x	4h	NA
Bacillus thruingiensis		x	x	x	x	u	u	x	x	0d	NA
Baythroid XL (1EC) **(RUP)**	3A	x	2.4-2.8 fl. oz.	x	x	2.4-2.8 fl. oz.	2-2.4 fl. oz.	1.4-2 fl. oz.	2.4-2.8 fl. oz.	12h	5.6 fl. oz.
beta-cyfluthrin		x	G	x	x	u	E	G	E	7d	NA
BeetleGone!	11A	x	x	1-17.5 lb.	x	x	x	x	x	4h	NA
Bacillus thruingiensis		x	x	G	x	x	x	x	x	0h	NA
Centaur WDG (70WDG)	16	x	x	x	34.5 oz.	x	x	x	x	12h	69 oz.
buprofezin		x	x	x	E	x	x	x	x	14d	2

(Continued)

Table 5-6. Plum Insects - Petal Fall Through Second Cover[1] *(continued)*

Product And Formulation Active Ingredient	IRAC Code[2]	European Red Mite	Plum Curculio	Japanese Beetle	San Jose Scale	Leaf-Roller	Oriental Fruit Moth	Peach Tree Borers	Periodical Cicada	REI[3] PHI[4]	Max Amt[5] Max App[6]
Closer SC (2SC)	4C	x	x	x	5.7 fl. oz.	x	x	x	x	12h	17 fl. oz.
sulfoxaflor		x	x	x	s	x	x	x	x	7d	4
Danitol 2.4EC **(RUP)**	3A	10.3-21.3 fl. oz.	10.3-21.3 fl. oz.	10.3-21.3 fl. oz.	x	10.3-21.3 fl. oz.	10.3-21.3 fl. oz.	10.7-21.3 fl. oz.	x	24h	42.7 fl. oz.
fenpropathrin		F	G	E	x	u	E	G	x	3d	NA
Delegate WG (25WG)	5	x	6-7 oz.	x	x	4.5-7 oz.	6-7 oz.	x	x	4h	28 oz.
spinetoram		x	s	x	x	E	E	x	x	1d	4
Diazinon AG600 WBC **(RUP)**	1B	6.5-12.25 fl. oz./100 gal.	x	x	x	x	x	x	x	4d	102 fl. oz.
diazinon		u	x	x	x	x	x	x	x	21d	2
Dimilin 2L **(RUP)**	15	x	8-16 fl. oz.	x	x	8-16 fl. oz.	8-16 fl. oz.	x	x	12h	32 fl. oz.
diflubenzuron		x	u	x	x	u	u	x	x	14d	2
Entrust SC (2SC)	5	x	x	x	x	4-8 fl. oz.	4-8 fl. oz.	x	x	4h	29 fl. oz.
spinosad		x	x	x	x	u	F	x	x	1d	3
Envidor 2SC	23	16-18 fl. oz.	x	x	x	x	x	x	x	12h	18fl. oz.
spirodiclofen		E	x	x	x	x	x	x	x	7d	1
Esteem 35WP	7C	x	x	x	4-5 oz.	x	4-5 oz.	x	x	12h	15 oz.
pyriproxyfen		x	x	x	E	x	s	x	x	14d	3
Exirel (0.83SE)	28	x	13.5-20.5 fl. oz.	13.5-20.5 fl. oz.	x	10-20.5 fl. oz.	10-20.5 fl. oz.	x	x	12h	61.5 fl. oz.
cyantraniliprole		x	G	G	x	E	E	x	x	3d	3
Imidan 70W	1B	x	2.13-4.25 lb.	2.13-4.25 lb.	2.13-4.25 lb.	2.13-4.25 lb.	2.13-4.25 lb.	x	x	7d	13 lb.
phosmet		x	G	G	E	E	E	x	x	7d	NA
Intrepid 2F	18	x	x	x	x	8-16 fl. oz.	10-16 fl. oz.	x	x	4h	64 fl. oz.
methoxyfenozide		x	x	x	x	E	G	x	x	7d	NA
Magister SC (1.7SC)	21A	32-36 fl. oz.	x	x	x	x	x	x	x	12h	36 fl. oz.
fenazaquin		E	x	x	x	x	x	x	x	3d	1
Movento (2SC)	23	6-9 fl. oz.	x	x	6-9 fl. oz.	x	x	x	x	24h	15.3 fl. oz.
spirotetramat		s	x	x	G	x	x	x	x	7d	NA
Mustang Maxx (0.83EC) **(RUP)**	3A	x	1.2-4 fl. oz.	x	x	1.2-4 fl. oz.	1.2-4 fl. oz.	1.2-4 fl. oz.	x	12h	24 fl. oz.
zeta-cypermethrin		x	E	x	x	E	E	G	x	14d	NA

(Continued)

Table 5-6. Plum Insects - Petal Fall Through Second Cover[1] *(continued)*

Product And Formulation Active Ingredient	IRAC Code[2]	European Red Mite	Plum Curculio	Japanese Beetle	San Jose Scale	Leaf-Roller	Oriental Fruit Moth	Peach Tree Borers	Periodical Cicada	REI[3] PHI[4]	Max Amt[5] Max App[6]
Nexter (75WP)	21	4.4-5.2 oz.	x	x	x	x	x	x	x	12h	21.3 oz.
pyridaben		G	x	x	x	x	x	x	x	7d	2
Oil (superior)	UN	1.5-2%	x	x	1.5-2%	x	x	x	x	4h	NA
mineral oil		E	x	x	G	x	x	x	x	0d	NA
Onager (1EC)	10A	12-24 oz.	x	x	x	x	x	x	x	12h	24 fl. oz.
hexythiazox		E	x	x	x	x	x	x	x	7d	1
Portal XLO (0.4EC)	21A	2 pt.	x	x	x	x	x	x	x	12h	4 pt.
fenpyroximate		E	x	x	x	x	x	x	x	7d	2
Proaxis (0.5EC) **(RUP)**	3A	x	2.5-5.1 fl. oz.	2.5-5.1 fl. oz.	x	2.5-5.1 fl. oz.	2.5-5.1 fl. oz.	2.5-5.1 fl. oz.	2.5-5.1 fl. oz.	24h	1.6 pt.
gamma-cyhalothrin		x	G	E	x	E	G	G	E	14d	NA
Pyganic 5EC	3A	4.5-15.6 fl. oz.	4.5-15.6 fl. oz.	4.5-15.6 fl. oz.	4.5-15.6 fl. oz.	4.5-15.6 fl. oz.	x	x	x	12h	NA
pyrethrins		u	i	F	u	u	x	x	x	0d	10
Rimon 0.83EC	15	x	x	x	x	20-50 fl. oz.	20-40 fl. oz.	20 fl. oz.	x	12h	150 fl. oz.
novaluron		x	x	x	x	E	E	u	x	8d	NA
Savey 50DF	10A	3-6 oz.	x	x	x	x	x	x	x	12h	6 oz.
hexythiazox		E	x	x	x	x	x	x	x	28d	1
Sevin XLR Plus (4F)	1A	x	2-3 qt.	2-3 qt.	4-5 qt.	2-3 qt.	2-3 qt.	2-3 qt.	2-3 qt.	12h	14 qt.
carbaryl		x	F	E	u	F	F	i	G	3d	3
Sivanto Prime (1.67SC)	4D	x	x	x	10.5-14 fl. oz.	x	x	x	x	4h	28 fl. oz.
flupyradifurone		x	x	x	G	x	x	x	x	14d	NA
Surround WP (95WP)	UN	x	25-50 lb.	25-50 lb.	x	25-50 lb.	25-50 lb.	25-50 lb.	x	4h	NA
kaolin		x	F	F	x	u	u	s	x	0d	NA
Vendex 50WP **(RUP)**	12B	1-2 lb.	x	x	x	x	x	x	x	2d	3 lb.
fenbutatin-oxide		G	x	x	x	x	x	x	x	14d	2
Verdepryn 100SL (0.83SL)	28	x	5.5-11 fl. oz.	5.5-11 fl. oz.	x	5.5-11 fl. oz.	5.5-11 fl. oz.	x	x	4h	33 fl. oz.
cyclaniliprole		x	G	u	x	E	E	x	x	7d	3
Warrior II (2.08CS) **(RUP)**	3A	x	1.2-2.5 fl. oz.	1.2-2.5 fl. oz.	x	1.2-2.5 fl. oz.	1.2-2.5 fl. oz.	1.2-2.5 fl. oz.	1.2-2.5 fl. oz.	24h	12.8 fl. oz.
lambda-cyhalothrin		x	G	E	x	u	G	G	E	14d	NA
Zeal (72WP)	10B	2-3 oz.	x	x	x	x	x	x	x	12h	3 oz.
etoxazole		E	x	x	x	x	x	x	x	7d	1

Footnotes: See how to read the spray schedule tables section at the beginning of the chapter.

Plum Summer Cover Sprays – Diseases

7-10 days after shuck split

Notes on disease management

Bacterial spot

- Copper pesticides are not recommended after first cover, to reduce the risk of phytotoxicity.

Brown rot

- Although captan is still labeled for use for brown rot control, it is phytotoxic to some varieties of European, hybrid and Japanese plums. Symptoms of phytotoxicity include shot-holes of leaves and spotting of fruit, and may be mistaken for bacterial leaf spot.
- To prevent brown rot at harvest, continue sprays 21 days before harvest. Depending on rainfall, repeat applications every 5-10 days, if needed. Merivon, Luna Sensation and Pristine all have PHIs of 1 day or less.

Powdery mildew

- Stanley plums: **Do not apply Quash.** Do not apply Quilt Xcel to Stanley plums earlier than 21 days prior to harvest, which has been implicated in reduced size and shape issues.

Table 5-7. Plum Diseases - Summer Cover[1]

Product And Formulation Active Ingredient	FRAC Code[2]	Brown Rot	Powdery Mildew	REI[3] PHI[4]	Max Amt[5] Max App[6]
Abound (SC)	11	12-15.5 fl. oz.	12-15.5 fl. oz.	4h	92.3 fl. oz.
azoxystrobin		F-E[r]	F	0d	15
Captan 80WDG	M	3.7 lb.	x	24h	40 lb.
captan		G	x	0d	NA
Cevya	3	5 oz.	3-5 fl. oz.	12h	15 fl. oz.
mefentrifluconazole		E	E	0d	5
Elevate 50 WDG	17	1-1.5 lb.	x	12h	6 lb.
fenhexamid		G-E	x	0d	NA
Elite 45DF	3	2 oz.	x	12h	3 lb.
tebuconazole		E	x	0d	NA
Flint Extra	11	2.5-3.8 fl. oz.	2.5-3.8 fl. oz.	12h	15.2 fl. oz.
trifloxystrobin		G-E	E	1d	3
Fontelis (SC)	7	14-20 fl. oz.	14-20 fl. oz.	12h	61 fl. oz.
penthiopyrad		G-E	F-G	0d	4
Indar 2F	3	6 fl. oz.	x	12h	48 fl. oz.
fenbuconazole		E[r]	G-E	0d	NA
Inspire Super (EW)	3+9	16-20 fl. oz.	16-20 fl. oz.	12h	80 fl. oz.
difenoconazole + cyprodinil		E	G-F	2d	8
Kenja 400 SC	7	12.5 fl. oz.	x	12h	37.5 fl. oz.
isofetamid		E	S	1 day	3
Luna Experience (SC)	7+3	6-10 fl. oz.	6-10 fl. oz.	12h	34 fl. oz.
fluopyram + tebuconazol		G-E	E	1d	NA
Luna Privilege	7	4-6.8 fl. oz.	4-6.8 fl. oz.	12h	13.7 fl. oz.
fluopyram		E	G	0d	6
Luna Sensation (SC)	7+11	6-10 fl. oz.	6-10 fl. oz.	12h	27.1 fl. oz.
fluopyram + trifloxystrobin		E	G-E	1d	4
Merivon XBF	7+11	4-6.7 fl. oz.	4-6.7 fl. oz.	12h	20.1 fl. oz.
fluxapyroxad + pyraclostrobin		E	E-G	0d	4

(Continued)

Table 5-7. Plum Diseases - Summer Cover[1] *(continued)*

Product And Formulation Active Ingredient	FRAC Code[2]	Brown Rot	Powdery Mildew	REI[3] PHI[4]	Max Amt[5] Max App[6]
Microthiol Disperss	M	10-20 lb.	10-20 lb.	24h	NA
sulfur		F	G	0d	3
Miravis	7	3.4-5.1 fl. oz.	3.4-5.1 fl. oz.	4 hr	20.4 fl. oz.
pydiflumetofen		G-E	G-E	0d	4
Ph-D	19	6.2 oz.	6.2 oz.	0d	NA
polyoxin D		G	G	NA	NA
Pristine	7+11	10.5-14.5 oz.	10.5-14.5 oz.	12h	72.5 oz.
pyaclostrobin + boscalid		E-G[r]	E[r]	0d	9
Quadris Top	11+3	12-14 fl. oz.	12-14 fl. oz.	12h	56 fl. oz.
azoxystrobin + difenoconazole		E	G	0d	5
Quash	3	2.5-3.5 oz.	3.5-4 oz.	12h	12 oz.
metconazole		E-G	E	14d	3
Quilt Xcel	11+3	14 fl. oz.	14 fl. oz.	12h	70 fl. oz.
azoxystrobin + propiconazole		E	G	0d	5
Quintec	13	x	7 fl. oz.	12h	28 fl. oz.
quinoxyfen		x	E	7d	4
Rally 40WSP	3	2.5-6 oz.	2.5-6 oz.	24h	2.75 lb.
myclobutanil		G	G-E	1d	NA
Rovral 4F	2	1-2 pt.	x	24h	4 pt.
iprodione		E	x	N/A	NA
Scala (SC)	9	9-18 fl. oz.	x	12h	54 fl. oz.
pyrimethanil		G-E	x	2d	2
Tilt (EC)	3	4 fl. oz.	4 fl. oz.	12h	20 fl. oz.
propiconazole		E	G	0d	5
Topguard EQ	3+11	6-8 oz.	6-8 oz.	12h	NA
flutriafol + azoxystrobin		G	E	7d	4
Topguard Specialty Crop	3	14 oz.	14 oz.	12h	56 fl. oz.
flutriafol		G	E	7d	4

Footnotes: See how to read the spray schedule tables section at the beginning of the chapter.

Plum Second To Summer Cover Sprays – Insects

Two weeks after first cover spray and 10- to 14-day intervals thereafter

Notes on insect management

- **Plum curculio** can stay active thorough second cover. Failure to control plum curculio may result in an increase in brown rot.
- **Peachtree borer:** Best controlled by a trunk drench at the time of peak moth flight in, usually in early August. See Borers of Peach, Cherry and Plum, page 152.
- **Japanese beetle:** Begin applications for Japanese beetle as soon as observed. Multiple applications may be needed.
- **Cherry fruit flies:** Adults emerge from late May to early July and lay their eggs in the fruits. Sprays need to target the adults before egg laying begins, generally 5 to 6 days after adults emerge.

Table 5-8. Plum Insects - Second Through Summer Cover[1]

Product And Formulation Active Ingredient	IRAC Code[2]	European Red Mite	Cherry Fruit Fly	Japanese Beetle	Leaf-roller	Oriental Fruit Moth	Spotted Wing Drosophila	REI[3] PHI[4]	Max Amt[5] Max App[6]
Acramite 50WS	20D	1 lb.	x	x	x	x	x	12h	1 lb.
bifenazate		G	x	x	x	x	x	3d	1
Actara (25WDG)	4A	x	4.5-5.5 oz.	x	x	x	x	12h	11 oz.
thiamethoxam		x	G	x	x	x	x	14d	NA
Admire Pro (4.6F)	4A	x	2-2.8 fl. oz.	1.4-2.8 fl. oz.	x	x	x	12h	10.5/14 fl. oz.
imidacloprid		x	G	G	x	x	x	0-21d	NA
Agri-Mek SC (0.7SC) **(RUP)**	6	2.25-4.25 fl. oz.	x	x	x	x	x	12h	8.5 fl. oz.
abamectin		G	x	x	x	x	x	21d	2
Altacor (35WDG)	28	x	3-4.5 oz.	x	3-4.5 oz.	3-4.5 oz.	x	4h	9 oz.
chlorantraniliprole		x	s	x	E	E	x	10d	NA
Apta (1.34SC)	21A	x	14-27 fl. oz.	x	21-27 fl. oz.	x	21-27 fl. oz.	12h	53.5 fl. oz.
tolfenpyrad		x	F	x	G	x	s	14d	2
Asana XL (0.66EC) **(RUP)**	3A	x	4.8-14.5 fl. oz.	x	4.8-14.5 fl. oz.	4.8-14.5 fl. oz.	x	12h	72.5 fl. oz.
esfenvalerate		x	G	x	E	E	x	14d	NA
Assail 30SG	4A	x	5.3-8 oz.	5.3-8 oz.	x	5.3-8 oz.	x	12h	32 oz.
acetamiprid		x	G	F	x	E	x	7d	4
Avaunt (30WDG)	22	x	x	x	x	6 oz.	x	12h	24 oz.
indoxacarb		x	x	x	x	F	x	14d	4
Bacillus thruingiensis (B.t.) (Dipel DF, etc)	11A	x	x	x	0.5-2 lb.	0.5-2 lb.	x	4h	NA
Bacillus thruingiensis		x	x	x	u	u	x	7d	NA
Baythroid XL (1EC) **(RUP)**	3A	x	2.4-2.8 fl. oz.	x	2.4-2.8 fl. oz.	2-2.4 fl. oz.	x	12h	5.6 fl. oz.
beta-cyfluthrin		x	G	x	u	E	x	7d	NA
BeetleGone!	11A	x	x	1-17.5 lb.	x	x	x	4h	NA
Bacillus thruingiensis		x	x	G	x	x	x	0d	NA
Danitol 2.4EC **(RUP)**	3A	10.3-21.3 fl. oz.	16-21.3 fl. oz.	10.3-21.3 fl. oz.	10.3-21.3 fl. oz.	10.3-21.3 fl. oz.	10.7-21.3 fl. oz.	24h	42.7 fl. oz.
fenpropathrin		F	G	E	u	E	E	3d	NA
Delegate WG (25WG)	5	x	x	x	4.5-7 oz.	6-7 oz.	4.5-7 oz.	4h	28 oz.
spinetoram		x	x	x	E	E	E	1d	4
Diazinon AG600 WBC **(RUP)**	1B	6.5-12.25 fl. oz./100 gal.	x	x	x	x	x	4d	102 fl. oz.
diazinon		u	x	x	x	x	x	21d	2
Dimilin 2L **(RUP)**	15	x	x	x	8-16 fl. oz.	8-16 fl. oz.	x	12h	32 fl. oz.
diflubenzuron		x	x	x	u	u	x	14d	2

(Continued)

Table 5-8. Plum Insects - Second Through Summer Cover[1] *(continued)*

Product And Formulation Active Ingredient	IRAC Code[2]	European Red Mite	Cherry Fruit Fly	Japanese Beetle	Leaf-roller	Oriental Fruit Moth	Spotted Wing Drosophila	REI[3] PHI[4]	Max Amt[5] Max App[6]
Entrust SC (2SC)	5	x	4-8 fl. oz.	x	4-8 fl. oz.	4-8 fl. oz.	x	4h	29 fl. oz.
spinosad		x	G	x	u	F	x	1d	3
Envidor 2SC	23	16-18 fl. oz.	x	x	x	x	x	12h	18 fl. oz.
spirodiclofen		E	x	x	x	x	x	7d	1
Esteem 35WP	7C	x	x	x	x	4-5 oz.	x	12h	15 oz.
pyriproxyfen		x	x	x	x	s	x	14d	3
Exirel (0.83SE)	28	x	10-17 fl. oz.	13.5-20.5 fl. oz.	10-20.5 fl. oz.	10-20.5 fl. oz.	13.5-20.5 fl. oz.	12h	61.5 fl. oz.
cyantraniliprole		x	E	G	E	E	G	3d	3
Imidan 70W	1B	x	x	2.1-4.25 lb.	2.1-4.25 lb.	2.1-4.25 lb.	x	7d	13 lb.
phosmet		x	x	G	E	E	x	7d	NA
Intrepid 2F	18	x	x	x	8-16 fl. oz.	10-16 fl. oz.	x	4h	64 fl. oz.
methoxyfenozide		x	x	x	E	G	x	7d	NA
Magister SC (1.7SC)	21A	32-36 fl. oz.	x	x	x	x	x	12h	36 fl. oz.
fenazaquin		E	x	x	x	x	x	3d	1
Movento (2SC)	23	6-9 fl. oz.	6-9 fl. oz.	x	x	x	6-9 fl. oz.	24h	15.3 fl. oz.
spirotetramat		s	s	x	x	x	s	7d	NA
Mustang Maxx (0.83EC) **(RUP)**	3A	x	1.28-4 fl. oz.	x	1.28-4 fl. oz.	1.28-4 fl. oz.	4 fl. oz.	12h	24 fl. oz.
zeta-cypermethrin		x	F	x	E	E	E	14d	NA
Nexter (75WP)	21	4.4-5.2 oz.	x	x	x	x	x	12h	21.3 oz.
pyridaben		G	x	x	x	x	x	7d	2
Oil (superior)	UN	see label	x	x	x	x	x	4h	NA
mineral oil		E	x	x	x	x	x	0d	NA
Onager (1EC)	10A	12-24 oz.	x	x	x	x	x	12h	24 fl. oz.
hexythiazox		E	x	x	x	x	x	7d	1
Portal XLO (0.4EC)	21A	2 pt.	x	x	x	x	x	12h	4 pt.
fenpyroximate		E	x	x	x	x	x	7d	2
Proaxis (0.5EC) **(RUP)**	3A	x	2.5-5.1 fl. oz.	2.5-5.1 fl. oz.	2.5-5.1 fl. oz.	2.5-5.1 fl. oz.	x	24h	1.6 pt.
gamma-cyhalothrin		x	G	E	E	G	x	14d	NA
Pyganic 5EC	3A	4.5-15.6 fl. oz.	4.5-15.6 fl. oz.	4.5-15.6 fl. oz.	4.5-15.6 fl. oz.	x	4.5-15.6 fl. oz.	12h	NA
pyrethrins		u	u	F	u	x	i	0d	10
Rimon 0.83EC	15	x	20-40 fl. oz.	x	20-50 fl. oz.	20-40 fl. oz.	x	12h	150 fl. oz.
novaluron		x	G	x	E	E	x	8d	NA

(Continued)

Table 5-8. Plum Insects - Second Through Summer Cover[1] *(continued)*

Product And Formulation Active Ingredient	IRAC Code[2]	European Red Mite	Cherry Fruit Fly	Japanese Beetle	Leaf-roller	Oriental Fruit Moth	Spotted Wing Drosophila	REI[3] PHI[4]	Max Amt[5] Max App[6]
Savey 50DF	10A	3-6 oz.	x	x	x	x	x	12h	6 oz.
hexythiazox		E	x	x	x	x	x	28d	1
Sevin XLR Plus (4F)	1A	x	2-3 qt.	2-3 qt.	2-3 qt.	2-3 qt.	x	12h	14 qt.
carbaryl		x	G	E	F	F	x	3d	3
Surround WP (95WP)	UN	x	25-50 lb.	25-50 lb.	25-50 lb.	25-50 lb.	x	4h	NA
kaolin		x	G	F	u	u	x	0d	NA
Vendex 50WP **(RUP)**	12B	1-2 lb	x	x	x	x	x	2d	3 lb.
fenbutatin-oxide		G	x	x	x	x	x	14d	2
Verdepryn 100SL (0.83SL)	28	x	5.5-11 fl. oz.	5.5-11 fl. oz.	5.5-11 fl. oz.	5.5-11 fl. oz.	5.5-11 fl. oz.	4h	33 fl. oz.
cyclaniliprole		x	G	u	E	E	u	7d	3
Warrior II (2.08CS) **(RUP)**	3A	x	1.2-2.5 fl. oz.	1.2-2.5 fl. oz.	1.2-2.5 fl. oz.	1.2-2.5 fl. oz.	x	24h	12.8 fl. oz.
lambda-cyhalothrin		x	G	E	u	G	x	14d	NA
Zeal (72WP)	10B	2-3 oz.	x	x	x	x	x	12h	3 oz.
etoxazole		E	x	x	x	x	x	7d	1

Footnotes: See how to read the spray schedule tables section at the beginning of the chapter.

Special Problems of Stone Fruit

Borers of peach, cherry, and plum trees

The peachtree borer, lesser peachtree borer and shothole borer often infest peach, apricot, cherry and plum trees. Peachtree borers infest the trunk at the soil line, while lesser peachtree borers infest scaffold limbs and the upper trunk.

The peachtree borer is primarily a pest of young trees, whereas the lesser peachtree borer is a pest of older trees. The shothole borer is often found in trees of low vigor with dead and/or diseased limbs. Moths of the two peachtree borers lay their eggs on the surface of bark; shothole beetles lay their eggs in the inner bark.

Some of the regularly applied cover sprays help control borers; however, specific trunk and scaffold branch spray are often required. Pheromone traps are available to monitor emergence of the adult stage (moth) of lesser peachtree borer and peachtree borer. Knowing the time of emergence can help you properly time insecticide applications, because insecticides target the hatching eggs laid by the newly emerged moths.

Bacterial canker of sweet cherry

Bacterial canker is a sporadic but serious problem on sweet cherries. It is generally less severe on tart cherries, plums and prunes.

The disease is favored by cold, wet conditions during and shortly after bloom. Copper compounds are moderately effective in reducing pathogen populations and controlling the disease. Apply copper compounds according to the product label in the spring while trees are dormant.

If favorable conditions for the disease persist, apply reduced-rate applications (25-35 percent of dormant rate) after bud break, but before bloom. You can add hydrated lime (6-9 lb./acre) to reduce the phytotoxicity that can occur when copper compounds are applied in cool, wet conditions.

Bacterial spot of peach, nectarine and plum

Bacterial spot of stone fruit can be a serious problem in certain varieties, areas and years. The disease is favored by stormy, rainy weather from May through August. It causes the most damage in areas where the soil is sandy and where strong winds blow the sand.

Planting cultivars resistant to bacterial spot provides the best control. In the past, various control programs have been tried using foliar sprays of zinc sulfate plus lime, or fall applications of copper with or without lime. None of these programs offered reliable control and, in some cases, caused foliar and twig damage.

For peaches, the antibiotic oxytetracycline (Mycoshield or FireLine) provides good control when properly applied. For best results, use oxytetracycline at 12 oz. per 100 gal. of dilute spray. Use dilute or 2x; higher concentrates are not effective and may be phytotoxic. These products are no longer labeled for plums.

Spraying the entire tree once per week is essential. If you spray only one side of the tree (alternate row middle), make certain to spray the other side of the tree within 3-4 days. Begin sprays at shuck split and continue at 7-day intervals until 21 days before harvest. Copper sprays, applied for peach leaf curl at leaf drop, also may help control bacterial spot. The rate of copper decreases over the growing season. On peaches, copper can cause injury to leaves and appears as reddish spots and shot-holes with some very mild defoliation when using an effective rate of copper. Because of risk for foliar injury, most copper materials are not registered for use post-bloom or in more than two applications post-bloom, and then only at low rates (always read and follow label instructions).

For more information, see Learning from Peach Bacterial Spot Epidemics: Potential Strategies for Reducing Fruit Losses (David Ritchie, North Carolina State University), https://plantpathology.ces.ncsu.edu/wp-content/uploads/2013/06/Learning-from-Peach-Bacterial-Spot-Epidemics.pdf?fwd=no

Phytophthora root, crown and collar rots

Peach rootstocks are highly susceptible to Phytophthora root, crown and collar rots. The main defense against these diseases is providing good soil drainage through proper site selection and tiling.

However, Ridomil Gold SL provides additional protection in wet years, on marginal sites, or in wetter sections of the orchard. Make applications just before growth starts in the spring and at two- to three-month intervals thereafter if soil is very wet. Apply to the soil beneath the tree canopy in sufficient water to ensure good coverage. (Subsequent rain or irrigation moves material into the soil.)

Ridomil Gold SL is also registered for use on cherries (sweet and tart), nectarines, plums and prunes. See label for further information and use rates. See page 133 for additional information on phosphorous acid, phosphonates and phosphites.

Periodical cicadas

See Periodical Cicadas in the Insect Management Notes section for apples, page 52.

Vole Control in Fruit Plantings

Mice, also known as voles, can cause serious damage to tree fruit plantings. Frequently, damage occurs but growers do not notice it until trees become weak, die, or need to be removed.

You can anticipate vole damage each year, particularly from late summer to early spring, as mice eat bark from the base of small saplings. Such damage can girdle and kill a tree. Apple trees are most susceptible, but hungry voles will attack other fruit trees. Apple trees on dwarfing rootstocks are particularly palatable to them.

Many plantings are made in a hedgerow pattern, which does not permit cultivation between trees. Such plantings favor vole migration, as do mulches and vigorous sods. High populations also favor vole migrations.

Voles can be a problem in blueberry plantings but almost never feed on grapes, blackberries, raspberries, or strawberries.

General Orchard Management Practices

You can employ several general orchard management practices to reduce the risk of injury and improve control. No single material or technique is effective for complete control of voles. We therefore suggest you vary both the materials and methods of control during the season.

You can construct tree guards from "hardware cloth" or similar materials with a mesh no larger than 0.25 inch. These guards should enclose the tree and extend from several inches below soil surface — voles dig in the top 2 to 3 inches of soil — to several inches above maximum snow line (about 18 inches).

Placing pea-sized gravel or cinders around the trees in a circle 4 to 6 inches wide and at the same depth tends to discourage meadow voles from attacking crowns of trees, but does not discourage other mouse species.

Voles need abundant cover to proliferate. Maintaining a clean area 1 to 2 feet around the base of each tree discourages surface feeding and also regulates vole populations long term. Chemical weed control in early spring significantly reduces the amount of labor involved in keeping the area around the tree clean.

Mow short the orchard cover or sod in late August and again after harvest to reduce runway cover and aid baiting. Cleaning out drainage ditches and fencerows, and picking up or crushing all dropped fruit, discourages large vole populations.

Orchard Vole Control Program

Essential Knowledge

The first thing you must do to control voles is to determine the problem species. Use snap traps for this. The three common species are meadow vole *(Microtus pennsylvanicus)*, prairie vole *(Microtus ochrogaster)*, and pine vole *(Pitymys pinetorum)*. While the control materials for these species may be the same, the control methods differ.

You can make quick field identifications of vole species (for both juveniles and adults) based on the length of their tails:

Pine vole: Tail is about as long as its hind foot.

Meadow and prairie vole: Tail is about twice as long as its hind foot.

Determine timing and site of infestations with snap traps. Knowing when and where mice are most abundant makes control easier.

Control

You can control voles in orchards by using either zinc phosphide or chlorophacinone baits. You must use both baits according to label directions.

Zinc phosphide, a restricted use pesticide, is an acutely toxic bait that kills mice within 24 hours. It is available either as a weather-resistant pellet bait or mixed with prepared grains such as oats and corn. Zinc phosphide is usually well accepted by mice. However, it is not effective if applied more than twice.

Chlorophacinone (e.g., RoZol) is an anticoagulant bait available as a weather-resistant, pellet-style bait. It is highly accepted by rodents but does not kill them for several days. For effective control, make a second application of chlorophacinone within 20 to 40 days.

Use caution: Baits can be attractive to other wildlife, including birds, and domestic pets. You must apply bait directly in runways or bait stations (see below) or broadcast. Pick up all spilled materials to avoid consumption by non-target animals.

Efficacy of Baits Against Meadow and Pine Voles

Chlorophacinone is more effective against pine voles than meadow voles. Zinc phosphide is more effective against meadow voles than pine voles. Consistently using just one of these chemicals results in population shifts from one vole species to another. Therefore, alternate baiting using zinc phosphide in the first application, followed by chlorophacinone in the second application, to reduce populations of both species.

Baiting Techniques

There are three main baiting techniques.

1. **Machine baiting.** You expose bait in an artificial trail (Trail Builder).
2. **Trail baiting.** You expose bait only in natural, active runways.
3. **Broadcast baiting.** You broadcast bait by hand, cyclone-type seeder, or tractor-drawn equipment at recommended rates. *This technique is not recommended for pine vole control.* When using zinc phosphide baits, the 2% concentration is recommended.

Observe safety precautions: Zinc phosphide is a restricted use material. Read and follow all label directions and precautions.

Comparison of Baiting Techniques

Baiting Technique	Meadow Or Prairie Vole Control (%)	Pine Vole Control (%)
Machine	90-95	80-85
Trail	80-85	70-75
Broadcast	78	Not Recommended

Timing

Apply rodenticides on a sunny day in late fall when voles are active. Voles begin to build up in early August, but delay baiting as late as possible in the fall. The most effective application period is just before snow cover, after frost reduces the grass cover and the fruit is rotted. Spot treatment during the winter and into early spring is recommended. Treat marginal lands to prevent re-invasion.

Pre-harvest Baiting Is Not Recommended

Applying poisoned bait before harvest to prevent vole damage to fruit in cold storage is not a sound practice for the following reasons:

1. The recommended methods of orchard vole control do not always provide 100 percent control. Some voles survive the pre-harvest control and enter fruit boxes on the ground that are carried into cold storage.
2. The pre-harvest poison application reduces the population of voles in the orchard, which greatly reduces competition among survivors, making food and cover ample. Under these favorable conditions, survivors breed, with as many as eight young per litter. In a very short time, populations may recover to original levels.
3. The recommended control season for voles in orchard and winter storage facilities is just prior to freezing conditions. *Note: Check your control program with snap traps. Lack of visible damage does not indicate the efficacy of your program.*

Control in Storage

To protect fruit in storage from rodents, pay attention to what you do before and during harvest.

Before harvest

- Poison rats and mice in storage one month before picking. Keep storage area baited and free of debris.
- Clean up outside debris one week before picking. Pay special attention near loading areas.
- Use rodent-proof storage. Seal all holes and cracks. Mice can fit through a hole the size of a dime.

During harvest

- Move filled boxes into storage quickly. Any box left overnight may have mice.
- As you load fruit into storage, bait the storage area. Place teaspoonful amounts in bait stations, on floor, along alleys, between rows of boxes, and under pallets. Do not place open baits on floors or any areas where contamination might occur. Commercial bait stations are available from agricultural supply companies. Always prevent contact with fruit.

Bait Stations in the Orchard

You can prepare bait stations in several ways and eliminate or reduce the opportunity for non-target animals to contact the bait. Squares of heavy roofing shingles (or other weather-resistant materials) placed out of traffic areas between trees can serve as bait stations to protect the bait and hiding of rodents.

Some growers have constructed bait stations that require less refilling by building inverted T-shaped stations from PVC tubing and fittings that provide bait storage and a protected feeding area. Place bait stations in the field two or three weeks before adding the bait.

Vole Control for Small Fruit

Prozap zinc phosphide pellets are a restricted use pesticide labeled for vole control in highbush blueberries, blackberries, and red and black raspberries. Apply this product only in the dormant season after final harvest and not later than the beginning of leaf emergence in the spring. The minimum pre-harvest interval is 70 days. Do not apply when the ground is snow-covered.

You may broadcast bait with a cyclone seeder or by hand. When applying by hand, throw a tablespoon (12 grams) into heavy cover along bushes, rocky outcrops, and fence lines. Make two applications at a rate of 6 to 10 lb per acre per application at a minimum interval of 21 days. The maximum application per growing season is 20 lb. per acre.

Growth Regulator PHIs and REIs

Growth Regulator Pre-harvest Intervals and Restricted Entry Intervals

Trade Name	Common Name	Preharvest Interval (Days)						REI (Hours)
		Apple	Pear	Peach	Sweet Cherry	Tart Cherry	Plum	
Apogee, Cryova[2], Kudos, Pro-Hex[2]	Prohexadione-calcium	45	—[1]	—	20	—	—	12
Amid Thin-W	NAD	2	2	—	—	—	—	48
Blush		7	—	—	—	—	—	4
Cytokin[2]	kinetin	0	0	0	0	0	0	4
Ethrel, Motivate, Ethephon	ethephon	7	—	—	7	7	—	48
Fruitone N	NAA	2	2	—	—	—	—	48
K-Salt Fruit Fix 200	NAA	2	2	—	—	—	—	24
K-Salt Fruit Fix 800	NAA	2	2	—	—	—	—	48
MaxCel, Exilis	6-benzladenine	86	86	—	—	—	—	12
ProGibb	gibberellic acid (GA3)	—	—	—	0	0	0	4
ProVide	GA4 + 7	—	—	—	—	—	—	4
Promalin, Typy, Cytoplex HMS, Perlan	6BA + GA4 + 7	0	NB[3]	0	NB[3]	—	—	4/24
ReTain	AVG	7	7	7	—	—	7	12

[1] — = not registered or not recommended

[2] Check label for state registration

[3] Non-bearing trees only.

Chemical Weed Control in Fruit Crops

Controlling weeds in fruit plantings is important. Weeds may reduce yields by competing for water and nutrients, harbor insects and other pests, and serve as alternate hosts for diseases. Herbicides can provide good weed management with less labor and frequently at a lower cost compared to manual weed control.

Proper Application

Herbicide effectiveness depends on the selection of the appropriate product and application of the product at the proper time, and the proper rate, with the proper equipment. The level of weed management depends largely on the operator's skill and attention to detail. In most cases, the given herbicide rates are for overall coverage (broadcast rates). For band treatment common in fruit plantings, reduce the amounts according to the portion of area treated. For example, to control weeds in a 4-foot-wide band beneath a crop planted in rows 10 feet apart, the amount of herbicide needed per acre of crop is 4/10 of the broadcast amount per acre. Make sprayer adjustments and calibrations as precise as possible to assure accurate and uniform applications. Improper application can damage fruit plantings and may result in illegal residues on the fruit crop. Over- or under-application also can reduce the profitability of the planting. Use nozzles appropriate for herbicide application at low pressures (20-40 psi) on a fixed boom-type applicator, unless the label has specific recommendations. This type of sprayer is calibrated easily and, when designed properly, deposits herbicide uniformly.

Consider using one of the recently introduced low-drift nozzles such as the Turbo TeeJet Nozzle or TurboDrop Nozzle. They have been designed to provide similar performance to traditional flat fan nozzles while reducing the number of very small droplets that are highly subject to drift.

While backpack or hand sprayers may be suitable for spot treatment with post-emergence herbicides, do not use them to apply pre-emergent herbicides around fruit plants. The application rate is critical with pre-emergent herbicides, and hand sprayers cannot be

calibrated well enough for accurate application. Slight application rate errors can cause severe damage to fruit plants.

Calibrate each sprayer carefully and apply herbicides according to the suggested rates. Note that when applying many pre-emergence herbicides to the soil, you should adjust rates according to soil characteristics. Generally, use lower rates on sandy soils with low organic matter, and use higher rates on heavier textured soils and those high in organic matter. With some herbicides, no rate changes are suggested. If you are unsure about an herbicide's effectiveness or possible crop damage, test it on a small portion of the planting before using it extensively.

Herbicide Resistance Management

Continued use of the same herbicide can lead to the development of herbicide-resistant weeds or the establishment of tolerant weeds. Avoid using the same product or chemically related products for several consecutive years to avoid building up herbicide-resistant weed biotypes. The HRAC code on the label indicates what group the chemical is in and chemicals with the same number function the same way. We recommend that you rotate herbicides with different modes of action and include non-chemical controls whenever possible to avoid these problems and improve weed control.

Tank Mixes

Certain herbicides may be combined in suitable tank mixes. Consult product labels for approved combinations and recommended rates. Use caution when tank mixing herbicides that are not specifically listed on the label.

By using tank mixes, you can apply a pre-emergence herbicide together with a post-emergence herbicide to provide improved weed control, or you can apply two herbicides to gain better weed control. **Always follow label recommendations. Improper mixing can form chemical compounds that are not compatible and that may damage your sprayer.**

Timing of Applications

Weed management may require multiple applications each year. Timing is important for best results.

Growers often apply a post-emergence herbicide in early spring to control winter annuals and perennials before they flower. The timing of this application may be too early for maximum pre-emergence herbicide effectiveness. It is often wise to follow the first application with a second application of a tank mix of post- and pre-emergence herbicides about three weeks after the first. This controls any weeds that have emerged since the first application and puts the pre- emergence in place at the right time, so it lasts through the main period of weed emergence.

Site Preparation Before Planting

Management of perennial weeds in perennial fruit crops can be challenging. Growers should strive to eradicate established perennial weeds during site preparation in the season prior to establishing the crop. Most perennial weeds cannot be controlled effectively in the spring before planting or once the crop is planted. Ideally, perennial broadleaf weeds should be approximately at the bud to early flowering stage at the time of treatment. Summer and early fall applications of glyphosate may be more effective against perennial broadleaf weeds than spring applications. Allow five to seven days for glyphosate to translocate throughout the root system before plowing under. This should be followed by repeated shallow cultivation as green "flushes" of weed seedlings appear. An alternative is to apply paraquat (Gramoxone) or glufosinate (Rely or generics) for contact non-selective weed control as flushes of weed seedlings appear.

Establishment of a grass crop on the site several years before planting will give the grower more options for control of perennial broadleaf weeds. Alternatively, cultivation combined with a non-selective herbicide can also be an effective strategy.

Trade Name and Active Ingredient (a.i.)

Herbicide labels list the chemical names of the active ingredients and the percentage or amount of the active ingredients as "a.i." Herbicides come in various formulations and under various trade names. For the sake of brevity, only the original trade name is listed in this guide. See the table on pages 255-260 for other trade names registered for use on fruit crops.

Always read each label carefully, as rates and labeled crops may differ between labels with similar active ingredients. Follow the recommended rates as they are listed on the label of the product you plan to use.

Follow the recommended rates as they are listed on the label of the product you plan to use.

Use Restrictions

Federal regulations control herbicide use and prescribe the crops the herbicides can be used on, as well as the timing and rates for which these materials are registered. Use only registered materials at the recommended rates for the crops listed. Herbicides are covered by

Worker Protection Standards where they apply. Labels include restricted-entry intervals (REI) and personal protective equipment (PPE) information. Product labels are the final authority — follow them carefully.

Good Rules to Remember

1. The rates recommended in this guide are mid-range rates applicable for medium to fine soils. Always refer to labels for full details about rates depending on soil type, organic matter content, age of plants, etc.
2. Applying post-emergence herbicides under stress conditions to weeds (such as high temperatures in midsummer, drought, cool temperatures in the spring, etc.) may result in poor weed control.
3. Use a fixed-spray boom, appropriate nozzles, and low pressure for even application without drift.
4. Spray only in little or no wind (less than 5 mph).
5. Adjust rates according to bandwidth.
6. Follow herbicide restrictions on new plantings. Allow plants to become well established and the soil well settled around plants before application.
7. Use herbicide sprayers for herbicides only.
8. Clean sprayers thoroughly when changing herbicides, especially when you have used 2,4-D, Chateau, or Prowl.
9. Store pesticides in locked storage. Do not allow liquid pesticides to freeze.
10. Protect the environment — avoid surface or ground water contamination. Dispose of excess spray material carefully and according to label directions. Do not allow grazing in treated areas.
11. **Read the label. Understand it thoroughly. Follow its directions.**

Herbicide Recommendations For Peach, Nectarine, Plum, And Cherry

Weed Problem	Material And Rate Per Acre	Notes And Comments
Pre-emergence		
Annual grasses and broadleaves	Alion (Indaziflam 1.67 lb. a.i./gal.) at 5.0-6.5 fl. oz. in minimum of 10 gal. water	Trees must be established at least 3 years after transplanting. Use lower rates as soil OM decreases. Avoid direct or indirect spray contact with crop foliage, green bark, roots, or fruit, as it may cause localized crop injury and death. Allow at least 30 days between applications. Do not exceed 10.3 fl. oz. per acre in a 12-month period. Do not apply to frozen ground. Do not apply within 25 feet of ponds, rivers, streams, or wetlands. Spot spraying is not recommended. Shake container well before use.
Annual and perennial grasses and broadleaves	Casoron 4G (dichlobenil 4% a.i./lb.) at 100-150 lb.	For perennial weed control, apply to untilled ground over old weed growth from November 15 to Feb 15; alternately apply late fall or very early spring before May 15 and incorporate immediately. For annual weed control, surface apply. Shallow incorporation or sprinkler irrigation is recommended when application is made during periods of high temperatures. Do not apply until 4 weeks after transplanting. Use higher rate for perennial weed control. Annual maximum rate 150 lbs./A.
Annual broadleaves and suppression of grasses	Chateau SW (flumioxazin 51% a.i.) at 6-12 oz. Chateau EZ (flumioxazin 41.4% a.i.) at 6-12 oz.	The preferred application timing in the fall to maximize the potential for rainfall to activate and set the herbicide. Do not apply to trees established less than 1 year unless protected from spray contact by nonporous wraps. Make applications only to berms. Do not apply after bud break. For non-bearing trees, do not apply during the period after flowering through leaf drop unless shielded application equipment ensures that spray drift will not contact crop foliage. Do not apply to fine- textured soils. Do not exceed 2 applications in a growing season or make a sequential application within 30 days of the first application. Do not exceed 24 oz. per season Do not apply when plants are under stress. Do not apply within 300 yards of nondormant pears. Apply alone pre-emergence or tank mix with Gramoxone post-emergence with a crop oil 1% v/v or NIS 0.25% v/v. Do not incorporate. Do not allow drift to contact foliage or green bark. Trees may be transplanted 2 months after application. Minimum 30 days between applications.
Annual broadleaves and annual grasses	Chateau Complete (flumioxazin 30% a.i. + rimsulfuron 8.25%) at 12 oz.	**Not registered in all states.** The preferred application timing is in the fall to maximize the potential for rainfall to activate and set the herbicide. Do not apply to trees established less than 1 year. Do not apply after bud break. Do not apply within 300 yards of nondormant pears. Make applications only to berms. Avoid direct or indirect spray contact to foliage and green bark (nonbarked trunk with the exception of undesirable suckers). Do not apply to powdery soils or soils that are susceptible to wind displacement unless irrigation can be applied immediately after application. Do not mow treated areas between bud break and final harvest. Do not incorporate. Max seasonal rate 12 oz./A.

(Continued)

Herbicide Recommendations For Peach, Nectarine, Plum, And Cherry (*continued*)

Weed Problem	Material And Rate Per Acre	Notes And Comments
Annual broadleaves and suppression of grasses	Goal 2XL (oxyfluorfen 2 lb. a.i./gal.) at 5-8 pt. in minimum of 20 gal. water	**Dormant Application Only:** Effective both pre-emergence (5-8 pt.) and post-emergence (2-8 pt.) as a directed spray on weeds larger than 4 inches. Do not apply from bud swell until harvest completion. Can be mixed with other pre-emergence herbicides or with Roundup or Gramoxone. Do not exceed 8 pt. per year.
Annual broadleaves and suppression of grasses	GoalTender (oxyfluorfen 4 lb. a.i./gal.) at 2.5-4 pt. in minimum of 20 gal. water	**Dormant Application Only:** Effective both pre-emergence banded application (2.5-4 pt.) and post-emergence (1-4 pt.) as directed spray on weeds larger than 4 inches. Do not apply from bud swell until harvest completion. Can be mixed with other pre-emergence herbicides or with Roundup or Gramoxone. Do not exceed 3 pt. per year on a broadcast basis.
Annual grasses and broadleaves	Karmex DF diuron (80% a.i.) at 2-5 lb. in 25-40 gal. water	**Peach Only:** Effective both pre-emergence and post-emergence (minimum 70°F with high humidity). Apply under trees established at least 3 years. May be tank mixed with Sinbar (2 lb. each) in orchards established at least 2 years. Karmex/Sinbar can be applied in the spring before weeds emerge or after harvest in the fall. Do not exceed 1 application per year.
Annual and perennial grasses and certain broadleaves	Kerb SC (pronamide 35.6% a.i.) at 2.5-9.5 pt. in 40-50 gal. water. Rate depends on weed pressure and soil type. See table on label.	Apply as a directed spray in the fall after harvest prior to soil freeze-up. Rainfall or irrigation are required to activate. Do not apply more than 5 pt./A/year or make more than 1 application per year. **Age restriction:** Kerb SC may not be applied to (1) trees less than 1 year old, (2) fall-transplanted stock transplanted less than 1 year old, or (3) spring-transplanted stock transplanted less than 6 months. Some Special Local Needs Labels (FIFRA 24(c)) are labelled as Restricted Use Pesticides (RUP), whereas the national label remains a general use pesticide.
Annual grasses and broadleaves	Matrix FNV (rimsulfuron 25% a.i.) at 4 oz. in minimum of 10 gal. water	Apply only to crops that have been established for 1 full growing season and are in good health and vigor. Weeds are controlled for 60-90 days after application. Matrix burns down small actively growing weeds less than 1 inch tall. When weeds are present at application, a labeled burndown herbicide such as paraquat with an appropriate adjuvant improves control. Avoid direct or indirect contact with crop foliage or fruit, except undesirable suckers. Do not use Matrix FNV in a spray solution with a pH below 4.0 or above 8.0. Best results are obtained when the soil is moist at the time of application, and 0.5 inch of rainfall or sprinkler irrigation occurs within 2 weeks of application.
Annual grasses and broadleaves	Pindar GT (penoxsulam 0.083 lbs./gal. + oxyfluorfen 3.93 lbs./gal.) at 1.5-3 pt.	Apply only to trees established at least 4 years; see label for reset requirements. Use trunk guards to protect plants until adequate bark has developed. Application window beginning after harvest, up to bud swell. See label for tank partners for complete burndown. A single rainfall or sprinkler irrigation of 0 5 inches or more, or flood irrigation within 21 days after application, is necessary to activate. The addition of 1 quart per acre of crop oil concentrate or methylated seed oil, or 0 25% v/v of an 80% active nonionic surfactant labeled for application to growing food crops, is required for effective postemergence control of susceptible emerged weeds. Avoid direct contact with fruit trees. Single max application rate 3 pts./A; 4.5 pts./A max total for the year with 30 days between sequential applications at lower rates.
Annual grasses and broadleaves	Princep 4L (simazine 4 lb. a.i./ gal.) at 2 -4 qt./A in min of 20 gals. water	Apply under trees established at least 2 years. Apply in spring before weeds emerge avoiding contact with fruit, foliage, or stems. Avoid use on sandy soils with OM <1%. 1 application per calendar year, with a max single application rate of 4 qt./A. Check label for state-specific restrictions on tank mixes. Replant restriction of 12 months following application. **Plum, Sweet Cherry Only:** Use only in MO and states east of the Mississippi River. **Nectarine:** Use restricted to CA.
Annual grasses and broadleaves	Sinbar WDG (terbacil 80% a.i.) at 0.5-4 lb. in minimum of 20 gal. water	**Peach Only:** Apply either in the spring before weeds emerge or during early stages of seedling growth or after harvest in the fall. Trees must be established at least 3 years. Do not contact foliage or fruit with spray or mist. **Non-bearing (young, newly planted) Stone Fruits:** Apply at 0.5-1 lb. Make the first application after a significant rainfall or irrigation event that allows the ground to settle around the base of the trees. Make 1-2 applications per season. Do not exceed 1 lb. per year. Do not use on soils with <1% OM.

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Herbicide Recommendations For Peach, Nectarine, Plum, And Cherry (*continued*)

Weed Problem	Material And Rate Per Acre	Notes And Comments
Annual grasses and broadleaves and suppression of yellow nutsedge	Solicam DF (noraflurazon 78.6% a.i.) at 2-5 lb./A in min of 20 gals. water	See label for rate based on soil type. Apply a directed spray from fall to early spring before weeds emerge. Soil should be settled and firm. Rainfall or irrigation of 0.5 inch is needed within 4 weeks. Do not contact fruit or foliage. Do not apply after bud break on sandy loam soils. Check label for maximum amount allowed per year depending on soil type. **Peach, Nectarine:** minimum 6 months after planting before first application. **Plum:** minimum 12 months after planting before first application. **Cherry:** minimum 18 months after planting before first application.
Annual grasses and certain broadleaves	Surflan 4AS As Special Herbicide (oryzalin 4 lb. a.i./ gal.) at 2-6 qt. in 20-40 gal. of water	**No longer in production - supply extremely limited to not available.** Make a single band of broadcast application to the ground beneath trees before weeds emerge. Apply alone to weed-free soil or post-emergence mixed with Roundup or Gramoxone. Minimum 0.5 inch rainfall or irrigation required for activation. Minimum 2.5 months between applications. Do not exceed 12 qt. per year.
Annual grasses and broadleaves	Treflan HFP 4EC (trifluralin 4 lb. a.i./ gal.) at 1.5-4 pt. in 5-40 gal. water	**Peach, Plum Only:** Incorporate within 24 hours to reduce loss of activity. **New Plantings:** Apply 1.25-2 pt. and incorporate before transplanting. **Established Plantings:** Apply 2-4 pt. and incorporate prior to period of weed germination or after removal of weeds with tillage of herbicides.
Post-emergence		
Annual broadleaves	Aim EC (carfentrazone 2 lb. a.i./gal.) at 2 fl. oz. in 20 gal. water	Apply any time during the season. Add NIS (2 pt./100 gal.) or COC (1 gal./100 gal.). Mix with Roundup or Gramoxone for broader weed control. Do not exceed 7.9 fl. oz. per year. Minimum 14 days between applications. **Sucker Management:** Apply when suckers are green. Do not allow spray to contact fruit, foliage, or green bark.
Annual and some perennial broadleaves	2,4-D (Amine) at 1-4 pt. in 5-25 gal. water	Apply as directed spray to annuals 1-2 inches high and to perennials up to early bud stage. Do not allow spray to contact leaves, fruit, limbs or exposed roots of tree. Use coarse spray and low pressure to avoid drift. Do not apply during windy periods, when there is a temperature inversion or at extremely high temperatures. Non-bearing trees must be established at least 1 year. On bearing trees, do not apply during bloom and only after irrigation. Do not apply to bare ground. Use higher rate on perennial weeds. Do not exceed 2 applications per year. Maximum 75 days between applications.
Annual and some perennial broadleaves	Embed (2,4-D Choline) at 1-4 pt. in a min. of 10 gal.	**Not registered in all states.** Apply only to orchards that have been established for at least one year and are in vigorous growth condition. Apply to annual weeds when small and actively growing. Use higher rate on perennial weeds in bud to bloom stage. Do not allow spray to contact leaves, fruit, limbs or exposed roots of tree. Use coarse spray and low pressure to avoid drift. Do not exceed 2 applications per year. Maximum 75 days between applications, max total rate 8.42 pints/A.
Annual broadleaves	Bellum (mesotrione 4 lbs. a.i./gal.) at 3 -6 fl. oz.	Apply only to trees established for one full year and in good health and vigor. Use trunk guards to protect plants until adequate bark has developed. For pre-emergent residual control, apply before rainfall or irrigation. See label for tank mix partners. Apply in a spray volume of 10-40 gals./A. Total application rate in a 12-month period 12 fl. oz./A. Single maximum application rate 6 fl. oz./A. Three applications per year allowed in a 12-month period when using reduced rates, allowing at least 12 weeks between applications at the 6 fl. oz./A rate or 6 weeks between applications at the 6 fl. oz/A rate and subsequent applications of 3 fl. oz./A. For application to emerged weeds, the use of crop oil concentrate (COC) type adjuvant at 1% v/v or non-ionic surfactant (NIS) at 25% is advised.
Annual broadleaves and annual grasses	Chateau Complete (flumioxazin 30% a.i. + rimsulfuron 8.25%) at 12 oz.	**Not registered in all states.** See Pre-emergence section (Page???) for details If weeds are emerged at the time of application, apply with an adjuvant (0.25% v/v non-ionic surfactant or 1 qt./A crop oil concentrate). For complete control of emerged weeds, addition of a labelled burndown product required.

(Continued)

Herbicide Recommendations For Peach, Nectarine, Plum, And Cherry (*continued*)

Weed Problem	Material And Rate Per Acre	Notes And Comments
Most annual and perennial grasses	Fusilade DX (Fluazifop- P-butyl 2 lb. a.i./gal.) at 16-24 fl. oz. in 20-40 gal. water	Apply post-emergence as a directed spray avoiding contact with tree foliage to young actively growing grasses. Add a COC at 1% v/v (1 gal./100 gal.) or NIS at 0.25-0.5% v/v (1-2 qt./100 gal.) in the finished spray volume. Do not exceed 72 fl. oz. per acre per year. Maintain a minimum of 21 days between applications. Do not exceed a maximum of 3 applications per year.
Annual broadleaves	Goal 2XL (oxyfluorfen 2 lb. a.i./gal.) at 5-8 pt. in minimum of 40 gal. water	See Pre-emergence section for details
Annual broadleaves	GoalTender (oxyfluorfen 4 lb. a.i./gal.) at 2.5-4 pt. in minimum of 40 gal. water	See Pre-emergence section for details
Most annual grasses and broadleaf weeds and top kill of perennial weeds	Gramoxone (paraquat 3 lb. a.i./gal.) at 1.7-2.7 pt. in minimum of 10 gal. water	Apply as directed spray to actively growing weeds. Repeat applications are necessary to give sustained control. Apply as a coarse spray. Always add NIS 0.25% v/v or crop oil 1% v/v. Do not allow spray to contact leaves, fruit, or green stems. Do not exceed 3 applications per year. **Restricted use pesticide. Only certified applicators can mix, load and apply. Not to be used by uncertified persons working under the supervision of a certified applicator. Applicators must complete an EPA-approved paraquat training every 3 years https://www.epa.gov/pesticide-worker-safety/paraquat-dichloride-training-certified- applicators Containers under 120 gallons will have "closed-system" packaging to be used with a closed-transfer system.**
Most annual grasses and broadleaf weeds and top kill of biennial and perennial weeds	Homeplate (caprylic acid 45.14% + Capric acid 34.74%) at 3-9% solution if used alone or 1% solution when tank mixed	OMRI listed. Use includes vegetation burndown, directed and shielded sprays, and sucker control. May be used any time during the year and works best during warm and dry conditions. Reapply if rain falls within 3 hours of application. Avoid contact with desirable foliage and green bark. **Sucker control:** Apply before suckers become woody.
Annual grasses and broadleaves	Karmex DF diuron (80% a.i.) at 2-5 lb. in 25-40 gal. water	See Pre-emergence section for details.
Annual grasses and broadleaves	Pindar GT (penoxsulam 0.083 lbs./gal. + oxyfluorfen 3.93 lbs./gal.) at 1.5-3 pt.	See Pre-emergence section for details.
Annual and perennial grasses	Poast 1.5E (sethoxydim 1.5 lb. a.i./gal.) at 1.5-2.5 pt. in 25 gal. water	Apply as a directed spray to actively growing grasses before they exceed maximum recommended heights. Always add crop oil 1.25% v/v. Do not exceed 2.5 pt. per application or 5 pt. per season. Peach, plum, and nectarine are very tolerant to Poast and may be applied over the top of small non-bearing trees.
Annual and perennial grasses and broadleaves	Rely 280 (glufosinate 2.34 lb. a.i./gal.) at 48-82 fl. oz. in minimum of 20 gal. water	Apply as a directed spray to actively growing weeds. Avoid spray drift or mist contact with green bark, stems, or foliage, as injury may occur. Only trunks with callused, mature brown bark should be sprayed unless protected by nonporous wraps, grow tubes, or waxed containers. Add AMS to the spray tank if spray water is hard. Maximum rate is 164 fl. oz. per acre in a 12-month period. Do not make more than 2 applications at a maximum rate of 82 fl. oz. per acre per year. Do not make spot or directed spray applications to tree trunks or to suckers as tree injury may occur. Applications must be a minimum of 28 days apart.

(Continued)

Herbicide Recommendations For Peach, Nectarine, Plum, And Cherry (*continued*)

Weed Problem	Material And Rate Per Acre	Notes And Comments
Annuals and some perennial grasses and broadleaves	Roundup 5.5EC (glyphosate 5.5 lb. a.i./gal.) at 11 fl. oz.-3.3 qt. in 10-40 gal. water (many other formulations)	Rate depends on weed species and growth stage. See label for details. Apply as preplant broadcast application or in fall for control of roots and rhizomes of perennial weeds or as a directed spray or wiper application (33-100% solution) to actively growing weeds in established plantings. Always add AMS 8.5-17 lb./100 gal in hard water or drought conditions. Do not allow spray to contact any part other than mature bark. Avoid application to suckers and recent pruning wounds. Use extreme care to ensure that no part of peach tree is contacted with spray. Apply only near trees that have been planted in the orchard for 2 or more years. Does not provide residual control; can be mixed with labeled pre-emergence herbicides.
Annual and perennial grasses and broadleaves	Scythe 4.2E (pelargonic acid 4.2 lb. a.i./gal.) at 3-10% solution	For contact nonselective control or burndown of a broad spectrum of actively growing weeds. Use low rate for annual weed control and high rates for maximum vegetative burndown. Use as a directed or shielded spray. Can be mixed with Roundup.
Most annual and perennial broadleaves	Select Max with Inside Technology (clethodim 0.97 lb. a.i./gal.) at 12-16 fl. oz.	Apply post-emergence as a directed spray to young, actively growing grasses. Do not exceed 16 fl. oz./A in a single application or per season. A minimum 14-day interval is required for repeat applications. Add NIS at 0.25% v/v or COC/MSO at 1 qt./A or 1% v/v.
Most annual and perennial broadleaves	Stinger (clopyralid 3 lb. a.i./ gal.) at 1/3-2/3 pt. in 10 gal. or more of total spray volume	Make one or two applications per crop year. Apply only to trees 1 year or older. Avoid direct contact with foliage, fruit, or tree trunks. Do not apply during bloom. Do not exceed 2/3 pt. per acre per crop year.
Annual and perennial grasses	Targa (quizalofop p-ethyl 0.88 lb. a.i./gal.) at 12 oz./A in 10-40 gal.	Apply as a directed spray in a band extending out a minimum of 3 feet on each side of the tree row in 10-40 gallons of water/acre to control labelled grass weeds. DO NOT apply by aerial application. Two applications with a max rate of 24 oz. per season with application intervals at least 14 days apart to allow regrowth to occur. DO NOT apply within 14 days of anticipated bloom of crop.
Annual and perennial broadleaves	Venue (Pyrafluven ethyl 2% a.i.) at 0.7-4.0 fl. oz. plus other labeled herbicides in minimum of 20 gal. water	Apply as a directed spray during dormant period and prior to bloom. Avoid contact with foliage and green bark. More effective on weeds less than 4 inches tall and 3 inches in diameter. Use higher rate and spray volume for larger weeds. Do not exceed 3 applications or 6.8 fl. oz. per acre per season. Allow a minimum of 30 days between applications. Adding COC or NIS is recommended. May be used for sucker growth control on the basil portion of trunks and root sprouts when tissue is young, immature and not hardened off. Avoid contact with green uncallused bark of young trees less than one year old unless protected by nonporous wraps or grow tubes. Do not allow spray to drift onto desirable fruit or foliage as damage will occur. May be mixed with 2, 4-D, glyphosate, or grass herbicides for enhanced control. Spray water pH needs to be less than 7.5.
Annual and perennial grasses and broadleaves	Zalo (quizalofop-p-ethyl .23 lbs./gal. + glufosinate-ammonium 2.29 lbs./gal.) at 46 fl. oz. in 10-40 gal.	Avoid contact with desirable foliage, green stems, or exposed non-woody roots. Do not apply to suckers. Do not apply withing 14 days of anticipated bloom. Rainfall or irrigation within 4 hours of application may reduce weed control. Avoid disturbing treated areas for at least 5 days before and 7 days following application. In addition to spray grade ammonium sulfate (AMS) at 3 lbs./A, use one of the following: crop oil concentrate (COC) adjuvants at 1% v/v: nonionic surfactants (NIS) with at least 90% ai at 0.25 to 0.5% v/v; MSO (methylated seed oil) adjuvants at 1% v/v; or HSOC (high surfactant oil concentrate) adjuvants at 0.5% v/v. Maximum single application rate 46 fl. oz./A. Two applications per calendar year, with at least 28 days separating applications.

(Continued)

Herbicide Recommendations For Non-Bearing Fruit Trees Only

Weed Problem	Material And Rate Per Acre	Notes And Comments
Pre- and Post-emergence		
Annual broadleaves and yellow nutsedge	Broadloom (bentazon 4 lb. a.i./gal.) at 1.5-2 pt. in minimum of 20 gal. water	**Not labelled in all states.** Apply as a directed post-emergence spray. Always add COC 1% v/v. Avoid spraying stems, bark, or foliage. Do not exceed 2 pt. per application or exceed 4 pt. per season.
	Crew (isoxaben 0.50% + dithiopyr 0.25%) at 150 lbs.	Prior to application, the bed or soil surface should be smooth and free of plant and weed debris. Apply using a drop or rotary-type spreader designed to apply granular fertilizer. A single rainfall or sprinkler irrigation of 0.5 inch is often required to activate this product. Maximum 2 application per year, with at least 3 months between applications.
Most annual and perennial grasses	Fusilade DX (Fluazifop-P-butyl 2 lb. a.i./gal.) at 16-24 fl. oz. in 20-40 gal. water	For non-bearing apple and pear that will not be harvested within 1 year after application. Apply post-emergence as a directed spray, avoiding contact with tree foliage to young actively growing grasses. Add COC at 1% v/v (1 gal./100 gal.) or NIS at 0.25-0.5% v/v (1-2 qt./100 gal.) in the finished spray volume. Do not exceed 72 fl. oz. per acre or 3 applications per year. Maintain a minimum of 14 days between applications.
Most broadleaves	Gallery 75DF (isoxaben 75% a.i.) at 0.66-1.33 lb. in minimum of 10 gal. water	Apply in late summer to early fall; or pre-emergence in early spring prior to seed germination or immediately after cultivation. Do not apply to new transplants until soil has settled with no cracks present. Rainfall or irrigation (1/2 inch) is needed within 21 days of application. Not effective on germinated weeds. Minimum 60 days between applications. Maximum rate is 4 lb. per acre.
Annual grasses and certain broadleaves	Prowl 3.3EC (pendimethalin 3.3 lb. a.i./gal.) **Short-term weed control:** at 2.4 qt. in minimum of 20 gal. water **Long-term weed control:** 4.8 qt. in minimum of 20 gal. water	Do not apply if buds have started to swell. May be applied preplant incorporated, preplant surface, or pre-emergence. For best results, rain or irrigation is needed within 21 days of application. Not effective on germinated weeds. Do not allow spray to contact leaves, shoots, or buds. For new plantings, do not apply until soil has settled and no cracks are present.
Annual grasses and broadleaves	Reglone (diquat 2 lb. a.i./gal.) at 1.5-2 pt. in minimum of 15 gal. water	Apply post-emergence as a directed spray using a shield for contact burn of weeds. Always use NIS at 0.5% v/v. Complete coverage is essential for good control, and best control is on weeds 1"-6" in height. Can be used during site preparations and up to within 1 year of harvest. Do not allow contact with green stems, foliage, or fruits. Apply when wind speeds are 3-10 mph. Do not use for food or feed for 1 year after application.
Annual grasses and certain broadleaves	Snapshot 2.5TG (isoxaben + trifluralin 2.5% a.i.) at 100- 200 lb.	Apply pre-emergence on weed-free clean soil. For best results 1/2 inch rain or irrigation is needed within 3 days of application. Not effective on germinated seeds. Minimum 60 days between applications. Do not exceed 600 lb. per year.

(Continued)

Relative Effectiveness Of Herbicides For Fruit Crops[1]

	Grasses						Annual Broadleaves																		Perennial Weeds				
Herbicide	Barnyardgrass	Crabgrass	Foxtails	Goosegrass	Panicum, Fall		Chickweed	Cocklebur	Groundsel, Common	Henbit	lambsquarters	marestail	Morningglory, Annual	Mustards	Nightshades	Palmer Amaranth	Pigweed	Purslane	Ragweed	Shepherdspurse	Smartweeds	Velvetleaf	Waterhemp		Dandelion	Johnsongrass	Nutsedge, Yellow	Thistle, Canada	Woodsorrel, Yellow
Pre-emergence																													
Alion	G	G	G	G	G		G	N	G	F	F	G	F	G	N	N	G	G	F	G	G	G	N		G	N	N	N	F
Bellum	N	N	N	N	N		G	G	N	N	G	F	F	G	G	F	G	N	F	N	G	G	G		N	N	N	N	N
Broadloom	N	N	N	N	N		N	F	F2	N	F	N	F	F	N	N	N	F	F2	F	G	F	N		N	N	N	N	N
Callisto	N	N	N	N	N		G	G	N	N	G	F	F	N	G	F	G	N	G	N	G	G	G		N	N	F	N	N
Casoron	N	G	G	G	G		G	F	G	G	G	F	N	G	N	N	G	G	G	G	G	G	N		G	N	N	G	G
Chateau	N	N	N	N	N		F	F	N	N	G	G	F	N	G	F	G	G	F	G	F	F	F		N	N	N	N	N
Chateau Complete	G	G	G	G	G		F	F	N	N	G	G	G	N	G	G	G	G	G	G	F	F	F		N	N	N	N	N
Crew	G	G	G	G	N		G	N	F	G	G	G	G	G	G	N	N	G	G	N	G	N	N		N	N	N	N	N
Dacthal	G	G	G	G	G		F	N	N	N	F	N	N	N	N	N	F	F	N	N	N	N	N		N	N	N	N	N
Devrinol	G	G	G	G	G		G	F	N	N	F	N	N	N	N	N	G	G	N	N	N	N	N		N	N	N	N	N
Gallery, Trellis	N	N	N	N	N		G	F	G	G	G	F	N	G	G	N	G	G	G	N	N	G	N		N	N	N	N	G
Goal	N	N	F	F	N		N	F	G	F	G	F	F	G	G	N	G	F	N	F	F	F	F		N	N	N	N	F
Karmex	G	G	F	G	F		G	F	G	G	G	F	F	G	G	N	G	G	G	G	N	P	N		N	N	N	N	N
Kerb	G	N	F	G	G		G	N	N	G	G	N	G	G	G	N	N	G	F	G	F	N	N		N	N	N	N	N
Matrix	G	G	G	N	G		N	F	G	G	F	G	N	G	F	N	F	G	F	F	F	F	N		G	N2	F	F	N
Mission	N	N	G	N	N		G	N	G	G	G	F	N	F	N	N	G	G	G	G	N	N	N		G	N	G	N	N
Optogen	F	F	F	F	F		F	F	N	G	F	N	F	F	G	F	G	F	G	N	F	G	F		N	N	N	N	N
Pindar GT	F	N	N	N	N		N	G	N	N	G	G	N	N	G	N	G	F	N	N	F	G	N		N	N	N	N	N
Princep	G	G	G	G	G		G	N	G	G	G	N	G	G	G	N	G	G	G	G	N	F	N		N	N	F	N	N
Prowl	G	G	G	G	G		G	N	N	N	G	N	N	N	N	G	F	F	N	G	F	F	G		N	N2	N	N	N
Sandea	N	N	N	N	N		N	F	G	N	G	F	N	G	N	N	G	F	G	G	G	G	N		N	N	G	N	N
Sinbar	G	G	G	N	G		G	N	F	G	G	N	N	G	G	N	G	G	G	G	G	N	N		G	F	F	N	N
Snapshot	G	G	F	G	G		G	F	G	G	G	F	F	G	F	N	G	N	N	G	F	G	N		G	F	N	N	G
Solicam	G	G	G	G	G		G	G	F	F	G	F	N	G	F	F	G	F	G	G	N	G	F		N	F	F	N	N
Spartan	N	F	N	N	G		G	N	N	N	F	N	G	F	G	G	G	G	N	F	F	N	G		N	N	F	N	N
Surflan	G	G	G	G	G		G	N	F	G	G	N	N	N	F	N	G	G	F	G	F	F	N		N	N2	N	N	N
Treflan	G	G	G	G	G		N	N	N	G	F	N	N	F	N	F	G	G	N	N	N	N	N		N	F	N	N	F
Velpar	G	N	F	N	G		G	N	G	N	G	F	N	N	N	N	N	N	G	N	G	F	N		F2	N	N	N	N
Zeus Prime|XC	G	G	G	G	G		G	N	G	G	G	N	G	G	G	F	G	G	N	G	G	N	G		N	N	G	G	N
Zeus XC, Spartan	N	G	N	G	N		G	N	G	N	G	N	G	G	G	F	G	G	N	G	F	F	F		G	F	G	G	F
Post-emergence																													
2,4-D	N	N	N	N	N		F	F	G	N	F	G	G	G	G	F	F	N	G	G	F	F	F		G	N	N	F	N
Aim	N	N	N	N	N		N	F	G	F	G	N	G	G	G	F	G	G	F	F	F	G	F		N	N	N	F	N
Broadloom	N	N	N	N	N		N	F	F2	N	F	N	F	F	N	N	N	F	F2	F	G	F	N		N	N	N	N	N
Chateau	N	N	N	N	N		G	N	N	N	G	G	F	N	F	F	F	G	F	G	F	G	F		N	N	N	N	N
Chateau Complete	G	G	G	G	G		F	F	N	N	G	G	G	N	G	G	G	G	G	G	F	F	F		N	N	N	N	N
Crew	G	G	G	G	N		G	N	F	G	G	G	G	G	G	N	N	G	G	N	G	N	N		N	N	N	N	N
Embed	N	N	N	N	N		F	F	G	N	F	G	G	G	G	F	F	N	G	G	F	F	F		G	N	N	F	N
Fusilade	G	G	G	G	G		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		N	F2	N	N	N
Gamma	F	F	N	N	N		F	N	N	G	N	F	N	N	N	N	N	N	N	F	N	G	F		F	G	N	N	N
Goal	N	F	F	F	N		N	F	G	G	G	F	F	G	G	N	G	F	N	F	F	F	F		N	N	N	N	F
Gramoxone	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	N	G	G	G		N	N	N	N	N
Homeplate	F2	F2	F2	F2	F2		G	F2	F2	F2	F2	F2	F2	F2	F2	F2	F2	F2	F2	F2	F2	F2	F2		N2	N	N	N	N2

(Continued)

Relative Effectiveness Of Herbicides For Fruit Crops[1] (*continued*)

	Grasses						Annual Broadleaves																	Perennial Weeds				
Herbicide	Barnyardgrass	Crabgrass	Foxtails	Goosegrass	Panicum, Fall		Chickweed	Cocklebur	Groundsel, Common	Henbit	Iambsquarters	marestail	Morningglory, Annual	Mustards	Nightshades	Palmer Amaranth	Pigweed	Purslane	Ragweed	Shepherdspurse	Smartweeds	Velvetleaf	Waterhemp		Dandelion	Johnsongrass	Nutsedge, Yellow	Thistle, Canada	Woodsorrel, Yellow
Post-emergence																												
Mission	N	G	G	N	N		G	N	G	G	G	G	N	G	N	N	G	G	G	G	N	N	N		F	N	G	G	N
Optogen	F	F	F	F	F		F	F	N	G	F	N	F	F	G	F	G	F	G	N	F	G	F		N	N	N	N	N
Poast	G	G	G	G	G		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		N	F	N	N	N
Reglone	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		N	N	N	N	N
Rely	G	N	G	G	G		G	G	N	N	G	G	G	G	G	F	G	G	G	G	G	F	F		G	F[2]	F	G	N
Roundup	G	G	G	G	G		G	G	G	G	G	F	G	G	G	F	G	G	G	G	G	G	F		G	F	F	G	G
Scythe	F[2]	F[2]	F[2]	F[2]	F[2]		G	F[2]	F[2]	F[2]	F[2]	F[2]	F[2]	F[2]	F[2]	F[2]	F[2]	F[2]	F[2]	F[2]	F[2]	F[2]	F[2]		N[2]	N	N	N	N[2]
Select	G	G	G	G	G		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		N	N	N	N	N
Starane Ultra	N	N	N	N	N		G	G	N	N	N	N	F	F	F	N	N	N	F	N	N	G	N		N	N	N	N	N
Stinger	N	N	N	N	N		N	F	G	N	N	G	N	N	G	N	N	N	G	N	F	N	N		G	N	N	G	N
Targa	G	G	G	G	G		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		N	F	N	N	N
Treevix	N	N	N	N	N		N	G	F	N	G	G	G	G	G	N	G	G	G	G	G	G	G		N	N	N	N	N
Trellis	N	N	N	N	N		G	N	F	G	G	F	N	G	G	N	N	G	N	G	G	N	N		N	N	N	N	N
Ultra Blazer	N	N	G	N	G		N	F	N	N	G	N	G	G	G	G	G	G	G	N	G	G	G		N	F[2]	N	N	N
Velpar	G	N	F	N	G		G	N	G	N	G	F	N	N	N	N	N	N	G	N	G	F	N		F[2]	N	N	N	N
Venue	N	N	N	N	N		G	G	N	G	G	F	G	N	G	F	G	G	G	G	G	G	F		G	N	N	N	N
Zalo	G	G	G	G	G		G	G	N	N	G	F	G	G	F	G	G	G	G	G	G	G	G		N	N	N	N	N

G = good. F = fair. N = not listed, based on product labels.

[2]Provides partial control.

Tree Fruit Herbicide REI, PHI And Special Notes

Trade Name	Common Name	WSSA	Risk of Resistance	REI	Apple	Pear	Peach	Nectarine	Plum	Cherry
Aim EC	carfentrazone-ethyl	14	medium	12	3	3	3	3	3	3
Alion	indaziflam	21	medium	12	14	14	14	14	14	14
Bellum	mesotrione	27	medi-um-high	12	30	30	30	30	30	30
Broadloom	bentazon	6	medium	48	NB/1 yr	NB/1 yr	NB/1 yr	NB/1 yr	NB/1 yr	NB/1 yr
Casoron 4G	dichlobenil	20	medium	12	N/A	N/A	--	--	--	N/A
Chateau SW/EZ	flumioxazin	14	medium	12	Not after pink bud/60	Not after bud break/60	Not after bud break/60	Not after bud break/60	Not after bud break/60	Not after bud break/60
Chateau Complete	flumioxazin + rimsulfuron	14 + 2	Medium + high	12	Not after pink bud/60	Not after bud break/60	Not after bud break/60	Not after bud break/60	Not after bud break/60	Not after bud break/60
Crew	Isoxaben + dithiopyr	21 + 3	Medium + low	24	NB/1 yr	NB/1 yr	NB/1 yr	NB/1 yr	NB/1 yr	NB/1 yr
Embed	2,4-D choline	4	low	48	14	14	40	40	40	40
2,4-D amine	2,4-D amine	4	low	48	14	14	40	40	40	40
Fusilade DX	fluazifop	1	high	12	NB/1 yr	NB/1 yr	14	14	14	14
Gallery	isoxaben DF or SC	21	medium	12	NB/1 yr	NB/1 yr	NB/1 yr	NB/1 yr	NB/1 yr	NB/1 yr
GoalTender	oxyfluorfen 41%	14	medium	24	Fallow Pre-plant| N-B| Dormant	Fallow Pre-plant| N-B| Dormant	Fallow Pre-plant| N-B| Dormant	Fallow Pre-plant| N-B| Dormant	Fallow Pre-plant| N-B| Dormant	Fallow Pre-plant| N-B| Dormant
Goal 2XL	oxyfluorfen 22.3%	14	medium	24	Fallow Pre-plant| N-B| Dormant	Fallow Pre-plant| N-B| Dormant	Fallow Pre-plant| N-B| Dormant	Fallow Pre-plant| N-B| Dormant	Fallow Pre-plant| N-B| Dormant	Fallow Pre-plant| N-B| Dormant
Gramoxone SL 3.0	paraquat	22	medium	24	N/A	N/A	14	28	28	28
Homeplate	caprylic acid + capric acid	0	very low	24	N/A	N/A	N/A	N/A	N/A	N/A
Karmex DF	diuron	7	medium	12	N/A	N/A	20	--	--	--
Kerb SC	pronamide	3	low	24	N/A[1]	N/A[1]	N/A[1]	N/A[1]	N/A[1]	N/A[1]
Matrix FNV	rimsulfuron	2	medium	4	7	7	14	14	14	14
Pindar GT	penoxsulam	2	high	24	60	60	60	60	60	60
Poast 1.5 EC	sethoxydim	1	high	12	14	14	25	25	NB/1yr	25
Princep 4L	simazine	5	medium	12	150	21	21[7]	--	21[7]	21[7] sweet
Prowl	pendimethalin	3	low	12	NB/1 yr	NB/1 yr	NB/1 yr	NB/1 yr	NB/1 yr	NB/1 yr
Prowl H2O	pendimethalin	3	low	12	60	60	60	60	60	60
Reglone	diquat	22	medium	24	NB/1 yr	NB/1 yr	NB/1 yr	NB/1 yr	NB/1 yr	NB/1 yr
Rely 280	glufosinate	10	medium	12	14	14	14	14	14	14
Roundup	glyphosate	9	low	12	14	14	17	17	17	17
Sandea	halosulfuron	2	low	12	14	14	--	--	--	--

(Continued)

Tree Fruit Herbicide REI, PHI And Special Notes (continued)

Trade Name	Common Name	WSSA	Risk of Resistance	REI	Apple	Pear	Peach	Nectarine	Plum	Cherry
Scythe	pelargonic acid	26	low	12	N/A	N/A	N/A	N/A	N/A	N/A
Select Max	clethodim	1	high	12	14	14	14	14	14	14
Showcase	trifluralin+ isoxaben+ oxyfluorfen	3, 21, 14	medium	24	--	--	NB/1 yr	NB/1 yr	NB/1 yr	NB/1 yr
Sinbar WDG	terbacil	5	medium	12	60	--	60	--	--	--
Snapshot	isoxaben+ trifluralin	21+3	medium	12	NB/1 yr	NB/1 yr	NB/1 yr	NB/1 yr	NB/1 yr	NB/1 yr
Solicam DF	norflurazon	12	medium	12	60	60	60	60	60	60
Starane Ultra	fluroxypyr	4	medium	24	14	14	--	--	--	--
Stinger	clopyralid	4	medium	12	30	--	30	30	30	30
Surflan 4AS	oryzalin	3	low	24	N/A	N/A	N/A	N/A	N/A	N/A
Targa	quizalofop p-ethyl	1	high	12	14	14	14	14	14	14
Treevix	saflufenacil	14	low	12	0	0	--	--	--	--
Treflan	trifluralin	3	low	12	--	--	N/A	N/A	N/A	N/A
Trellis	isoxaben 75%	21	medium	12	NB/1 yr	NB/1 yr	NB/1 yr	NB/1 yr	NB/1 yr	NB/1 yr
Trellis SC	isoxaben 45.45%	21	medium	12	NB/1 yr|30	NB/1 yr	NB/1 yr	NB/1 yr	NB/1 yr	NB/1 yr
Venue	pyraflufen ethyl	14	medium	12	0	0	0	0	0	0
Zalo	quizalofop p-ethyl + glu-fosinate-am-monium	1 +10	high + medium	12	14	14	14	14	14	14
Zeus Prime XC	carfentra-zone-ethyl+ sulfentra-zone	1	high	12	14	--	--	--	--	--

-- = not labeled

DS/NCC = Directed Spray/No Crop Contact N/A - no PHI specified

1 = application must be in the fall, after the fruit is harvested, but prior to soil freeze-up

2 = application in the fall or early winter, but prior to soil freeze-up and snow cover

3 = apply before emergence of new canes or shoots

4 = PHI for Highbush Blueberry only, no PHI stated for Lowbush Blueberry

5 = See label

6 = do not apply when fruit is present or illegal residues may result

7 = apply late fall to early spring prior to weed emergence. Do not apply more than once per calendar year

8 = apply anytime between harvest and early spring. Do not apply more than once per calendar year

Generic Pesticides

A generic agricultural chemical is manufactured and sold by a company other than the original manufacturer and patent holder, usually after the patent has expired. The generic pesticide contains the same active ingredient(s) (AI) and tend to be similar in performance to receive an EPA registration.

Generic products are not always identical, so be sure to carefully read the label, with special attention to rates and percent active ingredient.

Generic Fungicides

Original Trade Name (Current Manufacturer)	Common Name	Other Trade Names (Manufacturers)
Abound (Syngenta) Quadris (Syngenta)	azoxystrobin	Aframe (Syngenta) Azaka (FMC) Azoxystar, Equation
Aliette 80WDG (Bayer)	fosetyl-Al	Legion 80WDG (Makhteshim) Linebacker WDG (NovaSource)
Apogee (BASF)	prohexadione-calcium (Pro-Ca)	Cryova PGR (Makhteshim) Kudos (Fine Americas) Pro Hex (Axil Solutions) Regalis PLUS (BASF)
Bravo Weather Stick (Syngenta)	chlorothalonil	Echo (Sipcam Agro) Equus DF (Sipcam Agro, AMVAC) Chlorothalonil 720 (Albaugh)
Captec 4L (Arysta LifeScience North America LLC)	captan	Has several formulations including 50W
Copper	copper hydroxide	Champ (Nufam) Kocide (Certis) KOP-Hydroxide (Drexel) Nu-Cop (Albaugh)
	copper octanoate	Camelot-O (SePRO) Cueva (Certis)
	copper oxychloride	COC (Albaugh)
	copper oxychloride+copper hydroxide	Badge (Gowan)
	copper (cuprous) oxide	Nordox (NOROX Industrier)
	copper sulfate (basic)	Basic Copper (Albaugh) Cuprofix (UPL)
	copper sulfate pentahydrate	KOP-5 (Drexel) Mastercop (ADAMA) Phyton 35 (Phyton Corp)
Dithane M45 (Dow AgriSciences)	mancozeb	Manzate Max (United Phosphorus, Inc) Penncozeb (several formulations) Roper (Loveland) Koverall (Cheminova)
Elite 45DF	tebuconazole	Orius 3.6F (Makhteshim) Orius 20AQ (Makhteshim) TebuStar 3.6 L (Albaugh) TebuStar 45WSP (Albaugh) Tebuzol 45DF (United Phosphorous, Inc.)
PH-D (United Phosphorous Inc.)	Polyoxin D zinc salt	Affirm (Nufarm) OSO (Certis Biologicals)
ProBlad Verde SymAgro	Banda Lupinus Albus Doce	Fracture (FMC)
Prophyt (Helena)	Phosphite (mono- and dibasic salts	AgriFos (Monterey)/Agri-Fos (AgriChem) K-Phite (Plant Food Systems) Phostrol (Nufarm) Reliant (Quest Products)
Quilt Xcel (Syngenta)	azoxystrobin+ propiconazole	Aframe Plus (Syngenta) Cover XL (AgriStar)

(Continued)

Generic Fungicides (continued)

Original Trade Name (Current Manufacturer)	Common Name	Other Trade Names (Manufacturers)
Rally 40WSP (Dow AgriSciences)	myclobutanil	Sonoma 40WSP (Albaugh)
Ridomil 2E (Syngenta)	metalaxyl	Metastar 2E (Arysta Life Science)
Ridomil Gold SL (Syngenta)	mefenoxam	Apron XL (Syngenta) ReCon Bold SL (Atticus) Thrive 4M (Albaugh) Ultra Flourish (Nufarm)
Rovral 4F (Bayer)	iprodione	Iprodione 4L AG (Arysta Life Science) Meteor 4L (United Phosphorus Inc.) Nevado 4F (Makhteshim)
Streptomycin 17 (Loveland Products Canada Inc.)	streptomycin	AG Streptomycin (ADAMA) FireWall (AgroSource)
Tilt (Syngenta)	propiconazole	Propimax 41.8L (Dow AgriSciences) Bumper 41.8L (Makhteshim) Orbit 41.8L (Syngenta)
Topsin-M 70WDG (United Phosphorous Inc.)	thiophanate methyl	Thiophanate Methyl 85WSB (Makhteshim) T-Methyl EAG 70WSB (Nufarm) T-Methyl 70WWSB (Arysta Life Science)

Generic Insecticides

Original Trade Name (Current Manufacturer)	Common Name	Other Trade Names (Manufacturers)
Acramite (UPL)	bifenazate	Actuate (Atticus) Bifenamite 2SC (Albaugh) Bizate (Loveland) Engulf (Nufarm) Floramite SC (OHP) Floramite SC/LS (UPL) Vigilant 4SC (UPL)
Admire Pro (Bayer)	imidacloprid	Acronyx 4F (Atticus) Advise Four (WinField) Alias 4F (ADAMA) Macho 2FL, 4 (Albaugh) Madari 4F (Avalaire) Malice 75WSP (Loveland) Midash 2SC, Forte 4F (Sharda) Montana 2F, 4F (Albaugh) Nuprid 4F Max (Nufarm) Prey 1.6F (Loveland) Provoke (Innvictis) Sherpa 1.6F (Loveland) Viloprid 4, FC 1.7 (Vive) Widow 2F (Loveland) Willowood 4SC (Generic) Wrangler 4F (Loveland)

(Continued)

Generic Insecticides *(continued)*

Original Trade Name (Current Manufacturer)	Common Name	Other Trade Names (Manufacturers)
Agri-Mek SC (Syngenta)	abamectin	Abacus 0.15EC (Rotam) Abamex 0.15ED (Nufarm) Abba Ultra 0.30EC (Amvac) Averland 0.7FC (Vive) Borrada 0.15EC (ADAMA) Enterik 0.15LV, 0.7SC (Atticus) Reaper 0.15EC Advance 0.15EC Clearform 0.15EC (Loveland) Willowood Abamectin 0.15LV, 0.7SC (Generic)
Asana XL 0.66EC (Valent)	esfenvalerate	S-Fenvalostar 0.66EC (LG Life Sciences)
Assail 30SG, 30SC, 70WP (UPL)	acetamiprid	Afflict 30SG, 70WP (Aceto) Anarchy 30SG, 70WP (Loveland) ArVida 30SG (Atticus) Intruder Max 70WP (UPL)
Baythroid XL 1EC (Bayer)	Beta-cyfluthrin, cyfluthrin	Cryptoid XL 1EC (Atticus) Tombstone 2E (Loveland) Tombstone Helios 2E (Loveland)
Brigade 2EC, eVo (FMC)	bifenthrin	Banister 2EC (Avalaire) Batallion 2EC (Atticus) Bi-Dash 2EC (Sharda) Bifen 2AG Gold (WinField) Bifender 1.75FC (Vive) Bifenthrin 2EC (Aceto) Bifenture 2EC (UPL) Discipline 2EC (Amvac) Fanfare 2EC (ADAMA) GCS Bifentrhin 2EC, LFC 1.5EC (Generic) Lancer 2EC, FC 1.5EC (Albaugh) Reveal 2EC, Endurx 2EC (Innvictis) Sniper 2EC (Loveland) Tundra 2EC (Winfield)
Cygon 400EC (FMC)	dimethoate	Dimate 4EC (Winfield) Dimethoate 400, 400EC, 4EC (Loveland, FMC, Drexel)
Dimilin	diflubenzuron	Diflumax 2L (Helm Agro) Dimilin 2L, 25W (UPL) Durant 2L (Atticus) Micromite 2L (UPL) Unforgiven (Loveland)
Dipel (Valent)	*Bacillus thuringienisis*	Agree (Certis) Biobit (Valent) Bt Now (BioSafe) CryMax (Certis) Deliver (Certis) Javelin (Certis) Leprotec (Vestaron) Xentari (Valent)
Esteem 0.86EC, 35WP (Valent) Knack 0.83EC (Valent)	pyriproxyfen	Pitch (0.83EC), Pitch 35WP (ADAMA)

(Continued)

Generic Insecticides *(continued)*

Original Trade Name (Current Manufacturer)	Common Name	Other Trade Names (Manufacturers)
Intrepid 2F (Corteva AgriSciences)	methoxyfenozide	GCS Methoxy 2F (Generic) Inspirato 2F (Atticus) Invertid 2F (Loveland) Invicar 2SC (Albaugh) Thwartex (Agsurf) Troubador 2F (Helena) Turnstyle 2F (UPL) Vexer (Innvictis) Zylo (UPL)
Mustang Maxx (FMC)	zeta-cypermethrin	Cortes Maxx (Atticus)
Pounce 25WP (FMC)	permethrin	Arctic 3.2EC (Winfield) Permethrin 3.2EC (Loveland) Perm-Up 3.2EC, 25DF (UPL) Permastar AG (LG Life Sciences)
Savey 50DF, Onager, Onager Optek, Hexy- gon, Hexygon IQ (Gowan)	hexythiazox	Hexamite (Albaugh) Hexcel EW (Atticus)
Sevin XLR Plus, 4L (Novasource)	carbaryl	Carbaryl 4L (Drexel, Loveland)
Warrior II 2.08CS (Syngenta)	lambda-cyhalothrin	Actylis Lambda-Cy (Aceto) Calvary II (Growmark) Crusader 1EC, 2ME (Albaugh) Firestone (Altitude) Grizzly Too, Z 1CS (Winfield) Kaiso 24WG (Nufarm) Kendo 22.8CS (Helm) L - C Insecticide (Drexel) Lambda-Cy AG (Winfield) Lambda-Cy 1EC (UPL) Lambdastar 1CS, Plus (FarmHannong) Lambda T 1EC (Helena) Lamcap II (Syngenta) Lunge (UPL) Nufarm Lambda-Cyhalothrin 1EC (Nufarm) Paradigm 1VC (Winfield) Province II (Tenkoz) Ravage 1EC (Innvictus) Serpent 1EC (Atticus) Silencer 1EC (ADAMA) Willowood Lambda-Cy 1EC (Generic)
Zeal (Valent)	etoxazole	Suremite SC (Aceto) Zara WSB, Zara SC (Atticus)

Generic Herbicides[1]

Original Trade Name (Current Manufacturer)	Common Name	Other Trade Names (Manufacturers)
Aim® EC Herbicide (FMC Corporation)	carfentrazone-ethyl	Antik™ EC (Atticus Ag) Longbow™ EC (Nufarm Americas, Inc.) Maxunitech Carfentrazone 2 EC (Maxunitech North America, Inc.) Quinark™ EW (Atticus Ag) Shark® EW (FMC Corporation)
Alion® Herbicide (Bayer CropScience)	Indaziflam	Sage™ (Altamont)
Amine4 2,4-D (Tenkoz)	2,4-D amine	2,4-D Amine 4 (WinField United) 2,4-D/Amine 4 Heribicide (WinField United) Amine 4 2,4-D (Loveland Products, Inc.) Amine 6 (Loveland Products, Inc.) Base Camp® Amine 4 (Wilber-Ellis Company LLC) Clean Amine® (Loveland Products, Inc.) Cornbelt® 4Lb. Amine (Van Diest Supply Company) De-Amine® 4 (Drexel Chemical Company) Defy® Amine 4 (ADAMA) Embed® Extra (Corteva Agrisciences) Embed™ (Corteva Agriscience) Orchard Clean® (Nufarm Americas, Inc.) Orchard Master® Broadleaf Herbicide (PBI-Gordon Professional) Orchard Star® (Albaugh, LLC Agricultural Products) Rugged® Herbicide (WinField United) Saber® (Loveland Products, Inc.) Savage® Dry Soluble (Loveland Products, Inc.) Solution Water Soluble® (Nufarm Americas, Inc.) Usha 6 (Sharda USA LLC) Weedar® 64 (Nufarm Americas, Inc.) WeeDestroy® AM-40 Amine Salt (Nufarm Americas, Inc.)
Assure® II Herbicide (Amvac Chemical Corporation)	quizalofop p-ethyl	Targa® (Gowan Company, LLC)
Callisto (Syngenta Crop Protection, LLC)	mesotrione	Atticus Cavallo™ 4 SC (Atticus Ag) Bellum® (Albaugh, LLC Agricultural Products) Meso Star (Sharda USA LLC) Mesotrione 4SC (Albaugh, LLC Agricultural Products) MesoTryOne™ 4L (Drexel Chemical Company) Motif ® Herbicide (UPL NA Inc.) Undercover™ (Innvictis Crop Care, LLC)

(Continued)

Generic Herbicides[1] *(continued)*

Original Trade Name (Current Manufacturer)	Common Name	Other Trade Names (Manufacturers)
Chateau WDG (Valent USA)	flumioxazin	Chateau® EZ (Valent U.S.A. LLC) Chateau® Herbicide SW (Valent U.S.A. LLC) Flumi® 51 WDG (NuFarm Americas, Inc.) Flumi® SX Herbicide (Valent U.S.A. LLC) Flumigard Herbicide (Alligare, LLC) Flumigard SC (Alligare, LLC) Flumioxazin 51WDG Select (Alligare, LLC) Semera 51.0% WDG (Atticus EcoCore) Semera SC (Atticus EcoCore) SureGuard Herbicide (Nufarm Americas, Inc.) Tuscany ® (Nufarm Americas, Inc.) Tuscany ® SC Herbicide (Nufarm Americans, Inc.) Varsity ® (Innvictis Crop Care, LLC) Varsity ® SC (Innvictis Crop Care, LLC) Zaltus™ SC (Atticus Ag)
Gallery 75 DF / SC (Corteva Agrisciences)	isoxaben	Trellis and Trellis SC (Corteva AgriSciences)
Goal ® 2XL Herbicide (Nufarm Americas, Inc.)	oxyfluorfen	Collide ™ Herbicide (UPL NA Inc.) Galigan® 2E (ADAMA) Galigan® H2O Herbicide (ADAMA) GoalTender® Herbicide (Nufarm Americas, Inc.) Govee™ (Innvictis Crop Care, LLC) Oxystar ® 2E (Albaugh, LLC Agricultural Products) Oxystar® 4L (Albaugh, LLC Agricultural Products) ScrollOVR™ (Atticus Ag) Scroll™ 2 XL (Atticus Ag) Willowood OxyFlo 2EC (Generic Crop Science LLC)
Gramoxone (Syngenta Crop Protection, LLC)	paraquat	Axill Solutions Paraquat 3SL (Axill Solutions, LLC) Devour™ (Innvictis Crop Care, LLC) Gramoxone® SL 3.0 (Syngenta Crop Protection, LLC) Helmquat 3SL (Helm Agro US, Inc.) Paraquat Concentrate (Solera Sources Dynamics, LLC) Para-Shot 3.0 (Sharda USA LLC) Parazone® 3SL (Amvac Chemical Corporation) Quik-Quat™ (Drexel Chemical Company) Willowood Paraquat 3SL (Generic Crop Science LLC)
HomePlate® (Certis USA, L.L.C.)	caprylic acid + capric acid	Fireworxx™ (OHP, Inc.) SUPPRESS® Herbicide EC (SAN Group Biotech USA Inc.)
Karmex DF (ADAMA)	diuron	Direx 4L (ADAMA) Diuron 4L/80 DF (Alligare, LLC) Diuron 4L/80 (Drexel, Chemical Company) Diuron 4L (ADAMA) Diuron 4L (Loveland Products, Inc.) Diuron 80 (Drexel Chemical Company) Diuron 80 DF (Alligare, LLC) Diuron 80 (WDG Weed Killer (Loveland Products, Inc.) Drill (Sharda USA LLC)

(Continued)

Generic Herbicides *(continued)*

Original Trade Name (Current Manufacturer)	Common Name	Other Trade Names (Manufacturers)
Kerb SC (Corteva AgriSciences)	pronamide	Kerb® 50-W Herbicide (Corteva Agriscience) Kerb® SC (RUP) (Corteva Agriscience) Willowood Pronamide 3.3SC (Generic Crop Science LLC) Willowood Pronamide 50WSP (Generic Crop Science LLC)
Matrix® FNV/SG (Corteva AgriSciences)	rimsulfuron	DuPont Matrix® SG (Corteva Agriscience) Grapple™ (Nufarm Americas, Inc.)Hinge™ (Albaugh, LLC Agricultural Products) Matrix® FNV (Corteva Agriscience) Pruvin® Herbicide (ADAMA) Revolt™ (Innvictis Crop Care, LLC) Tetris™ SG (Atticus Ag)
Poast (BASF)	sethoxydim	Segment (BASF)
Princep® 4L (Syngenta Crop Protection, LLC)	simazine	Princep® Caliber 90® Herbicide (Syngenta Crop Protection, LLC) Simazine 4L (Drexel Chemical Company) Simazine 4L (WinField United) Simazine 4L Flowable (Loveland Products, Inc.) Simazine 90DF (Drexel Chemical Company) Simazine 90 WDG (Loveland Products, Inc.) Sim-Trol® 4L Simazine Flowable Herbicide (Sipcam Agro USA, Inc.) Sim-Trol® 90DF Simazine Dry Flowable Herbicide (Sipcam Agro USA, Inc.)
Prowl® 3.3 EC herbicide (BASF Ag Products)	pendimethalin	Acumen ® Herbicide (TENKOZ, Inc.) Acumen® Microcap (TENKOZ, Inc.) Framework® 3.3 EC Herbicide (WinField United) Pendulum® 2G granule herbicide (BASF Professional and Specialty Solutions) Pendulum® 3.3 EC herbicide (BASF Professional and Specialty Solutions) Pendulum® AquaCap™ herbicide (BASF Professional and Specialty Solutions) Pin-Dee™ 3.3 EC (Drexel Chemical Company) Pin-Dee™ 3.3 T & O (Drexel Chemical Company) Prowl® H2O herbicide (BASF Ag Products) Satellite® 3.3 herbicide (UPL NA Inc.) Satellite® Flex (UPL NA Inc.) Satellite® HydroCap herbicide (UPL NA Inc.) Stealth® Herbicide (Loveland Products, Inc.)
Reglone (Syngenta Crop Protection, LLC)	diquat	Aceto Diquat 2L AG (Aceto Life Sciences, L.L.C. d/b/a Actylis) Capone™ Desiccant (Atticus Ag) Dessicash Ag (Sharda USA LLC) Nufarm Diquat 2 L (Nufarm Americas, Inc.) Nufarm Diquat SPC 2 L (Nufarm Americas, Inc.) Verdure-X-Herbicide (Helm Agro US, Inc.)

(Continued)

Generic Herbicides *(continued)*

Original Trade Name (Current Manufacturer)	Common Name	Other Trade Names (Manufacturers)
Rely 280 (BASF Agricultural Solutions US LLC)	glufosinate-ammonium	Axill Solutions Glufosinate 280SL (Axill Solutions, LLC) Cheetah® Herbicide (Nufarm Americas, Inc.) Fever™ (Innvictis Crop Care, LLC) Forfeit® 280 (Loveland Products, Inc.) Inflame™ 280 SL (Atticus Ag) Interline® Herbicide (UPL NA Inc.) Lifeline® (UPL NA Inc.) Opportunity (Sharda USA LLC) Reckon™ 280SL (Solera Source Dynamics, LLC) Refer® 280 SL Herbicide (Summit Agro USA, LLC) Rely® 280 Herbicide (BASF Ag Products) Scout™ Herbicide (Valent U.S.A. LLC) Surmise® (Albaugh, LLC Agricultural Products) Surmise® 5 (Albaugh, LLC Agricultural Products) Total TNV (WinField United) Total® 2.3 (WinField United) Total® Herbicide (WinField United) Willowood Glufosinate 280SL (Generic Crop Science LLC)
Roundup PowerMAX® Herbicide (Bayer CropScience)	glyphosate	Abundit® Edge (Corteva Agriscience) Aquamaster® (Bayer CropScience) Buccaneer® 5 Extra (TENKOZ, Inc.) Buccaneer® Plus (55467-9) (TENKOZ, Inc.) Clearout™ 5 Extra (Albaugh, LLC Agricultural Products) Cornerstone K Herbicide (WinField United) Cornerstone® 5 Plus (WinField United) Cornerstone® Plus (1381-192) (WinField United) Credit® 41 Extra (Nufarm Americas, Inc.) Credit® 5.4 Extra (Nufarm Americas, Inc.) Credit® Xtreme (Nufarm Americas, Inc.) Duramax® Herbicide (Corteva Agriscience) Durango® DMA® Herbicide (Albaugh, LLC Agricultural Products) Envy™ (Innvictis Crop Care, LLC) Envy™ Intense (Innvictis Crop Care, LLC) Envy™ Six Max (Innvictis Crop Care, LLC) Four Power Plus® (Loveland Products, Inc.) Gly Star® 5 Extra (Albaugh, LLC Agricultural Products) Gly Star® K-Plus (Albaugh, LLC Agricultural Products) Gly Star® Original (Albaugh, LLC Agricultural Products) Gly Star® Plus (Albaugh, LLC Agricultural Products) Honcho® K6 Herbicide (Bayer CropScience) Honcho® Plus (Bayer CropScience) Mad Dog® (Loveland Products, Inc.) Mad Dog® Plus (Loveland Products, Inc.) Makaze® Herbicide (Loveland Products, Inc.)

(Continued)

Generic Herbicides *(continued)*

Original Trade Name (Current Manufacturer)	Common Name	Other Trade Names (Manufacturers)
Roundup PowerMAX® Herbicide (Bayer CropScience) ***(Continued)***	glyphosate	Roundup PowerMAX® 3 Herbicide (Bayer CropScience) Roundup PowerMAX® Herbicide (Bayer CropScience) Roundup PowerMAX® II (Bayer CropScience) Roundup Ultra® (Bayer CropScience) Roundup WeatherMAX® Herbicide (Bayer CropScience) Shar-Max Glyphosate 41% SL (Sharda USA LLC) Willowood Glypho 6 (Generic Crop Science LLC) Wynca USA™ Sunphosate 41% Herbicide (Wynca USA) Wynca USA™ Sunphosate® 5 MAX (Wynca USA)
Sandea® (Gowan Company, LLC)	halosulfuron	Herbivore® Herbicide (WinField United)
Select Max® Herbicide with Inside Technology™ (Valent U.S.A. LLC)	clethodim	Arrow® 2 EC (ADAMA) Avatar™ (Innvictis Crop Care, LLC) Avatar™ S2™ (Innvictis Crop Care, LLC) Axill Solutions Clethodim 2EC (Axill Solutions, LLC) Ceridian™ 2 EC (Atticus Ag) Cleanse® (WinField United) Cleanse® 2EC (WinField United) Clethodim 2E (Albaugh, LLC Agricultural Products) Dakota™ (Albaugh, LLC Agricultural Products)Envoy Plus™ Herbicide (Valent U.S.A. LLC Professional Products) Shadow® (UPL NA Inc.) Shadow® 3EC (UPL NA Inc.) Signature Clethodim (Albaugh, LLC Agricultural Products) Trizenta™ 3EC Herbicide (UPL NA Inc.) Trizenta™ Herbicide (UPL NA Inc.) Vaquero® (Wilbur-Ellis Company LLC) Volunteer® (TENKOZ, Inc.) Volunteer® Herbicide (42750-72-55467) (TENKOZ, Inc.) Volunteer® Herbicide (70506-484-55467) (TENKOZ, Inc.) Willowood Clethodim 2EC (Generic Crop Science LLC)
Stinger® Herbicide (Corteva AgriSciences)	clopyralid	Bite (Sharda USA LLC) Clean Slate (Nufarm Americas, Inc.) GCS Clopy 360SL (Generic Crop Science LLC) Spur® (Albaugh, LLC Agricultural Products) Stigmata™ (Atticus Ag)
Starane® Ultra Herbicide (Corteva Agriscience)	fluroxypyr	Comet® Selective Herbicide (Nufarm Americas, Inc.) Fancy (Sharda USA LLC) Stark™ Ultra (Atticus Ag)
Surflan AS	oryzalin	Fugitive (ADAMA) Oryzalin 4 AS (ADAMA)
Trellis® (Corteva Agriscience)	isoxaben	Trellis® SC (Corteva Agriscience) Gallery® 75 Dry Flowable Specialty Herbicide (Corteva Agriscience) Gallery® SC (Corteva Agriscience)

(Continued)

Generic Herbicides *(continued)*

Original Trade Name (Current Manufacturer)	Common Name	Other Trade Names (Manufacturers)
Treflan™ 4L Herbicide (Loveland Products, Inc.)	trifluralin	Treflan HFP Herbicide (Gowan Company, LLC) Treflan TR-10 Granular Herbicide (Gowan Company, LLC) Trifluralin 10G (Loveland Products, Inc.) Trifluralin 4 EC Herbicide (Aceto Life Sciences, L.L.C. d/b/a Actylis) Trifluralin 4EC (Albaugh, LLC Agricultural Products) Trifluralin 4EC (Drexel Chemical Company) Trifluralin HF (Loveland Products, Inc.) Trust (WinField United)
Ultra Blazer (United Phosphorus)	acifluorfen	Acifin 2 L (Summit) Acifluorfen 20.1% (Sharda) Avalanche Ultra (WinField) Derecho (Atticus) Levity (Innvictis) Uproar (WinField)
Velpar DF VU/L VU (Bayer)	hexazinone	Tide Hexazinone 2 SL/75 WDG (Tide Int'l) Velossa (Helena) Velpar L CU/DF CU (Tessenderlo)
Venue® (Nichino America, Inc.)	pyraflufen ethyl	Venue® Max Herbicide (Nichino America, Inc.)
Zeus /XC (FMC Corporation)	sulfentrazone	Maxunitech Sulfentrazone 4 SC Herbicide (Maxunitech North America, Inc.) Passage™ Herbicide (Alligare, LLC) Shutdown® Herbicide (UPL NA Inc Willowood Sulfen 4SC (Generic Crop Science LLC) Zone 4F (Helm Agro US, Inc.)

[1] Check label to make sure product is labeled for the crop that it is to be used on.

Suggested Recordkeeping Form For Restricted-use Pesticides

Farm Name And Address: _____

Date And State Of Growth	Crop	Chemical Applied (Trade Name, Formulation And EPA Registration Number)	Rate per Acre	Total Applied	Location And Size Of Block	Target Pest(s)	Name Of Applicator And Certification Number	Wind, Weather, Notes

Fruit Grower Newsletters

Arkansas

University of Arkansas Division of Agriculture Cooperative Extension Service offers *Arkansas Fruit, Vegetable, and Nut Update*. It is published monthly or as needed to Arkansas growers at no cost. It provides timely information about fruit and nut production practices, disease and insect/mite activity, and upcoming meetings. To subscribe, go to: https://www.uaex.uada.edu/farm-ranch/crops-commercial-horticulture/horticulture/ar-fruit-veg-nut-update-blog/

Illinois

University of Illinois Extension publishes *Illinois Fruit & Vegetable News* (ipm.illinois.edu/ifvn). This newsletter covers production practices and insect and disease management. For more information, contact Local Food Systems and Small Farms Educator: Bronwyn Aly (1715 College Ave., Carmi, IL 62821, 618-395-2441, baly@illinois.edu); or Commercial Agriculture Educator: Nathan Johanning, 901 Illinois Avenue. PO Box 117, Waterloo, IL 62298, 618-939-3434). For disease and insect diagnostics and management recommendations, contact the University of Illinois Plant Clinic at S-417 Turner Hall 1102 S. Goodwin Ave., Urbana IL 61801, 217-333-0519; plantclinic@illinois.edu.

Indiana

Purdue Extension offers *Facts for Fancy Fruit*, a newsletter issued biweekly throughout the growing season, that provides timely information on diseases and insects throughout the state, cultural practices and announcements about upcoming events. Subscribe to the online version free of charge at fff.hort.purdue.edu or receive a printout via first class mail for $15 a year.

For a hard copy, send your name, address, and current fruit interests along with a check for $15, made out to Purdue University to: *Facts For Fancy Fruit*, Department of Horticulture and Landscape Architecture, 625 Agricultural Mall Drive, Purdue University, West Lafayette, IN 47907-2010.

Iowa

You can find general horticulture information and Iowa State University Plant and Insect Diagnostic Clinic updates at https://yardandgarden.extension.iastate.edu/

Kentucky

Cooperative Extension issues a monthly newslet- ter, Kentucky Fruit Facts (https://horticulture.mgcafe.uky.edu/ky-fruit-facts), to all Kentucky growers at no cost. This service supplies timely information on disease and insect activity throughout the state, as well as cultural information.

To subscribe, send an email message:

TO: listserv@lsv.uky.edu
SUBJECT: Fruit Facts
MESSAGE: subscribe KY-FRUITFACTS

Followed by a blank line

OR to unsubscribe, the lines:
signoff KY-FRUITFACTS
Followed by a blank line

You should receive confirmation by return email. If you have a problem, or if you wish to communicate with a person about"fruitfacts", the owner's address (the TO: line of the message) is: owner-ky-fruit-facts@lsv.uky.edu

Ohio

Ohio Fruit News (OFN) is published six times a year by the Department of Plant Pathology at The Ohio State University, CFAES-Wooster. The newsletter is available free of charge in electronic format at u.osu.edu/fruitpathology/fruit-news-2/, or as a printed copy by request. To subscribe, contact Melanie Lewis Ivey at ivey.14@osu.edu or 330-263-3849.

The Ohio State University Extension Specialty Crop Team maintains an online blog, Fruit, Vegetable, and Specialty Crop News (u.osu.edu/vegnetnews/). New posts are added daily and feature timely updates and information on all specialty food crops.

The *Ohio Grape-Wine Electronic Newsletter (OGEN)* is available at ohiograpeweb.cfaes.ohio-state.edu/news. To subscribe, email Maria Smith at smith.127203@osu.edu.

Pesticide Drift Communication Tools

Several states involved in this spray guide have web-based mapping tools that enable producers of pesticide sensitive crops avoid drift injury by communicating with agricultural chemical applicators.

DriftWatch.org serves Colorado, Delaware, Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Montana, Nebraska, Ohio, New Mexico, North Carolina, Wisconsin, and Saskatchewan, Canada.

The Ohio Sensitive Crop Registry is available at www.agri.ohio.gov/scr https://agri.ohio.gov/divisions/plant-health/resources/oscr.

Check with the state department of agriculture in your state about similar tools.

Network for Environment and Weather Applications (NEWA)

NEWA collects weather data through the Internet from weather stations primarily located on farms and generates real-time weather data summaries, crop production tools, and IPM forecasts.

Contact your NEWA State coordinators for additional information on purchasing a weather station and connecting to NEWA for IPM weather tools and IPM crop forecasts. If you don't have a state coordinator you can contact Dan Olmstead at newa@cornell-ipm.org.

Illinois: Elizabeth Wahle, University of Illinois at Urbana-Champagne; 618-344-4230; wahle@illinois.edu.

Kentucky: Brent Arnoldussen, University of Kentucky; 859-257-4721; bar244@uky.edu.

Ohio: Melanie Lewis Ivey, The Ohio State University, CFAES-Wooster; 330-263-3849; ivey.14@osu.edu

Wisconsin: Amaya Atucha, University of Wisconsin-Madison; 608-262-6452; atucha@wisc.edu

Using a Plant Diagnostic Lab

The best way to identify insects, plants, and plant diseases, or to diagnose plant and pest problems, is to send a sample to a diagnostic laboratory along with information and observations about the problem. The National Plant Diagnostic Network website (www.npdn.org) lists diagnostic laboratories by state and region. Check with your local County Extension Office or Diagnostic lab for any costs associated with this service.

To ensure an accurate diagnosis, it's important to collect and ship your specimens properly. Here are a few guidelines for collecting and shipping specimens to a diagnostic lab. *Your state has specific instructions for collecting and shipping samples; check your local clinic's website for details.*

1. Collect fresh specimens. Send a generous amount of material, if available.
2. Ship specimens in a crush-proof container immediately after collecting. If holdover periods are encountered, keep specimen cool. Ship packages early in the week so they to arrive on weekdays.
3. Incomplete information or poorly selected specimens may result in an inaccurate diagnosis or inappropriate control recommendations. Badly damaged specimens are often unidentifiable, and additional sample requests can cause delays.

Submitting Plant Specimens for Disease/Injury Diagnosis

Herbaceous Plants. For generally declining, wilting, or dying plants, send several whole plants showing a range of symptoms — early through more advanced — with roots and adjacent soil intact, if possible. Dig the plants carefully so the root system remains intact. Place roots and surrounding soil in a plastic bag and fasten it to the base of the stem with a twist tie or string. Wrap the plants in dry newspaper and place in a crush-proof container for shipment. Do not add water or moist paper towels.

Leaves/fruit/woody tissues. When localized infections (such as leaf spots, fruit rots, or cankers) are suspected, send specimens representing early and moderate stages of disease. Press leaves flat between heavy paper or cardboard — do not tape leaves to paper — and wrap fruits and woody tissue in dry paper. For large fruit, wrap each individually in newspaper. Do not place soft fruit (i.e., strawberry, raspberry, blackberry, etc.) in plastic bags. Pack firmly in a crush-proof container so that fruit is not bruised during shipping.

Submitting Insect Specimens

Package insects carefully so they aren't crushed when they arrive at the lab. Do not tape insects to paper or package them loosely in envelopes. Separate and label the specimens if you send more than one type in the same package. Provide the appropriate information for each specimen.

Tiny or Soft-bodied Specimens. Submit such specimens (aphid, mites, thrips, caterpillars, grubs, spiders) in a small, leak-proof bottle or vial that is 1 ounce or less filled with 70 percent rubbing (Isopropyl) alcohol or hand sanitizer. In Kansas, submit in vinegar. Do not submit insects in water or formaldehyde, or without rubbing alcohol; they will ferment and decompose.

Hard-bodied Specimens. Submit such specimens (flies, grasshoppers, cockroaches, wasps, butterflies, beetles) dry in a crush-proof container. As noted above, do not tape insects to paper or place them loose in envelopes.

Submitting Samples for Nematode Analysis

If you suspect a nematode problem, contact your clinic for state-specific submission information (see page 288).

In general nematode identification requires collection of at least one quart of soil from the root zone of affected plants. Include roots if the plants are actively growing.

Place the entire sample in a plastic bag. Do not add water or allow it to dry out. Protect the sample from extreme heat (for example, don't leave samples inside a parked vehicle in direct sunlight). It is often helpful to collect a second, similar sample from a nearby area where plant growth appears normal.

Attach a label, note, or tag identifying the sample to the outside of each bag or package.

Selected University Diagnostic Labs

Arkansas

Plant Health Clinic University of Arkansas
2601 N. Young Ave.
Fayetteville, AR 72704
479-502-9713
https://www.uaex.uada.edu/yard-garden/plant-health
Clinic: https://www.facebook.com/UAEXPlant-HealthClinic
Contact:
Taylor Klass, tklass@uada.edu

Illinois

University of Illinois Plant Clinic
S-417 Turner Hall
1102 S. Goodwin Ave.
University of Illinois
Urbana, IL 61801
217-333-0519
https://extension.illinois.edu/plant-clinic
plantclinic@illinois.edu
www.facebook.com/UofIPlantClinic
Contacts:
Diane Plewa, dplewa@illinois.edu, (217) 300-3441

Indiana

Plant and Pest Diagnostic Laboratory
Purdue University
LSPS 101
915 Mitch Daniels Blvd, LSPS 116
West Lafayette, IN 47907-2054
765-494-7071
Fax: 765-494-3958
https://ag.purdue.edu/department/btny/ppdl/index.html.
ppdl-samles@purdue.edu
www.facebook.com/PurduePPDL
Contacts:
Tom Creswell, creswell@purdue.edu
John Bonkowski, jbonkows@purdue.edu

Iowa

Iowa State University Plant and Insect Diagnostic Clinic
2445 ATRB
2213 Pammel Dr
Ames, IA 50011
515-294-0581
Fax: 515-294-9420
https://yardandgarden.extension.iastate.edu/pidc
pidc@iastate.edu
www.facebook.com/ISUPIDC

Kentucky

Plant Disease Diagnostic Laboratory Agricultural Science Building-North
1100 South Limestone Street
University of Kentucky
Lexington, KY 40546-0091
859-257-8949
Fax: 859-323-1961
https://plantpathology.mgcafe.uky.edu/extension/diagnostic-laboratories
Contact:
Julie Beale, jbeale@uky.edu

Ohio

C. Wayne Ellett
The Ohio State University, CFAES-Wooster
234 Selby Hall
1680 Madison Avenue
Wooster, OH 44691
Phone: 330-263-3650
Email: ppdc@osu.edu
ppdc.osu.edu
Contact:
Francesca Rotondo, rotondo.11@osu.edu
CFAES-Wooster, 330-263-3650

Wisconsin

Plant Disease Diagnostics Clinic Department of Plant Pathology
1630 Linden Drive
University of Wisconsin-Madison
Madison, WI 53706-1598
pddc.wisc.edu
608-262-2863
Fax: 608-263-2626
Contact:
Brian Hudelson, hudelson@wisc.edu

Pesticide Applicator Safety Education Programs

Below are the state pesticide education programs that provide training and educational materials for becoming a certified pesticide applicator. Find other state pesticide safety education programs at https://nifacontacts.ipmcenters.org/PSEPDirectory.cfm.

University of Arkansas
https://uaex.uada.edu/farm-ranch/pest- management/pesticide-licensing/private-applicator- training.aspx

University of Illinois
https://extension.illinois.edu/psep

Iowa State University
www.extension.iastate.edu/psep

University of Kentucky
https://entomology.mgcafe.uky.edu/uk-pesticide-safety-education-program-psep

Ohio State University
pested.osu.edu

Purdue University
https://ag.purdue.edu/department/extension/ppp/

University of Wisconsin
https://fyi.extension.wisc.edu/pat

Pesticide Emergency and Poison Control Centers

Nationwide phone numbers

Pesticide Poisoning: Call the **Poison Center**, 800-222-1222
This number automatically connects you to the poison center nearest you.

National Pesticide Information Retrieval System (NPIRS): 765-494-5249
National Pesticide Information Center: 800-858-7378
CHEMTREC: (800) 424-9300

Arkansas

Arkansas Poison Center: 800-222-1222

Arkansas State Plant Board: 501-225-1595
Pesticide training, licensing, and education for applying restricted use pesticides.

Illinois

Illinois Poison Control Centers Emergency Nationwide: 800-222-1222

Emergency TTY/TDD: 312-906-6185

Indiana

Indiana Poison Center: 800-222-1222
Pesticide Poisoning

Indiana Department of Environmental Management:
888-233-7745 or 317-233-7745
Pesticide Spill Reporting

Purdue Pesticide Programs: 765-494-4566
General Information

Office of Indiana State Chemist: 765-494-1492
Pesticide Certification and Training

Environmental Protection Agency Region 5:
800-621-8431 or 312-353-2000

Iowa

Iowa Statewide Poison Control Center Emergency Phone Number: 800-222-1222
Administrative Phone Number: 712-273-7757

Kentucky

Kentucky Regional Poison Control Center: 800-222-1222

KY Environmental Response: 800-928-2380 or 502-564-2380

Ohio

Ohio Poison Exposure Centers: 800-222-1222
TDD number: 800-253-7955

Wisconsin

Wisconsin Poison Center: 800-222-1222

Conversion Factors for Weights and Measures: Equivalents

	Metric	U.S.
Length	1 Millimeter	0.039 inch
	1 Centimeter (10 mm)	0.39 inch
	1 Meter (100 cm)	39.4 inch
	1 Kilometer (1,000 m)	0.62 mile
Area	1 Square Centimeter	0.155 square inch
	1 Square Meter	1.2 square yards
	1 Hectare (10,000 sq m)	2.47 acres
	1 Square Kilometer (100 ha)	247 acres
Weight	1 Gram	0.035 ounces
	1 Kilogram (1,000 g)	2.2 pounds
	1 Ton (metric) — 1,000 kg	1.1 tons (U.S.)
Volume	1 Milliliter	0.034 fluid ounces
	1 Liter (1,000 ml)	1.056 quarts
	1 Cubic Meter (1,000 l)	264.17 gallons (U.S.)
	U.S.	**Metric**
Length	1 Inch	2.54 centimeters
	1 Foot (12 in)	30.5 centimeters
	1 Yard (3 ft)	0.91 meters
	1 Mile (5,280 ft)	1.6 kilometers
Area	1 Square Inch	6.5 square centimeters
	1 Square Foot (144 sq in)	930 square centimeters
	1 Square Yard (9 sq ft)	0.84 square meters
	1 Acre (43,560 sq ft)	0.405 hectares
	1 Square Mile (640 acres)	259 hectares
Weight	1 Ounce	28.3 grams
	1 Pound (16 oz)	0.454 kilograms
	1 Ton (U.S.) — 2,000 lb	0.907 tons (metric)
Volume	1 Tablespoon (3 teaspoons)	14.79 milliliters
	1 Fluid ounce (2 tablespoons)	29.6 milliliters
	1 Cup (8 fl oz)	0.237 liters
	1 Pint (2 cups)	0.473 liters
	1 Quart (4 cups)	0.946 liters
	1 Gallon (U.S.) — 4 qts	3.8 liters
	1 Cubic Foot	28.3 liters

Metric Abbreviations: mm=millimeter; cm=centimeter; m=meter; km=kilometer; ha=hectare; mg=milligram; g=gram; kg=kilogram; ml=milliliter; l=liter.

NOTES

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Printed copies of this publication are available from the Purdue Extension Education Store, https://edustore.purdue.edu. A free PDF download also is available from the Education Store.

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Additional Contributors

University of Arkansas
Entomology: Neelendra Joshi

University of Illinois
Entomology: Kacie Athey*
Horticulture: Elizabeth Wahle*, James Santiago*
Plant Pathology: Mohammed Babadoost*

Iowa State University
Horticulture: Randall Vos*, Suzanne Slack

Kansas State University
Entomology: Raymond Cloyd

University of Kentucky
Entomology: Ric Bessin*
Horticulture: Shawn Wright*, Brent Arnoldussen*, Elayna Stirn
Plant Pathology: Nicole Gauthier*, Kim Leonberger*

University of Minnesota
Horticulture: Madeline Wimmer*

Ohio State University
Entomology: Ashley Leach*
Horticulture: Ram Yadav*
Plant Pathology: Melanie Ivey*

Purdue University
Entomology: Elizabeth Long*
Horticulture: Stephen Meyer, Miranda Purcell

University of Wisconsin
Plant Pathology: Leslie Holland*

*Section Editor

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