



---

## **insect and disease control for home gardens**

---

# **SMALL FRUIT CROPS**

### **PRECAUTIONS IN USING PESTICIDES**

This publication lists and describes the control measures suggested for control of the more common injurious pests normally encountered. The pesticide recommendations are based on research by scientists of Washington State University, the USDA, and by other agencies. Those suggested are considered safe to use (when directions on label are followed carefully) and known to be effective.

In many cases, additional information on description of the pests, their damage, their life cycles, and their control may be desired. If your problem goes beyond the scope of this discussion, you can get additional help from your county Extension agent, from the Department of Entomology or Plant Pathology, Washington State University, Pullman, or accessing HortSense on-line (<http://pep.wsu.edu/hortsense>). Remember, not all insects are pests. Many are either beneficial or harmless. Be sure you have a real pest problem before you employ pesticides.

Pesticides can be poisonous to people and animals. Use them only when needed and handle them with care. Follow the directions and heed all precautions on the label.

Keep pesticides in closed, well-labeled containers in a dry place. Store them where they will not contaminate food or feed, and preferably in locked storage where children and animals cannot reach them.

Avoid contact with pesticides. If any are spilled on skin or clothing, wash them off the skin thoroughly with soap and water and change

clothing immediately. Wash contaminated clothing separately from all other clothes.

Avoid inhalation of pesticide dusts or mists.

When handling pesticides, wear clean, dry clothing.

Wash your hands and face before eating or smoking and immediately after completing pesticide application.

To protect fish and wildlife, do not contaminate lakes, streams, or ponds with pesticides. Do not clean spraying equipment or dump excess spray material near such water.

Dispose of *empty, properly rinsed* pesticide containers at a sanitary landfill dump. A pesticide container is considered properly rinsed when the empty container has been rinsed three times. Add rinse water to the spray tank and then add water to bring the mixture to the final volume. If you have trash collection service, wrap small *empty, properly rinsed* containers in several layers of newspaper and place them in the trash can.

### **PESTS NOT ON PRODUCT LABEL**

Some suggested uses of pesticides in this publication are for pests not listed on product labels. These are indicated by the symbol  $\Delta$ . Such uses comply with the federal law (FIFRA) which says a use is consistent with label directions provided the crop or site is on the label and directions concerning rates and interval before harvest are followed.

## HOME SPRAYING SCHEDULES

These spray schedules are recommended in order to achieve maximum disease and insect control with materials available to the homeowner. An ability to diagnose problems early in their developing stages, or an awareness of important weather patterns are also helpful in controlling pests. Information concerning the life cycles for specific diseases and insects is available at your county Extension office and on-line in HortSense.

As a precaution against improper use of a pesticide, read and follow label directions prior to making an application. Be sure the crop is listed on the label.

<b>Time of application</b>	<b>Crop</b>	<b>Insect and disease</b>	<b>Materials<sup>1, 2</sup></b>
Dormant or delayed-dormant period	Blueberry	Lecanium scale	Dormant oil spray when temperatures are above freezing
Early spring (before or just after buds swell)	Caneberries <sup>3</sup>	Anthracnose, Rust, Dryberry mites	Lime-sulfur. Apply as dormant or delayed-dormant spray as directed on the label.
		Powdery mildew	Potassium bicarbonate (0) (see label).
		Caterpillars	<i>Bacillus thuringiensis</i>
March through April	Caneberries <sup>3</sup>	Leaf and cane spot	Fixed copper. Apply when new canes are 1–2 ft tall; repeat 2–3 weeks later.
Prebloom treatment	Strawberry and Raspberry	Root weevils $\Delta$	Malathion (3 for strawberry, 1 for raspberry). Permethrin (14) (see label) for adult weevil control. Best control is achieved if applied at night when weevil adults are active.
		Leafrollers, armyworms, cutworms, and loopers	<i>Bacillus thuringiensis</i> (0) (caterpillars only). Neem (0).
		Aphids	Neem (0) OR Endosulfan (Thiodan) (4—strawberry only).
		Mites	Insecticidal soap (0). Thoroughly saturate underside of leaves.
	Blackberry	Redberry mite	Lime-sulfur (0) as directed on label.
	Strawberry	Spittlebug	Endosulfan (Thiodan) (4). Difficult to control once spittle masses have been formed.

<b>Time of application</b>	<b>Crop</b>	<b>Insect and disease</b>	<b>Materials<sup>1,2</sup></b>
During bloom and fruit formation	Strawberry	Fruit rots	Captan (0). During damp cloudy weather repeat applications as indicated on label.
	Blueberry	Leafrollers and other caterpillars	<i>Bacillus thuringiensis</i> (0). Permethrin (14)—do not apply during bloom. Bee hazard.
After blossom drop	Blueberry	Aphids	Permethrin (14) (see label). Do not apply if any blossoms are present—bee hazard. Insecticidal soap (0).
		Leafrollers and other caterpillars	<i>Bacillus thuringiensis</i> (Dipel 150 Dust) (0). Neem (0).
		Lecanium scale	Neem (0). Apply when crawlers are present.
	Strawberry	Powdery mildew	Sulfur (see label).
Postharvest (Sept.)	Caneberries	Cane and leaf spot	Fixed copper (0). Spray after old canes have been removed, about September 15, or before the fall rains begin.
Between Oct. 1 and March 1	Caneberries <sup>3</sup>	Crown borers $\Delta$	Diazinon (7). Apply to crown and lower 3 ft of canes. Must apply 2 consecutive years as larvae live in crowns for 2 years and generations overlap. Chemical application kills only very young larvae on canes, not those already in crown. After December 2004 Diazinon will no longer be available and there is nothing on the market to replace it.
Bloom through growing season	Currant and Gooseberry	Imported currantworm, Aphids, Gooseberry maggot	No home garden products are registered for effectively controlling these pests on currant or gooseberry. Physical destruction or netting (e.g., Remy or Agrinet) where practice is an option.
		Anthracnose and leaf spot	Fixed copper (0). Follow label directions.
Periodically throughout growing season	Grapes	Powdery mildew (susceptible varieties only)	Dust with sulfur when shoots are 6, 12, and 18 inches long, and then repeat at 2-week intervals until harvest. Do not apply when temperatures are above 85°F. Potassium bicarbonate (0) (see label).
		Grape leafhopper	Malathion (3). Spray as needed.

<b>Time of application</b>	<b>Crop</b>	<b>Insect and disease</b>	<b>Materials<sup>1,2</sup></b>
Periodically throughout growing season	Grapes	Cutworms $\Delta$	<i>Bacillus thuringiensis</i> (0) (caterpillars only).
	Strawberry	Slugs	Metaldehyde bait. Apply around plants when slug activity commences. Avoid bait exposure to pets.

<sup>1</sup>Add a spreader-sticker to spray mixes according to label directions. Do not use spreader-sticker with lime-sulfur.

<sup>2</sup>Numbers in parentheses, e.g. (5), indicate minimum days required between last application and harvest. The number will be given on the product label as the preharvest interval (PHI). Those with (0) may be harvested on the same day of application after sprays have dried or dusts have settled.

<sup>3</sup>Caneberries include red and black raspberries, and trailing berries such as blackberries, boysenberries, loganberries, etc. Caneberry or the specific berry must be listed on the label for use to be allowed.

$\Delta$ Pest does not appear on product label. See explanation on page 1.

By Peter R. Bristow, Ph.D., Washington State University Extension plant pathologist, WSU Puyallup; Arthur L. Antonelli, Ph.D., WSU Extension entomologist, WSU Puyallup; and Catherine H. Daniels, Ph.D., WSU Pesticide Coordinator.

Warning. Use pesticides with care. Apply them only to plants, animals, or sites listed on the label. When mixing and applying pesticides, follow all label precautions to protect yourself and others around you. It is a violation of the law to disregard label directions. If pesticides are spilled on skin or clothing, remove clothing and wash skin thoroughly. Store pesticides in their original containers and keep them out of the reach of children, pets, and livestock.

College of Agricultural, Human, and Natural Resource Sciences

Alternate formats of our educational materials are available upon request for persons with disabilities. Please contact the Information Department, College of Agriculture and Home Economics, Washington State University for more information.

Issued by Washington State University Extension, and the U.S. Department of Agriculture in furtherance of the Acts of May 8 and June 30, 1914. Extension programs and policies are consistent with federal and state laws and regulations on nondiscrimination regarding race, sex, religion, age, color, creed, national or ethnic origin; physical, mental or sensory disability; marital status, sexual orientation, and status as a Vietnam-era or disabled veteran. Evidence of noncompliance may be reported through your local Extension office. Trade names have been used to simplify information; no endorsement is intended. Revised September 2004. Subject code 231. EB1015E Online only.