

# **Insect and Mite Control in Home Orchard Tree Fruits and Nuts**

**EB 0932**



# SPRAYING YOUR BACKYARD ORCHARD

## Choosing a Sprayer

Many types and sizes of hand sprayers are available to home orchardists. The most commonly used sprayers are the 2–5 gallon hand-held, pump-up sprayers (Fig. 1). This type of sprayer is very effective for spraying young trees 1–6 years old, and may be used on trees up to 8–10 years if you are willing to climb a ladder and make several ladder moves while spraying your trees.

A trombone sprayer shown in Figure 2 is often used for small and mid-sized trees 1–12 years old. Old trees and large trees—apple, walnut, cherry, and pecan—often cannot be adequately sprayed using either the pump-up sprayer or the backpack equipment.

A third type of sprayer often seen in the backyard is the hose sprayer (Fig. 3). This sprayer attaches to the home garden hose. These sprayers consist of a bottle or jug which holds the pesticides and includes a nozzle metering device. The nozzle meters the water/pesticide mixture while the water pressure forces the mixture into the canopy of the tree. The hose sprayer, if properly adjusted, can give good spray coverage. However, misadjustment is common and often poor application and pest control failures are noted where this equipment is used.

A fourth type of sprayer is seen in large backyard plantings or small orchards. This is the small tank sprayer (Fig. 4). Usually these sprayers range in size from 10–100 gallon tanks, and are powered by small air cooled engines. Pump pressures of 100–400 pounds per square inch can be obtained with these sprayers. Size of tank pump, engine, and running gear varies considerably in these sprayers. For large trees or tree numbers running into several acres the power sprayers are the only proper type of equipment to use.

## Precautions in Spraying

When using any sprayer be sure to keep the chemical and water mixture stirred up or agitated at all times! If the chemical settles in the tank or is not mixed properly two things may occur:

1. You will obtain no pest control.
2. You may burn or injure the tree or its foliage.

## Wear the Proper Clothing

1. Keep your skin covered while spraying. Long-sleeved shirts or coveralls are best. Long pants

that cover your legs are essential. Eye protection is also essential.

2. Wear unlined rubber gloves when spraying pesticides. If chemicals somehow get inside the gloves, discard them and buy new ones.
3. Wash your clothes carefully following each spray application. Keep pesticide contaminated clothing separate from family laundry.
4. Wash your face and hands after spraying.
5. Bathe completely and immediately if you spill any chemical on your body during spraying.

## Choosing a Pesticide

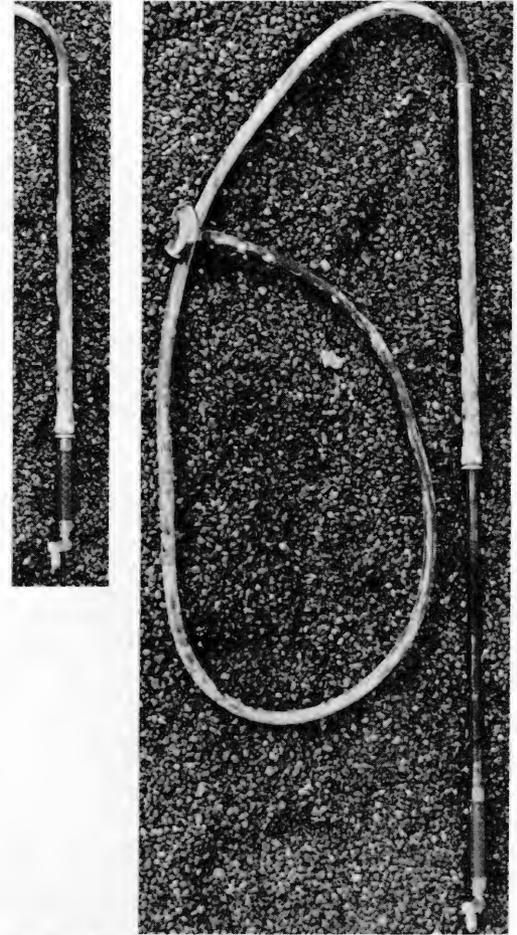
Pesticides come in many-sized bottles, cans, bags, and other containers. Many products are mixtures of two or more pesticides and prices of the products vary with area where they are sold.

When you choose a pesticide be sure to do the following:

1. *Make sure the pesticide is needed.* This may sound silly, but many pesticides are applied for the wrong insect or for an insect that is not a pest. Often beneficial insects may be present and could be doing more good than you would with a pesticide. Take your problem to an agriculture authority before you spray. Your county Cooperative Extension office, Master Gardener booth, state horticultural office, or other agricultural person can usually help you decide on the need for chemical control.
2. Choose *the most effective material available* for control of the pest with the following considerations:
  - A. How will the material affect you and the environment, including beneficial animals such as bees, birds, and ladybugs?
  - B. Is the material more costly than equally effective and safe materials that are also available?
3. Choose *chemicals recommended for home or small acreage use only.* Many materials are available in large packages prepared for commercial grower use. Commercial pesticides are often too toxic for use around the home and yard.
4. *Be sure that you can use the pesticide in the spraying equipment that you own.* Some chemical mixtures require special equipment.



**Fig. 1—Pump-up sprayers.**



**Fig. 2—Trombone sprayer. Wide end of hose is placed in a bucket with the spray mixture. Spraying is controlled by moving the handle in (left) and out (right).**



**Fig. 3—Hose sprayers.**

**Fig. 4—Small tank sprayer.**



## Kelthane Statement

Kelthane registrations were cancelled in 1986 and products manufactured after June of that year were recalled. Products not recalled can continue to be used in accordance with directions on the label. Two new labels, Kelthane MF and Kelthane 35 were registered in 1988, but they may not be used after March 31, 1989. The MF label has a use on walnuts. The 35 label has uses on apples and pears. If the manufacturer meets certain conditions it is possible other Kelthane labels will be registered in 1989.

## Precautions in Using Pesticides

Backyard home and garden pesticides range from slightly toxic or poisonous to moderately toxic or poisonous. Toxicity of pesticides and their hazard to humans are estimated from laboratory tests with experimental animals such as rats, rabbits, and dogs.

You can determine the relative hazard of a given pesticide product by looking for certain signal words which must appear on the label. These signal words are as follows:

1. The words **DANGER**, **POISON**, and a **skull and crossbones** symbol. These products are highly toxic and are not packages for home and garden use.
2. The word **WARNING** is on labels of products considered moderately toxic.
3. The word **CAUTION** is on labels of products considered slightly toxic.

## Safety Precautions

1. Store pesticides where they will not contaminate food or feed, and where children and animals cannot reach them. Keep them in the original containers, tightly closed, and in a dry place.
2. Avoid contact with pesticides. If any is spilled on skin or clothing, wash thoroughly and change clothing **IMMEDIATELY**.

3. Avoid inhalation of dusts or mists.
4. Wash clothing before reuse.
5. Wash hands and face before eating or smoking and immediately after completing the pesticide application. Do not smoke while applying or mixing pesticides.
6. If illness occurs during or shortly after application, call a physician immediately.
7. Protect fish and wildlife. Do not apply pesticides in any manner that will contaminate lakes, streams, ponds, irrigation ditches, or canals. Do not clean spray equipment or dump excess material near such bodies of water.
8. Bees are extremely important in raising trees that bear fruit annually. Honey bees and other wild bees are responsible for carrying pollen from flower to flower in your trees. If this did not happen you would not be able to obtain adequate fruit set on your trees. Other beneficial insects such as ladybugs, syrphid or hover flies, lacewings, and many others help you daily in destroying pest insects.
  - A. *Do not spray* when bees or beneficial insects are present in or on trees in noticeable numbers.
  - B. *Never spray* during the *blooming* period.
  - C. *If sprays* are necessary, apply them in late evening or very early morning.
  - D. *Choose a pesticide* that has a low toxicity to bees and beneficials.
9. Dispose of pesticide containers so they do not pose a threat to man or the environment. Empty containers should be rinsed at least three times and the rinse water poured into the spray tank. They can then be taken to a sanitary landfill dump or other site approved by the local health department. Small containers, such as those in the home and garden trade, can be handled by city trash disposal services.

---

NOTE: Under each heading a plant stage or weather period (e.g., dormant period) is given with reference to stages illustrated on the "Bud Development" page at the end of this publication. A "month" or "span of months" is often also given as a reference. The chronological period or month is given as a loose definition of the stage of development. The stage of development, however, may vary some during any one month from one area of Washington to another. Therefore, there should be a greater reliance on the stage entry as it relates to the bud development page than on a precise time of year.

# APPLES

Pest	Pesticide	Remarks
<b>DELAYED—DORMANT (STAGES 2–3*): MARCH TO APRIL</b>		
SAN JOSE SCALE	(Use one)	Apply sprays during dormant or delayed-dormant period (do not use after pink color appears in buds). Use enough water to thoroughly cover all portions of the tree including small limbs and shoots. The oil plus Diazinon sprays should give better mite egg control than oil alone. Diazinon plus superior type oil used at the late delayed dormant period will help control leafrollers.
EUROPEAN RED MITE EGGS	Superior type oil	
BROWN MITE EGGS	Superior type oil	
LEAFROLLERS	PLUS one of the following: lime-sulfur lime-sulfur materials such as orthorix or Polysulphide compound Diazinon (EC or WP)	

## PREPINK (STAGES 4–5\*): JUST BEFORE BLOSSOMS OPEN

APPLE APHIDS	(Use one) Diazinon (EC or WP) Thiodan EC	Do not apply after blossoms appear.
CLIMBING CUTWORMS	No effective chemical labeled for home use at this time. Sevin garden dust formulations applied on trunks and ground may help reduce cutworms. <i>Bacillus thuringiensis</i> may provide some relief providing enough is eaten to induce mortality.	

## PETAL FALL—(AFTER ALL PETALS ARE OFF)

CODLING MOTH	(Use one) Diazinon (EC or WP) Methoxychlor-Malathion EC	Apply sprays about 10 days after full petal fall or 17–21 days after full bloom. Apply at least four sprays of Diazinon and repeat every 7–10 days. A 14–21 day schedule should be maintained if the Methoxychlor-Malathion material is used. Diazinon has a minimum time till harvest of 14 days; Methoxychlor-Malathion has minimum time of 7 days till harvest. County agents maintain pheromone traps in the major and some minor apple growing areas. These traps are helpful in timing codling moth sprays. Check with your county agent on moth levels of your area.
LEAFHOPPERS	Diazinon EC Thiodan EC	14 days, minimum time to harvest. 30 days, minimum time to harvest.

## SPRING-SUMMER PERIOD

APPLE APHIDS	See prepink.	Do not apply in presence of blossoms.
MITES	Omite WP	7 days, minimum time to harvest. May not be available in garden stores, but may be obtained from commercial outlets.
APPLE ERMINE MOTH	<i>Bacillus thuringiensis</i> (Dipel, Thuricide, etc.)	See label for additional information.
APPLE-AND-THORN SKELETONIZER	No chemicals are labeled for specific control of this pest on fruit trees. Diazinon sprays applied in late spring and early summer for control of aphids and other insect pests often reduce this insect as well. <i>Bacillus thuringiensis</i> should also provide control.	
LEAFROLLERS	Codling moth materials will control leafrollers. <i>Bacillus thuringiensis</i> will also control leafrollers.	

EC = Emulsifiable Concentrate      WP = Wettable Powder

\*See back page for illustration of these stages.

# APRICOTS

Pest	Pesticide	Remarks
<b>DELAYED – DORMANT (STAGES 2–3*): MARCH TO APRIL</b>		
SAN JOSE SCALE MITE EGGS	(Use one) Superior type oil Superior type oil PLUS Diazinon EC	Use sufficient spray to thoroughly cover all portions of the tree including small limbs and shoots. Apply only during dormant or delayed-dormant period. May also reduce leafroller numbers.
<b>PREPINK (STAGES 3–5*): JUST BEFORE BLOOM WHEN BUDS SHOW COLOR</b>		
PEACH TWIG BORER FRUITTREE LEAFROLLER APHIDS THRIPS	Diazinon (WP or EC)	20 days, minimum time from last application to harvest.
PEACH TWIG BORER APHIDS	Thiodan EC	30 days, minimum time from last application to harvest.
<b>PETAL FALL – WHEN ALL PETALS HAVE DROPPED</b>		
PEACH TWIG BORER FRUITTREE LEAFROLLER APHIDS THRIPS	Diazinon (EC or WP)	10 days, minimum time to harvest.
PEACH TWIG BORER APHIDS	Thiodan EC	30 days, minimum time to harvest.
<b>LATE SPRING-SUMMER PERIOD</b>		
PEACHTREE BORER	Thiodan EC	Apply to tree trunks and crotches in early July and again in early August. 30 days, minimum time to harvest.
SPIDER MITES	Kelthane WP Omite WP	Omite is preferred, as it is more effective on most mite species and is much less damaging to predator mites. 14 days, minimum time to harvest for both chemicals.
EARWIGS	Sevin (WP or dust)	Use as a spray or dust around the trunk. 0 days, minimum time to harvest.
APHIDS PEACH TWIG BORER		(Same as Prepink Period/Petal-Fall Period above.) If twig borer sprays were not applied at petal fall, they must be applied in early June.

EC = Emulsifiable Concentrate      WP = Wettable Powder

\*See back page for illustration of these stages.

# CHERRIES

Pest	Pesticide	Remarks
<b>DELAYED—DORMANT (STAGE 1*): FEBRUARY TO MARCH</b>		
SAN JOSE SCALE BLACK CHERRY APHID EGGS LEAFROLLERS	(Use one) Superior type oil Superior type oil PLUS Diazinon (EC or WP)	Apply sprays using enough water to thoroughly cover all portions of the tree including small limbs and shoots. Apply only during dormant or delayed-dormant period. The Diazinon and oil mixture will help control leafrollers.
CLIMBING CUTWORMS	(Use one) Methoxychlor dust Sevin dust	Apply dust around base of the tree only. No effective spray material available for control of climbing cutworms on the tree. However, <i>Bacillus thuringiensis</i> may give some control providing they eat enough of it.
<b>PREBLOOM-CLUSTER BUD (STAGES 4-5*): APRIL TO MAY</b>		
LEAFROLLERS SAN JOSE SCALE APHIDS	Diazinon (EC or WP)	10 days, minimum time to harvest.
SPIDER MITES	Kelthane WP	10 days, minimum time to harvest.
<b>PETAL-FALL—WHEN ALL PETALS HAVE DROPPED</b>		
LEAFROLLERS APHIDS	(Use one) Diazinon (EC or WP) Malathion EC Malathion-Methoxychlor EC	10 days, minimum time to harvest for Diazinon. 3 days, minimum time to harvest for Malathion.
SPIDER MITES	Kelthane WP	10 days, minimum time to harvest. Mites are resistant to Kelthane in many areas of Washington.
<b>SUMMER SPRAYS: MAY TO JULY</b>		
BLACK CHERRY APHID SAN JOSE SCALE CHERRY FRUIT FLY CHERRY FRUITWORM	Diazinon (EC or WP)	The wettable powder materials will leave visible residues on fruit. 10 days, minimum time last application to harvest. Cherry fruit fly—present mid-May to last of July. Begin spraying about May 20 to 25. Spray at 10-day intervals.
LEAFROLLERS	<i>Bacillus thuringiensis</i>	See label for use directions.
CHERRY FRUIT FLY (ONLY)	(Use one) Malathion EC Diazinon EC	Cherry fruit fly—present from mid-May to last of July. Begin spraying at 10-day intervals. The wettable powder materials will leave visible residue on fruit.
EARWIG	Sevin (spray or dust)	Apply around bases of trees and on trunks as well as under vegetation and on trash.
PEAR-CHERRYSLUG		Diazinon EC may be used for control of this pest on cherries and some ornamental trees. If Diazinon is used for control of other pests such as aphids during the spring and summer it should also reduce the numbers of pear-cherry-slug.

EC = Emulsifiable Concentrate      WP = Wettable Powder

\*See back page for illustration of these stages.

## CHERRIES (continued)

Pest	Pesticide	Remarks
<b>SUMMER SPRAYS: MAY TO JULY (continued)</b>		
SPIDER MITES	Kelthane WP	10 days, minimum time from last application to harvest.
APPLE-AND-THORN SKELETONIZER	No chemicals are labeled for control of this pest on fruit trees. Diazinon sprays applied in late spring and early summer for control of aphids and other insect pests often reduce this insect as well. <i>Bacillus thuringiensis</i> should also provide control.	
<b>POSTHARVEST</b>		
SHOT HOLE BORER	No material labeled for this pest at this time. Remove and destroy infested firewood. Keep trees healthy and whitewash trunks of young trees to prevent sunburn and reduce potential hazard of attack by shothole borer and flathead borers.	

## PEACHES

### DORMANT PERIOD—FEBRUARY TO MARCH OR— DELAYED-DORMANT (STAGE 1\*): MARCH TO APRIL

SCALE INSECTS EUROPEAN RED MITE EGGS	(Use one) Superior type oil Superior type oil PLUS Diazinon EC	Apply sprays using enough water to thoroughly cover all portions of the tree including small limbs and shoots.
--------------------------------------------	----------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------

### PREPINK (STAGES 3–5\*): JUST BEFORE BLOOM WHEN BUDS SHOW COLOR

PEACH TWIG BORER FRUIT TREE LEAFROLLER APHIDS THRIPS	Diazinon (WP or EC)	20 days, minimum time from last application to harvest.
PEACH TWIG BORER APHIDS	Thiodan EC	30 days, minimum time from last application to harvest.

### SUMMER: MAY TO AUGUST

PEACH TWIG BORER APHIDS	(Use one) Diazinon (EC or WP) Thiodan EC	Apply sprays for twig borer in early June. Apply sprays for mites as needed. 20 days, minimum time from last application to harvest for Diazinon. 30 days, for Thiodan.
LEAFROLLERS	<i>Bacillus thuringiensis</i> (caterpillars only) Diazinon (EC or WP)	See label for use directions.
EARWIGS	Sevin (WP or dust)	Apply as a spray or dust around the trunk. 1 day, minimum time to harvest.
MITES (ONLY)	Omite WP	14 days, minimum time from last application to harvest.

EC = Emulsifiable Concentrate      WP = Wettable Powder

\*See back page for illustration of these stages.

# PEACHES (continued)

Pest	Pesticide	Remarks
<b>SUMMER: MAY TO AUGUST (continued)</b>		
SHOTHOLE BORER OTHER BORERS		No material labeled for this pest at this time. Remove and destroy infested firewood. Keep trees healthy and whitewash trunks of young trees to prevent sunburn and reduce potential hazard of attack by shothole borer and flathead borers.
PEACHTREE BORER		See Thiodan instructions under Apricot. This insect can be controlled by worming. In home orchards where only one or a few peach trees are involved, it is quicker and cheaper to use the worming method. This is merely the use of a pocket knife or some pointed instrument in which one removes the dirt around the tree and digs the larvae out. This method is time-consuming if a large orchard is involved, and if carelessly done will cause injury to the tree.

## PEARS

### DORMANT PERIOD (STAGES 1-2\*): FEBRUARY TO MARCH

SAN JOSE SCALE	(Use one)	Use enough water to thoroughly cover all portions of the tree including small limbs and shoots. Sprays in central Washington usually applied in first part of March. Eastern Washington sprays applied mid-to late March. Timing sprays during this period could vary greatly in western Washington. In general, it would be mid-late February. Apply only during dormant or delayed-dormant period. The oil plus Diazinon mixtures should give better control of mite eggs and psylla than oil alone. The Diazinon and oil mixture will help control leafrollers.
EUROPEAN RED MITE EGGS	Superior type oil	
PEAR PSYLLA	Superior type oil PLUS	
BROWN MITE EGGS	Diazinon (EC or WP)	
APHID EGGS		
LEAFROLLERS BLISTER MITES		

### DELAYED-DORMANT (STAGES 2-3\*): MARCH

MITE EGGS	(Use one)	Apply only during dormant or delayed-dormant period. Apply sprays at both delayed and full dormant periods for control of pear psylla as this will give much better control than a single spray.
APHID EGGS	Superior type oil	
SAN JOSE SCALE	PLUS	
PEAR PSYLLA	One of the following:	
LEAFROLLERS BLISTER MITES	lime-sulfur lime-sulfur type materials Diazinon EC	
PEAR PSYLLA (ONLY)	(Use one) Nicotine sulfate EC Thiodan EC	Apply sprays, using enough water to thoroughly cover all portions of the tree including small limbs and shoots. Apply only during dormant or delayed-dormant periods. The addition of superior type oil to the Thiodan material would greatly improve psylla control.

### CLUSTER BUD (STAGES 4-5\*)

CUTWORMS	No effective garden store insecticides available. <i>Bacillus thuringiensis</i> may provide some relief providing they eat enough of it.
----------	------------------------------------------------------------------------------------------------------------------------------------------

EC = Emulsifiable Concentrate      WP = Wettable Powder

\*See back page for illustration of these stages.

## PEARS (continued)

Pest	Pesticide	Remarks
<b>CLUSTER BUD (STAGES 4-5*) (continued)</b>		
THRIPS PEAR PSYLLA	(Use one) Diazinon (EC or WP) Thiodan EC	If pear psylla control is not satisfactory with the materials shown, the addition of superior oil should be used. 14 days, minimum time from last application to harvest for Diazinon. 21 days, minimum time from last application to harvest for Thiodan.
<b>PETAL-FALL – WHEN ALL PETALS HAVE DROPPED</b>		
CODLING MOTH	(Use one) Diazinon (EC or WP) Methoxychlor-Malathion EC	Apply treatment starting about 10 days after complete petal-fall. Repeat sprays 10 to 14 days. 14 days, minimum time to harvest for Diazinon. Apply Methoxychlor-Malathion mixture (7 days, minimum time to harvest) as per manufacturer's label. See codling moth control for apples.
<b>SUMMER PERIOD – MAY TO AUGUST</b>		
APHIDS PEAR PSYLLA	(Use one) Diazinon (WP or EC) Nicotine sulfate EC (psylla only) Thiodan EC	If pear psylla control is not satisfactory with the materials shown, the addition of minimal rates of superior oil should be used. Do not add oil to Thiodan. 14 days, minimum time from last application to harvest for Diazinon. 0 days for nicotine sulfate. 21 days for Thiodan.
CODLING MOTH		See petal-fall period.
APPLE-AND-THORN SKELETONIZER		No chemicals are labeled for control of this pest on fruit trees. Diazinon sprays applied in late spring and early summer for control of aphids and other insect pests often reduce this insect as well. <i>Bacillus thuringiensis</i> should also provide control.
PEAR-CHERRYSLUG	Diazinon EC	If Diazinon is used for control of other pests such as aphids during the spring and summer, it should also reduce the numbers of pear-cherryslug.

## PLUMS-PRUNES

### DORMANT PERIOD – FEBRUARY OR – DELAYED-DORMANT (STAGE 1\*): MARCH

SCALE INSECTS	(Use one) Superior type oil Superior type oil PLUS Diazinon (EC or WP)	Use enough water to thoroughly cover all portions of the tree including small limbs and shoots. Apply only during dormant or delayed-dormant period. The materials are not labeled for control of aphid eggs or mite eggs, but they often reduce the numbers of these pests. Apply only during dormant or delayed-dormant period. The oil plus Diazinon mixture should give better control of several overwintering pests than the oil alone.
---------------	------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

EC = Emulsifiable Concentrate      WP = Wettable Powder

\*See back page for illustration of these stages.

## PLUMS-PRUNES (continued)

Pest	Pesticide	Remarks
<b>PREBLOOM-CLUSTER BUD (STAGE 4*): APRIL TO MAY</b>		
PEACH TWIG BORER APHIDS FRUITTREE LEAFROLLER THRIPS	(Use one) Diazinon (EC or WP) <i>Bacillus thuringiensis</i> (caterpillars only) Thiodan EC (not labeled for thrips)	Apply twig borer sprays when pheromone traps show rapid moth buildup or when damage to buds first noticed. See label for use directions on <i>Bacillus thuringiensis</i> .
SPIDER MITES	(Use one) Kelthane WP Omite WP	Omite is preferred material, as it does not destroy beneficial predatory mites. 7 days, minimum time to harvest for Kelthane. Minimum time to harvest for Omite, 28 days.
<b>SUMMER PERIOD—JUNE TO SEPTEMBER</b>		
APHIDS TWIG BORER LEAFHOPPERS	(Use one) Diazinon (EC or WP) Thiodan EC	Apply twig borer sprays in early June if early bloom sprays were not applied. 10 days, minimum time from last application to harvest for Diazinon. 7 days, minimum time from last application to harvest for Thiodan.
APPLE-AND-THORN SKELETONIZER	No chemicals are labeled for control of this pest on fruit trees. Diazinon sprays applied in late spring and early summer for control of aphids and other insect pests often reduce this insect as well. <i>Bacillus thuringiensis</i> should also provide control.	
EARWIGS	Sevin (spray or dust)	Apply around trunk at ground level only. 0 days, minimum time to harvest.
PEAR-CHERRYSLUG	Diazinon EC	If Diazinon is used for control of other pests such as aphids during the spring and summer it should also reduce the numbers of pear-cherryslug.
SHOTHOLE BORER FLATHEAD BORER	No material labeled for this use at the present time. Remove infested limbs and firewood containing borers. Whitewash young trees for prevention of sunburn and borer damage. Maintain good tree vigor to reduce borer attack.	
SPIDER MITES	(Use one) Kelthane WP Omite WP	Omite is the preferred material, as it does not destroy beneficial predatory mites. 28 days, minimum time from last application to harvest for Omite. 7 days, minimum time from last application to harvest for Kelthane.

EC = Emulsifiable Concentrate      WP = Wettable Powder

\*See back page for illustration of these stages.

# FILBERTS

Pest	Pesticide	Remarks
<b>DELAYED – DORMANT</b>		
LECANIUM SCALE	Dormant type oil	Severe infestations may cause die back of small shoots and branches. Apply during dormant or delayed-dormant period.
FILBERT APHID	Ethion-oil	These materials are available in combination. Apply during dormant or delayed-dormant period.
<b>EARLY SPRING</b>		
APPLE MEALYBUG	Diazinon WP will control the crawler stage.	
EYESPOTTED BUD MOTH	Malathion (WP or EC) <i>Bacillus thuringiensis</i>	Larvae first noted in early spring; apply spray when first damage found on leaves or buds. 0 days, minimum time from last application to harvest. See label for <i>Bacillus thuringiensis</i> use directions.
FILBERT LEAFROLLER TENT CATERPILLARS	(Use one) Diazinon WP Sevin WP Thiodan WP <i>Bacillus thuringiensis</i>	Apply sprays in spring after over-wintering eggs hatch at about time leaves are 3/4 to 1 inch in size. Control much more effective if sprays applied when larvae are small. 0 days, minimum time from last application to harvest for all materials.
<b>LATE SPRING-SUMMER</b>		
FILBERT APHID	(Use one) Diazinon WP Malathion (EC or WP) Thiodan WP	Small greenish aphids cause honeydew from heavy leaf feeding. Heavy infestations reduce size and fill of nuts. Apply sprays when found and causing damage. 0 days, minimum time from last application to harvest for all materials.
FILBERTWORM	Sevin WP	Apply sprays in early July and again three weeks later. 0 days, minimum time to harvest.
OMNIVOROUS LEAFTIER	No material labeled for this pest specifically; however, <i>Bacillus thuringiensis</i> should provide control.	
SPIDER MITES	Kelthane WP	Apply sprays as needed to prevent damage. 14 days, minimum time from last application to harvest.

EC = Emulsifiable Concentrate

WP = Wettable Powder

# WALNUTS

Pest	Pesticide	Remarks
<b>SPRING AND SUMMER</b>		
WALNUT APHIDS	(Use one) Diazinon WP Malathion (WP or EC) Thiodan (EC or WP)	Do not apply Diazinon or Thiodan after husks open. Most common aphids are controlled by predator insects. Apply sprays only if aphids in large numbers and causing damage. 0 days, minimum time from last application to harvest for Malathion.
LECANIUM SCALE	No chemicals specifically labeled for this pest at the present time; however, if eggs have hatched, Malathion applied for aphid control should adequately control it.	
FROSTED SCALE	Diazinon WP	Do not apply after husks open. Apply spray when crawlers begin to move in June or July.
WALNUT HUSK FLY	(Use one) Ethion WP Malathion WP Malathion WP PLUS Staley's Bait No. 7	Do not apply after husks split. Do not apply it more than twice during growing season. Timely application of sprays is important. Control is directed against adults to prevent egg laying. Use fly traps. Apply first treatment within 10 days after catches in fly traps show a sharp or steady increase over a three day period, probably early or mid-August. A second applicaiton may be necessary three or four weeks later. <i>Note:</i> A.E. Staley Mfg. Co., Decatur, Ill., is the source of the Staley's Bait, but check local dealers for availability. See EB 0904, <i>Walnut Husk Fly</i> .
WALNUT CATERPILLARS	Diazinon WP <i>Bacillus thuringiensis</i>	Do not apply after husks split or open. Larvae pale yellow to brown; found on leaves. Spray when damage occurs. <i>Bacillus thuringiensis</i> materials must be consumed by the caterpillar to be effective.

EC = Emulsifiable Concentrate

WP = Wettable Powder

By Arthur Antonelli, Extension Entomologist, WSU Western Washington Research and Extension Center, Puyallup; Elizabeth Beers, Research and Extension Entomologist, WSU Tree Fruit Research Extension Center, Wenatchee; and Richard C. Maxwell, Agricultural Chemicals Specialist, WSU, Pullman.

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.

The law requires that pesticides be used as the label directs. Uses against pests not named on the label and low application rates are permissible exceptions. If there is any apparent conflict between label directions and the pesticide uses suggested in this publication, consult your county Extension agent.

Issued by Washington State University Cooperative Extension, F.L. Poston, Director, and the U.S. Department of Agriculture in furtherance of the Acts of May 8 and June 30, 1914. Cooperative Extension programs and policies are consistent with federal and state laws and regulations on nondiscrimination regarding race, color, national origin, religion, gender, age, disability, and gender preference. Trade names have been used to simplify information. No endorsement is intended. Revised from previous issue by A.H. Retan and V. Peterson. September 1988. 50¢

# BUD DEVELOPMENT CHART

STAGE

APPLE

PEAR

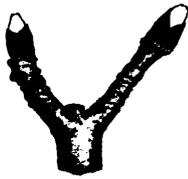
PEACH/COT

CHERRY/PLUM

1



2



3



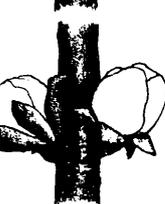
4



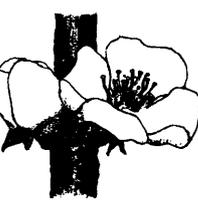
5



6



7



8

