



FRUIT TREE CARE

This information packet includes the following topics:

Fruit Tree Care by Month

Why Fruit Trees Fail To Bear Fruit

Insecticides & Fungicides

Common Fruit Tree Diseases

Common Fruit Tree Pests

Pruning

Resources



December - January

“DORMANT STAGE”

- ☑ Spray all fruit trees with copper and dormant oil. This will control blister mites, scale, pear psylla, moss and lichens, it also counts as one of three spray applications to control peach leaf curl. Three applications are required about three weeks apart to get full protection from peach leaf curl.
- ☑ Prune for air circulation, sun penetration, fruit production and to keep the trees a manageable size. Thin laterals to 2-3 buds. Do not prune off fruiting spurs. Try to prune during a dry spell.
- ☑ Apply non-nitrogen fertilizers, lime and trace elements.

Peach, Nectarine, Apricot & Plum Problems:

- For mites & scale: use dormant or summer oil. Apply oil when temperature is above 40 degrees and not within 14 days before or after using sulfur.
- For peach leaf curl: use copper or chlorothalonil. Apply at leaf drop in late fall and 1 to 2 additional applications in mid to late winter before bud swell.

Apple & Pear Problems:

- For mites & scale: use dormant oil. Apply oil when temperature is above 40 degrees.
- For fire blight: Use copper. Apply alone – may have compatibility problems with other pesticides. Best if applied at the bud swelling stage. Do not apply after the “half-inch green” stage or when drying conditions are slow – sever plant injury may occur.



February

“DELAYED DORMANT – PREBLOOM STAGES”

LEAVES ARE 0.25 TO 0.5 INCHES LONG & FLOWER BUDS NOW SHOW

- ☑ When the buds are beginning to swell but before any new growth starts, spray all fruit trees one more time with dormant oil. This will kill scale, aphid, and mite larvae.
- ☑ If you have not had good pollination, consider purchasing orchard mason bees. Mount bee houses near your fruit trees for a continuing supply of these wonderful pollinators.



Peach, Nectarine, Apricot & Plum Problems:

- For leafminers: use neem or spinosad.
- For mites & scale: use dormant oil. Oil application delayed until this time may give even better control of scale than when applied earlier. Apply oil when temperature is above 40 degrees and not within 14 days before or after using sulfur .
- For aphids: use permethrin, neem or insecticidal soap. For insecticidal soap, repeat application 3 to 4 days later.

- For pear psylla: use permethrin. Do not make more than three permethrin sprays per season.
- For primary scab: use copper or sulfur.

Apple & Pear Problems:

- For mites & scale: Use dormant oil or summer oil. Oil application delayed until this time may give even better control of scale than when applied earlier. Apply oil when temperatures are above 40 degrees, and do not apply within 14 days before or after using sulfur .
- For leafminers: Use neem or spinosad.
- For aphids: Use permethrin, neem or insecticidal soap. For insecticidal soap, repeat application 3 to 4 days later.
- For pear psylla: Use permethrin. Do not make more than three permethrin sprays per season.
- For primary scab: Use copper or sulfur.

Cherry Problems:

- For mites & scale: use dormant oil after buds break in spring

March

**“POPCORN STAGE”
FLOWER BUDS HAVE STARTED TO OPEN**

Peach, Nectarine, Apricot & Plum Problems:

- For plant bugs & stink bugs: use spinosad, or permethrin.
- For brown rot, scab & leaf spot: use copper, sulfur, or chlorothalonil .

Apple & Pear Problems (apply spray when buds are clearly evident but not open):

- For plant bugs & stink bugs: use spinosad, or permethrin.
- For aphids: use neem, insecticidal soap, or spinosad.
- For pear psylla: use spinosad or permethrin.
- For primary scab: use sulfur or copper.
- For rust: use copper or sulfur. Certain apple varieties may be injured by sulfur applications under certain conditions. Sulfur provides fair to poor rust control.
- For powdery mildew: use sulfur, copper, or potassium bicarbonate.



April

**“FULL BLOOM STAGE”
FLOWERS ARE IN FULL BLOOM**

NOTE: Do not use insecticides during the bloom period – save the bees! The following sprays can be applied when 25% or less of the blossoms are open.

- Check / install irrigation.

Peach, Nectarine, Apricot & Plum Problems:

- For brown rot & scab: use copper, chlorothalonil .
- For powdery mildew & leaf spot: use copper, sulfur or potassium bicarbonate.

Apple & Pear Problems:

- For primary scab: use copper or sulfur.
- For fire blight: use copper. Apply at first bloom on susceptible varieties. Repeat at 4 to 5 day intervals until the “petal-fall” stage.
- For rust: use copper or sulfur.
- For powdery mildew: use copper, sulfur or potassium bicarbonate.

Cherry Problems:

- For brown rot: use copper or chlorothalonil. Best control is achieved if application is also applied at the “popcorn” or prebloom stage.



May

**“PETAL FALL STAGE”
WHEN MOST OF THE FLOWER PETALS HAVE FALLEN**

- Apply apple maggot and codling moth control barriers.
- Remember to water deeply.
- Thin apples and pears: when the fruit is under a nickel size, thin out the smaller fruit to improve cropping consistency
- Fertilize.

Peach, Nectarine, Apricot & Plum Problems:

- For oriental fruit moth & plum curculio: use permethrin.
- For plant bugs & stink bugs: use spinosad or permethrin.
- For coryneum blight: use chlorothalonil. Apply 1 to 2 weeks after petal fall or at shuck-split.
- For brown rot & scab: use copper, sulfur, chlorothalonil . Make one additional application for scab at shuck-split.

Apple & Pear Problems:

- For plum curculio: use permethrin.
- For leafrollers: use spinosad.
- For plant bugs & stink bugs: use spinosad or permethrin.
- For aphids: use insecticidal soap, neem, permethrin or imidacloprid. One application of imidacloprid per year.
- For leafminers: use neem, permethrin, spinosad or imidacloprid. One application of imidacloprid per year.
- For pear psylla: use permethrin.
- For scab: use copper or sulfur.
- For rust: use copper or sulfur.
- For powdery mildew: use copper, sulfur or potassium bicarbonate.

Cherry Problems:

- For plum curculio: use neem or permethrin.
- For scale: use summer oil. To prevent damage to foliage or fruits, never use a summer oil with sulfur-

containing pesticides. Allow at least 14 days between applications of sulfur-containing compounds and the use of a summer oil. Apply oil when temperatures are between 40 and 90 degrees.

- For aphids: use neem, insecticidal soap, pyrethrins, or permethrin. For insecticidal soap repeat application 3 to 4 days later. For pyrethrins, repeat application every 5 to 10 days or as needed, do not apply within 1 day of harvest.



May-June

“POST PETAL FALL STAGE” ABOUT 10 DAYS AFTER PETAL-FALL

Peach, Nectarine, Apricot & Plum Problems:

- For brown rot & scab: use copper, sulfur .
- For mites: use summer oil, insecticidal soap or pyrethrins. To prevent damage to foliage or fruits, never use a summer oil with sulfur-containing pesticides. Allow at least 14 days between applications of sulfur-containing compounds and the use of a summer oil. Apply oil at temperatures above 40 and 80 degrees. For insecticidal soap repeat application 3 to 4 days later.
- For plum curculio & oriental fruit moth: use permethrin.
- For plant bugs & stink bugs: use spinosad or permethrin.
- For powdery mildew: Use sulfur or potassium bicarbonate.

Apple & Pear Problems (apply spray now and at 10 day intervals through May):

- For codling moth & leafrollers: use spinosad or permethrin.
- For leafrollers: use spinosad.
- For plum curculio: use permethrin.
- For aphids: use neem or imidacloprid.
- For powdery mildew: use lime sulfur, sulfur or potassium bicarbonate. Discontinue sulfur use when temperatures reach 90 degrees.
- For leafminers: use neem, spinosad, or imidacloprid.
- For mites: use neem, insecticidal soap or summer oil. To prevent damage to foliage or fruits, never use a summer oil with sulfur-containing pesticides. Allow at least 14 days between applications of sulfur-containing compounds and the use of a summer oil. Apply oil at temperatures between 40 and 80 degrees. For insecticidal soap repeat application 2 to 3 days later.
- For scale: use insecticidal soap, summer oil, or imidacloprid. To prevent damage to foliage or fruits, never use a summer oil with sulfur-containing pesticides. Allow at least 14 days between applications of sulfur-containing compounds and the use of a summer oil. Apply oil when temperatures are between 40 and 90 degrees. For insecticidal soap repeat application 2 to 3 days later. One application of imidacloprid per year.
- For pear psylla: use spinosad or permethrin.
- For scab: use copper, sulfur .
- For rust: use copper or sulfur.
- For fruit rots: use copper .

July-August

“RIPENING STAGE” ABOUT 10 DAYS AFTER SHUCK-FALL

NOTE: The shuck is the hard outer covering that protects the fruit as it starts to emerge from the flower.

- Net cherries and blueberries.
- Check soil moisture at six inches.

- Thin plums to improve cropping consistency.
- Train young plants and tie to stakes.
- Cut suckers.
- Remember to water deeply.

Peach, Nectarine, Apricot & Plum Problems:

- For plum curculio & oriental fruit moth: use spinosad or permethrin.
- For plant bugs & stink bugs: use spinosad or permethrin.
- For mites: use summer oil or insecticidal soap.
- For lesser peach tree borer: use permethrin.
- For brown rot & scab: use sulfur .
- For oriental fruit moth: use permethrin.
- For powdery mildew: use sulfur or copper soap.
- For aphids: use neem, insecticidal soap or pyrethrins.
- For webworm: use BT.

Cherry Problems:

- For plum curculio: If shucks have split and are falling, use neem. If it has been ten days after shuck-fall, use neem, spinosad, or pyrethrins.
- For cherry fruit fly: use spinosad or pyrethrins.
- For aphids: use neem, insecticidal soap, or pyrethrins.
- For scale: use summer oil.
- For brown rot: use copper soap .
- For mites: use summer oil, insecticidal soap or pyrethrin. To prevent damage to foliage or fruits, never use a summer oil with sulfur-containing pesticides. Allow at least 14 days between applications of sulfur-containing compounds and the use of a summer oil. Apply oil when temperatures are between 40 and 90 degrees.
- For cherry leaf spot: use copper soap. Apply as soon as all the fruit has been harvested.
- For webworm: use BT

September

“PRE-HARVEST STAGE”

- May reduce irrigation if tree is growing vigorously.
- Trim vines to keep them under control.
- Support or prune heavily fruited branches.
- Net grapes if needed.

Peach, Nectarine, Apricot & Plum Problems (apply spray 1-2 weeks before harvest):

- For green June beetle & Japanese beetle: use neem or pyrethrin.
- For oriental fruit moth: use permethrin.
- For aphids: use neem, insecticidal soap, or pyrethrin.

Apple & Pear Problems (apply spray at 14 day intervals, June through mid-August):

- For codling moth & leafrollers: use spinosad.
- For mites: use summer oil, insecticidal soap or pyrethrin.
- For scale: use summer oil, or insecticidal soap.
- For leafhoppers: use neem.
- For leafminers: use neem or spinosad.
- For aphids: use neem or insecticidal soap.
- For scab, fruit rots, sooty blotch and fly speck: use copper soap, lime-sulfur .

October – November

“POST-HARVEST STAGE”

- ☑ Winterize irrigation.
- ☑ After the crop is harvested, but while the leaves are still on the tree, spray thoroughly with a copper fungicide. This will guard against anthracnose and nectria canker in apples and pears, coryneum blight and bacterial canker in peaches, plums, and cherries, as well as moss and lichen growth.
- ☑ Before the fall rains start in earnest, spread lime around the trees. Fruit trees prefer a neutral pH (6.5 to 7.0). In the Pacific Northwest, our soil is generally more acidic so a yearly application of lime is beneficial.
- ☑ Remove fallen fruit and leaves. Many insect larvae and disease spores will overwinter in the debris. Do not compost the debris – burn it or throw it out with the trash.
- ☑ Avoid pruning any fruit trees. Open wounds will heal too slowly.

Why Fruit Trees Fail To Bear Fruit

Your fruit tree normally will begin to bear fruit soon after it has become old enough to blossom freely. The length of time from planting to fruit bearing varies with the type of fruit. Trees that grow at a moderate rate generally bear fruit sooner than those that grow either too quickly or too slowly. The health of your tree, its environment, fruiting habits, and the cultural practices you use can influence its ability to produce fruit. Adequate pollination is also essential to fruit yield. Each cultivar will have different ripening times as well.

Tree health – Weak or diseased trees produce poor quality fruit or no fruit at all. If not detected or controlled early enough, pest problems can restrict the size and quality of the yield.

Environment – Fruit trees need full sun for best production. Avoid placing fruit trees where they will be shaded by buildings or other trees. Most hardy fruit trees need a certain amount of cold weather to end their dormancy and to promote spring growth. When winters are too mild, spring growth is delayed, irregular and slow. These factors extend the period of blooming, thereby increasing the possibility of frost injury. On the other hand extreme cold during the winter can kill the fruit buds.

Fruiting Habits – Certain fruit trees such as apples, can bear heavily one year and sparsely the next. This habit is called “biennial bearing.” The spring-flowering buds have actually been formed during the previous

Tree	Years
Apple	2 to 5
Apricot	2 to 5
Cherry, sour	3 to 5
Cherry, sweet	4 to 7
Citrus	3 to 5
Fig	2 to 3
Peach	2 to 4
Pear	4 to 6
Plum	3 to 6
Quince	5 to 6

Note: Dwarf apple and dwarf pear trees usually begin to bear 1 to 2 years earlier than standard size trees.

summer, so an especially heavy crop one year may prevent adequate bud formation the following year. This is difficult to correct or alter, but you can try to induce a return to normal yearly fruit production by early and heavy thinning during the year in which the trees are producing their large yield.

Cultural Practices – A good watering and fertilizing program is also essential to a tree’s vigor and fruiting capacity. Water fruit trees deeply but at infrequent intervals. Since the flower buds for the next year’s fruit are formed during the summer, summer watering will affect the next year’s fruit yield. Do not over fertilize, especially with nitrogen since that will force the tree to produce foliage instead of fruit. Reduce the competition from weeds and grass. Good pruning practices are important. Prune young fruit trees to develop a strong framework with a central leader and horizontal branches. Also it is important to thin fruit trees to improve cropping consistency and reduce biennial bearing. See our Pruning Fruit Trees handout for more details.

Pollination – Pollination is affected by cold weather and reduced pollinating insect activity. Without sufficient pollination, trees may blossom abundantly but will not bear fruit. Some fruit trees can pollinize themselves. Some fruit trees are either male or female; one of each is needed for pollination. Many fruit trees need another variety of the same fruit for pollination. See our fruit tree list and pollination charts for details.

INSECTICIDES & FUNGICIDES

When it comes to chemicals, **it’s all Greek to me!** What chemicals were those and what do I buy? Here is a list of common ingredients and products that are used in fruit tree care. Check the label and makes sure the problem disease or pest is specifically listed. Formulations and labels can be confusing so if you have any questions, please ask a Sky employee.

Bt (Bacillus thuringiensis)

- Bonide® Bt Spray
- Safer Caterpillar Killer

Chlorothalonil

- Bonide® Fung-onil Multipurpose Fungicide

Copper

- Bonide® Captain Jack’s Copper Fungicide
- Bonide® Copper Dust
- Monterey Liqui-Cop

Dormant Oils and Summer Oils

- Bonide® All Seasons Hort Spray Oil
- Hi Yield Dormant Spray

Insecticidal soap

- Bonide® Insect Killing Soap
- Safer® Insecticidal Soap

MalathionBonide® Malathion

Neem (azadirachtin)

- Bonide® Bon-Neem™ Insecticide
- Bonide® Neem Oil
- Bonide® Fruit Tree Spray
- Safer® End All Insect Killer

Permethrin

- Bonide® Eight Insect Control

Pyrethrins

- Bonide® Orchard Spray
- Bonide® Pyrethrin Concentrate
- Safer® End All Insect Killer
- Safer® Tomato & Vegetable Insect Killer
- Worry Free® Ready to Use Dust

Spinosad

- Bonide® Captain Jack's Dead Bug Brew

Sulfur

- Bonide® Orchard Spray
- Bonide® Sulfur Plant Fungicide
- Safer® Garden Fungicide
- Safer® 3 in 1 Garden Spray

DISEASES

Fire Blight

Fire Blight, *Erwinia amylovora*, is one of the most destructive diseases of pears in Washington. It also affects apples, quinces, serviceberries and other members of the rose family. Fire Blight may occur on young pear and apple fruits. Fire Blight overwinters in the cankers (small area of dead tissue) on larger branches. During moist weather, drops of bacterial ooze are produced on the canker surface. This ooze contains masses of the bacterial that cause Fire Blight. In the spring, the bacteria ooze from the cankers can be spread to the blossoms, twigs and branches by insects, rain and pruning tools. The infected leaves die but do not fall. They remain on the tree, giving it the appearance of having been scorched. Infected fruit



becomes water-soaked and under humid conditions ooze appears on the surface. They then turn brown, shrivel and finally become black. Infected blossoms wilt, turn brown and die. Infected twigs shrivel, their tips curl over, and they become dark brown or black. There can be dark, slightly sunken cankers on the larger branches. Cankers are usually separated from the healthy bark by narrow cracks. Protective sprays may help prevent blossom infection. Cut off infected branches 15 to 18 inches below the visible margin of the canker. Disinfect all pruning tools after each cut. Dilute one part of household bleach to five parts water for an effective disinfectant solution.

Brown Rot

Brown rot affects all stone fruits (plums, cherries, peaches, apricots, etc.) The fungus, *Monilinia fruticola*, over-winters in the infected twigs and fruiting spurs and in mummified fruit on the tree. The fruit will appear first as sunken circular brown spots with a definite outline that rapidly increase in size and develop into a soft rot. Eventually tufts of gray-brown spore masses appear on the affected area and soon cover the fruit. The diseased fruit hang on the tree long after being completely rotted. The fruit dries into a firm mummy. Blossoms will suddenly wilt and brown. If conditions are moist, the dead flowers are soon covered by the same grayish brown powder consisting of masses of fungus spores. The twig is sometimes girdled and dies. Remove all infected fruit on the tree and on the ground. Prune out infected twigs in late spring or early summer when infection is readily visible. If pruning is delayed until the dormant season, locating the infected twigs is almost impossible. When pruning, disinfect the pruners in between each cut. Improving air circulation through the trees will do much to eliminate the moist conditions favorable to brown rot. During wet springs, preventative fungicide applications are necessary.



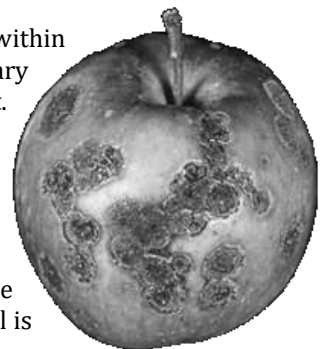
Botrytis

Botrytis cinerea infections are favored by cool, rainy springs and cool summer weather. Also known as Gray mold, it can be particularly damaging when rainy, drizzly weather continues for several days. Examine any brown or spotted plant material. This fungus will form masses of silver-grey spores on dead or dying tissues. If disturbed, it will appear as dust coming off. Botrytis blight can affect leaves, stems, flowers, seeds and just about any part of the plant except the roots. Fungal mycelium may overwinter in woody stem debris. Parts of this fungus will then germinate in the spring and grow into infectious spores. A preventative fungicide spray is the best way to prevent Botrytis.



Apple Scab

The fungus, *Venturia inaequalis*, overwinters in colonized dead leaves. Spores are produced within the "fungal structure" they make in the leaf. These spores spread during the rain causing primary scab. Then this fungus produces a second type of spore causing the scab lesions on the fruit. Velvety olive-green spots appear on the leaves. Eventually the lesions enlarge, turn brown or black and get a scabby appearance. Infection on or near the petiole (the small stalk attaching the leaf to the stem) may result in leaf drop. Infections that occur very early in development may result in blossom blight and possible fruit drop. If it attacks mature fruit, olive-green or brownish warty lesions develop on the fruit and form deep cracks. Remove all infected leaves. Fungicide applications during the primary scab cycle lessens the need for extensive fungicide applications during the latter stages of disease development. The critical period for scab control is from the beginning of bud growth until the apples are 1/2" in diameter.

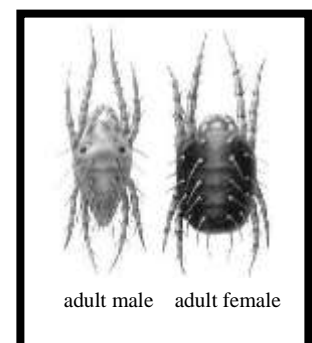


PESTS

EUROPEAN RED MITES: *Panonychus ulmi*

Damage: Leaf destruction. The leaves turn brown then black. They do not feed on the fruit, but the damage to the leaves can reduce the quality and size of the fruit.

Description: Eight-legged, globular body, 1/64" long, reddish-yellow to bright red to brown, white hairs on back.



Remarks: The mites' damage rarely occurs early enough to affect the setting of the current year's crop, they affect the bud set for the next spring. Mite populations naturally decrease by late July or August, but by then, the damage is done. The eggs overwinter in smaller twigs and branches. The eggs start to hatch when the tree's flower buds just start to break open. The young mites move to newly opened leaves where they will feed, mature and reproduce.

Damage: on the underside of leaves of apples, pear and plums, but could sometimes be found on cherries, peaches and apricots.

If Found: As a preventative, use a dormant oil spray in the dormant season. If they become a problem, spray a miticide between the flower bud break and full bloom, when the mites are on the move. Rotate miticides if more than one application is needed.

PEAR PSYLLA: *Cacopsylla pyricola*

Damage: Leaf destruction and fruit marking. The eggs hatch and the emerging nymphs feed on the leaves. The nibble sites will turn yellow and the surrounding leaf area will turn brown and then black. The leaf will sometimes fall. Psylla will secrete a "honeydew" waste which will grow a black sooty mold. This mold will drip onto the fruit and mark the fruit.



Description: 1/12" long, dark reddish brown. They resemble very small cicadas.

Remarks: They have developed a resistance to insecticides. They are generally a greater problem for European varieties than on Asian varieties. Tiny eggs are laid on the fruit spurs starting in late January. As the flower buds open, more eggs are laid along the leaves and flower stems.

Usually Found: On pear trees.

If Found: Considered the most serious pest of pear trees! Usually this pest is kept under control due to the dormant oil spraying for the control of other pests. However, if the psylla become a problem, it is essential to keep the population low through summer and fall to prevent the adults from laying eggs. Spray with an insecticide.

LEAFROLLERS: *Archips argyrospila*

Damage: Leaf destruction. They feed on tender new leaves giving them a ragged appearance. The leaves are rolled and tied together with silky threads. Fruit on the trees are also attacked by the larvae. Young fruit may fall because of the deep feeding grooves made just after the fruit has formed. Some fruit may remain on the tree but develop characteristically deep, bronze-colored scars with roughened netlike surfaces. The caterpillars frequently drop to the ground on their silken threads and may defoliate grass beneath the tree.



Description: The larvae are 1" long and green to brown. The pupae are ½" long and usually rolled in a leaf. The moths are 7/8" and have a brown body and gray wings.

Remarks: Even if completely defoliated, trees that are otherwise healthy can recover. The larvae feed for about 30 days and then pupate in a loose cocoon in the rolled leaves. Eight to eleven days later the adult moths emerge. They then fly from May to June to mate and lay eggs. Leafrollers start as egg masses on twigs and small branches. The egg mass has a dark grey or brown coating that turns white. The larvae hatch from March to May depending on the weather.

Usually Found: On all types of fruit trees.

If Found: Spray with *Bacillus thuringiensis*, BT, during the larval stages. The caterpillars must ingest the sprayed leaf in order to be affected.

TENTIFORM LEAFMINERS: *Phyllonorycter blancardella*

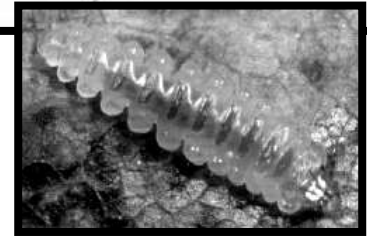
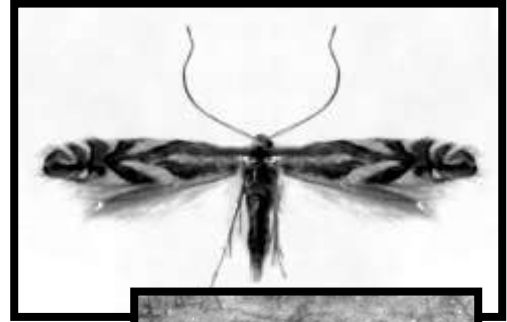
Damage: Leaf destruction. The young larvae feed on the sap of the leaf and cause blotch-shaped mines that are only visible from the underside of the leaf. Older larvae feed on the leaf tissue and produce speckled tent-shaped mines on the upper side of the leaf. A large enough infestation can cause premature leaf drop in August. The larvae do not attack the fruit, but the leaf damage can affect the quality and size of the fruit.

Description: The yellowish larvae are 1/8" long. The moths are 1/8" long and have a brown body with white stripes.

Remarks: Most leafminers are resistant to organophosphate insecticides so make sure the insecticide used is labeled to control leafminers.

Usually Found: On the undersides of leaves of apples, pears and cherries. Eggs are laid on the underside of the leaves and overwinter in fallen leaves.

If Found: Use an insecticide when the leafminer population is mainly in the sap-feeding stage. A second application may be required 10 days later. Parasitic wasps also help with keeping this pest under control. It is easiest to prevent this pest by keeping all leaf litter off the ground.



LEAFHOPPERS: *Edwardsiana rosae*

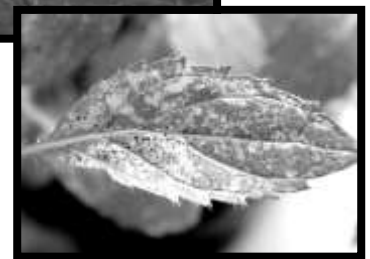
Damage: Leaf destruction and fruit marking. They feed on the undersides of leaves which causes whitish spots on the upper leaf surfaces. This can also lead to yellowing of leaf margins in a "V" shape that usually curls downwards. The leafhoppers also secrete a sticky honeydew which covers and marks the lower fruits, called tar spotting. They do not feed on or eat the fruit, but the damage to leaves can reduce the quality and size of the fruit.

Description: 1/8" creamy white to light yellow

Remarks: The eggs overwinter in nearby brambles and wild plants. Once the eggs hatch, the nymphs "hop" over to fruit trees and start eating the leaves. First generation adults begin to appear in June. The second and third generations feed on the apples. In the fall, adults return to their wild hosts to lay eggs.

Usually Found: Underside of leaves of fruit trees.

If Found: Use an insecticidal spray at petal fall.



CODLING MOTHS: *Cydia pomonella*

Damage: Destroys fruit by tunneling. They tunnel straight to the core of an apple, often leaving granular brown excrement around the entry hole.

Description: The larvae is pinkish to cream with black heads and six legs. The moths have a wingspan of 5/8" with grey bodies and copper stripes on their wings.

Remarks: The first generation continues to hatch through mid June. A



second generation of caterpillars tend to hatch between early July and early August.

Usually Found: In the fruit of apple and pear trees.

If Found: Use a pesticide spray at least twice per moth generation. Most pesticide sprays target the codling moth caterpillar after it hatches from the egg, about 10 to 14 days after bloom. Maintain apple tree height to 12-15 feet, keep the canopy open and the fruit bearing zone low. Select early-maturing varieties of apples. Dispose of any "wormy" fruit on the tree or on the ground. Using special apple bags or standard paper bags, bag the fruit when it is less than 1" in diameter. Tightly secure 4" strips of corrugated cardboard to the base of the tree 1 to 2 feet above the ground. Attach the cardboard in July, then remove and destroy the strips after fruit harvest. Look for any outside codling moth sources nearby, such as abandoned fruit trees, crabapples and quince trees.

APPLE MAGGOTS: *Rhagoletis pomonella*

Damage: Fruit invasion and destruction. Female apple maggot flies deposit eggs just below the skin of an apple or other fruit. A small, but visible puncture is made in the fruit which can lead to dimpling. The damage caused by the maggot resembles a series of brownish, irregular tunnels. The tunnels are enlarged by bacterial decay. The larvae stay near the mid to outer parts of the fruit.

Description: The larvae are ¼" long, white, headless and legless. The flies are ¼" long with a black body and red eyes, creamy-white strip abdomen and black banding pattern on the wings.

Remarks: After staying in the fruit for 20-30 days in the fruit, the maggots drop to the ground where they bury themselves in the soil. There they change into the pupa stage and spend the rest of the summer. They emerge as adults from July through September. About 7-10 days after they emerge from the soil, they mate and the females lay eggs.

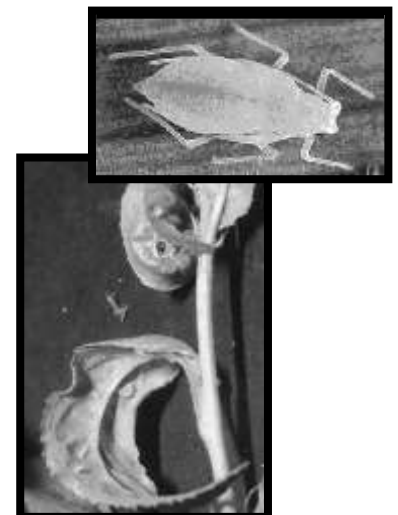
Usually Found: Often seen on apples, but has been known to invade plums, cherries, apricots and pears.

If Found: Keep your eye out for this insect! In late June, hang yellow, rectangular stick traps at eye level in the foliage of your tree. The yellow color attracts flies over short distances, and the flies become trapped by the sticky substance. Other types of sticky traps include red spherical traps that resemble apples. Check the traps daily for adult flies. Since these traps attract many flies, be sure to familiarize yourself with the distinct wing pattern and body size. Since apple maggots spend most of their life cycle within the fruit or buried in the soil, the insecticide sprays must be timed to coincide with adult fly activity. Apple maggot flies are active from late June to October. Apply the first spray within 7 days of trapping the first adult fly. Follow the label's instructions for reapplying.

APHIDS: *Aphidoidea*

AKA: plant lice, greenflies, ant cow

Damage: Sucks sap from leaves. During feeding, aphids inject their saliva into the plant. Their saliva contains chemicals that cause severe curling, stunting and leaf deformity. The leaves may turn bright crimson. As they feed, aphids also excrete excess sap known as honeydew. Honeydew on leaves and fruit provides a perfect medium for black sooty mold to grow. Sooty mold on leaves affects photosynthesis and may reduce fruit yield, while sooty mold on fruit can lower fruit quality.



Description: They are 1/16" to 3/16" long; many are green but some are black, brown and pink, soft-bodied, and have antennas and tail-like protrusions.

Remarks: Aphids overwinter in the egg stage in the crevices of bark. Some aphids occur on conifers only in the winter.

Usually Found: On expanding leaf buds and fruit buds.

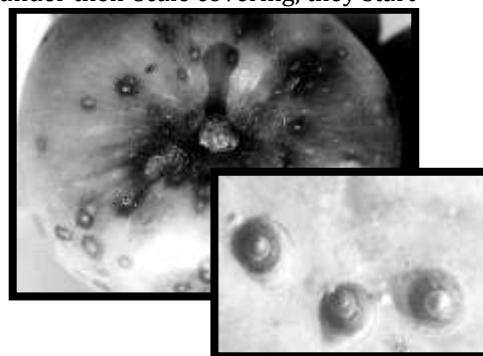
If Found: Use a contact insecticide. A delayed dormant spray with superior oil can be applied to prevent the overwintering aphid eggs from hatching. Small parasitic wasps and ladybugs also attack aphids.

SAN JOSE SCALE: *Quadraspidiotus perniciosus*

Damage: Leaf and fruit destruction. As soon as the San Jose Scales emerge from under their scale covering, they start feeding upon leaves and secreting a waxy material. Eventually this waxy coating on the leaf turns from white to gray to black. Infested fruit develop a reddish purple ring around each spot where a scale settles.

Description: Under the scale covering they are almost round, 1/16" across. The scales emerge as tiny yellow crawlers. As they molt, they become yellow winged insects 1/32" long.

Remarks: These adult males mate with the females under the scale covering in about April. Their peak emergence is generally in early May.



Usually Found: Apple, peach and pear trees. Before fruit set, they typically appear on the trunk and branches. Mid-season through harvest they can be found on the fruit, especially on the stem. Most of the scales overwinter under the covering, but in mild winters, some adults may also survive.

If Found: Use a dormant spray in January and insecticidal spray in May. Make sure the insecticide label lists scale.

OYSTER SHELL SCALE: *Lepidosaphes ulmi*

Damage: Sap sucking. These crawling scales feed on the plant by sucking out the plant sap of branches. Heavy infestations can kill branches and even cause the decline and death of the tree.

Description: A drab, bark-like appearance 1/10" long.

Remarks: Oil sprays are not very effective since they can't adequately smother the crowded scales which often clump together in layers.



Usually Found: Fruit tree branches. They overwinter as eggs under the waxy covering of the female. The eggs hatch in mid-to late April as crawlers that are active into early May.

If Found: Use an insecticidal soap in the “delayed-dormant stage” before the flower buds break open as a preventative measure. If they are a problem, use an insecticidal soap when they are in their crawling phase (April-May). Make sure the insecticide lists scale. In some cases, large sized scales can be scrubbed off with a stiff brush. Prune out heavily infested and sickly branches.

PEACH TWIG BORER: *Anarsia lineatella*

Damage: As the larvae emerge, they migrate up twigs and branches and attack new leaves, blossoms and shoots. As the shoots elongate, the larvae mine the inside of the branch, causing it to die back. As adults, the moths will attack twigs and fruit. During the next generation, the larvae will enter the fruit at the stem and feed on the fruit just under the skin.



Description: Larva – ½” long, white with a black head aging into brown with dark bands around abdomen. Pupa – ¼” long, brown. Moths – 3/8” long, grey body with fringed wings.

Remarks: Peach Twig Borer one of the worst pests for peach trees.

Usually Found: Twigs of peaches, apricots, nectarines and plums. Peach Twig Borers overwinter as larva in the crotches of 1 to 3 year-old wood or in deep cracks in the bark. Larvae emerge just before bloom, usually in April or early May.

If Found: Spray with *Bacillus thuringiensis*, BT, or spinosad at bloom time. A delayed dormant spray can kill overwintering larvae.

EUROPEAN EARWIG: *Forficula auricularia*

Damage: They will eat almost any plant material, as well as lichens, pollen and other arthropods. The damage they cause to gardens is usually minimal.



Description: They are 5/8” long and dark reddish-brown in color. The most distinguishing physical feature is the claw-like forceps on the end of the abdomen.

Remarks: They are active at night and hide during the day in cracks and crevices. They are mainly scavengers and occasionally feed on plants.

Usually Found: Earwigs can be found in large numbers under boards, in tree holes, under decaying bark or wherever it is moist and dark. The eggs are laid in burrows in the ground and most overwinter as adults.

If Found: They do not do much damage to gardens other than be a nuisance. However, if they need to be controlled, diatomaceous earth works great. Keep all leaf litter and plant debris clear of the garden and keep all downspouts in good repair.



ASIAN VINEGAR FRUIT BLY *Drosophila suzukii*

Damage: They will lay their eggs on unripe fruit; larvae hatch and eat the fruit from the inside.

Description: They are very tiny—2-3 millimeters long with red eyes and a straw-yellow body. Males have a distinctive dark spot near the wing tip.

Remarks: They have not yet been found in the Puget Sound area but have been found in Oregon and British Columbia.

Usually Found: These flies can attack soft fruits including berries, cherries, grapes, stone fruit, kiwis, and tomatoes.

If Found: No pesticides have yet been registered for this pest. Floating row covers or apple maggot barriers may be effective but would need to be kept in place until harvest; any gaps could allow the flies access.

PRUNING FRUIT TREES

Many articles and books are devoted to pruning fruit trees. Here is just a brief introduction to some of the techniques. See the last page of this handout for references to more great pruning information.

General Pruning Rules:

- Prune young trees very lightly.
- Prune mature trees more heavily, especially if they've shown little growth.
- Prune the top portion of the tree more heavily than the lower portion.
- Prune when all danger from fall or early winter freeze has passed, but before full bloom in spring. Sweet cherry trees may be pruned in August when there's less danger of bacterial infection.
- Thin out more shoots toward the end of a well-pruned branch in a mature tree. This will increase fruit size and quality on the remaining shoots.
- If pruning to reduce the height of an excessively tall tree, cut out whole limbs at the top, making cuts flush with the collar on a lower limb. Stubs left in the top of a tree won't heal.
- Avoid using asphalt-based sealing compounds.
- Always use sharp tools.

Apples & Pears:

On young trees, prune to produce a strong well-shaped tree. On mature trees, prune primarily to cut out dead, twiggy, or misplaced branches and to thin out the new growth. This will encourage the development of bearing spurs on older wood. Fruit is produced mainly on long-lived spurs. A spur begins producing fruit in its second year and keeps producing for as long as twenty years.

Apricots:

On young trees, prune to produce a strong well-shaped tree. Mature trees require heavy pruning. Fruit is produced mainly on short spurs that formed on the previous year's wood and remain fruitful for about four years. Pruning is directed toward conserving enough spur-producing growth to replace the older spurs that are ready to be cut off.

Cherries:

On young trees, prune to produce a strong well-shaped tree. On mature trees, prune primarily to cut out dead, twiggy, misplaced branches. Fruit is produced mainly on long-lived spurs. A spur begins producing fruit in its second year and keeps producing for as long as twelve years.

Peaches & Nectarines:

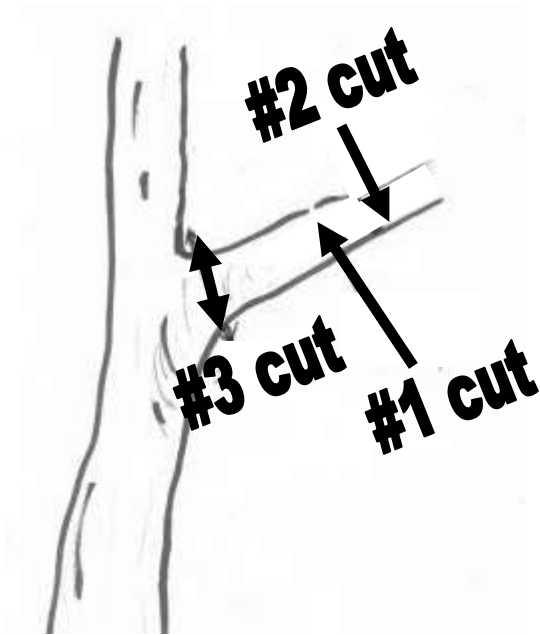
These trees are vigorous growers that benefit from hard pruning. The voluminous new growth of long, willowy shoots bears fruit the following summer. Prune hard to encourage new growth, otherwise, fruit will be produced farther and farther out on the branches each year. Cut off 2/3 of the preceding year's growth either by taking out 2 of every 3 new branches grown (cut off at the base) or by heading back each branch to 1/3 of its length.

Plums & Prunes

Train the young trees to a vase shape. Prune to avoid V-crotches. On mature trees, prune out crossing branches, dead limbs and twiggy stems. Thin out annual shoots if necessary.

Combination Trees

Fruit trees that combine several varieties on the same tree are increasingly popular. Combination trees produce several flavors of fruit, often with different ripening times, in the same space. Moreover, species that needs cross-pollination can be grafted with varieties that will automatically pollinate each other. In general, prune a combination tree as you would a single-variety tree of that species. There are two things to watch for, however. First, make sure not to remove one of your varieties. Second, often one variety in a combination is more vigorous than others. If so, prune that one back more to make sure it doesn't overwhelm the others.



Cutting Large Limbs

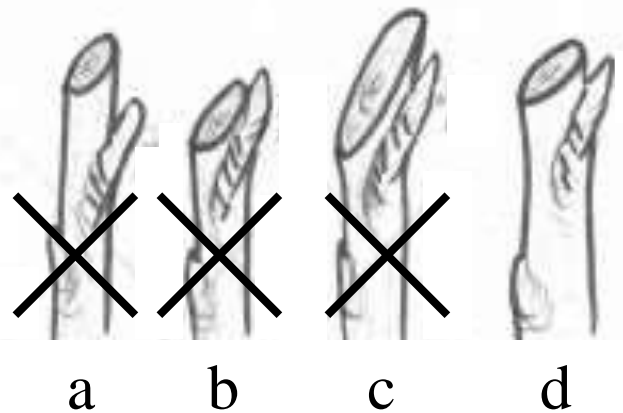
Always work from the larger branches first, then down to the finer cuts. If you have to cut off a large limb, the weight of the limb can cause the branch to split before it is neatly and cleanly cut. Split damage can often leave the woody parts without bark and therefore unprotected. Use this three-step method to prevent damage.

- 1) Make a cut sawing from the bottom up about a third of the way through the branch, 18-20 inches away from the tree trunk
- 2) Make the second cut from the top down 2-4 inches further out on the branch, this time cutting all the way through. The limb will break off but the jagged edge will go no-farther then the first cut.
- 3) Now you can cut the remaining stub flush with the branch collar. This ensures that the tree bark doesn't loosen up near the wound and allow for moisture and bugs to enter.

Making a Clean Cut

The main objective when pruning is to make clean cuts without leaving any stubs. A stub will rot and make the branch vulnerable to infections that eventually can spread throughout the rest of the tree.

- a** - this cut leaves too much of a stub. That stub will rot away, thus again leaving a bigger opening for diseases to enter the branch.
- b** - this cut is too close to the bud. The buds are fragile and can easily be damaged which in turn can make that area on the tree non-growing therefore non-productive
- c** - this cut leaves too much cut surface which gives diseases a bigger area to attack.
- d** - The right way to do a clean cut!



Common Pruning Tools



Hedge Shears



Combination Pole Saw-Pruner



Bow Saw



Pruning Saw w/ Crescent Grip



Lopping Shears



Bypass Pruners



D-Handle Saw



Folding Saw

ADDITIONAL RESOURCES

This information in this booklet was compiled from many sources including Sky Nursery employees and the following sources.

American Horticultural Society Pruning & Training Manual by the American Horticultural Society is a practical handbook to the correct pruning and training of ornamental trees, climbing plants, shrubs, roses, fruit trees, and more.

Plant Amnesty has a lot of information on general pruning tips and techniques. (206) 783-9813 or <https://www.plantamnesty.org/>

Training & Pruning Your Home Orchard, a collaborative publication of WSU, OSU, and UI is a great handbook on training and maintaining fruit trees:
<https://catalog.extension.oregonstate.edu/sites/catalog/files/project/pdf/pnw400.pdf>

The WSU Cooperative Extension has a great website for managing disease and pest problems.
<http://hortsense.cahnrs.wsu.edu/Home/HortsenseHome.aspx>

Seattle Tree Fruit Society brings together amateur growers to experts who share an interest in growing fruit and nut trees, berries, kiwis, grapes, and other fruit. They offer information on adapted varieties, up-to-the-minute growing techniques, and share their own experiences growing fruit. <http://www.seattletreefruitsociety.com/>

Solid Ground helps to organize gleanings parties to harvest unused backyard fruit in the Seattle area and give it to food banks. If you'd like to donate fruit from your trees, contact info@solid-ground.org or Seattle Tilth's Garden Hotline: phone 206.633.0224, email help@gardenhotline.org.

Western Washington Fruit Research Foundation has a demonstration fruit orchard open to the public at the WSU Mount Vernon Research & Extension Unit, 6650 State Route 536, Mount Vernon, WA. Check out their website at <http://nwfruit.org/>

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