

IPM Series: Ornamental Fruit Trees

Symptoms	Possible Causes	Comments/Controls
FOLIAGE	FOR ALL FOLIAR DISEASES: Promptly rake up and dispose of infected leaves. If defoliation was severe the previous season, a registered fungicide can be applied at bud break and at 7- day intervals after petal fall.	
Leaf spots/blotches	<p>Apple and pear scab: olive-brown velvety fungal spots on leaves.</p> <p>Rust diseases: bright yellow or orange spots or fungal growths (cedar-hawthorne, cedar-quince and cedar-apple rust diseases).</p> <p>Pear leaf blister mite: on apple and pear. Small green or yellow pimples turn into reddish-brown blisters. Tiny white or light-red mites can be seen on leaf undersides with a hand lens.</p> <p>Cherry leaf spot: small purple fungal spots on leaf surfaces. Leaves develop holes and turn yellow. Infected leaves often drop.</p> <p>Plum leaf spot: fungal leaf spot similar to cherry leaf spot but spots are smaller.</p>	<ul style="list-style-type: none"> •Plant resistant varieties. Rake up and discard all leaves, fruit and debris. •Plant resistant varieties. Do not plant cedar trees, the alternate host of the disease •Apply dormant oil spray before bud break in the spring. •Plant resistant varieties. •Plant resistant varieties.
	Burning from herbicide, pesticide, or fertilizer: light-colored spots from direct contact. Random or regular pattern of browning.	<ul style="list-style-type: none"> •Follow mixing directions carefully. Apply on windless days. Shield valuable plants.
White powder on leaves and buds	Powdery mildew: white surface growth on leaves that may cause distortion.	<ul style="list-style-type: none"> •Plant resistant varieties. Rake up fallen leaves in the fall. Remove damaged shoots and prune for improved air circulation. If powdery mildew was a problem the previous year, spray with wettable sulfur at bloom. Another option is to check horticultural oil labels for powdery mildew control listings.
Leaf yellowing or browning	<p>Spider mites: period-sized pest feeds mostly on leaf undersides, causing stippling and bronzing. Damage is more severe during hot weather.</p> <p>San Jose scale: gray to brown scale covers (1/16") with central yellowish white bump. Found on bark where leaf wilting and dieback are first noticed. Yellow crawlers are present in early June, late July, and early September. Covers of</p>	<ul style="list-style-type: none"> •Spray with dormant oil during pre-bloom period. Avoid broad-spectrum insecticides that kill mite predators and often worsen the problem. •Produces a toxin that turns inner bark red. Light infestations may cause leaf wilting and branch dieback. Heavy infestations may kill trees. Prune off infested branches showing dieback. Spray with a dormant oil to control light infestations. For

overwintering immatures are gray with white central rings.

Green peach aphid: leaves curl, yellow and drop. Aphids secrete honeydew which may lead to sooty mold on foliage.

Fireblight: bacterial disease that causes entire shoots to quickly die. Leaves turn brown/black but do not fall off. Shoot tips may curl over giving a “shepherd’s crook” appearance.

Cankers, Phytophthora, Verticillium wilt, Armillaria root rot: dark or loose bark usually sunken. Fungal growth sometimes visible under loose bark.

Excessive water: older leaves uniformly yellow.

Drought stress: first observed on newer growth.

heavy infestations, use a summer oil spray when crawlers are active.

- Primarily an early-season problem. A strong water spray will dislodge aphids. Apply a dormant oil spray at bud swell.

- Plant resistant varieties. During the growing season, prune out infected parts using the “ugly stub” pruning method. (See tip at end of this publication.) Otherwise, dormant pruning of cankers is recommended. Spray Bordeaux or fixed copper spray at bud break for severe infections. Reduce or eliminate nitrogen applications.

- Remove tree.

- Modify soil for better drainage.

- Keep trees well watered during extreme drought.

Leaf scorching /marginal burning

Pesticide burn: including soaps and oils. Stressed plants are more likely to be burned. Emulsifiable concentrates are more likely to burn than wettable powders.

Damage from herbicides (including dicamba and glyphosate): stunted, offcolor growth caused by drift onto foliage or absorption by roots.

Drought stress: marginal browning.

Fertilizer burn/root damage: upper leaves affected first. Excessive fertilizer applications can cause root dieback.

- Leaf margins are affected first. Leaves are particularly susceptible to burn when temperatures exceed 80-85°F. Copper, sulfur and other fungicides may cause leaf burn.

- Symptoms from fall-applied herbicides may not appear until spring.

- Upper leaves affected first. Irrigate during dry weather.

- Excessive fertilizer salts will cause root dieback. Avoid over-application of fertilizers.

Leaves curled, twisted or rolled

Green apple aphid, rosy apple aphid: also feeds on buds. Black sooty mold growing on honeydew excretions may be observed.

Peach leaf curl: fungal disease on unfolding leaves in spring. Leaves are thickened, malformed and brightly colored (purple, red, orange). Severe when spring weather is cool and wet. May cause significant defoliation.

Herbicide injury: new growth appears twisted and curled.

- Early season problem. Aphids spread fireblight. A strong water spray will dislodge aphids. Reduce or eliminate nitrogen applications.

- Apply a pre-bloom spray of liquid-lime sulfur on all tree parts. If leaf curl was severe the previous year, apply Bordeaux mixture before buds swell in the spring.

- Tree should recover from moderate damage.

Leaves with black/sticky coating

Sooty mold: fungal growth on honeydew (sticky excrement) from aphid or soft scale feeding.

- Spray a summer rate of horticultural oil to control aphids. Apply a dormant spray of horticultural oil to control soft scale infestations.

Holes in leaves

Shothole: disease on Prunus species. Brown spots on leaves eventually fall out leaving circular holes.

- Disease rarely affects health of tree.

Leaves chewed	<p>Various caterpillars: holes in leaves or portions of leaves missing.</p> <p>Japanese beetles: skeletonize leaves.</p>	<ul style="list-style-type: none"> •Inspect trees throughout the growing season. Handpick or spray young larvae with a B.t. product. •Handpick or use a registered insecticide if necessary.
Serpentine trails or blotches in leaves	<p>Various leafminers (maggots or small caterpillars): feed between the upper and lower leaf surfaces.</p>	<ul style="list-style-type: none"> •Control is difficult on large trees. Usually no control is necessary. Pick off infected leaves if damage is significant.
Webbed or tented foliage	<p>Tent caterpillars, webworms, leafrollers and leaf tiers: various caterpillars found within webbed leaves or silken tents.</p>	<ul style="list-style-type: none"> •If numerous caterpillars are present, use a B.t. product when the caterpillars are small. Knock down or prune out webs on terminal branches and destroy caterpillars.
Wilted foliage	<p>Oriental fruit moth: 3/8-inch long larvae with brown-black head bores several inches into new shoots. Larvae overwinter in soil under tree. Young, rapidly growing trees more severely affected.</p> <p>Peachtree borer: (primarily on peach, cherry and nectarine.) White larvae 1 1/4 inches long with brown head. Female adult clear wing moth is large, with a black band on the tip of each front wing. Larvae feed in tunnels below bark at base of tree and overwinter, renewing activity in early spring.</p> <p>San Jose scale: gray to brown scale covers (1/16") with central yellowish white bump. Found on bark where leaf wilting and dieback are first noticed. Yellow crawlers are present in early June, late July, and early September. Covers of overwintering immatures are gray with white central rings.</p> <p>Drought stress: foliage wilts, droops and drops prematurely.</p> <p>Root damage: freeze, drought, mechanical injury or root diseases.</p> <p>Wet, poorly drained/heavy clay soils: limits root growth. May also lead to root diseases.</p> <p>Dry sites/insufficient watering: especially important for newly transplanted trees.</p>	<ul style="list-style-type: none"> •Prune out and dispose of wilted tips 6 inches below visible damage. Shallow cultivation around base of tree 2 weeks before bloom can expose overwintering larvae for removal or natural predators. •Larvae can be speared with thin wire inserted into holes. If no sap is oozing from holes and frass is observed, beneficial nematodes may be used for control. One or two borers can kill a tree. •Produces a toxin that turns inner bark red. Light infestations may cause leaf wilting and branch dieback. Heavy infestations may kill trees. Prune off infested branches showing dieback. Spray with a dormant oil to control light infestations. For heavy infestations, use a summer oil spray when crawlers are active. •May lead to twig and limb dieback. Provide adequate water during summer and fall months. •Prune out affected areas and keep trees well-watered and protected. •Select suitable, well-drained planting sites. Standing water drowns roots. •Keep young and newly transplanted trees well watered.

SHOOTS, BRANCHES, TRUNK

Shoots wilt and bend at ends (shepherd's crook); sunken, black or wine-colored cankers	<p>Fireblight: bacterial disease that causes entire shoots to quickly die. Leaves turn brown/black but do not fall off. Shoot tips may curl over giving a "shepherd's crook" appearance.</p>	<ul style="list-style-type: none"> •Plant resistant varieties. During the growing season prune out infected parts using the "ugly stub" pruning method. (See tip at end of this section.) Otherwise, dormant pruning of cankers is recommended. Spray Bordeaux or fixed copper spray at bud break for severe infections. Reduce or eliminate nitrogen applications.
Dark, sunken cankers; gummosis may be observed	<p>Various fungal and bacterial diseases (especially Cytospora canker): Enters through insect feeding or lawnmower wounds, frost cracks, or hail damage.</p>	<ul style="list-style-type: none"> •Prune out and dispose of infected wood below visible damage. Prune on dry, warm days in early spring. Do not leave stubs. Fertilize only in late winter or early spring. Apply outdoor white latex paint to trunk and large branches after leaf fall to prevent frost cracks.

White, woolly, waxy material on new growth

Woolly Apple Aphid: dark aphids under fluffy white wax on exposed roots, wounds on trunks and branches, and at the bases of new shoots. Heavy infestations on the roots of small trees may kill them. Heavy infestations on large trees may deform twigs and branches and cause the trees to be unthrifty.

- Usually controlled by parasitic wasp (*Aphelinus mali*). Horticultural oil or soap sprays in spring reduce large infestations until wasps appear. Parasitized aphids turn into black mummies and the white wax disintegrates.

Silken webs/tents in branch crotches

Eastern Tent Caterpillar: caterpillars found within silken tents.

- If caterpillars are numerous, use a B.t. product when the caterpillars are small. Be sure to penetrate the webs. Manually destroy the web contents in the evening during April. Prune out egg masses during the dormant season. (Egg masses look like black styrofoam on twigs.)

Black, gnarled swellings along twigs and branches

Black knot: (*Prunus* species) fungal disease of plum and cherry.

- Prune out and dispose of infected wood below visible damage.

Gum oozes from holes at base of trunk or lower branch crotches; sawdust-like frass may be observed.

Peachtree borer: (primarily on peach, cherry and nectarine.) White larvae 1 1/4 inches long with brown head. Female adult clear wing moth is large, blue and orange, with a black band on the tip of each front wing. Larvae feed in tunnels below bark at base of tree and overwinter, renewing activity in early spring.

Stress: weakens tree and makes it more susceptible to insect and disease problems.

- Larvae can be speared with thin wire inserted into holes. If no sap is oozing from holes and frass is observed, beneficial nematodes may be used for control. One or two borers can kill a tree.

- Gummosis is extruded sap from any damaged area of the bark especially from insect borers.

Numerous small round holes in twigs and branches (gum may be evident)

Shothole borers: numerous tiny holes along branch or trunk caused by small beetles.

- Remove and destroy infested wood promptly.

Shoot/twig/branch wilting/dieback

Oriental fruit moth: 3/8 inch long, larvae with brown-black head. Bore several inches into new shoots. Larvae overwinter in soil under tree. Young, rapidly growing trees more severely affected.

San Jose scale: gray to brown scale covers (1/16") with central yellowish white bump. Found on bark where leaf wilting and dieback are first noticed. Yellow crawlers are present in early June, late July, and early September. Covers of overwintering immatures are gray with white central rings.

Fireblight: bacterial disease that causes entire shoots to quickly die. Leaves turn brown/black but do not fall off. Shoot tips may curl over giving a "shepherd's crook" appearance.

Root damage, drought or mechanical injury: affects water and nutrient uptake.

Wet, poorly drained soil: limited root growth.

Herbicide damage: stunted offcolor growth.

- Prune out and dispose of wilted tips 6 inches below visible damage. Shallow cultivation around base of tree 2 weeks before bloom can expose larvae for removal or natural predators.

- Produces a toxin that turns inner bark red. Light infestations may cause leaf wilting and branch dieback. Heavy infestations may kill trees. Prune off infested branches showing dieback. Spray with a dormant oil to control light infestations. For heavy infestations, use a summer oil spray when crawlers are active.

- Plant resistant varieties. During the growing season prune out infected parts using the "ugly stub" pruning method. (See tip at end of this section.) Otherwise, dormant pruning of cankers is recommended. Spray Bordeaux or fixed copper spray at bud break for severe infections. Reduce or eliminate nitrogen applications.

- Prune out affected areas and keep trees well-watered and protected.

- Select suitable, well-drained planting sites.

- Avoid spray drift.

Twigs/limbs broken or injured	Ice, wind or hail damage: disease cankers may develop. Small twigs may be pruned by squirrels for nest-building.	<ul style="list-style-type: none"> •Prune out affected parts.
Bark cracked longitudinally, usually on south or west side	Frost/freeze cracks, sunscald: due to differential freezing and thawing of water in tree.	<ul style="list-style-type: none"> •Consider wrapping trunks of young trees. Apply outdoor white latex paint to trunk and large branches after leaf fall to prevent frost cracks.
Trunk gouged or scarred	<p>Lawn mower or string trimmer injury: bark removed near base of tree.</p> <p>Embedded wires or collars: from tree support apparatus left on too long.</p>	<ul style="list-style-type: none"> •Can lead to disease and borer problems. Mulch a wide circle around the tree but keep the mulch 6 inches from the trunk and less than 3 inches deep. •Remove wires or collars embedded in the trunk. If they cannot be pulled out, cut the wire or collar in several places to relieve the pressure.
Small reddish-brown and black bumps on 1-3 year old wood	Lecanium scale: reddish-brown to black, 3/8 inch long bumps usually found on young wood.	<ul style="list-style-type: none"> •Scrape off small colonies by hand. Spray with dormant oil and prune out damaged wood.
Roughened bark, clusters of hard, gray-colored specks	San Jose scale: gray to brown scale covers (1/16") with central yellowish white bump. Found on bark where leaf wilting and dieback are first noticed. Yellow crawlers are present in early June, late July, and early September. Covers of overwintering immatures are gray with white central rings.	<ul style="list-style-type: none"> •Produces a toxin that turns inner bark red. Light infestations may cause leaf wilting and branch dieback. Heavy infestations may kill trees. Prune off infested branches showing dieback. Spray with a dormant oil to control light infestations. For heavy infestations, use a summer oil spray when crawlers are active.
White encrustations on large branches and trunk	White peach scale and white prunicola scale: crawlers feed on foliage. High populations can cause branch dieback, especially on Japanese flowering cherry.	<ul style="list-style-type: none"> •Apply a dormant rate horticultural oil spray before bud break. For light infestations, scrape away scales with a soft brush.
Water sprouts, small vertical shoots along a branch or trunk	Response to environmental stress or removal of large branches and limbs: excessive green shoot growth.	<ul style="list-style-type: none"> •Promptly pull or cut all water sprouts at point of attachment.
Suckers, proliferation of young shoots.	Numerous green shoots: at base of tree, grow from root stock.	<ul style="list-style-type: none"> •Promptly pull or cut at point of attachment.
Shoots chewed, trunk girdled, bark stripped from trunks and branches	Deer feeding and antler rubbing by bucks: worse during very cold snowy winters.	<ul style="list-style-type: none"> •Where appropriate, electric fences are very effective. Repel deer by hanging one or more of the following from mesh bags on trees: small soap bars, human hair, or dried blood meal. Commercial repellents are also available.
Roots and base of young trees chewed	Voles (meadow mice), rabbits: nest in mulch, weeds and plant debris around trunk. More serious problem during very cold winters.	<ul style="list-style-type: none"> •Keep grass mowed and mulch pulled back from trunk. Place tree guards (18 inch high cylinders formed from hardware cloth) around trees which should extend 2-3 inches below the soil line. Use mouse traps to reduce vole populations.
Bulging or deformity of trunk at graft union	Scion wood overgrows or undergrows the rootstock: causes an enlarged swelling.	<ul style="list-style-type: none"> •Normal on grafted trees. Remove all suckers that arise below the graft union. If graft union is damaged or killed, sucker growth may outgrow desired scion stock.

FLOWERS/FRUITS

Blasted or damaged blooms

Winter kill of buds: sustained cold temperatures.

Spring frost damage to buds and flowers: trees may leaf out without flowering. Leaf buds are hardier than flower buds.

Misuse of dormant oil sprays or pesticide sprays: may kill leaf and flower buds.

- Avoid planting in low areas or frost pockets. If possible, apply overhead irrigation prior to frost to reduce freeze damage.

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- Over-spraying pesticides, especially dormant oil, and liquid lime-sulfur, may damage buds and blooms. Sprays should be applied when temperatures are expected to be above 40°F for 24 hours. Do not apply oil sprays 30 days before or after pesticide applications such as captan, carbaryl, dimethoate, or products containing sulfur. Check product label carefully.

Blossom drop

Spraying pesticides on open blooms: may damage tender tissue.

Water stress: may cause desiccation of buds.

Stressful conditions: drought, wind, low temperatures.

Over-use of nitrogen fertilizers prior to bloom period: promotes excessive vegetative growth.

- Over-spraying pesticides may damage buds and blooms. Follow label directions.

- Irrigate during dry periods.

- Avoid planting in problem sites.

- Reduce applications of high nitrogen fertilizers.

Failure to flower

Winter kill of buds: sustained cold temperatures.

Spring frost damage to buds and flowers: trees may leaf out without flowering. Leaf buds are hardier than flower buds.

Low light conditions

Over-use of nitrogen fertilizers prior to bloom period: promotes excessive vegetative growth.

Severe pruning: will reduce number of blooms.

- Avoid planting in low areas or frost pockets. If possible, apply overhead irrigation to reduce freeze damage.

- Avoid planting in low areas or frost pockets. If possible, apply overhead irrigation prior to frost to reduce freeze damage.

- Follow proper thinning and pruning guidelines. Situate plantings for optimum light exposure.

- Avoid excessive nitrogen application.

- Do not prune spring flowering trees after July.

Spots on fruits

Scab: olive-brown velvety fungal spots on fruit. Lesions become corky.

Fireblight: bacterial disease that causes brown spots. Fruit eventually shrivels.

- Plant resistant varieties. Rake up and discard all leaves, fruit and debris.

- Plant resistant varieties. During the growing season prune out infected parts using the “ugly stub” pruning method (see tip at end of this section). Otherwise, dormant pruning of cankers is recommended. Spray Bordeaux or fixed copper spray at bud break for severe infections. Reduce or eliminate nitrogen applications.

Orange growths on fruit

Rust: on Hawthorne, crabapple and Bradford pear fruit.

- Plant resistant varieties. Do not plant cedar trees, the alternate host of the disease.

The IPM Approach to Preventing and Managing Pest Problems

Ornamental flowering fruit trees in this publication include plum, peach, apricot, hawthorn, cherry, crabapple and pear. All belong to the rose family of plants. They make attractive ornamental specimens but are subject to many problems such as insects, diseases, weather extremes, and wildlife.

To grow ornamental flowering fruit trees successfully, you must keep the trees healthy by anticipating and managing problems or preventing them altogether. When symptoms are noticed you must be able to accurately identify the problem (e.g. weed, insect, disease), monitor for changes (e.g. increasing severity) and be prepared to act. Preventive techniques and control measures may be physical (e.g., hand-picking Japanese beetles), cultural (e.g. pruning to improve air circulation) or chemical (e.g. spraying horticultural oil to control San Jose scale crawlers and aphids).

Most diseases are generally favored by wet seasons. Pest problems tend to be worse in areas where there are a significant number of active or abandoned orchards. Be aware, however, that a large number of the problems observed each season by gardeners are cultural and environmental. These abiotic problems include: incorrect moisture level, nutrients, plant spacing, sunlight, support, soil, pH, temperature extremes, and root damage from cultivation. Choosing inappropriate varieties and purchasing poor quality trees also contribute to problems.

The integrated pest management (IPM) approach to preventing or managing pest problems is recommended and can be summarized as follows:

- 1. Correctly identify the problem; if insect or disease, learn the life cycle and habits.**
- 2. Learn to anticipate and prevent problems; reduce plant stress.**
- 3. Monitor the problem for worsening symptoms.**
- 4. If level of damage becomes unacceptable, choose a least toxic control.**

Pesticides may still be required using the IPM approach, but you may reduce the number of sprays through monitoring and good sanitation practices.

Cultivar Selection and Planting

Before you plant your first tree, prevent problems by following these pointers:

- Make sure the species or varieties are well adapted to soil, water, light, heat, wind and other prevailing conditions where they will be planted.
- Select varieties that have resistance to diseases and pests you are likely to encounter.
- Avoid poor quality bargain plants.
- Look for trees that are free of insects, diseases, cankers, wounds, etc.

- Make sure the roots aren't kinked or circling the trunk, and that they aren't a solid mass (pot bound).

Fertilizing

- Ornamental flowering fruit trees, like most plants, need the nutrients nitrogen, potassium and phosphorous in the greatest quantities. The latter two are needed in relatively large amounts when the tree is young. After the trees reach maturity only nitrogen may be required.
- One month after planting, broadcast 8 ounces of 10-10-10 fertilizer over a 2 foot circle. Keep the fertilizer 6-inches away from the trunk and broadcast it evenly. **Do not put any fertilizer in the hole before planting.** In June following planting, broadcast another 8 ounces of 10-10-10 around your tree.
- Organic fertilizers and composted farm manure and yard waste can be substituted for chemical fertilizers. Foliar applications of seaweed extract, compost tea, or fish emulsion are beneficial, especially when new growth begins in the spring and during bloom.
- Most ornamental flowering trees are fertilized in early spring. Late summer and fall fertilization may interfere with the hardening-off process and lead to winter damage.
- Over-fertilization, regardless of the nutrient source, can produce weak growth or make plant more prone to attack by diseases and sap-sucking insect pests.

Watering and Mulching

- Water newly planted trees to a 6-8 inch depth 2-3 times each week during the first growing season. This amount can be reduced if rainfall is plentiful. A small ridge of soil may be formed around each tree to prevent runoff. Remember, young trees need adequate moisture in the fall to overwinter successfully.
- Trees up to 4-5 years in age are still very susceptible to drought stress and need to be watered deeply during dry periods.
- Keep organic mulch around your trees during the growing and dormant seasons. Mulch should be kept 6 inches away from tree trunks to prevent vole damage, borer problems, and trunk diseases.

Pruning and Training

Proper pruning can help prevent or minimize pest problems by:

- allowing sunlight and spray materials to enter the center of the tree.
- improving tree strength and inducing branching.
- improving air circulation within the tree, thus reducing the potential for foliar disease.
- removing dead or broken branches which may encourage disease/insect problems.

Protecting Trees From Wildlife and Mechanical Damage

- Protect young trees from vole damage by surrounding the lower trunk with hardware cloth, which should extend 2-3 inches below soil level.
- Ornamental flowering fruit trees may need protection from deer. Use hardware cloth to loosely enclose the trunks of trees vulnerable to deer feeding.
- Where deer pressure is heavy, try rotating various commercial repellents. Hanging small cakes of deodorant soap from branches may also be helpful. Predator urine has not proven effective in Maryland.
- Protect trees from lawn mower and string trimmer damage. Place a **thin layer of mulch** in a wide circle around the trunk to eliminate the need for close trimming of unwanted grass.

Anticipating and Preventing Problems

- Anything that stresses an ornamental flowering fruit tree may encourage insect (especially borers) and disease problems. Stressors include drought, physical damage to the trunk, compacted or poorly drained soil, defoliation, winter damage, poor planting stock, etc.
- Prune out water sprouts and root suckers.
- Keep weeds cut down in and around your fruit plantings to remove favorable habitats for pests.
- Control insect pests like thrips, aphids, and leafhoppers that vector (spread) diseases.
- Spray on a schedule for serious, predictable diseases, or consider replacing the tree with a resistant variety.
- Stone fruits (cherries, peaches, plums, apricots) tend to have shorter lives than pome fruits (apples and pears). The useful life of a peach tree, for example, is 12 to 15 years.

Troubleshooting a Declining Tree

Examine the 6-8 inch area just above and below the soil line and look for the following:

1. **Is there evidence of vole feeding?** Voles (meadow mice) can girdle and kill a tree. Damage is more likely during a cold winter with deep snow cover.
2. **Are heavy gum deposits present?** Peachtree borers are associated with heavy gummosis along the lower trunk and may extend below the soil level. Gummosis is extruded sap from any damaged area of the bark. The tree produces the gum as an attack response to the borer.

3. **Do you notice cankers and browning of the tissue under the bark?** Scrape away some of the tree bark (especially on the most symptomatic side of the tree). This indicates Phytophthora root rot or Verticillium wilt. These soil-borne fungal diseases are more prevalent on wet soils. The foliage of infected trees tends to yellow gradually and drop during the summer.
4. **With the bark scraped away, can you see white, fan-shaped fungal mats between bark and wood?** This is Armillaria root rot. Infected trees tend to collapse in mid-summer.
5. **Is the bark spongy and thickened?** With the bark scraped away, small pits or grooves in the wood indicate stem pitting (tomato ringspot) virus which is spread by weeds and nematodes.

Fighting Fireblight with the “Ugly Stub” Method

The fireblight bacterium is a systemic pathogen that can move rapidly into healthy tree tissue. Backyard orchardists are often unaware that pruning out infected shoots and limbs during the growing season can further spread the disease. Follow these pruning guidelines to improve fireblight control:

1. Use very sharp pruning tools to remove infected limbs 8-12 inches below visible symptoms. Always sterilize pruning shears.
2. Do not cut all the way back to healthy wood, but leave an “ugly stub” around 4-6 inches. (The bacterium will colonize the ends of these pruning cuts and produce cankers, which serve as a source of inoculum for continued infection).
3. Mark the stubs to make it easier to locate them. Remove and dispose of the “ugly stubs” during dormant pruning (November-January).

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References:
Davidson, J.A. and M.J. Raupp. 1999. Landscape IPM, Bulletin 350, MCE, University of Maryland.

Protect the Bay • Use Pesticides and Fertilizers Wisely

ALWAYS READ THE PESTICIDE LABEL AND FOLLOW ALL DIRECTIONS AND SAFETY PRECAUTIONS.

Mention of trade names does not constitute an endorsement by the Maryland Cooperative Extension, University of Maryland, College Park, MD.

**Have a home pest or garden question?
Call the Home and Garden Information Center**

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