

SPRAYING OF HOME FRUIT TREES FOR DISEASE PREVENTION

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Many diseases affect the more common fruit trees (peach, nectarine, apricot, cherry, plum, apple and pear) of the Sierra foothills region. Most are caused by fungi, bacteria or viruses. Due to the limited time for this presentation, however, I will discuss only several of the most prevalent fungal and bacterial diseases occurring in our area.

Many of the diseases which affect the roots and crown of the trunk and branches of fruit trees have no effective chemical methods of prevention or treatment. Chemicals, including various fungicides and bactericides, are most effective when aimed at controlling diseases which affect the fruit, blossoms, foliage and twigs of the tree. When these parts of the tree are infected, localized lesions are produced on the affected structures and if the infection becomes severe and larger in area, shoots and/or branches may die, especially on young developing tissues.

Fruit trees are especially susceptible to infection during bloom because flowers provide a good entry point for pathogens (microscopic organisms that cause disease). Infections may also occur later when water wetting the tree's canopy following rain or sprinkler irrigation spreads pathogens and creates favorable conditions for infection. Honey bees and other insects also spread the organisms.

Materials acceptable for use as fungicides or bactericides on fruit trees include copper, sulfur, Bordeaux - a mixture of blustone (copper sulfate) and lime (calcium hydroxide) - and fungicidal soaps. When using any of these compounds, follow the label instructions and precautions faithfully to avoid complications occurring to the fruit tree or injury to yourself.

1. FUNGAL DISEASE

A. Coryneum Blight

1. Synonyms: shot hole disease, peach blight
2. Causal Organism: *stigmina carpophila*
3. Affects peaches, nectarines, apricots and almonds; rarely found on other stone fruits in California.
4. A major disease in California
5. What problem looks like:
 - a. Small, round, purplish spots occur on leaves and fruit
 - b. Spots enlarge to about 1/8" to 1/4"
 - c. Centers of leaf spots turn brown and then fall out; when centers fall out, leaves have many "shot holes"
6. Occurs in years when long periods of rain, fog or dew occur during winter and spring
7. Peaches and Nectarines:
 - a. Unprotected trees may be severely injured
 - b. Most damage secondary to twig and bud death; lesions usually don't cause significant damage to fruit, flowers or leaves.
 - c. Fungus invades bud and twigs any time from autumn to spring
 - d. Most peach cultivars grown in California susceptible:
 1. Elberta peach very susceptible
 2. Clingstone cultivars more likely to be infected than Freestone types

8. Apricot:

- a. Most damage caused by fruit and leaf infection
- b. Common Cultivars, Blenheim and Tilton, very susceptible
- 9. Chemical Control (spraying)
 - a. Use Bordeaux or any of the many mixed copper sprays available which contain 50% actual copper
 - b. Apply to dormant trees in late autumn (after leaf fall but before heavy winter rains, by mid November to early December) to protect against twig and bud infection.
 - c. One application usually is sufficient for peach; if an extremely wet year, do another application at bud swell, but before bloom
 - d. Apricot should have another application at bud swell, but before bloom, to prevent severe fruit and leaf infection.

B. Leaf Curl

- 1. Synonyms: peach leaf curl, curly leaf
- 2. Causal organism: *Taphrina deformans*
- 3. Affects peaches and nectarines
- 4. What problem looks like
 - a. Reddish or yellowish areas appear on first spring leaves
 - b. These areas progressively thicken and pucker causing leaf to curl and become crisp in texture
 - c. Most leaves fall
 - d. After leaf drop, a second crop of leaves produced which decreases tree growth and fruit production
 - e. If disease is uncontrolled for several years, tree may die
- 5. Disease potential greatest in years when excessive or long winter and spring rainfall occur.
- 6. All peach and nectarine cultivars susceptible.
 - a. Most susceptible Freestone peaches: Elberta variety, followed by J.H.Hale and Rio Oso Gem.
 - b. Most susceptible Clingstone peaches: Gaume, Dixon, Paloro, Klamt, Andross and Carolyn.
- 7. Chemical control:
 - a. Use Bordeaux or any of the many fixed copper sprays available which contain 50% actual copper.
 - b. Apply to dormant trees after leaf fall about November 15th.
 - c. If disease has been allowed to build up or if winter rainfall has been especially heavy, do another application at bud swell, but before bloom.
 - d. Full tree coverage essential
 - e. Effective control necessitates regular, annual treatment.

C. Brown Rot (American Brown Rot)

- 1. Casual organism: *Monilinia fructicola*
- 2. Primarily affects peaches, nectarines and plums
- 3. Usually causes fruit rot (both pre and post harvest) and this is the primary problem of the disease; however, it may cause blossom and twig blight in early spring.
- 4. What problem looks like:
 - a. Begins as dark brown, circular spots that spread rapidly over the mature fruit
 - b. Affected tissues remain relatively firm and dry.
- 5. Most infection occurs within last 4 weeks before fruit harvest; fungus invades uninjured mature fruit through hair (trichome) sockets.
- 6. Although epidemic of fruit rot may follow a brief summer rain, it may appear during a rainless period.
- 7. Chemical control:
 - a. For blossom protection:

1. At bud swell, but before bloom, apply a fixed copper spray which contains 50% actual copper, AND
 2. At 70% bloom, apply either Captan 50% wettable powder (W.P.) or Benlate 50% W.P.
- b. For fruit protection: a fungicide must be applied before free moisture occurs on the fruit.

II. BACTERIAL DISEASE

A. Fireblight

1. Synonyms: Blossom Blight, pear blight
2. Causal organism: *Erwinia amylovora*
3. Affects pear, apples and quinces
4. Most serious disease of European and Asian pears in California
5. What problem looks like:
 - a. Symptoms first appear on blossoms which wilt, followed by shriveling, blackening of blossoms and death
 - b. From blighted blossom, the bacteria may move into twigs and branches.
 - c. The resultant infected leaves and small shoots wilt and turn black (pears) or brown (apples, quinces); the affected parts look as if they were scorched by fire - thus the name fireblight.
6. The disease develops (from bacteria overwintering in blighted twigs and cankers) as soon as the trees begin active growth during the cool weather of early spring, especially during periods when intermittent rain and hail occur.
7. Pear varieties most susceptible to disease include red varieties Starkrimson, Sensation Red Bartlett, Bartlett, Bosc, Hardy and most Asian pear varieties.
8. Most susceptible apple varieties include Jonathan, Fuji and Rhode Island Greenings.
9. Chemical control:
 - a. Use a 50% powder, fixed copper spray
 - b. Apply at bloom period; starting at 5% bloom, treat every five days throughout the bloom period when such weather conditions exist.

B. Bacterial Canker and Blossom Blast

1. Synonyms: bacterial gummosis, sour sap, bacterial blast
2. Causal organism; *Pseudomonas syringae* van Hall
3. Although the organism is present on many plant species worldwide, it usually does not cause disease in the plants in which it lives. However, it may cause serious infections in almonds, Asian pears, and stone fruits (apricots, cherries, nectarines, peaches, plums).
4. A poorly understood disease that has two distinct presentations:
 - a. A canker phase which causes young trees to wilt and collapse after leaf out, AND
 - b. A blast phase which kills blossoms in the spring
5. In Sierra foothills, the canker phase commonly affects almonds, Asian pears and stone fruits.
6. What problem looks like:
 - a. Trees collapse in late spring after leaf out.
 - b. The disease induces bark cankers which form on the spurs, branches and trunk; the cankers are irregularly-shaped, brown, water soaked or gum-soaked areas which are darker than the adjacent healthy bark.
 - c. The diseased tissue lying beneath the canker is reddish-brown, moist and may be sour smelling.
7. In Sierra foothills, the blast phase of the disease has sporadically occurred in pears (the disease being called blossom blast in pears: and almonds; it may also occasionally occur in stone fruits.
8. What problem looks like:

- a. Brown to black circular areas of tissue death 1/12" to 1/6" in diameter, with a reddish-yellow halo surrounding the area, rapidly develop on the blossoms and leaves.
 - b. Although these symptoms may look like fireblight, the tissue death occurring in blossom blast seldom extends far into the spur or supporting branch
9. Chemical control: Consistent, reliable methods for preventing bacterial canker and blossom blast have not been developed.

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