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Backyard orchard management: insect and disease guide

¹C.E. Swift

Quick Facts

Wormy apples and pears are caused by the codling moth.

Spray apples and pears with Diazinon every 10 to 14 days during the summer to have worm-free fruit.

Peach twig borer can cause severe twig dieback and damage to fruit of peach, apricot and plum if not controlled.

Treat peaches, apricots, nectarines and plums in July and August to control peach tree borer (crown borer).

Never spray insecticides when the tree is in bloom; they will kill the bees that pollinate the blossoms.

Author's note: This fact sheet contains up-to-date information for homeowner control of insect and disease problems on tree fruits. Insect and disease controls have been combined in an easy-to-follow format. Recommended chemicals usually are readily available to homeowners. In some cases, the concentration of the product listed and what is available locally may differ. Always read the label directions. Labels often are updated yearly or more often. If there is a conflict between recommendations in this fact sheet and the product label, always follow the product label. Restricted use chemicals (for use by certified applicators only) are not included.

Introduction

Insect control on fruit trees should begin with prebloom sprays (dormant or delayed dormant) for scale insects, aphids and mites. Applications of a dormant Supreme or Superior type oil in combination with Diazinon or Thiodan will control these insects if applied any time during late winter or early spring, before buds open. Do not apply dormant oil if a heavy freeze is expected, damage to the tree could occur.

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The amount of spray to apply should be based on the size of the tree (except when mentioned otherwise). A tree 20 feet in diameter and 20-feet tall needs 4 gallons of prepared spray; 3 gallons for a tree 15 feet by 15 feet; 2 gallons for a tree 10-feet by 10-feet; and one gallon of diluted spray for a tree 5 feet by 5 feet.

Apples and Pears

For pears, apply a dormant spray to help control pear psylla (reported in western Colorado, Fremont County and the Fort Collins area). Spray trees with a mixture of water plus Superior oil and either Thiodan or Diazinon when pear psylla egg-laying first begins. This usually occurs the first to second week in March. In areas of Colorado where psylla is not reported, apply dormant oil plus Diazinon or Thiodan to control scale insects, aphids and mites.

Apples also should have a dormant spray of oil plus Diazinon or Thiodan applied to control mites, aphids and scales. Apples and pears need additional summer treatments of Diazinon to control codling moth. Avoid using Sevin (carbaryl). This insecticide can thin fruit in early season and kill mite predators, which leads to mite buildups later in the season.

LATE MARCH: mites, scales, aphids and pear psylla.

What: Scale insects, mites, aphids overwinter on apple and pear trees. Psylla will be present on pear trees as early as January. A spray applied in late March just after pruning will help control these pests. Spray apples and pears with a mixture of dormant oil plus Diazinon or Thiodan.

How: In each gallon of water mix 5 tablespoons Superior or Supreme oil and one of the following: 2 teaspoons 25% Diazinon liquid concentrate, 1 tablespoon Diazinon 50WP (wettable powder), 1 tablespoon Thiodan 50WP, or 2 teaspoons Thiodan 3 E.C.

Prebloom (before bloom): (Powdery mildew on Jonathan, Rome, MacIntosh, Golden Delicious, Akane, Granny Smith, Yellow Transparent and Lodi apples)

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What: Powdery mildew shows up as a grayish-white powdery coating on terminal shoots and leaves. Do not confuse this with the normal hairiness of twigs and leaves. Powdery mildew is mostly a problem on Jonathan, Rome, Akane, Granny Smith and Yellow Transparent (Lodi) apples, but occasionally attacks Delicious. Make additional fungicide applications at petal fall and two-week intervals through June or July. If powdery mildew is not controlled on highly susceptible varieties, there may be a poor bloom the following year. Flower buds are injured by the disease fungus and infected buds are killed by moderately cold winter temperatures (10° to 15° below zero °F).

How: In each gallon of water, mix 1 tablespoon summer weight horticultural spray oil plus one of the following: 2 to 4 tablespoons of wettable sulfur, 1 teaspoon of Karathane WD (18.25% wettable dust), or 1/2 teaspoon of Benlate 50WP or 50DF (benomyl).

Note: Avoid the use of sulfur or Karathane within two weeks of any oil spray (e.g. dormant oil).

BLOSSOM PERIOD (fire blight): Bartlett pear and Jonathan, Lodi, Rome and Yellow Transparent apples are susceptible to fire blight infection. Delicious and Winesap apples and Moonglow, Magness and Maxine (Starking Delicious) pears are resistant.

What: Potential fire blight infection periods are those of 18 hours or more in which the average hourly temperatures are 65 to 90 °F (18 to 32.2 °C) with rain or relative humidity above 65%. For areas prone to fire blight (Colorado's Front Range), apply protective sprays at three- to five-day intervals during bloom period.

How: Use 1 teaspoon streptomycin (Agristrep or Agrimycin) per 1 gallon of water (= 100 ppm), or a 53% fixed copper sulfate at 1 teaspoon per gallon of water.

PETAL FALL: (powdery mildew on apples)

See discussion and control recommendations under "Prebloom."

LATE SPRING AND SUMMER SPRAYS (codling moth, powdery mildew, fire blight)

What: Spray with Diazinon to control codling moth (larvae cause wormy apples). Moths usually start flying at bloom time. Eggs laid by these moths begin to hatch about two weeks after petal fall, depending on the weather. Apply the first codling moth spray at this time to prevent larvae from entering the fruit. Diazinon residues last 10 to 14 days. Since moths are continuously present throughout the summer, apply a spray every 10 to 14 days to prevent later broods of codling moth larvae from entering apple and pear fruits.

Stop spraying Diazinon 10 days before picking apples (14 days on pears) to allow the pesticide residue to degrade. The wettable powder formulation is preferable where agitation of the spray mixture is possible; otherwise use Diazinon liquid and apply sprays during the evening when temperatures are cool (the carrier in liquid formulations can burn foliage on hot days).

If powdery mildew was noted earlier or if Romes, Jonathans or MacIntosh are in the orchard, spray at 10 to 14-day intervals with Benlate + oil, Karathane,

or flowable sulfur. Mildew sprays generally can be stopped by early July (although young, non-bearing mildew susceptible varieties need protection until late July). Avoid sulfur products when daily temperatures exceed 80 °F (26.7 °C) and use of Karathane when temperatures exceed 90 °F (32.2 °C). Do not spray Karathane within 21 days or Benlate within 30 days of harvest.

If apples or pears are damaged by hail, apply a spray of Agristrep, Agrimycin or a copper spray as soon as possible (within four to 18 hours) to help prevent fire blight. Do not use Copper sprays on Golden Delicious or Anjou pears because russetting may occur. Streptomycin cannot be used within 30 days of harvest on pears or within 50 days of harvest on apples. Copper sprays can be used to the day of harvest, but can cause severe fruit russet if applied when fruit is present (especially on Anjou Pears).

Remove branches infected with fire blight as soon as possible in order to reduce the possibility for disease spread. Cut affected branches 6 inches below the lowest evidence of infection (sunken or reddened bark, ooze, etc.). Peel bark from the cut toward the branch tip for 6 inches or so and examine for evidence of red-brown discoloration of the cambium and bark. This is the true limit of the infection. If the cut was not below the infection limit, sterilize the pruning equipment by dipping in a 70% alcohol solution or spray with Lysol disinfectant spray and make a second cut 6 to 12 inches below the first cut. Repeat the examination process to be sure all the infected tissue is removed. Disinfect the cut and tools before moving to a different tree or branch. Allow the cut to air dry and do NOT seal with pruning paint.

Control sucking insects during the summer months to prevent shoot and/or fruit fire blight infections.

How: Use 1 tablespoon Diazinon 50WP or 2 teaspoons 25% liquid Diazinon in each gallon of water for codling moth control. For powdery mildew use rates of sulfur, Karathane or Benlate as indicated under "Prebloom." For fire blight prevention use rates of streptomycin or copper as indicated under "Blossom period."

FALL TREATMENT (Crown Rot)

What: Visible signs of crown rot infection include poor growth with reduced leaf size, prematurely bronzed or reddened leaves, small and brightly colored fruit, and a weak rooting structure. This disease causes a dark brown discoloration just under the bark at the soil line. The discoloration is described as similar to chocolate swirl ice cream because the dark diseased tissue is interspersed with swirls and stripes of living white or yellowish tissue. To check for discolored tissue, cut away bark at ground line with a sharp knife but be careful to avoid girdling the tree. Over-watering often is a major contributing factor for this disease and should be avoided. Drench the base of infected trees with copper sulfate after removing soil to expose and dry the diseased tissue. After treatment, replace the soil prior to winter to avoid additional damage due to winter injury.

How: Use 6 tablespoons of a 53% copper sulfate material per gallon of water. Spray infected trees from ground level to a height of 2 to 3 feet, thoroughly saturating the lower trunk and soil. Alternatively, a copper paint (1 pound of 53% copper sulfate +

1 gallon water + 1 tablespoon spray oil) can be applied to affected tree roots and trunks after they have been excavated and before the soil is replaced. This latter treatment should provide protection for several years if you can avoid over-watering.

Peaches, Nectarines, Apricots, Cherries and Plums

The best control for peach twig borer on peaches, nectarines, apricots and plums is a dormant or delayed dormant spray (shortly before bloom). Avoid summer applications of insecticides unless peach twig borer is a problem. Peach twig borer control is most effective if sprays are applied the last of May or the first of June for the first generation. Apply a second application in mid-July for the second generation of peach twig borer. Stone fruit trees should be protected from attack by peach tree borer (crown borer) with two spray applications, one during early July and the other during early August. Direct these sprays at the base of the tree near the soil line. As in apples and pears, avoid use of Sevin (carbaryl) on stone fruit trees.

Note: Dates indicated are approximate. They vary with elevation, exposure and variety. Stage of bud development (i.e., pink stage) is a more dependable way to schedule needed sprays.

LATE MARCH: DELAYED DORMANT (mites, aphids, twig borer, cytospora canker)

What: Prune trees, then apply Dormant oil plus Diazinon for control of twig borer, aphids and mites. On peaches and nectarines, add Benlate as a preventative to control cytospora canker (gummosis).

Cytospora canker is a fungus problem that results in an amber to brown-colored gum on trunk or branches. Do not confuse with peach tree borer (insect) that results in a clear to black ooze that contains wood or sawdust chips at or below ground level.

How: Use 5 to 6 tablespoons Superior or Supreme dormant oil plus 1 tablespoon Diazinon 50% wettable powder (WP), or 2 teaspoons 25% Diazinon liquid in sufficient water to make 1 gallon of spray. For Cytospora control, add 1 to 2 teaspoons of Benlate 50WP or 50DF (benomyl).

EARLY APRIL: PINK STAGE (aphids, mites, twig borer)

What: Pink Stage is when the flower buds start to show pink, before tree blooms. If you missed the delayed dormant spray, apply a spray to control twig borer, aphids and mites.

How: Spray with 3 tablespoons Superior or Supreme oil plus one of the following: 1 tablespoon Diazinon 50WP, 2 teaspoons 25% Diazinon liquid, or 1 tablespoon Thiodan 50WP, per gallon of water.

MID-APRIL: PETAL FALL (Cytospora, powdery mildew, coryneum blight)

What: For Cytospora, make a second application of Benlate on peaches and nectarines, with or without summer weight oil.

See "Late March" for description and application rates.

Apply micronized wettable sulfur, Karathane or Benlate to control powdery mildew (rusty spot) on

peach fruit if this has been a problem in the past.

The term "rusty spot" is used because dark-reddish or rusty-brown spots are present on the fruit as it begins to mature. It affects only the immature peach and nectarine fruit until the pits have hardened, in late June or early July. This problem is particularly severe when high humidity and showers occur during spring and early summer. This disease apparently is associated with apple powdery mildew. Its incidence invariably is highest in peach plantings within one-fourth mile of highly mildew susceptible apple varieties.

Coryneum blight appears on young peach, nectarine and apricot leaves and twigs (occasionally on sweet cherries) as small red spots that enlarge and become purple with a whitish-tan center. These spots eventually drop out of the leaf blade, hence the name "shothole disease."

Spots may first appear on fruit 10 to 12 weeks prior to harvest and can continue to appear through pit hardening (late June). Infections that occur on fruit two to three weeks before harvest can develop rapidly to produce sunken rot spots up to 1/2 inch in diameter and depth. This fungus disease is most severe in years when frequent showers occur in late spring and summer. Treat with Ziram, Captan or fixed copper at petal fall and two weeks later. If spots continue to show up in late May or early June, spray with Captan.

Sweet cherry leaves are similarly affected with a fungus called *Coccomyces*. This causes numerous small purple spots on the upper leaf surface. Tissue in the center of the spot dies and sometimes falls out, leaving a shothole appearance. This problem is more common in areas where moist conditions are prevalent.

Note: Shot holes also can result from a mycoplasma disease known as X-disease. This disease causes sparse, yellowed foliage and the eventual death of the infected tree. It can be distinguished from coryneum blight by the lack of red-purple spots on the new twigs. This disease is spread by leafhoppers, and control of this insect vector may be necessary to prevent the spread of disease.

How: For Cytospora control spray, use 1 tablespoon of Benlate 50WP or 50DF (benomyl) with each gallon of water. Rusty spot sprays include Karathane 18.25% WD at 1/2 tablespoon, Benlate 50WP or 50DF at 1/2 tablespoon, or micronized wettable sulfur at 3 tablespoons per gallon of water. Apply Rusty Spot sprays at seven to 10-day intervals beginning with petal fall and continuing through pit hardening in June or July.

For coryneum blight control, spray trees with 4 teaspoons of Captan 50WP or 5 teaspoons of Ziram (76% wettable powder) per gallon of water. Use fixed copper in accordance with label directions.

Do not use sulfur during hot weather or on apricots.

JUNE 10 (twig borer)

What: Apply an insecticide to help prevent twig borer damage to apricot, plum, nectarine and peach fruit. Young larvae feed on terminals and the stem end of fruit. This is the common "worm" that causes damage to apricot, peach and nectarine fruit.

How: Use 1 tablespoon Diazinon 50W, 2 teaspoons 25% liquid Diazinon, or 1 tablespoon Thiodan 50 WP in each gallon of water.

JULY 1-10 (peach tree borer, crown borer, twig borer, pear or cherry slug, cytospora canker)

What: Apply an insecticide to control peach tree borer. This insect bores into the lower trunk of peach, apricot, cherry, nectarine and plum trees. Its feeding injury can kill the tree if it chews its way completely around the trunk.

Note: The application of these materials at the time recommended may not comply with the recommended preharvest interval (PHI) prior to harvest of the crop. If this is the case, apply the treatments early to allow for the proper number of days. For example, if Thiodan 3 E.C. is used on peaches (21-day PHI), you may need to apply the August application earlier to allow the proper PHI. Thirty days later, an additional application (a third treatment) may be made instead of the recommended two in order to provide adequate protection from the peach tree borer. Diazinon also is used to treat this insect pest. Apply Diazinon sprays every 14 days to provide adequate protection. Diazinon has a 10-day PHI on apricot, cherry, plums and prunes, and nectarines, and a 20-day PHI on peach. Comply with the PHI to help prevent pesticide residue problems.

Apply an insecticide to help control twig borer (see June). This treatment also helps control pear and cherry slug. This is the larval stage of a large-bodied fly. The larvae is dark, and shiny and resembles a slug. This insect feeds on leaves and damages them by stripping the green tissue leaving only the veins.

Scrape Cytospora cankers down to the wood to remove diseased tissue and then treat with a Benlate (benomyl) paint. Round the treated areas at the top and bottom, not pointed, to allow for more rapid healing. Round or nearly round treated areas heal best. Large pruning wounds or mechanical injury also can be treated with this protective paint.

How: For peach tree borer control use one of the following with sufficient water to make 1 gallon of mix: 1 tablespoon Thiodan 3 E.C. (Endocide 3EC), 1 1/2 tablespoons Thiodan 50 WP, or 1 tablespoon Lindane 20% liquid. Apply only to the trunk and soil around the base of the tree. **Do NOT** contaminate the fruit. Use approximately 1/2 gallon of material per tree. Observe the necessary PHI (Thiodan 3 E.C., Endocide 3 E.C. on peach, apricots, nectarines = 21 days; on plums, prunes = 7 days. Lindane = 60 days).

For twig borer control, spray fruit and foliage. Use one of the materials recommended for the June twig borer spray. Observe the necessary preharvest waiting period before picking the fruit (**Diazinon:** peaches = 20 days; apricots, nectarines, cherries, prunes, plums = 10 days. **Thiodan:** peaches, apricots, nectarines = 30 days, prunes and plums = 7 days).

For cytospora canker control, prepare paint by adding 1/2 to 1 tablespoon of Benlate 50WP or 50DF per gallon of white interior latex paint (diluted one part paint to two parts water). The latter helps reduce sun-scald ("South West Injury"), a winter induced condition responsible for winter trunk and branch injury. Sun-scald increases the severity of cytospora canker. If you prefer not to use paint with Benlate, use water as a carrier.

HARVEST PERIOD (fruit rot, coryneum blight)

What: Rhizopus fruit rot control. Botran sprays may be necessary if fruit is held a few days after picking. Avoid bruising fruit during picking, packing and other handling. Apply Botran one to three days prior to harvest, no later than one day before harvest.

If coryneum blight spots are present and showers occur just before harvest, spray with Captan. There is a required four-day reentry period between Captan applications and reentering the orchard.

How: For Rhizopus rot control, spray with Botran 75WP at the rate of 1 tablespoon per gallon of water.

For coryneum blight, spray with Captan 50WP at the rate of 4 teaspoons per gallon of water.

AUGUST 1-10 (peach tree borer)

What: Second treatment for peach tree borer (crown borer).

How: See July 1-10 application.

If July and August treatments were missed or inadequate, masses of clear to black gum may exude from around the base of the tree. This ooze contains minute sawdust-like bark chips. The damage usually occurs from 6 inches above, to 2 to 6 inches below the soil surface. Check for borer larvae if this occurs. These white worms with brown heads feed on living tissue as they tunnel beneath the bark. If larvae are noted, apply para-dichlorobenzene (PDB) to fumigate the root system. You can use PDB in the spring but early fall treatments are preferred. Apply the crystals in a ring completely encircling the trunk, not closer to the bark than 1 inch or at distance greater than 3 inches. Cover the crystals with several shovelfuls of soil to confine the PDB gas. Do not apply the treatment when soil temperature is below 60 F (16 C). Follow label directions for amount of material to use per tree.

Note: A treatment for peach tree borers in July and August as indicated previously should prevent root damage and eliminate need for PDB treatment.

FALL TREATMENT: (coryneum blight)

What: If coryneum blight was severe, spray after leaves drop.

How: Use Bordeaux mixture or copper fungicides. Bordeaux mixture is available from some nurseries and garden shops. Follow the directions when diluting with water. Apply fixed copper at the rate of 2 to 3 teaspoons per gallon of water.

Resources

For additional information see Service in Action sheets: 2.907, *Fire blight*; 2.914, *Coryneum blight*; 5.507, *Spider mites: characteristics and control*; 5.519, *Apple and pear insects: control in home plantings*; 5.520, *Stone fruit insects: control in home plantings*; 5.560, *Pear slugs: characteristics and control*; 5.566, *Peach tree borer: characteristics and control*; and 5.569, *Spray oils for insect and mite control on woody plants*. For commercial recommendations see XCM-41, *Colorado Tree Fruits: Pest and Crop Management Guide*. All can be obtained from your Colorado State University Cooperative Extension county office.