Colorado State University Extension

Backyard Orchard: Apples and Pears

Fact Sheet No. **2.800** Gardening Series | **Fruits and Vegetables**

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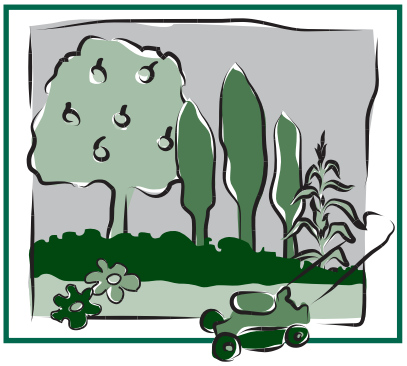

Apples and pears in Colorado usually require sprays to produce insect damage free fruit. While the dry climate usually limits disease, pathogens can impact tree growth when weather conditions are right for infections. The key to successful insect and disease management in apples and pears is to apply management in a preventative manner. This requires knowing what insect pests are present in a particular site and being able to predict when conditions favor disease development. Past experience in a particular location is probably the best predictor of pest problems.

Using Pesticides

Pesticides in this publication are referred to by active ingredient since trade names vary and labels change on a regular basis. Active ingredients are always listed prominently in tiny print on product labels. Always read and follow label directions when purchasing or using any pesticide.

An appropriate sprayer is required to get good spray coverage on fruit trees. This can be as simple as a small one gallon hand pump can type sprayer for one or two small trees, or as large as a many gallon electric or gas motor pressured sprayer for larger plantings. The sprayer should be able to cover the entire tree, top to bottom. Complete and even coverage is essential for good control with most pesticides. Trees should be sprayed from all directions, above and below, to cover leaves and fruit.

Base the amount of spray to mix on the size of the tree (except when noted otherwise on label) and the type of sprayer used. Sprays should be applied to thoroughly wet the leaves and fruit to obtain good coverage. Sprays applied until the leaves are wet (to drip) will require the volume of spray listed below once the trees have a full canopy. Most pesticides require complete coverage of the foliage and/or fruit. Proper pruning and fruit thinning is required to achieve good spray coverage.

Table 1. Amount of final spray material to mix for different tree sizes.

Tree Diameter x Height	Amount of Prepared Spray
20 x 20	4 gallons
15 x 15	3 gallons
10 x 10	2 gallons
5 x 5	1 gallon

Insect Control

Actual timing and number of sprays needed will vary with location and year.

Table 2. Timing of apple and pear sprays based on tree growth stage.

Dormant	Aphids, mites, pear psyllid	Oil
Pre-bloom	Powdery mildew	Fungicide
Bloom	Fire blight	Bactericide if wet weather
Petal fall	Powdery mildew	
Late spring & summer	Codling moth, apple maggot, powdery mildew, fire blight	Insecticide on regular schedule depending on product used. Disease controls will vary with weather conditions.

Insect control on pome fruit trees begins with prebloom sprays (dormant or delayed dormant) for scale, aphids and mites. Applications of a dormant Superior or Supreme type horticultural oil in combination with an insecticide (malathion or permethrin) will control these insects if applied during early spring, before buds open. Oil sprays darken the bark, causing them to warm and speed up spring bud

Quick Facts

- The number of sprays and spray timing required to produce good fruit will vary with location and year.
- Codling moth is a significant pest of apples and pears in many locations in Colorado.
- The arid climate usually limits fungal diseases in Colorado pome fruits, but extended wetting periods during critical times can lead to problems with powdery mildew, scab or fire blight.
- Several spray products are available on the home-use market, but there are many products that are available only in commercial quantities.

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development. It is therefore best to delay dormant oil sprays until the buds are starting to break. See Colorado Extension fact sheet 5.569 *Insect Control: Horticultural Oils* for detailed information on their use. There are foliar and soil applied systemic insecticides available for aphid control in non bearing and bearing trees.

For pears, a dormant spray is required to control pear psylla where it is present. These insects are present in western Colorado, Fremont County and the Fort Collins area. Dormant oil timing should coincide with pear psylla egg-laying which occurs in early spring. In areas where psylla is not present, a dormant oil applied a little later, just before buds break dormancy will aid in controlling scale insects, aphids and mites.

Codling moth is the most serious pest of pome fruits. Damage potential varies considerably with location. Remote locations where there are few pome fruits grown may have fewer codling moths, but infestation rates are often 100% in higher pressure areas. Codling moth biology and management is covered in detail in Colorado Extension fact sheet 5.613: *Codling Moth: Control in Home Plantings*.

Codling moth control in apples and pears requires summertime insecticide treatments on a regular schedule. Insecticides can be mixed with a summer grade horticultural oil to improve performance. Weekly sprays are needed for complete codling moth control in high pressure areas. Spray intervals vary with the particular insecticide used, with greater time between sprays when longer residual products are used. The longer residual products used by commercial apple and pear growers are not available on the home use market so back yard growers must often spray on a 7 to 10 day interval to get acceptable codling moth control.

Apple maggots are present in some areas along the front range of Colorado. If apple maggot is present and requires control, a spray schedule similar to that used for codling moth should be used. The spray schedule should be initiated about a week to ten days after the first adult flies are captured in local yellow sticky traps.

Disease Control

Colorado's dry climate limits fungal and bacterial diseases of pome fruits, but there are some that can damage fruit and/or foliage during extended wetting periods. Powdery mildew and fire blight are the two most commonly encountered diseases of pome fruits in Colorado. Apple scab or pear scab can be an occasional problem. All are associated with extended periods of rain or high humidity. Chemical control of these diseases must be applied in a preventative mode. Once diseases have appeared on the tree, sprays may slow down disease progression, but they will not stop existing infections.

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. It is mostly a problem on Jonathan, Rome, Akane, Granny Smith, Gala, Fuji, Braeburn, Yellow Transparent (Lodi) and Golden Delicious. Fungicide timing is prebloom, and again at petal fall, then at two-week intervals until mid-June (young, nonbearing fruit trees until late July) if there is a history of disease or if weather conditions are good for infection. If powdery mildew is not controlled on highly susceptible varieties, there may be a poor bloom and reduced winter hardiness the following year.

Fire blight biology and management is covered in Colorado Extension fact sheet 2.907: *Fire Blight*. Bartlett pear and Jonathan, Lodi, Rome, Gala, Fuji, Braeburn and Yellow Transparent apples are susceptible to fire blight infection. Delicious and Winesap apples and Moonglow, Magness, Harrow Delight, Harvest Queen, Potomac and Maxine pears are resistant. Potential fire blight infection periods are those of 18 hours or more in which the average hourly temperatures are 65 to 90 degrees with rain or relative humidity above 65 percent. For areas prone to fire blight (Colorado's Front Range), if you chose to use preventative treatements, apply protective sprays at three- to five-day intervals during bloom period.

References

For additional information, see the following fact sheets which are all available from your local Colorado State University Extension county office or the University Resource Center, (970) 491-6198.

- 2.804, *Backyard Orchard: Stone Fruits*
- 2.907, *Fire Blight*
- 5.507, *Spider Mites*
- 5.560, *Pear Slugs*
- 5.569, *Insect Control: Horticultural Oils*
- *7.615, The Preparation of Small Spray Quantities of Pesticides*

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**.

Table 3. Insecticides for use on apples and pears, listed by active ingredient. Always read and follow label directions.			
Common Name	**Chemical Class**	**Target Pests**	**Comments**
acetamiprid	Neonicitinoid	Codling moth (CM), apple maggot (AM), sucking insects	Do not use before petal fall. 12 day minimum between sprays.
carbaryl	Carbamate	CM, AM	Use during first 4-6 weeks after bloom can thin fruit; avoid using more than once in mid- to late season as carbaryl use can lead to spider mite problems.
esfenvalerate	Pyrethroid	CM, AM pear psylla	Restricted Entry Interval (REI): when dry. One to two week residual.
malathion	Organophosphate	CM, AM, aphids, pear psylla	Restricted Entry Interval (REI): when dry. Maximum one week residual.
permethrin	Pyrethroid	Aphids, CM, OFM, pear psylla	Do not use after petal fall on apple or after delayed dormant on pear.
petroleum oil	Hydrocarbon	CM eggs, San Jose scale, aphid eggs, mites, pear psylla	Can cause plant injury if applied at concentrations higher than 2%.
Potassium salt of fatty acid	Soap	Sucking insects, mites	Contact insecticide, no residual. Many products certified organic.
pyrethrum	Botanical	Sucking insects	Contact insecticide with no residual. Some formulations are certified organic.
spinosad	Heterocyclic lactone	CM, AM	Some formulations approved for organic use. Maximum seven day residual.

Table 4. Disease control products for use on apples and pears.			
Common Name	**Chemical Class**	**Target Pests**	**Comments**
Bacillus subtilis	Biological (bacteria)	Powdery mildew, fire blight, apple scab	Acceptable for organic production.
captan	Thiophthalimide	apple scab	
copper hydroxide	Mineral	fire blight	Do not use on pear after petal fall.
myclobutanil	Demethylation Inhibito	PM, AS	
potassium bicarbonate	Mineral	powdery mildew, leafspots	
sulfur	Mineral	powdery mildew	24 hour Restricted Entry Interval (REI).
thiophanate methyl	Benzimidazole	powdery mildew, apple scab	Repeat at 7-10 day intervals.
Bactericides			
streptomycin sulfate	Aminoglycoside	fire blight	Long pre harvest intervals.