

Organic Fruit Growing for Homeowners

Goals of the Home Orchard vs. Commercial Orchards

Your goal is to have healthy trees that produce enough high quality fruit to satisfy your needs. Your home grown fruit does not have to be cosmetically perfect. A commercial grower has to produce good looking marketable fruit at low enough cost to be economically viable.

Major Tree Fruit Crops for Western Washington and their issues

The most serious issues in growing tree fruits in our climate are fungal and bacterial diseases. Our climate challenges us first by its inconsistent seasonality (possibility of warm or cold winters changing when trees break dormancy). Our second challenge comes from our cool, rainy springs, which encourages fungal diseases that affect blossoms and developing fruit. Insect pests can also be a challenge in the home orchard. Some homeowners might be tempted to ignore pest issues, but allowing pest populations to increase may cause problems for your neighbors, so knowing how and when to react is important.

1. Apples
 - a. Fungal diseases including scab and powdery mildew
 - b. Bacterial canker disease, including anthracnose
 - c. Insect pests, including apple maggot and codling moth
2. Pears
 - a. Fungal diseases including scab and pear trellis rust
 - b. Bacterial canker disease caused by *pseudomonas* (Asian pears)
 - c. Insect pests including blister mite and occasionally codling moth
3. Cherries, sweet or sour
 - a. Bacterial canker diseases
 - b. Fungal diseases including brown rot and coryneum blight
 - c. Insect pests including spotted wing drosophila
4. Peaches & Nectarines
 - a. Fungal diseases including peach leaf curl and brown rot
 - b. Bacterial cankers
5. Plums
 - a. Fungal diseases including brown rot and black knot
 - b. Aphids



Scab infection on apple leaves

Management Strategies, or, how do you keep your trees healthy?

Fruit trees as we know them today have gone through centuries of selection. Because they were developed for fruit quality and production, many of their natural resistances to pest and diseases have been lost.

The home orchardist has the goal of keeping their trees healthy and productive. Because of the challenges of our climate, you will need to do some sprays, especially on young trees. You

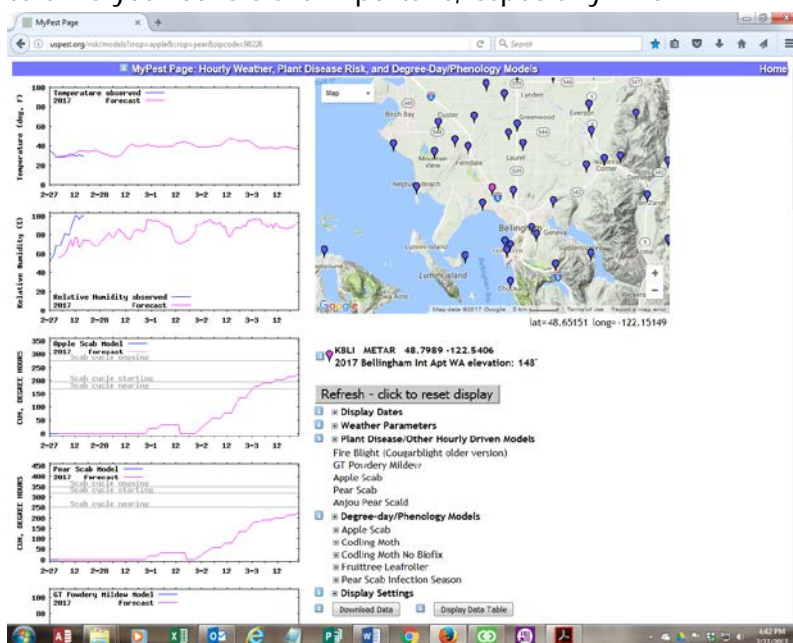
can grow healthy trees using organic methods, but to be successful, you need to be proactive. Organic disease control needs to be in place before the infection occurs.

Repeated 'misses' on your timing can lead to stunted trees and blind wood (no fruit buds).

Learning to use bud stages and heat units to time your controls is important, especially when

using organic sprays. Online decision making tools/websites are very valuable in helping you target your strategies:

1. USPest.org - this site uses weather stations to run disease and pest models and help you make decisions on when to spray. It is worth spending time here, learning to use the models. It will let you set up the models that work for your orchard, using the weather stations closest to you. For most home orchards, look at the models for
 - a. Apple Scab
 - b. Pear Scab
 - c. Codling Moth
 - d. Apple Maggot



USPest.org page

2. Ag Weather Net - this site is run by WSU, and uses just the Ag Weather stations throughout WA state. It requires registration to use, and many of the models require a subscription. For some homeowners, there will not be a weather station close enough to you to make this site useful (weather stations are only located in prime agricultural land areas).

When planting new trees, try to choose disease resistant varieties. Look for scab and mildew resistance in apples and pears, and leaf curl resistance in peaches. Later blooming sweet cherries and all tart cherries are easier to grow in frost prone sites.

Organic Products for fungal and bacterial disease control

1. Micronized Sulfur - available as powder and occasionally liquid concentrate form.
 - a. Use with oil for delayed dormant sprays on pears and apples, controls powdery mildew, between stages 4 and 6
 - b. Use for scab control on apples and pears, at pre-pink and petal fall
 - c. Use with oil at leaf fall to control blister mite on pears
 - d. Use at shuck fall (just after petal fall) on plums to help control black knot
2. Lime Sulfur - usually only available at agronomy stores, in large quantity. Considered organic, but caustic, so use caution
 - a. Control for powdery mildew on apples as delayed dormant spray, between stages 4 and 6
 - b. Control for peach leaf curl- spray at bud swell, then again in 3 weeks, and again 3 weeks later
3. Copper, as copper sulfate or copper soap

- a. Use at stage 3, combined with oil, on cherries, peaches and apricots, to control blossom blight and brown rot. The oil will smother overwintering aphid and mite eggs
 - b. Use with a sticker at leaf fall on stone fruits to protect against bacterial canker, and on pome fruits to protect against anthracnose and pseudomonas canker.
4. Serenade/Sonata/Monterey Complete Disease Control- bacterial based fungicide that provides some control against fungal diseases, and unlike copper, can be used on actively growing trees.
- a. Powdery mildew on pome fruits
 - b. Brown rot on stone fruits
 - c. Pear blister rust (not complete control, some suppression)

Beyond fungal and bacterial diseases, every orchard will at some point have pest issues. Your first line of defense is vigilance- scouting your orchard for problems so you can react before too much damage occurs. Scouting can be routine observation of your trees. Pheromone and sticky traps can also be used to monitor for pest presence.

Sanitation is a very effective tool in managing pests. Picking up and destroying fallen fruit, especially fruit that has larval stages of codling moth or apple maggot in it, or fruit affected by brown rot, helps remove the pest or disease from your orchard.

Physical barriers can also help with pest control, i.e. bird netting, apple maggot barriers, deer fencing, trunk guards. A newer product we're trying is orchard specific insect netting, covering the whole tree.

Organic pest controls for the home orchard

1. Horticultural oils, either mineral or vegetable based, are effective at smothering overwintering eggs of aphids and mites. They need full contact/coverage to work, and if used during the growing season can cause foliage and/or flower burn on some varieties.
2. Horticultural soap is used to control soft bodied insects such as aphids during the growing season. They need repeat applications to work.
3. *Bacillus thuringiensis* (Bt) is a bacterial control for the larval stages of many moths. The main use in the home orchard is to control leaf roller on apples and pears. Add this to your delayed dormant and first scab sprays to get the early hatch. This product can also be used for the early stages of webworm outbreaks.
4. Spinosad is also bacteria based, but broader spectrum. It is toxic to bees, so do not use it when bees are active. It is effective on codling moth, and somewhat effective on apple maggot. There is a danger of overuse, leading to resistant pests, so should be used with caution.
5. Codling Moth virus (Cyd-X, Carpovirusine, Virossoft) is a virus based control for codling moth only. Timing is crucial, and it is an expensive product.
6. Mycotrol is a fungal based insecticide that is effective against aphids and leaf hoppers. Expensive and hard to find locally.
7. Neem oil based insecticides, including Azadiract are effective on some insects including SWD, pear slug, apple maggot, and cherry fruit fly.



Anthraxnose canker on apple tree. Prevention: remove diseased trees from orchard. Prune out small cankers religiously. Spray copper plus sticker at leaf fall.



Bacterial canker on cherry. Prevention: remove diseased trees, prune out small cankers. Spray copper at leaf fall, and at prebloom.



Black knot on plum. Control: prune out cankers in summer and fall. Spray sulfur at shuck fall (just past petal fall).



Cherry buds killed by brown rot. Prevent brown rot by spraying copper at stage 3, just as the flower buds swell, but before bloom.



Orange spot is pear trellis rust. Prevention: remove susceptible junipers from area. Pick infected leaves as seen. Spray with Serenade or Sonata during growing season. The black slug-like pest is pear slug. Pick off and destroy. Not a significant pest on established trees.



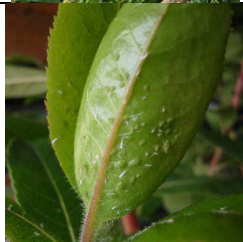
Pear blister mite. Occasional pest of pears. Spray sulfur or sulfur plus oil at leaf fall to kill overwintering mite eggs in bud scales.



Peach leaf curl. Prevention: At bud swell (usually January) spray sulfur, lime-sulfur, or copper. Spray again in 2-3 weeks, and again in 2-3 weeks. Resistant varieties should be sprayed the first 2-3 years after planting.



Powdery mildew on apple. Prevention: spray sulfur plus oil at stage 4- green leaf tip.



Aphids. Spray off with strong jet of water, or use horticultural soap (repeat in 7 days) or summer weight horticultural oil.



Codling moth. Use the no biofix model at USPest.org to time sprays. Spinosad plus 1% summer oil at 525 degree days is effective. Sanitation is crucial.



Apple maggot. Apply maggot barriers by early June. Use sticky red traps to monitor for flies. Spray spinosad, py-ganic or Azadirect if adult flies are present and barriers are not.