

Growing Tree Fruits Successfully Part 2

Ross Penhallegon



IPM



Sandwich baggies

- <http://www.gordosoft.com/orchard/bagging.htm>



- Use nylon footies
- Web:
<http://www.homeorchardsociety.org/article/50/>
- - many web references

<http://www.garden.org/regional/report/arch/inmygarden/3486>



WHAT IPM IS

IPM is a comprehensive system of orchard management that incorporates sound cultural practices, establishing thresholds for pest damage, regular monitoring, proper plant problem diagnosis, and using the least toxic (yet effective and practical) methods available for managing pests that cause damage exceeding thresholds.

WHAT IPM IS NOT

IPM is neither inherently organic nor “conventional”, it is often somewhat of a middle ground between the two.

Definition of Pest

We will be using the term “pest” to mean insects and diseases.

Cultural Practices

- Planting disease-resistant varieties that are less likely to succumb to disease pressures.
- Pruning to maintain an open canopy so air flow can dry the foliage quickly after rain.
- Irrigating in a way that does not wet foliage.
- Removing and destroying leaves and fruit from the orchard in the fall to reduce sources of insect larvae, fungal spores, etc. that can re-infest the orchard later.

Establishing Thresholds

One insect in an orchard doesn't warrant applying an insecticide to the entire orchard. However, one insect pest per fruit is probably well beyond the level considered by most people to be acceptable. What is considered acceptable varies from person to person, so knowing how much scab you can tolerate on your apples or how many worms you're willing to cut around is critical to knowing if and when to invoke additional pest management strategies.

Monitoring

- Establishing thresholds only works when you monitor to determine if and when those thresholds are exceeded.
- Regular monitoring also helps you to be familiar with what your orchard looks like when it's healthy, so you can easily recognize when something is wrong.
- Traps aid in monitoring for specific insect pests.

Proper Plant Problem Diagnosis

- Applying an insecticide simply because you see holes in leaves won't do any good if the holes are the result of common fungal disease.
- Proper plant problem diagnosis must come before any pest management strategy is employed.

Least toxic methods

- Once you properly diagnose a plant problem, use cultural controls, if available, followed by least toxic chemical controls.
- Knowing the life cycle of pest organisms is critical to selecting appropriate pest management strategies.

In Summary

Use sound cultural practices, determine what levels of damage are acceptable to you, monitor, properly diagnose problems, and use the least toxic methods available to manage pests.

Pest control

- Sanitation, sanitation, sanitation!!!!
 - Remove **all** fruit before winter
 - Cut out cankers/dead wood
 - If bad scab year, rake up leaves and compost
 - Prune for good air movement
 - Plant disease resistant varieties
 - Plant dwarf, semi dwarf for management

Tree Fruits Diseases and Pests

Integrated Pest Management
(IPM) in Orchards



Oregon State **OSU** Extension
UNIVERSITY Service

Apricots

Presented by
Ross
Penhallegon

Apricots



Apricot Bloom



Apricots

- Easy to grow
- Bloom very early (a major problem in the Willamette valley – frost!)
- Rootstock - mainly peach
- Thinning of fruit - not needed, but may be needed and slows alternate bearing

Varieties

- Flora Gold
- Moorpack
- Perfection
- Royal
- Tilton



Apricots: Soils

- Apples and pears like deep well drained soils
- Soils needed are:
 - - sandy or sandy and rocky
 - - loamy (with clay) is preferred
- Work with soil or bring in better soil

Soils in the area



Pruning

- can grow on central leader of upright multiple leader
- head back all branches to face outward
- also can prune open center
- avoid tight crotches

Apricot – before pruning



Apricot – after pruning



Apricot Pest Control

Blossom blight / *Cytospora*

- Pruning
- Fixed copper before bloom
- Sulfur, post-bloom
- Remove rotten fruit

Brown rot *Monilinia fructicola*

- bloom spray
- pre-harvest spray

Blossom Blight or *Cytospora*



Brown Rot



Pest Control continued

- Coryneum blight (shothole) *Wilsonomyces carpophilus*
- peach leaf curl
 - three dormant copper sprays
- Bacterial canker (*Pseudomonas or gummosis*)
 - Pruning
 - Bordeaux, Fixed copper (late fall and dormant)

Coryneum blight (shothole) *Wilsonomyces carpophilus*



Coryneum or Shothole



Peach Leaf Curl *Taphrina deformane*



Peach Leaf Curl



Bacterial canker



Insects & Other Pests

- peach tree borer
- peach twig borer
- aphids
- western spotted cucumber beetle



Peach Tree Borer



Peach Twig Borer *Synanthedon exitiosa*



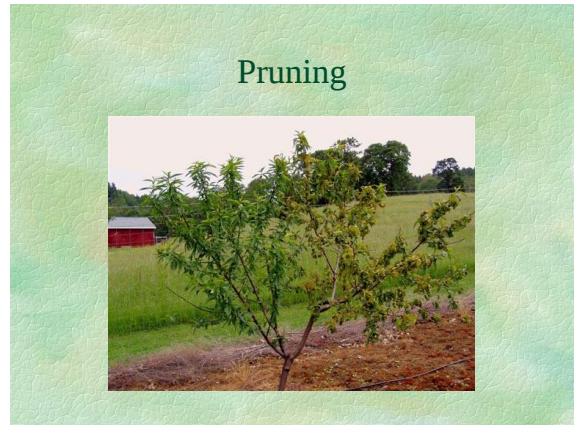
Green Peach Aphid *Myzus persicae*



Western Spotted Cucumber Beetle



- **Apricot/Peach Tree Borer**



Harvest – when ripe and nicely colored



PLUM/PRUNE



Plum and Prune Varieties

- | | |
|----------------------|---------------------|
| ▪ Plums- (Japanese) | ▪ Prunes-(European) |
| ▪ Burbank-red | ▪ Stanley- blue |
| ▪ Shiro-yellow | ▪ Italian- purple |
| ▪ Santa Rosa- red | ▪ Brooks- blue |
| ▪ Beauty- red | ▪ Moyer- purple |
| ▪ Red Heart-red | |
| ▪ Methley- light red | |

Common PNW Plum Varieties

European

- Parsons
- Stanley
- Italian
- Brooks
- Moyer Perfecto

Oriental

- Early Golden
- Shiro
- Burbank
- Red Heart

PEACHES



Peach Varieties for Western Oregon

- | | |
|--------------------|-----------------------|
| ▪ Favorites | ▪ Leaf curl resistant |
| ▪ Sunhaven | ▪ Frost |
| ▪ Redhaven | ▪ Creswell |
| ▪ Suncrest | ▪ Clayton |
| ▪ Veteran | ▪ Muir |
| ▪ O'Henry | ▪ Krummel |
| ▪ Improved Elberta | |



Common PNW Peach Varieties

- Red Haven
- July Elberta
- Veteran
- Early Elberta
- Rochester
- Frost
- Genetic dwarfs

Peach - Leaf Curl

- Leaf Curl (*Taphrina deformans*, a fungus)
- Redhaven are very susceptible in the PNW.
- Leaf Curl resistant: Autumn Rose, August Etter, Avalon, Avalon Pride, Charlotte, Early Charlotte, Early Crawford, Frost, Indian Free, Kriebich, Muir, Nanaimo, Oregon Curl Free, Q-1-8.

Peach - Shothole

- Shothole (*Wilsonomyces carpophilus*, a fungus; formerly *Coryneum beyerinckii*)
- The cultivars Lovell and Muir are reportedly tolerant.

Frost



Peach Leaf Curl *Taphrina deformans*





Peach Shothole (**Coryneum Blight**) *Wilsonomyces carpophilus*



Peach Pest Control

- Peach leaf curl
 - 3 dormant copper or lime-sulfur sprays
 - Nov, Jan or Feb, pre bud break
- Coryneum blight- fall copper
- Bacterial canker- fall copper
- Brown rot- pre bud break sulfur and mid summer to harvest

Peach Pest Control

- Peach leaf curl
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■ CHERRIES

CHERRIES



Which tree fruit?
Why does it NOT need thinning?



Which two problems?
Frost? Pseudomonas?
Differences?



Common PNW Cherry Varieties

- Royal Ann
- Lapins
- Bada
- Stella
- Compact Stella
- Sweetheart
- Kordia (Attika)
- Lambert
- Regina

Cherry Varieties

OLD	NEW
▪ Bing	Sonata
▪ Cristalina	Lapin
▪ Rainier	Stella
▪ Royal Anne	Sweetheart
▪ Regina	Skeena
▪ Chelan	Sandra Rose

Spotted Wing Drosophila (SWD)



Cherry pest control

- Bacterial canker (*Pseudomonas*)-
 - Pruning in late Aug-Sep dry season
 - Bordeaux, Fixed copper (late fall and dormant)
- Blossom blight and brown rot
 - Pruning
 - Fixed copper during bloom
 - Sulfur, post-bloom
 - Remove rotten fruit

Cherry - Bacterial Canker *Pseudomonas syringae*



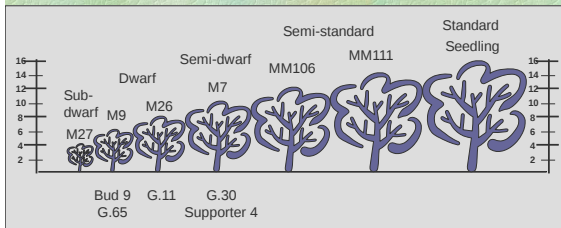
Cherry - Bacterial Canker

- Bacterial Canker (*Pseudomonas syringae* pv. *syringae*, a bacterium)
- Very susceptible: Royal Ann, Bing, Lambert, Napoleon, Sweetheart, Van
- Tolerant*: Corum, Regina, Rainier, Sam, Sue
 - *Appear to have sufficient tolerance to canker to be grown commercially without serious tree loss.

APPLES



Apple rootstocks



Common PNW Apple Varieties

- Lodi
- Earligold
- Akane
- Gravenstien
- Elstar
- Gala
- Jonagold
- Empire
- Red Delicious
- Golden Delicious
- Braeburn
- Newton
- Fuji
- Granny Smith

Old Favorites

- Gravenstein
- Newtown Pippin
- Spitzenberg
- Arkansas Black
- Northern Spy
- Winesap
- Ida red
- Jonathan
- Elstar
- Cox's Orange

Liberty



Pristine



Prima



Chehalis



Arkansas Black



Jonathan



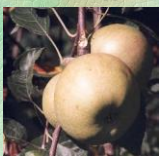
Spitzenberg



Cox Orange



Newtown Pippin



Northern Spy



Apple Scab Resistance

- Akane (Tokyo Rose)
- Cheallis
- Enterprise
- Liberty
- Prima
- Pristine
- Tydeman Red and
- New York and Coop numbered cultivars

Scab-resistant apple varieties

- Early ripening-
 - Pristine
 - Dayton
 - Chehalis
- Mid-/ early late
 - Liberty
 - Prima
- Late
 - Goldrush

Insects & Other Pests

Apple maggot
Codling moth
Leaf-roller
Scales
Aphids
Spotted Wing Drosophila (SWD)
Mice, Moles and Voles
Deer

Apple Maggot
Rhagoletis pomonella



UC Statewide IPM Project
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Codling Moth
Cydia pomonella



Oystershell Scale
Lepidosaphes ulmi



San Jose Scale Damage
Quadraspidotus perniciosus



Rosy Apple Aphid
Dysaphis plantaginea



Woolly Aphid
Eriosoma lanigerum

Fruit Tree Leaf Roller
Choristoneura rosaceana



Leaf Damage

Leaf Hopper
Stictocephala bupalus



Apple pest control

- Summer to harvest
 - Codling moth-
 - Trap to determine emergence- 2-3 flights
 - Horticultural oils (~3-4 weeks after bloom-apply every 5-7 days for 4-5 weeks)
 - Cyd-X virus
 - Surround
 - Spinosad
 - Mites, scale and aphids -
 - Horticultural oils
 - Insecticidal soaps

Anthraxnose
Cryptosporiopsis curvispora



Powdery Mildew
Podosphaera leucotricha



Anthracnose *Cryptosporiopsis curvispora*



Two Spotted Mite *Tetranychus urticae*



Red Mite *Panonychus ulmi*



Red Mite Damage

Apple – powdery mildew



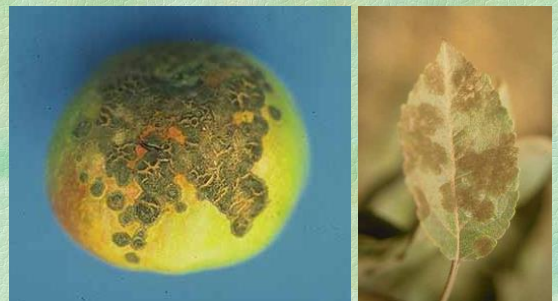
Powdery Mildew *Podosphaera leucotricha*



Apple - Powdery Mildew

- Powdery Mildew (*Podosphaera leucotricha*, a fungus)
- Very susceptible: Braeburn, Jonathan, Rome, Newtown, Granny Smith, Gravenstein (fruits of Jonathan and Rome also may be severely affected)
- Moderately susceptible: Winesap
- Less susceptible: Golden Delicious, Red Delicious, and Delicious strains
- **Resistant:** Pristine and Enterprise (both also scab-resistant)

Apple Scab *Venturia inaequalis*



Harvest Date

▪ Yellow transparent	July 20
▪ Lodi	July 25
▪ Paulared	Aug. 15
▪ Gala	Aug. 20
▪ Prima	Aug. 25
▪ McIntoch	Sept. 5
▪ Jonagold	Sept. 13

▪ Red delicious	Sept. 15
▪ Honeycrisp	Sept. 20
▪ Braeburn	Sept. 20
▪ Cameo	Sept. 25

YIELDS

- Yields SHOULD be in the 500 – 40 pound bushel or boxes per acre OR 20,000 pounds per acre.
- In Washington, we averaged 1000 - 40 pound boxes per acre = 40,000 pounds per acre.

PEARS



PEARS



PEARS



Bosc



D'Anjou



Comice



Yellow Bartlett



Common PNW Pear Varieties

European

- Yellow and Red Bartlett
- Green and Red Anjou
- Bosc
- Comice
- Cascasde
- Seckel
- Reimer Red
- Starkcrimson

Asian

- Kosui
- Shinseiki
- Chojuro
- Hosui
- Nijisseki

Standard pear varieties

Big four-

- Bartlett (Summer*)
- D'Anjou (Winter**)
- Bosc (Winter**)
- Comice (Winter**)

*Summer- will ripen after harvest

**Winter- requires chilling to ripen normally

Pear pest control

- Similar to apple
- Pseudomonas blight- Fixed copper (late fall and dormant)
- Fireblight-
 - Pruning
 - Copper sulfate and oil, Bordeaux

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Pear - Powdery Mildew

- Powdery Mildew (*Podosphaera leucotricha*, a fungus)
- The disease is important on the cultivar d'Anjou where a smooth fruit finish is highly desired.
- Bartlett rarely has a problem with this disease.

Pear Powdery Mildew *Podosphaera leucotricha*



Pear - Scab

- Scab (*Venturia pirina*, a fungus)
- The cultivars Forelle and Bartlett Red Sensation are very susceptible.

Pear Scab *Venturia pirina*



Pear Scab *Venturia pirina*



Pear - Pacific Coast Pear Rust

- Pacific Coast Pear Rust (*Gymnosporangium libocedri*, a fungus)
 - *Gymnosporangium asiaticum* is on Asian Pears
- Winter Nelis is severely affected
- Bartlett is affected less

Pacific Coast Pear Rust *Gymnosporangium libocedri*



Pear Fire Blight *Erwinia amylovora*,



Pomegranates

- Few insects.
- Center rot – too much irrigation.
- Prune – open center bush.
- High production.

Challenges

- Growing
- Tree fruits
- Is a challenge
- That bears
- FRUIT!!!



Also known as The
“Chinese apple”



By: Lacey Hartsack

<http://www.foodsubs.com/Fruitto.h>
info@pomegranate

What is it?

- Grown on shrub-like trees with orange flowers and glossy leaves from October to December
- Weighs about 9 ounces; the size of a large orange
- Full and rounded fruit with a flared, spiky crown
- A translucent, scarlet pulp surrounds 800 seeds that are compartmentalized between shiny, tough membranes
- Each seed is a fleshy, unusually bright-colored, glassy unit that is called an aril
- The flavor of the seeds is sweet with a hint of sour.

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NEWER INSECTS

- San Jose scale
- Oyster shell scale
- SWD?
- Brown Marmorated stink bug
- Why the important for the MG Hotlines!

San Jose Scale Damage *Quadraspidiotus perniciosus*



Oystershell Scale *Lepidosaphes ulmi*



This is WHAT? (SWD)
Which TF do we need to worry
about



<http://horticulture.oregonstate.edu/group/brown-marmorated-stink-bug-oregon>



Overview of Tree Fruit Diseases

Apple – Anthracnose
Apple - Powdery Mildew
Apple – Scab
Pear - Powdery Mildew
Pear - Scab
Pear - Pacific Coast Pear Rust
Pear - Fire Blight
Peach - Leaf Curl
Peach - Shothole
Cherry - Bacterial Canker

MORE INFORMATION

- **Local Extension office**
- **EESC Extension Experiment
Station Communications web site**
- **Cornell- New York**
- **WSU – Washington State University**

Questions?

