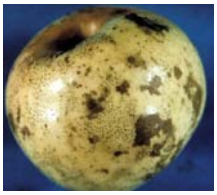

Prevention of Disease in Home Apple Trees

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General Considerations

- Chose varieties tolerant or resistant to disease
- Plant in well drained, sunny but fertile site, adjust pH as needed
- Use good planting technique
- Train/prune trees to maintain open canopy with strong scaffolds, first few years most critical
- Maintain moderate fertility
- Keep weeds and grass away from plants, mulch as needed

Ease of Growing Fruits
(variety dependent)

Difficult to Impossible	Moderate Amount of Care	Relatively easy
Peach	Apples (some)	Rabbiteye blueberries
Cherries	Plums (some)	Pears (some)
Apricots	Brambles	Figs
Commercial pear varieties	Pomegranate	Muscadines
Almonds	Paw Paw	Native/oriental Persimmon
Certain figs		Strawberry

Tree Fruit Health Management

- Apples – fruit may not be perfect, need TLC
  - Fire blight
  - Summer rots
- Pears – fireblight only serious problem
  - Fire blight – use resistant varieties
- Peaches/plums - try plums, not peaches, cherries, apricots.
  - Brown rot! Top disease constraint
  - Wood/root rots – pome and stone fruits need TLC and proper pruning

Most Serious Tree Fruit Diseases

- Apples
  - Fire blight
  - Summer fruit rot
- Pears
  - Fire blight – use resistant varieties
- Peaches/plums
  - Cherries, apricots not good choice
  - Brown rot! Top disease constraint
  - Plums: Black knot
  - Wood/root rots – pome and stone fruits need TLC and proper pruning

- Trees will not fulfill promise if improperly planted
- Improper pruning/injuries = wood rots and decline
- Very susceptible to canker pathogens/borers

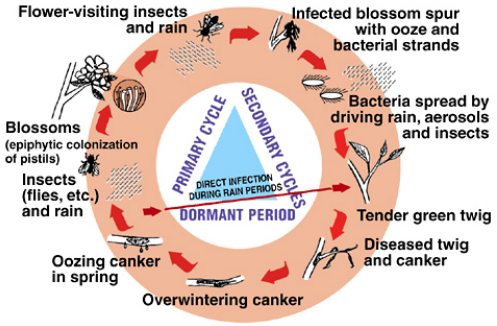
Pome and Prunus Fruit Trees Not Robust

Apple/Pear Diseases

Fire Blight of Apple and Pear

(*Erwinia amylovora*)

- First plant disease attributed to bacterium (Burrill;1878)
- Native disease on imported hosts
- Most important bacterial disease of apple and pear.
- Severity depends on environmental conditions at bloom and host resistance.
- Young trees more susceptible to serious damage.



Management of Fire Blight

- Home growers should use cultivars with moderate resistance
  - Often enough to prevent serious damage
  - Resistance essential in pear
- Rootstock choice can influence severity
  - Some dwarf rootstocks highly susceptible
- Avoid over-fertilizing, especially with nitrogen
- Remove early infections if possible, especially on young trees
- Prune out remaining cankers in the winter
- Chemical options:
  - Copper pre bloom (silver tip), Streptomycin during bloom
  - Biological antagonists available
  - Use based on past problems

Fire Blight Symptoms on Pear

With resistant cultivars, disease happens in a bad year resulting in 'strikes', but damage not seriously impact tree health.

Fire Blight Resistance of Apple Cultivars

Moderately Resistant	Highly Susceptible
Arkansas Black * **	Cortland
Arkansas * **	Fuji
Ben Davis	Gala
Blairmont **	Ginger Gold
Bramley's Seedling **	Jonathan
Daniels * **	Molly's Delicious
Golden Delicious **	Paulared
Goldrush	Pink Lady
Grimes	RI Greening
Jonafree **	Starr
Liberty * **	
Ozark Gold	
Redfree *	
Williams Pride * **	
Winesap	
Yates **	

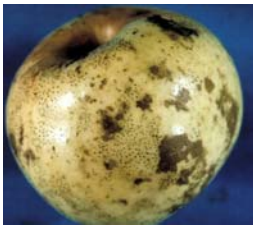
Fire Blight Resistance of Pear Cultivars

Moderately Resistant	Highly Susceptible
Kieffer	D'Anjou
LeConte	Bartlett
Magness	Bosc
Maxine	Clapp's Favorite
Moonglow	Comice
Old Home	Red Bartlett
Orient	Starkrimson
	Winter Nellis

* Has some resistance to cedar-apple rust
**Has some resistance to summer rots

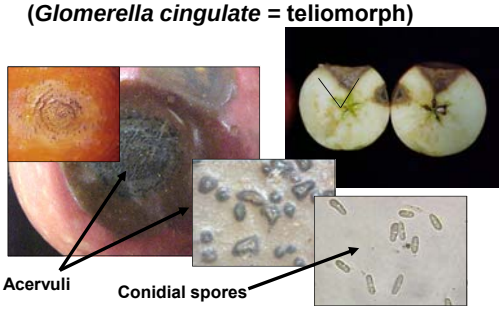
Apple Summer Rots

- Bitter, white, and black rot
- Most serious disease in south
- Fungi survive on diseased fruits and wood
- Flyspeck and sooty blotch common in summer but are superficial, fruit still edible



Bitter Rot

Colletotrichum gloeosporioides
(*Glomerella cingulate* = teliomorph)



Bitter Rot

- Survives from year to year on mummified apples and colonized dead wood and cankers.
- Spores are released after rain throughout the growing season.
- Infection can occur in as little as 5 hours. Wet conditions increase infection.
- Fruit infection can occur as early as bloom, more prevalent mid to late season.
- The most severe epidemics occur when early season is warm and wet, setting up early primary infections and multiple secondary infections.

Summer Rots Management

- Use Southeast adapted and resistant varieties
- Removal of mummified fruit, cankers and dead wood and branches in winter.
- Removal of infected fruit during the season.
- Proper cultural conditions, good air circulation
- If needed, copper and sulfur alternated every 7 to 10 days starting early, Captan also effective as summer cover spray (see home pest management guide)

Cedar Apple Rust

Gymnosporangium juniperi-virginianae

Use resistant varieties

Myclobutanil at bloom to petal fall if history of defoliation

Juniper – overwintering host

Apple – leaf spot, can defoliate

Alternaria Leaf Spot

Alternaria mali

- Common leaf spot in Georgia
- Varietal differences
- Does not appear to be a serious concern

Apple Scab

- Most important disease in northern apple growing regions
- Rarely a problem in Georgia
- No need to spray

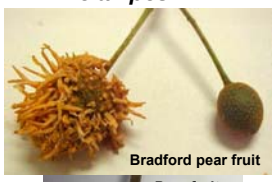
Pear trees have fewer disease issues (if fire blight resistant cultivars used)

Leaf spots, such as *Entomosporium* may lead to late season defoliation in wet years. Chemical management of leaf spot diseases on larger fruit trees usually not practical in home situations.

Juniper rust sporulation in early spring

Cedar Quince Rust

Gymnosporangium clavipes



Bradford pear fruit

Pear fruit symptoms

Burr Knot
A Genetic Disorder

- Clusters of root initials growing above ground
- Can develop on root stock or on top portions
- Dwarf root stocks and certain cultivars, such as Gala, are more prone to development.
- Will continue to increase over time leading to tree decline

Apple Insect Pests

- Frequent use of insecticides will affect beneficials and increase insect problems such as mites and others
- Scales, mites, aphids, leaf miners – generally not an important problem. Dormant oil (see pest manual) does not harm beneficials and can be used if history of problem, especially scales.
- Fruit moths, stink bugs and plant bugs may damage fruit. If insecticides wanted based on past problems, two applications 14 days apart at early fruit set usually enough, although can be highly toxic to bees and beneficials. (See home pest management guide for more options)
- Alternative is the kaolin clay-based Surround.

Surround Kaolin Clay

Protects against fruit insects
Treat early in season (after bloom) and repeat

Sprays that may be needed:

- Dormant:
  - Horticultural oil for insects
  - Copper for fireblight
- Bloom:
  - DO NOT SPRAY INSECTICIDES DURING BLOOM.
  - Spreptomycin if growing fireblight susceptible cultivars
  - Possibly captan during bloom for summer rots
- Cover sprays during growing season:
  - Copper, sulfur or captan early for summer rots
  - A couple of insecticide sprays early if history of fruit damaging insects

Resources for More Information

- County extension agent for accurate diagnosis of problem and recommendation
- Apples: Organic Production Guide, ATTRA publication (this site also has many other pubs on organic production): https://attra.ncat.org/
- "The Holistic Orchard" and other information on growing healthy apple trees from Michael Phillips: https://www.groworganicapples.com/