

# Tree Fruit Disease Management

Pick TN Conference 2023

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February 17, 2023

# New (ish) EPA regulations

- EPA has always been required to comply with Endangered Species Act (ESA)
  - Historically has only met requirement for <5% of registered products
- EPA facing numerous lawsuits over this
  - Currently >50 a.i.s and >1,000 pesticides under litigation
- Moving forward, EPA will review ALL products for ESA compliance
- **“Every product label likely to see major changes from this”** – Ag chem company reps
- Process slow, new registrations slower than ever

# Considerations for perennial fruit crops

## Focus on cultural practices

1. Site selection
  - Goal: encourage air movement
2. Variety selection
  - Goal: choose disease-resistant varieties
3. Canopy management
  - Goal: encourage air movement, sunlight & spray penetration
4. Sanitation
  - Goal: reduce disease pressure

# 1. Site selection

Disease management goal: encourage air movement

- Plant on a slope
- Avoid low-lying areas
- Full sun
- Avoid close proximity to wooded areas
  - May restrict air movement and harbor diseases and pests

## 2. Variety selection

Disease management goal: limit disease susceptibility

- **Apple** (many varieties, small example here)
  - Resistance available to scab, powdery mildew, **rust, fireblight**
    - Gala & Honeycrisp – popular in grocery store but high disease susceptibility
    - Empire & Red Delicious – resistance to rust and fireblight
- **Peach**
  - Resistance available to **bacterial spot & brown rot**
    - Venture – resistance to bacterial spot & brown rot
    - Intrepid – resistant to bacterial spot

# 3. Canopy management

Disease management goal: encourage air movement, sunlight & spray penetration

- Pruning & training – annual removal of plant parts
  - Develop canopy to promote air movement, sun exposure, & spray penetration

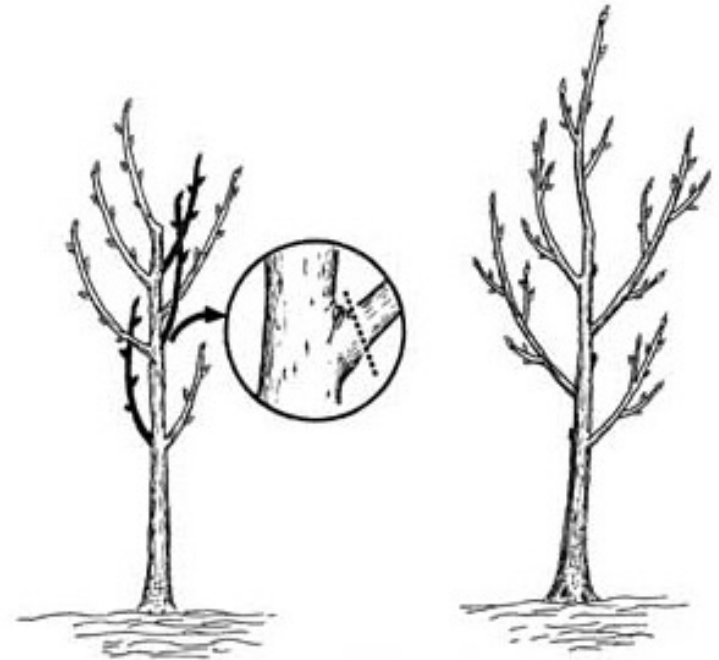


Figure 2: Prune interfering, weak or crowded branches. Stems in black are the ones to be removed (left). Make the cut outside of branch bark ridge and collar (circle insert).

<https://extension.colostate.edu/>

# 4. Sanitation

Disease management goal: reduce disease pressure

- Leaf removal
- Mummified fruit removal
- Pruning debris removal
- Several pathogens overwinter in crop debris
  - Removal of debris reduces disease pressure the following season
    - Crucial to keep disease levels as low as possible

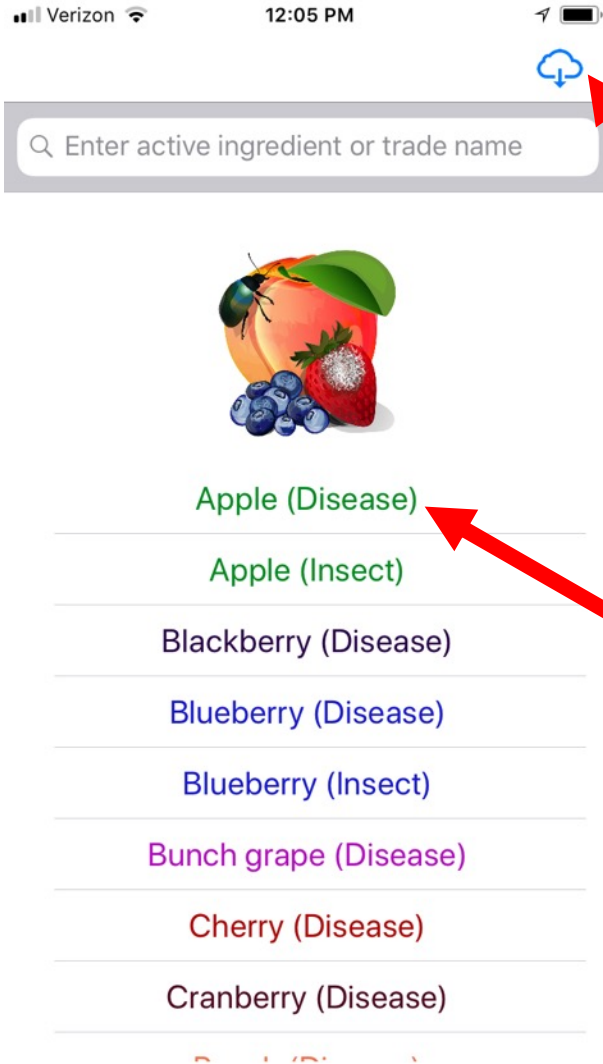
# “MyIPM” – free mobile app



- MyIPM – an app designed to help commercial growers make disease management decisions
- useful to help identify pests & diseases, especially on-the-go



# “MyIPM” – free mobile app

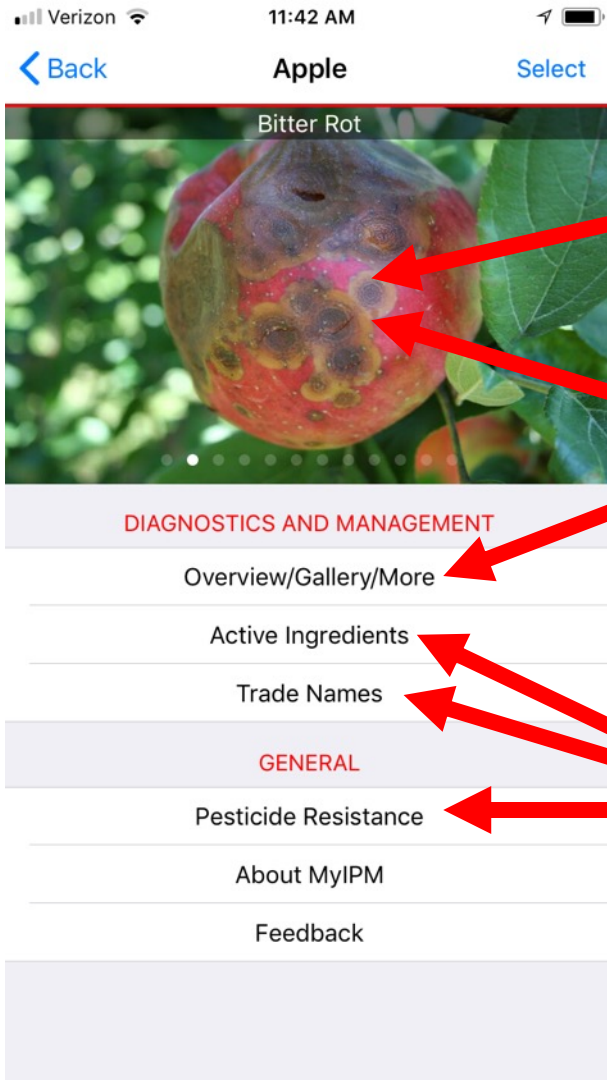


Select the Cloud icon to choose content to download

- you can download all content, or only topics you want

Once you’ve downloaded your topics, click one to see content

# “MyIPM” – free mobile app



Swipe photos left/right to see different diseases or pests

Click on picture or Overview/Gallery/More for photos and management info

Active Ingredients, Trade Names, & Pesticide Resistance geared towards commercial growers

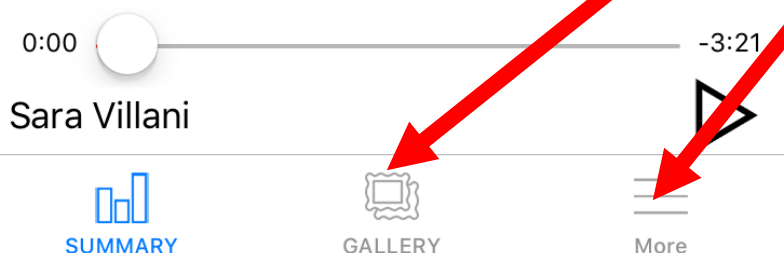
### OVERVIEW

**Bitter rot** of apple is caused by various *Colletotrichum* species, including *C. gloeosporioides*, *C. acutatum*, and by *C. fioriniae*.

**Infection** by *Colletotrichum* spp. occurs when spores overwintering in fruit mummies, dead wood, cankers, and buds are released during rainfall and directly infect fruit.

**Cultural Control** by removal of mummified fruit, cankers, dead wood, and current-season shoots killed by fire blight is effective for minimizing bitter rot infections. Flail mowing or leaf removal from the orchard floor may reduce primary inoculum for *Glomerella* leaf spot, an associated leaf-spot caused by *Glomerella cingulata*.

**Chemical control** is effective for managing bitter rot of apple. Fungicides should be initiated at petal fall and continue through harvest.



# MyIPM Mobile App

## Example of “Overview” screen including

- Pathogen name
- Disease cycle
- Cultural control strategies
- Chemical control strategies
  - Chemicals geared towards commercial growers
- Click “GALLERY” to see more photos
- Click “More” for additional info

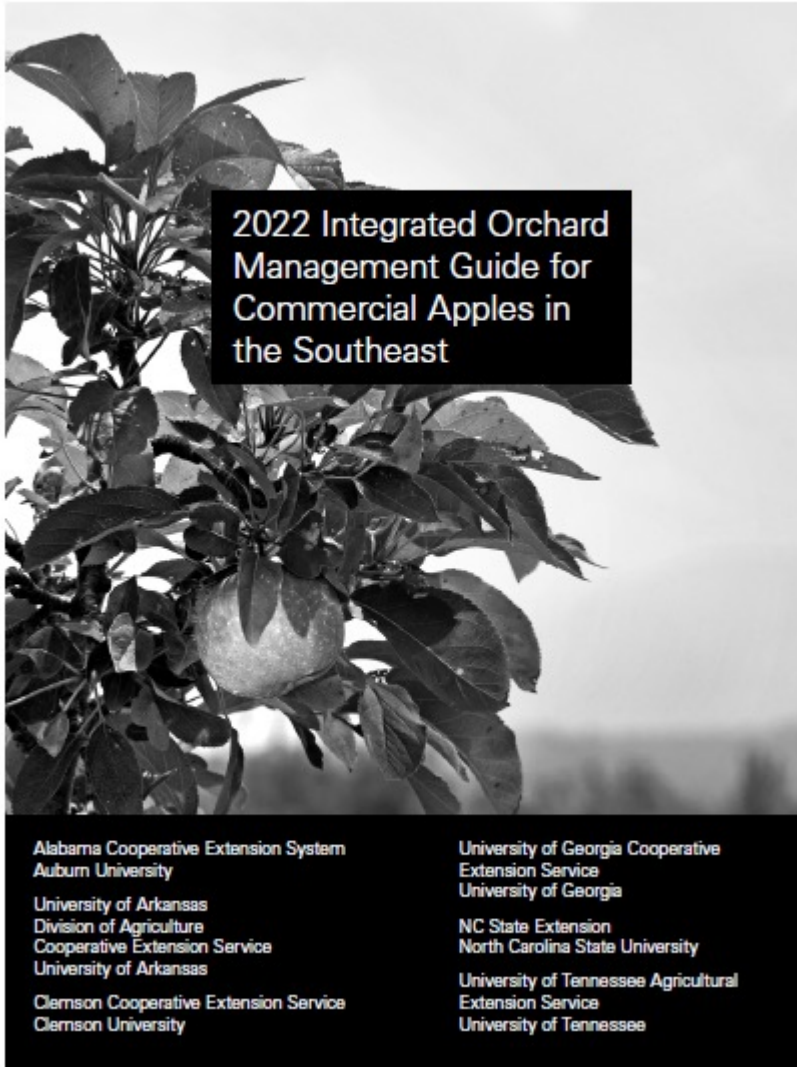
# Identify major disease problems

- Disease pressure varies by variety, site, and management practices

## Some of the most common apple diseases in TN

- Fire blight
- Cedar apple rust
- Fruit rots (bitter rot, white rot, black rot)

# Commercial Orchard IPM Guide



**Search title at  
[content.ces.NCSU.edu](http://content.ces.NCSU.edu)**



# Apple & pear – fire blight

Bacteria – *Erwinia amylovora*



Photo: P.G. Psallidas  
bugwood.org



# Apple & pear – fire blight





# Cedar apple rust

Fungus - *Gymnosporangium juniperi-virginianae*





# Apple fruit rots (caused by fungi)

1. **Bitter rot** - *Colletotrichum acutatum* & *gloeosporioides* (& *Glomerella* leaf spot)
2. **White rot** – *Botryosphaeria dothidea*
3. **Black rot** – *Diplodia seriata* (& frog-eye leaf spot)



# Bitter rot



Fungi

*Colletotrichum gloeosporioides*

*C. acutatum*

Photo: Alan Windham, EPP,  
UTIA





# Glomerella leaf spot

Photo: Sara Villani, NC State

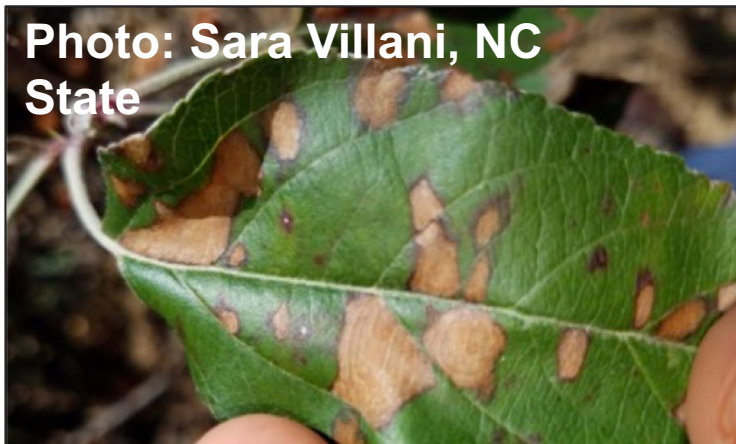


Photo: Sara Villani, NC State



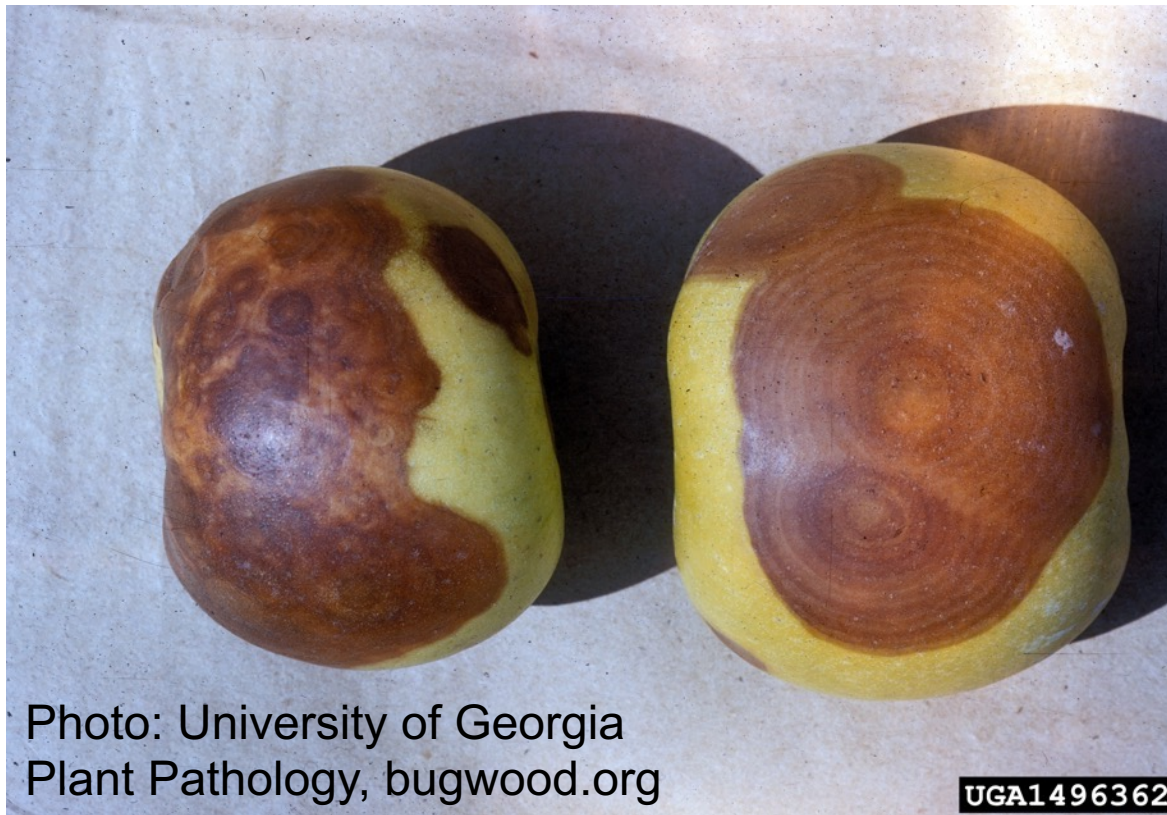
Photo: Dave Lockwood, PS, UTIA

# White rot – *Botryosphaeria dothidea*





# Black rot & frog-eye leaf spot – *Diplodia seriata*



# Common peach diseases

- Brown rot
- Bacterial leaf spot
- Black knot (more common on plum & cherry)

# Commercial Peach, Nectarine, & Plum IPM Guide

<https://site.extension.uga.edu>

## 2022 SOUTHEASTERN PEACH, NECTARINE, AND PLUM PEST MANAGEMENT AND CULTURE GUIDE

**Senior Editors:** Brett Blaauw, Phil Brannen, David Lockwood, Guido Schnabel, and David Ritchie

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# Peach – brown rot

Fungus - *Monilinia fructicola*



Photo: Rebecca Melanson, Mississippi State  
University Extension  
bugwood.org

5558709





# Brown rot management

- Sanitation (mummy fruit and dead wood/cankers)
- Late-season fungicide sprays during last three weeks of ripening
  - Spray at 14-days, 7-days, and possibly 0-days prior to first harvest
    - Select fungicides from IPM guide or MyIPM app
- Blossom blight – spray fungicides at bloom during wet seasons

# Peach – bacterial spot

Bacteria - *Xanthomonas campestris* pv. *pruni*



Photo: U. Mazzucchi  
bugwood.org

# Bacterial spot management

- Small, angular, black lesions
- Copper toxicity – similar symptoms but lesions not angular
- Small lesions may develop on fruit
- Choose tolerant varieties
- Chemical control only moderately effective
- Spray from dormancy up to 3 weeks pre harvest if high disease pressure
  - Copper
    - High label rate at late dormancy reduces inoculum
  - Oxytetracycline





# Black Knot

Fungus - *Apiosporina morbosa*

- Source: wild or abandoned trees
- **Affects plum, cherry**, can occur on peach
- Spreads in spring during rainy, windy weather
- Control:
  - Remove infected twigs & branches while tree is dormant
  - Make cuts 2 to 4 inches below the gall
  - Bury or burn prunings
  - Fungicide applications

\*Slide by Dave Lockwood

# Disease management resources

## Commercial fungicide recommendations

- [2021 Integrated Orchard Management Guide for Commercial Apples in the Southeast](#)
- [2022 Southeastern Peach, Nectarine, and Plum Pest Management and Culture Guide](#)

## MyIPM app

- Diagnostic photos and management recommendations

# Home garden fungicide recommendations

## UT Extension PB 1622 (recently updated)

PB 1622

### Disease and Insect Control in Home Fruit Plantings

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Growing fruit in residential areas can be an interesting, fun and rewarding hobby. Many novices dream of plucking perfect fruit off trees or plants in their yards and gardens. However, high quality harvests do not happen without knowledge and a great deal of work. Controlling pests (insects and diseases) is an integral part of the care necessary to achieve good results.

This publication provides guidelines for pest management in home fruit plantings, but good pest control is not possible if spraying is the only action taken. Success starts with selection of disease resistant cultivars and sites that are open and full sun. Cultural practices such as pruning and sanitation are also necessary for good pest control. Specific cultural practices for each type of fruit are provided with the spray charts.

#### How to Use the Spray Schedules

Most fungicide (disease control product) and some insecticide (insect control product) applications are effective only if applied preventatively because it is not possible to control the pest satisfactorily after infection or infestation. The timing of these preventive sprays is based on the growth stage of the plant and forms the foundation of the spray charts that follow.

In very rainy seasons, sprays may need to be applied more frequently than the schedule given in the following charts. Wet weather favors development of the disease-causing organisms; thus, more chemical protection is needed. Also, rains can wash off the pesticides (fungicides and insecticides). When rain occurs before a spray has dried or if rainfall totals more than 1 inch within 24 hours, the spray should be re-applied. However, do not delay fungicide application if rain is forecast because fungicides provide more benefit when applied before a rain than after. Protection from infection by disease-causing organisms is needed when plant surfaces are wet.

#### Additional Spray Tips

Thorough coverage of all aboveground plant parts is needed for good pest control. One of the biggest mistakes home fruit growers make is allowing plants and trees to grow too tall. If dwarf and semi-dwarf trees are selected and then maintained at a manageable height, it is easier to spray them properly as well as to harvest the fruit. Proper pruning practices also reduce the amount of spray needed and permits better coverage.



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