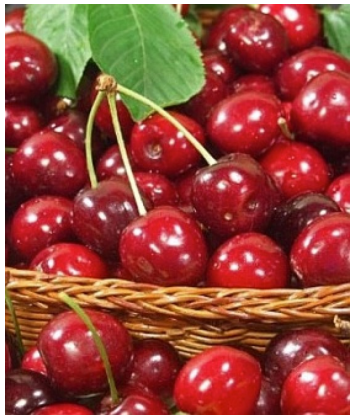

Common Insects & Diseases of Home Fruit

Presented by
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Extension Educator

EXTENSION

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Common Insects of Home Fruits

- Fruits
  - Codling moth
  - Plum curculio
  - **Apple maggot**
  - Cherry maggot
  - Spotted wing dropsophila
  - Grape berry moth
  - Tarnished plant bug
  - Sap beetle
- Foliage
  - Aphids
  - Grape phylloxera
- Stem
  - Grape flea beetle
  - **Apple tree borers**
  - **Peach tree borers**
  - American plum borer

2

Resources

- Fruit Spray Schedules for the Homeowner
  - University of Missouri Extension
  - Go.unl.edu/sprayschedule
- Midwest Tree Fruit Spray Guide
  - Go.unl.edu/sprayguide

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Apple & Pear Spray Periods

- Dormant- apply before buds swell
- Green tip- tips of green leaves begin to appear
- Half-inch green- tips of green leaves are ½" long
- Prebloom- flower buds visible but still closed
- Pink bud- flower petals elongating; sepals slightly open; petal color just visible
- Bloom- flowers are open
- Petal fall- apply when most of the blossom petals have fallen
- Cover sprays- apply 10 days after petal-fall and at 10 day intervals through May

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Integrated Pest Management (IPM)

- Biological
- Mechanical
- Cultural
- Chemical

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General Guidelines for Insect Control

- Avoid wounding fruit trees
- Maintain plant vigor with proper irrigation, pruning and soil fertility
- Preserve beneficial insect populations
- Identify the insect
- Young insects are easier to kill than mature insects

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Codling Moth

- Hosts include apple, pear, plum, apricot, cherry, quince & other fruits
- Introduced by European immigrants over 200 years ago
- 2-3 generations/year
- Larvae overwinter in cocoons under loose tree bark
  - Larvae have legs
- First generation moths begin to emerge as the last petals fall from the apple blossoms
- Emergence may extend for 6-7 weeks after petal fall

Image from University of Kentucky Entomology

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Codling Moth

- Eggs are laid on fruits or nearby leaves
- Larvae enter from the side or calyx end of fruit, or other rough areas
- Larvae feed for about 3 weeks, then leave the fruit to seek pupation sites
- Pupation is completed in 14-21 days
- Second generation insects emerge in early July
- Many first generation larvae remain in the cocoon until the following spring

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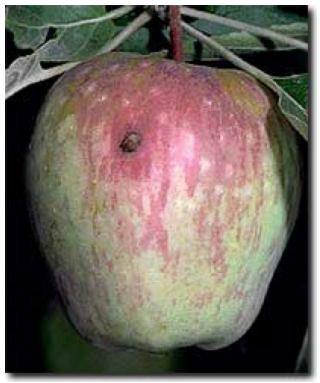
Codling Moth Control

- Pick up and discard fallen fruits weekly
- Cardboard strips applied in June & August
- Insecticide applications every 10-14 days from petal fall to pre-harvest



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Plum Curculio

- A major pest of stone fruits, ranking in order of preference: nectarine, plum, cherry, peach and apricot
- Also attacks apple, blueberry, pear and quince
- All insect stages are damaging
- 1 generation/year
- Adults brownish-black weevil mottled with orange and white
- Overwinters as adult in debris and protected locations

Image from The Bugwood Network

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Plum Curculio

- Adults emerge in spring
  - Shortly after the peaches finish blooming
  - Apples are near the pink bud stage
- Adults immediately begin feeding on the buds, blossoms, leaves and new fruits
- Egg laying begins as soon as the new fruits begin to form, and continues for 3-4 weeks
- Larvae feed for about 10-16 days
- Larvae leave fruits and burrow into soil to pupate
- Adults emerge in July and August

Images from Michigan State University Extension

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Plum Curculio Control

- Pick up and discard fallen fruits 2-3 times each week
- Make 3 insecticide applications every 7-10 days following petal fall to control the first generation adults

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Cherry Maggot

- Cherry fruit fly and black cherry fruit fly
- Hosts include sweet and tart cherries; also attack wild black cherry, pin cherry, and choke cherry
- Damage is caused by adult and larval feeding, and egg laying
- 1 generation/year
- Overwinters as pupa in the soil, resembling a grain of wheat
- Adults emerge and feed for about 10 days before beginning to lay eggs
  - BCFF in late May to mid June
  - CFF mid June to early July
- Adults feed on plant juices, dew, aphid honeydew, or liquids at punctures in fruits

Images from Washington State University

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Cherry Maggot

- Eggs require 5-7 days to hatch
- Maggots feed inside the fruit for about two weeks before dropping to the ground and burrowing into the soil

Images from Washington State University

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Cherry Maggot Control

- Use yellow sticky traps during the pre-oviposition period
- Use red sphere traps during the egg laying period
  - 1-3 traps/tree
  - Mix Tanglefoot with household ammonia which mimics the smell of aphid honeydew
  - Place traps on south side, 1 foot inside the foliage and remove foliage and twigs for at least 1 foot around the trap
- First chemical application 10 days after shuck fall

Images from Washington State University

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Spotted Wing Drosophila

Right – adult male

Left – adult female

Photograph by Eric LaGrasa, courtesy of the Washington Department of Agriculture.

- Non-native vinegar or fruit fly from East Asia
- Very attracted to soft, late season fruits
  - Brambles, blueberries, late season strawberries, peaches, cherries, elderberries
  - Also many wild, ornamental & weedy hosts

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Spotted Wing Drosophila

- Adults overwinter, often in dried fruit debris
- Egg laying begins in late spring and early summer when ripening fruits are developing
- Affected fruits rapidly soften
  - Skin becomes dimpled & wrinkled
  - Sunken craters form in fruits

Photograph courtesy of Hannah Burrack, North Carolina State University.

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Spotted Wing Drosophila

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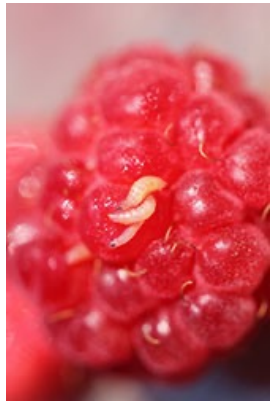

Image from Colorado State University

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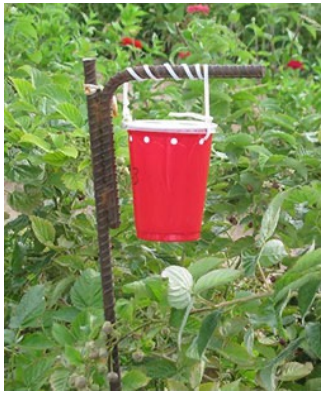
SWD Management

- Traps to monitor
- Frequent harvest – every 3 to 4 days
  - Also harvest damaged fruits that will not be eaten
  - Heat treatment to kill developing larvae in damaged fruits
- Sanitation
- Crop canopy management through pruning
- Cultivar selection
- Fine mesh nets (1mm)
- Spinosad – 5 to 7 day residual (PRE 1 day)



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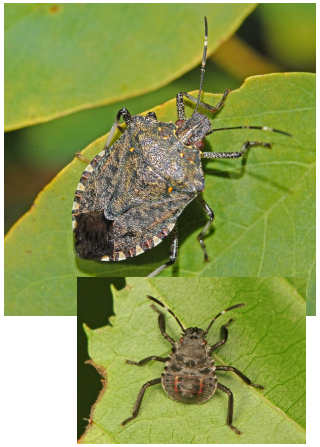
Brown Marmorated Stink Bug

- Non-native, East Asia, 1998
- Damaging to tree fruits and vegetables; over 300 different plant species
- Overwinters as adult, 1 generation/year
- 5 nymphal stages



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Brown Marmorated Stink Bug

Photo: Amy Irish-Brown, MSU Extension.

Photo: StopBMSB.org

Kernels of sweet corn damaged by feeding of stink bugs.

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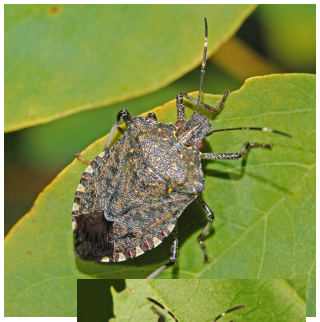
BMSB Management

- Overwintering generation tends to be more susceptible to insecticides than the summer generation
- Border sprays can give good results



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Integrated Pest Management & General Disease Management Practices

- Use resistant varieties
- Buy healthy, high quality plants
- Avoid planting too closely
- Sanitation
- Weed control

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Common Diseases of Home Fruits

- Leaf
  - **Cedar-apple rust**
  - **Apple scab**
  - **Cherry leaf spot**
  - Peach leaf curl
- Stem
  - Fire blight
  - Black knot
  - Bacterial canker
  - Perennial canker
  - Verticillium wilt
  - Bacterial crown gall
  - Cane blight of brambles
- Fruit
  - American brown rot
  - Bacterial spot
  - Plum Pockets
  - Strawberry leaf spot
  - Iron chlorosis of blueberry
  - Grape black rot
  - Strawberry gray mold
  - White rot
- Root
  - Red stele of strawberry

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Apple Scab

- Hosts- Crabapple, apple, hawthorn, mountain ash, firethorn and loquat
- Overwinters on infected leaves and fruits
- Infection begins when blossoms start to open
- Favored by wet, humid weather, spores forcibly ejected from infected leaf tissue
- Velvety-brown to olive lesions deveop on leaf undersides first, then petioles and fruits
- Severe infection causes serious defoliation

Image from South Dakota State University Pest Alert

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Apple Scab

- Fruit lesions enlarge and become cracked & scabby
- Plant resistant varieties
  - Prima, Priscilla, Sir Prize, Freedom, Liberty, Jonafree, Enterprise, Goldrush, Redfree, Pristine, Williams Pride, Novamac and Nova Easygro
- Somewhat resistant
  - Golden Delicious and Jonathan
- Very susceptible
  - McIntosh, Cortland, Red Delicious and Rome Beauty

Image courtesy of J. Hartman and University of Wisconsin- LaCrosse

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Apple Scab Control

- Rake & remove infected leaves and fruit 'mummies'
- Protective fungicide sprays must be present on the leaf surface before infection
- Start at green tip stage, continue every 7 days until approximately 20 days after petal fall
  - 2nd cover spray
  - Or while spring weather stay wet and rainy

Image courtesy of J. Hartman, www.apsnet.org

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Cedar-Apple Rust

- Hosts include apple, crabapple
  - Cedar Quince Rust
  - Cedar Hawthorn Rust
- Juniper infected in late summer
- Gall requires 18 months to mature
- Spore production & release favored by wet weather
- Spores blown from juniper host to apple host

Image courtesy of Sarah Browning, University of Nebraska- Lincoln Extension

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Cedar-Apple Rust

- Symptoms begin as small yellowish-orange leaf spots
- Leaf spots enlarge, and may develop a red or yellow halo
- Small dark pycnidia develop within the spots as they develop
- Severe infection results in heavy defoliation and weakens the tree

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Cedar-Apple Rust Control

- Fruit lesions similar to leaf spots
- Usually infected at blossom end
- Decrease fruit size
- Fruit distortion
- Premature fruit drop
- Control
  - Plant resistant varieties
  - Protective fungicides
  - Pink stage to petal fall (May-June)

Image courtesy of Minnesota Fruit and Vegetable IPM News

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Cherry Leaf Spot

- Hosts- sweet & sour cherry (serious defoliation)
  - Also almond, pin, sand, and chokecherry
  - Plum (less susceptible)
- Overwinters on infected leaves; spores released during and shortly after rain from early bloom to 6 weeks after petal fall
- Favored by 60-68 F temp, with rainfall or high humidity
- Small ¼", "pinpoint", purple leaf spots; lesions may merge into irregular spots
- "Shot-hole", especially on plum, occasionally on tart cherry, less on sweet cherry
- Leaves turn golden yellow

Image courtesy West Virginia University, Kearneysville Tree Fruit Research and Education Center

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Cherry Leaf Spot

- Consequences of defoliation
  - Unevenly ripening fruit with poor taste
  - Weakened tree that is more susceptible to winter injury
  - Small, weak fruit buds
  - Reduction in fruit size & set
  - Death of fruit spurs
  - Tree death

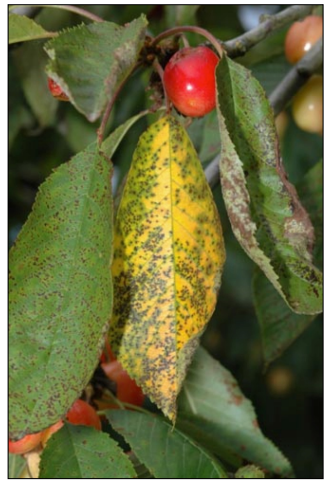

Image courtesy Oregon State University Extension

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Cherry Leaf Spot Control

- Sanitation
- Planting site selection
  - Direct sun
  - Good air movement
  - Good soil drainage
- Avoid excess fertilization
- Proper pruning
- Fungicides
  - Petal fall, every 10 days to harvest
  - Post harvest

Cherry leaf spot lesions on petioles, image courtesy Michigan State University Extension

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Questions?

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