

# Cut flower disease and insect update

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# **Powdery mildew**

# Powdery mildew

- Obligate parasite – needs living tissue to survive
- Most plants are infected with at least one species of powdery mildew
- Some PM infect many different plant species, others are very host specific

# Powdery mildew

- Does not need free water on leaves to infect; Rain can actually have a negative effect on the fungus
- Spread of PM:
  - Conidia can be carried for miles by wind
  - Infected plants contacting non-infected plants
  - Dispersal by humans

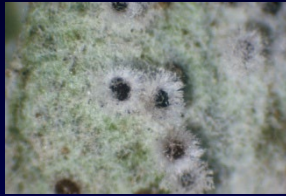
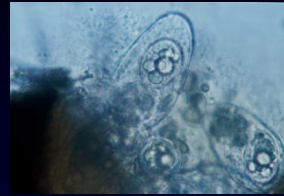
# Powdery mildew

- Survival in winter:
  - Ascospores survive in fruiting bodies on dead plant material
  - During mild winter temperatures PM can survive on green plant tissue (shoots, leaves)



T. Smith, UMass

Ascospores released  
in the spring



Re-infect new leaves



Spores infect tissue

Overwinter in plant  
debris



Colonies form and  
produce conidia or  
chasmothecia



# Powdery mildew

Plant	Powdery mildew
Dahlia, zinnia, celosia	<i>Golovinomyces ambrosiae</i>
Rose	<i>Podosphaera pannosa</i>
Peony	<i>Erysiphe paeoniae</i>
Delphinium, larkspur	<i>Erysiphe aquilegiae</i>
Beebalm	<i>Golovinomyces monardae</i>

# Powdery mildew

- Management:
  - Fungicide applications including sulfur or Kaligreen (potassium bicarbonate) work well
  - Need to be started as soon as the first spots appear
  - Reminder: Do not apply sulfur above 90F
  - Test it on a couple of plants first to check for phytotoxicity



# Powdery mildew

- Request:
  - We are looking for powdery mildew in Utah on:
    - *Echinacea*
    - *Echinops*
    - *Eryngium*
    - *Strawflower*
    - *Sunflower*
    - *Ornamental tobacco*

If you see any please contact: Claudia Nischwitz or Melanie Stock

# **Dahlia mosaic virus**

# Dahlia mosaic virus

- Three former strains are now classified as separate viruses
  - DMV-D10 (DvEPRS)
  - DMV-Portland (DMV)
  - DMV-Holland (DCMV)
  - Can occur single or in combination in plants
- Transmission: Aphids (melon aphid) and seed/tubers
- There have been reports that all three strains have been found in seed
- Agdia tests for DMV/DCMV but does not differentiate between the two

# **Leafy gall and crown gall**

# Leafy gall

- Causal agent: *Rhodococcus fascians*
  - Soilborne and can grow on surface of plant material
  - Enters plant tissue through wounds or natural openings like lenticels or stomates
  - Bacteria manipulate the hormone levels in the plant
  - Over 80 known hosts including dahlia, delphinium, sunflower, chrysanthemum, Veronica, many other ornamentals, corn, vegetables

# Leafy gall

- Symptoms:
  - Fasciation: Stems are flattened and ribbon-like
  - Shoot proliferation: Numerous shoots emerging from one area
  - Stunted plants, reduced root growth
- Symptoms in some plants can be caused by:
  - Eriophyid mites
  - Herbicide
  - Phytoplasma



# Leafy gall

- Management:
  - Remove infected plants (if neighboring plants are very close to infected plant, remove them as well)
  - Get the symptomatic plants tested to determine cause
  - Do not take cuttings from infected plants
  - Sterilize pruning tools between plants
  - Use new or sterilized pots and trays

# Crown gall

- Causal agent: *Rhizobium radiobacter* (syn. *Agrobacterium tumefaciens*)
  - Soilborne
  - Enters plant tissue through fresh wounds
  - Transmission by splashing water, soil and pruning tools
  - Bacteria insert Ti plasmid into plant cells leading to unregulated cell division
  - Wide host range especially woody ornamentals but also herbaceous plants like dahlia, chrysanthemum



# Crown gall

- Symptoms:
  - Tumors with no shoots on stems, tubers



# Crown gall

- Management:
  - Crop rotation with grass or cereals to reduce population
  - Remove galls by cutting into healthy tissue with sterile pruners when possible (during dry weather)
  - Sterilize pruning tools between plants

# Leafy gall and crown gall

## Leafy gall

- *Rhodococcus fascians*
- Shoots sprout from tumors
- Infect through wounds and natural openings
- Soilborne as well as on plant tissue
- Infects mostly herbaceous plants

## Crown gall

- *Agrobacterium tumefaciens*
- No shoots are produced
- Infect through fresh wounds
- Soilborne
- Infects many woody and some herbaceous plants

# Thrips management

# Thrips

- Thrips are 1/16-1/8 in depending on species
- Transmit Tospoviruses (TSWV, INSV, IYSV)
- Thrips acquire virus as 1<sup>st</sup> and 2<sup>nd</sup> stage larvae
- Once acquired the thrips will transmit the viruses their entire life
- Adult thrips can acquire tospoviruses but cannot transmit them
- Thrips can also cause direct damage when feeding



# Thrips management

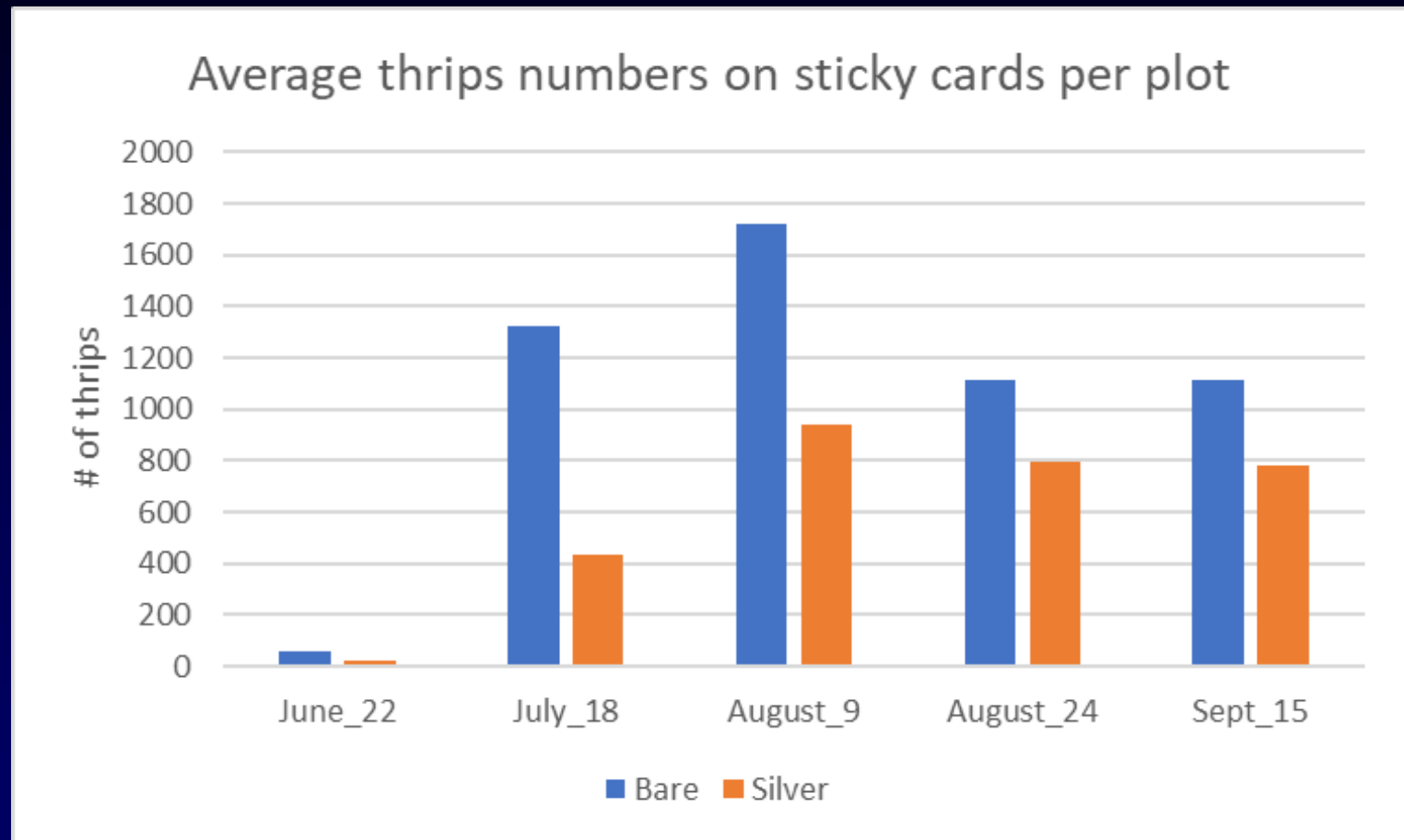
- Insecticides but resistance can develop and use may be limited for cut flower production
- Biological control agents
  - Green lace wings
  - Minute pirate bugs
  - Predatory mites

# Thrips management trial

- Silver reflective mulch
  - Black plastic mulch painted silver (4ft x 50ft)  
Other sizes are available



# Thrips management trial





# Thrips management trial

- Benefits:
  - Reduces number of thrips especially early in the season
  - Tubers in the silver mulch treatment were quite a bit bigger at the end of the growing season compared to the bare ground treatment
- Disadvantages:
  - Not cheap
  - Towards the end of the growing season the silver paint gets scratched off
  - Can only be used for one season

# Dahlias deer resistant?



# Acknowledgements

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- Cut flower producers
- Student employees
- Funding sources:
  - Utah Agriculture Experiment Station
  - USU Extension grant
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  - USDA WPDN diagnostic funding

A scenic landscape featuring a dense forest of green trees in the foreground and a large, snow-capped mountain peak in the distance. The sky is light blue with some clouds. The text "Thank you for listening! Questions?" is overlaid in yellow on the forest.

Thank you for listening!  
Questions?