

Cut flower disease and insect update

Claudia Nischwitz

Associate Professor and Extension Specialist

Melanie Stock

Assistant Professor and Extension Specialist

Benjamin Scow

Professional Practice Extension Assistant Professor,
Washington County



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Powdery mildew

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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

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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

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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)

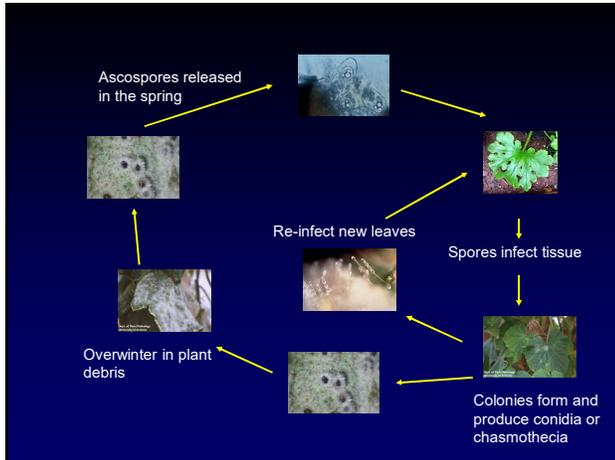


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Powdery mildew

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

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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

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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
(Claudia.Nischwitz@usu.edu)

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Dahlia mosaic virus

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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

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Leafy gall and crown gall

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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

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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



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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

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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

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Crown gall

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



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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

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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

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Thrips management

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Thrips

- Thrips are 1/16-1/8 in depending on species
- Transmit Tospoviruses (TSWV, INSV, IWSV)
- Thrips acquire virus as 1st and 2nd 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



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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

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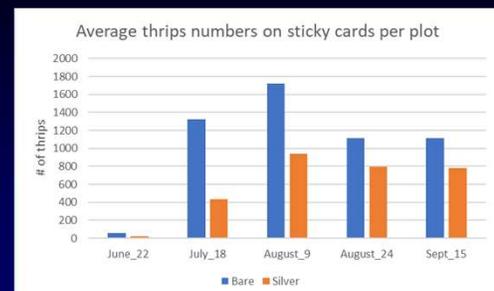
Thrips management trial

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



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Thrips management trial



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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

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Dahlias deer resistant?



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