PEST IDENTIFICATION AND MANAGEMENT FOR CUT FLOWERS

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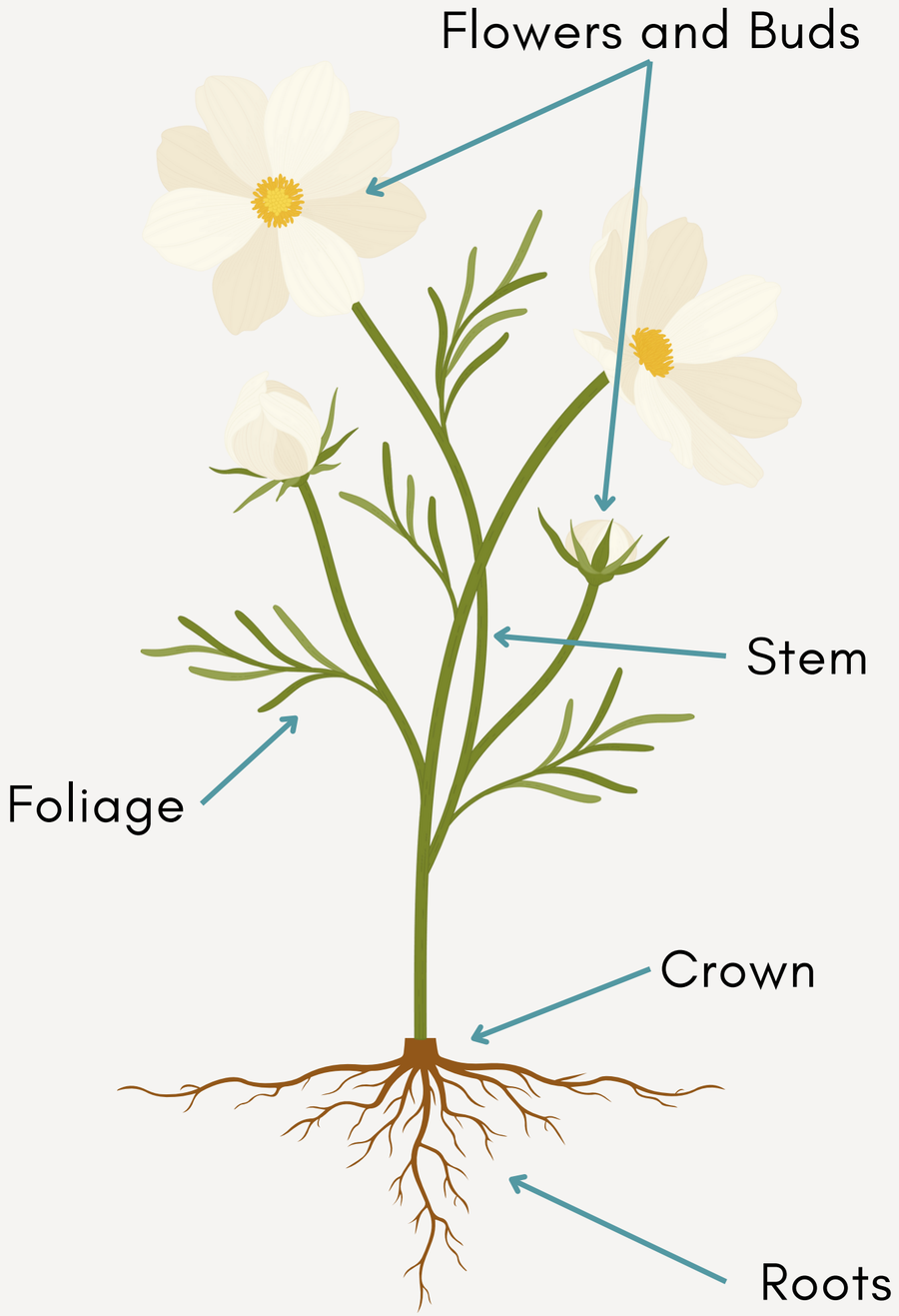
INTRODUCTION

- Program Associate (USU Extension IPM Program)
- M.S. Student (USU Small Farms Lab)

I send out seasonal advisories, develop educational content (videos, fact sheets, etc.), and provide outreach on integrated pest management.
In 2023, I began scouting cut flower production for plant diseases and other pests.

WHY MANAGE PESTS IN CUT FLOWERS

- Pests contribute to 20%–25% of crop loss nationwide. **However**, plant-insect pests make up only 0.5% of insect species in the world. **Identification is important!**
- Pest feeding damage (all plant parts) affects the health and aesthetics of a flower, therefore affecting its marketability.
- There are no formal thresholds established for cut flower production in the region. Individual considerations should be based on budget, farm size, and pest presence.



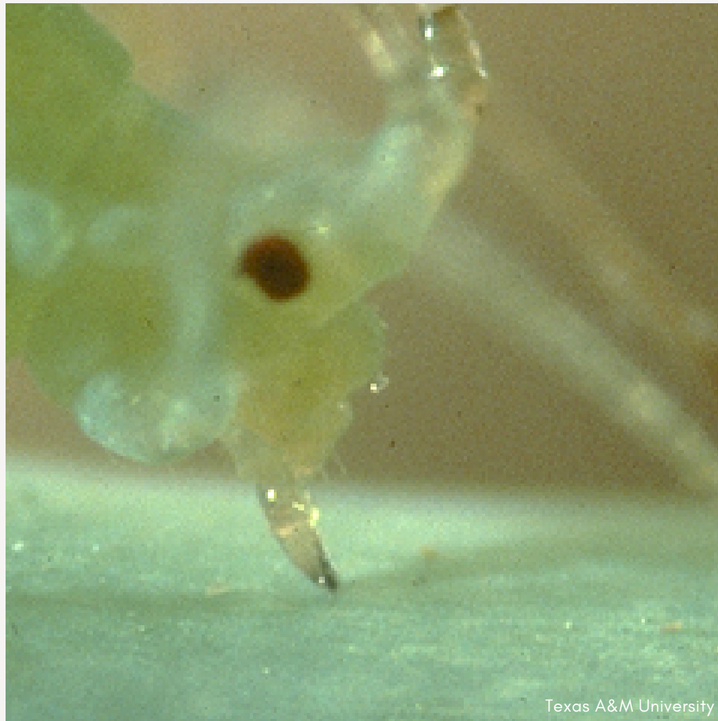
SCOUT AND MONITOR FOR PEST PROBLEMS

Monitoring flowers regularly from seedling to harvest allows for early detection of any pest or abiotic problems. Closely inspect all parts of the plants for the signs and symptoms.

- **Signs** are physical evidence of a pest. This can include visible feeding damage, insect excrement, shed skin, or the presence of the pest itself.
- **Symptoms** are a plant's reaction to a pest. This includes discoloration, wilting, or lesions (usually correlated with pathogens).

APHIDS

- They have piercing-sucking mouthparts. Feeding distorts and stunts plants produces honeydew that supports sooty mold fungi, and can vector plant viruses.
- Adults may be winged or wingless with a pear-shaped, soft body, and vary in color depending on the species (1-2 mm).
- During spring and summer, aphids can be abundant.
- Aphids reproduce asexually during the growing season but reproduce sexually when temperatures cool in the fall. Overwinter as eggs on woody hosts or crop debris.
- Multiple generations per growing season.



APHID MANAGEMENT

- Thoroughly scout flowers and weeds for signs or symptoms.
- Remove weeds and volunteer crops that can serve as hosts.
- Use yellow sticky traps to monitor populations.
- Encourage natural enemies such as lady beetles, damsel bugs, syphid flies, predatory midges, lacewings, and parasitic wasps.
- Use a strong stream of water to spray colonies off the plants.
- Best to apply insecticides in the early morning or evening. Target young and susceptible life stages.
- Insecticide options:
  - bifenthrin (Bonide® Eight Flower & Vegetable; GardenTech Sevin® Insect Killer Dust)
  - zeta-cypermethrin (GardenTech Sevin® Insect Killer Con.)
  - permethrin (Hi-Yield® Garden & Farm Insect Control; Bonide® Eight Vegetable, Fruit & Flower Con.)
  - malathion (Bonide® Malathion Con., Spectracide® Malathion Insect Spray Con.)
  - spinosad (Natural Guard® Spinosad Con.; Bonide Captain Jack's Deadbug Brew Con.)
  - neem oil (Natural Guard® Neem; Natria® Neem Oil; BioAdvanced® Organics Neem)
  - insecticidal soap (Natural Guard®, Monterey®, Bonide®, Natria®)

EARWIGS

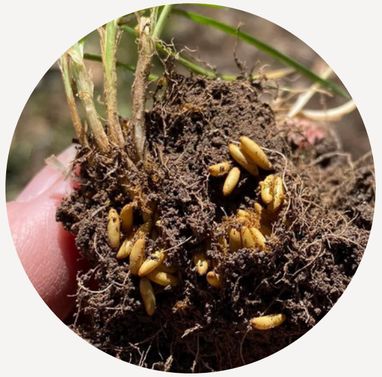
- Earwigs feed on buds, flowers, leaves, and other plant parts leading to low marketability and aesthetic injury.
- Adults are slender with a brown body, red-brown head, and a prominent pair of “pinchers” (cerci) on the rear of the body (⩽ 16 mm).
- European earwigs are omnivores, feeding on a diverse diet including plants, fungal spores, small invertebrates, and decaying organic matter.
- Adults like to hide in dark, tight, and moist places during the daytime (under weed barriers and petals).
- Eggs are laid in clusters of 30-40 within nests in the soil.

EARWIG MANAGEMENT

- Create bait containers (e.g. tuna can, yogurt container) with smelly oils (e.g. clam oil, bacon grease) for production areas in early spring and monitor weekly. (Check traps first thing in the morning! Replace as needed).
- Reduce or remove nesting and hiding places (debris lying around).
- Insecticide options:
  - bifenthrin (Bonide® Eight Flower & Vegetable; GardenTech Sevin® Insect Killer Dust)
  - zeta-cypermethrin (GardenTech Sevin® Insect Killer Con.)
  - lambda cyhalothrin (GardenTech® Sevin Insect Killer RTU, Spectracide® Triazicide Insect
  - Killer for Lawns & Landscapes RTU)
  - permethrin (Hi-Yield® Garden & Farm Insect Control; Bonide® Eight Vegetable, Fruit & Flower Con.)
  - deltamethrin (Ortho® Insect Killer Flower & Vegetable Garden Dust)
  - silicon dioxide (Bonide® Diatomaceous Earth; Natural Guard® Diatomaceous Earth)
    - (challenges with diatomaceous earth)

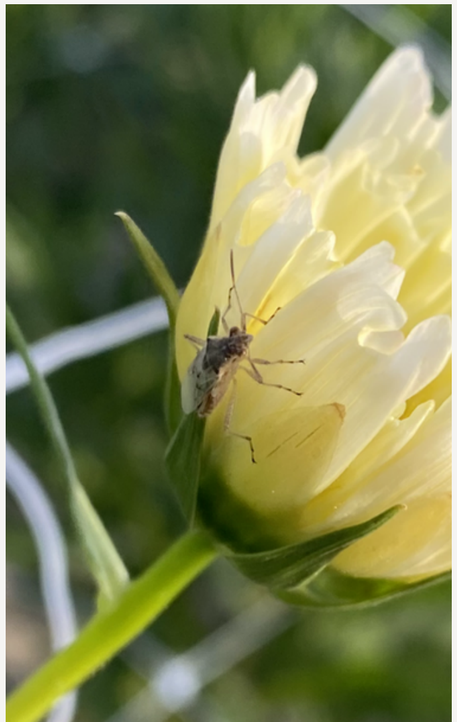
GRASSHOPPERS

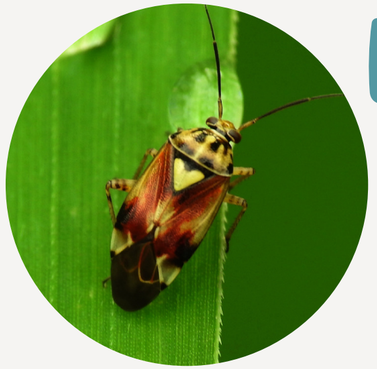
- Nymphs and adults can cause feeding damage on <u>all</u> plant parts (foliage, stems, buds, flowers, etc.)
- Adults and nymphs have a robust body, hind legs with enlarged femurs for long-distance jumping, and relatively short antennae.
- Damage occurs starting in early summer after rangeland weeds dry up and may continue all season. (Different species have subtly different life cycles/damage timelines).
- Utah's grasshopper populations fluctuate from year to year (weather dependent).
    - Precipitation and snowpack have an impact on overwintering eggs in the soil.



GRASSHOPPER MANAGEMENT

- Focus on management in the springtime, while grasshoppers <u>are still nymphs</u> (less mobile).
- Work with your community or neighborhood to suppress grasshopper populations. Treating as wide an area as possible is the key to success.
- Consider using physical exclusion methods to protect the marketability of your flowers (insect netting row covers, organza bags, etc.).
- Bait products:
  - wheat bran infused with carbaryl (Eco Bran®)
  - *Nosema locustae* (NoLo® Bait) (not currently available)
- Apply baits and insecticides early in the season in the mornings.
- Insecticides:
  - bifenthrin (Bonide® Eight Flower & Vegetable; GardenTech Sevin® Insect Killer Dust)
  - zeta-cypermethrin (GardenTech Sevin® Insect Killer Con.)
  - lambda cyhalothrin (GardenTech® Sevin Insect Killer RTU, Spectracide® Triazicide Insect Killer for Lawns & Landscapes RTU)
  - permethrin (Hi-Yield® Garden & Farm Insect Control; Bonide® Eight Vegetable, Fruit & Flower Con.)
  - pyrethrin (Monterey® Bug Buster-O)
  - deltamethrin (Ortho® Insect Killer Flower & Vegetable Garden Dust)





TRUE BUGS

- True bugs are a whole order of insects that includes many plant pest insects.
- Common species; tarnished plant (lygus) bugs, various stink bugs, false chinch bugs, and more.
- Adults and nymphs feed on plant cells (not sap) with piercing-sucking mouthparts. Feeding on seeds causes them to shrivel and heavy feeding on flowers may cause bud drop or flower abortion.
- Various true bugs have a wide host range and tend to be most prevalent in areas near weedy areas, alfalfa fields, vegetable farms, and fruit orchards.

TRUE BUG MANAGEMENT

- Only manage when there is unacceptable crop damage. Populations tend to be sporadic, so usually not worth it!
- Manage weedy areas.
- Insecticide options:
  - bifenthrin (Bonide® Eight Flower & Vegetable; GardenTech Sevin® Insect Killer Dust)
  - zeta-cypermethrin (GardenTech Sevin® Insect Killer Con.)
  - lambda cyhalothrin (GardenTech® Sevin Insect Killer RTU, Spectracide® Triazicide Insect Killer for Lawns & Landscapes RTU)
  - permethrin (Hi-Yield® Garden & Farm Insect Control; Bonide® Eight Vegetable, Fruit & Flower Con.)
  - deltamethrin (Ortho® Insect Killer Flower & Vegetable Garden Dust)

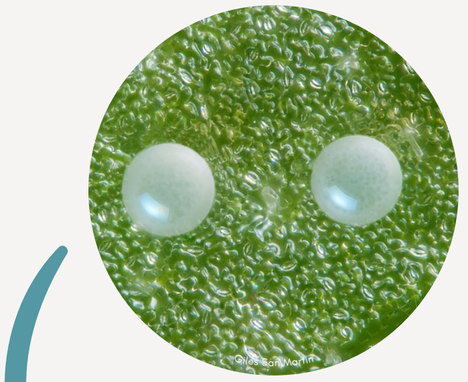
MITES

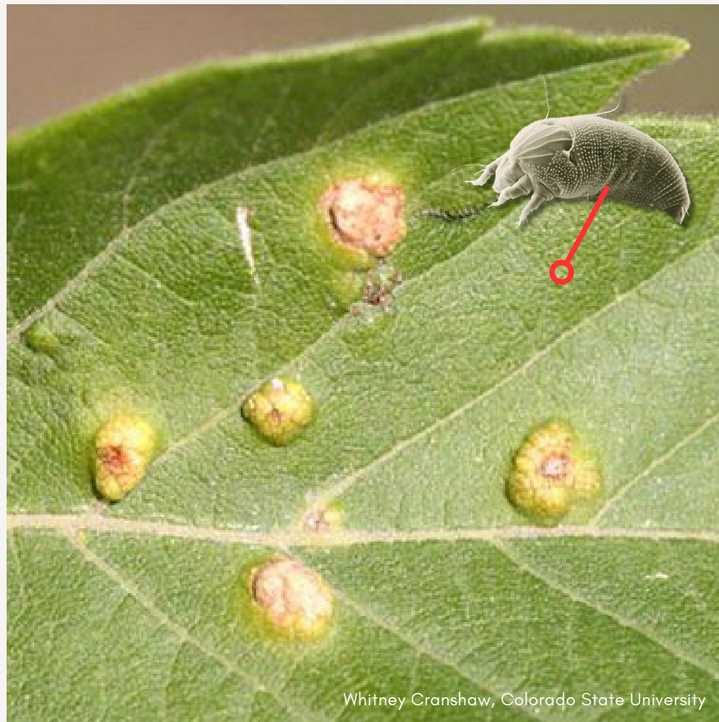
Spider mite-

- Leaves become stippled (small yellow spots). Generalized bronzing or reddish discoloration on leaves and stems as infestations progress.
- Adults are tiny, with a yellowish-clear body and two dark spots on either side of their back. All life stages most frequently occur on the undersides of leaves.
- Spider mites are more prevalent later in the season.

Eriophyid mites-

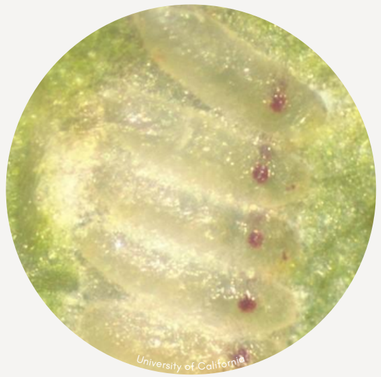
- Symptoms consist of leaf galls, bud or flower galls, blisters, scabbing, and deformities of leaves, stems, buds, and flowers.
- Translucent, cigar-shaped microscopic mites. They seldom cause serious injury or stress to plants; damage is normally aesthetic.





MITE MANAGEMENT

- Keep plants healthy; reduce drought stress. Mites are attracted to diseased and stressed plants.
- Prevent dust from settling on foliage as this promotes spider mite survival.
- Prune and remove infected plant parts.
- Overuse of miticides can eliminate natural predators and can lead to pest resistance, making long-term control difficult.
- Miticide Options:
  - bifenthrin (Bonide® Eight Flower & Vegetable; GardenTech Sevin® Insect Killer Dust)
  - pyrethrin (Bonide® Pyrethrin Garden Spray Concentrate)
  - canola oil (Natural Guard® Horticultural Oil Con.)
  - neem oil (Natural Guard® Neem; Natria® Neem Oil; BioAdvanced® Organics Neem)
  - insecticidal soap (Natural Guard®, Monterey®, Bonide®, Natria®)



LEAFHOPPERS

- Damage may include sap on leaves and white stippled areas speckled with dark excrement.
- Leafhoppers can also vector phytoplasma that can cause distortion to plants (e.g. aster yellows).
- Leafhoppers are very common throughout Utah.
- Leafhoppers include several different species and families (other groups may include froghoppers, spittlebugs, etc.).
- Most species overwinter in the egg stage in the bark of the host plant or among the fallen host plant leaves.

LEAFHOPPER MANAGEMENT

- Only manage when there is unacceptable crop damage (which is rare).
- Leafhoppers are highly mobile, so management should be focused on the nymphal stages.
- Insecticide Options:
  - bifenthrin (Bonide® Eight Flower & Vegetable; GardenTech Sevin® Insect Killer Dust)
  - zeta-cypermethrin (GardenTech Sevin® Insect Killer Con.)
  - permethrin (Hi-Yield® Garden & Farm Insect Control; Bonide® Eight Vegetable, Fruit & Flower Con.)
  - malathion (Ortho® MAX Malathion Insect Spray Con.)

SLUGS & SNAILS

- Slugs and snails can be active season-long.
- Very prevalent in moist areas or near irrigation sources (near valves, high tunnels, etc.).
- Chew irregular holes that have smooth edges in leaves.
- Similar characteristics except snails have an external, spiral shell.
- Glide with a long, flat, muscular organ called a foot.
- Lay multiple clusters of eggs throughout the growing season.

SLUGS & SNAIL MANAGEMENT

- Monitor early in the morning or in the evening, especially when there's lots of moisture.
- Avoid excessive irrigation and moisture.
- Handpick and remove slugs/snails.
- Bait options:
  - metaldehyde (Deadline Slug & Snail Slayer)
  - iron-phosphate (Sluggo Snail and Slug Bait; Bone Captain Jack's Slug Magic Granules)
  - Challenges with diatomaceous earth.

CATERPILLARS

- Caterpillar is the general term for the larval stage of moths and butterflies. Common species in Utah include cutworms, armyworms, loopers, etc.
- Damage severity is correlated to population numbers and host presence.
- Feeding damage primarily occurs in the foliage but may extend to other plant parts.
- Size, color, pattern, and life cycle are dependent on the species and instar. Typically caterpillars overwinter in a pupa stage within soil or plant debris.
- Larva tends to be the problem life stage, adults may serve as a beneficial.

CATERPILLAR MANAGEMENT

- Hand-removing and placing them in soapy water.
- Control weeds to reduce overwintering and alternate feeding sites.
- Soil tilling or discing can also help destroy or expose overwintering pupae.
- Encourage natural enemies (e.g. predators and parasites).
- Apply row covers to physically exclude adult butterflies and moths from laying eggs.
- Insecticide Options:
  - bifenthrin (Bonide® Eight Flower & Vegetable; GardenTech Sevin® Insect Killer Dust)
  - zeta-cypermethrin (GardenTech Sevin® Insect Killer Con.)
  - lambda cyhalothrin (GardenTech® Sevin Insect Killer RTU, Spectracide® Triazicide Insect Killer for Lawns & Landscapes RTU)
  - *Bacillus thruigiensis* (Safer® Caterpillar Killer Spray, Natural Guard Caterpillar Killer)
  - spinosad (Natural Guard® Spinosad Con.; Bonide® Captain Jack's Deadbug Brew Dust)

MAMMAL PESTS

- Deer, rabbits, and rodents (mice, voles, gophers) are all mammal wildlife that can cause destruction to cut flower production in home landscapes or farms.
- Damage identification can be easily identified through plants being knocked over/crushed, extensive feeding (more so than insects), and signs of tunneling in the soil or tracks.

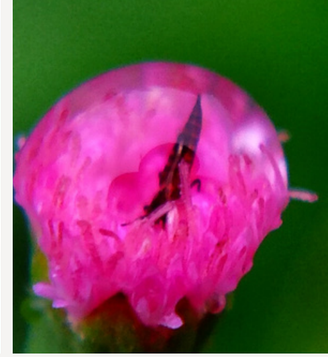
MAMMAL MANAGEMENT

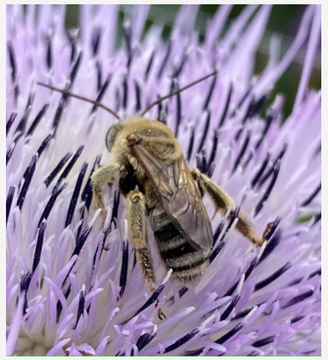
- Larger mammal pests are best prevented through physical exclusion (i.e. fences).
- Rodent populations fluctuate from season to season. Monitor for activity (e.g. burrows, feeding, etc.)
- Use lethal or non-lethal trapping mechanisms. Follow local city or county guidelines and laws.
- Bait stations for rodents can be used with pelleted products labeled for the control of specific species.
- Rodenticide Options:
  - dipacione
  - zinc phosphide

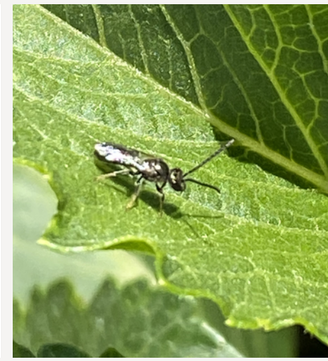
DON’T FORGET ABOUT POLLINATORS AND OTHER BENEFICIALS

- Cut flowers produce color and nectar and will attract pollinators and additional beneficial insects.
- It is important when managing pests, that we are mindful of the “good guys”. Many are natural enemies of the pests and good to have around.
- If using pesticides always review the label for proper application instructions and timing.

- Learn more about pollinators and beneficial insects at **extension.usu.edu/pests**







QUESTIONS?

Contact:

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Additional Pest Management Content Available at

extension.usu.edu/pests