SOUTHEAST ORGANIC PARTNERSHIP
AT TUSKEGEE UNIVERSITY

PESTS AND DISEASES IN ORGANIC SUMMER SQUASH

Anitha Chitturi, Franklin Quarcoo & Leslie Grill

Organic Squash System's Approach

SOUTHEAST ORGANIC PARTNERSHIP AT TUSKEGEE UNIVERSITY

Soil Health

- Soil Test
- Crop rotations
- Cover crops
- Compost

Pests & Diseases

- Use National Organic program (USDA) approved products
- Increase biodiversity
- Encourage natural enemies

Weeds

- Use of mulches
- Tillage
- Hand weeding

Summer Squash *(Cucurbita pepo)*

- ✓ Warm-season crop, grows best at temp's b/w 65 and 75 °F
- ✓Planted from seed or transplants.

Types of Summer squash

- Yellow squash
- Zucchini

✓Yellow Summer Squash

- Straight neck
- Crook neck

✓Zucchini

- Straight and green

Source: https://www.thekitchn.com/a-visual-guide-to-8-varieties-of-summer-squash-220740

- ✓ Other types
  - Pattypan/scallop
  - Cocozelle/vegetable marrow

Varieties	Features
Gentry, Zephyr Spineless beauty	Hybrids, Uniform, highly productive, 45-55 days harvest period.

Insect Pest Management in Summer Squash

Key step for successful pest management is

- ✓Timing of pest control is critical
- ✓Regular Scouting plan
- ✓Monitor randomly 10 plants
- ✓5-8 different locations in the field
- ✓Scouting should be distributed across the field.
- ✓Important to identify the pest and its potential damage
- ✓Helps in timely pest control sprays

Insect Pests of Squash

Striped Cucumber beetle -*Acalymma vittatum*

- Most damaging pests, larvae feed and damage roots
- Transmit bacterial wilt disease
- Overwinter and become active in spring (55-65^{o} F)
- Females lays eggs in the soil at the base of the plant
- Eggs hatch in about 10 days and larvae feed on roots

Source :www.extension.umd.edu/mdvegetables

Spotted Cucumber beetle -*Diabrotica undecimpunctata*

- Both adults and larvae are polyphagous
- Adults are strong fliers,
- Feed on roots, disperse from field-field
- Produce 2-3 generations in a growing season.

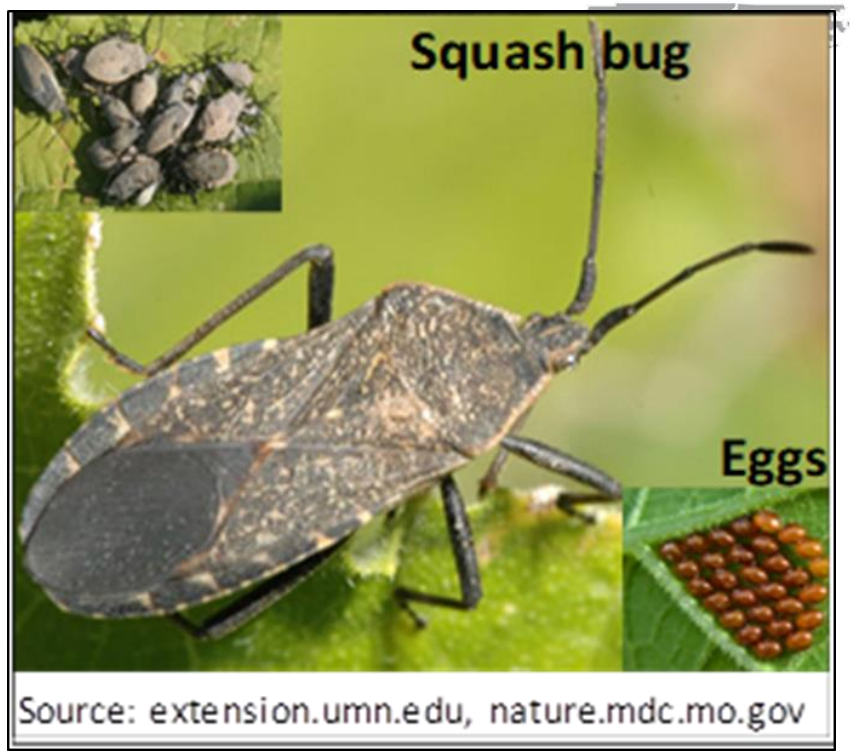
Source :www.extension.umd.edu/mdvegetables

Management -

- No good organic insecticides available
- Spray applications with Pyrethrin or Neem extract
- Spray only when the plants are small
- Beetle populations average 1 per plant

Squash bug - *Anasa tristis*

- Adults are dark brown or gray.
- Lay eggs on underside of leaves in ‘V’ shape along leaf veins.
- Eggs are yellowish brown to bronze color and hatch in 1-2 weeks.
- Late instar nymphs are greenish-gray, gregarious and feed in groups
- Primarily feed on leaves, secret highly toxic saliva as they feed, leaves turn yellow become necrotic and the leaf wilts, called “anasa” wilt.



Management

- Timing is the key to successful squash bug control.
- Very difficult to control if populations are allowed to build.
- Early detection of adult squash bugs is very important since they are difficult to kill
- Pyrethrin or Neem based extracts will control best if used on small instars or 1 egg mass/ plant when plants are larger.
- Sprays for adults should be directed at the base of the plant (down in the plastic hole) as this will increase control.

Aphids- *Aphis spp.*

- Small, soft-bodied insects vary in color and size (winged or wingless).
- Feed on underside of the leaves/ growing tips, cause reduction in quality & quantity of fruit.
- Secretes sticky material ‘honeydew’ which makes fruit unmarketable.
- Infested leaves curl downward, turn brown and die.
- Transmit cucumber mosaic virus
- **Management**-Insecticidal soap, Neem oil extract and Pyrethrin

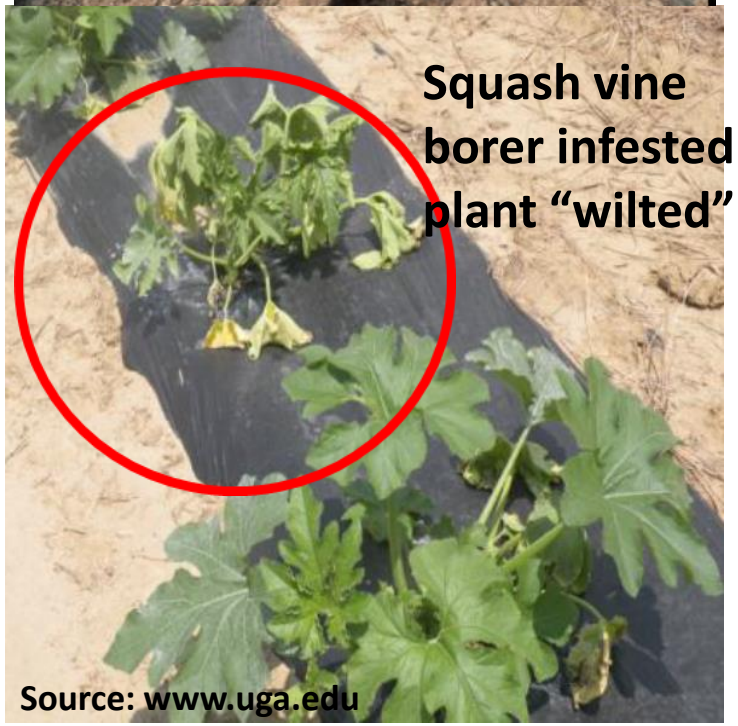
Squash Vine Borer-*Melittia cucurbitae*

- Moths emerge early summer and are daytime fliers
- Lay eggs singly on stems/ leaf stalks near base of plant
- Eggs are small, oval, brown and upon hatching (7-10 days)
- Larvae tunnel into the stems, feed in the basal portions of vines, evidence of saw-dust like waste from holes
- Plants wilt, or leaves turn yellow and eventually brown around leaf margins

- Vine Borer damage- Large swollen stem, large amounts of yellowish green frass from holes

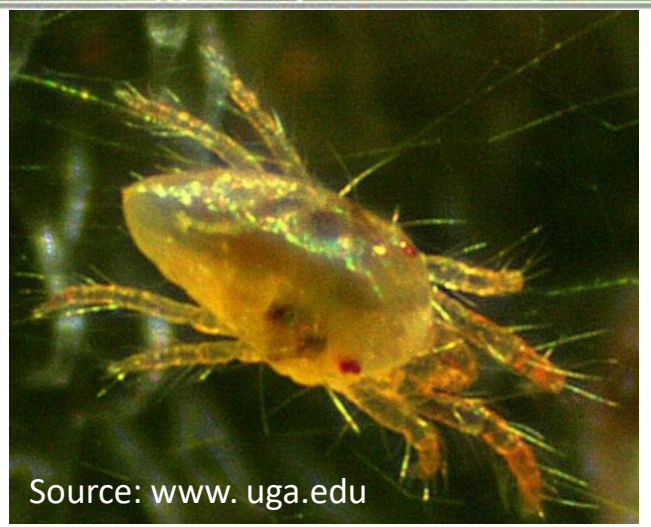
Management

- Look for adult moths flying around the plants
- Control newly hatching larvae before they enter the plant.
- Spray Neem based extracts
- Rotate squash to another location in the field.



2-spotted Spider mite –*Tetranychus urticae*

- Serious problem during hot and dry weather
- Mites are tiny, feed on individual cells of the leaves.
- Damage appears as pale yellow, reddish-brown spots ranging in size from small specks to large areas on the upper sides of leaves.
- Damage can develop very quickly, can kill or seriously stunt the growth of plants.



- Because of their small size, spider mites are hard to detect until vines are damaged with hundreds of mites on each leaf.

Management

- Spider mites can be controlled with neem oil extract.
- Mites can be removed with a strong spray of water.
- Lady bird beetles and minute pirate bugs are natural predators

Typical stippling damage to leaves from 2-spotted spider mites damage

Squash/Mexican bean beetle- *Epilachna varivestis*

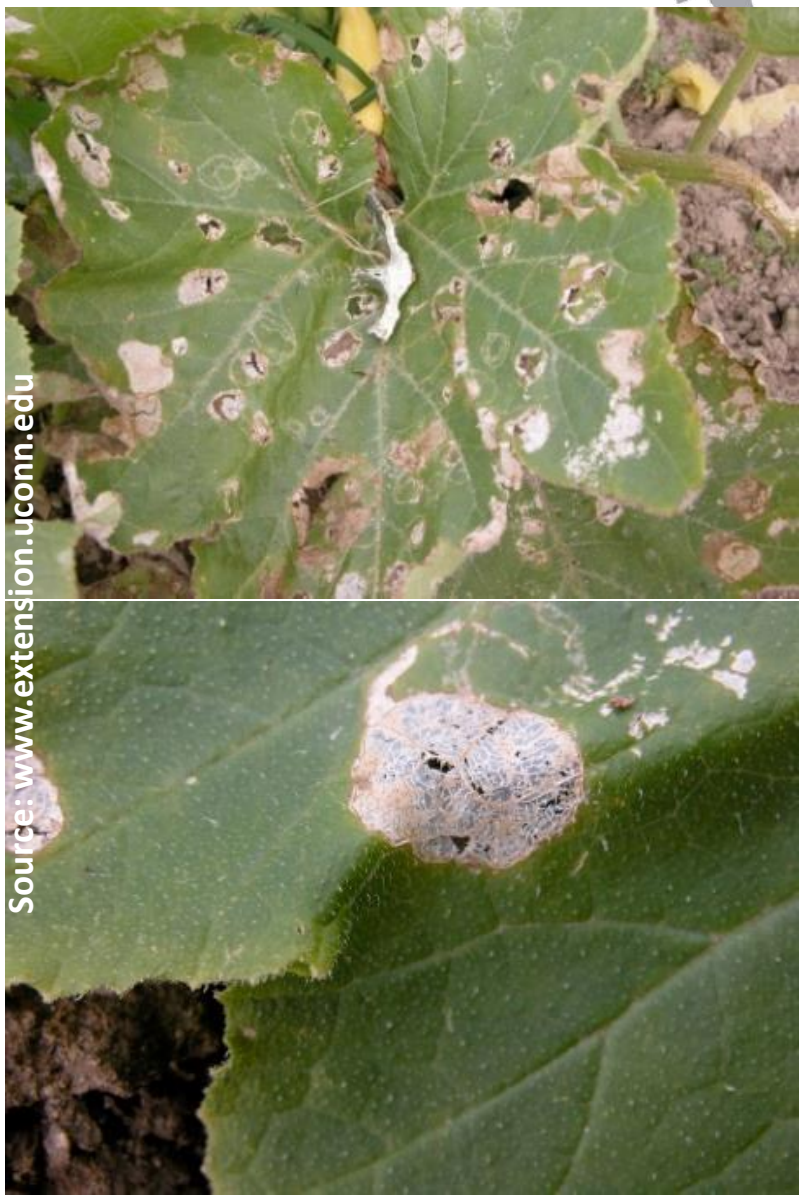
- Adults are bright yellow color beetles with black spots on wings
- Both adults and larvae feed and produce a trench around the leaf tissue
- Adults feed in semi-circular pattern, but consume all leaf tissue except small veins
- Larvae trench in a similar pattern at the edge of the leaf or circular pattern in the middle of the leaf.

Source: www.extension.uconn.edu

- Late in the season, beetles feed on the rind of squash fruit.

Management-

- Usually low in numbers, do not require control
- Extensive defoliation on young plants or direct feeding on fruits requires management.
- Pyrethrin (Pyganic) and Spinosad (Entrust) are effective in control.



Diseases of Summer Squash

Diseases can be prevented or minimized by using the following simple cultural controls:

- Plant certified disease-free seeds.
- Select recommended disease resistant varieties
- Keep the surrounding field area free of weeds.
- Weeds harbor insects, that spread viruses and bacterial wilt.
- Remove plant debris from the field after harvest
- Many diseases survive on plant debris from year-year.

Bacterial Wilt- *Erwinia tracheiphila*

- Less severe on Squash
- Caused by striped or spotted cucumber beetles
- Bacteria is carried by the beetles from plant to plant
- Symptoms- severe wilting of the vines, followed by rapid death of the plant.

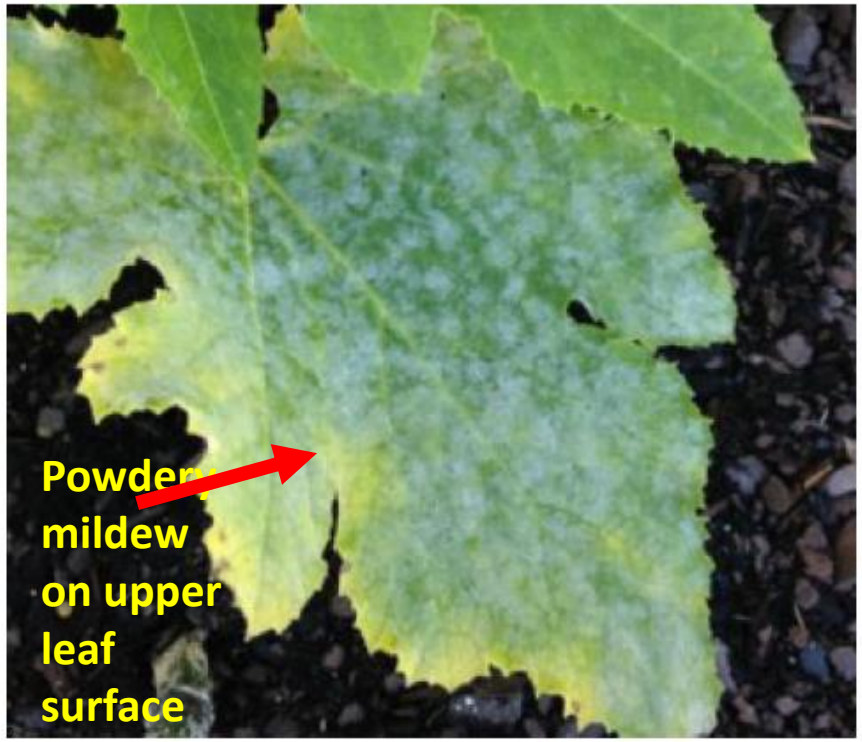
Management

- No chemical control, once plants become infected for bacterial wilt
- Control the beetles at first sign.

Source: https://hgic.clemson.edu/factsheet/cucumber-squash-melon-other-cucurbit-diseases

Powdery Mildew (fungi) - *Erysiphe cichoracearum* - *Sphaerotheca fuliginea*

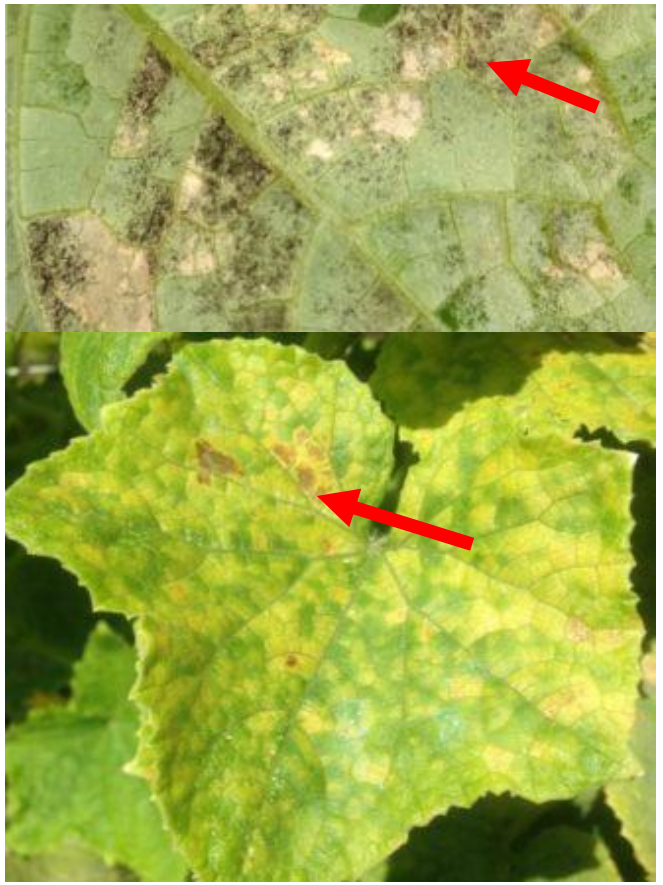
- Disease can be a problem on late-planted squash.
- Infection can occur when temp's are b/w 50 & 90 °F, (dry weather, ⬆RH)
- Powdery growth on upper surfaces of leaves and stems of infected plants.
- Infected areas are stunted, distorted and drop prematurely from the plant.
- Fruits are not directly affected, but their size and growth may be stunted



Source: https://hgic.clemson.edu/factsheet/cucumber-squash-melon-other-cucurbit-diseases

Downy Mildew -*Pseudoperonospora cubensis*

- Disease is caused by fungus, favored by moist conditions.
- Symptoms begin as small yellow areas on the upper leaf surface.
- Lesions expand, become brown with irregular margins and entire leaf withers and die.
- Infected plants also develop a gray mold on the lower leaf surface.
- Leaves infected with downy mildew curl inward as the leaf dies (spores on bottom of leaf) .
- Use disease resistant varieties



Downy mildew spores on lower leaf surface

Downy mildew spores on upper leaf surface

Source: https://hgic.clemson.edu/factsheet/cucumber squash-melon-other-cucurbit-diseases

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Thank You

Questions?