Weed, Insect & Disease Management in Pumpkin

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Reasons for Prevention & Management of Weeds, Insects & Diseases

- Achieve suitable crop growth
- So crop will be productive
- To have a desirable field appearance
- Reduction of future incidence and severity

Land Use for Vegetables

- Continuous vegetables
  - Same or different vegetables
- Occasional vegetables
  - Rotations with row crops, forages, pasture or fallow
- “Clean land” rotations
  - Watermelon – disease concerns

Weeds

- Undesired plants in the crop
- Vary with farm and field
- Vary with season
- Vary with year

Diseases

- May be caused by bacteria, fungi, virus
  - Insects sometimes introduce these
- Other abnormalities are abiotic
- Some are soilborne, some are airborne
- Incidence of the disease depends on environmental and field conditions
- Control is usually by prevention, rather than cure

Insects

- All insect in the field are not bad
  - Pollinators and others
- Of pest insects, there are key pests and minor pests
  - Both can be damaging
- Prevention is sometimes important
- Management involves monitoring the pest and controlling as needed

Weed Control

- A judicious control program uses:
  - Pre-crop season clean up of perennial weeds
  - Proper soil preparation
  - Weed control during early crop development
  - Lay-by weed control
  - Spot weed removal

Pre Season Weed Control

- Perennials interfere with production and people
  - Horsenettle
  - Johnsongrass (& bermuda)
- Control a year in advance
  - Roundup herbicide safe
  - Caution using pasture Herbicides
- Avoid areas with
  - Brambles
  - Bullnettle

Proper Soil Preparation

- Clean tillage and minimum tillage can be used
  - A system must be developed
- New growers should use clean tillage, at least in the planting row
- Often, plowing 8-10 “ deep is advised
- Consult with someone familiar with the local soil and land

Proper Soil Preparation

- **Clean tillage**
  - **Destroy all vegetation with offset disk**
  - **Level and smooth with finishing implements**
  - **Make raised beds if desired**
  - **Prepare a smooth, non cloddy seedbed**

Early Crop Development Control

- **Two options:**
  - **Bare oil**
  - **Mulched soil**

Weed Control - Mulch Planting

- Mulch solves part of the problem
- Weed control still needed at:
  - Planting holes
  - Along edges
  - Between mulch strips

Weed Control Methods for Mulch Plantings

- Plant hole
  - Hand weed
  - Postemergence Herbicides
- Plastic mulch edges
  - Preemergence and postemergence herbicides
  - Cultivation – with care!
- Between beds
  - Cultivation (disk)
  - Preemergence herbicides

Weed Control for Bare Soil Planting

- Selective preemergence herbicides can be used at seeding.
  - This is only needed in the immediate row area
- Less expensive methods can be used between rows
  - Cultivate as long as possible
  - Preemegence herbicide - Treflan

Weed Control for Bare Soil Planting

- Selective preemergence herbicides for row area – control annual weeds
  - Curbit 3EC – post plant surface (seeding)
  - Strategy – post plant surface (seeding)
  - Sandea – post plant surface (seeding)
    - For transplanting call us
    - Helps with yellow nutsedge
- Preemergence herbicide between rows
  - Treflan (several generics)
    - Can affect fall cereal crops

Postemergence Weed Control

- Selective postemergence herbicides
  - Herbicides that only control grasses
    - Poast
    - Volunteer
    - Select
  - Sandea Herbicide for non grass weeds
    - Apply over crop and weeds from 2 true leaf stage until the start of female flowering

Questions on weeds?

Cucurbit Insects

Courtesy J. Wes Lee, McClain County OSU Extension

- Identification
- Beneficial Insects
- Harmful Insects
  - Plant damage
  - Disease transmission
- Populations

Beneficials:
Convergent Lady Beetle

Pollinators

Harmful Cucurbit Insects

Major Pests

- Squash Bugs
- Cucumber Beetles
  - Spotted, Striped, Banded
- Squash Vine Borers

Occasional Pests

- Aphids (melon, green peach)
- Whiteflies
- Seed Corn Maggots
- Pickleworms
- Squash Beetles
- Spider Mites

Squash Bugs

- All cucurbit vine crops are subject to squash bug infestation.
- Squash bugs prefer squash, pumpkin >> watermelon > cantaloupe > and cucumber


Squash Bug
nymphs

Squash Bug Damage

- **Sucking Mouthparts**
  - **Draw sap**
  - **Inject toxins**

- **Can vector the yellow vine disease**
  - **Usually a problem with early crops**

Cucumber Beetles

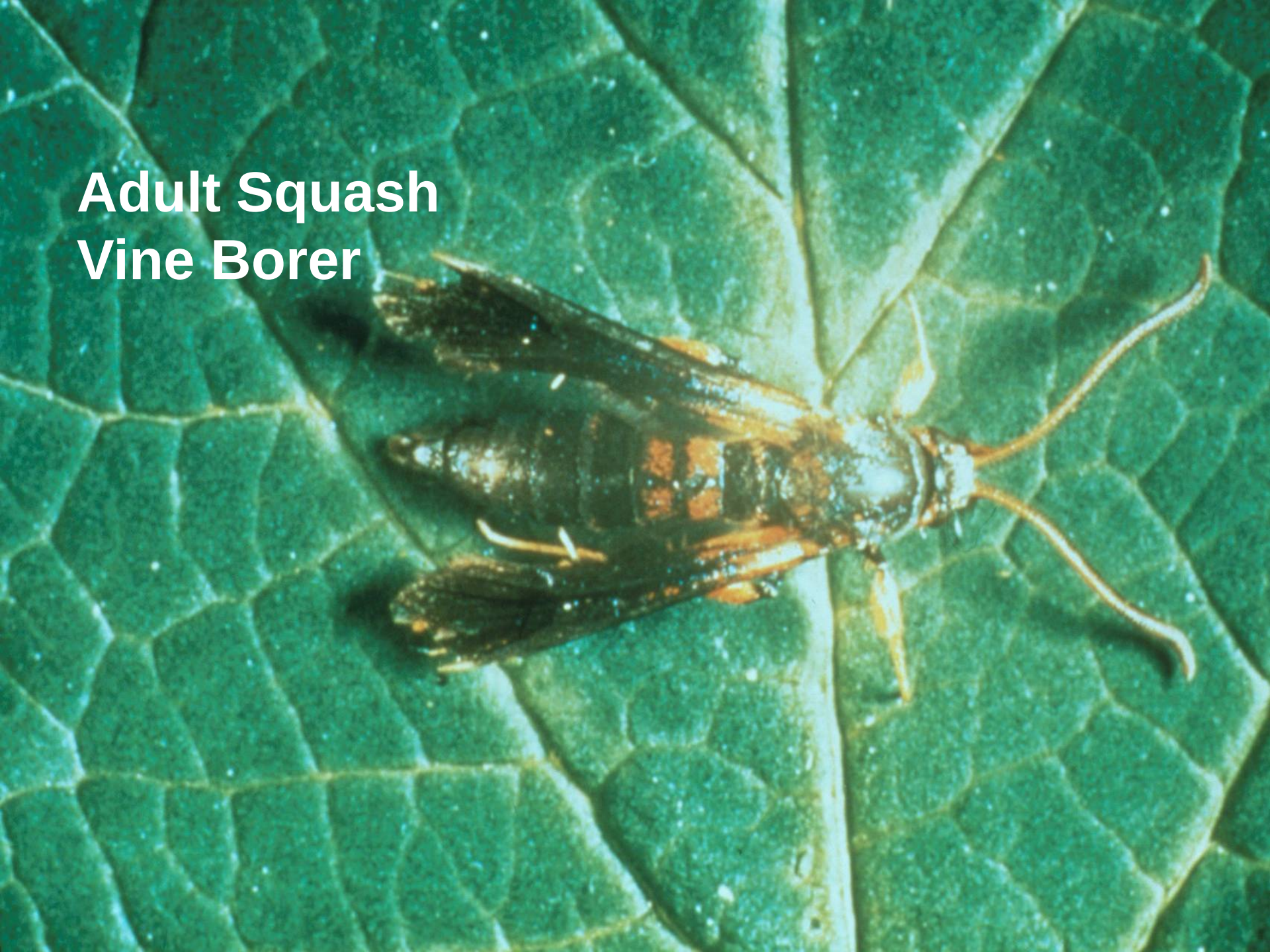
- Three forms: Spotted, striped, banded but spotted is the most common form
- Spotted is also known as the Southern Corn Rootworm
- Can transmit bacterial wilt and squash mosaic virus (more important than the feeding damage)
- Both adults (above ground)and larvae (below ground) have chewing mouthparts

Cucumber Beetles

Bacterial Wilt and Feeding Damage by Cucumber Beetle

Squash Vine Borer

- Pest on the rise, especially in the East
- 2 generations per year (May then August)
- Adult is a clear wing moth
- Rotation may help
- Feed primarily on squash, pumpkins and gourds and occasionally on melons and cucumbers
- Look for coarse yellowish excrement near the base of the plant covering an entrance hole

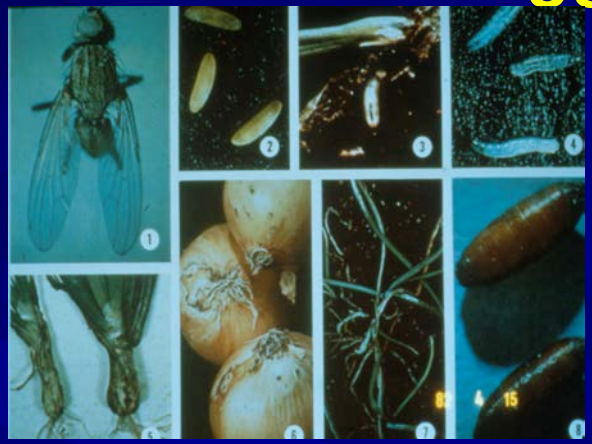

Adult Squash
Vine Borer


Squash Vine borer larvae


Squash vine borer damage

Occasional Pests

Seed Corn Maggots



Whitefly

Melon Aphid

Occasional Pest

Squash Beetle

Pickleworms

Spider Mites

Chemical Control

- Pyrethroids: Pounce, Asana, Capture, others
- Imadacloprid: Admire 2F (systemic)
- Older Chemistry: Malathion, Sevin, Lannate, others
- Organics: Spinosad, Neem, BT's, Soaps
- Check with your extension office for latest Oklahoma recommendations

Pumpkin Diseases

- Bacterial Spot / Blight

Pumpkin Diseases

- Downy Mildew

- Gummy stem blight

Cucurbit Powdery Mildew Biology and Control

Courtesy of Dr. John Damicone
OSU Extension Plant Pathologist

Economic Effects

- Reduced fruit # or wt
- Reduced harvest period
- More culls (eg. sunburn)
- Reduced quality
  - storability
  - sugar content
  - shriveled handles

Relative Disease Importance

Crop	Anthrac.	DM	GSB	PM
cucumber	++	+++	+	+
cantaloupe	++	+++	+++	+++*
squash	-	+	+	+++
pumpkin	-	+	+	+++
watermelon	+++	+++	+++	++

* Good resistance available

Powdery Mildew Biology

- *Sphaerotheca fuliginea* / *Podospora xanthii*
- Asexual spores (conidia) viable 7-8 days
- Sexual stage is rare
- Airborne spores from greenhouses/field crops
- Symptoms in 3-7 days
- Cloudy weather
- Dense plant growth
- High relative humidity
- 50 to 90F
- Optimum at 68 to 81F
- Rain not required

Sources of Cucurbit Diseases

Disease	seed	debris	soil	air
anthracnose	+	+	-	-
downy mildew	-	-	-	+
gummy stem blight	+	+	-	+
powdery mildew	-	-	-	+

Powdery Mildew Control

Resistant varieties
- strong - cucumbers, cantaloupe
- fair - pumpkin, squash

Fungicide programs
- new chemistry - Quintec
- organics / biologicals
- resistance is a problem
- Sulfur - Microthiol

Powdery Mildew Control

- - Fungicide program

- - Check with your County Extension office for more details on Oklahoma recommendations

Fungicide programs

- Start early
  - At bloom
  - At early fruit set
  - At 1 infected leaf out of 50 old leaves
- Rotate product modes of action
- 7 to 14 day schedule

It’s too late……

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