Pest Management in Vegetable Gardens

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Pest Management Involves:

➢ Providing proper cultural practices

➢ Scouting/Identifying/Monitoring

➢ Choosing a method of control

➢ Protecting beneficial insects and the environment

Cultural Practices

➢Choose plants resistant to disease
- Tomatoes – VFN
- Use plants recommended for Florida

➢Sanitation
- Remove infected plants
- Remove plant debris and mulch
- Soil solarization
- Control weeds

Cultural Practices

➢ Exclusion

- Floating row covers

- Micro-irrigation

- Rotate crops

➢ Follow recommended planting dates

➢ Plant some flowers

Scouting

> **Observe vegetable plants regularly**

- Look carefully – tops and undersides of leaves and at soil line

- You might need a hand lens

- Do you see insects, signs of insects or disease?

Scouting

➢ **Look for damage:**

- Distorted new growth
- Yellow or brown spots on leaves
- Webs around leaves
- Notched or chewed leaves
- Black sooty mold
- Rotting roots

Identifying

➢ **Is damage due to insect pest, disease or cultural practices?**

➢ **If you see insects, are they harmful, helpful, or harmless?**

➢ **If the insects are harmful, do you also see evidence of beneficial insects?**

Gregg S. Nuessly
University of Florida

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Monitoring

➢ Check to see if insect population is getting larger or problem getting worse

➢ Check for beneficial insect activity

➢ Have a pest tolerance level

- When level of infestation reached – act
- Only treat affected areas or plants
- Monitor results
- Re-treat as needed

UC Statewide IPM Project
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Insects with Piercing, Sucking Mouthparts

- ➤ Aphids
- ➤ Whiteflies
- ➤ True bugs
- ➤ Spider mites

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Aphids

➤ Found on new plant growth and/or flowers
➤ Damage: leaf curling or puckering, deformed flowers
➤ Sooty mold & ants

Heavy population control:
- Sharp spray from hose
- Beneficial insects
- Neem oil or Organocide
- Insecticidal Soaps

Whiteflies

➢ Found on undersides of leaves
- Adults look like white gnats
- Larvae stationary on leaves

➢ Leaves pale or spotted

➢ Heavy sooty mold

➢ Vector for many diseases

Control:
- Beneficial Insects
- Yellow sticky cards
- Neem oil or Organocide
- Insecticidal soap

This is a good bug

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True Bugs

Leaf-footed bug, Squash bug, Stink Bug

➢ Hide under leaves near base

➢ Suck juices from leaves & fruit

• Especially damaging on fruit

➢ Squash, beans, tomatoes, eggplant, peppers

Control:

Insecticidal soap – nymphs

Neem oil or Organocide
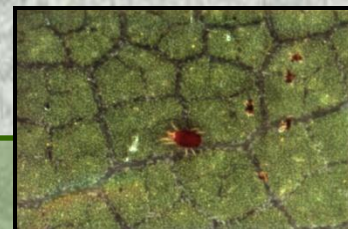
Spinosad

Mechanical removal

Spider Mites

➢ Relatives of spiders – eight legs
➢ Found on lower leaf surfaces and fruits
➢ Webs sometimes present
➢ Feeding causes stippling on leaf surface
➢ Prevalent during hot, dry weather

Control:

• Sharp spray from hose
• Beneficial insects
• Neem oil or Organocide
• Insecticidal soap

Chewers

Larvae

➢ Live below soil level

- Cutworms, wireworms, grubs, lesser cornstalk borers

➢ Leaf and stem chewers

- Armyworms, cabbage loopers, tomato hornworms, bean leafrollers, leafminers

Chewers

Beetles and Weevils

➢ Banded cucumber beetle

➢ Colorado potato beetle

➢ Mexican bean beetle

➢ Flea beetles

➢ Pepper weevils

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Control of Chewers

Controlled best if very young

- Bt (*Bacillis thuringiensis)* for caterpillars
- Spinosad
- Neen oil
- Beneficial insects
- Mechanical removal

Remember – butterfly larvae are caterpillars. If you want butterflies, be careful where you use pesticides, including Bt.

Snails and Slugs

➢ Rasping mouth parts

➢ Irregular shaped holes in leaves, flowers, fruit and stems

➢ Wet weather or over watered gardens

Control:

▪ Upside down grapefruit hulls

▪ Boards

▪ Beer in tins sunk in ground

▪ Iron Phosphate based control granules

Root Knot Nematodes

- Decline and thinning
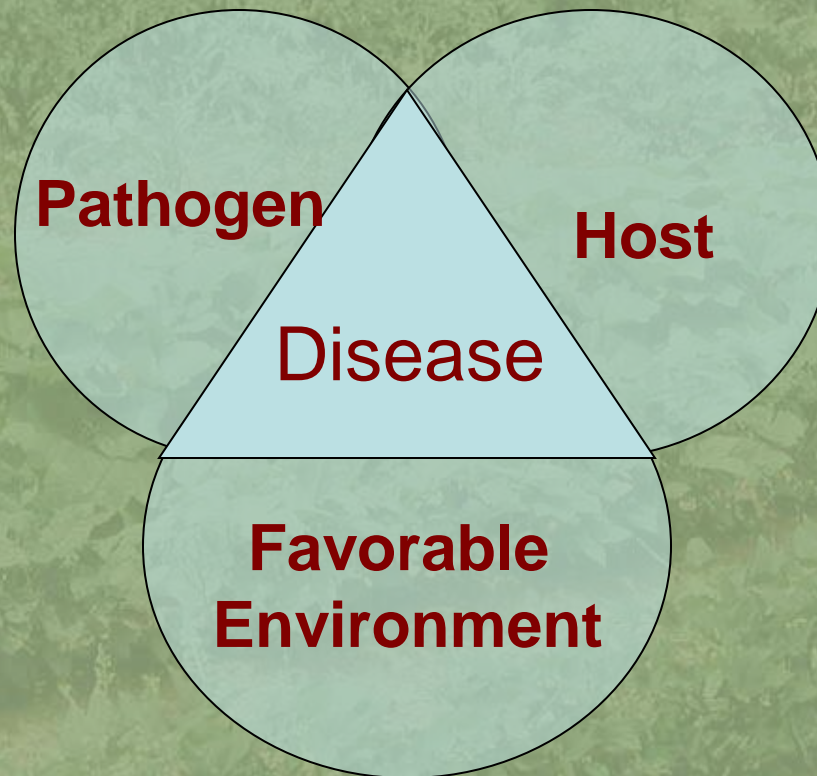- Roots may be brown, stunted and galled

Management

- Provide adequate water and fertilizer
- Crop rotation
- Heavy applications of organic matter
- Resistance?
- Red plastic mulch
- Soil solarization in summer
- Grow marigolds in summer

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Diseases

Requirements for disease to occur:

Pathogen

Host

Disease

Favorable Environment

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Plant Diseases

Large

- ➤ Fungi
- ➤ Bacteria
- ➤ Phytoplasmas
- ➤ Viruses

Small

85% of all plant diseases are caused by fungi

Bacterial decay = bad

odor

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Diseases of Vegetables

Damping off Fungus

Early Blight

Late Blight

Powdery mildew

Rust

Tomato Yellow Leaf Curl Virus

Blossom End Rot

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Points to Remember:

➢ Fungi cause more diseases than bacteria.

➢ Bacterial diseases are more difficult to control.

➢ Most fungal and bacterial diseases are promoted by high humidity.

➢ Viral diseases cannot be cured.

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Weeds – plants with a people problem

➢ **Common garden weeds:**
- Grass like weeds:
  - Common bermudagrass
  - Sedges – nutsedge
  - Crabgrass

Weeds

➤ **Common garden weeds:**

- Broadleaved weeds:
  - Asiatic Hawkskbeard
  - Chamberbitter
  - Carolina geranium
  - Yellow woodsorrel
  - Bittercress

Weeds

➢ **Control strategies**

- Mulch
- Weed barriers – layers of newspapers
- Hand pulling

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Beneficial Organisms:

Most **insects** found in **gardens** are not **pests**. Many are beneficial, preying on **pests** or performing other useful tasks.

Beneficial Organisms:

Predators

- Kill and eat harmful pests

Parasites

- Live in or on pests eventually causing death

Beneficial diseases

- Viruses, fungi and bacteria that naturally infect and kill insects.

Learn to Recognize the Good Guys:

More Good Guys

Summary

➤ Many insects inhabit gardens

➤ Scouting helps catch pests early

➤ Pests easier to control if caught early

➤ Sanitation helps with pest & disease control

➤ Organic treatments can be effective

➤ Protecting beneficial insects is important or we inherit their job

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QUESTIONS?