Recognizing Virus Symptoms In Vegetable Crops

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Snap Bean Viruses – A Recurring Problem Since 2000

- **2000** - Fields near Oostburg, Belgium and Cambria
  - High incidence of plants with virus-like symptoms
  - Many fields exhibiting these symptoms were destroyed prior to harvest – losses represented several hundred acres
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- **2001** – Primary incidence along Lake Michigan near Manitowoc; scattered incidence elsewhere; losses less than 2000

- **2002** - Disease most visible on late plantings in eastern WI along Lake MI
  - Outbreaks of soybean aphids delayed
  - Virus outbreaks on snap beans observed only on late planted snap bean fields
Snap Bean Viruses – A Recurring Problem Since 2000

- **2003** – Wide distribution along Lake Michigan, Cambria, central and southern WI
  - Aphid pressure early and heavy
  - 100% virus infection in many fields
  - Losses due to reduced yields and pod quality
Virus Symptoms on Snap Beans

**Overall Key Points**

- **Pathogen:** Several viruses detected
  - Involve CMV (Cucumber mosaic virus), AMV (alfalfa mosaic virus) and other viruses
  - All are stylet borne aphid transmitted

- **Key Symptoms:**
  - Leaf and pod mosaic
  - Plant stunting, pod blemishes, internal pod discoloration
  - Blossom abortion, pod drop, low yields, low quality
  - Yield loss not evident until harvest

- **Timing of symptoms consistent with soybean aphid buildup**
Leaf Curl and Plant Stunting
Tall plant – Short plant
Pod Necrosis – Internal and External
Pod Necrosis – Internal and External
Necrosis of stems and pedicels
Symptoms of CMV on Pepper

- **Key Symptoms:**
  - Early infection
    - mosaic
    - necrosis
    - tiny deformed leaves
    - severe plant stunting
  - Late infection
    - mild symptoms
    - blossom drop
    - low yields
    - symptoms on fruit are variable
CMV - Pepper

Note: Leaf mosaic, rosette
CMV - Pepper

Note: Fruit scaring, Leaf Pattern
Symptoms of CMV on Tomato

Key Symptoms:

- Early infection
  - yellow foliage
  - bushy appearance
  - stunted plants
  - shoestring leaf blades

- Later infection
  - few fruit
  - smaller fruit
  - delayed maturity
CMV - Tomato
CMV – Tomato
Shoe-string Leaf Symptom
Symptoms of CMV on Cucurbits

Key Symptoms:

- **Early infection**
  - plant stunting
  - leaf curl and crinkling
  - mosaic patterns

- **Later infection**
  - symptoms on young leaves
  - fruit symptoms
    - low yield
    - bitter fruit
    - mosaic
    - bumpy and deformed fruit
CMV - Cucurbits

Leaf curl, stunted leaves
CMV - Cucurbits

Tattered leaves, shoestring leaves
CMV - Cucurbits

Mosaic, leaf deformation

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Cucumber Mosaic Virus
Cucumber Mosaic Virus

CMV-NY causing color breaking on pumpkin (Cucurbita pepo)
Summary

- CMV continues to affect many vegetable crops in WI
- CMV can infect 1,200 plant species in 101 families
- With continued presence of the primary vector, the soybean aphid, problems will continue
- Symptoms include:
  - poor growth
  - weak foliage
  - abnormal shape, color, texture of leaves and fruit
  - blossom drop
  - low yields
- CMV may well be overlooked problem on many crops