Coastal California Vegetables: Pathology Update

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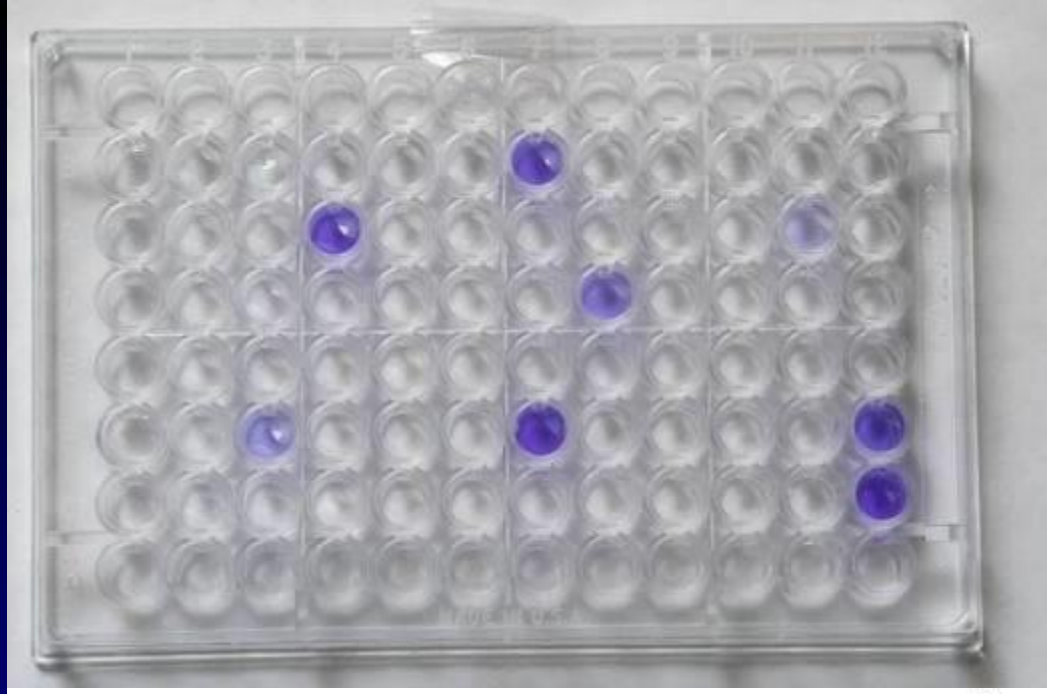
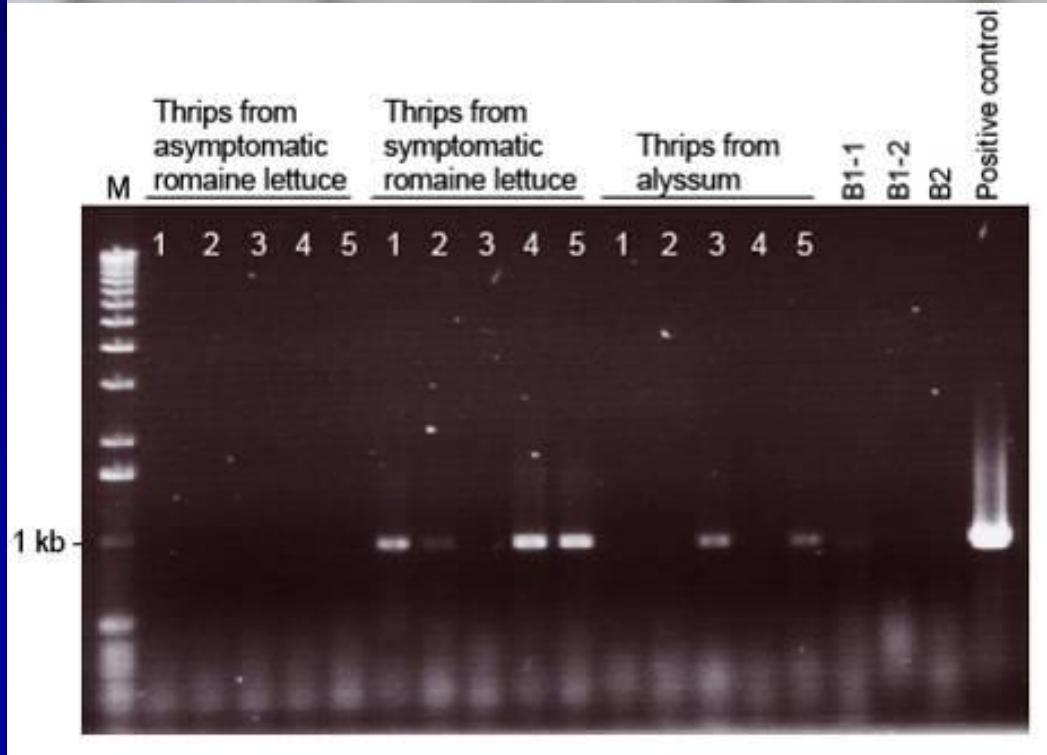
Virus diseases of plants

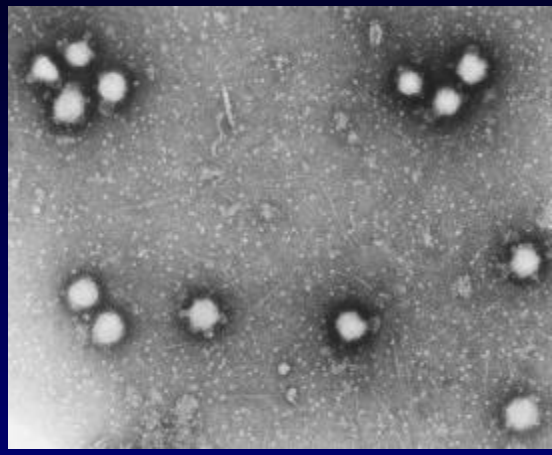
- **Difficult to diagnose:**
  - **Overlapping symptoms: many viruses**
  - **Overlapping symptoms: other problems**
  - **No visual signs of the pathogen**
  - **Symptoms are variable**
    - **Age of plant when infected**
    - **Crop cultivar**
    - **Time of year or weather conditions**
    - **Strain of the virus**
  - **Multiple viruses can infect the same plant**
  - **Most tests are serological / molecular**

dia®
FOR TESTING USE ONLY
INSV
CMV
SAMPLE
SAMPLE
SAMPLE




M
Thrips from asymptomatic romaine lettuce
Thrips from symptomatic romaine lettuce
Thrips from alyssum
B1-1
B1-2
B2
Positive control
1 2 3 4 5 1 2 3 4 5 1 2 3 4 5
1 kb

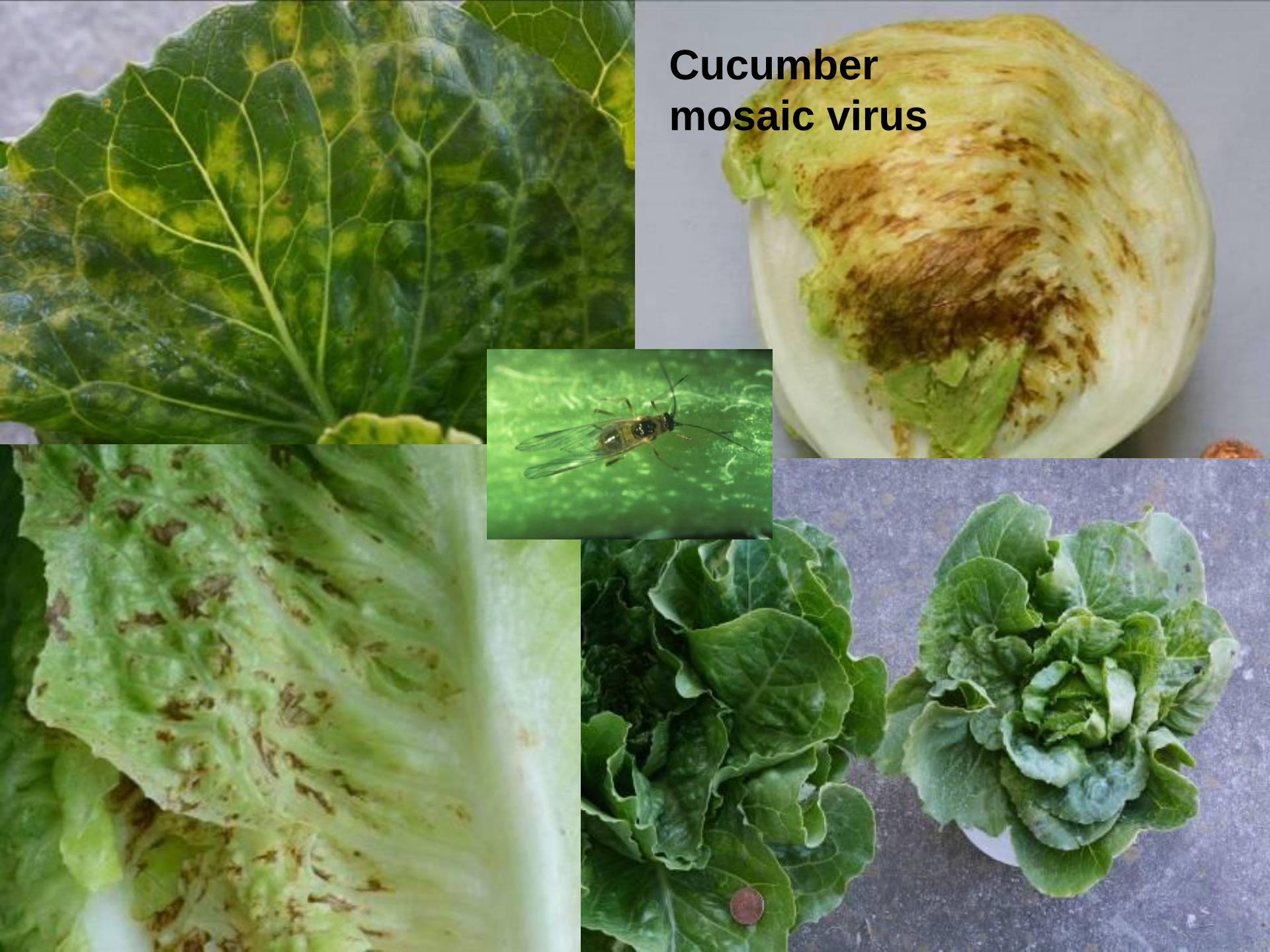
Virus diseases of plants



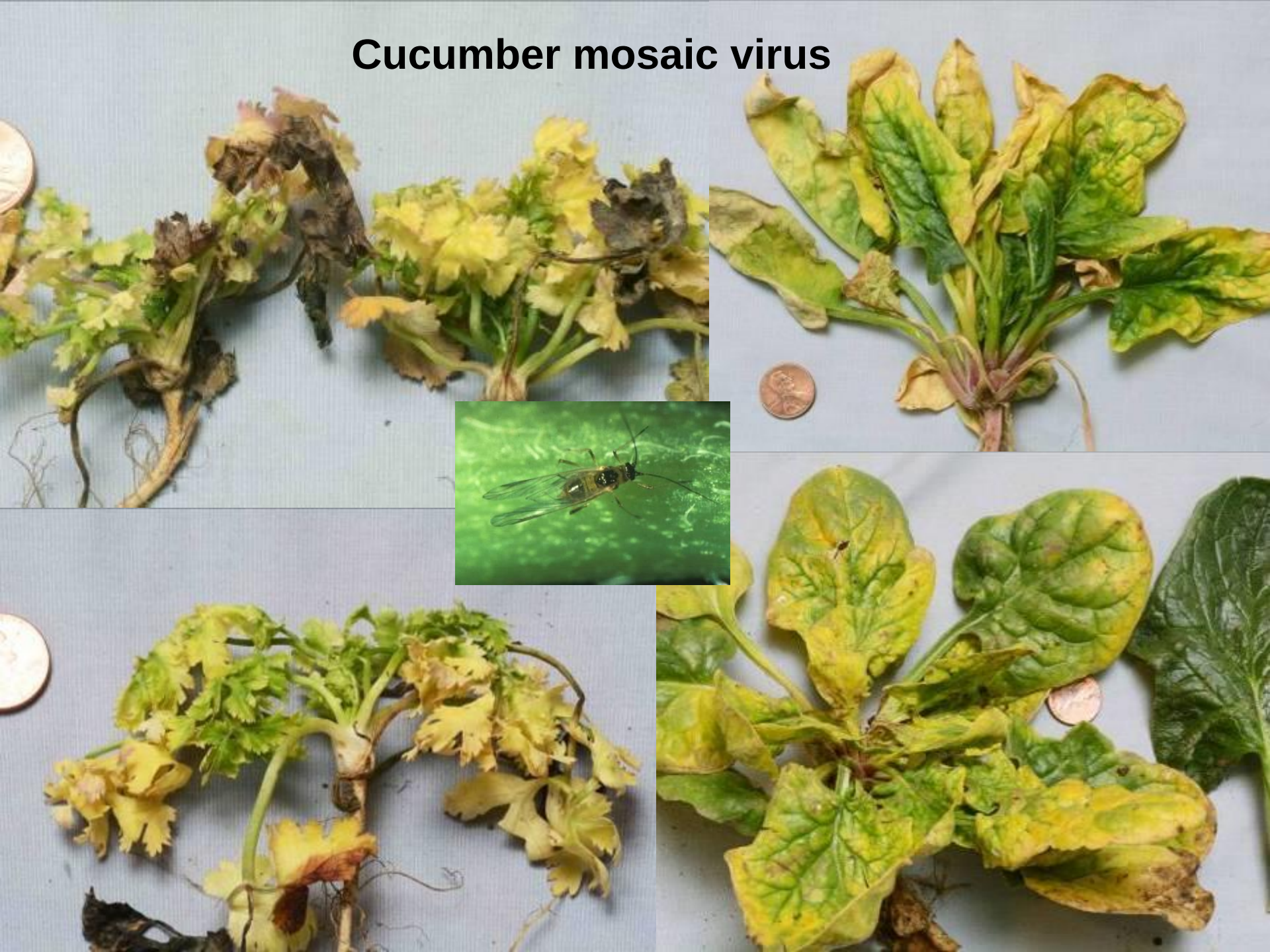
- Complex systems
  - Host plant
  - Virus pathogen
  - Vector that spreads the virus
  - Alternate hosts
    - Other crops
    - Weeds and surrounding vegetation
    - Over-wintering hosts
  - Source of primary inoculum: seed, vegetative propagation, alternate hosts, (soil)

Virus diseases in 2015

- **Why? Vector dynamics:**
  - **Mild winter**
  - **Warm spring**
  - **Little rain: early dry down of hill vegetation**
- **Which crops?**
  - **Lettuce, spinach, Brussels sprouts, cauliflower, Swiss chard, beet, cilantro, radicchio, tomato**
- **Which viruses?**
  - **CMV, INSV, TSWV, LMV, AMV, BCTV, BWYV**


Cucumber
mosaic virus

Cucumber mosaic virus



Cucumber mosaic virus

Lettuce mosaic virus

Alfalfa mosaic virus

Impatiens necrotic spot virus

Tomato spotted wilt virus

Beet curly top virus and/or Beet western yellows virus

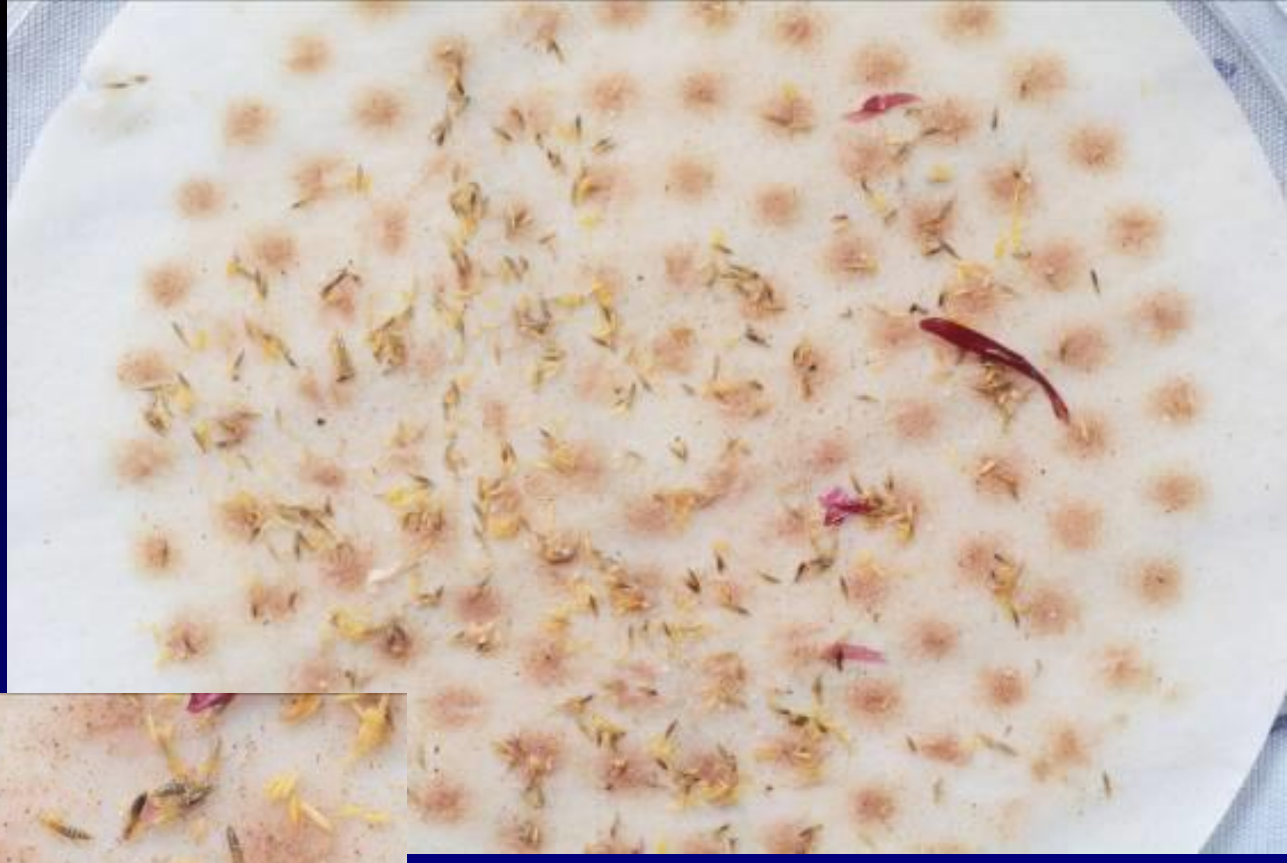
Cucumber mosaic virus
and
Tomato spotted wilt virus

Virus diseases of plants

- **Management:**
  - **Host plant:**
    - **resistant cultivars, site selection, crop rotation**
  - **Vector:**
    - **insecticides*, site selection, IPM**
  - **Alternate hosts:**
    - **weed control, site selection, crop rotation, host-free periods**

*** Insecticides do not completely prevent infection.**

20 iceplant flowers/sample
sample average: 363 adults
664 juveniles
51 total thrips per flower



Phoma

Ramularia

Alternaria

Alternaria species from cilantro

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