

Diagnosing Plant Diseases in the Lab and Field

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Disease ID Steps

- Identify Host Plant.
- Identify diseases that attack host.
- Compare healthy plant with affected plant.
- Look at distribution: space and time.
- Look at other plants in and around the field.
- Examine the area plants are growing in.
- Examine symptoms both above and below ground
- Look for signs macroscopic=field, microscopic=clinic
- Keep an open mind (no preconceptions)

Virus Infected Plant



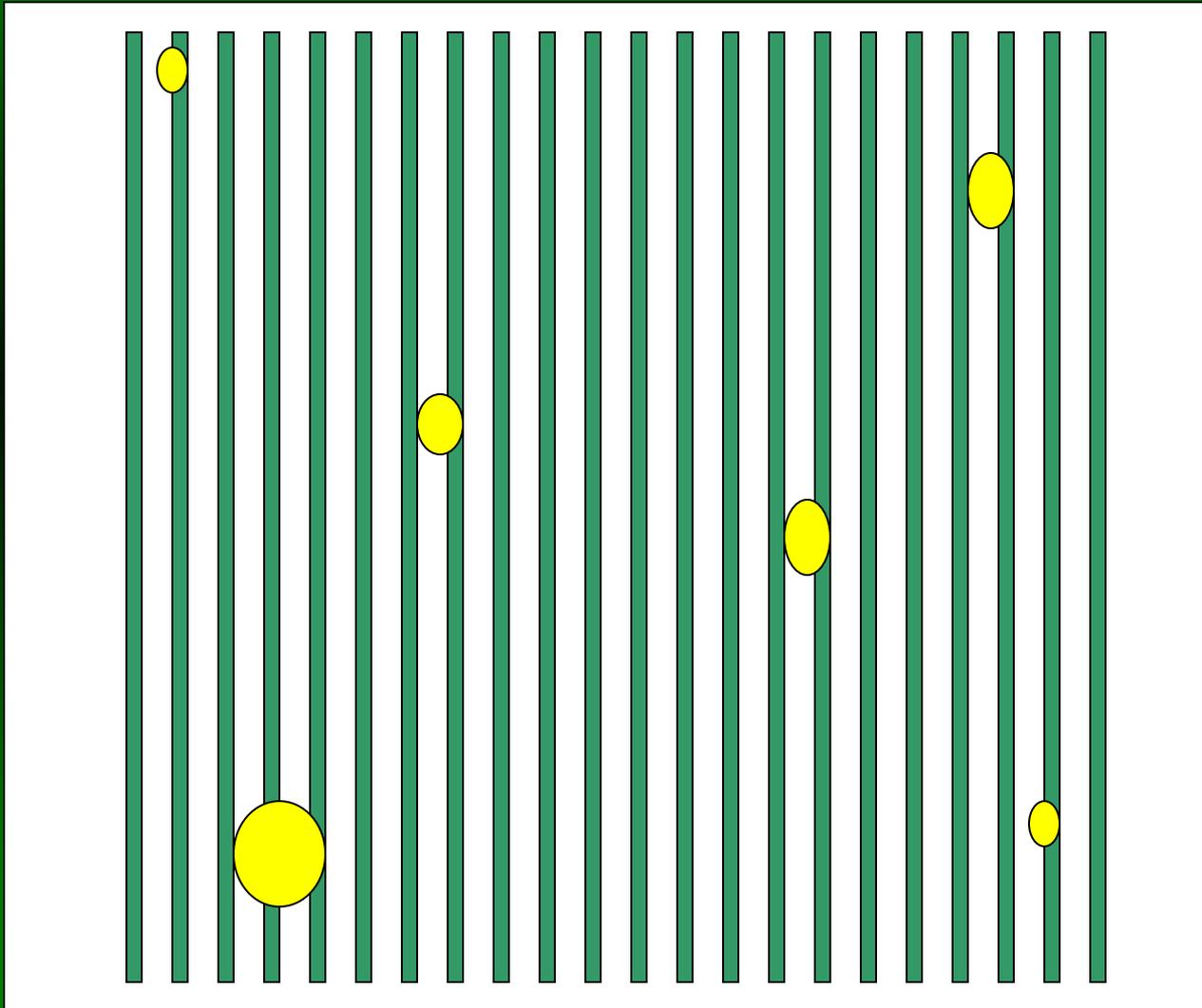
Variegated Plant



Distribution of the Problem

- Is it in certain rows?
- Does it cross rows and affect areas?
- Is it random or is there a pattern?
- Does it affect individuals or groups?
- Is it near the woods, in high spots, low spots?

Random Distribution (outside source)



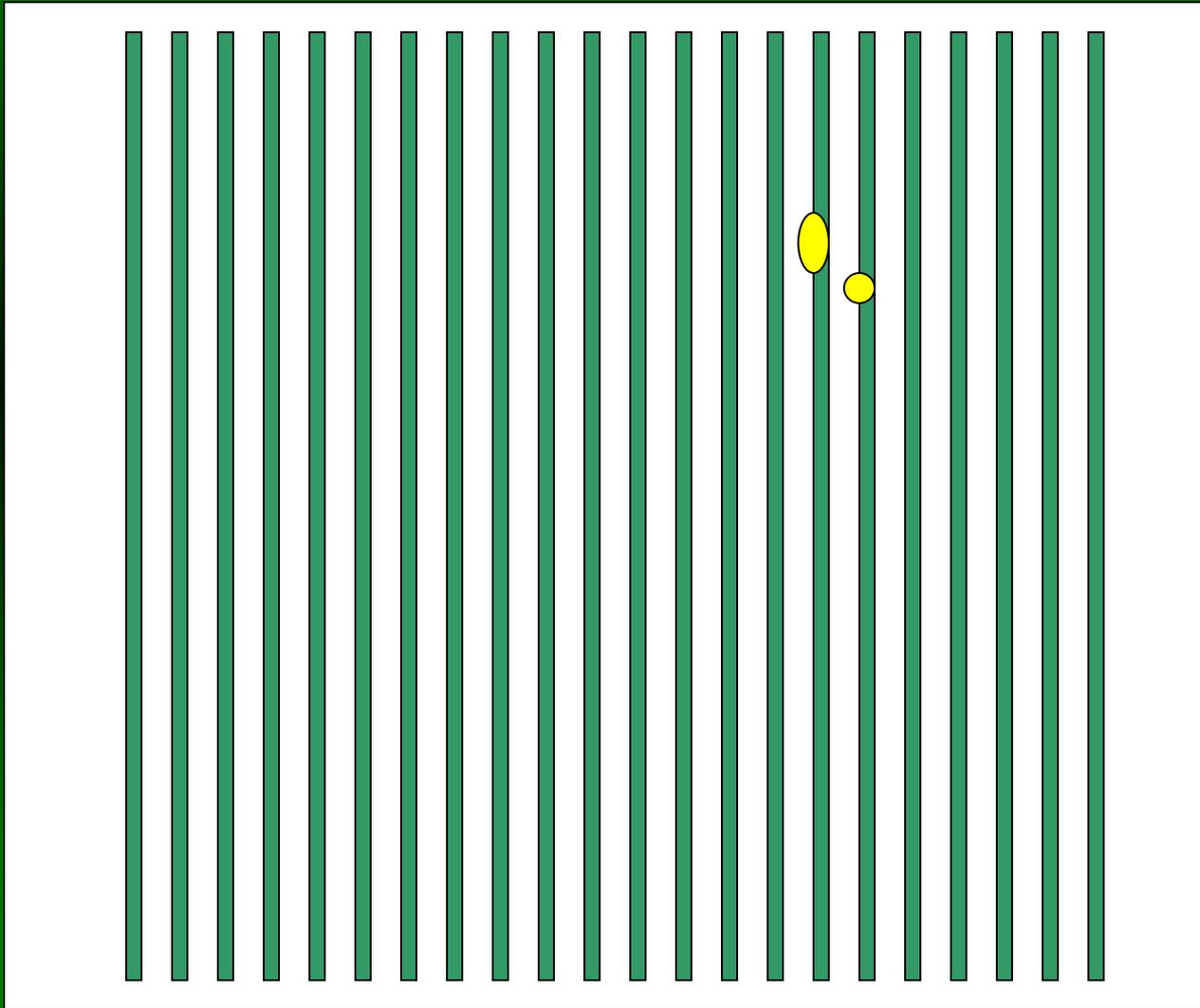
Powdery Mildew
Downy Mildew
TSWV
Squash Mosaics

Sometimes
Transplanted or
Seedborne diseases

Powdery Mildew

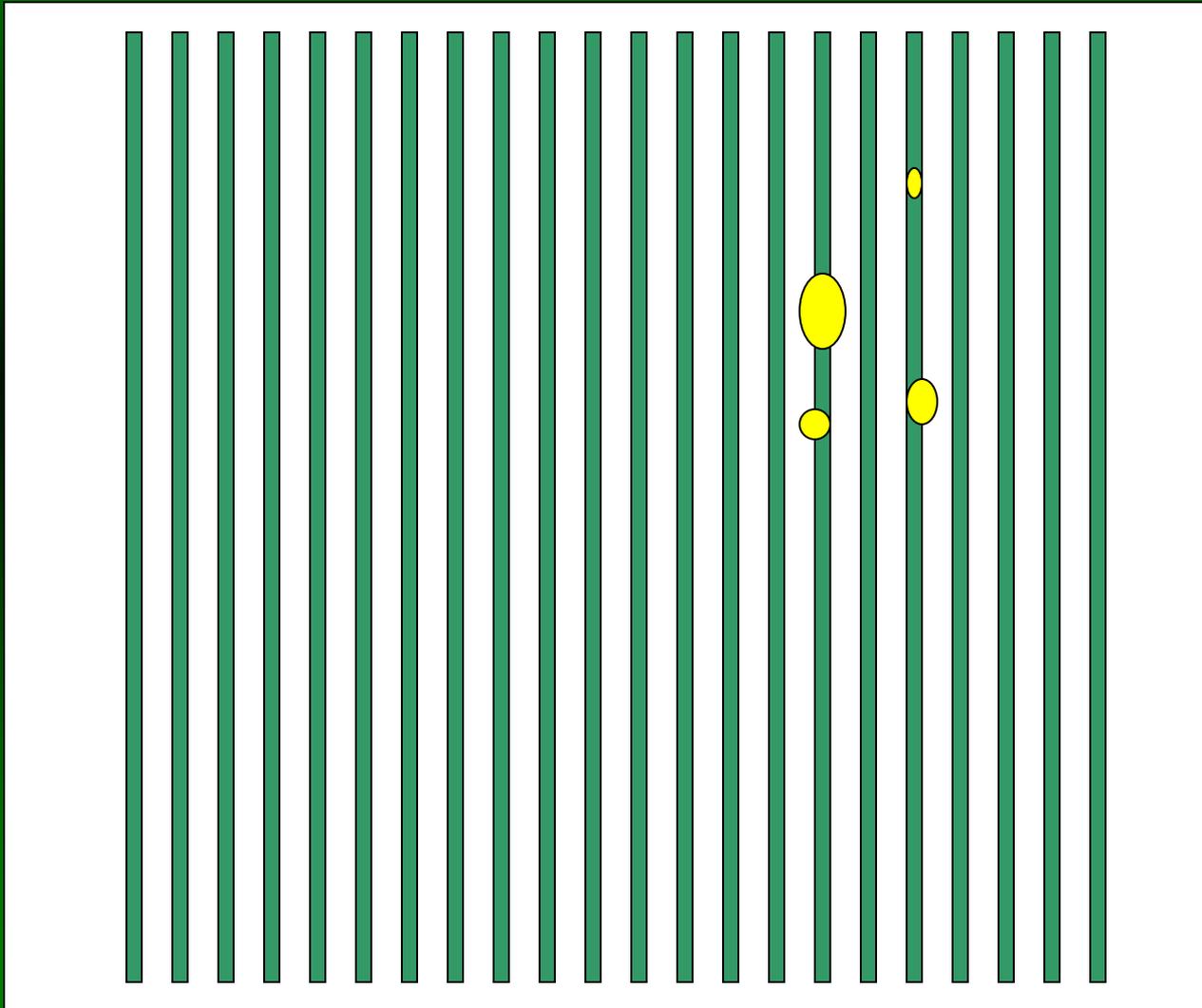


Clumped Distribution (inside source year 1)



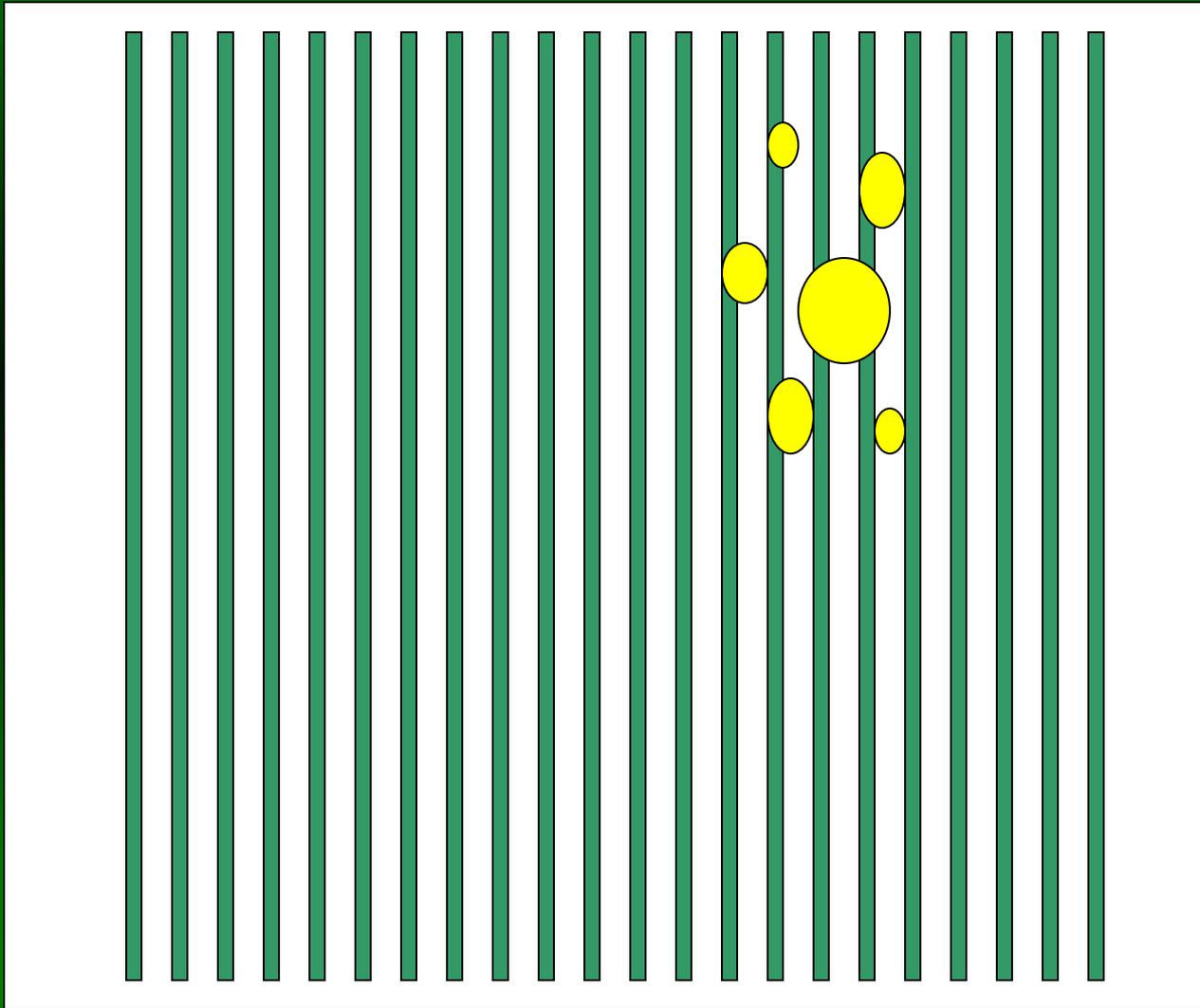
Soilborne diseases:
Fusarium Wilt
CBR
White Mold
Bacterial Wilt
Nematodes

Clumped Distribution (inside source year 2)



Soilborne diseases:
Fusarium Wilt
CBR
White Mold
Bacterial Wilt
Nematodes

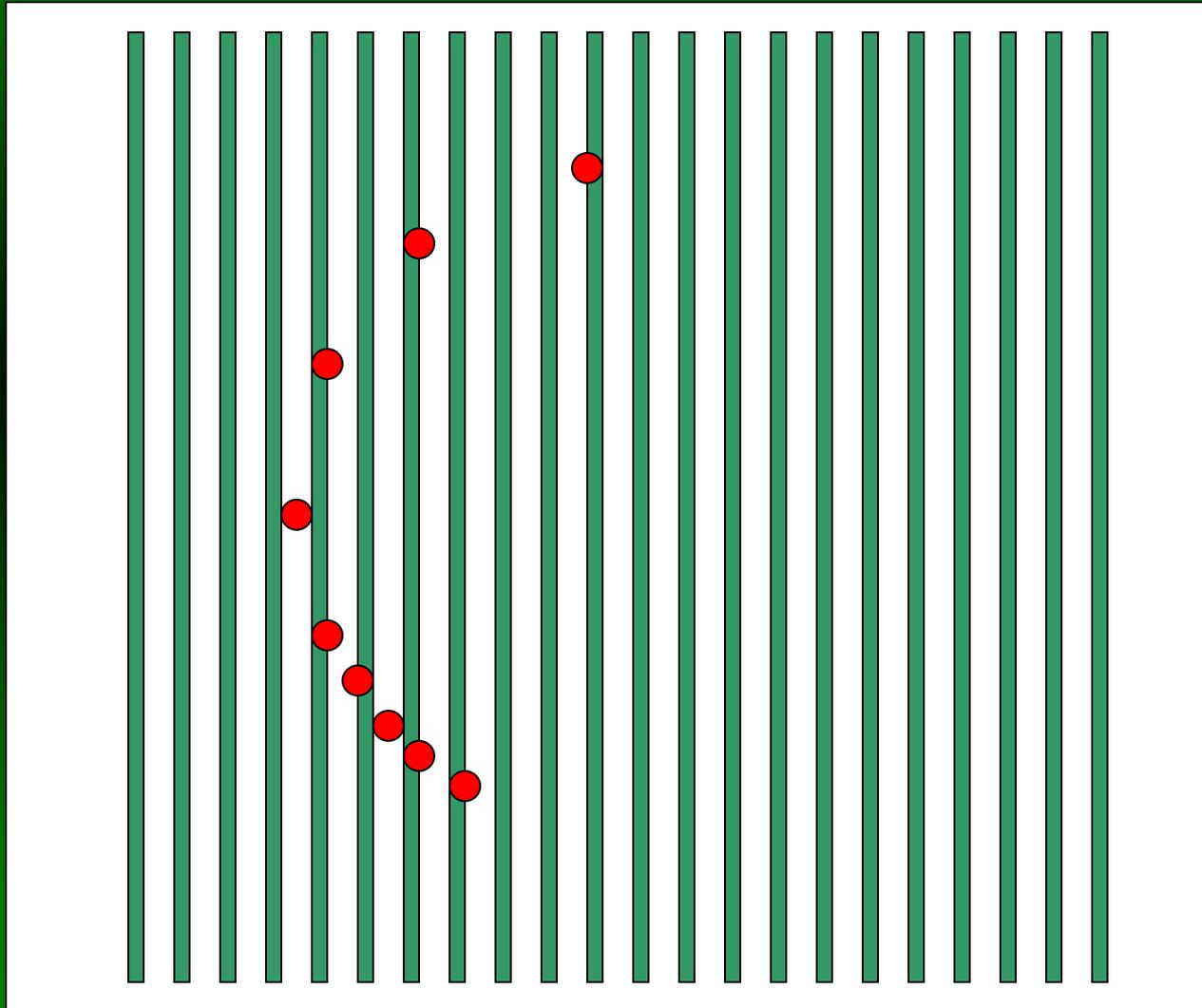
Clumped Distribution (inside source year 3)



Soilborne diseases:
Fusarium Wilt
CBR
White Mold
Bacterial Wilt
Nematodes



Patterns of Distribution (man and machinery aided)



Walking pattern

Pivot pattern

Bacterial diseases
Such as fruit blotch
And bacterial spot.

TMV

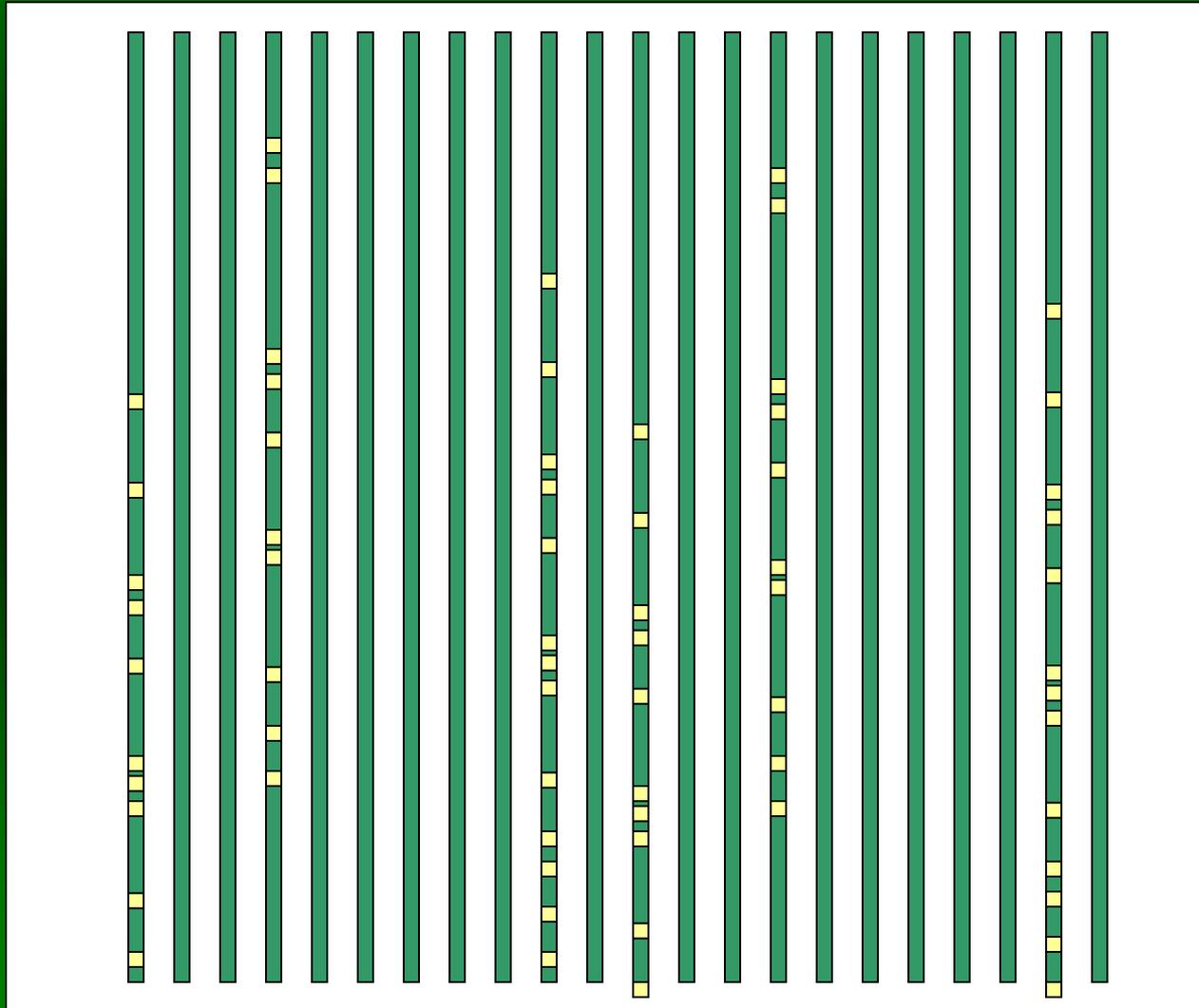


N. Gregory

Bacterial isolation



Patterns of Distribution (man and machinery aided)



Down row spread
Drip Irrigation

TMV
Bacterial Spot
Phytophthora cap.

Question the Grower

- What was planted last?
- What has the weather been like?
- What variety is it?
- What is your planting pattern?
- What has been sprayed on or near?

Look at Surrounding Plants

- Are weeds affected?
- Are there volunteers?
- Are plants close together or spaced apart?
- Weed control?
- Windbreaks?

Roundup Injury



Patterns of Distribution (herbicide)

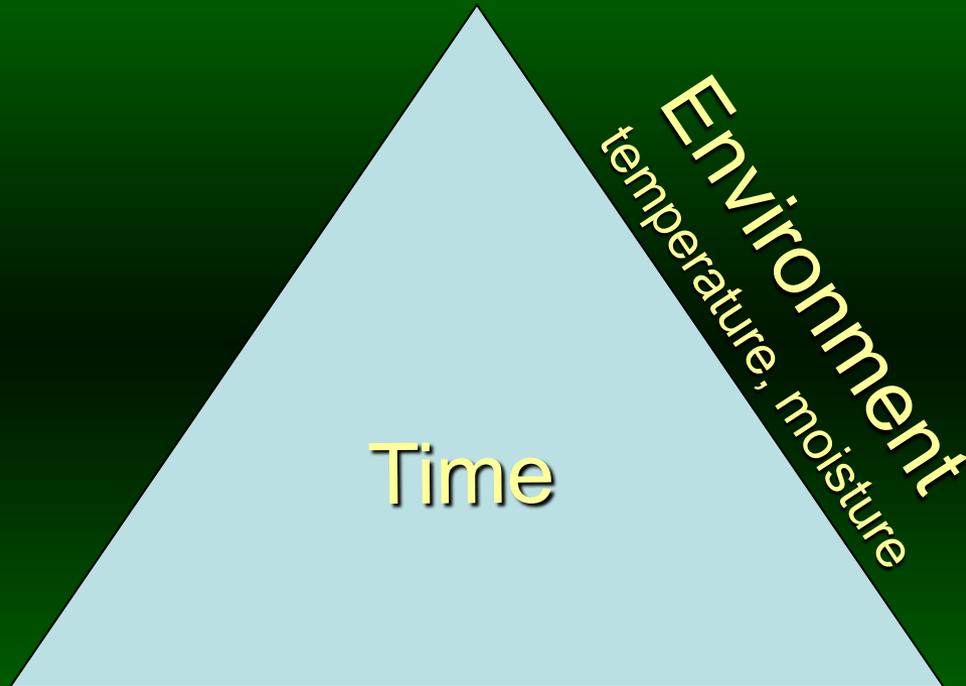


Drift across field
from source

Think About Disease Triangle

- What has the environment been like?
- Is the host a resistant variety?
- What time of year is it?
- Have we seen much of this already?

Disease Triangle



Pythium
(aerial)



Pythium
(aerial)



Sclerotinia



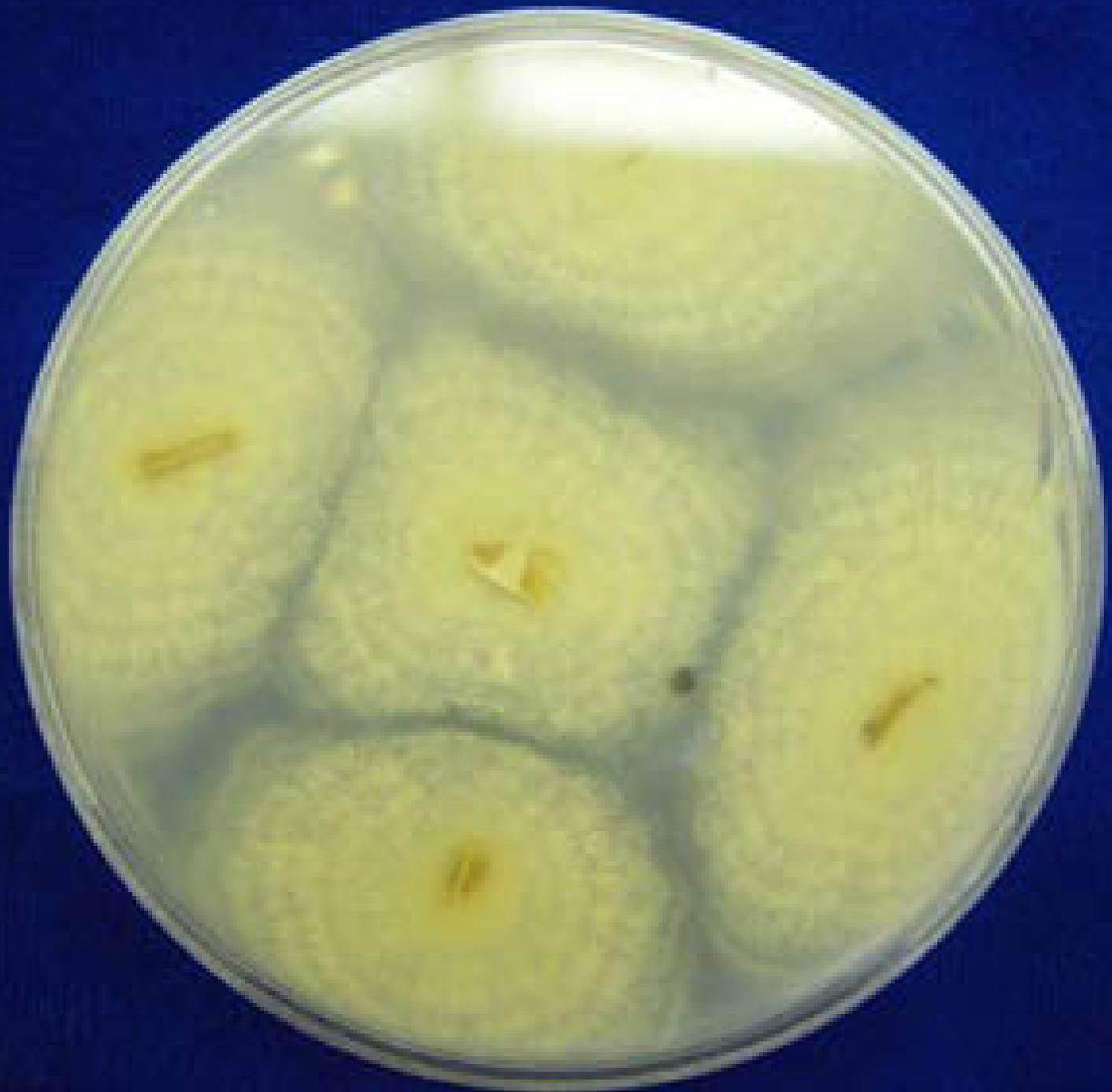
Southern Blight



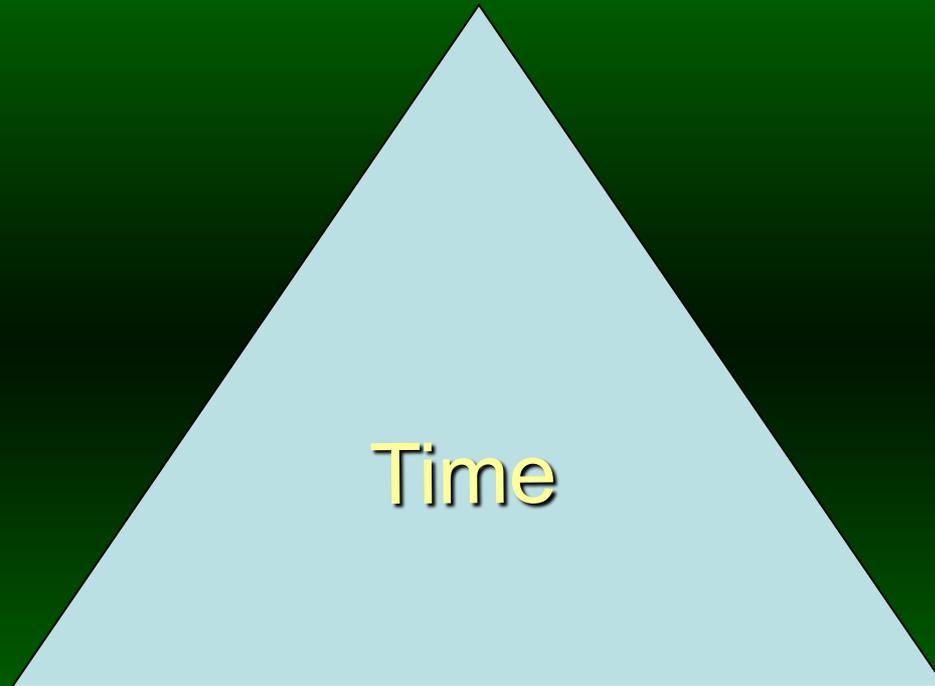
Southern Blight



Tissue Biopsy



Disease Triangle



Time

Host

variety susceptibility, growth stage

Powdery Mildew



Powdery Mildew



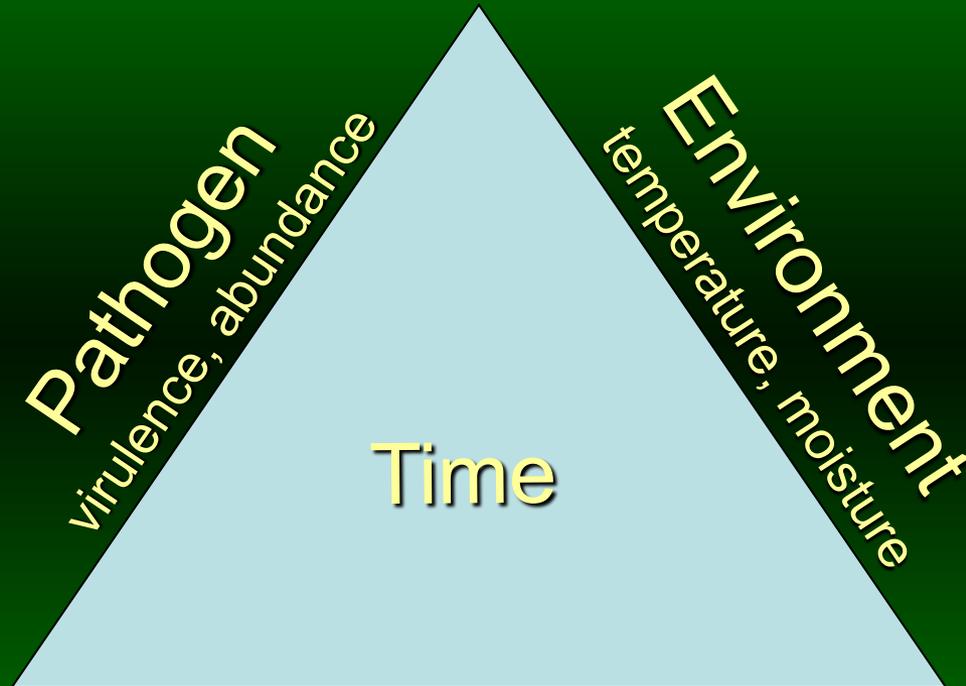
Rhizoctonia



Ashy Stem Blight



Disease Triangle



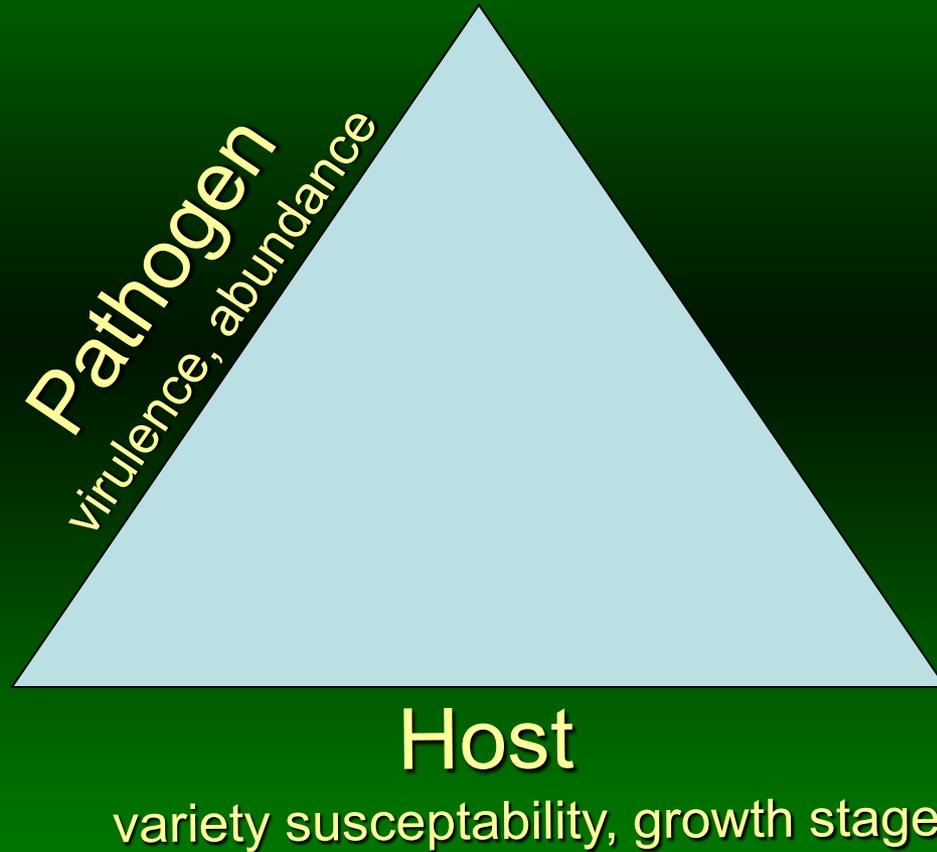
Cabbage Leaf Curl Virus



Tomato Yellow Leaf Curl



Disease Triangle

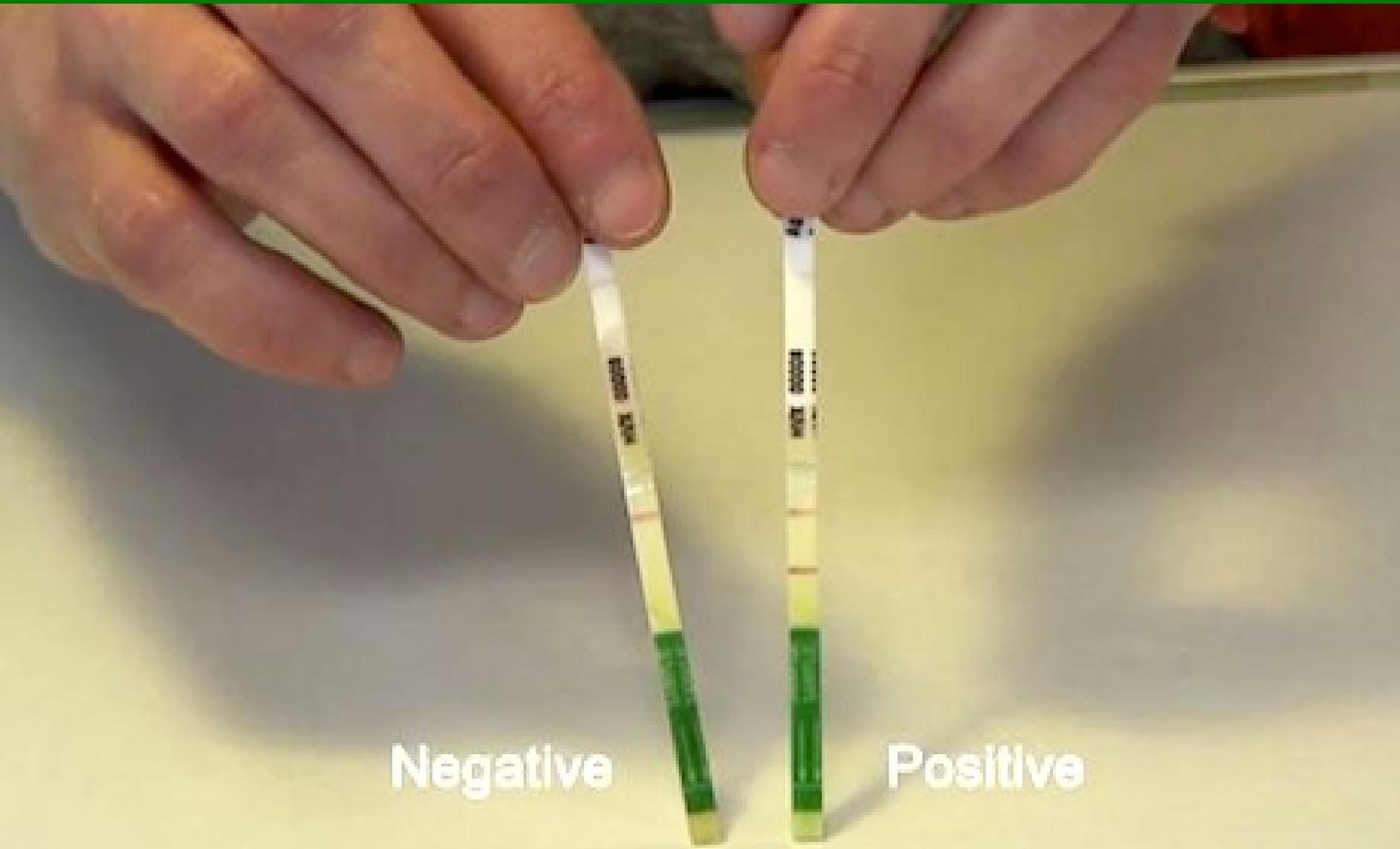


Tomato Spotted Wilt









Negative

Positive