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Commonly seen viruses in dahlia (there are dozens of them!)

- Tobacco streak virus (most prevalent)
- Tomato spotted wilt virus
- Impatiens necrotic spot virus
- Dahlia mosaic virus (fewer cases over the last few years)

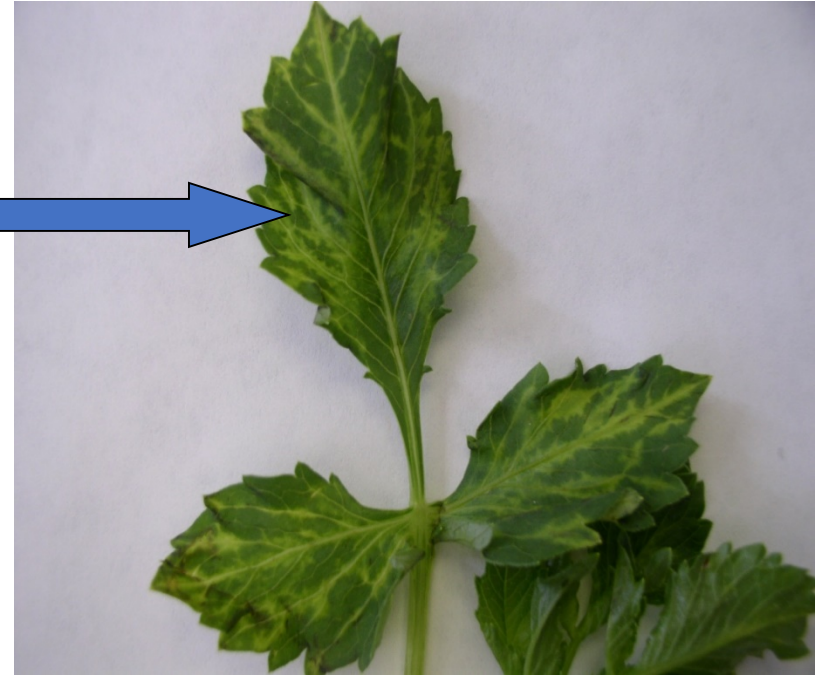
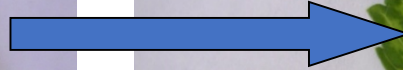
Mosaic



Chlorosis (=yellowing)



*Veinal chlorosis
(yellowing or loss of 'green' along the veins)*



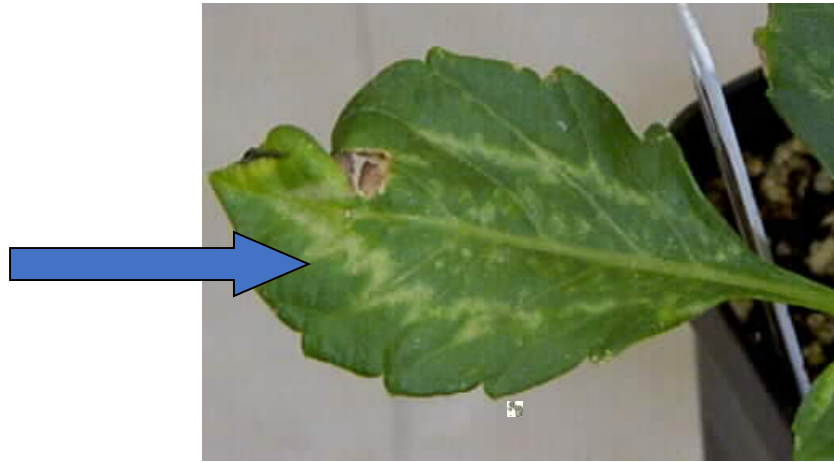
Systemic chlorosis: entire plant is symptomatic



Severe stunting,
chlorosis,
mottling



'Fanleaf' symptom by Tomato spotted wilt virus



'Fanleaf' symptom by Tomato spotted wilt virus



Concentric ringspots Impatiens necrotic spot virus



Ring spots/Netting : Tomato spotted wilt virus



*Ring spots/Netting :
Tomato spotted wilt virus*



Virus Testing: Findings from last two years

More than 1,000 samples tested for five viruses

“All dahlias have the virus.” **NOT TRUE!**

(there are pieces of a viral DNA that exists as part of the dahlia genome: may plants have these remnants). Even our own DNA has pieces of viral genome integrated!

Of the viruses that are known to infect dahlias: Tobacco streak virus seems to be more prevalent than others. This virus is spread by thrips.

Using virus-tested/virus-free plants to propagate further – will reduce the virus infections to a minimum.

Some of the symptoms are specific and unique to virus infection: visually screening and discarding plants with those symptoms is recommended.

Viruses: how do they spread?

Natural means: **Insects**

Human activities:

Gardening tools/implements

Propagating material (tubers, cuttings)



**Tobacco
thrips**



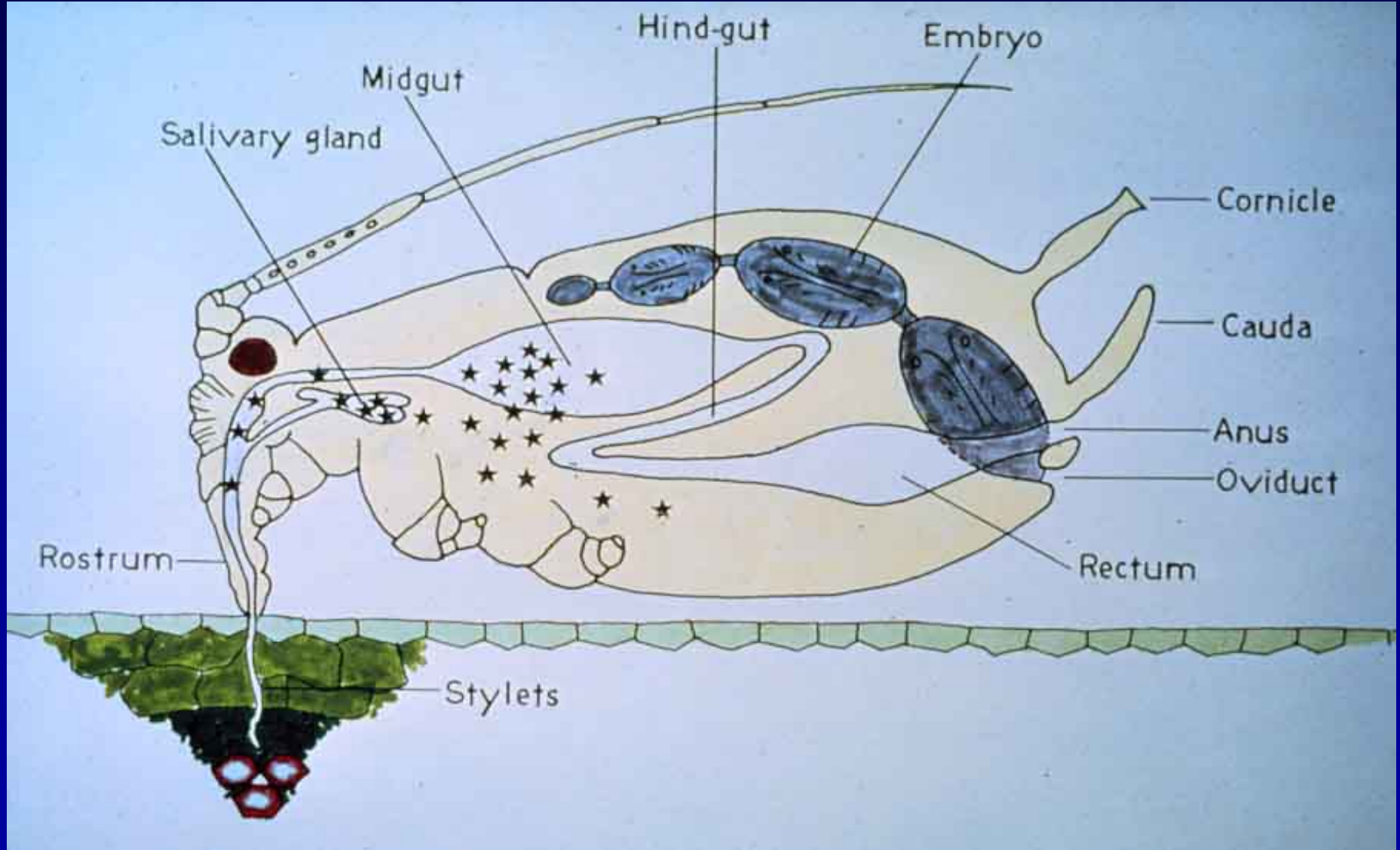
male

female

**Western flower
thrips**



Vector Transmission



Control of plant viruses

Once the plant gets 'sick' (=got infected with a virus):

There is little that could be done to 'cure' that plant or 'get rid of the virus' from that plant

Control of plant viruses

As a result,

Most of the control options are directed at **PREVENTING** infection

Managing Virus Diseases

- Start with virus-free/healthy, vigorously growing plants
- Eliminate infected plants (and tubers)
- Avoid contamination
- Disinfect tools

Control

- Early detection of infected plants
- Discarding infected plants (to minimize further spread)
- Disinfect tools frequently to avoid Contamination (=carry over)

Disinfectants

- 10% household bleach
- DAWN detergent solution
 - 2 teaspoons of Dawn in 600 ml of water (gives 1.6% solution)
- Vircon S (commercially available)

FAQs

I pulled out a diseased plant. Is it okay to plant in the same soil again?

>Depends. If the disease was due to a virus, you may plant again in the same soil. Many viruses do not survive in soil

FAQs

I really take good care of my plants and I don't see much of a disease issues!

>Stresses like lack of water or poor soil fertility could weaken your plants and could make the plants prone to disease

FAQs

Is it possible to make dahlias resistant to viruses?

>Yes. Through the process called plant breeding. For this, we first need to first identify genes that provide that resistance and move them into desirable cultivars

FAQs

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>In my experience, those with dark foliage tend to have less disease. These could have genes for virus resistance.

FAQs

Is it possible to make dahlias resistant to viruses?

>In my observations over the years, those with dark foliage tend to have less disease. These could have genes for virus resistance.

FAQs

Some of my plants looked diseased but new growth looked fine rest of the season. Why is that?

> This happens some times. Plants fight back and try to recover from the disease. This does not mean that they completely got rid of the virus

FAQs

My plants looked like diseased with leaves showing symptoms similar to what Dr. Pappu showed. But the flowers came out normal. Should I keep using the tubers/cuttings from these plants?

> Not a good idea! Viruses accumulate and pass on from generation to generation and can cause more damage.

FAQs

What can I do to reduce virus spread?

- Disinfecting knives/tools goes a long way!

FAQs

Is there something that I can spray to 'cure' my diseased plants?

- No
- There are no known chemical therapies for plant viruses - to 'get rid of/kill' a virus from a diseased plant

FAQs

I pulled out a few diseased plants. Is it okay to compost them?

- It is better if you don't. It depends on the region: where summer temperatures are higher, the composting process could inactivate the viruses

FAQs

You just said dahlia viruses are spread by bugs. What can I do about it?

- Yes, many of the dahlia viruses are spread by insects - but their relative importance in disease spread in household gardens can vary.
- Removing leaves with symptoms - first time they appear and become visible - reduces the amount of virus that could be spread by insects

FAQs

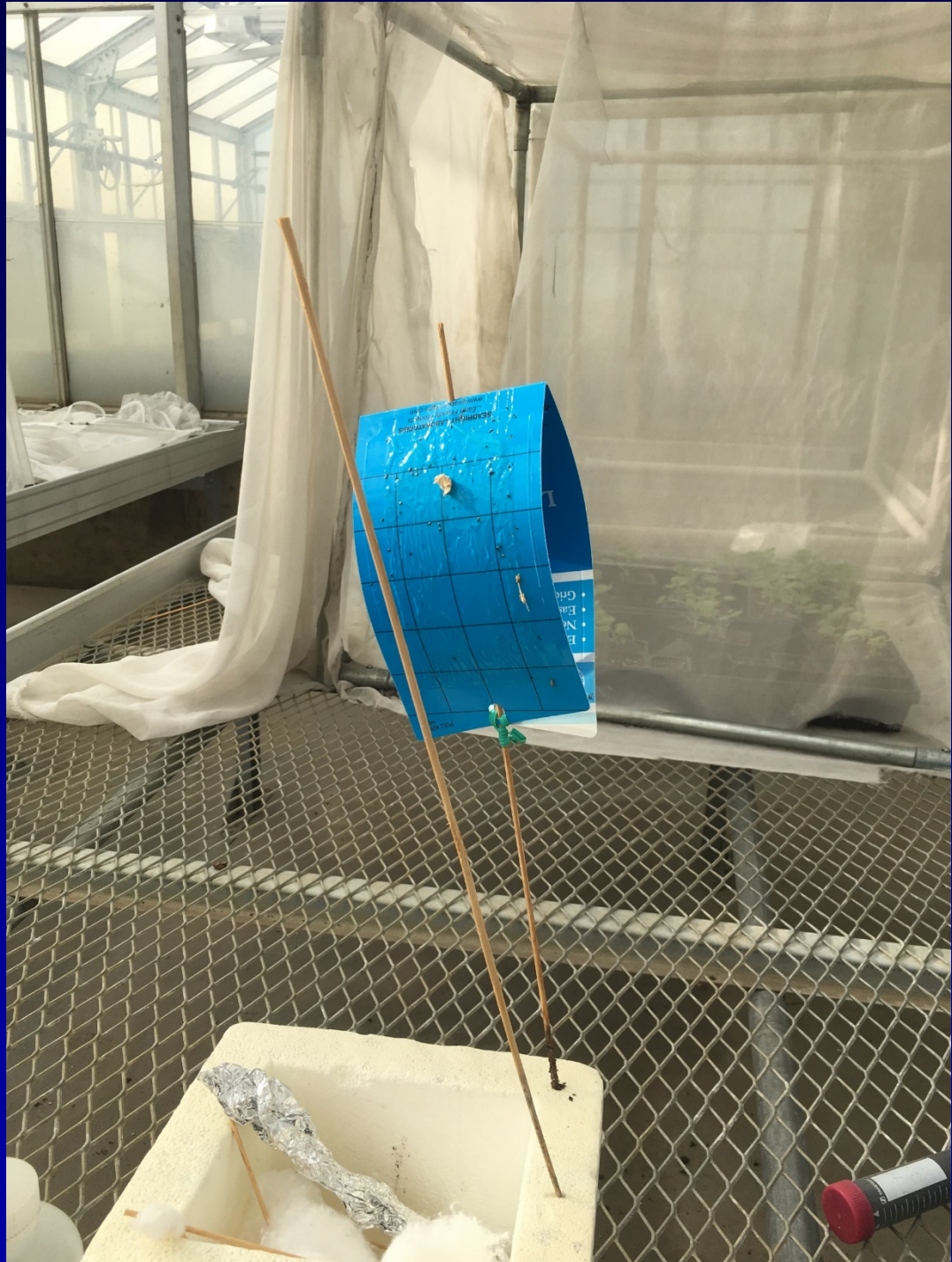
Which insects are more important in virus spread?

>The most common viruses on dahlia are spread by tiny insects called 'thrips'. They are responsible for virus spread during the season.

FAQs

What can I do about thrips?

>The non-chemical way to reduce their numbers is to use yellow and blue sticky cards as shown in the next slides. They tend to be attracted to these colors.





Remember!

Removing plants with disease as soon as you notice them and not using/selling/sharing tubers from those plants is the surest way to reduce the virus problem over time.

Those who have been doing this over the years have virus-free plants.

Start Clean; Stay Clean!

Virus-free dahlias

- One way to produce virus-free dahlias is through a process called 'tissue culture' (=growing plants in artificial media, under controlled, laboratory conditions).
- At WSU, research into developing a pipeline for tissue culture is being explored.