



Scouting For Viral Diseases In the Greenhouse

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Some Viruses on Greenhouse Flower Crops:

Impatiens necrotic spot tospovirus (INSV)

Tomato spotted wilt tospovirus (TSWV)

Cucumber mosaic cucumovirus (CMV)

Tobacco mosaic tobamovirus (TMV)

Insects that may serve as virus vectors:

Aphids

Thrips

Whiteflies, Leafhoppers, Planthoppers

Beetles

Mealybugs

(and mites get in the act, too, at times!)

**VIRUS
SYMPTOMS:**

Flower break

Mosaic

Chlorotic Mottle

Ringspots

Chlorotic or Necrotic Spots

Line Patterns

Leaf Strapping

Distortion

Stem cankers

Vein clearing, vein banding

Stunt

Flower Break Symptoms

TFBV
Tulip flower break virus



NGI

Flower Break symptoms



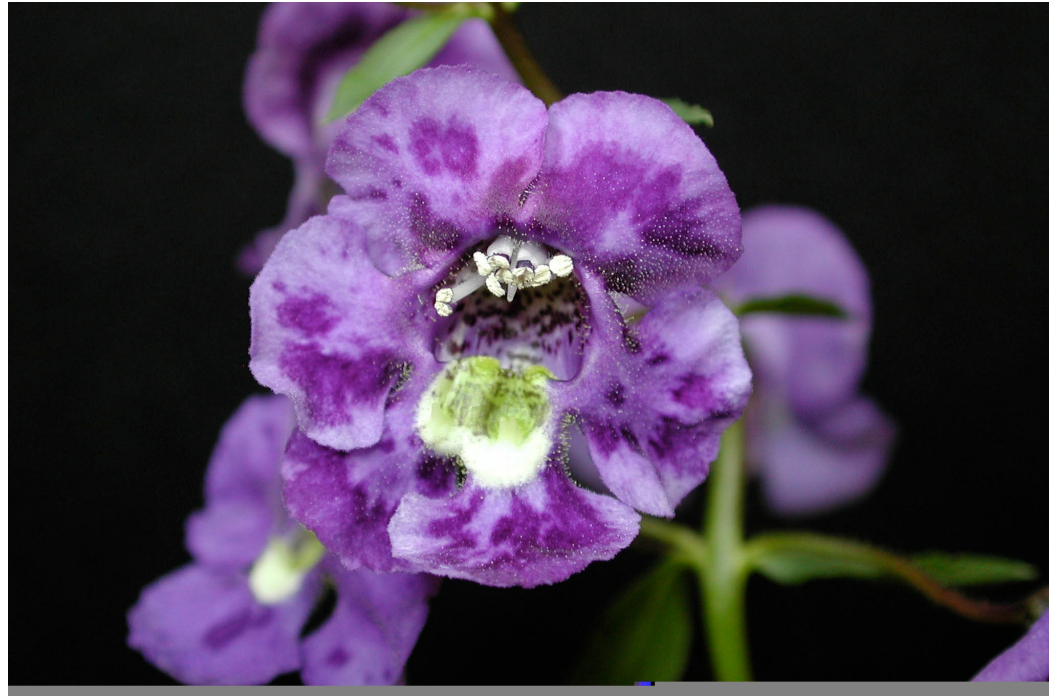
Flower Break In Lily



Cucumber mosaic cucumovirus (CMV)

Angelonia Flower Break Virus

Angelonia



Western Flower Thrips is an important vector of INSV and TSWV:
Scout for thrips injury and you may find the virus symptoms too!



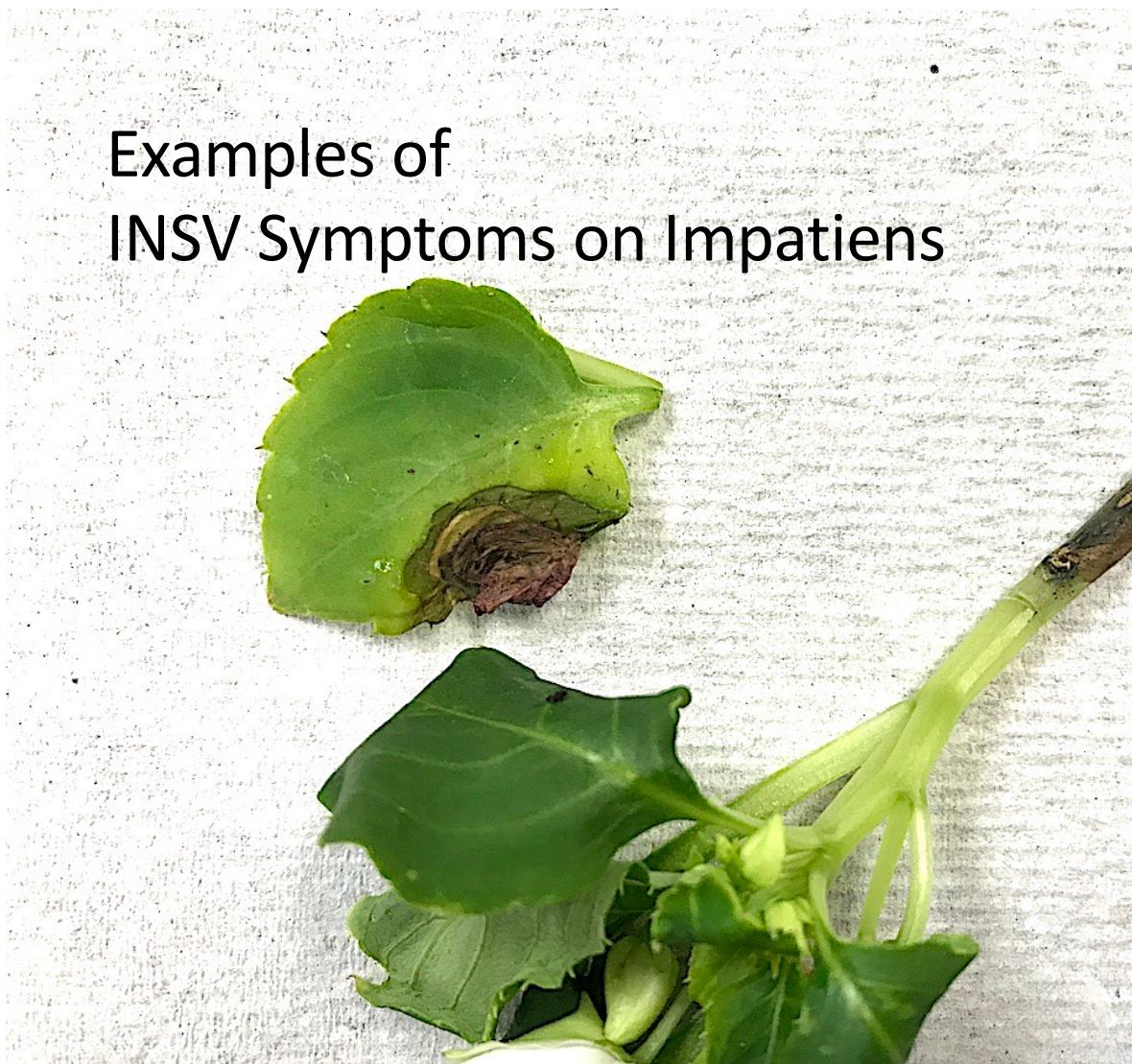
Scout for thrips!



- Injury and frass on leaves and petals
- YSC counts
- Breathe CO₂ into flowers

You can learn almost all the virus symptoms by
looking at INSV and TSWV
(they cause so many different symptoms on so many crops!)

Examples of INSV Symptoms on Impatiens



Tool for Your Scouting: Immunostrips

Agdia Inc.
agdia.com

Test whether a
virus is the one
you think . . .



INSV Symptoms

can appear on hundreds of
different kinds of plant

Necrotic spots

New Guinea
INSV



Necrotic spots



Coleus - INSV



Chlorotic spots

Symptoms of Impatiens Necrotic Spot Virus (INSV) on Pepper transplants

Necrotic spots

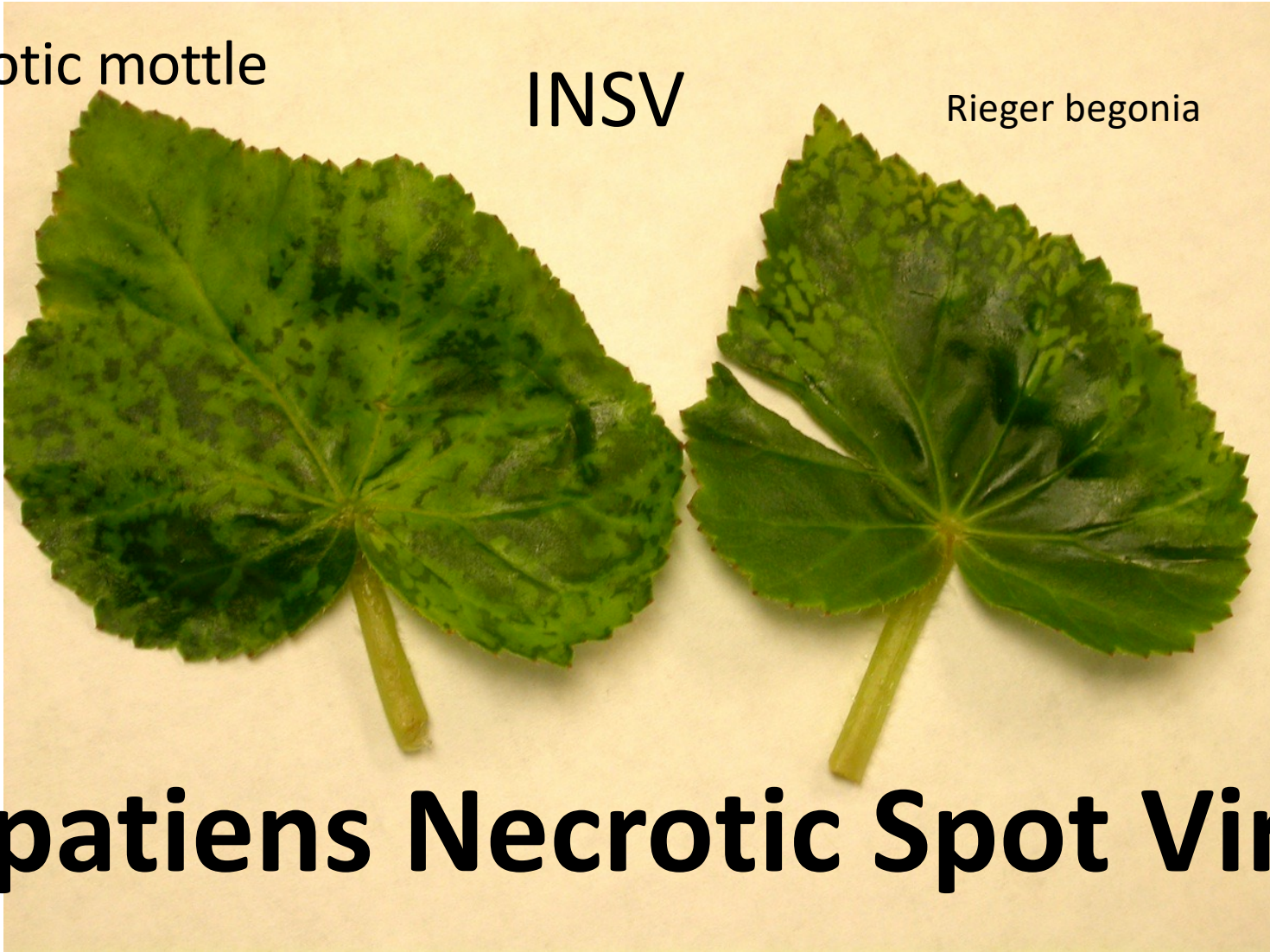


Chlorotic mottle

INSV

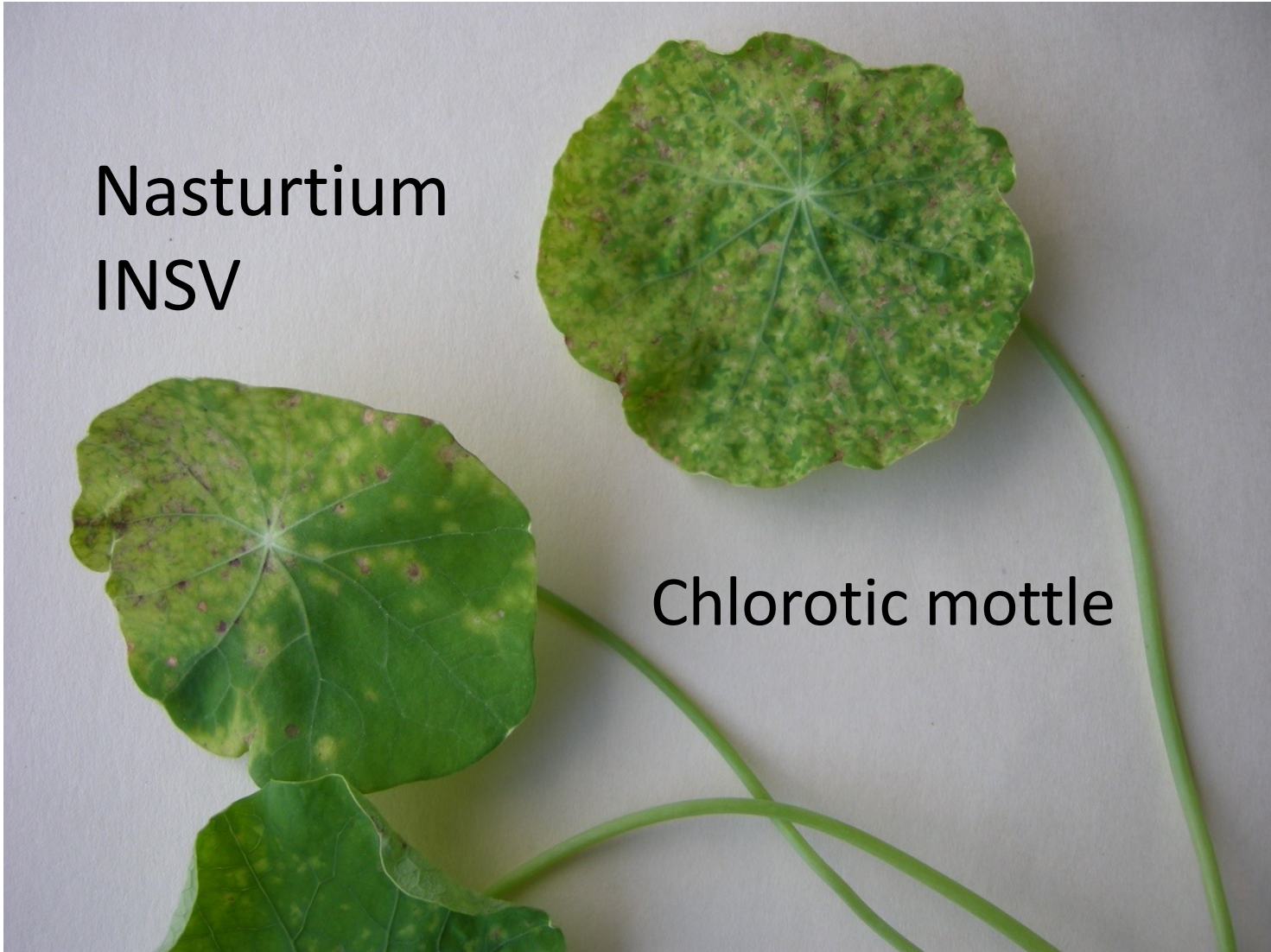
Rieger begonia

Impatiens Necrotic Spot Virus



Nasturtium
INSV

Chlorotic mottle





Chlorotic mottle

Trout Lily - INSV

Chlorotic mottle



Saintpaulia INSV

Chlorotic mottle



Cineraria - INSV



Cyclamen
INSV



Ringspots

Leaf
necrosis



Nemesia - INSV



Line pattern symptom

Gloxinia - INSV



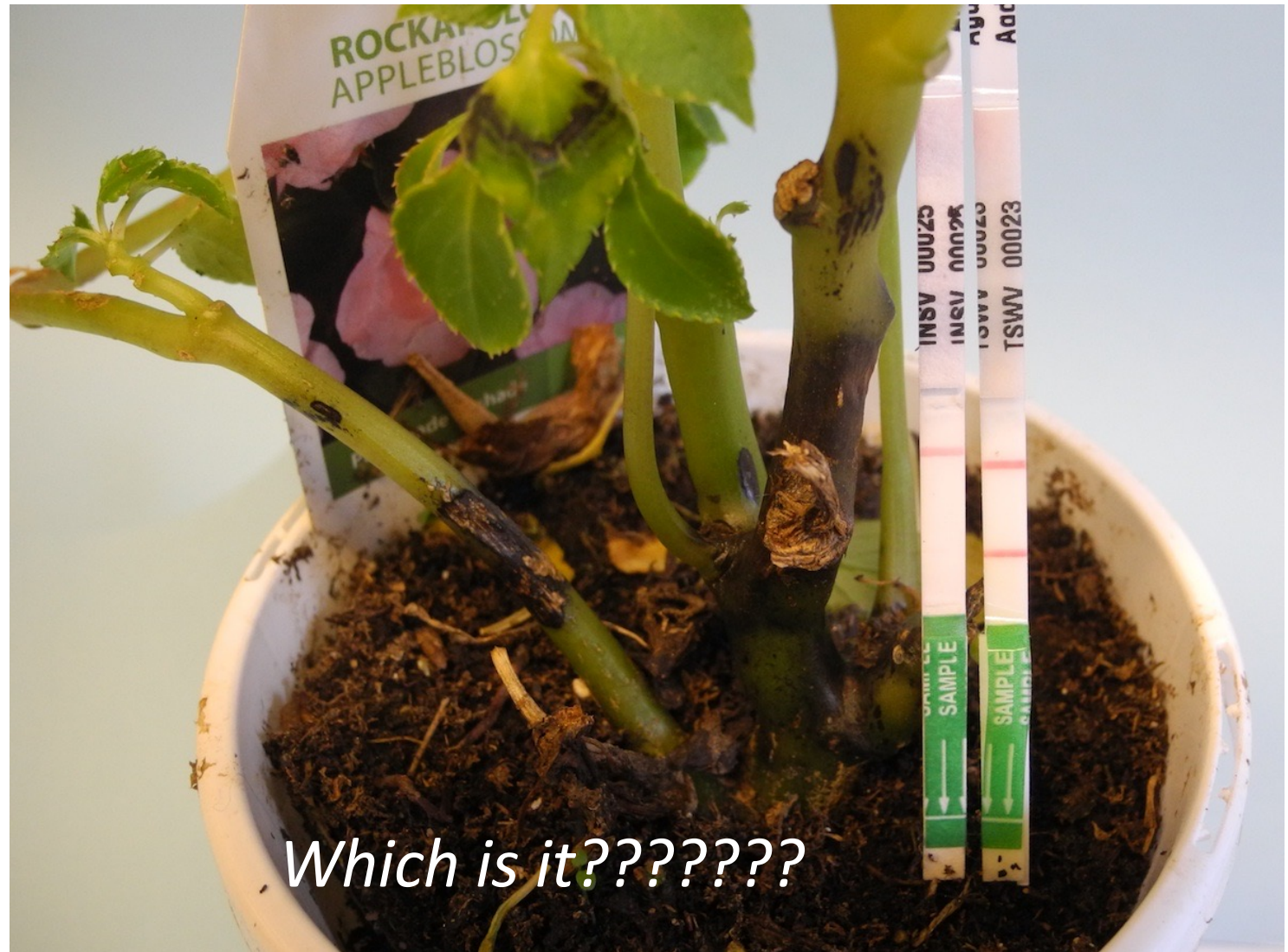


Tomato Spotted Wilt Virus

TSWV is
Another
orthotospovirus

(cousin to INSV)

To decide, use
immunostrips



Verbena -
TSWV

veinclearing



Zinnias -
TSWV

Chlorosis,
Vein clearing





Basil
TSWV

Chlorotic mottle

Begonia - TSWV

Chlorotic mottle
with
'green islands'





Senectis
Pericallis hyb.



Necrotic leaf spots



New Guinea
Impatiens - TSWV



NGI -
TSWV

Necrotic stem
cankers

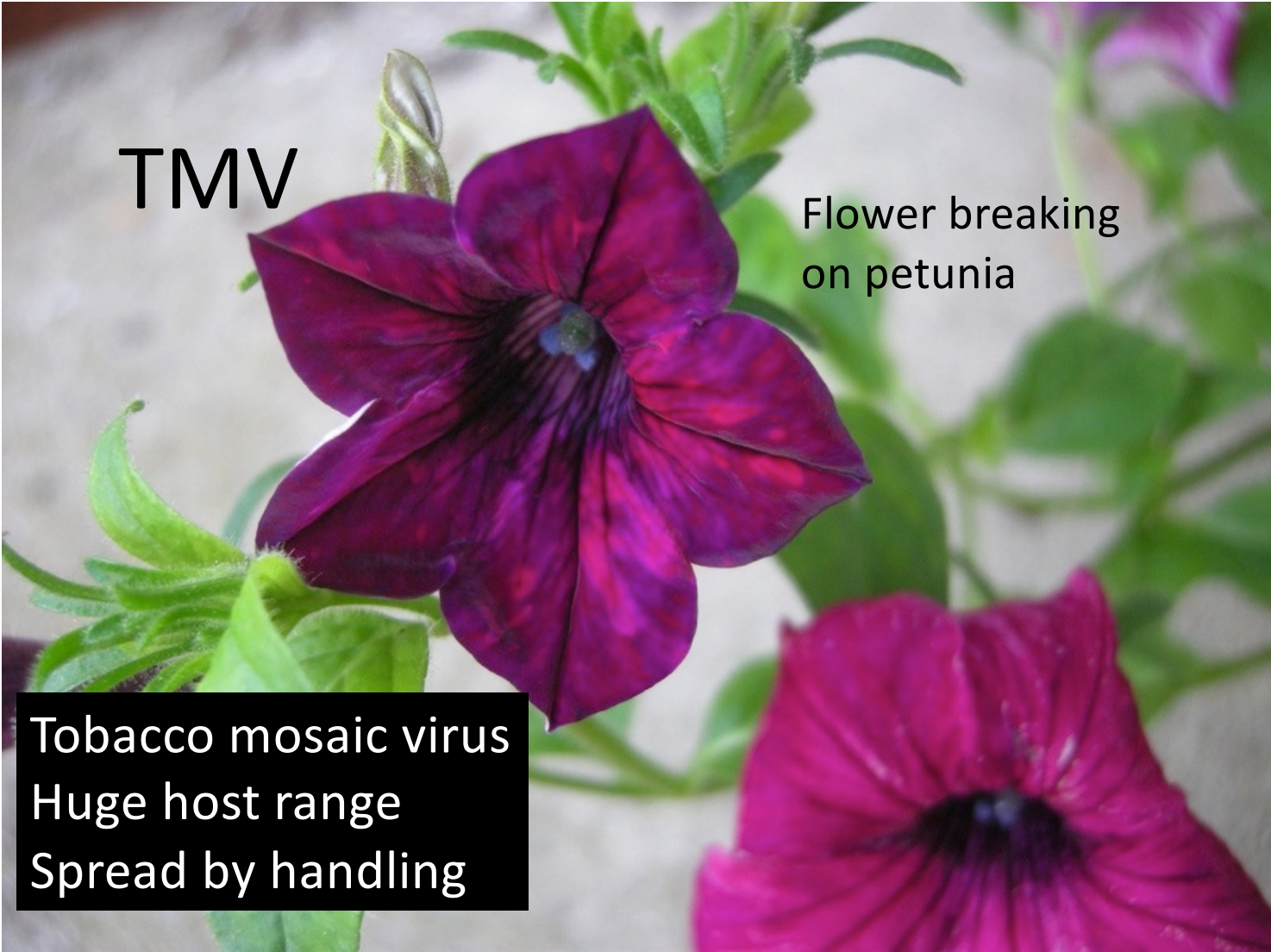
Tomato Spotted Wilt Virus (TSWV)



mum



INSV on Rieger Begonia



TMV

Flower breaking
on petunia

Tobacco mosaic virus
Huge host range
Spread by handling



TMV - Petunia

mosaic

Cheryl Smith, UNH



TMV
Petunia
Strapped leaves



Cheryl Smith, UNH

CMV on Monkshood

Cucumber mosaic cucumovirus

Infects > 1000 spp.

Yellow mottle with ringspots

Insects that may serve as CMV vectors:

Aphids!

>80 species

Non-persistent

Stylet-borne



Black bean aphid

Image by Sandra Jensen



Questions?
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Virus
Ringspots



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