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Cyclamen: Targeting INSV

Impatiens necrotic spot virus (INSV) is a detrimental virus and can be spread very easily by Western Flower thrips, but how do you know if INSV is present in your greenhouse? With best management practices, growers can mitigate problems.



Figure 1. Cyclamen plant with classic bullseye ringspots associated with an Impatiens Necrotic Spot Virus (INSV) infection. (© Brian Whipker)

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Cyclamen (*Cyclamen persicum*) are flowering plants that are regarded for their unique and long-lasting blooms. They make excellent potted household plants or cool-season ornamentals. During a recent greenhouse visit, a few scattered cyclamen plants were noticed to be showing bullseye ringspots on the leaves (Fig. 1). Further inspection revealed that the symptomology was present on a few leaves on the plant

(Fig. 2), which is a distinct characteristic of an INSV infection. In some cases, the leaves also had slight chlorosis developing (Fig. 3). Symptoms can be masked by the plants' waxy surface; ringspots are less noticeable in some areas of the leaf and prominent in others (Fig. 4).

In addition, leaves will ultimately begin to develop chlorosis and eventually necrosis. If the problem is not previously noticed, this is the stage that will be easily observed.

These are all typical signs of a virus infection of cyclamen. A plant was tested for INSV. Impatiens necrotic spot virus was confirmed with an enzyme-linked immunosorbent assay (ELISA) test by Mike Munster of the NC State University Plant and Insect Clinic.

Management

Once a plant has INSV or tomato spotted wilt virus (TSWV), the virus cannot be removed. Discarding infected plants is an important option to prevent the virus from spreading further. It is important to note that some plants may be asymptomatic, but still have INSV or TSWV. Since the primary method of spreading these viruses is via Western Flower thrips (*Frankliniella occidentalis*) (WFT) feeding, it is critical to keep them under control. Additional information about the biology and control of WFT was written by [Cloyd \(2010\)](#) and [UMASS Extension \(2015\)](#).



Figure 2. Multiple leaves develop ringspot symptoms. (© Brian Whipker)

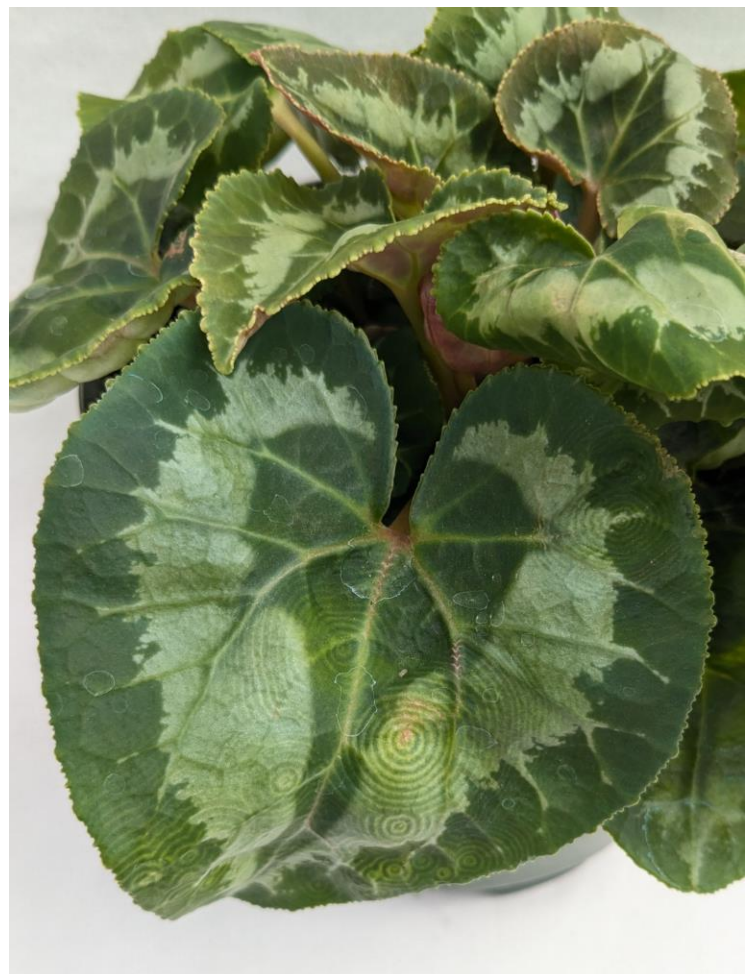


Figure 3. Close-up of leaf ringspotting on cyclamen. (© Brian Whipker)

Western flower thrips only become INSV and TSWV vectors if they acquire the virus early in their lifecycle. The acquisition period only occurs during the first larval instar stage of development. A short feeding period of under 30 minutes will allow the larvae to acquire the virus. It is reported that adult WFT do not become viruliferous upon feeding on virus-infected plants. Therefore, the key to control of WFT is to eliminate adult populations that may harbor INSV or TSWV and curtail egg laying so that no first larval instar thrips can acquire the disease.

The lifecycle of WFT is temperature-dependent. The egg-to-egg lifecycle quickens as temperatures increase from 45.8 days at 15°C (59°F), 15.2 days at 25°C (77°F), to 11.4 days at 35°C (95°F) (Malais and Ravensberg, 2003). While lifecycle development is quickest at 35°C, it comes at the expense of a shorter lifespan, fewer eggs hatched, and a higher mortality rate. Unfortunately, at the higher temperatures used for many floriculture species, it also corresponds to lower mortality, a higher number of hatched eggs, and a ~30-day lifecycle. This is why WFT populations can exponentially explode in a greenhouse environment.

Summary

Viruses can become a serious problem if not controlled when they begin. Continual control of WFT and rogueing out virus-affected plants are the primary ways to stop an INSV or TSWV problem before it gets out of hand.

References

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Figure 4. Very pronounced ringspots highlighted on cyclamen associated with Impatiens necrotic spot virus (INSV) infection. (© Brian Whipker)

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