

## Kalanchoes: Impatiens Necrotic Spot Virus (INSV)

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On a recent trip visiting greenhouses, a grower asked me to look at her kalanchoes. This was the same grower with symptoms on her non-stop (tuberous) begonias [e-GRO Alert 1(6)]. Kalanchoe leaf symptoms varied from a yellow mottled pattern to necrotic spots (see photos below). Symptoms appeared on multiple cultivars scattered over four benches. Western flower thrips had been a problem a few weeks earlier, but at the time of the visit none were found and they were under control.

The mottled leaf pattern and necrotic spots are typical symptoms of a virus. So to confirm the diagnosis, plants were tested by Mike Munster of the NC State University Plant Disease and Insect Clinic (<http://www.cals.ncsu.edu/>

[plantpath/extension/clinic/](#)). INSV was confirmed with an enzyme-linked immunosorbent assay (ELISA) test.

If you suspect a virus problem, have the plants tested by a diagnostic clinic. You can also conduct in-house testing with



**Mottled yellow and green leaf spots on kalanchoes**



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ELISA kits from Agdia (<http://www.agdia.com/>). If you choose to test in-house, Stephen Nameth of Ohio State University wrote a great article about improving INSV diagnosis techniques (<http://www.gpnmag.com/improving-insv-diagnosis>).

**Management.**

Once a plant has INSV, it cannot be cured. So discarding infected plants is the only option. Note some plants may be asymptomatic but still have INSV. Thus with the primary method of spreading INSV is by Western Flower thrips (*Frankliniella occidentalis*) feeding, it is critical to keep them under control.

**Additional Resources.**

There are additional online resources with details about the disease, host range, and how it is spread. Below is a listing of a few which pertain to greenhouse crops.

**NC State University**

<http://www.ces.ncsu.edu/depts/ent/notes/O&T/production/note120.html>

<http://www.ces.ncsu.edu/depts/ent/notes/O&T/flowers/ort072e/ort072e.htm>

<http://ncsupdicblog.blogspot.com/2012/01/sample-of-week-insv-on-cyclamen.html>

**Penn State University**

<http://extension.psu.edu/plant-disease-factsheets/all-factsheets/impatiens-necrotic-spot-virus>

**University of Massachusetts**

<http://extension.umass.edu/floriculture/fact-sheets/impatiens-necrotic-spot-virus-and-tomato-spotted-wilt-virus>

**University of Connecticut**

<http://www.hort.uconn.edu/ipm/greenhs/htms/tos pov.htm>

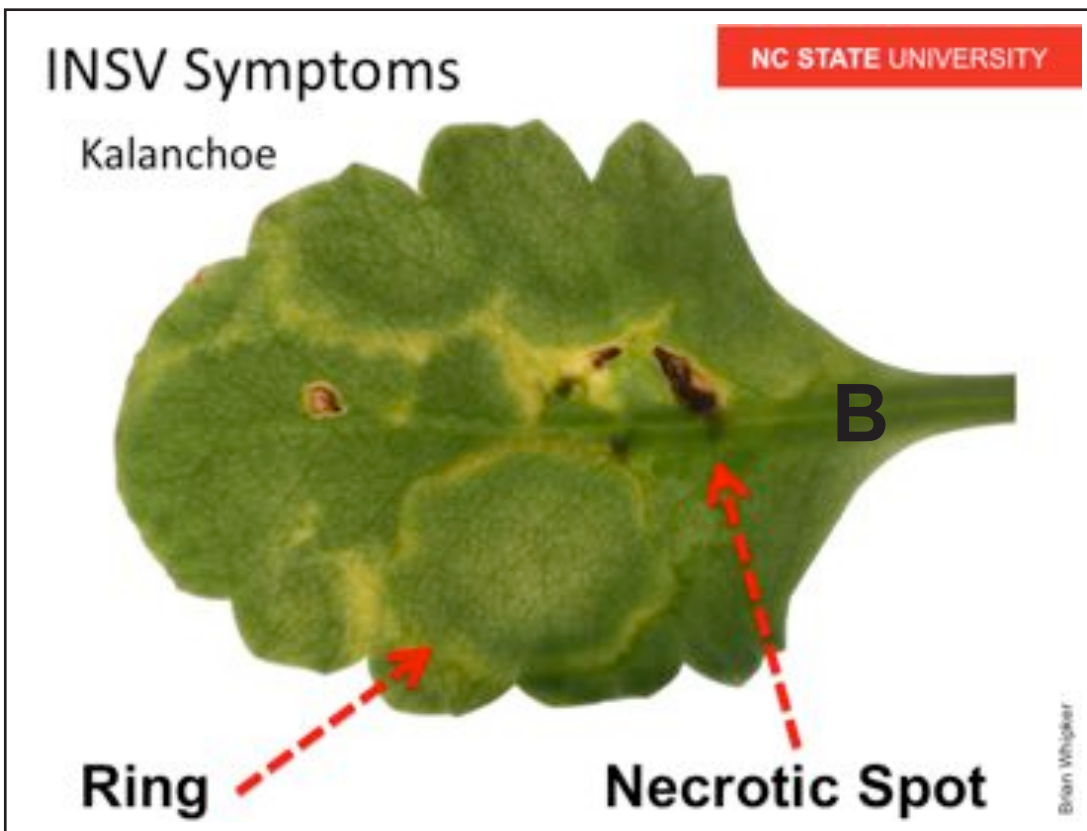
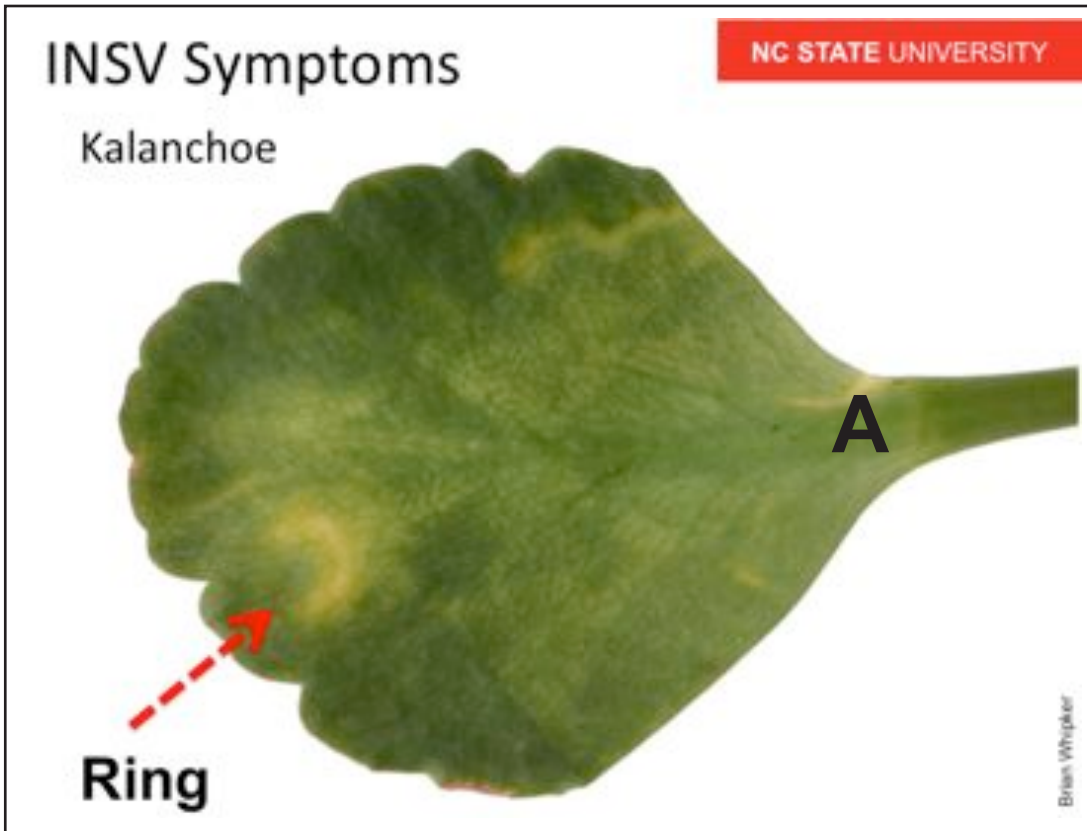
In cooperation with our local and state greenhouse organizations





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**Necrotic leaf spots on kalanchoes. This is a typical symptom of INSV on kalanchoes.**



Close up photos of the ring spots (A) and necrotic leaf spots (B) on kalanchoes.