

Iris Yellow Spot Virus (IYSV) Tospovirus

EPMS- 002

Quick Facts

- IYSV was first discovered in Davis County, Utah, in commercial onions during 2000.
- IYSV is a Tospovirus related to Tomato Spotted Wilt Virus and Impatiens Necrotic Spot Virus.
- IYSV is vectored by the onion thrips (*Thrips tabaci*), but has not been shown to be vectored by the Western Flower Thrips (*Frankliniella occidentalis*).
- The IYSV present in the US shows symptoms on the seed stalk (scape) and vegetative leaves.
- Once an onion is infected, there are no curative measures for IYSV.

Iris Yellow Spot Virus (IYSV) was discovered in the United States in 1991 in seed onions from Idaho. Genetic testing revealed that IYSV is a Tospovirus, but not the Tomato Spotted Wilt Virus (TSWV) or Impatiens Necrotic Spot Virus (INSV), which are two of the most common Tospoviruses in agriculture. Since its initial discovery in Idaho, IYSV has been found in eastern Oregon, *Allium* spp. seed fields, California, and Arizona onion seed fields. During the 2001 growing season, bulb onion production fields in Colorado, Idaho, Washington, and Davis

County, Utah, tested positive for IYSV infection. It is not uncommon to find 100% of the plants in an affected field infected with IYSV. Infected plants are still able to produce a good quality bulb in many cases, but infected plants are extremely susceptible to adverse environmental conditions such as drought, over irrigation, and excessive heat. Under these difficult environmental conditions aerial portions of the plant will die and result in cessation of bulb growth.

Symptoms:

Symptoms of IYSV consist of eyespot to diamond shaped yellow or straw colored lesions on the seed stalk (scape) and bulb leaves of onion, chive, and leek (Figure 1-3).

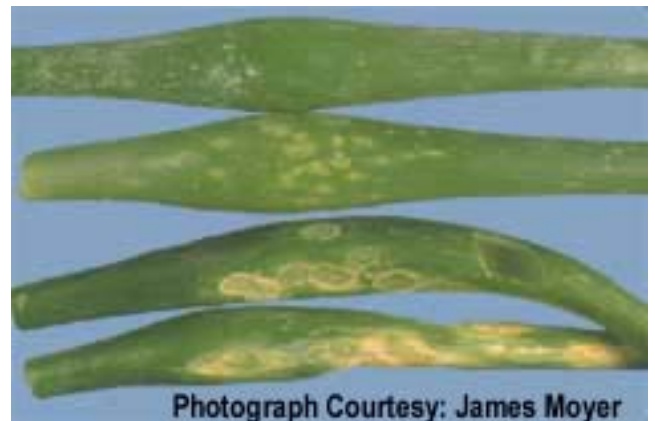


Figure 1. Range of IYSV symptoms on onion bulb leaves. Range of symptoms: uninfected leaf (top), multiple infections on single leaf (bottom).

Infected leaves will fall over at the point of infection during the latter part of the growing season (Figure 4). This symptom is enhanced in fields experiencing environmental stresses.



Figure 2. Close up of IYSV lesion on onion bulb leaf. Lesions on bulb leaves tend to be eyespot shaped.



Figure 3. Close up of IYSV lesion on onion seed stalk (scape). Lesions on the scape tend to be diamond shaped.



Figure 4. Infected onion plants falling over where lesions are present.

(enveloped tripartite RNA genome). The nature of their enveloping proteins allow Tospoviruses to be effectively vectored by Thrips. The onion thrips (*Thrips tabaci*) is the only thrips species capable of vectoring IYSV, whereas both onion thrips and western flower thrips (*Frankliniella occidentalis*) can vector TSWV and INSV. Studies are currently investigating the IYSV pathway within thrips to determine whether the virus is harbored within the salivary glands or gut of onion thrips or if transmission is simply mechanical.

IYSV host range is reportedly limited to *Allium* spp, Jamestown-weed (*Datura stramonium*) and *Nicotiana benthamiana*. It is not clear if IYSV holds over in infected hosts, within the digestive tract of overwintering thrips or both. In either case, Utah has susceptible hosts that are viable hold over sites as well as overwintering populations of onion thrips.

Control Recommendations:

As with all other plant viruses, once a plant is infected with IYSV there are no cures short of removal. Fortunately, the IYSV infection does not mean plant death. Maintaining optimum growing conditions (irrigation and fertility) will allow onions to grow and produce salable bulbs.

Because IYSV is a relatively neoteric disease, little is known about host resistance, however red skinned onions are reportedly more resistant to infection than yellow skinned onions. No host resistance information is currently available for chive or leek varieties, but these crops are of little concern for Utah agriculture.

Causal Agent:

IYSV has been identified as a Tospovirus. Tospoviruses are characterized as having an encased three-part viral ribonucleic acid genome

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Questions for Iris Yellow Spot Virus samples/survey

Grower Information

Name:

Address:

Farm Location:

Crop Information:

Origin of seeds:

Plant and Variety:

Source of irrigation water:

Irrigation type and frequency:

Soil type:

Fertilization and pesticide applications:

Fertilizer (units applied):

Insecticide applications:

Insecticide Name:

Target Pest(s):

Fungicide applications:

Fungicide Name:

Target Pest(s):

Neighboring farms with host plants: yes/no

Are neighboring farms experiencing same disease: yes/no

Percent crop loss:

Recent environmental conditions experienced at affected location: