

OUTBREAK OF IRIS YELLOW SPOT VIRUS IN ONION SEED CROPS IN CENTRAL OREGON

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Iris yellow spot virus (IYSV) of the genus *Tospovirus*, family *Bunyaviridae* is considered an emerging or re-emerging pathogen affecting onions in the United States. The virus has been endemic to the Treasure Valley of southern Idaho for over a decade (Hall et al. 1993). Reports of its further spread came from several states in the region, most recently from New Mexico and Washington (Creamer et al. 2004, Du Toit et al. 2004). As with other viruses in this genus, IYSV is spread by thrips. Onion thrips (*Thrips tabaci*) are the only known vector of IYSV. Western flower thrips (*Frankliniella occidentalis*) are not believed to vector IYSV (although they do vector distantly related viruses such as tomato spotted wilt and impatiens necrotic spot viruses). Most *Allium* species and several other plants are known hosts for IYSV, but garlic is not believed to be a host.

During the 2004 growing season, a few onion seed crops near Madras, Jefferson County, in central Oregon showed symptoms suggestive of IYSV infection. These included characteristic diamond-shaped scape lesions (Du Toit et al. 2004). By July, scapes in half of one 4-ha field were 100 percent symptomatic and 95 percent lodged, leading to nearly total crop failure; in the other half, scapes were 30-40 percent symptomatic and 15 percent lodged, with symptoms and lodging increasing weekly at 8 weeks remaining before harvest. The half of this crop with greater incidence was immediately adjacent to a field where very limited IYSV-like symptoms were noticed in a 2002-2003 onion seed crop that was harvested in mid-August 2003 after the highly symptomatic 2003-2004 onion seed crop was planted next to it in early July 2003. Both crops were planted from true seed.

In another onion seed crop located 1,000 m away, IYSV-like symptoms were abundant around the field edges in July and through the field in August 2004, with approximately 5 percent lodging by mid-August. A few plants with IYSV-like symptoms were present in several more distant fields, but not in most onion seed fields in central Oregon.

Symptomatic plants were collected and tested in the laboratory for confirmation of IYSV infection. IYSV was confirmed by ELISA using a commercially available antiserum (Agdia Inc., Elkhart, IN). Total nucleic acids were extracted and, using primers specific to the nucleocapsid (N) gene of IYSV (2), reverse transcription-polymerase chain reaction (RT-PCR) was done. RT-PCR gave DNA amplicons of the expected size. The DNA amplicons were cloned and sequenced. Nucleotide sequence comparisons with known IYSV N gene sequences confirmed virus identity.

The rapid spread of IYSV in the Pacific Northwest and its severity, often leading to 100 percent incidence, is cause for concern for onion growers and industry. Incidence in Washington in 2004 was not restricted to seed crops, as many commercial bulb crops also

were damaged by IYSV (L. Du Toit, Washington State University, personal communication), as has been observed in recent years in Colorado (H. Schwartz, Colorado State University, personal communication) and the Treasure Valley of eastern Oregon (L. Jensen, personal communication). Efforts to identify management practices to reduce its impact have to be undertaken on a regional basis due to its widespread occurrence across several states in the northwestern United States.

References

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