

Increasing Outbreaks and Impact of *Iris yellow spot virus* in Bulb and Seed Onion Crops in the Imperial and Antelope Valleys of California

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Poole, G. J., Pappu, H. R., Davis, R. M., and Turini, T. A. 2007. Increasing outbreaks and impact of *Iris yellow spot virus* in bulb and seed onion crops in the Imperial and Antelope Valleys of California. Online. Plant Health Progress doi: 10.1094/PHP-2007-0508-01-BR.

California is the largest producer of onion and garlic in the USA with approximately 14,973 ha of garlic with a total value of \$261 million and 14,569 ha of onions with a total value of \$144 million in about 27 counties. Imperial Valley (Imperial County) and Antelope Valley (Los Angeles County) comprise a major onion-producing region in southern California.

In May 2003, in two Imperial County seed onion fields, irregular necrotic lesions on scapes were observed. Using a commercially available ELISA kit (Agdia Inc., Elkhart, IN), the causal agent of the disease was identified to be *Iris yellow spot virus* (IYSV; genus *Tospovirus*, family *Bunyaviridae*). Disease incidence in both fields was nearly 100% and substantial seed losses occurred.



Fig. 1. Symptoms of *Iris yellow spot virus* infection on onion scapes collected from commercial onion fields in Imperial County, California in 2005.

Since 2003, IYSV has been detected annually in both bulb and seed onion, with symptomatic plants (Fig. 1) in approximately 20, 60, and 40% of the Imperial County onion fields in 2004, 2005, and 2006, respectively. However, severity was typically low and yield losses attributed to IYSV have been rare in this production area.

In August 2005, onion plants with diamond-shaped lesions on scapes and sunken yellow lesions on the leaves in production fields indicative of IYSV infection (Fig. 2) were widespread in four fields (varieties Granero and Vaquero) in the Antelope Valley. In bulb onion fields, plant tops died back

2 to 3 weeks before harvest and bulbs failed to reach marketable size. The incidence of the disease was greater than 50% in two of the fields and nearly 10% in the other two fields. Field size ranged from 8 to 32 ha. IYSV infection was confirmed by ELISA and RT-PCR. This was the first known recording of IYSV in the Antelope Valley.



Fig. 2. Effect of *Iris yellow spot virus* infection on onion. Lesions develop on leaves and coalesce, leading to drying and lodging.

In 2006, IYSV-induced symptoms became widespread during harvest of intermediate day length bulb onions in early July. More than 50% yield loss occurred in the long-day onions, representing 53% of bulb onion production area in the Antelope Valley (Fig. 3). By 15 August, the virus was detected in all fields that remained to be harvested which represented 47% of the 805 ha in the Antelope Valley.



Fig. 3. Impact of *Iris yellow spot virus* on onion: A severely affected commercial field in Antelope Valley in Los Angeles County, CA in August 2006.

IYSV continues to spread to other parts of the country and other parts of the world and has become a major constraint for the production of bulb and onion seed crops in the Columbia Basin (1). Since its first report of occurrence in California (2), the increasing incidence and impact of IYSV in a major onion-growing area highlight the need for research into developing management options for this important disease of onion.

Literature Cited

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