

2004 ONION IYSV – Emerging IPM Issue Final Report

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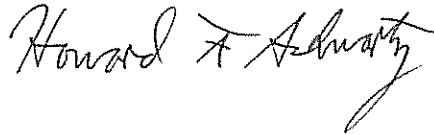
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Background:

Iris yellow spot virus (IYSV) and its thrips vector are immediate and serious threats to sustainable and profitable onion production in the western U.S. These two pests were recently ranked as number 1 and 3 research priorities, respectively, in the Western Region Pest Management Strategic Plan developed for dry bulb storage onions in the Western United States. Onion growers in the western U.S. currently rely exclusively on high-risk insecticides for thrips management, and their use has increased with widespread insecticide resistance in thrips populations. The literature is devoid of IYSV management studies and in the absence of sound management strategies, growers have implemented even more intensive thrips insecticide programs with little reduction in IYSV incidence or severity.

Emergency funding was provided by the WRIPM Center on May 19, 2004 for Colorado State University researchers (Project 5-34928, 06/01/04 – 05/30/05) to initiate field studies in 2004 in northern Colorado in areas with a history of *Iris Yellow Spot Virus*. This information is vital to help support future grant activities and support of IR-4 and EPA labeling for novel reduced risk biopesticides that showed some promise in a preliminary study in 2003 in Colorado.

Replicated field plots were established at various sites (CSU ARDEC Research and Extension Facility near Fort Collins, and 2 grower fields near Greeley and Peckham), and the various treatments with innovative pesticides were applied. Novel reduced-risk chemical treatments such as imidacloprid (Provado) and acibenzolar (Actigard) were investigated for their ability to reduce or suppress thrips populations and IYSV incidence/severity. These experiments were monitored during the season for thrips, beneficial predators, and IYSV incidence/severity.

Results:

Iris yellow spot incidence was low throughout much of the season in the Front Range production areas. At Fagerberg Farms, the crop was destroyed by a hailstorm in mid-August before any Iris yellow spot symptoms developed. Biomass yields were measured on 25 August prior to disking of the field, but did not represent the yield potential if the crop had progressed to maturity. Bulbs larger than medium size were rarely found. Actigard did not affect total yield, but Actigard treatment reduced yield of medium grade bulbs 14% compared to non-Actigard treated plots.

At Zabka Farms, no treatment reduced Iris yellow spot incidence on the two evaluation dates, but Actigard treated plots produced 13% greater medium grade bulbs and 15% greater total yield than non-Actigard treated plots.

At ARDEC, Iris yellow spot incidence was not different among treatments on three of four evaluation dates. On 1 September, all treatments except Admire applied at planting reduced disease incidence as compared to the untreated. Most treatments did not improve bulb yield or grade, but the highest total and jumbo grade yield was produced in plots treated with Warrior/Lannate combined with Actigard. There were no significant effects upon thrips populations or beneficial insects (predators) in these trials in eastern Colorado.

Other trials at ARDEC provided some additional data on the effect of Actigard when combined with various insecticide treatments: IYSV disease incidence was reduced 15 to 32% with treatments of Actigard + Provdo from that of the untreated controls in two experiments with transplanted onions. Our disease and insect evaluations in a cooperator's spray trial in western Colorado, showed that the combination of Actigard + Provado reduced IYSV incidence by nearly 70% when compared to the untreated control in a commercial field of red onions. In addition, conventional (Lannate, Warrior) and soft (Proclaim, Denim, Provado) insecticides reduced mid-season thrips (vector) populations by 38 – 85% and 37 – 68% and the resulting incidence of IYSV by more than 50%.

No treatment provided a consistent and significant reduction in Iris yellow spot incidence or improvement in yield or grade across all locations during 2004. More experimentation during 2005 with Actigard under varying environmental, production, and experimental conditions is warranted to quantify the benefits of Actigard and other biopesticides in reducing Iris yellow spot and other onion diseases, in addition to thrips.

The WRIPM Center grant enabled us to gather additional data and experience with these priority pests, and these results will strengthen future research and extension proposals and outreach programs for our clientele throughout the western USA.

Thank you for your facilitation of this early-generation research related to onion IPM.