Western Regional IPM Grants
Annual Progress Report Guidelines
Due October 15, 2008

INSTRUCTIONS: PLEASE PROVIDE ONLY THE ESSENTIAL COMPONENTS OF ACCOMPLISHMENT WHICH ARE:

1. A CLEAR IDENTIFICATION OF THE PROBLEM/ISSUE ADDRESSED BY THE RESEARCH/EXTENSION.
2. A CONCISE EXPLANATION OF HOW THE RESEARCH/EXTENSION ACHIEVEMENT CONTRIBUTED TO THE SOLUTION OF THE PROBLEM/ISSUE BEING RESEARCHED.
3. THE IDENTIFICATION OF OTHER BENEFITS RESULTING FROM THE RESEARCH/EXTENSION, EVEN IF UNPLANNED.
4. **PLEASE ATTACH A SUMMARY OF THE PAST YEARS PROGRESS, ONE PAGE MINIMUM.**

PROJECT NUMBER: 2007-03622

PROJECT TITLE: Developing a Monitoring Program for Thrips-Iris Yellow Spot Virus Complex: Adding a Novel Management Component to the IPM Program in Bulb and Seed Onion Crop

LEAD PRINCIPAL INVESTIGATOR: Hanu R. Pappu

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CO-PIs or OTHER KEY PERSONNEL, and their INSTITUTIONS or AFFILIATIONS: Silvia Rondon, Oregon State University, Hermiston Agricultural Research and Extension Center, Hermiston, OR

WHO MAY WE CONTACT FOR ADDITIONAL INFORMATION IF NOT THE LEAD PI?

NAME: Co-PI as above

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THE PROBLEM, ISSUE, OR REASON FOR PURSUING THIS RESEARCH/ EXTENSION PROJECT.

Thrips-transmitted *Iris yellow spot virus* (IYSV) has become one of the major constraints to onion production in the western US. The disease affects both the yield and grade. Total crop losses in seed crops were reported from Columbia Basin in WA and OR and in southern Idaho. Limited control options are available. Since thrips vectors play a critical role in virus spread, tactics to identify viruliferous thrips and their seasonal dynamics would help devise more effective and environmentally friendly disease management strategies.

THE SINGLE MOST IMPORTANT ACCOMPLISHMENT OR BENEFIT RESULTING FROM THIS RESEARCH/EXTENSION PROJECT.

Using biotechnological tools, antiserum to the non-structural protein of IYSV was produced and a serological assay is developed for use in determining the seasonal dynamics of viruliferous thrips and refining thrips management tactics.

BRIEFLY DESCRIBE ADDITIONAL BENEFITS, SUCH AS:

SOCIAL BENEFITS – None to report yet.

ECONOMIC BENEFITS – None to report yet.

ENVIRONMENTAL BENEFITS – None to report yet.

OTHER – (a) Identification of alternate hosts that could be serving as reservoirs for virus inoculums; (b) better understanding of the genetic diversity of the virus populations in the US compared to those from other parts of the world; and (c) information on the seasonal dynamics of thrips vectors.

PLEASE SUBMIT A HIGH RESOLUSION DIGITAL IMAGE REPRESENTATIVE OF YOUR RESEARCH/EXTENSION PROJECT THAT WE CAN USE IN WESTERN IPM CENTER PUBLICATIONS WHICH MENTION YOUR PROJECT.

When you have completed this form, return to

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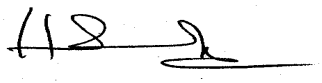

Hanu R. Pappu, PhD., Associate Professor
(Name and Title)

Western Regional IPM Grants Program; Project # 2007-03622
Progress Report – FY 07

Alternate hosts and genetic diversity of virus populations. Several potential alternate hosts for the virus were identified (Sampangi et al., 2007. New weed hosts of Iris yellow spot virus. *Plant Disease* 91:1683). This information would be useful for growers to refine their weed management practices as part of an integrated disease management program that could lead to reduction in disease incidence. Molecular typing of IYSV isolates has been carried out to better understand the genetic diversity of the virus populations in the US and other parts of the world (Pappu, H.R., and M.E. Matheron. 2008. Characterization of *Iris yellow spot virus* from onion in Arizona. *Plant Health Progress*. doi:10.1094/PHP-2008-0711-01-BR: Huchette, O., C. Bellamy, R. Filomenko, B. Pouleau, S. Seddas, and H.R. Pappu. 2008. *Iris yellow spot virus* in Shallot and Onion in France. *Plant Health Progress* doi:10.1094/PHP-2008-0610-01-BR; Ward, L.I., Z. Perez-Egusquiza, J.D. Fletcher, F.M. Ochoa Corona, J.Z. Tang, L.W.Liefting, E.J. Martin, B.D. Quinn, H.R. Pappu and G.R.G. Clover. 2008. First Report of *Iris yellow spot virus* on *Allium cepa* in New Zealand. *New Disease Reports* http://www.bspp.org.uk/ndr/july2008/2008-43.asp; Bag, S., J. Singh, R.M. Davis, W..Chounet, and H.R. Pappu. 2008. *Iris yellow spot virus* in Nevada and Northern California. *Plant Health Progress*. In review).

Seasonal occurrence of viruliferous onion thrips and determining the incidence of IYSV. In 2008, onion thrips were monitored in two field plots on a weekly basis using full plant counts technique. This research was conducted at OSU's Hermiston Agricultural Research and Extension Center (HAREC). Preliminary data shows that onion fields planted next to overwintering onions, a potential source of onion thrips for the following season, did not increase the mean number of onion thrips per plant per week in the field planted adjacent to it. However, numbers of symptomatic leaves were higher in field planted next to overwintering onion plots (25%) as compared to the field planted on the bare area (4%). Leaves will be tested later this year to confirm this observation. Samples were taken from July 8 until September 9. In field A, a steady increase on onion thrips mean numbers was observed week after week. A peak was reached on August 5; with a consequent decrease thereafter. August 5, 17.10 ± 1.3 onion thrips per plant per week were counted. In field B, two peaks were observed on July 22 and August 12, reaching a maximum number of 27.25 ± 8 onion thrips per plant per week on August 12 (Fig. 1). Each week, at least 20 onion thrips were collected from each field and from each sampling site. All those samples were preserved on PBS and will be tested for IYSV late 2008-early 2009. These thrips samples are being tested for the presence of IYSV using an ELISA-based assay to determine the proportion of viruliferous thrips.

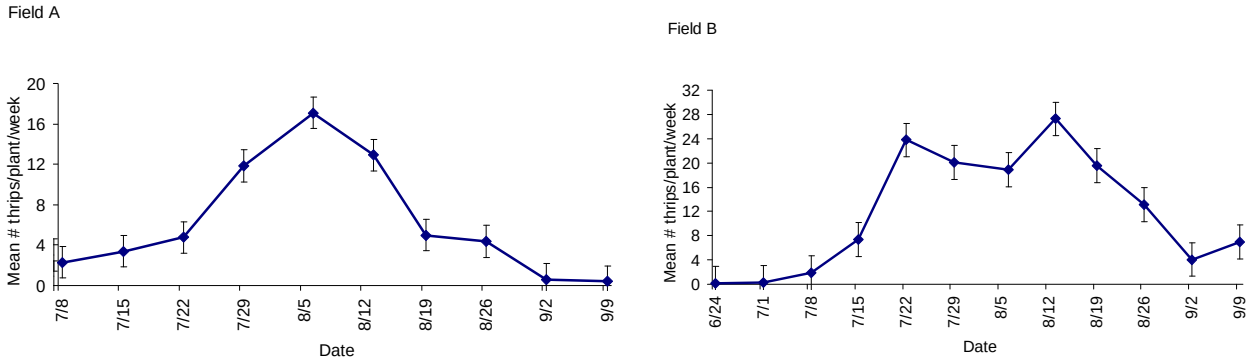

Fig. 1. Population dynamics of Field A (next to overwintering onion field plots) and Field B (planted on bare area).