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: COLO-2007-04128 & COLO-2007-03625

PROJECT TITLE:
Cultivar Resistance to IYSV and Thrips in Bulb Onion in the Western United States

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

Iris yellow spot virus (IYSV) and its onion thrips vector are immediate and serious threats to sustainable and profitable onion production in the western U.S. Onion growers in the western U.S. currently rely exclusively on high-risk insecticides for thrips management, the use of which has increased with a resultant widespread increase in insecticide resistance in thrips populations. This WRIPM project is viewed as an important investment in development and testing of a prototype national nursery that could uniformly evaluate germplasm for resistance and tolerance to IYSV and thrips.

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

Ranking of onion varietal responses to IYSV and Thrips pressure under field conditions in Colorado revealed that entries such as 'Colorado 6' and 'OLYSOS5N5' were less affected by thrips and disease than most of the other entries at 2 locations during 2008 (and 2007).

BRIEFLY DESCRIBE ADDITIONAL BENEFITS, SUCH AS:

SOCIAL BENEFITS -
Less susceptible varieties should require fewer pesticide applications, thereby reducing pesticide exposure and potential health threats to applicators, growers and consumers.

ECONOMIC BENEFITS -
Fewer pesticide applications will reduce economic costs for growers, and contribute to the long-term sustainability of onion production in the western United States.

ENVIRONMENTAL BENEFITS -
Fewer pesticide applications will reduce potential negative impacts on environmental resources including water, soil and wildlife.

OTHER -
The successful experiments during 2007 and 2008 have confirmed the reliability of field protocols to evaluate onion varieties and germplasm for susceptibility to IYSV and thrips, identified more resistant materials for future germplasm improvement efforts, and contributed to more effective and sustainable IPM strategies that can be promoted to growers to produce varieties with varying responses to this critical pest/disease complex.

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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THIS FORM WAS COMPLETED BY:

Howard F. Schwartz, Professor of Plant Pathology
(Name and Title)

Evaluation of Onion Cultivars for IYSV & Thrips Resistance - Arkansas Valley Research Center, 2008: Trials were conducted at the Arkansas Valley Research Center in Rocky Ford, CO. Individual plots consisted of 50-row ft of seeded onions in 4-row beds at 5-ft centers. Each cultivar was replicated four times in a randomized complete block design. Subplots were established within each plot, so that one half of the area was treated to control thrips, the other half remaining untreated. Thrips treatments consisted of a mixture of fipronil (Regent) and spirometrastat (Movento), which had been identified as the most effective treatments at that site in previous season. Applications were made 12 June, repeated 3 July. Excellent control (>5 thrips/plant) was maintained on these treated plots through the end of July when last observations were made (July 24).

IYSV disease incidence was monitored throughout the season, and only a trace incidence was observed in the field on August 19, 2008; disease pressure was too low for evaluation at that time and did not progress during the remainder of the season.

Two counts of thrips were made, each by counting the number of thrips on 10 plants in the center of untreated areas. Varieties with blue or blue-green leaves (higher wax coating) generally had higher thrips populations than varieties with green leaves (glossy coating).

	19 June*	10 July*
1. Cometal	133.5 ab	243.5 abc
2. White Wing	132.0 ab	202.3 abcd
3. Salsa	136.5 a	339.25 ab
4. Red Bull	120.0 ab	303.5 abc
5. Red Wing	138.0 a	316.75 ab
6. Talon	104.0 abc	353.75 a
7. Tioga	91.0 abc	206.75 abcd
8. Gunnison	100.0 abc	259.0 abcd
9. Arcero	99.5 abc	153.0 abcde
10. Ranchero	105.0 abc	166.50 abcd
11. Calibra	127.0 ab	126.25 abce
12. X-202 (Tequila)	103.5 abc	103.75 bcde
13. Sedona	135.3 a	234.75 abc
14. OLYSOS5N5	100.3 abc	64.25 de
15. Colorado 6	114.3 ab	51.25 e
16. T-433	64.5 bc	78.25 de
17. Tamara	63.0 c	91.00 cde
18. Granero	129.3 ab	155.25 abcde
19. Oro Blanco	140.5 a	47.25 e
20. Vaquero	106.0 abc	101.0 bcde

* Original means presented; analysis used log transformation.

1. Cometal	Yes	22.8 bcdefgh	+19.8%
	No	19.0 defgh	
2. White Wing	Yes	18.8 defgh	**-15.3%**
	No	22.3 bcdefg	
3. Salsa	Yes	19.2 defgh	+0.7%
	No	19.0 defgh	
4. Red Bull	Yes	17.6 efgh	+36.1%
	No	13.0 h	
5. Red Wing	Yes	17.0 efgh	+25.5%
	No	13.6 gh	
6. Talon	Yes	17.3 efgh	+9.5%
	No	15.8 efgh	
7. Tioga	Yes	26.3 abcde	+27.8
	No	20.6 cdefgh	
8. Gunnison	Yes	19.7 defgh	+40.0%
	No	14.1 fgh	
9. Arcero	Yes	23.8 abcdefgh	**-0.4%**
	No	23.9 abcdefgh	
10. Ranchero	Yes	33.0 ab	+11.7%
	No	29.6 abcd	
11. Calibra	Yes	23.6 abcdefgh	+7.8%
	No	21.9 bcdefgh	
12. X-202 (Tequila)	Yes	31.0 abc	**-2.3%**
	No	31.7 ab	
13. Sedona	Yes	23.1 abcdefgh	+4.7%
	No	24.2 abcdefgh	
14. OLYSOS5N5	Yes	34.1 a	+9.7%
	No	31.1 abc	
15. Colorado 6	Yes	29.2 abcd	**-2.6%**
	No	30.0 abcd	
16. T-433	Yes	26.5 abcde	+6.4%
	No	24.9 abcdef	
17. Tamara	Yes	13.1 h	**-7.1%**
	No	14.1 fgh	
18. Granero	Yes	32.1 ab	+38.1%
	No	23.2 abcdefgh	
19. Oro Blanco	Yes	29.5 abcd	+33.9%
	No	22.1 bcdefg	
20. Vaquero	Yes	32.7 ab	+33.4%
	No	24.5 abcdefg	

Onion Varietal Trial - ARDEC: Experimental design was a completely randomized 10 x 10 lattice with five replications; plots size was 4 beds wide with 2 lines seed/bed x 25 ft long and a 5 ft alley way between blocks. The plot was furrow irrigated and received herbicides as needed in accordance with standard grower practices.

Thrips counts were determined on 14 July & 14 August by counting all thrips on 10 plants/plot. A severe hail storm occurred late afternoon of 14 August, and plants sustained 50 – 75% defoliation; recovery was slow and plant growth was acceptable by mid September, but too late to promote resumed pressure from thrips or allow for adequate development (100% incidence as observed in 2007) of IYSV.

IYSV Ratings were determined on 7 October by examining 10 or more infected plants in the center 2 beds of each plot for the average severity of IYSV infection as: 1 = 1-2 small, 2 = 3 – 10 medium, 3 = 11-25 medium to large, and 4 = more than 25 medium to large lesions/leaf.

	Thrips/10 plants[a]		IYSV Rating
Cultivar	14 July*	14 August	7 October
1. Cometal	66.8 ab	153.0 abcd	2.0
2. White Wing	Poor Stand	Poor Stand	2.0
3. Salsa	27.0 c	115.0 abcd	2.2
4. Red Bull	64.2 abc	106.8 bcd	3.0
5. Red Wing	27.8 c	139.2 abcd	2.8
6. Talon	34.8 bc	154.2 abcd	2.0
7. Tioga	40.8 bc	85.2 cd	2.0
8. Gunnison	60.8 abc	207.2 a	2.4
9. Arcero	50.4 abc	55.8 d	2.0
10. Ranchero	45.4 abc	64.8 d	2.0
11. Calibra	49.5 abc	71.8 cd	2.0
12. X-202	41.2 abc	62.8 d	2.0
13. Sedona	41.8 abc	173.2 abc	2.0
14. OLYSO5N5	34.6 bc	51.0 d	2.0
15. Colorado 6	34.8 bc	76.2 cd	2.0
16. Vantage	54.6 ab	79.2 cd	2.0
17. Damascus	48.8 abc	194.8 ab	2.0
18. Granero	41.4 abc	83.8 cd	2.0
19. Oro Blanco	56.6 ab	72.0 cd	2.0
20. Vaquero	42.8 abc	65.2 d	2.0

a Numbers within a column not follow by the same letter are significantly different (P>0.05) by SNK. * Original data. Thrips Data were log transformed for analysis.