

Project Title: Field Monitoring of the Cucurbit Yellow Stunting Disorder Virus (CYSDV) and Trapping of Virus Vectors, *Bemisia tabaci* (Genn.) in Maricopa County

Project Leader: Erin Taylor, Area Assistant Agent, Field Crops

Project Team: New hire (Research Specialist, Maricopa County, monitoring and sampling), Dr. Judith Brown (Virologist, sample analysis), Dr. Kurt Nolte (Extension Agent, Yuma County, mapping of virus and vectors), Kevin Rice (Area Assistant Agent, Pinal County, sampling and monitoring)

Location: Maricopa County (Erin Taylor and Research Technician), Pinal County (Kevin Rice), Yuma County (Dr. Kurt Nolte)

Critical Issue:

(Taken from CYSDV Project Narrative-Special Topics Western IPM Grant, Dr. Judith K. Brown)

In the fall of 2006 a new virus that attacked cucurbits was discovered in the Southwestern Region of Arizona (Yuma Co.). This virus attacks watermelon, cantaloupe, honeydew and winter and summer squashes. These commodities are a major part of Arizona Agriculture with a value of nearly \$175,000 (source: USDA, NASS) in 2007 and acreage is expected to rise for the 2008 growing season to ~50,000 acres. Although we are seeing a rise in acreage and production, the U.S. still imports a significant amount of melons from Sonora, Mexico during the winter months (Brown, 2007 CYSDV Project Narrative).

Cucurbit Yellow Stunting Disorder Virus (CYSDV) is a white-fly (*Bemisia tabaci*) transmitted virus introduced to the United States from the Mediterranean/Middle East. This virus was first discovered in Yuma Co., AZ, Imperial Co., CA, and Caborca, Sonora, Mexico in the fall of 2006. This virus now threatens the desert southwest melon production. It was estimated that melon losses for the 2006 fall melon crop were near \$14 million. In 2007 it was estimated that nearly 80% of Arizona's melon crop and 100% of Sonora's melon crop was infected with this new virus. The virus has been positively identified in all 4 melon producing counties within the state of Arizona (Yuma, Maricopa, Pinal and La Paz).

In the spring of 2007 CYSDV was discovered in western Maricopa County near Harquahala Valley. Although the white fly pressure in Maricopa County was considerably light in the 2006/2007 growing season, the virus is continuing to spread. The B biotype of *Bemisia tabaci* has been associated with all infested fields thus far (Costa, et al., 1991; Brown, 2000; J. Brown, un-pub: J. Brown, project narrative-Special Topics Western IPM). Although the virus has only been reported in the U.S. and Mexico as infecting cucurbit species, there is little known about the host range of this virus. The Spanish isolate of CYSDV was tested in lettuce and was found to be a non-host;

however, in follow-up studies, lettuce is showing to be a possible host to CYSDV. (http://www.eppo.org/QUARANTINE/virus/Cucurbit_yellow_stunting_disorder/DSCYS DV0.pdf). There are no reported cases of CYSDV on native vegetation or weeds near infected fields however, continued monitoring will be crucial in controlling this virus.

With the movement of the virus being so widespread, it is crucial that monitoring of fields in Maricopa and Pinal counties be initiated for the 2008 planting/growing season. The growers in these areas have been notified about the new virus; however, with the monitoring, sampling, and mapping it is imperative that Cooperative Extension attempts to monitor the movement of the virus. The objectives of this study will be to: 1) identify fields infected with CYSDV (accomplished with weekly visits to 4-6 fields in Maricopa Co. and with samples being collected and sent to Dr. Brown's lab for analysis), 2) monitor the movement/threshold levels of white flies within the fields (accomplished by setting out yellow sticky traps with weekly monitoring and trap change out), and 3) monitor nearby crops, native species and weeds for symptoms of CYSDV and identify alternate hosts (accomplished by walking perimeters of cucurbit fields, scouting other crops within close proximity, working with the master gardeners on samples brought into the office, and placing sticky traps in areas that are suspected to harbor the CYSDV virus).

Inputs:

Supplies: Coolers, Ice, sticky traps (24/week for 24 weeks), bags, counting devices, shipping of samples	\$1000.00
Milage: \$.445 per mile (100 miles/week)	\$1000.00
Salary support for technician (ERE included) 12 [(16.72 * 8) + 42.4%]=\$2285.69 12 [(16.72 * 8) + 44.6%]=\$2321.00	\$4600.00
Total	\$6600.00

Other Funding/Support:

Pending: CSREES-USDA IPM Grant-2 years
\$5000 for Maricopa County (\$10,000.00 total)

Dr. Judith K. Brown, Virologist, University of Arizona will provide analysis of samples.

Dr. Kurt Nolte, Extension Agent, Yuma County, University of Arizona will provide GPS/GIS mapping of fields.

Kevin Rice and Dr. Kurt Nolte will provide sampling and monitoring in Pinal and Yuma counties.

Outputs

With this extensive monitoring of cucurbit fields in Maricopa County, the goal of the project will be to:

1. Identify movement of the CYSDV virus.
2. Identify the movement of vectors from infected fields to non-infected
3. Identify alternate hosts of the virus by monitoring field edges (weeds), other nearby crops, and native plant material.
4. Notify cucurbit growers about the virus once it has been positively identified in their area via e-mail, phone calls, and mailings.
5. Work with the Maricopa County Master Gardeners in notifying homeowners of the virus and the possible problems they will encounter.
6. Produce bulletins about the virus, the vectors, and alternate hosts of the virus.
7. Conduct seminars, extension workshops, and information sessions on the virus for the agriculture industry and work with providing the same information to other county agents for dissemination of information to their clientele.
8. Collaborate with other agents and specialists within the University of Arizona and other States in developing and IPM strategy for reducing the severity of this new virus.

Evaluation of Project

At the end of the season a map of infected fields will be compiled to visually show the distribution of this virus over the course of one year and how the virus progressed across the county. At the end of the project, any new information will be compiled and put into a bulletin for clientele and an extension meeting will be held for the agriculture industry.

Supplement:

Letter of support from Dr. Judith K. Brown.