

Year end report March 2012

Renewal progress report for CDFA contract number 09-0782.

Title: Field trial for resistance to Pierce's disease

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Reporting Period: The results reported here are from work conducted January 2011 through December 2011.

Introduction.

This project is designed to monitor field plots of genetically modified grapevines being tested for resistance to Pierce's disease. There is no research approved, but we were fortunate to have an undergraduate student take an interest in monitoring the insect populations trapped in the experimental vineyards. The undergraduate won undergraduate research grants from the UC Riverside campus to support her work.

Objective and activities to achieve objectives.

A major focus of Pierce's disease management includes attempts to develop grapevine varieties that are less susceptible to *Xylella fastidiosa*. We are providing support for field trials of newly developed grapevine varieties that show promising reductions in Pierce's disease severity. The field trial is intended to duplicate a commercial operation to determine how grapevines will fare in the presence of pressure from the sharpshooter leafhopper vectors that transmit the pathogen causing Pierce's disease. The specific objectives of the project are as follows:

1. Prepare the vineyard. Rogue out existing plants and prepare additional trellises as needed.
2. Transplant test grapevines to the experimental vineyard.
3. Maintain the grapevines exactly as handled by commercial vineyards.
4. Monitor for pests and diseases.
5. Dispose of plants at the end of trials.

Results.

The project was initiated in the spring of 2010, which included the first phase of planting. Since that time Agricultural Operations personnel have continued to maintain the research plot, which has included irrigation, pruning and training vines on the trellis, removal of flowers to meet compliance requirements, and occasional fertilization and fungicide application to control powdery mildew. Moreover, the vines in the research plot are regularly inspected to evaluate insect pest abundance and evidence of pathogen damage.

In April of 2011 the second phase of planting occurred at the site. After planting, drip irrigation and trellises were setup. Since that time we have continued to maintain and monitor the new planting in a manner that is consistent with vines from the first planting. So far this year there has been no evidence of Pierce's disease in any of the vines in the plot (from either planting). Seasonal sharpshooter abundance so far this year is normal with peak in middle of July.

We have indeed been fortunate in that despite lack of funds for personnel, a freshman undergraduate student volunteered to monitor the glassy winged sharpshooter (GWSS) presence in test plots. Candice

Sanscartier has been doing this from nearly the start of the project. She monitors the presence of GWSS and egg masses by vine and has done Q-PCR analysis of the GWSS for presence of *Xylella* strains.

Figure one shows total numbers of GWSS captured by sticky trap by week through the 2011 season. Trap locations were on the ends off the rows two were in the middle and two were along the north row. The results are a classic pattern that has been repeated since the monitoring surveys were started.

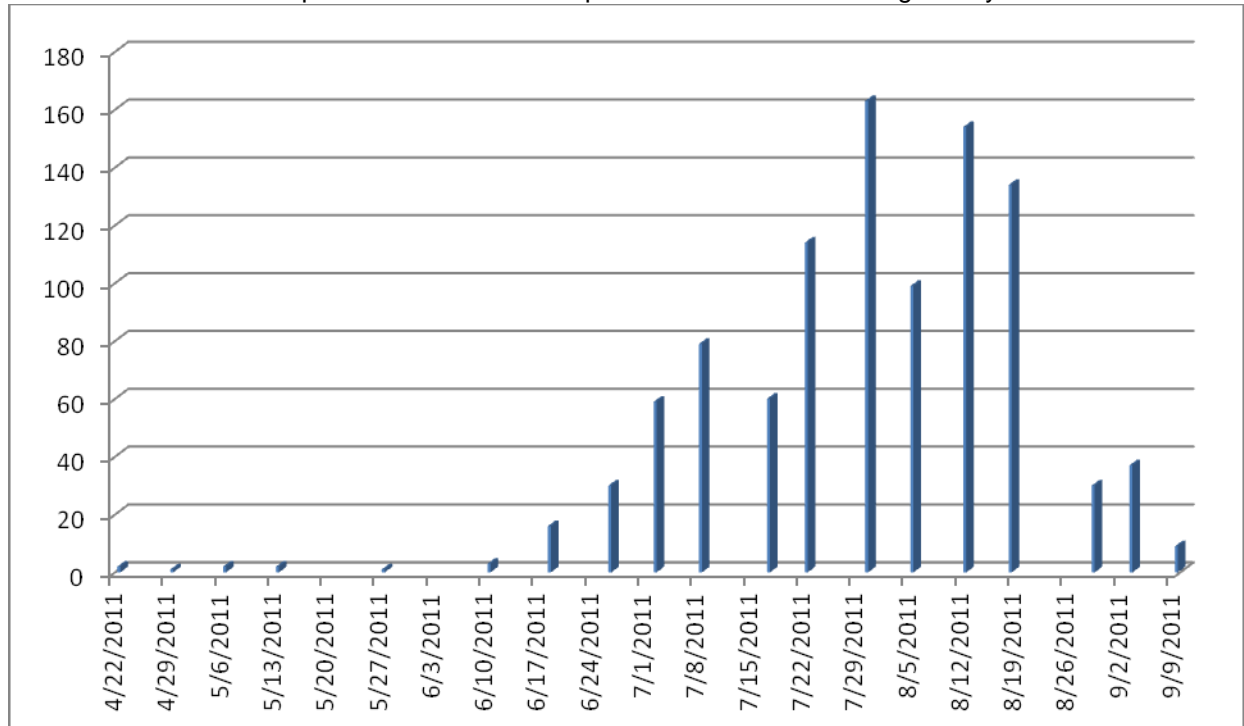


Figure 1. Plot of GWSS capture for 2011 season at Dandekar test vineyard.

Summary of each objective

1. Prepare the vineyard. Rogue out existing plants and prepare additional trellises as needed.
This was done as described above.
2. Transplant test grapevines to the experimental vineyard.
Done as described above.
3. Maintain the grapevines exactly as handled by commercial vineyards.
Has been and is being done.
4. Monitor for pests and diseases.
Data partly shown in the graph above.
5. Dispose of plants at the end of trials.
Trials are continuing.

Publications or presentations

Candice Sanscartier Undergraduate Presentations/Awards

Oral Presentation	Nov 2011	Southern California Conference for Undergraduate Research
Poster Presentation	Sept 2011	Entomology Student Seminar Day
Poster Presentation	May 2011	UCR Symposium for Undergraduate Research
UCR Undergraduate Research Grant	\$600	Spring 2011

Research relevance

This project is providing support for a field trial of novel grapevine varieties that show promising reductions in their susceptibility to Pierce's disease. Over the past year we continued to maintain grapevines, and monitor for sharpshooters and disease symptoms within the initial planting at UC Riverside's Citrus Research Center and Agricultural Experiment Station. Since April 2011 we begun similar maintenance and monitoring in the second planting at the site. Ultimately the sharpshooter and disease monitoring information is important for determining whether research plants are exposed to *Xylella fastidiosa*, which is a requirement for adequately testing these novel grapevine varieties.

Layperson summary of project accomplishments.

Our part of this project is to just maintain experimental grapevines in a vineyard in Agricultural Operations. In fact we are basically a pass-through for funds to reimburse Ag Ops for the work they assign the crews there and materials used in building the trellises and maintenance of the grapevines.

However, we took the opportunity to use other experiment station funds from my Hatch project to hire a part time undergraduate to do all of the monitoring and testing of GWSS insects for presence of the pathogen causing Pierce's disease. We are quite proud of Candice. Her grant funding activities are listed above bringing extra funds from the campus. UCR is very undergraduate-friendly and encourages students to do what Candice did.

Ag Ops did extras. They drilled in barley this winter between the trellises to help hold moisture for the grapevines and prevent erosion. The grass also keep down weeds to some extent as a bonus. They did a nice job on the irrigation and drainage system in place in the vineyard. It looks professional to me.

The entire Agricultural Operations grounds are now completely fenced with key card entry. Thus the gates are always closed. I know of no vandalism or intruders causing trouble on the grounds. Lots of coyotes around though. You can see their spore around equipment next to the vineyard, but the vineyard itself is untouched.

We occasionally send pictures of the grapevines to our colleagues at Davis so they have a visual image of their plants. It is not the same as being here, but makes them feel better. Also they travel here periodically at critical times. They are about to come again in March to collect sap for measurements. We have been testing the sap flow rates for them so that we all will know when the plants are ready to weep.

Status of funds.

The account balance is over \$26,000, but his for the entire three years of the project. Work has been contracted and fulfilled on this funding, the final bills have not been received.

Intellectual property issues.

N/A