

**CDFA PD/GWSS BOARD PROGRESS REPORT**  
**October 1, 2008 – July 1, 2010**

**I. Project Title**

The Benefits and Costs of Alternative Policies for the Management of Pierce's Disease

**II. Principal investigator and cooperators**

*Principal Investigator*

Professor Julian M. Alston

Department of Agricultural and Resource Economics, University of California, Davis

*Co-operator(s)*

Professor M. Andrew Walker

Department of Viticulture and Enology, University of California, Davis

Professor Kym Anderson

Department of Economics, University of Adelaide

Dr Mark Hoddle

Department of Entomology, University of California, Riverside

Professor Philip G. Pardey

Department of Applied Economics, University of Minnesota

Professor Jennifer S. James

Department of Agribusiness, California Polytechnic State University, San Luis Obispo

Professor Nicholas Kalaitzandonakes

Department of Agricultural Economics, University of Missouri-Columbia

*Other*

Dr Bob Sutherst, consultant, Brisbane, Australia

Ms Kate Fuller, Graduate Research Assistant

Department of Agricultural and Resource Economics, University of California, Davis

Professor James Sanchirico

Department of Environmental Science and Policy, University of California, Davis

Dr. Barry Hill

California Department of Food and Agriculture

### **III. List of objectives and description of activities conducted to accomplish each objective**

The overall objective of the proposed research is to develop a detailed, practical, quantitative understanding of the economic consequences of Pierce's disease and alternative management strategies. More specific objectives are to quantify the current and potential economic impact of the disease, to estimate the potential economic payoff to investments in Pierce's disease R&D, to evaluate alternative management strategies including alternative research investments, and to guide policy decisions, including research priorities.

To pursue these objectives we will develop an economic model of the California wine and wine-grape sector. The model will be structured to allow us to simulate market outcomes under alternative scenarios for the prevalence of Pierce's disease, and alternative technologies and policies for its management, and to assess the economic consequences of these alternatives for various stakeholder groups. The model will be designed specifically with a view to using it to evaluate the likely expected benefits from investments in alternative R&D projects related to the management of Pierce's disease.

Our project commenced formally on September 1, 2008. Kate Fuller has been employed as a Graduate Research Assistant to work half-time on the project. Kate's doctoral dissertation work will form an element of the project. Jim Sanchirico, an expert bio-economic modeller, has recently been added to the team of participants and he is actively involved in co-chairing Kate's dissertation committee with Julian Alston. Kate and Jim have been working on a model that can be used to examine control decisions made by growers. Their model now allows for vectors that are mobile across properties belonging to several growers with several different treatment options.

In the work to date we have emphasized investment in developing our own knowledge and information resources. One important element of this is to develop a detailed data base on the economics of wine and wine grape production in California. We have completed the data gathering phase of this element. We are compiling this information into a report documenting by county and crush district for each important grape variety the area planted, yield, quantity produced (crush volume), price, and other such variables over the past 40 years. This information will be useful for other purposes as well as for parameterizing our model of the industry, which was our primary purpose for developing the data base. We have also made some investment in learning about how to structure and use models of spatial-dynamic processes such as the spread of disease.

We have made significant progress in developing an understanding of the pest and disease problem, and an overview of the issues, through consulting with scientists and others and reviewing literature. We have learned that the PD/GWSS problem will be more difficult in some ways to model than we envisioned, so we opted to focus initially on studying the issues as they arise in the north coastal valleys where Pierce's Disease is endemic and spread by native sharpshooters. This approach has the advantage that the pest and disease is a more regular continuing phenomenon, which will enable us to develop some economic data and insight into the problem, management strategies, and costs of prevention, control, and eradication strategies.

Taking this approach has enabled us to develop a better understanding that will help us in designing approaches to study the more general problem, including the role of the GWSS.

On January 14, 2010 we held a meeting in Sacramento with key people to review the status of the project and guide future directions. The participants included Bob Wynn, Tom Esser, Judy Stewart-Leslie, Joe Morse, Dan Sumner (moderator), Beth Stone-Smith, Sandy Purcell, Andy Walker, and Barry Hill, as well as Kate Fuller and Julian Alston. In the course of that very productive discussion we clarified a range of issues and ideas. We resolved to begin work in Spring 2010 gathering information pertinent to modeling Pierce's Disease as spread by the GWSS in the Central Valley, beginning in Temecula, and to continue consultation with other participants in the discussion, especially Barry Hill.

On May 13-14, 2010, Julian Alston and Kate Fuller traveled with Barry Hill to Riverside and Temecula to meet with a variety of individuals and discuss the disease and its vector in that part of the state, and to visit vineyards and develop a better understanding of the issues on the ground. We visited several vineyards and held meetings with researchers at UC-Riverside (Matt Daugherty and Frank Byrne) as well as consultants and growers (Ben Drake and Billy Bauers). In the course of these visits and discussions we learned about research efforts underway with which we may be able to collaborate, as well as concerns held by some of the industry participants. This visit was very useful in helping us develop a clearer conception of the issues and as a preliminary step towards designing and conducting some more in-depth work on the problem of PD/GWSS in Temecula, which will be the primary focus of work over the coming months.

The objectives for the remainder of the current year are:

- To continue to consult with scientists and others to learn about Pierce's disease and industry technology as it relates to our project, and document what we have learned.
- Based on that knowledge, identify technological alternatives and policies to be evaluated
- Complete our work on developing data on the "economic geography" of the California grape and wine industry
- Complete the modelling work pertaining to Pierce's Disease as spread by native sharpshooters in the coastal valleys.
- Conduct comparable data gathering and vineyard-level modelling work pertaining to Pierce's Disease as spread by the GWSS in Southern California and potentially in the Central Valley.
- Combine the various pieces of technological and market information to develop a market model and undertake initial applications.

#### **IV. Summary of major accomplishments and results for each objective**

As described above, we have been developing data and other information but do not have any specific major accomplishments to report beyond making progress generally as planned towards achieving the specified objectives. Kate Fuller has continued to make progress in meeting the requirements for her dissertation, which will be an important output from the project, including her research essay (July 2009) and her dissertation prospectus (August 2010). Intermediate research outputs have been presented (or are to be presented) at several conferences.

#### **V. Publications or reports resulting from the project**

Fuller, Kate B. “The Economics of Pierce’s Disease Policies in California.” Dissertation prospectus, as required by the Ph.D. program in Agricultural and Resource Economics at UC Davis. Forthcoming, August, 2010.

Fuller, Kate B. “Optimal Management Strategies for Vector-Borne Agricultural Pests and Diseases: Theory and Application to Pierce’s Disease of Wine Grapes in Northern California.” Research essay, as required by the Ph.D. program in Agricultural and Resource Economics at UC Davis. July, 2009.

#### **VI. Presentations on research**

Fuller, Kate B. “The Economics of Pierce’s Disease Policies in California.” Dissertation prospectus presentation, as required by the Ph.D. program in Agricultural and Resource Economics at UC Davis. University of California, Davis, August 2010.

Fuller, Kate B., Sanchirico, James N., and Alston, Julian M. “The Benefits and Costs of Alternative Policies for the Management of Pierce’s Disease.” Poster to be presented at the 2010 American Agricultural Economics Association Annual Meeting, Sheraton Downtown Hotel, Denver, CO, July 25-27, 2010.

Fuller, Kate B., Sanchirico, James N., and Alston, Julian M. “Optimal Management Strategies for Vector-Borne Agricultural Pests and Disease: Theory and Application to Pierce’s Disease of Wine Grapes in Northern California.” Presented at the 2010 American Association of Wine Economists Annual Meeting, University of California, Davis, June 25-27, 2010.

Alston, Julian M. “The Benefits and Costs of Alternative Policies for the Management of Pierce’s Disease.” Proceedings of the 2009 Pierce’s Disease Symposium, Doubletree Hotel, Sacramento, December 9-11, 2009.

Fuller, Kate B., Sanchirico, James N., and Alston, Julian M. “The Benefits and Costs of Alternative Policies for the Management of Pierce’s Disease: A Case Study of Pierce’s Disease and the Blue-Green Sharpshooter in the Napa Valley.” Poster presented at the 2009 Pierce’s Disease Symposium, Doubletree Hotel, Sacramento, December 9-11, 2009.

## **VII. Research relevance statement**

This project will contribute to solving the PD/GWSS problem in California by providing detailed, practical, quantitative information about the economic consequences of Pierce's disease and alternative management strategies. More specifically the project will provide quantitative information about (1) the current and potential economic impact of the disease, (2) the potential economic payoff to investments in Pierce's disease R&D, and (3) the benefits and costs of alternative management strategies (including alternative research investments), which can be used to guide policy decisions, including research priorities.

## **VIII. Lay summary of current year's results**

In work on the project to date we have concentrated on gathering data and other information and learning about Pierce's Disease and the sharpshooters that spread it. Our progress has led us to revise some aspects of the research strategy, but the work has gone generally according to plan, albeit after a delayed start. We have focused attention to date mostly on the disease as spread by native sharpshooters in the northern coastal valleys. We have begun to shift attention to Southern California, the Central Valley, and the GWSS, and this will be our primary focus in the coming months.

## **IX. Status of funds**

Total expenditure by the end of June 2010 was about \$66,766. We have spent less of the funds to date than budgeted for the first phase of work (1) because of some delays in the approval process and in establishing the grant account, (2) because we were able to cover some expenses related to this work from other sources, (3) because we have not yet been able to identify a suitable postdoctoral scholar to employ on the project, and (4) because we revised our approach based on things learned during the initial months of work on the project.

## **X. Summary and status of intellectual property produced during this research project**

None to date.