

**CDFA PD/GWSS BOARD PROGRESS REPORT**  
**July 1, 2008 – July 1, 2009**

**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

**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 propose to 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.

In our proposal we specified a plan of work over three years. The more-specific objectives for the first year of the project were defined as follows:

- Consult in depth with scientists and industry and conduct literature reviews to learn about Pierce's disease and industry technology
- Identify technological alternatives and policies to be evaluated
- Complete simple model and applications
- Work on development and adaptation of world-wide-wine market model
- Prepare foundation for more complete bio-economic model

Our project commenced formally on September 1, 2009. Kate Fuller has been employed as a Graduate Research Assistant to work half-time on the project. 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 is 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 also 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 have opted to focus initially on studying the issues as they arise in the north coastal valleys where Pierce's Disease is spread by native sharpshooters (in particular, the Blue-Green Sharpshooter, BGSS). This approach has the advantage that the pest and disease is a 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. In this way we hope to develop a better understanding that will help us in designing approaches to study the more general problem, including the role of the GWSS.

Based on this work, Kate Fuller wrote a research essay (as required by the PhD program in Agricultural and Resource Economics at UC Davis), titled: "Optimal Management Strategies for Vector-Borne Agricultural Pests and Diseases: Theory and Application to Pierce's Disease of Wine Grapes in Northern California." This essay entailed a review of relevant literature as well

as the development of the framework for a general economic model of vector-borne disease as applicable to Pierce's Disease. As well as providing a useful reference document for our project, it formed the basis for Kate's oral qualifying examination, which she successfully took and passed on July 14 2009, and hence advanced to candidacy for her doctoral degree. Kate's dissertation research plan, to be conducted over the next two years, entails elements related to the main objectives of the project. It will begin with work on the BGSS in Northern California as a basis for work on the GWSS, ultimately providing a basis for evaluating payoffs to research.

We have not yet completed all of the objectives for the first year of the project, partly because of the delayed start, and partly because of things we have learned along the way that led us to reorder some priorities. Currently, we are working to

- Identify technological alternatives and policies to be evaluated
- Complete the write-up of our extensive new data on the "economic geography" of the California grape and wine industry
- Combine the various pieces of technological and market information to develop a simple model and undertake initial applications

All of this activity will contribute towards preparing the foundation for a more complete bio-economic model to be applied to the problem of PD/GWSS in California. The current plan is to defer the issue of integrating this analysis into an updated and revised world-wide-wine market model until later in the project. For the time being, we can represent these aspects reasonably well a relatively simplified form.

We aim to complete this phase of the work by the end of 2009, a few months behind our original schedule, but also well below budget. In conjunction with those steps, in the coming year we also plan to

- Survey growers and consultants regarding control choice, insect prevalence, and beliefs regarding effectiveness of controls for the BGSS in Northern California
- Develop a full-scale model for BGSS in Northern California
- Incorporate technological alternatives and policies in this model
- Document and bench test model
- Consult with scientists regarding GWSS-specific issues
- Begin to model PD/GWSS, using the PD/BGSS model as a starting point

#### **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 as planned towards achieving the specified objectives for the first-year.

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

None to date.

## **VI. Presentations on research**

None to date.

## **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 the first year of the project 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 laid the foundation to develop a working (but simplified) model by the end of 2009 that can be used for initial applications and as a basis for consultation to establish directions for elaboration and refinement.

## **IX. Status of funds**

We have spent less than anticipated of the funds to date, partly because of some delays in the approval process and in establishing the grant account, and partly because of some rethinking about priorities for the first year. Total expenditure by the end of June 2009 was about \$29,000.

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

None to date.