THE BENEFITS AND COSTS OF ALTERNATIVE POLICIES FOR THE MANAGEMENT OF PIERCE'S DISEASE

Principal Investigator:
Julian M. Alston
Dept. of Agric. & Res. Econ.
University of California
Davis, CA 95616
julian@primal.ucdavis.edu

Graduate Student Researcher:
Kate Fuller
Dept. of Agric. & Res. Econ.
University of California
Davis, CA 95616
fuller@primal.ucdavis.edu

Cooperators:

M. Andrew Walker
Dept. of Viticulture and Enology
University of California,
Davis, CA 95616
awalker@ucdavis.edu

Kym Anderson
Dept. of Economics
University of Adelaide
Adelaide, Australia
kym.anderson@adelaide.edu.au

Mark Hoddle
Dept. of Entomology
University of California
Riverside, CA 92521
mark.hoddle@ucr.edu

Philip G. Pardey
Dept. of Applied Economics
University of Minnesota
St. Paul, MN 55108
ppardey@umn.edu

Jennifer S. James
Dept. of Agribusiness
Calif. Poly. State University
San Luis Obispo, CA 93407
jsjames@calpoly.edu

Nicholas Kalaitzandonakes
Dept. of Agric. Econ.
University of Missouri-Columbia
Columbia, MO
KalaitzandonakesN@Missouri.edu

Reporting Period: The results reported here are from work conducted October 2008 to October 2010.

ABSTRACT

We propose to address economic questions related to Pierce's disease (PD) by developing and applying a quantitative model of the supply and demand for California wine and wine grapes. The economic component of this model will combine existing wine market models with some entirely new elements. The biophysical component will draw on a range of technical information and, where appropriate, evidence from crop and disease simulation modeling. To begin, we have consulted with scientists the study the disease and its vectors. Drawing on their advice, combined with information gleaned from interviews with vineyard managers, we have modeled the problem of the Blue-Green Sharpshooter (BGSS) in Northern California. By doing so, we have gained a better understanding of how to model the statewide Pierce's Disease problem. Additionally, we have begun to study the role of the Glassy-Winged Sharpshooter (GWSS) and the problems it poses in southern regions of the state. The end result will be a model that is designed specifically to evaluate the likely expected benefits from investments in alternative R&D projects related to the management of PD.

LAYPERSON SUMMARY

In the first two years of the project we have concentrated on gathering data and other information and learning about PD and the sharpshooters that spread it, creating a model of the economic impacts of the disease in the Napa Valley, and working to extend that model so that it can reflect the situation across the state. 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. In the coming months we will work to extend that model so that it better incorporates the role of PD/GWSS in southern California and can be used to evaluate the benefits from investments in alternative R&D projects.

INTRODUCTION

It is widely accepted that Pierce's disease (PD) with its vectors, including the glassy-winged sharpshooter (GWSS, *Homalodisca coagulata*), has large current and very large potential economic consequences. However, we are not aware of other studies that have modeled and measured the economic consequences. Siebert (2001) discussed the economics and he estimated that the value of lost wine grape production—in Temecula, Riverside County, alone, in 1988 and 1989—was worth $37.9 million to California. Echoing that sense of economic importance, the National Academy of Science (2004) undertook an extensive study and published a book on California research priorities focused on PD. That book does not contain estimates of the economic consequences of PD or alternative management or control methods, but it does provide a comprehensive documentation of knowledge about the problem, as well as a useful classification of types of research and priorities for them, including economic research. Further work is needed to develop a quantitative economic understanding of PD and alternative policies to address it.

OBJECTIVES

The overall objective of this project is to develop a detailed, practical, quantitative understanding of the economic consequences of PD 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 PD R&D, to evaluate alternative management strategies including alternative research investments, and to guide policy decisions, including research priorities.

Additionally, we aim to study regional differences across California in PD and its associated vectors, allowing for a better understanding of the problem and a more precise evaluation of alternative management regimes. 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 PD, 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 PD.

RESULTS AND DISCUSSION

Our project commenced formally on September 1, 2008. Kate Fuller has been employed as a Graduate Student Researcher to work half-time on the project. In the work to date we have emphasized investment in developing our own knowledge and information resources and creating preliminary models. 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, and we are compiling the information into a report documenting by county and crush district for each important grape variety the area planted, yield, quantity produced (crush volume), and price over the past 30 years. 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, and 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. Having learned that the PD/GWSS problem will be difficult to model, we opted to focus initially on studying the issues as they arise in the north coastal valleys where PD is spread by native sharpshooters (in particular, the BGSS). To guide our efforts to understand the issue in that area, we conducted interviews with vineyard managers there, utilizing a process known as "participatory mapping," in which managers were asked to sketch out PD incidence, controls, and associated costs onto aerial images of their vineyards. This approach has enabled us to develop some economic data and insight into the problem, management strategies, and costs of prevention, control, and eradication strategies, which will help us in designing approaches to study the more general problem, including the role of the GWSS. We will continue this interview strategy in the Temecula area to gain insight into the issue there.

Based on this work, Kate Fuller has written two research essays (as required by the Ph.D. program in Agricultural and Resource Economics at UC Davis). These essays 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 PD. As well as providing a useful reference document for our project, they formed the basis for Kate's oral qualifying examination and prospectus. Kate's dissertation research plan, to be conducted over the next year, entails elements related to the main objectives of the project. It begins 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.

As described above, we have been developing data and information but do not have any specific accomplishments to report beyond making progress as planned towards achieving the specified objectives for the first-year.

CONCLUSIONS

None to date.

REFERENCES CITED

National Research Council of the National Academies. 2004. *California Agricultural Research Priorities: Pierce's Disease.* Washington, D.C.: National Academies Press.

Siebert, J. 2001. "Economic impact of Pierce's disease on the California grape industry." Proceedings of the CDFA Pierce's Disease Research Symposium: 111-116. Referenced in National Research Council 2004.

FUNDING AGENCIES

Funding for this project was provided by the CDFA Pierce's Disease and Glassy-winged Sharpshooter Board and the University of California, Giannini Foundation of Agricultural Economics.