

The Center for Invasive Plant Management

Final Report for a Seed Money Grant
(grant awarded 2004)

**"The Ecology and Economics of Commercialization when Plants
Carry a Risk of becoming Invasive"**

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Objectives

The introduction of exotic plant species into the natural environment as an accidental by-product of commercial horticultural operations has been recognized for some time as a major problem in North America. The assessment of the threat of plant invasion must be concerned with analyzing the potential unintended risk of introduction associated with private nursery operations benefiting from sales of exotics. Prior efforts on the part of two of the principal investigators [Barbier and Knowler] to analyze policies to address the problem have been hampered by poor and incomplete data. The purpose of this pilot study funded by CIPM seed grant money has been to enable the two PIs to rectify this shortcoming through:

- Initiating collaborative links and planning future interdisciplinary research with a third PI from ecology [Reichard],
- Hiring a research assistant [Burgess] to plan and coordinate an organizational meeting at the University Wyoming between the three PIs and to investigate the availability of funding and data sources for future interdisciplinary collaborate research, and
- Submitting a proposal for future research to an appropriate funding agency.

Results

Joanne Burgess was hired as the project RA throughout the duration of the study. She has been based at the Department of Economics and Finance, University of Wyoming. Throughout the project, Dr Burgess conducted reviews of the existing ecological and economic literature on plant invasives in North America, explored key data sources on the horticultural industry in

North America and identified potential sources of funding for any future interdisciplinary research proposal to emerge from this study.

A key output of the project was a two-day meeting of the PIs and the RA over January 6-7, 2005 (see the attached meeting minutes). The meeting had two principal objectives.

First, it allowed the CIPM-funded research team to identify the key tasks required for interdisciplinary research into the problem of the risk of accidental invasive plant species introductions due to the commercial operations of the North American horticultural industry.

Second, the meeting identified two possible funding sources for proposals submitted by the research team on the above topic: i) the Canadian Studies Research Grant Program of the Canadian Embassy to the United States and ii) the Program of Research on the Economics of Invasive Species (PREISM) of the Economic Research Service of the US Department of Agriculture. During the two-day meeting, the research team was able to develop preliminary research proposal ideas and to develop a timetable for submitting these proposals to the two funding sources (see the attached meeting minutes).

After the January 2005 meeting, the research team focused on finalizing the proposals and submitting them to the respective funding agencies.

Unfortunately, the research team was not successful in obtaining the Canadian Studies Research Grant. However, the proposed funding for this grant was modest (\$13,250), and the main objective of the proposal was to enable the research team to meet and collaborate on writing an article on the current state of ecological and economic research on the risk of plant invasions posed by the commercial horticultural industry of North America. It was anticipated that any resulting article would be submitted to *BioScience*.

However, the research team was informed in August 2005 that it was successful in obtaining a major research grant for its proposal to PREISM. Entitled "The Economics and Ecology of the Risk of Invasive Plant Establishment from the Horticultural Trade in North America", the PREISM-funded project will begin in January 2006 for two years. The total research grant awarded is \$248,826, which will be administered by the University of Wyoming with sub-contracts to Simon Fraser University and the University of Washington.

The main research tasks to be undertaken under the PREISM study are:

- (1) Modeling the economic behavior of a profit-maximizing horticultural industry that imports an exotic plant species through establishing nurseries at specific geographical locations in North America.
- (2) Ecological and economic analysis of the risk and potential damages from accidental introduction and establishment of invasive plant species associated with a commercial plant industry that imports and breeds exotic plant species at its various locations.
- (3) Integrating these economic and ecological analyses to model the potential policy tradeoff between the profits of the commercial plant breeding industry with the expected losses associated with the risk of accidental introduction.
- (4) Evaluation of various policy interventions for reducing the risk of accidental introduction by the North American horticultural industry; for example, these might include: "doing nothing", self-regulation by the industry, taxing or banning the sale of exotic species and policy coordination between the US and Canadian governments.

Further details of the proposed research can be found in the attached full PREISM proposal.

Publications

Although no new publications were directly attributed to the CIPM-funded study, the seed grant to facilitate two of the researchers [Barbier and Knowler] to revise and resubmit two journal articles that are now published and in press, respectively:

Knowler, D. and Barbier, E.B. 2005. "Importing Exotic Plants and the Risk of Invasion: Are Market-Based Instruments Adequate?" *Ecological Economics* 52:341-354.

Barbier, E.B. and Knowler, D. "Commercialization Decisions and the Economics of Introduction." *Euphytica* (In press).

The pdf version of the *Ecological Economics* is attached.

In addition, the research team has decided that it will continue to develop its proposed article for *BioScience* as the first task of the newly funded PREISM project.

Acknowledgement

We are grateful to CIPM for providing the seed grant money to help us initiate and develop our collaborative research ideas on the economics and ecology of the risk of introducing plant invasives due to commercial horticultural operations in North America. Without this seed grant money, it is doubtful that the research team would have been able to meet and to formulate our research proposals. The CIPM grant was therefore chiefly responsible for our success in the goal of obtaining long-term research funding from USDA PREISM for our proposed research.