

Vol. 12, No. 1; May 1999
ISSN: 0886-3970

The Development of CARD, 1985–96

by Ellen Balm and Judith Pim

CONTENTS

The Development of CARD 1

Environmental Policy Development at CARD 3

From the Director 5

CARD Conferences 8

Pioneer Hi-Bred Endows Science and Technology Chair 9

A Birthday Party for CARD ... 10

CARD Director and Faculty .. 11

Where Are They Now? Bruno Larue 15

Stanley R. Johnson became the second director of CARD in March 1985. He came to Iowa State University from the University of Missouri-Columbia, where he was a professor of economics and agricultural economics. “Stan brought to CARD a broader perspective,” said William Meyers (CARD associate director from 1985 to 1996, and interim director from 1996 to 1998). By the mid 1980s “CARD had become focused on conservation and resource issues . . . but what Stan brought was strength in two additional areas [food and nutrition policy and agricultural trade policy].”

When he assumed the directorship of CARD, Johnson’s objectives were threefold:

- to integrate CARD more fully with the Colleges of Agriculture and Liberal Arts and Sciences, especially with the Department of Economics and the Department of Statistics;
- to strengthen the scientific and policy publications of CARD faculty, graduate students, and staff; and
- to broaden the research capability.

Johnson felt that a key to fulfilling those objectives was to increase the number of faculty members in CARD to provide leadership in theoretical and applied analysis. “The research philosophy at CARD continues to be one of blending applied policy analysis and graduate

studies in a university context,” he said in 1987. “Our work in theory and the development of advanced quantitative and econometric methods is stimulated by problems raised in this policy analysis context.”

FAPRI Affiliated with CARD

In 1984, the Food and Agricultural Policy Research Institute (FAPRI) was funded through a special appropriation of the U.S. Congress and established as a joint effort of Iowa State University and the University of Missouri-Columbia. An econometric modeling system was developed at FAPRI capable of providing information to public policy participants and decision-makers in their efforts to evaluate the trends and changes in agricultural commodity markets.

In 1985 William Meyers, who was then head of the FARPI unit at Iowa State, and Johnson, who served as executive director of the dual university institute, negotiated to incorporate Iowa State’s FAPRI into the newly formed Trade and Agricultural Policy (TAP) Division of CARD.

FAPRI’s first year of operation within CARD focused on providing Congress with quantitative analysis of alternative proposals for the 1985 Farm Bill. Varel Bailey, former president of the Iowa Corn Growers Association, said that FARPI played a significant role in shaping the final



www.card.iastate.edu

legislation. “The 1985 Farm Bill—as far as I was concerned in feed grains, anyway—was totally written off the FAPRI coefficients.”

According to Johnson, among the benefits that CARD derives from affiliation with FAPRI is the cooperative production of two annual reports: the *U.S. Agricultural Outlook* and the *World Agricultural Outlook*. These baseline reports provide CARD with widely disseminated products on a regular basis, and the baseline provides a foundation for ongoing policy analyses.

The TAP division conducted an ongoing analysis of the General Agreement on Tariffs and Trade (the GATT) from 1989 to 1994. CARD has been a critical source of information for international agricultural trade negotiations, providing public, independent analyses of the policy impacts of multilateral agreements.

Broadening the Policy Research Base

Four research divisions were established within CARD during 1985 and 1986. Johnson said at the time, “Behind our organizational plan is the idea that effective policy analysis for agriculture and rural development must have a wider scope than in the past. This is because of the increasing importance of international markets, a shrinking

political base for agricultural and rural populations, a more integrated food production and distribution system, and the linkage of agricultural, rural development, and resource issues.”

The conservation and natural resource projects that had developed during the previous years centered around a long-term contract with the U.S. Department of Agriculture’s Soil Conservation Service (SCS). This project analyzed agricultural production patterns and soil erosion. In addition to CARD staff and graduate students, the SCS and the Economic Research Service sent staff to work at CARD on this project. An analysis of the government Conservation Reserve Program was also under way at CARD during the mid-1980s. Johnson placed these and similar projects in a division called Resource and Environmental Policy. While the SCS contract remained active after 1985, the environmental research at CARD became more diverse and multidisciplinary under Johnson’s leadership (see the environmental modeling article in this issue).

Food and Nutrition Policy

Helen H. Jensen joined the ISU faculty in 1985 and became head of CARD’s new Food and Nutrition Policy Division (FNP). With the establishment of the FNP, CARD

began to explore the relationship between agricultural and trade policy (which often affects the price of food) and consumption patterns and consumer choices.

Responsible governments worldwide have an intrinsic interest in the health and nutritional well-being of their citizens. In response to this concern, CARD designed and/or analyzed nationwide household consumption surveys and health surveys not only in the United States but also in Indonesia, Haiti, Jamaica, and Zambia. Food assistance programs were evaluated for countries that no longer had the ability to transfer payments to their low-income populations because of trade liberalization policies. CARD was ready to conduct analyses that answered questions such as: How can a food stamp program be designed to deliver benefits to low-income populations? and, What will be the incidence of these benefits?

Jensen and a multidisciplinary research team including faculty from the ISU Department of Statistics and the Snedecor Statistical Laboratory developed new techniques for analyzing food consumption survey data collected by the U.S. Department of Agriculture’s Human Nutrition Information Service. In the area of food safety, faculty in CARD’s Resource and Environmental Policy

Continued on page 6

Timeline—Highlights of the Past Fifteen Years of CARD

1984

- Earl Heady retired as director of CARD.

1985

- FAPRI (Food and Agricultural Policy Research Institute) became an affiliated unit of the Trade and Agricultural Policy division of CARD. The FAPRI programs are conducted cooperatively by CARD and by the Center for National Food and Agricultural Policy at the University of Missouri-Columbia.

- Stanley R. Johnson was appointed director of CARD. Johnson established new programs, including a focus on international trade, international agricultural policy, food and nutrition policy, resource and environmental policy, and rural economic development policy.
- The *CARDreport* news periodical was inaugurated to disseminate information about the projects and people at CARD.

Environmental Policy Development at CARD

by Ellen Balm and Phil Gassman

Since the Dust Bowl years of the 1930s, farmers have been held accountable for the preservation of natural resources, specifically the prevention of topsoil loss through wind and water erosion. Farmers have, therefore, often taken financial risks to sustain the environment. Throughout the 1970s, in response to this situation, researchers at CARD worked on conservation problems with economists from the U.S. Department of Agriculture (USDA). The CARD linear programming model was adapted during these years to study resource issues such as the use of water in agricultural production. Beginning in 1979, a large-scale programming model was developed at CARD under a cooperative agreement with the Economic Research Service (ERS/USDA) and the Soil Conservation Service (SCS/USDA). This model, known as the Agricultural Resource Interregional Modeling System (ARIMS), dealt with issues of resource or tillage practice constraints on the agricultural economy [See *CARDreport* Vol. 11, No. 2:5–13].

By the 1980s, however, agricultural practices other than tillage had come under scrutiny for their effects on the environment. Apprehension over pesticide use in agriculture, first

voiced in the 1960s, was building into a concern that many people were exposed to pesticides through diet, drinking water, air, and workplace contamination, and that a certain percentage of this population might be at risk for cancer or other serious health consequences.

The CARD linear programming model was not suited to answering the kinds of questions that were being asked about water quality, the effects of pesticides on human health, and the fate of chemicals applied to crops in the field. According to Stanley Johnson, director of CARD from 1985 to 1996, “Researchers were using statistical relationships that did not and could not reflect the complexity of the processes they were describing.”

Development of CEEPES

In 1986, CARD entered into a cooperative agreement with the Office of Policy Analysis (OPA) of the U.S. Environmental Protection Agency (U.S. EPA) to conduct a nationwide survey of pesticides and groundwater quality. Conceptualized by Johnson and Robert Wolcott of EPA, the Comprehensive Economic Environmental Policy Evaluation System (CEEPES) was developed to be a more scientifically accurate

approach to the economic analysis of environmental issues.¹

CEEPES was an integrated analysis system. While a few new models were created to meet specific analytical requirements, the system relied primarily on a set of models that had been previously developed in a number of disciplines. The system allowed the policy analyses of agricultural economists to be influenced by the work of other agricultural experts such as hydrologists, soil scientists, and entomologists.

CEEPES had four major components:

- agricultural decision,
- biogeophysical,
- health and environmental risk, and
- policy.

Each of the components was envisioned to consist of several modules that included a mix of complex computer models and simpler algorithms, depending on the component. For example, the biogeophysical component originally included four modules: plant process, groundwater, surface water, and atmospheric. The

¹ CEEPES was originally named the “Comprehensive Economic Pesticide Policy Evaluation System,” and is referred to under the CEPPES acronym in most early publications. The system will hereafter be called CEEPES in this article.

1986

- CARD and FAPRI conducted an analysis of the 1985 Farm Bill, delineating the likely outcomes of new legislation on commodity prices, agricultural production, consumption, farm income, and government expenditures.
- CARD initiated projects in Indonesia and Zambia with a grant from the Office of Nutrition, Agency for International Development. These projects developed procedures to better evaluate the impact of agricultural pricing policies on food production, consumption, and nutrition.
- CARD cooperated with the U.S. Bureau of the Census, Organization for International Cooperation and Development, USDA, and the government of Haiti to develop, conduct, edit, and analyze food consumption and expenditure survey data for policymakers to use in formulating agricultural pricing strategies.

intent was to link different computer models within and between these modules to predict crop yields, estimates of agricultural chemical impacts on water resources, and soil degradation due to erosion under variation in management and cropping practices.

A simpler approach was ultimately adopted, however, after initial investigations proved that such a complex and data intensive methodology was not practicable. This involved applying field-scale models to generate crop yields and edge-of-field predictions of soil erosion, chemical leaching and runoff, and other environmental indicators. These indicators provide potential rather than direct estimates when assessing the impacts of agricultural practices on water resources. An early application of this approach was for corn rootworm insecticide use in Iowa, in which the Erosion Productivity Impact Calculator (EPIC) model was used to predict crop yields and the Pesticide Root Zone Model (PRZM) was used to predict edge-of-field insecticide leaching and runoff losses for selected combinations of soil, climate, crop, and management inputs. The use of edge-of-field indicators has remained a key aspect of CARD environmental analyses to the present.

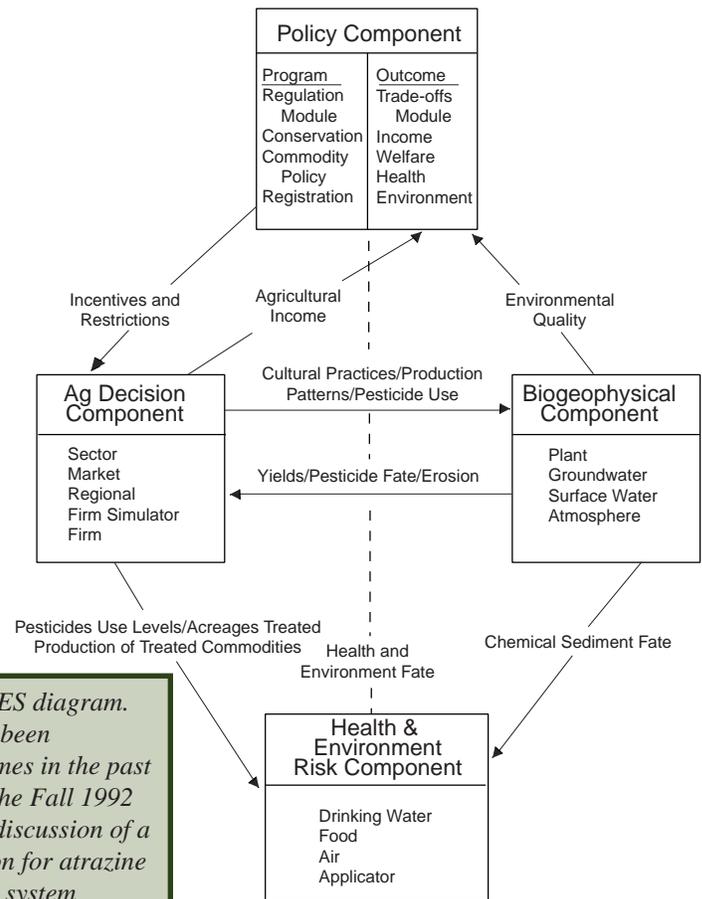
The agricultural decision component initially combined a variety of modeling approaches, ranging from

micro to macroeconomic analysis. The original agricultural decision component contained:

- a farm/firm module, which included a firm-level, recursive simulation model intended to generate annual production, farm marketing, and financial management data;
- a regional module, which included ARIMS, a linear program-

ming model used to simulate U.S. agriculture in long-run competitive equilibrium;

- a commodity market module, which consisted of the CARD/FAPRI baseline; and
- a sector module, which consisted of the Basic Linked System (BLS), a general equilibrium model developed and operated at CARD to evaluate trade and trade policy on an international level.



The original CEEPES diagram. This schematic has been redesigned many times in the past 13 years; e.g., see the Fall 1992 CARDreport for a discussion of a CEEPES application for atrazine with accompanying system flowchart.

Continued on page 12

1987

- MATRIC (Midwest Agribusiness, Trade, Research, and Information Center) was established as a unit affiliated with CARD. MATRIC provides assistance to U.S. businesses in developing and expanding international markets for agricultural products and services, and provides market and policy research and access to prospective trade and investment partners.
- Selected as the North American center for a global modeling project by the International Institute for Applied Systems Analysis (IIASA), CARD focused research on food and agricultural problems.
- A research grant was awarded to CARD to analyze the General Agreement on Tariffs and Trade (GATT) proposals for agriculture, and a series of special reports were published for policymakers in the United States, Canada, the Organization for Economic Cooperation and Development, and others.

From the Director



Bruce A. Babcock

It is fitting that we review Stan Johnson's enormous contribution to CARD with this, the last issue of the *CARDreport*. Stan brought a unique combination of energy, vision, and academic excellence to CARD when its future was in doubt. CARD was really "Heady's shop" in the sense that Earl Heady and CARD were synonymous. As Stan expanded the scope of CARD's activities during his tenure as director he wisely chose to decentralize its operations and to put accomplished research economists in charge of the research divisions.

At the time of Stan's departure from the directorship, he had delegated the operation of the Food and

Nutrition Policy, Trade and Agricultural Policy, and Resource and Environmental Policy research divisions to Helen Jensen, Dermot Hayes, and myself, respectively. All three of us were tenured faculty members in the Department of Economics. What this commitment to academic excellence brought CARD was increased credibility among the numerous agencies, organizations, and institutes with whom CARD interacts.

As we begin a new era at CARD, the legacy of this commitment to academic excellence will be emphasized to an even greater degree. As the nation's and world's populations continue to become better educated and more technically proficient, the demand for high-quality, innovative research to help guide agriculture and food policy will dramatically expand. There simply is no room in public policy research for mediocrity.

I am grateful that Helen Jensen agreed to continue heading up the Food and Nutrition Policy division of CARD. The need for coherent food and nutrition policy has never been greater than in this time of expanding incomes, international trade agreements and tensions, and new technologies.

And I could not have hoped for two more accomplished researchers to head up the Trade and Agricultural Policy and Resource and Environmental Policy divisions than John Beghin and Cathy Kling. John is an outstanding agricultural trade economist who is looking forward to bringing his expertise to bear on the numerous agricultural trade issues that CARD analyzes. And Cathy has developed an outstanding reputation in the area of valuation of nonmarket goods.

As I noted above, this is the last issue of the *CARDreport*. Given the increased use of the web and the accompanying increased demand for timely information, we feel that we can better communicate our message and disseminate our research directly through the CARD website. We will continue to publish the news periodical *Iowa Ag Review* and the *CARD Annual Report*.

I look forward to my time here as director of CARD and can only hope for a portion of the success enjoyed by my two distinguished predecessors. ♦

1988

- CARD established a formal research exchange agreement with the All-Union Academy of Agricultural Sciences of the USSR (VASKhNIL), which laid the groundwork for multiple projects in the USSR and Eastern Europe.
- The World Food Conference was organized and sponsored by CARD in Des Moines, Iowa. The program focused on coordinating macroeconomic, agricultural, and food policies for developed and developing countries and was attended by participants from more than forty countries.
- The Agribusiness Outlook and Policy Conference series was initiated by CARD to provide a forum for public discussion of contemporary agricultural policy. Later renamed the Fall Policy Conference and the National Forum for Agriculture, these conferences have been held annually up to the present. (See page 8 for a list of all past conference titles.)
- The CEEPES model (Comprehensive Environmental Economic Policy Evaluation System) was configured to provide decision support for policies on the regulation of atrazine and corn and sorghum insecticides.

The Development of CARD, 1985–96 (cont. from page 2)

Division and Trade and Agricultural Policy Division worked with Jensen in evaluating consumer willingness to pay for a safe food supply.

Rural and Economic Development Policy

The problem once termed “agricultural adjustment” had not disappeared by the 1980s. Rural communities in the Midwest were undergoing continual change in economic structure. Under-performing economies and diminishing rural populations posed a significant economic policy problem. The Rural and Economic Development Policy Division (REDP) was created to provide a source of analysis for those interested in rural economic development. CARD’s modeling capability was used to study the impacts of agricultural performance and policies on rural economies, and to analyze rural economic development programs.

CARD cooperated with the U.S. National Governors Association Center for Policy Research in the development of a general policy information system. Databases, policy models, and policy studies were made available nationwide to the staff of state governments interested in rural economic development.

Rural economic development research at CARD resulted in a number of state economic profiles,

CARD publications, and presentations on rural development issues. In 1992, a strategy-oriented conference was organized that emphasized rural growth and economic development: “Industrial Policy for Agriculture in the Global Economy.”

While CARD has pursued a number of approaches to evaluating rural economic development policy, the issue remains challenging. Johnson said that he agrees with other researchers that it is difficult to invigorate rural communities. “I think the biggest disappointment was that we [CARD] really didn’t do what I had hoped we could do in rural economic development.”

Midwest Agribusiness Trade Research and Information Center (MATRIC)

MATRIC was established as an affiliate of CARD in 1987. Its purpose has been to offer assistance to medium-sized companies to get involved in international trade. Along with several other international trade development centers, MATRIC was funded through an authorization in the 1985 Farm Bill. MATRIC has collaborated with ISU’s Utilization Center for Agricultural Products, International Agriculture Programs in the College of Agriculture, and the College of Business, as well as the Greater Des Moines Chamber of Commerce Federation.

MATRIC assists U.S. firms desiring to expand into international trade by providing information and market analyses and collecting foreign investment information. MATRIC also conducts workshops and training programs on U.S. agribusiness for international delegations and encourages partnering between U.S. and overseas firms. According to William Meyers, MATRIC executive director from 1987–98, the training programs have gained a reliable reputation, and organizations (both domestic and foreign) periodically contact MATRIC to design and execute a program for them.

Highlights 1985–96

According to Gordon Rausser (dean of the College of Natural Resources, University of California, Berkeley), “The strength of centers like CARD is that they can bring lots of talent together to focus on important problems for which CARD has serious expertise. Raw talent is easy to come by in terms of first-rate scholars interested in real problems. CARD excels at handling problems that expand beyond the capacity of a couple of people.”

Johnson’s leadership brought expansion of projects, contracts, and personnel. From a staff of approximately 35 in 1985, CARD grew to more than 100 faculty, graduate students, visiting scholars, and staff by 1992. The audiences for CARD’s

1989

- CARD initiated a new project in Indonesia: “Analysis and Formulation of Food Crop Policy,” aimed at improving policy analysis capabilities of the Indonesian Ministry of Agriculture.
- A project in Indonesia funded by the U.S. Agency for International Development analyzed food crop policy.

1990

- The National Forum for Agriculture expanded CARD’s outreach efforts and added cosponsors: the Food and Agriculture Committee of the Greater Des Moines Chamber of Commerce Federation and Iowa State University Extension.
- An international symposium sponsored by CARD was held in Ames: “Insights into Perestroika—Implications for Agricultural and Scientific Cooperation.” Participants explored channels for developing scientific and commercial cooperation between the U.S. and the USSR.

public policy research were extended to include not only government officials, agricultural producers, and policymakers but also marketers and consumers of agricultural products. The funding sources increased with the expanded list of policy issues.

The international focus initiated by CARD's founder, Earl Heady, continued and became refocused under Johnson. An involvement in research exchange agreements with the Soviet Union was built around common interests in economic policy issues. "Among these," Johnson said back in 1988, "are the implications of chemical use on the sustainability of agriculture, and assessments of economic policy changes on production patterns and consumption levels. . . . We are very pleased with the exchange agreement between ISU and the Lenin All-Union Academy of Agricultural Sciences. . . . It underscores the importance of the agricultural research programs at both institutions."

In the years following the break up of the Soviet Union, CARD was also involved in a number of enterprises including joint ventures and watershed management projects in the former Soviet Union republics and in Eastern Europe.

Early in his tenure at CARD, Johnson set up a comprehensive publications program of internally produced working papers, staff reports, technical reports, journal reprints, and monographs bearing the

CARD imprimatur. Joint publication efforts with several academic presses resulted in the publication of books and conference proceedings.

Outreach activities came to include the annual Fall Agricultural Policy Conference and the annual National Forum for Agriculture. With



Stanley R. Johnson

these policy discussions and airing of technical information, CARD reaches a wide audience of agricultural producers and leaders, commodity and farm organization members, and agribusiness and government officials.

An innovative institute originally developed by Johnson at CARD eventually became an independent entity in 1991. This is the Institute for Policy Reform (IPR), located in Washington D.C., which was established under a cooperative agreement

between CARD and the U.S. Agency for International Development (USAID) in 1990. Johnson directed IPR, and CARD maintained close working ties even after IPR became independent. According to IPR advisory board member Vernon Ruttan, professor emeritus at the University of Minnesota, "IPR served as an academic advisory group to USAID economists, keeping them apprised of new developments in the discipline."

Stan Johnson's term as CARD director concluded when he was appointed by ISU President Martin Jischke to the post of vice provost for Extension. The appointment was effective September 1996.

Under Johnson's leadership of CARD, as under Heady before him, anticipating trends and cutting-edge issues remained a distinguishing hallmark of the center. Johnson views the risk management and revenue insurance research conducted in recent years by the faculty members at CARD as topics that fall into this category.

Johnson believes that, in one respect at least, the role of the director of CARD does not change with a shift in personnel. "The job of the director in an entrepreneurial institute like CARD is to guess where the action is going to be and take your limited resources and be there when it happens." ♦

- The Institute for Policy Reform (IPR) was established under a cooperative agreement between CARD and the U.S. Agency for International Development.
- A grant awarded by the Asian Development Bank funded the project, "Food and Agricultural Policy in Indonesia."
- A grant awarded by the World Bank funded the project, "Impact of Adjustment on Health and Nutrition in Jamaica."

1991

- FAPRI received the American Agricultural Economics Association Policy Award for major research contributions to analytical study of the 1990 Farm Bill.

CARD Conferences

Fall Agricultural Policy Conference

Locations: Iowa towns and cities

- 1988 Cedar Rapids, "Agricultural Outlook"
- 1989 Carroll, "Agribusiness Outlook and Policy"
- 1990 Waterloo, "Agribusiness Outlook and Policy"
- 1991 Iowa City, "Biotechnology and Agriculture: Developing Alternative Uses for Crops"
- 1992 Ames, "Industrial Policy for Agriculture in a Global Economy"
- 1993 Council Bluffs, "Changes and Choices for Agriculture and Rural Communities"
- 1994 Mason City, "Impacts of the 1995 Farm Bill"
- 1995 Cedar Rapids (Kirkwood Community College), "Changes and Choices for Agriculture and Rural Communities"
- 1996 Emmetsburg (Iowa Lakes Community College) and Ottumwa (Indian Hills Community College), "Market-Based Agriculture: Opportunities and Challenges"
- 1997 (no conference)
- 1998 Ames, "Agricultural Contracts: Freedom or Restraint?"

National Forum for Agriculture

Location: Des Moines (except where indicated)

- 1990 "Policy Options for the 1990 Farm Bill"
- 1991 "The Impact of GATT on Agricultural Trade"
- 1992 "Opportunities for the Livestock Industry"
- 1993 "The Challenge of Industrialization"
- 1994 "Who Will Control the U.S. Food and Agricultural System?"
- 1995 "The Power and Politics of Information"
- 1996 "Technology and the Structure of Agriculture"
- 1997 "Food in a Borderless World: A Dilemma of Politics, Money, and Beliefs"
- 1998 "Hello Dolly: The Biotechnology Revolution for Agriculture Has Arrived"
- 1999 Ames, "Climate Change and the Implications for Agriculture and Energy"

1992

- A grant from the U.S. Environmental Protection Agency funded the project, "Poland Agricultural Water Quality," which ran through 1996. Work focused on sustainable practices to improve water quality and agricultural policy reform in the Polish government.
- The "Restructuring Agriculture and Agribusiness Private Sector" program was initiated jointly by MATRIC, Farmland Industries, Tri-Valley Growers, and Budapest University of Economic Sciences to support privatization and restructuring of agricultural firms in Hungary.
- A national conference, "Industrial Policy for Agriculture in the Global Economy," convened at Iowa State University under CARD sponsorship. The Proceedings were published by Iowa State University Press in 1993.

Pioneer Hi-Bred Endows Science and Technology Chair

Pioneer Hi-Bred International, Inc., has established a research program in science and technology policy at Iowa State University. The program and the associated Pioneer Hi-Bred Chair in Science and Technology Policy will be located in CARD.

CARD's 1998 Fall Policy Conference, provided the occasion for Thomas Phillips, director of Community Investment, Pioneer Hi-Bred, to make the public announcement and present ISU President Martin Jischke with a check for \$250,000, which brings Pioneer's total investment in the new science and technology policy program to \$1 million.

Developments in agricultural science and technology are irrevocably linked to agricultural productivity. Along with the benefits of increased agricultural productivity, however, come a number of complex issues, including the following:

- The proper roles of the public and private sectors in agricultural research and development and the coordination between the two.
- Public/private sector and international intellectual property rights.
- Introduction of new technologies and international phytosanitary conventions.
- Strategic planning for the public and private sectors.

The Pioneer endowment provides the foundation for an innovative program intended to keep Iowa and the Midwest competitive in a global economy in an

era of rapid technological change. In addition to the faculty position, the Pioneer endowment will support graduate student education in science and technology policy as well as research results that will benefit both Iowa agriculture and agribusiness.



Iowa State University President Martin Jischke accepts the Pioneer Hi-Bred endowment contribution from Community Investment Director Thomas Phillips during CARD's 1998 Fall Policy Conference.

1993

- CARD began work on a project in Egypt to develop the indigenous agricultural and agribusiness sectors, including advanced research and education programs for scholars in the agricultural sciences.
- CARD cooperated with the Winrock International Institute for Agricultural Development to identify and place agricultural specialists in the Newly Independent States of the former Soviet Union to support the transition to a market economy.
- CARD cosponsored a national conference held in Kansas City, "Conservation of Great Plains Ecosystems: Current Science, Future Options," with the U.S. Environmental Protection Agency, the Western Governor's Association, and the U.S. Fish and Wildlife Service. The Proceedings were published by Kluwer Academic Publishers.

A Birthday Party for CARD

At a breakfast meeting on September 4, 1998, Marian Heady, widow of Earl O. Heady, and Stanley Johnson, former director of CARD, welcomed a group of long-time friends and supporters to celebrate the 40th anniversary of the Center for Agricultural and Rural Development. This gathering preceded the 1998 CARD Fall Policy Conference and included approximately 65 guests, among them George Christensen, a former ISU vice president; George Ladd, C. F. Curtiss Distinguished Professor in Agriculture, and his wife Marlys; Neal Smith, former U.S. Congressman, and his wife Bea; Dale Cochran, then Iowa Secretary of Agriculture; and John Ruan, Des Moines businessman.

“When the Iowa legislature granted the funding for what was to become CARD in 1957, no one envisioned the impact it would have on agriculture,” said Mrs. Heady. “I am very pleased to be here today. I only wish that Earl could be here, too.” Johnson, proclaiming that it is Marian Heady who still represents the CARD tradition and sense of family, went on to highlight CARD’s past accomplishments.

Johnson credited CARD’s founder, Earl Heady, with recognizing the need to bring quantitative analysis to the study of agricultural policy. Prior to 1957, agricultural policy development was characterized by forums in which experts shared their thoughts on what would happen if certain policies were enacted. “But agriculture has such a broad scope, it is difficult to generate change by stating opinions. . . . It is hard to get your feet under the table at critical policy discussions without the numbers,” said Johnson. He also praised the idea of a multidisciplinary center designed to study the problems of agriculture.

According to Johnson, several additional factors served to keep CARD in the forefront of agricultural policy development.

- It has always been a place where young people can develop professionally and where leaders in agricultural policy can get their start.
- It has developed a number of extremely valuable partnerships over the years with such organizations as the ISU Statistical Laboratory, the National Resource Conservation Service, the

U.S. Department of Agriculture, and the University of Missouri.

- ISU has strong economics, agricultural sciences, and statistics departments.
- The College of Agriculture, Iowa State University, and the Iowa legislature have furnished strong support for CARD throughout the past 40 years.

CARD’s early accomplishments in the areas of agricultural adjustment, Johnson noted, were followed by analytical work for the U.S. Department of Agriculture’s Soil Conservation Service, the Soil Bank program, the Conservation Reserve Program, and the 1985 Farm Bill.

CARD has provided the only comprehensive analysis of the GATT program that is publicly available and has completed both environmental and trade policy work in the transition economies of the former Soviet Union. CARD has contributed equally to the theory and methods of agricultural economics, beginning with the development of linear models and computation methods, and including applied general equilibrium analysis, usual daily intakes of diet components, and integrated biological/geological systems models. ♦

1994

- A grant from the U.S. Agency for International Development set up the “Istra River Basin Watershed Management” project in Russia to introduce watershed management and reduce the environmental impact of local agricultural practices.
- A GATT conference held in Washington, D.C., was organized by CARD to present the final analytical studies from the GATT project.
- CARD began publishing the *Iowa Ag Review* to disseminate information on the changes in U.S. farm policy and analyses of current developments for Iowa farmers, agribusinesses, legislators, and the concerned public.

1995

- The project to reform the agricultural and agribusiness sectors in Egypt was extended via a grant from the U.S. Agency for International Development.
- In conjunction with the Oceanic Institute in Hawaii, CARD initiated the Midwest Feeds Consortium to develop value-added processes for expanding the use of agricultural coproducts in aquaculture feed.

CARD Director and Faculty

Bruce Babcock, a professor in the economics department, was appointed director of the Center for Agricultural and Rural Development (CARD) in November 1998.

“One of my goals as director is to make sure that policymakers and others who can potentially benefit from CARD analysis understand the analytical capabilities of CARD, what CARD is doing, and that CARD is ready and willing to undertake new projects,” he said.

Babcock’s goals include integrating the existing research programs of the new division heads—Catherine Kling, professor of economics, and John Beghin, associate professor of economics—into CARD. His plans are to establish new areas of research in financial management in agricultural policy, rural development policy, and science and technology policy.

Before being named director, Babcock was head of CARD’s Resource and Environmental Policy Division, which assesses regional, national, and international policies affecting the environment. He will continue work in this area with research looking at ways to increase the environmental performance of government policies.

Another area of research is the potential contribution of midwestern agricultural soils as a “carbon sink.” The objective of this research, Babcock said, “is to determine how the agricultural sector can contribute and benefit if a carbon market comes into existence. A nice side benefit of sequestering carbon through conservation tillage is that the long-term productivity of soil is enhanced by increasing soil organic material.”

The main thrust of Babcock’s future research, however, will be on risk management policy. This includes identifying both the government’s and private sector’s role in providing a safety net to those in agriculture.

“We are looking for ways to maximize the efficiency of federal funds,” he said. This potentially could come in the form of risk management policies, as opposed to lump-sum transition payments, ad-hoc disaster payments, or traditional price support payments.”

Babcock received a bachelor’s degree in economics of resource use and a master’s degree in agricultural economics from the University of California at Davis. He received a doctorate from the University of California at Berkeley in agricultural and resource economics.



Catherine Kling
Head, Resource and Environmental
Policy Division

Cathy Kling is the new Resource and Environmental Policy Division head at CARD. “I am excited to learn about CARD in more detail as I begin my new position,” she said. “And, I am looking forward to the policy orientation of the work here.”

Kling’s research focuses on valuing environmental goods. For example, she is currently working on a project looking at the potential use of Iowa wetlands. She is also doing work in determining market-based incentives for controlling pollution.

Kling received a bachelor’s degree in business and economics

1996

- CARD performed a series of analyses relating to the FAIR (Federal Agricultural Improvement and Reform) Act, evaluating the impact of freedom-to-farm policies and the potential effects on the environment.
- Food safety research at CARD addressed key issues and problems focused on the entire food chain.
- Stanley Johnson assumed new responsibilities as vice provost for Iowa State University Extension.

1997

- CARD received a grant from the U.S. Agency for International Development to implement an agricultural policy project in Ukraine. The Center for Privatization and Economic Reform in Agriculture was established in Kiev to lead the effort.



John Beghin
Head, Trade and Agricultural
Policy Division

from the University of Iowa and a doctorate in economics from the University of Maryland.

John Beghin is the new Trade and Agricultural Policy Division head. His area of research looks at the linkages between the environment and international trade, such as how government regulations affect the competitiveness of the U.S. hog industry in the world marketplace, and how labeling and phytosanitary regulations may impede the trade of agricultural products.

“Working at CARD will provide me with an opportunity to do policy relevant work that passes the academic test for quality,” he said.

Originally from Belgium, Beghin studied economics at both Université de l’Etat de Mons and Université Libre de Bruxelles. He has a master’s degree in agricultural economics from North Carolina State University and a doctorate in agricultural and resource economics from the University of California at Berkeley. ♦

Environmental Policy Development at CARD
(cont. from page 4)

While each subroutine had its drawbacks (ARIMS was a cost minimization model that could not adjust for government commodity programs, for instance), the intent was that the models would provide feedback to each other and the analysis would be continually adjusted as new problems emerged and new policy exercises were developed.

The results generated by the system were transferrable across as well as within components. The amount of pesticides contained in groundwater calculated by the biogeophysical component served as feedback for the health and environ-

mental risk component; a regulation to ban or restrict a certain pesticide that was developed in the policy component affected the behavior of farmers in the agricultural decision component; the steps farmers took to compensate for a restriction on a certain pesticide (increased use of other chemicals or altered tillage practices) provided input for the biogeophysical component. The major components shared information and were changed as a result of such input in a way that “was highly nonlinear,” according to Johnson.

The Atrazine Studies

There has always been a need for a modeling tool capable of compre-

hensively considering economic, natural resource, and environmental questions. Economic models generally answer crop production questions and do not consider the impacts of agricultural policies on the environment. However, the conservation compliance requirement of the 1985 Farm Security Act increased the desirability of developing such an analytical tool.

Conservation compliance meant that producers who wanted to be eligible for commodity program payments had to guarantee that they were implementing conservation tillage practices on erodible land. The generally accepted solution to the problem of soil erosion is no-till or

- CARD provided administrative assistance and research for a new group of farm and commodity leaders, agribusiness heads, state government officials, and Iowa State University faculty. The group is known as AgSTATE (Agricultural Strategic Thinkers Acting Together Effectively).
- Stanley Johnson ended his directorship of CARD and William H. Meyers began serving as the interim director.

1998

- CARD marked its fortieth anniversary.
- The 200th CARD Working Paper was published (the series began in 1985).
- The tenth annual Fall Policy Conference explored the implications of agricultural contracts for producers, and the impacts of contracting systems on the industry.
- In November, Bruce Babcock was named CARD’s new director.

low-till cultivation, which relies heavily on the use of herbicides for weed control. The EPA was interested in developing a tool that could evaluate the overall environmental effects of minimum tillage practices. As Andrew Manale of the EPA put it, “You can solve a sediment problem by creating a drinking water problem.”

Following the preliminary study involving insecticides and corn rootworm in 1988, CEEPES was applied to an analysis of the economic and environmental impacts of atrazine use. Atrazine is one of a group of chemicals called triazines that have proven to be effective herbicides in corn and sorghum production. Atrazine use represents a classic tradeoff between economic and environmental interests. On the one hand, atrazine is inexpensive and highly effective as a weed control strategy. On the other hand, atrazine is persistently found in excessive concentrations in drinking water. The concern was that greater reliance on minimum tillage practices would further degrade water quality in the Midwest.

The first step in operating CEEPES was to design a set of appropriate policy options. Five scenarios were developed, ranging from a complete ban on triazines to restricting atrazine use to post-emergent applications.

The next step was to run the process models, such as EPIC and PRZM, that were included in the biophysical component. Execution of large process model runs can be both cost and time prohibitive.

Among the contributions that CEEPES has made to the integrated system approach to environmental analysis is the use of experimental design and metamodeling to defer the

costs of rerunning the process models for every change in variables. Rather than running the models for all points in the data set, a carefully chosen statistical sampling of soil characteristics, climatic conditions, pest control strategies, and other parameters representative of the geographic region under analysis are used. The simulations are run until their output approaches reality to an acceptable degree of precision.

“Before CEEPES, pesticide programs simply banned or did not ban. With CEEPES, an entire range of other possibilities come into play.”

—Andrew Manale, U.S. EPA

Once the simulations have been run, however, the problem of linking the information gathered to the policy and agricultural decision models remains. According to Manale, “In the past, we would run one model, then we’d use that as input into the next model. It became very, very complex very quickly.” ISU and CARD researchers working with Manale, Richard Cabe (University of New Mexico), and the EPA Office of Research and Development in Athens, Georgia, found a way to reduce some of this complexity by using statistical abstractions that related the outputs to the inputs of the environmental fate and transport models. Thus, the environmental impacts of a variety of policy scenarios could be studied without constantly rerunning the process models. This is called metamodeling

because the original models are no longer used, only the relationship between inputs and outputs. Manale believes that the ability to successfully reduce the time and cost involved in running and integrating the models has made the difference between success and failure for the project.

A Work in Progress

CEEPES was always a work in progress. It was the accomplishment not only of its originators (Johnson and Wolcott) but of a large group of researchers at CARD and at other organizations. CEEPES was designed to be flexible. One model could be replaced with another as the system required. Early on, for example, the CARD linear programming model (ARIMS) was replaced with the Resource and Agricultural Management System (RAMS) model.

RAMS was developed by Aziz Bouzاهر (The World Bank; a former head of CARD’s Resource and Environmental Policy Division) to simulate producer economic behavior, given a variety of pest control strategies and pesticide use options. Bouzاهر also led the development of the Weather Impact Simulator on Herbicide (WISH) model, a novel tool that was used to determine the weed control strategies that were analyzed in RAMS.

The policy options also evolved as the atrazine studies continued. For example, payment incentives to producers for limiting pesticide use were incorporated—a nontraditional option in the EPA approach to addressing pesticide issues.

According to Manale, CEEPES has made a fundamental difference in the way the EPA views pesticide issues. “Before CEEPES, pesticide programs simply banned or did not ban. With CEEPES, an entire range of other possibilities come into play.”

There are times when changing the agricultural practices may offer better solutions to overall environmental quality problems than simply banning one chemical only to be confronted with problems caused by the use of another.

The Future of Integrated Systems Modeling

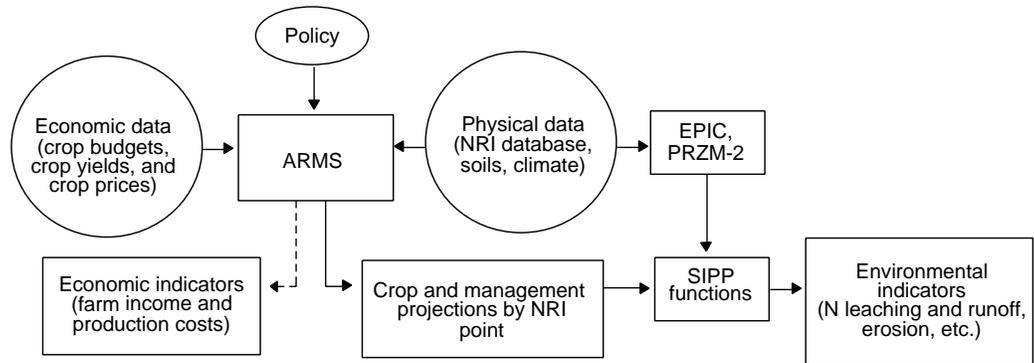
In 1995, CEEPES was renamed the Resource and Agricultural Policy System (RAPS). It is currently funded at CARD through the end of 1999. Major enhancements introduced in RAPS include: (1) using the 1992

National Resources Inventory (NRI) database as a baseline set of input data; (2) the development of the Acreage Response Modeling System (ARMS) that replaced the previous RAMS model; and (3) the development of the Site-Specific Pollution Production modeling system, which incorporates new techniques that improve upon previous metamodeling efforts.

To date, RAPS has been used primarily to assess water and wind erosion rates and nutrient leaching and runoff losses at specific points

contained in the NRI, resulting from management and cropping shifts projected to occur in response to the 1996 Farm Agriculture Improvement and Reform Act (FAIR). This contrasts with previous CEEPES applications, which were focused on assessing herbicide use impacts on water quality. Future applications of RAPS will likely incorporate other environmental indicators, such as carbon sequestration (or storage) in soils to offset the effects of atmospheric carbon buildup and accompanying potential climate change. ♦

Figure 2. Schematic of the input data, main components, and linkages in RAPS



Selected Bibliography of CEEPES Research, 1988-96

Manale, A.; Gassman, P. W. An analytical framework for multiple attribute comparisons of pesticide risks and benefits: the case of the corn rootworm insecticides. In *Evaluating Natural Resource Use in Agriculture*. Ames, Iowa: Iowa State University Press, 1988, 115-149.

Johnson, S. R.; Wolcott, R.; and Aradhyula, S. V. Coordinating agricultural and environmental policies: Opportunities and tradeoffs. *American Economic Review*, 1990, Vol. 80 (2):203-207.

Cabe, R.; Johnson, S. R. Natural resource accounting systems and environmental policy modeling. *Journal of Soil and Water Conservation*, Sept/Oct 1990, Vol. 45 (5):533-539.

Cabe, R.; Kuch, P. J.; Shogren, J. F. Integrating economic and environmental process models: An application of CEEPES to atrazine. Staff Report, Center for Agricultural and Rural Development, Ames, Iowa: Center for Agricultural and Rural Development, May 1991. CARD Staff Report 91-SR 54.

Bouzaher, A.; Cabe, R. J.; Carriquiry, A.; Shogren, J. F. Effects of environmental policy on trade-offs in agri-chemical management. *Journal of Environmental Management*, 1992, Vol. 36:69-80.

Bouzaher, A.; Lakshminarayan, P. G.; Cabe, R.; Carriquiry, A.; Gassman, P. W.; Shogren, J. F. Metamodels and nonpoint pollution policy in agriculture. *Water Resources Research*. June 1993, Vol. 29(6): 1579-1587.

Lakshminarayan, P. G.; Johnson, S. R.; Bouzaher, A. A multi-objective approach to integrating agricultural economic and environmental policies. *Journal of Environmental Management*, December 1995, Vol. 45 (4):365-378.

Bouzaher, A.; Shogren, J. F.; Gassman, P. W.; Holtkamp, D.; Manale, A. Use of a linked biophysical and economic modeling system to evaluate risk-benefit tradeoffs of corn herbicide use in the Midwest. In *Agrochemical Environmental Fate: State of the Art*. Ed. Leng, M. L.; Leovey, E. M. K.; Zubkoff, P. L. Boca Raton, Florida: Lewis Publishers, 1995.

Lakshminarayan, P. G.; Bouzaher, A.; Shogren, J. F. Atrazine and water quality: an evaluation of alternative policy options. *Journal of Environmental Management*, October 1996, Vol. 48(2):111-126. ♦

Where Are They Now?



Bruno Larue

Bruno Larue began graduate work at Iowa State University under Professor Earl Heady in August 1983. He was part of Heady's last group of graduate students.

In December 1983, "I was visiting my parents in Canada when I got a phone call from Dr. Heady's secretary." Heady had suffered a debilitating heart attack, and he never returned to teaching duties. Larue continued his program of study, however, and in the spring of 1988 he completed his Ph.D. program with Stanley Johnson as his major professor.

Larue did his undergraduate work at McGill University. He originally planned to study production economics in graduate school at ISU, but he said, "after I took Harvey Lapan's international trade course, there was no returning."

In February 1988, Larue joined the faculty of the University of Guelph, Ontario. In 1991, he moved to Université Laval, near Québec City. At Laval, he teaches marketing and graduate-level international trade courses in the Département d'Économie Agroalimentaire et Sciences de la Consommation (Agrifood Economics and Consumer Studies). He has continued his research in international trade and recently finished a paper on the economics of smuggling.

Larue and colleagues from the University of Saskatchewan have also finished a report on state trading issues. State trade is trade conducted by government institutions rather than private companies (the Canadian Wheat Board, the New Zealand Dairy Board, for example). They are now writing papers based on the results of that study. Larue also serves as an

editor of the *Canadian Journal of Agricultural Economics*.

On sabbatical from Laval, Larue is temporarily back where he started. For the 1998/99 academic year, he is a visiting scholar in the Department of Economics at ISU. He is finishing some research projects and is pursuing an interest in Bayesian econometrics with members of the Department of Statistics. He hopes to begin new work with Professor Lapan on strategic trade policy and is teaching a graduate course in international trade during the spring semester.

Larue and his wife, Gale, met and married while they were both at ISU. She is from Kansas and has a Ph.D. in sociology. They have two children, Benjamin, age 5, and Sophie, age 2. Gale Larue also teaches in the Agrifood Economics and Consumer Studies department at Laval and is currently a visiting scholar in the ISU College of Family and Consumer Sciences. Family activities take up the majority of the Larues' nonwork hours. As for returning to Ames after ten years, Larue said the town has not changed too much, "except there are some pretty good coffee shops here now."♦

CARD is a public policy research center founded in 1958 at Iowa State University. Research, educational, and outreach programs at CARD are conducted in four primary areas: trade and agricultural policy, food and nutrition policy, resource and environmental policy, and rural and economic development policy.

Bruce A. Babcock
Director

Judith Pim
Communications and
Information Coordinator

Ellen Balm
Staff Writer

Karleen Gillen
Publication Design
and Production

Thanks to Phil Gassman, CARD assistant scientist, for his contribution to the article on environmental policy. This is the last issue of *CARDreport*. This issue and selected back issues can be accessed on our web site (www.card.iastate.edu).

Iowa State University does not discriminate on the basis of race, color, age, religion, national origin, sexual orientation, sex, marital status, disability, or status as a U.S. Vietnam Era Veteran. Any persons having inquiries concerning this may contact the Director of Affirmative Action, 318 Beardshear Hall, 515-294-7612.

CARD



Iowa State University
578 Heady Hall
Ames, IA 50011-1070

PRESORTED
STANDARD
U.S. POSTAGE PAID
AMES, IA
PERMIT NO. 200