THE MAGAZINE OF FOOD, FARM, AND RESOURCE ISSUES

CHOICES

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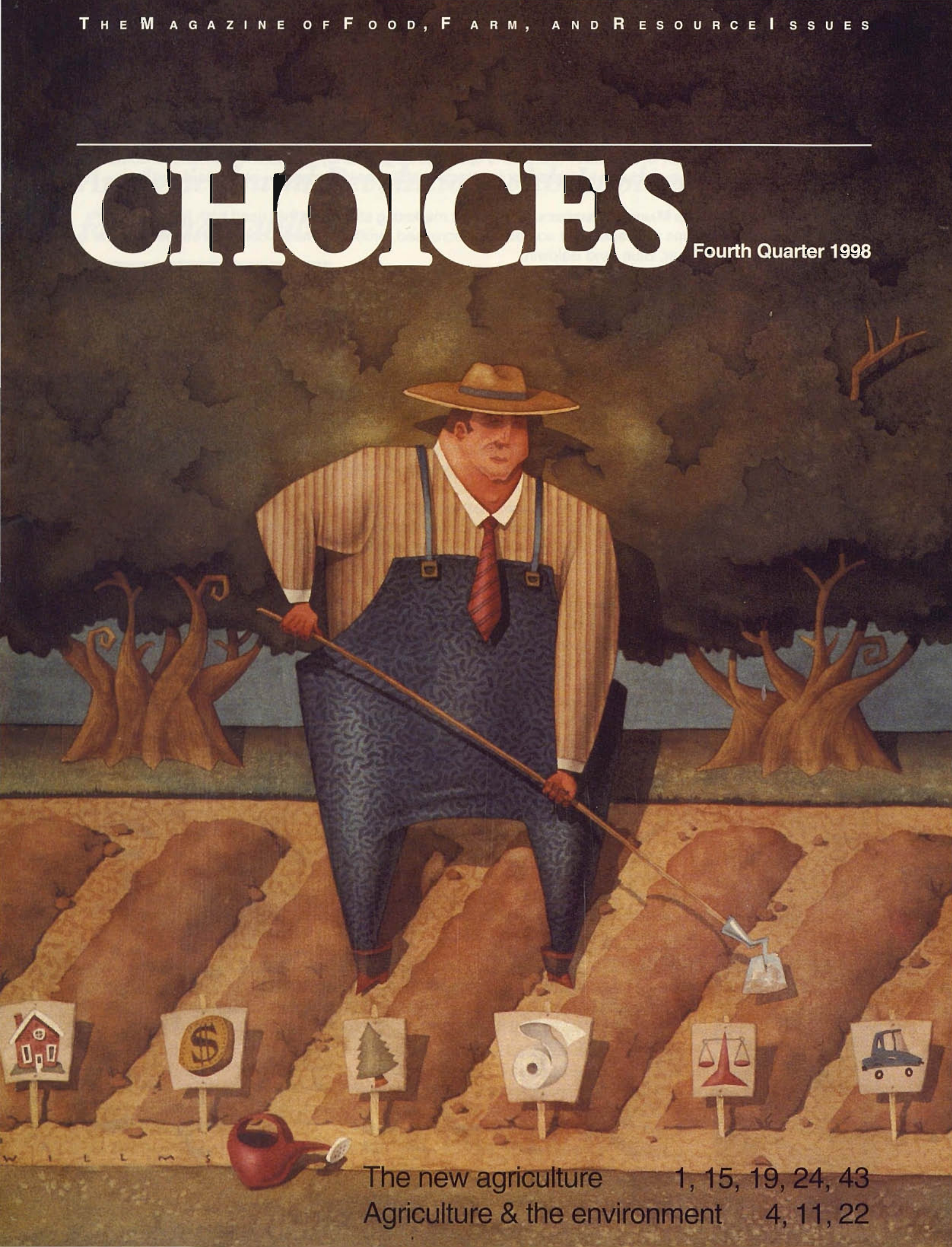


Findings

What agricultural and resource economists are finding about food, farm, and resource issues.

- **Options and Futures Market Strategies.** Futures and option strategies rarely consistently enhance incomes from field crops, unless the producer has superior forecasting ability or information—say Zulauf and Irwin.

- **More Options and Futures Market Strategies.** Preharvest marketing strategies that used both futures and options markets sometimes increased, but sometimes decreased, profits for model corn and soybean farms in Iowa and Ohio—say Wisner, Blue, and Baldwin.

- **Fisheries.** For the Mid-Atlantic surf clam and ocean quahog fishery, a program to issue individual transferable quota to commercial fishers will both cut the number of fishing vessels and improve economic efficiency—says Weninger.

- **Canada-U.S. Milk and Dairy Products Trade.** Eliminating border tariffs and other trade impediments would have little or no net effect on milk and dairy product trade between Canada and the U.S.—say Meilke, Sarker, and LeRoy.

- **Canadian Demand for U.S. Fresh Beef and Pork.** Western Canadians prefer fresh beef and pork products from Canada to those produced in the U.S.—say Quagrainie, Unterschultz, and Veeman.

- **Dietary Fat and Coronary Heart Disease.** Between 1955 and 1993, increased consumption of less saturated vegetable oils, which displaced some of the animal fats in the Canadian diet, cut the incidence of coronary heart disease by just over 10 percent, and reduced associated costs of illness by over $800 million—say Gray, Malla, and Stephen.

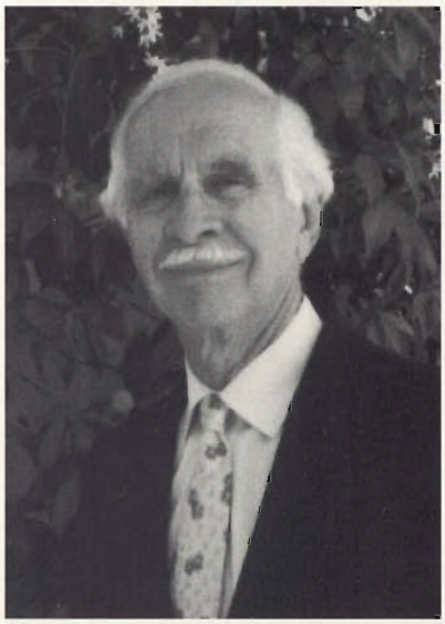
- **Conserving Residential Water.** Raising the price of water does reduce household water use, but affects low-income households most. Other types of conservation policies, such as landscape irrigation restrictions, also reduce household water use—say Renwick and Archibald.

* Findings are taken from recently or soon-to-be published research in the *American Journal of Agricultural Economics, Journal of Agricultural and Resource Economics, Review of Agricultural Economics, Journal of Agricultural and Applied Economics, Agricultural and Resource Economics Review, Land Economics, Journal of Environmental Economics and Management, Agribusiness—An International Journal,* and other journals which publish the research findings of agricultural and resource economists. Abbreviated citations are found on page 42.

ON OUR COVER—The new agriculture. Farming always evolves, but today it seems to change faster and in more directions. Our cover artist's farmer is taking some cues from the business sector, a recurring theme in this issue. Authors discuss how biotechnology, environmental concerns, and new consumer power affect farm and agribusiness operations.

by John A. Schnittker ■ **Guest Editorial**

An Agricultural Revolution with Implications for Sustainability



John A. Schnittker is a consultant in Santa Ynez, California, and former under secretary of agriculture.

Agricultural biotechnology is advancing rapidly in the United States. The rate of adoption of transgenic seeds swamps that of any previous farm technology. Corn, soybean, and cotton growers have purchased genetically modified seeds at premium prices as fast as they became available. Next year, half of U.S. soybeans, and within a few years close to half of our corn and cotton, will come from the seed products of biotechnology. The implications of these developments for U.S. and world agriculture have scarcely been considered. At a recent meeting, biotechnology was barely mentioned in discussions of international food security by five senior agricultural economists. However, after questions were raised about its potential impact, capturing the benefits for developing countries dominated the discussion.

Herbicide-resistant soybeans, cotton, and corn permit substantial cost reductions on the farm. Weeds are controlled more effectively, generally with fewer operations, by herbicides not previously usable on those crops. Yields usually rise when weeds are controlled. Active ingredients applied may be reduced; the herbicides used may be less toxic than those replaced.

Insect-resistant transgenic corn and cotton also reduce chemical use and may increase yields. Herbicide-tolerant and insect-resistant traits are being combined in the same corn hybrids and perhaps in other plants. Transgenic wheats are likely to be in use in a few years.

A second generation of crop biotechnology products appears to be just over the horizon. Widespread production of grains and oilseeds designed for use in specific food and industrial products will significantly alter the agricultural marketing system, especially the relationship of growers to local grain merchants.

Transgenic seeds are being developed for use worldwide. Companies dominating the business—Monsanto, DuPont, Pioneer HiBred, Novartis, and others—operate in most major countries. Farmers abroad will respond to the availability of the new seeds with the same enthusiasm seen in the United States, if sizable cost reductions or yield and quality increases are anticipated.

Europe has been slow to approve the use of food products from transgenic seeds, but these objections are being overcome. Foods made from commodities produced with the new seeds will be labeled. No other major nation has resisted importation of U.S. soybeans and corn; already most bulk cargoes of those commodities exported from the United States include transgenic products.

Organic producers in the United States made it clear during the recent debate with the U.S. Department of Agriculture over regulations for organic foods that transgenic seeds have no place in that sector. That's not a problem; organic growers can define their products with little impact on the food sector. Sustainable agriculture adherents, often allied with organic interests, face a more difficult decision. Are transgenic seeds new tools for integrated pest management (IPM)? Or will sustainability advocates reject them, despite the potential reductions in chemical use?

The biotechnology revolution could fail. Herbicide resistance or consumer rejection could stifle it. Jeremy Rifkin, in his new book, *The Biotech Century*, says he expects biotechnology to have "...some enviable short-term market successes, only to ultimately fail at the hands of an unpredictable and noncompliant nature."

Regulatory authorities, government officials, the companies and scientists making the revolution, and farmers expect the biotechnology revolution to succeed. As it progresses, farm operations and marketing will become more complex and more subject to external control. Farm consolidation, still moving rapidly, may accelerate, adding to the objections some will make to the new seeds and other biotechnology products. The future costs of weed resistance may fall on individuals and even generations who did not reap the early gains.

There is no road back to the nostalgic past of small farms, open-pollinated seeds, organic fertilizers, and weed control accomplished principally by cultivation. For better or for worse, agricultural biotechnology is a part of the real-world agriculture of the next century, and we must examine its impacts as it develops.

John A. Schnittker

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Sandra S. Batie is the Elton R. Smith Professor of Food and Agricultural Policy in the Department of Agricultural Economics at Michigan State University. Her distinguished career has combined scholarly research and educational outreach on leading edge developments in natural resource and agro-environmental policy at state and federal levels. She is currently investigating the motives and consequences of environmental management by business.

David E. Ervin is director of the Policy Studies Program for the Henry A. Wallace Institute, a private, nonprofit research and education organization. His research on conservation and environmental policies for agriculture has been used widely in the U.S. and Europe. He is now focusing on the design of policy that stimulates business innovations to reduce persistent agro-environmental problems and maintain competitiveness.

C. Ford Runge is Distinguished McKnight University Professor of Applied Economics and Law at the University of Minnesota, where he also holds appointments in the Hubert H. Humphrey Institute of Public Affairs, and the Department of Forest Resources. Runge has served on the staff of the House Committee on Agriculture, and as a Science and Diplomacy Fellow of the American Association for the Advancement of Science, working in U.S. AID on food aid and trade. He was the first director of the Center for International Food and Agricultural Policy at the University of Minnesota, and continues as subdirector in charge of commodities and trade policy. Runge owns and operates a small farm in his native Wisconsin.

Nicholas Kalaitzandonakes is associate professor of agribusiness at the University of Missouri, Columbia. He is currently a visiting professor at the Monsanto Company. His research and teaching focus on the economics and strategy of agribusiness innovation. Recent work investigates the structural changes in agriculture and agribusiness resulting from the introduction of biotechnology. He is the editor of *AgBioForum*, a quarterly on-line magazine devoted to the economics and management of agricultural biotechnology.

Richard Maltsbarger is a graduate student at the University of Missouri, Columbia, where he is working toward a master's degree in agricultural economics. He has been an intern in the information technology division at the Monsanto Company and in the finance division of Farmland Industries. In his master's thesis research he analyzes the physical flows and economics of identity-preserved supply chains for bioengineered, value-enhanced crops.

Prior to her university work as assistant professor of agricultural economics at Colorado State University, **Susan Hine** operated a western wear/feed store in Colorado, as well as a horse sale consignment company. Additionally, she worked as vice president of financial services at a large Colorado bank holding company. Her current research focuses on cooperatives, from both marketing and financial perspectives.

Joan Fulton is assistant professor in the Department of Agricultural Economics at Purdue University. Her research examines the broad question of how the organizational structure of agribusinesses affects efficiency. Given the current proliferation of change in structure and ownership of agribusinesses, her research has moved into examining the factors that affect these changes, and what firms should be watching for as they initiate these changes.

Barry K. Goodwin is professor in the Department of Agricultural and Resource Economics at North Carolina State University. He previously served on the faculty at Kansas State University, where his initial interest in crop insurance was stimulated by discussions with colleagues. Over the past ten years he has worked on several dimensions of U.S. farm programs for the protection of farmers from yield and price risks. He currently teaches graduate econometrics and undergraduate introductory agricultural economics.

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William T. Coyle has been with the USDA since 1977. Currently he is senior economist for Asia and APEC affairs in the Economic Research Service, where he is studying the implications of the Asian financial crisis for the U.S. farm economy, and working on an assessment of the changing structure of global food and agriculture trade. Coyle headed the agency's Asia Initiative (1995–97) to develop and administer a program of work on prospects and impediments to agricultural trade in Asia.

Warwick J. McKibbin is professor of international economics and head of the economics department in the Research School of Pacific and Asian Studies at the Australian National University. He is also a Senior Fellow at the Brookings Institution in Washington, D.C. McKibbin spent sixteen years at the Reserve Bank of Australia and has been a visiting scholar at the Japanese Ministry of Finance and at the United States Congressional Budget Office. He has been a consultant for international agencies including the United Nations, the World Bank, and the Asian Development Bank.

Zhi Wang is an economist at the Economic Research Service, United States Department of Agriculture, through a Cooperative Agreement with Purdue University. He was previously a research fellow at Chinese Academy of Agricultural Sciences (CAAS) and served on the board of directors of the Chinese Economists Society (1992–93). His major fields of study include computable general equilibrium modeling, economic integration among Pacific Rim countries, and international trade.

After obtaining his PhD in Economics from Yale University in 1975, **Michael Lopez** taught development economics and computer science at the University of Dakar in Senegal, then development economics and macroeconomics at Michigan State University. Since 1980, he has been an agricultural economist at the USDA's Economic Research Service, working in the many incarnations of what started out as the Asia Branch. His main interests are modeling and, especially, finding ways to clearly explain complicated ideas.

Otto Doering is a public policy specialist at Purdue, covering agricultural and resource policy for research, teaching, and extension responsibilities. He served on the policy group at the U.S. Department of Agriculture for the 1977 farm bill and did similar duty for the 1990 Farm Act on natural resource issues. He has a book forthcoming with Lyle Schertz on the making of the 1996 Farm Act. Doering spent five years directing the forecasting and planning effort for the State of Indiana for its electric utilities and is currently the economic assessment team leader for the national hypoxia assessment.

Philip L. Paarlberg worked for the Economic Research Service of the U.S. Department of Agriculture from 1977 to 1985, responsibilities including commodity analysis, agricultural trade policy analysis, and other various duties. In 1985, he joined the Department of Agricultural Economics at Purdue to develop students' minds by teaching international trade theory and policy. His research efforts focus on agricultural trade policies, particularly export subsidies, sanitary and phytosanitary trade barriers, and the economic transformation of formerly centrally planned economies.

John W. Mellor is president of John Mellor Associates, Inc., a policy consulting firm. He is a former chief economist of the U.S. Agency for International Development (AID), former director of the International Food Policy Research Institute (IFPRI), and former Cornell University professor. He is author of numerous prize-winning books and articles on the development of low-income countries. He is recipient of the Wihuri Prize (Finland) and the Presidential Award (White House) and is a fellow of three professional societies.