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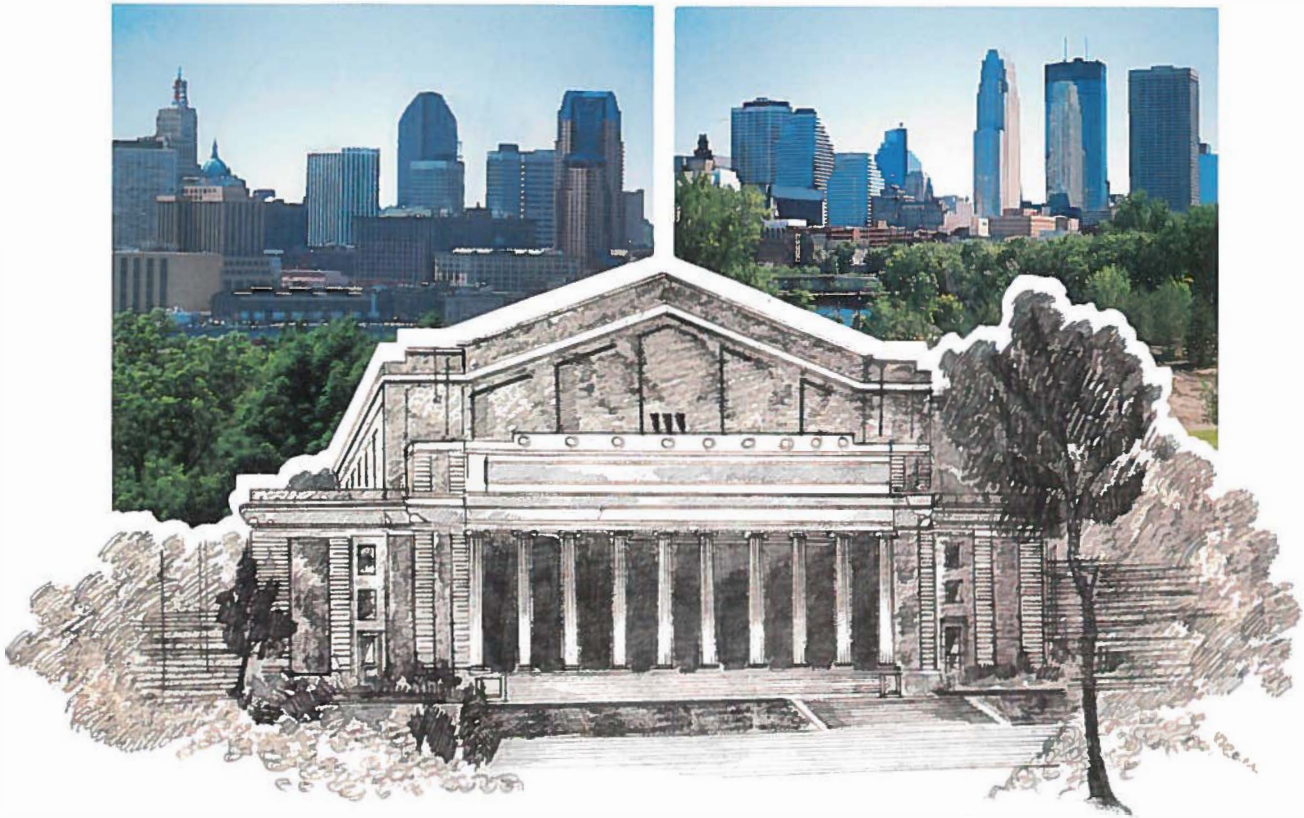
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UNIVERSITY OF MINNESOTA

TWIN CITIES

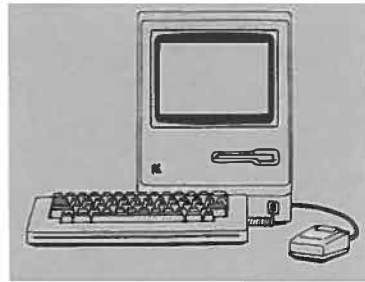
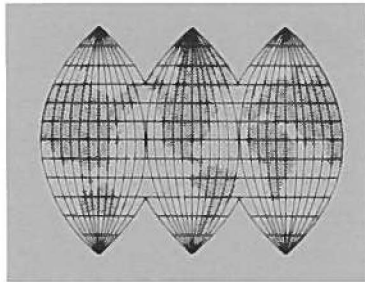
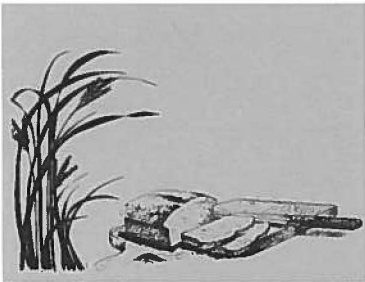


GRADUATE :: STUDIES

[Archival copy - 1992]



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AGRICULTURAL AND APPLIED ECONOMICS

DEPARTMENT OF AGRICULTURAL AND APPLIED ECONOMICS

**231 Classroom Office Building, 1994 Buford Avenue
St. Paul, Minnesota 55108 (612) 625-3777**



“The fact that I went to Minnesota opened a lot of doors. There’s no question that the degree is well known and has a good reputation.”

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FOREWORD

Graduate study in Agricultural and Applied Economics at Minnesota is comprehensive and rigorous. The achievement of the M.S. or the Ph.D. in this department reflects strong scholarship in one of the top three agricultural economics departments in the nation. Both degree programs reflect the belief that an effective economist must have operational knowledge of economic theory, modern methods of quantitative analysis, and the practical realities of the specialized fields selected for concentrated study.

This brochure provides an overview of the opportunities and requirements for graduate study in the specialized

fields of Agricultural and Applied Economics at Minnesota and information about life in the Twin Cities. It is an unofficial guide. Official statements about admission and degree requirements can be found in the *Graduate School Bulletin*.

For further information on graduate study in Agricultural and Applied Economics and applications for admission and financial support, please write to the Director of Graduate Studies, Department of Agricultural and Applied Economics, 231 Classroom Office Building, University of Minnesota, St. Paul, Minnesota 55108, or call (612) 625-3777.

DISTINGUISHED FACULTY

This department has a distinguished and internationally known faculty. Many of its forty-three members have received awards, appointments, and elected positions reflecting outstanding accomplishments and professional service. Here are a few examples.

Five department faculty members have been elected as Fellows of the American Agricultural Economics Association (AAEA). Four of these individuals are still active in the department.

The department has boasted seven elected presidents of the AAEA, including the current President-elect, James P. Houck. Recently a department member served as the elected president of the American Council on Consumer Interests (ACCI), an interdisciplinary professional association and another as president of the American Agricultural Law Association (AALA). At least seven current faculty have served on the governing boards of the AAEA, ACCI, or AALA in recent years.

Since its inception, the *American Journal of Agricultural Economics* has had three editors from the University of Minnesota, the most recent in 1981-83.

Three of the department's current faculty have served as staff members with the prestigious Council of Economic Advisors in Washington, DC.

One distinguished professor emeritus of the department was the appointed Director of Agricultural Economics in the Office of the Secretary of Agriculture during the John F. Kennedy administration.

The department's outstanding extension faculty has received much national and international recognition. For example, the Center for Farm Financial Management was awarded a U.S. Department of Agriculture Superior Service Award in 1988 for its pioneering work in the development and wide distribution of FINPACK, a sophisticated computer software package for farm financial planning and analysis.

Three awards have been earned by faculty members for outstanding teaching in the past five years.

One of our most distinguished faculty members, Vernon Ruttan, holds a University of Minnesota Regents' Professorship.



Dr. Vernon Ruttan, Regents' Professor

REGENTS' PROFESSOR

Vernon W. Ruttan

Vernon W. Ruttan is Regents' Professor at the University of Minnesota. Born in northern Michigan in 1924, he received his B.A. from Yale University in 1948 and M.A. and Ph.D. degrees from the University of Chicago in 1952 and 1954. He has held academic appointments at Purdue University (1954-1963), and at the University of Minnesota where he served as Professor and Head of the Department of Agricultural and Applied Economics (1965-1970) and as Director of the Economic Development Center (1970-1973). He served as Visiting Professor at the University of California, Berkeley (1958-1959) and at the University of the Philippines (1963-1965).

Ruttan has also had substantial non-academic experience. He was on the Government Relations and Economics staff at the Tennessee Valley Authority (1951-1954), and the staff of the President's Council of Economic Advisors (1961-1962). He was agricultural economist with the Rockefeller Foundation at the International Rice Research Institute in the Philippines (1963-1965). From 1973 to 1978 he was president of the Agricultural Development Council. He was president of the American Agricultural Economics Association in 1971-1972. He is currently on the Board on Agriculture of the National Academy of Sciences, National Research Council. He is the

first agricultural economist to be elected to the National Academy of Sciences.

Ruttan's research has been on the economics of technical change and agricultural development. His books (with Yujiro Hayami), *Agricultural Development: An International Perspective* (1971 and 1985), *Agricultural Research Policy*, (1982), are leading works in the field. His most recent book (with Anne O. Krueger and Constantine Michalopoulos), is titled *Aid and Development* (1989). He is currently working on a book titled *United States Development Assistance Policy*.

The quality of Ruttan's research has been recognized by the American Agricultural Economics Association by six awards for published research. He has been honored by election as a Fellow of the American Agricultural Economics Association (1974), the American Academy of Arts and Sciences (1976), and the American Association for the Advancement of Science (1986). He holds honorary degrees from Rutgers University (1978) and Christian Albrechts University of Kiel (1986). He has received the Alexander von Humboldt Award for outstanding contribution to agriculture (1984) and the U.S. Department of Agriculture Distinguished Service Award (1986).

FACULTY

DEPARTMENT OF AGRICULTURAL AND APPLIED ECONOMICS

Jeffrey Apland* - Associate Professor. Ph.D., Purdue University, 1979. Production economics, farm management and mathematical programming. Current research emphasizes production and market decision-making under risk, and the economics of alternative agricultural technologies. Past work has been published in journals including the *American Journal of Agricultural Economics*, *North Central Journal of Agricultural Economics*, *Southern Journal of Agricultural Economics*, and *Energy in Agriculture*.

Michael Boehlje* - Professor. Ph.D., Purdue University, 1971. Farm management and farm finance. Current research includes financial markets and policy for agriculture and integrating financial and production theory. He is the coauthor of three books and numerous articles in the *Southern Journal of Agricultural Economics*, *Western Journal of Agricultural Economics*, *North Central Journal of Agricultural Economics*, and *American Journal of Agricultural Economics* in the areas of farm management, finance, and policy.

Karen Brooks* - Assistant Professor. Ph.D., University of Chicago, 1982. Agricultural policy and prices. Current research includes economic policy in centrally planned economies, especially the USSR, and applied price theory in the area of human capital investment. She serves on the American Agricultural Economics Association's Committee on Professional Relations with the USSR. Her work has been published by Indiana University Press, Iowa State University Press, Johns Hopkins University Press, The American Enterprise Institute, *American Journal of Agricultural Economics*, *Science*, and *The Bulletin of the Atomic Scientists*.

Willard Cochrane* - Professor Emeritus. Ph.D., Harvard University, 1945. Domestic food and agricultural policy, world food problems and economic development. He has served on the board of the American Agricultural Economics Association, was agricultural advisor to Senator J. F.

Kennedy and to the Secretary of Agriculture while being director, Agricultural Economics, USDA. He has held numerous advisory and consulting positions throughout the world. His current interests include collaborating on a new book, *Reforming Farm Policy: Toward a National Agenda*. His work has been published in several books and journals, including *American Journal of Agricultural Economics*, *Journal of Farm Economics*, and *Agricultural Economics Research*.

Bud Crewdson* - Associate Professor, Extension Economist and Director, Small Business Development Center. M.S., University of Minnesota, 1966. Small business management education. Current activities emphasize the development of decision support systems for managers of small non-farm businesses and determining the role of small businesses in community/regional economics development.

Dale Dahl* - Professor. Ph.D., University of Minnesota, 1964. Agricultural marketing and price analysis; agricultural law. Current research involves studies related to agricultural inputs, aggregate input demand interrelationships, input industrial organization. Teaching involves input marketing and agricultural law.

Reynold Dahl* - Professor. Ph.D., University of Minnesota, 1954. Agricultural marketing, futures markets and prices, agricultural cooperatives. He chairs the undergraduate committee and coordinates the Applied Economics major. Current research includes economic analysis of marketing wild rice and performance of the U.S. grain marketing system. He is a member of the editorial board of the *Review of Futures Markets* and the coauthor of "Economics of Grain and Soybean Processing in the United States" in *Economics of Food Processing in the United States*. He has served as a consultant on agricultural marketing in several developing countries and Chief of Party and Economist for the University of Minnesota in Tunisia under contract with U.S.A.I.D.

K. William Easter* - Professor. Ph.D., Michigan State University, 1966. Resource economics and development. Current research includes analysis of groundwater pollution, an estimation of damages caused by cropland soil erosion, evaluation of interbasin water transfers, and a study of the role of resources and the environment in international development. He has published widely in such journals as *Water Resources Research*, *American Journal of Agricultural Economics* and *Land Economics* and has recently edited two books, one on *Irrigation Investment, Technology and Management Strategies for Development* and the other on *Watershed Resources Management: An Integrated Framework with Studies from Asia and the Pacific*.

Vernon Eidman* - Professor. Ph.D., University of California, Berkeley, 1965. Production economics and farm management. Current research focuses on dynamic modeling of agricultural production and the analysis of risk management strategies for farm firms and on the factors leading to structured change in the livestock and poultry industry and the implications of these changes for the agricultural sector. He is on the board of directors of the American Agricultural Economics Association. Publications in recent years include coauthor of a farm management textbook and numerous articles in the *American Journal of Agricultural Economics* and *Western Journal of Agricultural Economics*.

Jeremiah Fruin* - Associate Professor and Extension Economist. Ph.D., University of California, Berkeley, 1971. Transportation economics, agricultural marketing and logistics. Current research includes international logistics and transportation requirements for agricultural commodities and the management of rural road systems. Activities include NC137 North Central Committee for Agricultural Transportation Research. Publications include articles in the *North Central Journal of Agricultural Economics* and *Journal of the Transportation Research Forum*.

Earl Fuller* - Professor and Extension Economist. Ph.D., University of

Minnesota, 1965. Farm management and production economics. Current research includes the development of decision supporting management information systems for farm firms and the economics of dairy and crop farm adjustment to a changing environment. He teaches (resident) linear programming and (extension) tax management, outlook, marketing management, dairy, crop and machinery economics and management, communications and human relations in management, and computer use on farms.

Jerome Hammond* - Professor. Ph.D., University of Wisconsin, 1963. Agricultural marketing and pricing. Current research focuses on price and marketing policies in developing countries, structural changes in the U.S. dairy industry and dairy price policies. He teaches classes on agricultural marketing, prices, and dairy marketing and policy. Recent publications appear in the Minnesota Experiment Station Series and in the *American Journal of Agricultural Economics*.

Richard Hawkins - Professor, Extension Economist and Director of the Center for Farm Financial Management. M.S., University of Minnesota, 1969. Production economics and farm management. Current work is in the areas of farm financial planning and analysis, management information systems, computerized farm decision aids, and agricultural credit analysis.

James Houck* - Professor and Department Head. Ph.D., University of Minnesota, 1963. Agricultural prices, policy, and trade. Current research involves U.S. trade, trade policy, and agricultural policy. He has traveled and worked professionally in Australia, Thailand, Spain, and China. He has published several books and articles in professional journals such as *American Journal of Agricultural Economics*, *North Central Journal of Agricultural Economics*, *Agricultural Economics*, and others. He has been editor of *American Journal of Agricultural Economics* and active on the boards of several professional organizations including the Agricultural

Development Council and the American Agricultural Economics Association to which he was elected President in 1991. He played on the department softball team for 26 years.

Robert King* - Professor. Ph.D., Michigan State University, 1979. Management information systems, production economics, and agribusiness management. Current research includes economics of information systems, risk management, and decision support system development for commodity marketing management. He holds the E. Fred Koller Chair in Agricultural Management Information Systems, serves as associate editor of *American Journal of Agricultural Economics* and as associate director, Strategic Management Research Center. Recent publications have appeared in *American Journal of Agricultural Economics*, *Southern Journal of Agricultural Economics*, and *Agribusiness*.

Jean Kinsey* - Professor and Director of Graduate Studies. Ph.D., University of California, Davis, 1976. Consumption and household economics; consumer, food, and agricultural policy; food safety and the economics of information. Current research includes the impact of food prices on aggregate consumption, valuing non-market time and exploring the shifts in domestic food demand and its implications for agricultural production and policy. She has served as president of the American Council on Consumer Interests, was on the Governing Board of the American Agricultural Economics Association Foundation, and is on the Board of Directors of the Federal Reserve Bank of Minneapolis. Publications appear in several book chapters, the *American Journal of Agricultural Economics*, *Journal of Consumer Research*, *European Agricultural Economics Journal*, *Journal of Consumer Affairs*, and a new book on *Food Trends and the Changing Consumer*.

William Lazarus* - Associate Professor and Extension Economist. Ph.D., University of Illinois, 1981. Farm business and financial management. Current research interests include economics of alternative enterprises and technologies, and agricultural

information systems. He has published in the *North Central Journal of Agricultural Economics*, *American Journal of Agricultural Economics*, *Energy in Agriculture* and *Journal of Dairy Science*.

Richard Levins* - Associate Professor and Extension Economist. Ph.D., Mississippi State University, 1982. Farm management and computer applications. His research and extension programs involve applications of artificial intelligence, sustainable agriculture, and alternative crops. He has published two books on agricultural computing and several articles in national and regional journals. Current work involves combining practical decision making with advanced computer techniques.

Scott Loveridge* - Assistant Professor and Extension Economist. Ph.D., Michigan State University, 1989. Community economic development policy and regional economics. Current research includes alternative measures of the impact of regional policies and programs on economic growth. He served as an agricultural policy advisor in Rwanda from 1985 to 1987. He has published in *Food Policy* and the *Economic Development Review*.

Wilbur Maki* - Professor. Ph.D., Iowa State University, 1956. Regional economics and regional decision information systems. Current research includes analysis and construction of decision support systems for state and regional resource management and new business ventures. He has served as the Minnesota State Economist.

George Morse* - Professor. Ph.D., University of Wisconsin, 1975. Community and regional economics. Current research emphasizes the evaluation of community programs to encourage the retention and expansion of local businesses. He does applied research/educational programs with community groups on economic development strategic planning and business retention and expansion strategies. He recently edited and was senior author of a book on *The Retention and Expansion of Existing Businesses* and co-authored articles in the *Economic Development Review*.

Kent Olson* - Associate Professor and Extension Economist. Ph.D., Iowa State University, 1979. Production economics and farm management. Current research interests include financial planning and control, management and policy issues of sustainable agriculture, and size and structure issues. He is the state coordinator with the Southeastern and Southwestern Minnesota Farm Business Management Associations. He has published in the *Southern Journal of Agricultural Economics*, *Western Journal of Agricultural Economics* and *Computers and Electronics in Agriculture*.

Philip Pardey* - Assistant Professor. Ph.D., University of Minnesota, 1986. Agricultural research policy, technology transfer and agricultural development. Current research includes building and analyzing a global data base on agricultural research systems and the impact of research policies on developing countries. He holds a joint appointment as a research officer at the International Service for National Agricultural Research (ISNAR), The Hague and this department. He is coauthor of two books and numerous papers on agricultural research policy.

Claudia Parliament* - Associate Professor and Extension Economist. Ph.D., University of California, Berkeley, 1984. Community economic development and small business management. Current research includes a study comparing financial performance of investor-owned firms and cooperatives and a study evaluating the effect of land ownership on local economies. Research on production cooperatives was recently published in the *Journal of Comparative Economics*.

Glenn Pederson* - Associate Professor. Ph.D., Michigan State University, 1979. Agricultural finance. Research activities include analysis of financial institutions and markets; management, performance, and policy issues; farm finance and investment decisions; and cooperative financial management. His research has been published in the *Western Journal of Agricultural Economics*, *Choices*, and *Agricultural Finance Review*.

Willis Peterson* - Professor. Ph.D., University of Chicago, 1966. Technical change and economic development. Current research includes the measurement of research productivity of U.S. agricultural experiment stations, an analysis of world food problems, and measurement of international differences in agricultural productivity. His work is published in *The American Economic Review*, *American Journal of Agricultural Economics*, *Journal of Economic History*, *Journal of Political Economy*, *Agricultural Economics*, *KYKLOS*, *Food Policy*, and *Principles of Economics: Micro*, and *Principles of Economics: Macro*.

Philip Raup* - Professor Emeritus. Ph.D., University of Wisconsin, 1949. Land economics, structural change, world agricultural development. Current research is in land markets and values, land use shifts, comparative land tenure structure and reform, with representative reports in *Land Tenure* (coeditor); *The Changing Structure of Europe* (coauthor); and chapters in *Agricultural Development and Economic Growth: Size, Structure and Future of Farms*; *Soviet Economic Statistics*; *The Future of American Agriculture as a Strategic Resource*; *Farming in the Soviet Union and Eastern Europe*; *Our American Land*.

Terry Roe* - Professor and codirector of the Economic Development Center. Ph.D., Purdue University, 1969. Economic development, prices and marketing. Current research includes general equilibrium with rent-seeking households and endogenous government behavior, stochastic market processes, the economics of information, and food safety. He is leader of the Development Assistance and Policy Program of the Center for International Food and Agricultural Policy and an adjunct member of the faculty of the University's Hubert H. Humphrey Institute of Public Affairs. He was a Visiting Fellow of Yale University's Economic Growth Center during 1984-85. He has published in the *American Journal of Agricultural Economics*, *Journal of Development Economics*, *Review of Economics and Statistics*, and *Journal of Policy Modelling*.

C. Ford Runge* - Associate Professor. Ph.D., University of Wisconsin, 1981. Agricultural policy, natural resources policy, welfare economics. Current research interests include U.S.-European agricultural trade and policy, GATT negotiations, and comparative soil and water conservation policies. His recent publications are in *Foreign Affairs*, *American Journal of Agricultural Economics*, and *Land Economics*, and a new book, *Reforming Farm Policy: Toward a National Agenda*.

Vernon Ruttan* - Regents' Professor. Ph.D., University of Chicago, 1952. Economic development, agricultural research policy and development assistance policy. Current research includes a series of (a) technical assessments and (b) development assistance impact and policy studies. (See section on Regents' Professor on page 3.)

G. Edward Schuh* - Professor and Dean of the Hubert H. Humphrey Institute of Public Affairs. Ph.D., University of Chicago, 1961. Agricultural development, international finance and exchange rate policy. He has been a director of the American Agricultural Economics Association; the National Bureau of Economic Research in Cambridge, Massachusetts; the Economic Institute in Boulder, Colorado; the Minneapolis Grain Exchange; and the Department of Agriculture and Rural Development at the World Bank. He served on the President's Council of Economic Advisors and was an Assistant Secretary for International Development and Commodity programs in the USDA. He has had international teaching and advising experience in Latin America, Egypt, and India. His current interests and work include food and agricultural policy, economic development, and international trade. He has authored four books, edited six others, and published research articles in numerous journals including the *American Journal of Agricultural Economics*, *Western Journal of Agricultural Economics*, *Canadian Journal of Agricultural Economics*, *The American Economic Review*, *Ceres*, *Revista Brasileira de Economia*, and *Cuadernos de Economia*.

Benjamin Senauer* - Professor. Ph.D., Stanford University, 1975. Consumption economics and food policy. Current research interests include food demand analysis, welfare analysis of consumer information, models of household behavior, and food and nutrition policy both domestic and in developing countries. A new research interest is the topic of food safety. He is coauthoring a book on *Food Trends and the Changing Consumer* and has coedited a book on agricultural development policy. He has published papers in *The Quarterly Journal of Economics*, *American Journal of Agricultural Economics*, *Journal of Consumer Affairs* and *Food Policy*.

Frank Smith* - Professor Emeritus. Ph.D., University of California, Berkeley, 1961. Agribusiness management and finance. He has coauthored books in these two areas. He has served as an associate editor of the *American Journal of Agricultural Economics* (1981-82). He teaches a course in agribusiness strategy at the undergraduate level and is currently developing case materials for use in the course. He maintains a research interest in small business development and cooperative organization.

Stanley Stevens* - Associate Professor and Extension Economist. Ph.D., University of Illinois, 1972. Marketing. Current research includes efficiency of the agricultural options markets and weather driven markets in corn and soybeans.

Thomas Stinson* - Professor and Minnesota State Economist. Ph.D., University of Minnesota, 1973. Public finance and regional economic development. Current research includes evaluations of alternative strategies for nonmetropolitan development and estimates of the impact of taxes on individual decisions. He serves as the state economist for the State of Minnesota.

Wesley (Burt) Sundquist* - Professor. Ph.D., Michigan State University, 1957. Agricultural production economics and policy. Current research includes technology assessment, analysis of agricultural research policy and commercial farm policy. He has

served on the Editorial Council of the Journal of Farm Economics, on the Board of Directors of the American Agricultural Economics Association, and on the Governing Boards of the American Agricultural Economics Association Foundation. He has published papers in the *American Journal of Agricultural Economics*, *North Central Journal of Agricultural Economics*, and in a number of Agricultural Experiment Station and Office of Technical Assistance publications.

Steven Taff* - Associate Professor and Extension Economist. Ph.D., University of Wisconsin, Madison, 1985. Agricultural, resource, and environmental policy. Current research includes analysis of cropland retirement programs, establishment of workable easement programs, and evaluation of water quality protection efforts. Major extension teaching is in commercial agricultural policy, international trade, natural resource management, and environmental policy.

Kenneth Thomas* - Professor and Extension Economist. Ph.D., University of Minnesota, 1968. Farm Management. Current activities emphasize farm financial planning, estate planning, business arrangements, and personnel management.

Yacov Tsur* - Assistant Professor. Ph.D., University of California, Berkeley, 1983. Econometrics and natural resource economics. Current research includes dynamic modeling of innovation processes adoption, welfare analysis under uncertainty, and developing distribution free estimation methods for censored regression (Tobit) models. Recent publications will appear in *Economics Letters*, *Oxford Economics Papers*, and *Water Resources Research*.

Harald von Witzke* - Associate Professor, and Director, Center for International Food and Agricultural Policy. Ph.D., University of Goettingen, West Germany, 1977. International agricultural policy and trade, European agriculture. Current research includes European Community (EC) enlargement, U.S.-EC trade policy analysis, international

policy coordination (GATT) and determinants of agricultural and trade policy decisions. He is a member of the International Agricultural Trade Research Consortium and a program leader of Trade and Commodity Policy of the Center for International Food and Agricultural Policy. His publications include several books; and articles on agricultural trade and policy in books and professional journals such as *Public Choice*, *American Journal of Agricultural Economics*, and *European Review of Agricultural Economics*. His publications have been translated into Italian, Spanish, Portuguese and German.

Arley Waldo* - Professor and Extension Economist. Ph.D., Michigan State University, 1963. Public finance and tax policy, economics of public services. Current research focuses on the interrelationships between property taxation and state aid to local governments and school districts.

Delane Welsch* - Professor and Assistant Dean for International Agriculture, College of Agriculture. Ph.D., Michigan State University, 1964. Production economics, farm management, and international agricultural development. Research activities include international development assistance, farming systems, and selected tropical products. He has served as liaison officer, American Agricultural Economics Association to the American Agronomy Association; member of the Board of Directors, Midwestern Universities Consortium for International Activities (MUCIA); and Association of U.S. Universities International Agricultural Programs.

Carole Yoho - Associate Professor and Extension Economist. M.A., University of Minnesota, 1961. Public policy education, local government, public finance, and policymaking process. Current work is in the Extension Community Economic Development Program area. Current interests include education and aging issues. She writes the *Public Policy Newsletter* for the department.

*Graduate student advisor

THE GRADUATE PROGRAM IN AGRICULTURAL AND APPLIED ECONOMICS

DEGREES OFFERED

The Department offers Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degrees. The M.S. is offered under Plan A (with thesis) or Plan B (with a major research paper).

REQUIREMENTS FOR THE M.S.

Admittance into the M.S. program requires knowledge of undergraduate micro and macroeconomic theory, calculus, and linear algebra. All M.S. students are required to take the following core courses or to have had equivalent courses.

- Econ 5151 3 credits Micro Theory
- Econ 5152 3 credits Macro Theory
- Stat 5021 5 credits Statistical Analysis
- Stat 5302 5 credits Applied Regression Analysis

The student is required to: (1) participate in an M.S. research seminar, (2) attain a 3.0 GPA (grade point average) in the program for graduation, and (3) complete 44 credits.

Under Plan A, 28 course credits and 16 thesis credits are required. A total of 20 course credits must be in a designated major field and 8 course credits in one or more related fields. If the candidate wishes to take a designated minor field, a total of 9 course credits is required (making a total of 29).

Candidates for a Plan B Master's degree substitute a "project" for the thesis and must complete at least 44 course credits, with at least 20 course credits in a major field, 8 credits in one or more related fields or 9 credits in a minor field, and the remainder selected with the advice of a faculty advisor to round out a coherent program of study. The Plan B project demonstrates the candidate's capacities to make use of the tools of research, the ability to work independently and to present the results of such work

effectively. Up to 9 of the required credits can be earned for the approved project.

Candidates for the Master's degree take a final oral examination given by a committee of three faculty members including one member from outside the Department. The thesis/paper will be read by the committee prior to the final oral examination.

"There was good direction in the research program but enough flexibility to give me the opportunity to work in my area of interest."

REQUIREMENTS FOR THE PH.D.

Entrance into the Ph.D. program requires M.S.-level economic theory, advanced calculus, and statistics. Students who have only bachelor's-level work are usually asked to start at the M.S. level with an opportunity to change status to a Ph.D. student after two or three quarters of successful work.

Candidates are expected to follow a study program that includes a general field and a supporting program (or a minor plus a special field). The general field is made up of three subfields chosen from among: Agricultural Production Economics, Agricultural Prices and Marketing, Consumption Economics, Natural Resource and Environmental Economics, Agricultural Policy, Agricultural Development and Trade, and Regional Economics. A written preliminary examination is offered in each subfield and includes appropriate quantitative techniques.

The student's program must include a "supporting field" or minor program of 18 to 24 credits. Usually the candidate's supporting program includes work in Economics, Econo-

metrics and Statistics, but may include fields in other disciplines such as Political Science, Business Administration, Anthropology, Public Affairs, or one of the agricultural sciences.

Whether a minor in Economics is chosen or not, all Ph.D. candidates are required to pass a Department of Economics written preliminary examination in microeconomics.

In addition, candidates are expected to pass the following oral examinations:

1. A preliminary oral examination over the major program and the supporting program or minor, and/or the dissertation proposal.
2. A final oral examination covering the dissertation.

The Ph.D. dissertation must demonstrate originality and independent mastery of the literature of the subject. It must be completed within five years of the preliminary oral.

Students must be in residency for seven quarters of full-time registration.

"Strong points of the Minnesota program are the emphasis on economics and a lot of good courses in both the Economics and the Agricultural and Applied Economics Departments."

THE FIELDS OF SPECIALIZATION

The Department offers graduate instruction in four traditional fields of agricultural economics and in three applied economics fields related to agriculture. The principal fields of study are:

1. Production Economics and Agricultural Business Management
2. Agricultural Policy
3. Agricultural Development and Trade
4. Agricultural Prices and Marketing
5. Consumption Economics
6. Natural Resource and Environmental Economics
7. Regional Economics

PRODUCTION ECONOMICS AND AGRICULTURAL BUSINESS MANAGEMENT

Major emphasis in production economics is placed on the application of both static and dynamic theories of the firm to decision problems of farms and other agriculturally related enterprises. Intensive study is directed to the application of production, profit, and cost functions in policy analyses. Stochastic and dynamic considerations in resource allocation questions at the firm and aggregate level are stressed.

The central focus for the management area is on the application of economic and management principles to the decision problems of managers of agribusiness enterprises. Attention is given to managerial aspects of the operations of farm supply firms and farm product marketing firms. Study in this field involves course work in the University's Carlson School of Management as well as course work in the Department.

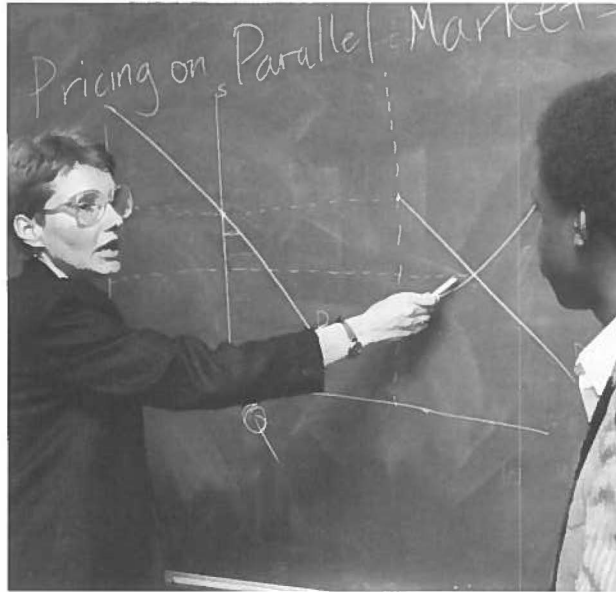
The following courses (and the professors who usually teach them) are associated with this field:

- 5020 Applied Linear Programming (Earl Fuller)
- 5104 Agricultural Systems Analysis and Modeling (Rob King)
- 5440 Cooperatives and Agribusiness Organization (Reynold Dahl)



Vernon Eidman consulting with graduate students

- 5500 Financial Markets and Agricultural Credit Institutions (Glenn Pederson)
- 5860 Economics of Agricultural Production (Jeff Apland)
- 5890 Advanced Topics in Farm Management (staff)
- 8220 Applied Mathematical Programming (Jeff Apland)
- 8287 Production and Supply (Willis Peterson)
- 8288 Dynamic Production Economics (Vernon Eidman and Rob King)
- 8382 Seminar: Farm Management and Production Economics (Vernon Eidman and Rob King)



Karen Brooks and a student



Rob King

AGRICULTURAL POLICY

Both theoretical and pragmatic aspects of agricultural and food policy are treated, with special emphasis on income, price, and production policies. Major attention is given to U.S. policy, its formulation and implementation. There is also opportunity for intensive study of international food and rural welfare policy, including the provision of public services. In addition, substantial attention is given to public policy dimensions of other fields of applied economics.

The following courses (and the professors who usually teach them) are associated with this field:

- 5650 Economics of Natural Resource Policy (William Easter)
- 5710 U.S. Agriculture: Farm, Food, and Environmental Policy (staff)
- 5730 European Agriculture: Farm, Food, and Environmental Policy (Harald von Witzke)
- 5740 Agricultural Policy in Planned Economies (staff)
- 5750 Agricultural Trade and Commercial Policy (James Houck)
- 8270 Applied Welfare Economics and Public Policy (Ford Runge)
- 8370 Agricultural and Trade Policy in Developed Countries (Harald von Witzke)
- 8373 Seminar: Food and Agricultural Policy in the U.S. (staff)
- 8590 Economics of Food and Consumer Policy (Jean Kinsey)

In addition, the Hubert H. Humphrey Institute of Public Affairs offers a variety of policy oriented courses including Policy Process, Policy Analysis and topics in housing policy, energy policy, income maintenance policy, professional services and public policy, and urban public policy.

AGRICULTURAL DEVELOPMENT AND TRADE

Attention is given to theories of socioeconomic growth; technical, economic, and institutional aspects of the development process; policy matters including food supplies, rural welfare, and regional and international considerations.

The following courses (and the professors who usually teach them) are associated with this field:

- 5580 Human Capital and Household Economics (Jean Kinsey)
- 5720 Economics of World Agriculture (Vernon Ruttan)
- 5730 European Agriculture: Farm, Food, and Environmental Policy (Harald von Witzke)
- 5750 Agricultural Trade and Commercial Policy (James Houck)
- 5790 World Food Problems (Willis Peterson)
- 8278 Agricultural and Economic Development (Terry Roe)
- 8370 Agricultural and Trade Policy in Developed Countries (Harald von Witzke)
- 8378 Seminar: Agricultural Development (Vernon Ruttan, Terry Roe)

See also Public Affairs 8540, Agricultural Development Planning



Terry Roe

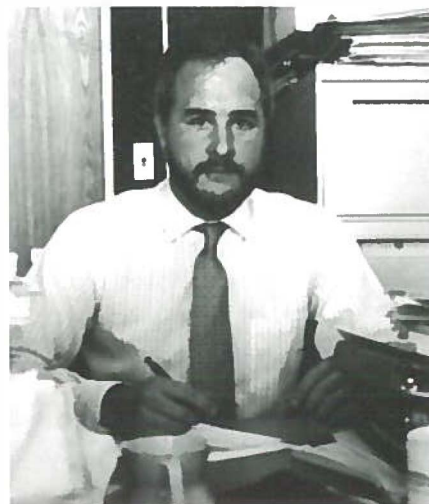


James Houck, Department Head

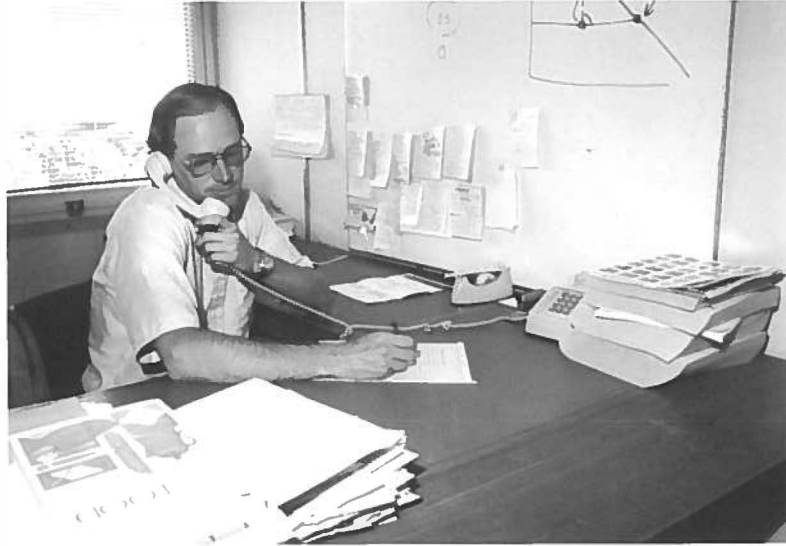
AGRICULTURAL PRICES AND MARKETING

Primary attention is given to contemporary price theory and to modern methods of price analysis, demand and supply estimation, and price forecasting. The development of analytical models and their applications in various market situations is covered, plus advanced study of the demand for agricultural products, factors affecting their supply, and prices.

Study is directed to the structure and performance of economic systems involved in the processing and distribution of food and fiber products and of inputs used by farmers. Attention is given to demand and supply factors over time, space, and product form,



Jeff Apland



Ben Senauer

international mechanisms, pricing practices, product differentiation, uncertainty, and market regulation. Studies of such institutions as cooperatives, corporations, and futures trading markets are given special emphasis. Regulation and policy in food marketing are addressed.

The following courses (and the professors who usually teach them) are associated with this field:

- 5400 Intermediate Market and Price Analysis (Jerome Hammond)
- 5440 Cooperatives and Agribusiness Organization (Reynold Dahl)
- 5480 Futures Markets and Prices (Reynold Dahl)
- 5750 Agricultural Trade and Commercial Policy (James Houck)
- 8210 Applied Econometrics (Yacov Tsur)
- 8231 Agricultural Prices (James Houck)
- 8245 Agricultural Marketing Economics (staff)
- 8345 Seminar: Agricultural Marketing (staff)

"The program can accommodate students with a diverse range of career and intellectual interests."

CONSUMPTION ECONOMICS

Attention is given to the theory of consumer behavior, demand analysis, and public policy. A major focus is on the impact of legislative and regulatory policies on consumer welfare. Study in the field also includes application of various methods of economic and statistical analysis of consumer demand, utility maximizing behavior, changes in consumer welfare, food consumption and distribution, and consumption externalities.

The following courses (and the professors who usually teach them) are associated with this field:



William Easter

- 5550 Food Marketing Economics (Ben Senauer, Elaine Asp)
- 5580 Human Capital and Household Economics (Jean Kinsey)
- 8345 Seminar: Agricultural Marketing (staff)
- 8590 Economics of Food and Consumer Policy (Jean Kinsey)
- 8591 Consumption Economics (Ben Senauer)

NATURAL RESOURCE AND ENVIRONMENTAL ECONOMICS

Emphasis is given to economic analysis of the private and public decision problems relating to the conservation and use of natural resources. Attention is given to land, water, forest, and wildlife resource problems, to problems of environmental quality and to nonrenewable resources, including minerals, coal, and petroleum.

The following courses (and the professors who usually teach them) are associated with this field:

- 5600 Land Economics (Philip Raup)
- 5650 Economics of Natural Resource Policy (William Easter)
- 8264 Resource Economics (staff)
- 8270 Applied Welfare Economics and Public Policy (Ford Runge)
- 8360 Seminar: Land and Institutional Economics (Ford Runge)
- 8364 Seminar: Resource Economics and Policy (staff)

REGIONAL ECONOMICS

A central focus is on the changing economic prospects of communities and regions and the effects of these changes on employment, income, and services. Attention is given to basic concepts and methods of analysis used in the analysis of subregions; particularly space utilization, development planning, industrial location, and population and employment problems. The field also includes the study

of regional economic systems including market economies and public sector activities.

The following courses (and the professors who usually teach them) are associated with this field:

- 5600 Land Economics (Philip Raup)
- 5620 Regional Economic Analysis (Wilbur Maki)
- 5630 Regional Development Systems (Wilbur Maki)
- 5640 Financing State and Local Governments (staff)
- 5650 Economics of Natural Resource Policy (William Easter)
- 8266 Applied Regional Economics (Wilbur Maki)
- 8270 Applied Welfare Economics and Public Policy (Ford Runge)
- 8366 Seminar: Applied Regional Economics (Wilbur Maki)



Philip Raup

GRADUATE COURSES

Prerequisites: Most of these courses have as a prerequisite intermediate micro economic theory; most require calculus and linear algebra as well.

5020. **Applied Linear Programming** (4 cr)
Application of linear programming to farm and agribusiness firms. Emphasizes economic concepts using minimal mathematics. Develop skills in computer use for decision making. Profit maximization, cost minimization, and transportation analysis.
5030. **Methods Of Economic Data Analysis** (4 cr)
Designed primarily for M.S. students, emphasizes practical aspects of economic data analysis and intends to familiarize students with various econometric methods and models commonly used in applied economics, and the economic and statistical theory that underlies these methods.
5400. **Intermediate Market And Price Analysis** (4 cr)
Development of analytical models and their applications in various market situations. Unique market institutions developed in response to marketing problems and policies.
5440. **Cooperatives And Agribusiness Organization** (4 cr)
Analysis of the economic problems and issues facing agricultural cooperatives including changing market organization, financing, taxation, antitrust regulations and others.
5480. **Futures Markets And Prices** (4 cr)
Economics of futures trading; the basis and theoretical price relationships in storable and nonstorable commodities; hedging and commercial use of futures markets with illustrations; arbitrage, options on agricultural futures; financial futures; speculation; futures market performances and regulations.
5500. **Financial Markets and Agricultural Credit Institutions** (4 cr)
Analysis of financial institutions and financial markets. Managerial policy issues confronting managers of financial intermediaries with particular reference to those operating in an agricultural setting. Current issues confronting financial intermediaries.
5550. **Food Marketing Economics** (4 cr)
Economics of food marketing in the U.S. Covers food consumption trends, consumer food behavior, food expenditure and consumption data, consumer survey methodology, the food distribution and retailing system, food policy issues related to food marketing. Students pursue individual and group projects.
5580. **Human Capital And Household Economics** (3 cr)
Investment in household formation, children, education, health, labor force participation, and nonmarket work will be analyzed in the context of household economics and national productivity; effects of economic variables on investment decisions and returns.
5600. **Land Economics** (3 cr)
Land as a factor of production; land use, classification, and value; sale and rental markets for land; domestic and foreign land policies.
5620. **Regional Economic Analysis** (3 cr)
Analysis of regional industry and community structure; role of resource, transportation and institutional constraints, trade, migration, and investment and regional growth and change. Use of regional economic information in business investment and location planning.

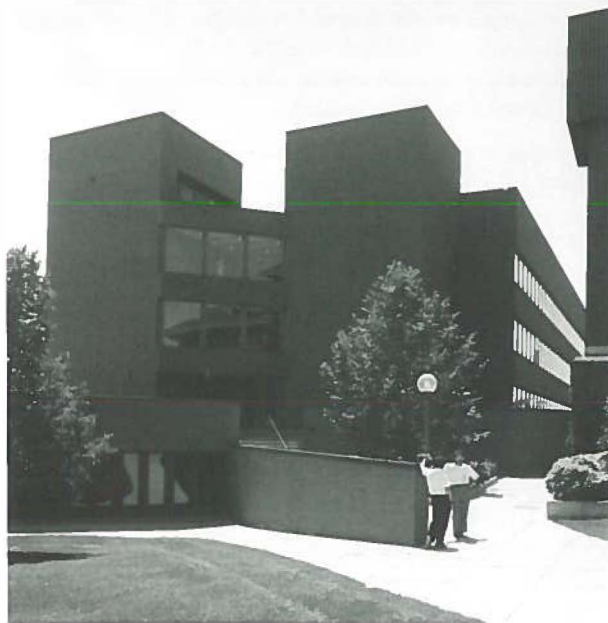
5630. **Regional Development Systems** (3 cr)
Population, income, and employment disparities in regional growth and development in selected countries. Regional development strategies and institutions for public intervention in regional development process. Regional systems analyses and forecasts for economic policy and development planning.
5640. **Financing State And Local Governments** (4 cr)
Problems and issues in financing state and local public services in the U.S., state and local revenue systems, debt, and expenditures. Intergovernmental fiscal relations. Budget analysis.
5650. **Economics Of Natural Resource Policy** (4 cr)
Application of economic analysis, including project evaluation, to current natural resource issues. Emphasis on conservation and resource scarcity, environmental quality, population growth and resource use issues and their implications for public policy.
5710. **U.S. Agriculture: Farm, Food, And Environmental Policy** (3 cr)
Development of U.S. agriculture and U.S. agricultural and trade policy; agricultural input and commodity markets; design and economic effects of U.S. agricultural policy; determinants of U.S. agricultural and trade policies.
5720. **Economics Of World Agriculture** (3 cr)
Theories of agricultural development, comparative agricultural organization and structure, technical and institutional change in agricultural development, national development policies, bilateral and multilateral assistance, international policy conflicts.
5730. **European Agriculture: Farm, Food, And Environmental Policy** (4 cr)
Characteristics of agriculture in Europe; determinants of the development of European agriculture; goals and instruments of the European Community's agricultural policy.
5740. **Agricultural Policy In Planned Economies** (4 cr)
Principles of economics used to analyze agricultural policy and performance in centrally planned economies. Emphasis is on Soviet agriculture, but some attention to China and Eastern Europe.
5750. **Agricultural Trade And Commercial Policy** (3 cr)
Patterns of trade in agricultural products, trade policies and practices of export and import nations, commodity agreements, agricultural trade policies of common market areas, negotiations and potential trade developments.
5790. **World Food Problems** (3 cr)
A multidisciplinary approach to the social, economic, and technical problems of feeding the world's growing population. Principles are developed from social and economic sciences, plant sciences, and animal sciences for their application to food problems.
5860. **Economics Of Agricultural Production** (3 cr)
Production economics applied to agriculture, profitable combination of production factors; comparative advantage and location of production.
5890. **Independent Study: Advanced Topics In Farm Management** (1-6 cr)
Special topics or individual work may be arranged on subjects suited to the needs of particular groups of students.

5990. **Special Topics And Independent Study In Agricultural And Applied Economics** (cr ar)
Special classes, independent study, and supervised reading and research on subjects and problems not covered in regularly offered courses. Will also be used for Plan B Master's degree projects.
8200. **Advanced Topics In Agricultural And Applied Economics** (1-9 cr) (may be repeated for cr)
Special seminars or individual work on subject suited to needs of students. May be used for the purpose of developing a Ph.D. thesis proposal on S-N basis only.
8210. **Applied Econometrics** (3 cr)
Basic skills needed to use econometrics in actual practice. Choosing functional forms and selecting variables; collinearity and outliers; limited dependent variable models in a single and simultaneous-equation context. Emphasis is on application to real world data.
8220. **Applied Mathematical Programming** (3 cr)
Application of linear, integer, nonlinear, and simulation techniques to problems of the firm, market, economy, and regional or sectorial planning.
8231. **Agricultural Prices** (3 cr)
Nature of demand for farm products, supply considerations, price formation and markets, price variation and instability, methodological considerations.
8245. **Agricultural Marketing Economics** (3 cr)
The time, space, and form dimensions of markets are studied for cases of static and stochastic environments. Emphasis is placed on the use of current conceptual constructs. The implications of markets for contingent claims, incomplete information and rent seeking on welfare are also evaluated.
8264. **Resource Economics** (3 cr)
Economic analysis of resource use and management. Emphasis on capital theory and dynamic resource allocation, uncertainty and irreversibility in resource decision making and dynamic game analysis of common property resources. Applications to exhaustible forestry, fishery, and water resources.
8266. **Applied Regional Economics** (3 cr)
Concepts, theories, and models of regional economic growth and development. Application of regional location, income and product, export base and multiplier, business cycle, industrial complex, and community economic analysis in regional policy and planning.
8270. **Applied Welfare Economics And Public Policy** (3 cr)
The course considers the basic concepts underlying the measurement of welfare change, problems of market failure and externalities, social welfare functions, and distribution within and across generations. The last section of the course briefly examines how these concepts are applied in practice, based on case studies of the environment, returns to research, technical change, and agricultural policy.
8278. **Agricultural And Economic Development** (3 cr)
Theories of socioeconomic growth; consumption, production, and supply relations in agricultural development; agricultural development policy.
8287. **Production And Supply** (3 cr)
Functional forms and specification of production functions; measurement problems; specification bias; dummy variables; evaluating marginal products and returns to scale; supply estimation; distributed lags;

- demand for factors of production; project evaluation; technical change; returns to research; human capital.
8288. **Dynamic Production Economics** (3 cr)
The analysis of firm-level production economics problems in a dynamic setting is stressed. Alternative theories of the firm and techniques of analysis are studied and evaluated.
8345. **Seminar: Agricultural Marketing** (3 cr)
8360. **Seminar: Land And Institutional Economics** (3 cr)
This course addresses the current coming together of neoclassical and institutional schools of economic thought in what is known as the "New Institutional Economics." The primary area of application is to land economics, property rights, and environmental issues.
8364. **Seminar: Resource Economics And Policy** (3 cr)
Economic analysis of externalities. Models of regulation of environmental pollution, valuation of nonmarket goods, benefit-cost analysis.
8366. **Seminar: Applied Regional Economics** (3 cr)
8370. **Agricultural And Trade Policy In Developed Countries** (3 cr)
Agriculture in developed countries and the world economy; goals, principles, and instruments of agricultural trade policy intervention; implementation and problems of agricultural and trade policies in developed countries; political economy of agricultural policy decision making.
8373. **Seminar: Food And Agricultural Policy In The United States** (3 cr)
The formulation and execution of policy in the food and agricultural sector: application of economic analysis to food and agricultural policies and programs, critical review

and analysis of policies past and present, the future of food and agricultural policy.

8378. **Seminar: Agricultural Development** (1 or 3 cr)
8382. **Seminar: Farm Management And Production Economics** (3 cr)
8590. **Economics Of Food And Consumer Policy** (3 cr)
Economic analysis of the issues and impacts of public policies relating to food pricing and distribution, product quality and information, food safety and liability; international comparisons of food and agricultural policy and its impact on consumers' welfare.
8591. **Consumption Economics** (3 cr)
Analytical and empirical treatment of consumer behavior. Modern adaptations of theory to explain household economics, Lancaster models, consumer demand and expenditure models and estimations.



The Classroom Office Building, the home of the Department of Agricultural and Applied Economics

THE DEPARTMENT

JOINT ACTIVITIES WITH OTHER DEPARTMENTS/INSTITUTES

Faculty members in the Department of Agricultural and Applied Economics at the University of Minnesota collaborate with colleagues in numerous departments in addition to those in the College of Agriculture. They include the Departments of: Economics, Theoretical and Applied Statistics, Political Science, The Carlson School of Management, Food Science and Nutrition, Family Social Science, and the Hubert H. Humphrey Institute of Public Affairs.

The Department of Economics at the University of Minnesota is nationally recognized as one of the leading economics departments in the country. A further linkage between the departments is the Economic Development Center, which is jointly administered by the two departments.

The Departments of Theoretical and Applied Statistics are ranked among the top ten nationally. The wide range of course offerings provides an opportunity for graduate students in Agricultural and Applied Economics to develop related fields and minors at both the M.S. and Ph.D. levels.

The department also has ties with the Department of Political Science and has worked cooperatively in international development programs.

The department is involved with the Hubert H. Humphrey Institute of Public Affairs, which was created in memory of the late Senator Hubert H. Humphrey. The Institute has an international perspective and is the base for the well-known North-South Fellows Program.

INTERNATIONAL ACTIVITIES

The department and many of its faculty have been extensively involved in research and education in other countries. The department has had long-term contracts with U.S.A.I.D. and other international development agencies to provide staff for both short-



Jerome Hammond, William Easter, Vern Eidman and Burt Sundquist at a department reception.

and long-term consulting, research, and teaching. This includes an eight-year project on economic planning in the Ministry of Agriculture in Tunisia, the staffing of the University of Minnesota project at the Institute of Agronomy and Veterinary Medicine in Rabat, Morocco, a study of food marketing in Rwanda, analysis of irrigation projects in India and Thailand, and economic studies for the International Service for National Agricultural Research (ISNAR) in the Netherlands. As a result of these contracts and other individually negotiated arrangements, faculty members have taught courses, undertaken and collaborated on research, and have provided consulting services in virtually all parts of the world.

"The program was both flexible and generous, allowing me to do Ph.D. research in a developing country on a developing country problem."

Many of the graduate faculty members have advised foreign students who frequently undertake research on problems in their own countries. When funding has been available, some of our domestic students have collected data in foreign countries for economic research. Domestic U.S. students have undertaken research on irrigation in Thailand, fertilizer distribution in Tunisia, food policy in the Dominican Republic, and analysis of investment in agricultural research in Indonesia.



James Houck conferring with Chinese agricultural officials in Chanchung, China

The long history and strengths of the department in international agricultural policy research and training led to the creation of the Center for International Food and Agricultural Policy in 1988. The goals are "to provide leadership in research to improve our knowledge of the international aspects of food, agriculture, natural and human resources, and the environment." Teaching, research, and public service programs will be undertaken in four major areas: 1) commodity and trade policy, 2) research policy, 3) development assistance and policy, and 4) natural resource and environmental policy. As the Center expands its activities, the potential to fund graduate student research on international issues and in foreign countries should increase.



Jerome Hammond (left) and Jean Kinsey (5th from left) and students with officials from a dry bean marketing project in Rwanda, Africa.

CENTERS DIRECTED BY DEPARTMENT FACULTY

The Department of Agricultural and Applied Economics has been actively involved in the establishment and administration of four centers.

Center for International Food and Agricultural Policy—an interdepartmental research organization headquartered in the Department of Agricultural and Applied Economics. The director is Harald von Witzke. Its staff includes faculty from the Department of Agricultural and Applied Economics and from the Departments of Soil Science and Forest Resources as well as the Law School and the Hubert H. Humphrey Institute of Public Affairs.

The Center implements research activities under cooperative agreements with the University of Padova in northern Italy, the University of Guelph in Canada, and the International Service for National Agricultural Research in the Netherlands. Under the terms of these agreements, graduate students may perform research or take courses at these cooperating institutions.

A graduate student in Agricultural and Applied Economics can participate in Center activities by serving as a research assistant to one of the twenty-eight faculty members affiliated with the Center. In addition, the Center offers a graduate student fellowship in international food and



C. Ford Runge

agricultural policy. This four-year fellowship includes a generous stipend as well as a \$2,000 research travel grant to facilitate dissertation research overseas. One new Center fellowship is awarded per year.

The Center for Farm Financial Management—an extension education and research center focused on farm financial concerns. Its mission is to develop and support educational programs in farm financial planning, control, and analysis. It consists of a full-time staff of five plus associated faculty at Minnesota and forty other U.S. land grant colleges and a university in Ireland.

The Center supports FINPACK, a set of computerized farm financial planning and analysis programs made available through most state extension services. FINPACK has been used by over 60,000 farms across the country in the past four years. Development, use, and adaptation of the FINPACK computer system is a case study in successful institutional development and technological innovation without parallel in agricultural extension education. The Center funds two departmental research assistants in farm management and agricultural finance research projects.

The Economic Development Center—administered jointly by the Department of Economics and the Department of Agricultural and Applied Economics. The Center was organized to facilitate the research interests of the two departments in development economics and policy. It maintains an economics library and working paper series.

The State and Regional Research Center—jointly administered and funded by the Hubert H. Humphrey Institute, the Department of Geography, and the Department of Agricultural and Applied Economics. The Center's primary goal is to facilitate the scholarly research on regional economic development.



Professor Earl Fuller and Professor Richard Hawkins, Director, The Center for Farm Financial Management

Centers With Which Department Faculty Are Affiliated

Other centers which involve interdisciplinary research and with which members of the faculty are affiliated include:

The Strategic Management Research Center—jointly administered and funded by the Hubert H. Humphrey Institute, the Carlson School of Management, and the Department of Agricultural and Applied Economics. This Center undertakes research on issues of strategic importance to general managers and assists organizations in becoming more effective in strategic management. Current research program areas in this Center include management innovation and change, mergers and acquisitions, and new business start-ups.

The Water Resources Research Center—administered by the Graduate School. The Center is involved in water resources research and education in Minnesota.

The Center for Agricultural Impacts on Water Quality—formed within the Minnesota Agricultural Experiment Station to provide an interdisciplinary approach to research and educational programs on water quality issues. Its objectives include minimizing water contamination by chemicals, developing and improving managerial procedures that reduce agricultural chemical use, increasing our understanding of behavior and longevity of agricultural chemicals in

soil and ground water systems, and assessing the social and economic impacts of management practices.

The Center for Alternative Plant and Animal Products—administered by the Department of Horticultural Science and Landscape Architecture in collaboration with the Departments of Agricultural and Applied Economics, Agronomy and Plant Genetics, Food Science and Nutrition, Agricultural Engineering, Entomology, and Plant Pathology. This Center provides a forum for the systematic evaluation of plants and processes useful in commerce.

The Tourism Center—a relatively new Center associated with the Minnesota Extension Service in which the department played a significant initiating role and has a continuing interest. The Center, with cooperating programs in Duluth and Crookston will provide a focal point for education and research in the tourism/hospitality area, working with small businesses, communities, and industry associations.

Center for Rural Social Development—a newly developed Center to mobilize broad-based University resources (including all University of Minnesota campuses) to conduct research and extension programs about rural social issues.

Swine Center—supports interdisciplinary activities in the Colleges of Agriculture and Veterinary Medicine. Its purpose is to strengthen the research, teaching and extension programs, and service to the swine industry of Minnesota and the Midwest.

DEPARTMENTAL FACILITIES FOR GRADUATE STUDENTS

Financial Support

A number of graduate research assistantships (R.A.s) are available each year for training and work on research projects under the supervision of a faculty member. These are offered on

a competitive basis, subject to availability, with priority going to those with the best performance records. A new student holding an assistantship is encouraged to interview faculty who have openings or who share an interest

in a similar topic. The Director of Graduate Studies assigns positions based on the preferences of the faculty member and the student. Students are urged to develop thesis topics that can be pursued in connection with assistantship duties. A very limited number of teaching assistantships (T.A.s) are also available.

Generally awarded for twelve months, the assistantships are renewable subject to satisfactory performance with a limit of 21 months for a M.S. degree and 45 months for the Ph.D. degree (beginning at the date of entry into the program). Stipends are usually adjusted annually to reflect cost of living changes. In addition, benefits include health insurance and tuition payment. Assistantships normally entail a 50% workload throughout the year, or approximately twenty hours a week. Prior to passing the preliminary oral examination, Ph.D. level assistantships generally pay a stipend about 16% higher than the stipend for M.S. students. Ph.D. stipends increase after passing the preliminary oral examination. Students completing both the M.S. and Ph.D. degrees in the department may be supported for up to 60 months (beginning at the date of entry into the program).

It is often possible for students on a research assistantship to arrange for their thesis research to be carried on as part of the department's ongoing research activity and to fund data collection and computing costs from available research budgets. Where thesis research topics are selected that are outside the range of currently available funding, efforts may be made to seek special grants to support such programs of work.

There are a limited number of fellowships available from the Graduate School. The department regularly nominates those students who can compete well across the University; we are regularly awarded some of these fellowships. Some of our students hold fellowships from sources outside the university, such as the World Bank and the Fulbright, MacArthur, and other foundations.

Internship Opportunities

The department is very supportive of students pursuing internships to broaden their graduate programs. During an internship students can obtain professional work experience as well as ideas and information for Plan B research papers. Recently several students took three- to six-month leaves of absence and worked in Washington, D.C. at the Foreign Agricultural Service of the United States Department of Agriculture. Alternatively, students have combined local internships with course work. Examples of organizations which have provided internships are the Minnesota Association for Cooperatives, the Minnesota Higher Education Coordinating Board, and the Farm Credit Administration.

"At Minnesota there are people who have a genuine concern for me as an individual. They respect my goals and are willing to work with me to support my strengths and ideals in pursuit of a career."



The graduate committee of students and faculty make policy decisions.

THE ADVISING SYSTEM

All first-term graduate students are initially advised by a member of the department faculty well qualified to assess the initial needs of incoming students and to direct them to courses that will meet their basic needs, particularly in the areas of economic theory, statistics, and mathematics. Usually, after the first quarter, graduate students are advised by the department staff member under whose direction they will likely complete their graduate research.



"There is always someone to give you a good argument or to bounce your ideas off of."

THE GRADUATE CLUB

The Agricultural Economics Graduate Club is internally organized. A president, Ph.D. representative, M.S. representative, foreign student representative, and treasurer are nominated and elected by the graduate students each spring. This body represents the interests of the graduate students in the department by appointing student members to almost all the departmental committees; student views generally have a good reception in the department. The Club also organizes social activities throughout the year.



Grad Club picnic after finals

LIBRARY

The University of Minnesota Libraries on the Twin Cities campuses have more than 4 million cataloged volumes as well as extensive government document collections.

The St. Paul Campus Central Library, the building next to the Classroom Office Building, contains the Agricultural Economics collection as well as materials supporting the other disciplines taught on the St. Paul Campus. The St. Paul Campus Library has a large documents collection—U.S. FAO, OECD, and EC, as well as agricultural experiment station publications from 50 states. LUMINA, the library's catalog, provides access to the collections at the University. U.S. documents (published in 1976 or later) are on LUMINA, but FAO and state



Librarian, Louise Letnes, helps a student access on-line data

agricultural experiment station documents are not. Access to these uncataloged collections is available in the Reference Department of the St. Paul Campus Libraries. LUMINA can be accessed via microcomputers with modems from remote locations as well as in the library. The Reference Department offers CD-ROM searching of AGRICOLA and CAB as well as other databases. The library provides interlibrary loan services for materials not owned by the University Libraries.

Wilson Library, the Humanities/Social Sciences Library located on the West Bank of the Minneapolis Campus, holds the general economics collection. The Government Publications Library housed on the fourth floor of Wilson Library is a depository



Waite Library, a convenient resource in the department

for U.S. documents as well as United Nations, EC, and OECD documents.

The department maintains Waite Memorial Library for its faculty and graduate students. Major agricultural economics and economics texts are immediately accessible among the 20,000 cataloged volumes. The *American Journal of Agricultural Economics*, *American Economic Review*, and other major economic journals are available. Government publications from the USDA, U.S. Census Bureau, and other government agencies provide current statistics for research use. Trade journals, international research reports, and current working papers from agricultural economics departments and institutions are also included in the collection.

A full-time librarian provides reference support and updates on new publications and texts. The library also



Classroom Office Building

houses a collection of computer software and machine-readable data. On-line service accesses databases such as DIALOG and LEGI-SLATE.

OFFICE SPACE

The department attempts to provide desk space for all of our graduate students in the Classroom Office Building where the departmental offices and classrooms are located. Most students have desks in well-lighted, air-conditioned offices. Usually two to four graduate students share an office.

COMPUTER FACILITIES

Graduate students in the department have access to a variety of computing facilities. There is an assortment of



Graduate students using the computer lab

departmental software, time-sharing terminals, and micro computers and access to an IBM 3090, CDC CYBER 835 and 855, VAX 8600 ENCORE MULTIMAX, and CRAY 2 computer systems. Students are encouraged to develop skills essential to the effective use of such computing equipment. In addition the department has a computer support staff which collaborates in research designs. There is also access to other highly specialized technicians who can assist in developing the computer work for research efforts.

In the Classroom Office Building where the Department of Agricultural and Applied Economics is located, the University has a Microcomputer Lab with both Macintosh and IBM PS/2



The computer lab helps students conduct their research

computers. It has 17 Apple Macintoshes, 6 Apple Mac SEs, an Apple Laserwriter NT, an Apple flatbed scanner, 2 Apple Imagewriter II printers, and 6 Apple Imagewriter I printers. It also has 21 IBM PS/2 Model 50s with VGA color monitors and math coprocessors, 1 IBM personal pageprinter, 2 Hewlett Packard Deskjet printers, 2 IBM Proprinter IIs and 1 Epson LQ-1050 printer. Various wordprocessing and statistical software are installed on all these microcomputers. They are available for students to use.

STUDENT PROFILE

The composition of the graduate students in the Department of Agricultural and Applied Economics typically includes men and women from several foreign countries and from many parts of the United States. During 1990, a fairly representative period, the composition of students was as follows:

Total enrollment was 99 students: 34 M.S. students and 65 Ph.D. students.

30% of the total enrollment (or 30 students) were women. Women comprise 14% of the U.S. students and 16% of the foreign students.

61% of the total enrollment (or 61 students) were from foreign countries. Foreign students comprise 41% of the M.S. students and 72% of the Ph.D. students.

26% of the M.S. students and 23% of the Ph.D. students were men from the United States.

32% of the M.S. students and 4% of the Ph.D. students were women from the United States.

During 1990, 22 M.S. degrees and 16 Ph.D. degrees were granted.

QUOTES FROM STUDENTS AND ALUMNI

“The University of Minnesota offers students a rare combination of three strengths:

- a. A strong Agricultural and Applied Economics faculty with a tradition of both theoretical and empirical work,
- b. A proximity to top-notch economics, statistics and mathematics departments and,
- c. Location in a major metropolitan area with a variety of interesting colleagues and career opportunities in both the public and the private sectors.”

“The quality of the Ph.D. program is excellent, in part because the University of Minnesota has excellent resources and a first-rate reputation.”

“Both the theoretical background and practical knowledge that I have received from the program in price analysis and production have been useful in my career.”

“The presence of a strong economics program was a real plus.”

“The combination of a wide array of technical courses in applied and theoretical fields and the feasibility of doing research in a field of interest to me and the generous financial support made it a useful, formative, and enjoyable experience.”

“The academic environment in the department fostered my ability to think for myself, to have more confidence in my conclusions, and to continue to develop.”

"It was exciting to work with the faculty in production and natural resource and environmental economics who have a clear understanding of the latest advances in economic theory and are successfully developing innovative ways to apply this theory."

"Two things come to mind—opportunity and commitment. I think of opportunity because the program has opened up a world of opportunities for me. I think of commitment in the mutual sense. I have committed time and energy in pursuit of knowledge. The program has committed the means for that to happen."

"The program has afforded me the opportunity to expand my abilities and go beyond what I thought I could accomplish."

"Recalling my graduate school days in Minnesota, two attributes come to mind. First is the excellent blend of economic theory with applications to agricultural problems. Second (and perhaps more important) is the friendly environment and the great group of individuals I had the opportunity to meet and become friends with."

"When people ask, 'how's school?' I usually say, 'intellectually stimulating.' I love the daily exposure to people who are working to promote knowledge and understanding."

"The program produces young economists able to survive in the fast lane."

THESIS AWARDS WON BY MINNESOTA STUDENTS: 1983-1991

AMERICAN AGRICULTURAL ECONOMICS ASSOCIATION

Outstanding Doctoral Dissertation

Frances Antonovitz, 1983. "The Value of Information and Allocative Error under Risk in Fat Cattle Production: The Role of Cash and Futures Markets."

Robert J. Myers, 1987. "Economic Inefficiency under Uncertainty and the Effects of Ideal Risk Markets in U.S. Agriculture."

John L. Rodgers, 1989. "Structural Change in Agriculture."

Honorable Mention Doctoral Dissertation

Richard M. Todd, 1984. "A Dynamic Equilibrium Model of Seasonal and Cyclical Fluctuations in the Corn-Soybean-Hog Sector."

Nir Becker, 1991. "Dynamic Supply from a Common Property Resource: Water Diversions from the Great Lakes."

Honorable Mention Master's Thesis

Maryline Gois, 1984. "Production and Price Risk Management in Agriculture: An Application to a Southwest Minnesota Farm."

Maureen R. Kilkenny, 1985. "An Economic Assessment of Biological Nitrogen Fixation in a Farming System in Southeast Minnesota."

AMERICAN INSTITUTE OF COOPERATION

Edwin Nourse Award

Richard Sexton, 1984. "The Formation of Cooperatives: An Analysis of Entry Incentives, Entry Deterrence, Optimal Financing Arrangements, and Stability Requirements," Ph.D. Thesis.

RECENT GRADUATES

MASTER'S DEGREES AWARDED—1990-1991

<u>Name</u>	<u>Current Place of Employment</u>	<u>Title of Thesis & Date of Degree Awarded</u>
Amitrajeet A. Batabyal	Pursuing Ph.D. degree Department of Agricultural & Resource Economics University of California— Berkeley, CA	"A Simple General Equilibrium Model of the Effects of Unilateral Envir- onmental Controls," Jul. 1990
Even Bjornstad	Returned to Norway	"Potential Effects of bST Use on the Minnesota Dairy Industry," Jul. 1991
David Brewer	No information	"Transboundary Phospho- rus Pollution in the Great Lakes: A Public Choice Analysis," Oct. 1990
Zhuo Cao	No information	"A Supply and Demand Analysis of the Urban Pork Market in China," Jun. 1990
Kelly Ann Day	Agricultural Economist Resources & Technology Division ERS—USDA Washington, DC	"Federal Funding of Natu- ral Resource Research and Development, 1978-1988," Aug. 1990
Lafayette P. Duarte	No information	"Evaluation of the Agricul- tural Financial Analysis Export Systems," Aug. 1990
Jorunn Grande	Returned to Norway	"Changes in the Consump- tion of Livestock Products: Trends, Influential Factors and Future Projections," Jul. 1991
Augusto A. Herrera	Panama Republic Panama	"Evaluation of the Agricul- tural Policies on Pricing and Trading Decision Con- cerning Rice and Coffee in Panama During the Period 1970 to 1987," Jun. 1990
Dana Huseby	General Mills Great Falls, MT	"Equity Capital in Regional Cooperatives: An Analysis by Industry, Size, and Pooling," Jul. 1991
Anwar Hussain	Pursing Ph.D. degree Department of Agricultural & Applied Economics University of Minnesota	"Resource Use and Effi- ciency: A Case Study of Peshawar Valley," Mar. 1991
Frank P. Jetter	Agricultural Transporta- tion Economist Alberta Government Department of Economic Development & Trade Edmonton, Alberta	"An Economic Analysis of the Profitability of Option Writing on Soybeans," Oct. 1990

Stuart T. Lee	Pursuing Ph.D. degree Department of Economics University of Washington Seattle, WA	“The Waterfowl Hunting Value of Restored Wetlands in Minnesota,” Sep. 1990
Bruce E. Lyman	No information	“Sustainable Farming: An Evaluation of Selected Options for a Cash Grain Farm in Southwest Minne- sota,” Jan. 1990
Mark McGuire	Energy Analyst Department of Public Service State of Minnesota St. Paul, MN	“Lost Directions: U.S. Foreign Assistance Policy Since New Directions,” Oct. 1990
James D. Monke	Pursuing Ph.D. degree Department of Agricultural Economics University of Illinois Urbana, IL	“Pre-Retirement Invest- ment Strategies for Farmers,” Apr. 1990
Marcelo E. Montero	Financial Analyst Department of Financial Information Systems Cargill, Inc. Minnetonka, MN	“Nonparametric Tests in Production Analysis: An Empirical Application to the U.S. Agricultural Sec- tor,” Dec. 1990
Kathleen M. Novak	Legislative Analyst Minnesota House of Representatives St. Paul, MN	“State Government and Telecommunications in Rural Development: A Case Study of the Minne- sota Department of Revenue Remote Tele- phone Collection Office,” Aug. 1990
Catherine S. Otte	Grain and Feed Division FAS—USDA Washington, DC	“The West German Cur- rency Reform in 1948 and Implication for Economic Reforms in the Soviet Union,” Sep. 1990
David A. Pottebaum	Programme Officer of UN’s Thai Villages Programme Prachinburi, Thailand	“The Benefits of Ground- water Pollution Avoidance: A Case Study in Southeast- ern Minnesota,” Aug. 1990
P.C. Ratnayake	Returned to Sri Lanka	Mar. 1990
Winston T. Rego	Computer Programmer Medical University of South Carolina Charleston, SC	“Is the Use of Mathemati- cal Models in Agricultural Economics Scientific” Mar. 1990
David W. Richardson	Assistant Extension Economist Center for Farm Financial Management Department of Agricultural & Applied Economics University of Minnesota	“Implementing a Neural Network Model as an Eco- nomic Predictor,” Mar. 1991

Charles A. Rodgers	Research Assistant IFPRI Washington, DC	“The Off-Site Economic Benefits of Soil Conservation: A Review and Discussion of Recent Literature on the Recreational Demand for Water Quality Improvement,” May 1990
Andrew L. Schwab	Returned to Canada	“The Effect of Sugarbeets on Relative Land Prices in Southern Minnesota,” Dec. 1990
Yong Wang	No information	“Economic Analysis of the United States Aluminum Industry,” Jul. 1990
Scott M. Wulff	Commodity Analyst Grand Metropolitan Minneapolis, MN	“An Economic Analysis of Crosshedging Sunflowers on the Soybean Complex,” Feb. 1990
Zhi Xu	Pursuing Ph.D. degree Forest Resources University of Minnesota	“Regional Impact of Technical Change in Forestry: The Case of Structural Particleboard in the United States,” Apr. 1990
David E. Zanussi	Manager of Futures Trading CENEX Inver Grove Heights, MN	“Applied Risk Management Strategy for a Mid-Continent Refiner,” Jan. 1990

PH.D DEGREES AWARDED, 1990-1991

<u>Name</u>	<u>Current Place of Employment</u>	<u>Title of Dissertation & Date of Degree Awarded</u>
Hans A. Andersson	Assistant Professor Department of Economics Swedish University of Agricultural Sciences Uppsala, Sweden	“Owner Operated Land, Fixed Rent Leases and Share-Leasing Arrangements: Some Implications for Asset and Debt Restructuring on Minnesota Farms,” Feb. 1990
Jong H. Bae	Assistant Director of Marketing and Planning Ministry of Agriculture, Forestry & Fisheries Seoul, Korea	“Estimating Dynamic Input Demand Primal & Dual,” Jun. 1990
Nir E. Becker	Lecturer Department of Economics University of Haifa Haifa, Israel	“Dynamic Supply from a Common Property Resource: Water Diversions from the Great Lakes,” Jul. 1990
Anthony C. Crooks	Economist USDA—APHIS—VS Ft. Collins, CO	“Modeling the Dairy Cooperatives Sector for Policy Analysis,” Aug. 1990

Joan R. Fulton	Department of Rural Economy University of Alberta Edmonton, Alberta	"Centralization Versus Decentralization of Decision Making Authority in Grain Marketing Cooperatives," Dec. 1990
Luis Miguel Garcia	No information	"Bioeconomics of Interdependent Fishery and Forest Resources," Jan. 1991
Hermanto	Center for Agricultural Economic Research Bogor, Indonesia	"Demand for Inputs and Supply of Rice Under Risk and Selectivity Bias: A Study of Indonesian Farmers," Aug. 1990
David D. Johnson	Assistant Professor Department of Agricultural Economics University of North Dakota—Fargo	"Dynamic Aspects of Grain Merchandising Decisions," Aug. 1990
Martin A. Johnson	Economist ATP—ATAD—ERS USDA Washington, DC	"Agricultural Policies as Nash Equilibria," Dec. 1990
Hun Kim	Returned to Korea	"Information in the Term Structure of Commodity-Specific Interest Rates in the Chicago Wheat Futures Market," Oct. 1990
Thomas D. Legg	Associate Professor Department of Management & Finance College of Business St. Cloud, MN	"Farm Level Effects of Environmental Policies Aimed at Nitrogen Management," Mar. 1991
Luis F. Macagno	Instituto Nacional de Tecnologia Agropecuaria Buenos Aires, Argentina	"The Nature and Distribution of Gains from Quality Improving Research in a Multimarket Framework: The Case of Barley," Sep. 1990
Champak P. Pokharel	Economist Agriculture Projects Services Center Kathmandu, Nepal	"Portfolio Adjustment and Asset Fixity Under Uncertainty at Agricultural Banks," Aug. 1990
Jorge Ramirez	Operations Evaluation Officer Inter-American Development Bank Washington, DC	"The Role of Irrigation Development in the Indian Foodgrain Sector," Aug. 1990
Anita Regmi	No information	"The Value of Information in Integrated Pest Management of Corn Rootworm and European Corn Borer in Minnesota," Sep. 1990

Iain G. Shuker	IFPRI Washington, DC	"The Economics of Information Production and Use: An Application to Agribusiness Cooperatives," Dec. 1990
Peter L. Stenberg	Economist USDA—ARED Washington, DC	"A University's Relationship to High-Tech Industry and the Regional Economy: The Case of Minnesota and the U.S.," Jul. 1990
Man-Sik Yoo	No information	"An Application of a Linear-Quadratic Regulator Optimal Control Problem for a Beef Cattle Operator and Its Implications," Oct. 1990

LIVING AND WORKING IN THE TWIN CITIES

CLIMATE

Minnesota is a state with great variation in its weather. This provides a variety of scenery, gives the state much of its character, and opens opportunities for a wide range of recreational activities. Spring, early summer, and fall are exceptionally beautiful. Although winter temperatures can dip below zero and summer temperatures often climb well into the 90's, the average daytime high temperatures are: Summer 78°F; Fall 41°F; Winter 28°F; and Spring 67°F. Average annual snow fall is 49 inches in the Twin Cities; average rainfall is 22 inches. Except for November and

December the sun shines more than half of the days.

Office facilities are well-heated and air-conditioned as are most modern buildings and homes. The downtown areas of both cities have enclosed skyways (walkways above the streets) connecting parking ramps and shopping and cultural centers. An underground tunnel connects the Department of Agricultural and Applied Economics offices with the campus library, student center, and administrative offices on the St. Paul campus. Twin Citians are full of tips on how to winterize your wardrobe, your car, and your home.



The Minneapolis Campus



The Guthrie Theater in Minneapolis

CULTURAL ACTIVITIES

The Twin Cities area offers a wide variety of cultural opportunities. The University itself has an art museum, a natural history museum, a theater complex, film clubs, and movie theaters and numerous music, ballet, and dance performances by international artists. Most of the many liberal arts colleges in the area offer similar opportunities. Beyond the campuses one finds even greater variety.

The Minnesota Orchestra is a national attraction in its own right; but even more so now that it is playing in both Minneapolis' Orchestra Hall and St. Paul's Ordway Music Theatre. The famous acoustic design of Orchestra Hall continues to attract an impressive list of guest soloists. Performances are given year-round.

The St. Paul Chamber Orchestra, a Grammy award-winning group, performs in the elegant Ordway Music Theatre, which has also been praised for its design and acoustic clarity.

The Tyrone Guthrie Theater is the hub of an active and excellent local theater scene. Acting, costuming, and set design are excellent, and the three-quarter thrust stage creates an intimate theater. The company has an expanded repertoire which provides diversity and experimentation.

The Minneapolis Children's Theatre is composed of the faculty and students of Children's Theatre School. Young and old mingle on the stage and in the audience, and the MCT's

sensitive adaptations of famous scripts captivate them all. The MCT also has an impressive home which specializes in imaginative proscenium staging.

Other excellent theater is provided by the University's Rarig Theaters, Theater in the Round, Actor's Theater, Dudley Riggs Brave New Workshop and many others. Major Broadway touring plays come to the Twin Cities regularly as do ballet and opera companies. The World Theater houses many musical activities.

The Minneapolis Institute of Arts is located in the same complex as the Children's Theatre. It is known for its large and well-rounded collection of styles, periods, and countries. The staff is very accommodating to those who wish to make a special study of any part of the collection.

The Walker Art Center adjoins the Guthrie Theater. Both its permanent and special exhibition galleries emphasize twentieth-century art. Works by important contemporary artists are exhibited every year. The Walker presents film, poetry reading, dance, and music. It is located across the street from the 7.5 acre Minneapolis Sculpture Garden.

The 500-acre Minnesota Zoological Garden opened in 1978. Its indoor-outdoor exhibits include a five-story building devoted mostly to tropical animals in "nearly natural" habitats and the outdoor "Northern Trek" can be viewed from paths or a monorail. Exhibits range from Siberian tigers to dolphins and include over 100 species of native wildlife.

The Science Museum of Minnesota, an \$11+ million facility opened in 1978, features the Omnitheater. Additional features of the museum include Egyptian mummies, life-sized animated dinosaurs, and participatory exhibits.

The Como Zoo was established in 1897 and has been renovated to enlarge the living space for the animals as well as to add more exhibits. The Conservatory, adjacent to the zoo, features many tropical plants. The park, zoo, and conservatory are located only 1.5 miles (2.4 kilometers) from the St. Paul campus.

It is not possible to list all the important local cultural resources, which include many more opera, dance, and theater companies, art galleries, and hundreds of bars and cafes that feature live entertainment at low prices. Free outdoor music concerts or festivals are plentiful in the summer. Students often receive substantial discounts at the theaters, so all these events are quite accessible. Furthermore, there are abundant opportunities to receive instruction and participate in almost all performing arts.

SPORTS

The University of Minnesota belongs to the Big Ten Athletic Conference, and the Minnesota "Gophers" participate in all major collegiate sports. Professional teams in the Twin Cities include the Vikings (football), Twins (baseball), North Stars (hockey), and the Timberwolves (basketball). Only Vikings tickets are difficult to come by.

There are also many opportunities for those who wish to participate in sports. The University sponsors intramural and club competition in more than thirty sports. Minnesota has hundreds of lakes and rivers that are popular with swimmers, boaters, water skiers, sailors, canoeists, fishers, and bikers. Indoor and outdoor skating areas abound. Downhill skiing is popular even though cross-country skiing is more appropriate to the relatively flat terrain.

The St. Paul campus gym offers a variety of athletic facilities. It has tennis courts, a swimming pool, indoor and outdoor tracks, a weight lifting room, basketball court, softball and soccer fields, men's and women's saunas, and racquet-ball courts. The department usually enters softball, basketball, volleyball, bowling, and football teams in the University's intramural program. There is a University golf course less than a mile from the St. Paul campus. More information can be obtained at the St. Paul gym. The St. Paul gym has locker facilities for both men and women, but demand is high. Thus, lockers are issued on a first-come, first-served basis. The Minneapolis campus has several gymnasiums which have an even greater variety of facilities. The University's recreation facilities are scheduled for updating and expansion in 1990-92.

Sporting goods such as backpacking supplies, cross-country ski equipment, boots, etc., can be obtained at wholesale price plus cost from The Outdoor Store in the St. Paul Student Center. Many items, such as canoes, tents and skis, can also be rented.

"Participation in the department's softball team helped me to improve my swing."



LOCAL SCHOOLS

Day Care and Preschool

You will be able to find good day-care or preschool facilities either near campus or near your home, but you should plan ahead and expect to spend some time searching. Decide whether you need full-time or part-time care; some centers offer more flexibility than others. Costs are usually between \$2 and \$3 per hour for group care outside the home. Infant care (younger than 16 months) is hardest to find, since few day-care centers have infant programs. Many people with infants choose family day-care homes, and there are many good ones in Commonwealth Terrace, the student housing complex adjacent to the St. Paul campus. Check bulletin boards in Commonwealth Terrace and ask graduate students who live there.

Four day-care programs are affiliated with the University. The University of Minnesota Child Care Center (612-627-4014) offers full-time day-care with fees varying according to family income. The waiting list for this center is long; put your name on the list and look for available alternatives. Community Child Care Center in Commonwealth Terrace offers full- and part-time care. Como Community Child Care Center is in the Como student housing complex and offers full- and part-time care (612-331-8340). The University Institute of Child Development runs a part-time Nursery School and Play School (612-624-0526).

Many of the public and private schools also have extended day programs for school children, including kindergartners.

Elementary and High Schools

The St. Paul campus is located within the jurisdictional limits of the Village of Falcon Heights which makes for an interesting situation with respect to local school districts. Students can live in any one of several cities or villages adjacent to the campus. Immediately west, east and south is St. Paul itself, to

the northwest is Lauderdale, and to the north are Falcon Heights and Roseville. Roseville schools have a particularly good reputation.

Several local elementary schools are close to the St. Paul campus. There are also several good private elementary and high schools in the metropolitan area. The best advice we can offer is to come here and discuss the situation with other graduate students and staff.

Adult Education

The University Extension Service runs a comprehensive and excellent series of evening classes which may be taken for credit or merely for interest. A bulletin and registration forms are available from General Extension Division, 101 Westbrook Hall, Minneapolis, Minnesota 55455 (612-624-2388). In addition, the Minneapolis and St. Paul and suburban public school systems offer evening classes ranging from aerobic dance to photography and ceramics to ancient Sanskrit. There are other institutions in the Cities, such as the St. Paul Council for the Arts and Sciences, which offer wide ranges of artistic and "self-improvement" pursuits. The Twin Cities also has numerous public and private vocational-technical schools which offer short-term training in a variety of skills. Six community (2-year) colleges offer many courses comparable to those at the University for freshmen and sophomores.

University Education

Frequently both husband and wife will be engaged in some kind of ongoing higher education. The University of Minnesota offers a full range of courses leading to a number of degrees. *The Graduate School Bulletin* describes the courses available at the graduate level.

In addition, there are three law schools, at least ten private four-year colleges in the metropolitan area, and several small religiously oriented colleges.

LOCAL EMPLOYMENT OPPORTUNITIES

The Twin Cities is the home of several large companies including Control Data, 3M, Dayton Hudson, Honeywell, and Northwest Airlines. It is also the headquarters for several agribusiness and food companies such as Cargill, General Mills, Pillsbury, International Multifoods, Land-O-Lakes, Con-Agra, and Harvest States Cooperatives. St. Paul is the state capitol, and state government offers opportunities for internships and employment.

It is difficult to generalize about employment opportunities since much depends on personal desires, qualifications, and needs. But a metropolitan area as large as the Twin Cities (with a population of over 2 million) has a wide variety of jobs available, and a good start for job-hunters is the local papers. The University has numerous secretarial, computer technician, and accounting positions that may be available to students or spouses.

Students might find part-time employment by going to the University Student Employment Service and by consulting the Bulletin Board listings posted at several locations throughout the campuses. Both off-campus and on-campus jobs are listed.

TRANSPORTATION

Bus. Free bus service links the St. Paul and Minneapolis campuses of the University of Minnesota throughout the year and from early morning to late evening (except Sundays, during

the summer, and holidays, when evening service is not available). A one-way ride between campuses takes about twenty minutes. The Minneapolis campus is near downtown and is well-served by many lines of the Metropolitan Transit Commission (MTC). The MTC fare is \$1.10 during peak hours, and 85¢ during off hours; transfers are free.

Auto. Automobile commuters make up a large proportion of the student body, and both campuses have outdoor parking space for between 50¢ and 80¢ a day. Freeways serve the entire area and pass near both campuses.

Motorcycle. Motorcyclists will usually be able to park nearer to classes than those who drive an automobile and usually at no charge. Winter quarter is a bit cool for this activity, however.

Bicycle. Biking enthusiasts will be pleased to know that the Twin Cities terrain is relatively flat. It is usually possible to find a safe and enjoyable route to the campus. There is a growing network of parkways and bike trails through the parks and residential neighborhoods of the area. However, winter weather reduces the bike season to seven or eight months.

Air. The Minneapolis/St. Paul International Airport is located about twenty-five minutes from the St. Paul campus. It is served by numerous airlines and is the hub for Northwest Airlines. Frequent flights link the Cities with Chicago, Washington, D.C., and most other major U.S. cities as well as directly to international destinations.

LIVING AND WORKING AT THE UNIVERSITY OF MINNESOTA

The University of Minnesota is one of America's major research universities. It regularly ranks among the top ten in the United States in receipt of federal grants for research and development, and its Graduate School was recently ranked among the six best American public universities.

Established in 1869, the University of Minnesota is a land grant institution of

five campuses throughout the state, including the Twin Cities, Duluth, Morris, Crookston, and Waseca—and numerous research stations.

Enrollment on the Twin Cities campus is about 41,000 students—the largest single-campus enrollment in the United States. Both its size and variety of students, who come from all 50 states and more than 100 countries,



St. Paul Campus Mall

contribute to its cosmopolitan character. Some 8,700 students are enrolled in the University's 171 graduate programs.

The University's Twin Cities campus, by far the largest of the five, is really two campuses—one in Minneapolis and one in St. Paul. The Colleges of Agriculture, Biological Sciences, Human Ecology, Natural Resources and Veterinary Medicine are located on the St. Paul campus with a student population of about 4,000. This campus is situated in the heart of a pleasant residential neighborhood, which gives it a relatively small-town feeling. It is located near the northern suburbs, less than a 15-minute drive from either downtown St. Paul or Minneapolis. This quick access to two major urban areas offers distinct advantages not possible in most other places.

"This is an exciting place to study. Everyone works hard. They take their research seriously."

The Minneapolis Campus spans the Mississippi River. The west side of the river, where Wilson Library, the Economics Department, and the Hubert H. Humphrey Institute of Public Affairs (among other departments) are located, is known as the West Bank and is less than 2 miles from downtown Minneapolis.

The campuses are linked by rapid and frequent bus service. If you get on and off the bus at either campus, the ride is free; if you get on or off at several points in between, a fare is charged. Since the two campuses are only four miles apart, many students bicycle back and forth.

HOUSING

The Student Housing Office is located on the Minneapolis campus and has a branch open, summers only, on the St. Paul Campus. Lists of rooms, apartments, and houses for rent in the Twin Cities area particularly close to the campuses are maintained. For information, write to:

Housing Office
Comstock Hall
210 Delaware St. S.E.
Minneapolis, MN 55455
Telephone: (612) 624-2994

or (summers only)

Housing Office
190 Coffey Hall
University of Minnesota
St. Paul, MN 55108

The University's phone number for general information is (612) 625-5000.

In addition to the University listings there are ads in the local newspapers, including the University's student newspaper, the *Minnesota Daily*. Students in the department who have already gone through the process of finding a place to live are always willing to share information and advice.



Student Center

Single Student Housing

Rooms and apartments are found near the campuses and along the routes of the intercampus bus. Competition is fairly keen for places within a 10-minute walk. Suggestions include:

Minnesota Graduate Club, a cooperative located within a block of the St. Paul campus. Double rooms are available for \$140 a month. For more details, contact the Manager, Minnesota Graduate Club, 2089 Carter Avenue, St. Paul, Minnesota 55108 (612-645-5032). The Graduate Club is particularly well-suited as accommodation for newly arrived foreign students.

Minnesota Students' Co-op is also just off the St. Paul campus and, as the name suggests, is also run as a cooperative venture. Room rates run \$107-121 per month and dinner is offered at \$2.75. Residents are required to pay for 16 dinners monthly and must take part in kitchen duty lasting one week each quarter. Parking costs \$7-8 per month. More details are available from the Manager, Minnesota Students' Co-op, 1469 Cleveland Avenue, St. Paul, Minnesota 55108 (612-645-0053) or (612-645-4888).

Oikoumene International Co-op is just off the St. Paul campus. It is for women only. For details, call (612-644-3351) or write to 1387 N. Cleveland Avenue, St. Paul, Minnesota 55108.

Dinnaken House provides two-bedroom, furnished, carpeted, and air conditioned apartments for 4 students. Some appliances are provided with laundry facilities on each floor. Located close to a convenience store, bank, hotel, and other shopping makes the use of a car virtually unnecessary. Dinnaken House is a living, learning environment with computer lab, fitness center and steam room, 24-hour reception desk, and great room for academic and social activities, meetings, or relaxing. For further information contact the Dinnaken House, 900 Washington Avenue S.E., Minneapolis, MN 55414-9850 (612-623-0606).

Great Places Relocation Service, 7200 France Avenue South, Edina, MN 55436, offers rental housing information free to students. For further information call 333-7368 or 1-800-827-6004.

Residence Halls

The only residence hall on the St. Paul campus is Bailey Hall (coed), and this is largely populated by undergradu-

ates. Only double rooms are available. Centennial, Middlebrook, Pioneer, Sanford, Territorial, Comstock, and Frontier Halls (all coed) on the Minneapolis campus are convenient but slightly impersonal. Centennial has some sections which are set aside for older students, and some single rooms are available.

Rooms must be reserved some months in advance, and you may sign a contract for a full year's residence. Further information is available from the Housing Office in Minneapolis (address above).

Foreign students are advised to approach this residence choice through the Office of International Education.

University Family Housing

There are two separate University-affiliated cooperative family housing facilities. These are:

Commonwealth Terrace Cooperative. CTC is located adjacent to the St. Paul campus. It provides 18 furnished efficiency apartments (\$312/month), 160 unfurnished one-bedroom apartments (\$299/month), 281 two-bedroom apartments (\$395 to \$405/month), and 24 three-bedroom apartments (\$492/month). Members of the Cooperative pay from \$10 to \$30 less per month in rent. Membership also includes a certain number of work-hours per year committed to the Cooperative for chores like snow-shoveling, leaf raking, etc. Rent includes all utilities except telephone. A community center provides daycare service, meeting and entertaining space, and an auto workshop for residents' use.

There is a waiting list of 12 to 18 months for this housing, so it is advisable to apply early. For more information and applications, write to CTC, 1250 Fifield Street, St. Paul, MN 55108. Phone: (612) 646-7526.

Como Student Community is an apartment complex located on the intercampus bus route midway between the St. Paul and Minneapolis

campuses. The 360 units include two-bedroom apartments at \$339 - \$352/month, two-bedroom townhouses at \$360 - \$373/month, and three-bedroom townhouses for \$409 - \$427/month. These apartments are carpeted (CTCs are not), but unfurnished. There is a waiting list at Como Student Community also. It was 13-18 months in 1991. For more information, write to CSC, 1024 27th Avenue, S.E., Minneapolis, MN 55414. Phone: (612) 378-2434.

Commercial housing - rental. A wide range of rental prices and locations are available. Most students tend to live around each campus or along the line of the intercampus bus. There are fewer duplexes than apartments available close to the University area, and they offer some advantages like more space for the money, a garage, plenty of basement/attic storage room, and yard space for children. Duplexes are less likely to require a lease. Be sure you know in advance whether your rent includes heat. The additional heating costs for the four winter months could surprise you.

A Precautionary Note

All prices quoted herein are subject to change. If you rent an apartment or duplex, you should be fully aware of the conditions of rental and your basic rights as a tenant. At some apartment buildings you may be required to sign a year's lease, and state law requires a 30-day written notice before you leave an apartment. Rental units are typically rented out three to five weeks prior to occupancy. You can obtain help or advice from a Tenants' Union in both Minneapolis and St. Paul (see telephone directory). In addition you may want to explore your insurance coverage as a tenant or resident.

Commercial housing-purchase. If you wish to buy a house, a real estate agents' guide is published twice per month with a wide range of houses for sale. This list is available at any real estate agent's office. A rough guideline is that a modest two-bedroom house falls in the \$60,000-\$70,000 range.

HEALTH INSURANCE

All students who take 6 or more credits must pay the student services fee (about \$120). By paying the fee, you become eligible to receive most outpatient services at Boynton Health Service at no charge and others at a reduced cost. If you do not pay the student services fee, you may purchase outpatient health coverage through the Extended Coverage Plan. Students who do not pay the student services fee or purchase extended coverage may use Boynton Health Service on a fee-for-service basis.

All students taking 6 or more credits per quarter are required to carry hospitalization insurance. International students must carry hospitalization insurance for themselves and their dependents for the entire time they are in the United States.

Graduate assistants with appointments of 25% or more, and who pay the student services fee, are eligible to receive health-care coverage through Group Health Inc. as part of the benefits of employment. As with the tuition benefit, the percentage of the Group Health premium that is paid by the University is equal to two times the percentage of a graduate assistant's appointment level. This program does not include dependent coverage. Graduate assistants may purchase dependent coverage for about \$75.00 per month by applying directly to Group Health.

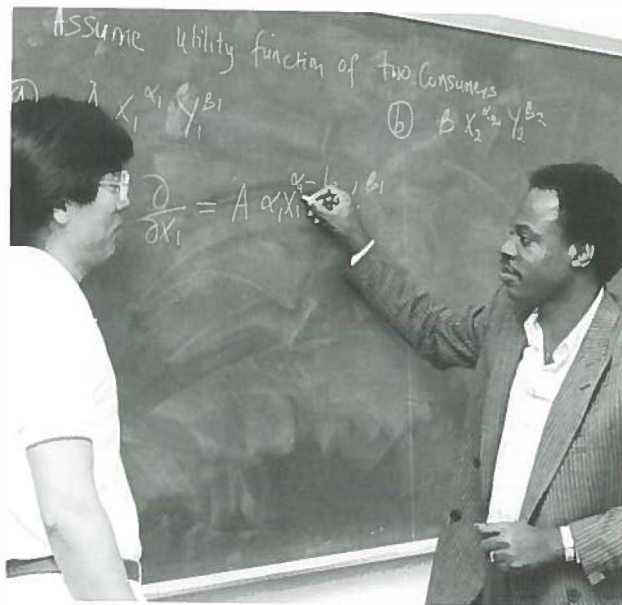
Immunization Clearance

State of Minnesota law requires all students born after December 31, 1956, to provide documentation of immunization for measles, mumps, rubella, tetanus, and diphtheria. This documentation must be entered on a Student Immunization form and must include the month and year each immunization was given. Forms are available at your registration center and at the Boynton Health Service information desk. You only need to fill out a Student Immunization form the first time you register for classes.

FOREIGN STUDENTS

About one-half of the department's students are from foreign countries, including in recent years, Argentina, Bangladesh, Bolivia, Brazil, Cameroon, Canada, Chile, People's Republic of China, Colombia, Dominica, Ecuador, Egypt, Germany, Ghana, Greece, India, Indonesia, Israel, Jamaica, Japan, Korea, Mali, Mexico, Morocco, Nepal, Netherlands, Nigeria, Norway, Pakistan, The Philippines, Portugal, Peru, Republic of South Africa, Sierra Leone, Sweden, Taiwan, Thailand, Togo, Turkey, and Uganda. Many of the faculty and several of the domestic graduate students have also lived and worked in other countries. This provides an enriching variety of cultural and linguistic backgrounds within the department.

All new international students must sign up at the Office of International Education (OIE) to attend a pre-registration program before attending college orientation and before registering for classes. Several sessions are offered prior to the start of fall quarter. The Office of International Education, 20 Nicholson Hall (149 Nicholson Hall is the mailing address). Hours are Monday-Friday, 8:00 - 12:00 a.m. and 1:00 - 4:15 p.m. The telephone number is (612) 626-7100. The OIE staff is small and sometimes



overworked, so it is best to seek their help early. In general, promptness is important in all matters concerning the slow-moving immigration paperwork. This certainly includes renewal of entry permits, which should be picked up from the student's sponsoring organization well in advance of expiration. These and related forms are processed at the United States Customs and Immigrations Office in downtown St. Paul.

OIE is also the official channel for dealing with the United States Immigration and Naturalization Service (INS) after you arrive in the United States. Foreign students and their spouses should realize that job permits and full-time jobs are very difficult to obtain. This is partly because of strict INS regulation as well as the current economic situation, and OIE has little power over either.

When notified in advance, the department's Graduate Club will do its best to meet incoming foreign students at the Twin Cities airport, rail, or bus terminals.

In short, the foreign student will have to draw upon his/her patience and pluck in dealing with American culture, bureaucracy, and school work. However, the prospective student should not be discouraged. There is plenty of help available, and most of our foreign students have had pleasant and rewarding intellectual and personal experiences here.

"An important aspect to me is that students come to the department with a great variety of international experiences, and many expect to have careers that include international involvement."

ADMISSION

Admission Requirements

An undergraduate grade point average of 3.0 (B) or better is normally required for admission. Prospective students should have had intermediate level undergraduate economic theory, elementary statistics, calculus, and linear algebra. Students must read and

write English proficiently. Students without part of this preparation, but otherwise well-qualified, may apply, but their application materials should explain their plans to complete appropriate courses prior to the outset of graduate study.

Admission Procedures

Admission forms and applications for financial support are obtained from this department. The completed admission form should be returned to the Graduate School; the application for financial assistance is to be returned to this department. The departmental Graduate Committee reviews all applications and makes recommendations to the Dean of the Graduate School. Final decisions as to admission are made by the Graduate School. Letters of recommendation are helpful, but are not required in connection with requests for admission to graduate study. Such letters are required, however, with requests for financial assistance. Candidates are advised that they should give the Graduate School as full an explanation as seems appropriate of their qualifications, including evidence of superior scholarship, professional experience, and general aptitude for graduate study. Scores from the Graduate Record Examination (GRE) are required for all applicants who are U.S. citizens. Scores on the Test of English as a Foreign Language (TOEFL) exams must be at least 550 for those whose native language is not English.



Michael Boehlje, and Jean Kinsey, Director of Graduate Studies

Only complete applications will be processed by the Graduate School.

The lack of any part of the required materials will delay consideration until the missing materials are provided. An **official** transcript from each college or university attended and the payment of the Graduate School application fee are among the essentials. (This fee was \$30 in 1991.)

Math Preparation Course

For those students who need or want to improve their mathematical skills before starting their course work, the Department of Agricultural and Applied Economics offers an intensive Math Preparation Course. It is intended for incoming students but is available to any of our graduate students. It typically starts about August 15 and runs 5 days a week for 5 weeks.

It is designed to review the fundamental mathematical tools generally required in the Ph.D. level economic theory courses and has been perceived as very useful by the students who have taken it.

A relatively large number of topics are touched on in this course, including operations with sets, properties of real numbers, binary relations, basic topology, continuity and differentiation, linear transformations, differentiation, optimization of real-valued functions, the separating hyperplane theorem and fixed point theorems. The use of logical principles and their application in proving mathematical theorems is emphasized.

It is assumed that students have completed differential and integral calculus, multivariate calculus, and linear algebra.

CHECKLIST FOR APPLICATIONS

Please use this form as a checklist to be sure that you have obtained, distributed, and returned all the necessary application materials for graduate work in the Department of Agricultural and Applied Economics at the University of Minnesota. Remember, your application won't be reviewed until both files (Department of Agricultural and Applied Economics and Graduate School) contain all the required materials.

- I. Obtain admission form and an application for financial support from the Department of Agricultural and Applied Economics. (Write to: Director of Graduate Studies, Department of Agricultural and Applied Economics, 231 Classroom Office Building, 1994 Buford Avenue, St. Paul, MN 55108 or phone (612) 625-3777, or FAX (612) 625-6245.
- II. Complete the Admission Form and return it to the GRADUATE SCHOOL. Include:
 - a. Application fee (\$30 U.S. in 1991)
 - b. Statement of objectives for your graduate studies
 - c. Be sure to have your GRE scores sent directly (U.S. citizens)
 - d. Be sure to have your TOEFL scores sent directly (foreign students whose native language is not English)
 - e. Be sure to have an **official** copy of all your college transcripts sent directly
 - f. Information about your current registration if you are still in school
- III. Complete the Application for Financial Support (if applicable) and mail it to the DEPARTMENT OF AGRICULTURAL AND APPLIED ECONOMICS. Include:
 - a. Names of 3 references
 - b. Be sure to have requested that three reference persons send letters of recommendation directly to the department

Deadlines for completed applications

Most students enter in the fall; most of these applications are considered between February and April. However, please note that the deadlines for application for each quarter are: Fall (July 15); Winter (October 25); and Spring (December 15).

1991-92 ACADEMIC CALENDAR

Fall Quarter 1991

August 1991

- 12-September 13 Math Preparation Course.
26 Fall quarter registration reopens.

September 1991

- 2 Labor Day, holiday. University offices closed.
19-20 Orientation.
20 Last day to register for fall without paying late registration fee.
23 **Fall quarter classes begin.**

October 1991

- 4 Last day to register, add a course or change sections, change grading option or cancel individual course without transcript record.
25 Graduate School application deadline for winter quarter.

November 1991

- 7 Winter quarter registration begins.
15 Last day applications to most undergraduate colleges and programs or for change of college within the University can be assured a winter quarter admission decision.
28-29 Thanksgiving, holiday. Classes excused and University offices closed.

December 1991

- 3 Last day of instruction.
4 Study day.
5-11 Final examinations.
11 **End of fall quarter.**
15 Graduate School application deadline for spring quarter.
23-25 Christmas, holiday. University offices closed.

Winter Quarter 1992

January 1992

- 1 New Year's, holiday. University offices closed.
3 Last day to register for winter quarter without paying late registration fee.
6 **Winter quarter classes begin.**
17 Last day to register, add a course or change sections, change grading option or cancel individual course without transcript record.
20 Martin Luther King's Birthday observed. Classes excused and University offices closed.

February 1992

- 15 Last day applications to most undergraduate colleges and programs or for change of college within the University can be assured a spring quarter admission decision.
- 21 Spring quarter registration begins.

March 1992

- 13 Last day of instruction.
- 14 Study day.
- 16-21 Final examinations.
- 21 **End of winter quarter.**

Spring Quarter 1992

March 1992

- 27 Last day to register for spring without paying late registration fee.
- 30 **Spring quarter classes begin.**

April 1992

- 10 Last day to register, add a course or change sections, change grading option or cancel individual course without transcript record.
- 15 Graduate School application deadline for first term of summer session.

May 1992

- 15 Graduate School application deadline for second term of summer session.
- 25 Memorial Day, holiday. Classes excused and University offices closed.

June 1992

- 5 Last day of instruction.
- 6 Study day.
- 8-13 Final examinations.
- 13 **End of spring quarter.**

July 1992

- 15 Graduate School application deadline for fall quarter.

EQUAL OPPORTUNITY STATEMENT

The University of Minnesota is committed to the policy that all persons shall have equal access to its programs, facilities, and employment without regard to race, religion, color, sex, national origin, handicap, age, veteran status, or sexual orientation. In adhering to this policy, the University abides by the Minnesota Human Rights Act, Minnesota Statute Ch. 363; by the Federal Civil Rights Act, 42 U.S.C. 20000e; and by the requirement of Title IX of the Education Amendments of 1972, by Sections 503 and 504 of the Rehabilitation Act of 1973, by Executive Order 11246, as amended; 38 U.S.C. 2012, the Vietnam Era Veterans Readjustment Assistance Act of 1972, as amended; and by other applicable statutes and regulations relating to equality of opportunity.

Inquiries regarding compliance may be directed to Patricia A. Mullen, Director, Office of Equal Opportunity and Affirmative Action, 419 Morrill Hall, 100 Church Street S.E., University of Minnesota, Minneapolis, MN 55455 (612-624-9547).

THE UNIVERSITY OF MINNESOTA
FOUNDED IN THE FAITH THAT WE ARE ENNOBLED
BY UNDERSTANDING
DEDICATED TO THE ADVANCEMENT OF LEARNING
AND THE SEARCH FOR TRUTH
DEVOTED TO THE INSTRUCTION OF YOUTH
AND THE WELFARE OF THE STATE.

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