ABSTRACTS

SELECTED PAPERS
Annual Meeting, SAEA, Lexington, Kentucky, February 2-5, 1992

PRODUCTIVITY, RISK MANAGEMENT, AND EFFICIENCY (Moderator: *Dan McLemore, University of Tennessee*).

"Productivity Changes in U.S. Broiler Production and the Contribution of Improved Broiler Genetics." *Brian Larson, Kelly Zering, and Gerald Havenstein, North Carolina State; and Richard Perrin, Iowa State University.*

Total Factor Productivity (TFP) is used to measure productivity changes in the U.S. broiler industry between 1967 and 1988. TFP is found to have increased by almost 30 percent over the period. An experiment comparing growth and feed consumption of a 1957 strain of broilers and a modern (1987) strain of broilers fed 1957 rations and 1987 rations is reported. The results of the experiment suggest that most of the increased productivity since 1957 in the U.S. broiler industry can be attributed to genetic improvement as opposed to improved nutrition. Several unanswered questions are identified.

"Productivity Growth in Florida Orange Production." *T. G. Taylor, University of Florida, and N. G. Kalaitzandonakes, University of Missouri.*

Nonparametric procedures in the presence of an intertemporally heterogeneous and quasi-fixed input are employed to measure total factor productivity in Florida orange production. Variations in productivity growth are subsequently explained in terms of variations in weather and technical progress embodied into several technological innovations.

"Integrated Risk Management: A Recursive Target MOTAD Approach." *Viswanath Tirupattur, University of Illinois; and James Pease and David Kenyon, VPI and State University.*

A two-stage recursive Target MOTAD farm planning model was formulated to investigate the risk-return impacts of marketing and government program strategies for a representative Virginia cash grain farm. Adequate income to assure firm survival could not be obtained without enrollment in government programs, but complementary risk management alternatives both lower risk and increase income.

"A Whole-Farm Risk Analysis of Double-Cropping and Alternative Crop Rotations Under Farm Commodity Programs: An Application of Crop and Market Simulation Models." *Mario F. Crisostomo, University of California; Robert O. Burton, Jr., and Allen M. Featherstone, Kansas State University; and Kenneth W. Kelley, Southeast Kansas Experiment Station.*

This research examines the economic potential of double-cropping in crop rotations on a representative dryland farm that produces wheat, soybeans, and grain sorghum. Crop simulation, market simulation, and quadratic programming are used to determine optimal combinations of crop rotations. Simulated data are an alternative to historical data, which may not reflect current conditions. A risk-neutral operator double-crops soybeans on all wheat acres, whereas the most risk-averse operator does not double-crop. Procedures used provide a means of incorporating changes in prices and yield potential into analyses that will generate optimal solutions for farmers with diverse preferences for returns and risk.

"The Relationship Between Technical Efficiency and Firm Size Revisited." *Nicholas G. Kalaitzandonakes, Wu Shunxiang, and Ma Jian-chun, Missouri University.*

In this study the efficiency levels of a sample of Missouri grain farms are measured through alternative frontier estimation procedures. Different estimation approaches were found to significantly alter both the absolute and relative rankings of the firms in the sample. The relationship between farm size and technical efficiency was also found not to be robust to the choice of estimation technique. A latent variable model that reconciles conflicting efficiency series by accounting for measurement error was estimated in this study. Within this framework, a positive relationship between farm size and efficiency was supported.

"An Economic Analysis of the Cotton Planting Decision Problem in the Oklahoma Rolling Plains." *James A. Larson, Harry P. Mapp, and Laval M. Verhalen, Oklahoma State University.*

This paper examines the cotton planting decision problem under the dynamic and uncertain growing conditions of the Oklahoma Rolling Plains. Yield and net revenue distributions for alternative planting strategies are generated using a cotton simulation model. Stochastic dominance analysis identifies the short-season variety planted on May 31 with a 120,000 seeding rate as the dominant planting tactic. Strategy valuation analysis indicates considerable willingness to pay for information about planting time and seeding rate, but low willingness to pay for information on a flexible versus a short-season variety strategy.

ECONOMICS OF FOOD CONSUMPTION
(Moderator: *John Adrian, Auburn University*).

"Consumer Acceptance of Vacuum Packed Fresh Beef: A Case Study Using Scan Data." *David B. Eastwood and Stanley Shoaf, University of Tennessee.*

Vacuum packaging represents an alternative way of providing fresh beef to food shoppers, although the airtight seal causes the beef to have a brownish-red color in the package. However, consumers still perceive red as indicative of quality fresh beef, and may not favor beef because of its appearance in vacuum packaging. A regression model is estimated using scan data to compare four cuts of steak in the two types of packaging. Results suggest that the information gap is a problem for three of the lower priced steaks but not for the filet mignon.

"Estimating Food Consumption of U.S. Elderly: Comparing Equivalence Scales Approaches." *Randal Kinoshita and Jack E. Houston, University of Georgia.*

Consumer research generally treats the elderly as a homogeneous category with regard to the effects of household composition on food consumption. Such an aggregation may not accurately reflect diversities in this growing segment of the U.S. populace. This paper examines total food expenditures for households with elderly (aged 65 years and over) heads. Adult equivalence scales are tested for effects of various age-sex and other household characteristics. Significant differences appeared among age group subsets, possibly in response to dramatic life-style changes, and estimated equivalence scales were sensitive to the method and model used.

"Analysis of Consumer Perceptions Toward Organic Produce Characteristics and Food Component Concerns." *Craig R. Kreider, Patrick J. Byrne, and Ulrich C. Toensmeyer, University of Delaware.*

Consumers are increasingly concerned about the presence of pesticide residues in fresh produce. They are also increasingly aware of the nutritional content of food. This study attempts to determine what consumers perceive as characteristics of organic produce, and demographic effects on these determinations, as well as analyzing some food component concerns and their relation to concern for pesticide residues. The largest percentage of consumers felt that labeling produce organic should require a use-restriction of pesticides, herbicides, and artificial fertilizer, as well as field organic for at least three years.

"Analysis of Socioeconomic and Demographic Factors Affecting the Decision to Consume Food Away from Home." *Rodolfo M. Nayga, Jr., and Oral Capps, Jr., Texas A&M University.*

Using the recent 1987-1988 National Food Consumption Survey (the individual intake portion), this study identifies several socioeconomic and demographic characteristics of individuals who have consumed food away from home. The analysis was performed using logit analysis. The significant characteristics are: race, ethnicity, employment status, food stamp participation, seasonality, household size, age, income, and time of week of consumption.

"A Sensory Panel Evaluation of Selected Species of Finfish." *Lynn Dellenbarger, Alvin Schupp, Joseph Liuzzo, and Linda Andrews, Louisiana State University Agricultural Center.*

An eight-member sensory panel was trained to evaluate two aquacultural finfish (catfish and hybrid striped bass) and one saltwater finfish (red snapper) for flavor, texture, juiciness, and overall acceptability. It was hypothesized that catfish would receive higher overall acceptability ratings than hybrid striped bass or red snapper. The panel preferred catfish, giving it higher ratings for texture, juiciness, and overall acceptability. Catfish was considered a mild flavored fish relative to the other finfish. Comparable ratings for both red snapper and hybrid striped bass indicate that these two species of finfish are possible substitutes.

DEMAND AND PRICE ANALYSIS (Moderator: *Wojciech Florkowski, University of Georgia*).

"The Demand for Chemical Inputs in Agriculture and Policies for Reducing Their Use in the Central Corn Belt." *Jorge Fernandez-Cornejo, USDA.*

Short- and long-run Hicksian and Marshallian elasticities are estimated for the chemical inputs (fertilizers and pesticides), using a restricted profit function and a series of decomposition equations. The model uses a Fuss-Quadratic flexible functional form, incorporates the impact of agricultural policies, and introduces a new weather index. Convexity in prices and concavity in quasi-fixed factors are simultaneously imposed on the restricted profit function using Bayesian techniques. The model is estimated for the central Corn Belt states, and the results are used to calculate the impact of market-oriented policies to reduce chemical input use.

"The Differential Demand Model with Habit Persistence." *Mark G. Brown and Jonq-Ying Lee, University of Florida.*

The differential demand system or Rotterdam model is extended to include lagged consumption through translation parameters, providing an alternative to simply adding constant terms to the model to allow for trends in consumption and changes in tastes. Application of the model to four broadly defined groups of goods indicates significant lag effects, resulting in differences in short-run and long-run income and price responses.

"Testing for Overdispersion in Truncated Count Data Recreation Demand Functions." *Irma Adriana Gomez and Teofilo Ozuna, Jr., Texas A&M University.*

Specification tests are presented and discussed as a means for determining whether a fitted count data recreation demand function is adequate and whether a specific deficiency of any initially entertained count data estimator can be removed by progression to a less restrictive estimator. The usefulness of such tests are illustrated through an empirical illustration which examines the demand for recreational boating. The results indicate that overdispersion can have significant effects on the welfare estimates. Given the importance of these tests and the ease with which they can be implemented, they should routinely be performed on future truncated count data recreation demand applications.

"Regional Demand for Meat: An Application of an Inverse Almost Ideal Demand System." *Mark A. Peters, USDA; and Thomas H. Spreen, University of Florida.*

A system of regional demand equations was estimated. The inverse form of the Almost Ideal Demand System (AIDS) model was utilized. The data were survey data from the Bureau of Labor Statistics Consumer Expenditure Survey. The estimated parameters were consistent with economic theory, although the implied flexibilities were smaller than those reported elsewhere.

"Impact of Quality Factors on the Price Received for Processing Apples." *Jayson K. Harper, Pennsylvania State University; and George M. Greene II, Pennsylvania State Fruit Research Lab.*

This study quantifies the discounts and premiums associated with various quality factors for processing apples. Discounts and premiums were estimated using a hedonic price model estimated from quality data collected on 137 samples of three processing apple varieties (45 *York Imperial*, 43 *Rome Beauty*, and 49 *Golden Delicious*). Results indicate that statistically significant price discounts existed in the sample for apple size, bruise, bitter pit, decay, misshapen apples, and internal breakdown. Commonly cited defects such as insect damage and apple scab did not cause significant price discounts.

POLICY IMPACTS OF RESEARCH AND GOVERNMENT PROGRAMS (Moderator: *Jerry Skees, University of Kentucky*).

"The Effect of the Changing Composition of Research Expenditures on the Marginal Product of Agricultural Research." *David Schweikhardt, Mississippi State University.*

Past studies have concluded that the marginal product of agricultural research has declined in recent years, but have not considered the impact of changes in the composition of experiment station expenditures. Changes in the composition of research expenditures and growth in research that is unrelated to agricultural production—particularly the growth in forestry research—would be expected to have an effect on the estimated marginal product of agricultural research. This study adjusts the research expenditure variable to reflect the growth in forestry research in recent years. The results indicate that the marginal product of agricultural research has not declined.

"U.S. Domestic Edible Peanut Demand Linkage to Farmers' Income: Policy Impacts." *Stanley M. Fletcher and Dale H. Carley, Georgia Experiment Station.*

Improved information on domestic use of edible peanuts is important in assessing the impact of changes in peanut programs. This study estimates four peanut products' demand equations. These relationships were used to evaluate two policy scenarios. The inelastic demand for peanuts results in demand increasing considerably less than prices decreasing. However, the expected increase in per capita consumption resulting from the lower price, coupled with expected income and population increases, tempers the income-decreasing impact on peanut farmers. The potential farmer income loss could have approximately $666 million economic impact on Southern agriculture.

"Calculating the Effect of Food Stamp Outreach Programs Using the Household's Anticipated Program Eligibility." *J. William Levedahl, USDA.*

The GAO reports that one-half of eligible nonparticipants in the Food Stamp Program (FSP) do not know they are eligible. Using data from the Panel Study of Income Dynamics, the probability of FSP participation conditional on the household's anticipated eligibility is estimated. The change in FSP participation resulting from outreach programs in which households are informed of their eligibility is estimated.

"Alternative Environmental Policies and Input Substitution in the Corn Belt: A Multi-Output Nonparametric Approach." *Dan Primont, University of Southern Illinois; and Richard Nehring and Agapi Somwaru, USDA.*

This study investigates the impact on output and input substitution and profitability of production in corn farming of various agricultural chemical regulatory policies. The research evaluates the economic impact of restricting triazine and nitrogen use, and of taxing excess nitrogen use. Data on corn production from the USDA Farm Costs and Returns Survey are used to estimate a multi-output nonparametric model of profit maximization. Frontier specification of the profit function provides a benchmark from which to compare alternative policies. The results indicate that restricting nitrogen use results in the greatest decrease in nitrogen and pesticide loadings.

MACROECONOMIC ISSUES IN INTERNATIONAL AGRICULTURAL ECONOMICS

(Moderator: *Greg Pompelli, University of Tennessee*).

"The Political Economy of Agricultural Trade Negotiations in the Uruguay Round of the MTN: Can the U.S. and European Community Reach an Acceptable Compromise in the GATT?" *Glenn C. W. Ames, University of Georgia.*

A model of the political economy of agricultural policy formulation was used to analyze the current stalemate in the Uruguay Round of Multilateral Trade Negotiations. The combination of social welfare increasing and transferring policies in the European Community is the cause of the deadlock in trade negotiations. The Community's farm policy of high internal price supports, limited market access, and export subsidies represent short-term equilibria in the market for social-welfare policies which distributes benefits to producers at the expense of consumers and taxpayers. The Commission's reform proposals contain only incremental changes in the Common Agricultural Policy, but they create structural conflicts within the Community itself. Thus, the opportunity for internal reform of the CAP leading to a compromise in the GATT negotiations is problematic at best.

"Macroeconomic Factors and the Thoroughbred Industry." *Michael Reed, Doug Tvedt, and Peter Karungu, University of Kentucky.*

This paper estimates the effects of macroeconomic variables (interest rates, exchange rates, and overall prices) on yearling auction prices. The analysis found that many factors which had changed to increase prices in the early 1980s moved in the opposite direction after 1985. However, the largest contributor to the depressed thoroughbred market was the 1986 Tax Reform Act.

"Preferential Trading Arrangements: Wheat Trade in Western Hemisphere Countries." *Barry Krissoff and Jerry Sharples, USDA.*

Developed and developing countries have shown a growing interest in preferential trading arrangements (PTAs) in the last few years. The United States has negotiated a PTA with Canada in 1989 and is discussing an extended agreement to include Mexico. Negotiations with other Western Hemisphere countries may also be forthcoming. The potential trade effects of different participants in a Western Hemisphere PTA is analyzed for the wheat market.

We estimate that there would be small changes in total wheat exports for the United States and Canada regardless of who participates in a Western Hemisphere PTA. Significant changes could occur in wheat trade, however, for Argentina and some wheat importing countries.

"Issues Influencing the Restructuring of East German Agriculture Following Reunification." *Dietmar Schuricke, VPI and State University.*

This paper discusses issues and implications for structural change in agriculture in East Germany. Prescribing appropriate structural change is made difficult by the several factors influencing the development of a new market-oriented agricultural structure. The most important factors influencing the appropriate composition of production factors (capital, soil, labor) are: capital and technological inputs, organization factors, market factors, legal factors, and ownership. Recently, the ownership factor—the reintroduction of landowners—has had the most important influence. Thus far, only 20 percent of landowners have elected to operate their own farms. The remaining 80 percent are still operating under the cooperative system.

EMERGING ISSUES IN INTERNATIONAL AGRICULTURAL ECONOMICS (Moderator: *Glenn Ames, University of Georgia*).

"Canadian and Japanese Import Demands for U.S. Dry Onions." *Nicolas Gutierrez, Stephen Fuller, and Oral Capps, Jr., Texas A&M University.*

This study estimated import demands for U.S. dry onions in Canada and Japan. Historically, these countries have imported about three-fourths of U.S. onion exports. Shipment data indicate that Washington, Oregon, Texas, Idaho, California, Colorado, Georgia, and New York are important exporting states. Import demands are specified for Canada and Japan and then estimated by joint generalized least squares. Results show that FOB onion price in the U.S. and the price of domestically produced onions in the importing country have an important influence on U.S. dry onion exports. Finally, even though similar variables affect the import demands for U.S. dry onions in Japan and Canada, the magnitudes of the elasticities are quite different for each country.

"Effect of Targeted Export Assistance Program and Selected Government Policies on the Import Demand for U.S. Grapefruit." *Stephen Fuller, Haruna Bello, and Oral Capps, Jr., Texas A&M University.*

This study estimated import demands for U.S. fresh grapefruit in five major importing nations; historically, these nations have imported about 95 percent of U.S. grapefruit exports. Five import demands are specified and estimated by joint generalized least squares. Results for the sample period 1969I to 1988IV show that devaluation of the dollar had an important influence on U.S. exports as did income and trade concessions. Further, analysis shows that the Targeted Export Assistance program has been successful in expanding foreign demand for U.S. grapefruit.

"The Farm-Export Price Spread for U.S. Wheat." *Stephanie Mercier, CED/ERS/USDA.*

This study examines the interaction between the domestic and international markets for U.S. wheat in the form of the price spread between farm-level and export prices. The study supports some of the theoretical results suggested in Gardner's 1975 AJAE paper on farm-retail price spreads. It finds that U.S. export subsidies do not necessarily lead to a reduction of the marketing margin, as economic theory and policy makers suppose, and thus may benefit foreign consumers more than U.S. producers.

"Substitution Among Imported Inputs: The Case of the Japanese Beef Market." *Brad Gehrke, Nicholas Kalaitzandonakes, and Maury Bredahl, University of Missouri.*

Determination of the substitution of imported inputs is critical in evaluating the impacts of policies across alternative sources of imports. Liberalization of the Japanese beef market is analyzed using a cost function approach to determine the degree of substitution across alternative sources of beef imports and to determine the optimization behavior of the Japanese import monopoly. U.S. beef was found to substitute more readily for Australian beef, and support for contention that the import monopoly acted to maximize economic rents was also obtained.

FINANCIAL ANALYSIS AND RISK ASSESSMENT (Moderator: *Marvin Batte, Ohio State University*).

"Systematic and Nonsystematic Risk in the Farm Credit System Cost of Capital." *Charles B. Moss, Richard N. Weldon, Robert D. Emerson, and P. J. van Blokland, University of Florida.*

During the 1980s, financial stress in the farm sector increased dramatically leading to increased financial difficulties among agricultural financial intermedi-

aries. The Farm Credit System suffered because of its single industry mission. This study examines the effect of these adversities on the Farm Credit System by estimating the importance of systematic and non-systematic risk in determining the interest rate paid by the Farm Credit System on Federal Intermediate Credit Bank bonds. The results indicate that a majority of the variation in Federal Intermediate Credit Bank bond rates is explained by systematic factors.

"Financial Stress Measurement: A Multi-Period Classification Analysis." *C. Robert Stark, Jr., and Bruce J. Sherrick, University of Illinois, Urbana-Champaign.*

Analyses of various financial-stress classification criteria are employed to classify samples of Illinois farms using cash, cash minus depreciation, and accrual income measures from 1985 to 1990. Regression analysis is used to identify relationships among the measures. Discrepancies in classification over multiple time periods are greater than previous single-year analysis had indicated. Classification shift patterns for individual farm operations in a selected continuous subsample of the data are examined as predictive indicators of the future financial condition of the farm operation.

"An Estimation of Expected Portfolio Risk for Farm Credit Banks." *Charles B. Dodson, Texas Tech University.*

Portfolio risk for Farm Credit System (FCS) banks and combined associations were analyzed using a procedure which simulated the performance of the loan portfolio of FCS district banks and combined associations over a 10-year period. Loan portfolios were generated for each FCS district bank and combined association using USDA 1989 Farm Cost and Returns Survey data. The results indicate that FCS will continue to face a substantial amount of portfolio risk over the forecast period. However, the risk is concentrated among midwestern districts and could be reduced to a manageable level through mergers or consolidations of district banks.

"A Structural Approach to Estimating Rate of Return Expectations of Farmers." *Bruce L. Ahrendsen, University of Arkansas.*

The cost function is a unique approach offered as an alternative to a time series approach for estimating farmers' expected operating rates of return on assets. A translog restricted cost function is estimated using data provided by 152 North Carolina dairy farmers over the period 1976 through 1986. The predicted

costs from the estimated restricted cost function are used to construct an estimate of farmers' expected operating rates of return on assets.

"Risk Diversification in Integrated Poultry and Aquaculture Production." *J. Richard Bacon and Conrado M. Gempesaw II, University of Delaware.*

A traditional approach to risk management in agriculture is output diversification. Commercial aquaculture has been identified as one of the fastest growing segments of U.S. agriculture. Expected returns for aquaculture production are high; however, the variability in expected returns is also high. On the other hand, broiler production through the integrator/contract grower interface has provided stable income to broiler contract growers in the Mid-Atlantic and Southeast regions. In view of the increasing interest in commercial aquaculture in these regions, this study evaluates the financial implications of broiler growers diversifying into commercial aquaculture.

"A Case Study Evaluation of the Effect of Selected Liquidity Strategies on Farm Profitability." *Gary Robertson and Kevin C. Moore, University of Missouri-Columbia.*

A computerized spreadsheet of integrated financial statements was developed to trace cash flow, net farm income, and ending net worth over several years. The model was used to determine the effect of four different liquidity management strategies upon farm profit and terminal net worth. Results indicate that liquidity management does affect the net income and resulting net worth change of the farm business, especially during difficult economic time periods.

QUANTITATIVE METHODS (Moderator: *Greg Traxler, Auburn University).*

"Correlating Random Events Using Spreadsheet Simulation Models." *Raymond E. Massey, University of Nebraska.*

The spreadsheet add-in program @RISK is discussed for its usefulness in simulation models. @RISK is a useful program for many simulation studies but unacceptably models correlation of random variables. Changes to the spreadsheet can be made which allow proper modelling of correlated random variables without diminishing the other procedures @RISK performs. Detailed instructions on correlating normal, uniform, and triangular distributions are given. More general information regarding other distributions is provided.

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"The U.S. Export of Wheat, Corn, and Soybeans: A Disequilibrium Econometric Approach." *Muhammad Mustafa, South Carolina State College.*

The demand for and supply of U.S. wheat, corn, and soybean exports are specified and estimated in a disequilibrium model. When a disequilibrium model is used, estimates of parameters are more efficient and differ from estimates of an equilibrium model. The estimates of parameters indicate that the U.S. wheat and corn exports are elastic, while soybean exports exhibit an inelastic response.

"Projecting Yield Response to Changing Climate: Impact of Solar Radiation and Timing Weather Variables to Crop Growth Stage." *Bruce L. Dixon, University of Arkansas; Steven E. Hollinger, Illinois Water Survey Research Center, and Philip Garcia and Viswanath Tirupattur, University of Illinois.*

The study investigates alternative specifications for corn yield response models using field data in Illinois. Inclusion of solar radiation and soil moisture in place of temperature and precipitation as explanatory variables was found to be a more appropriate specification. Contrary to the conventional approach of measuring weather events relative to calendar months, timing of these measurements relative to the critical growth stages of the crop produces results more consistent with the underlying biological processes.

"Estimating Welfare Costs of a Food Safety Regulation Under Risks." *Wen-yuan Huang, USDA ERS.*

This paper presents a method for conducting an ex-ante benefit and cost analysis for evaluating the welfare costs of a food safety regulation and identifies data needed for the analysis. It proposes a range estimate to measure the welfare costs under risks. A range estimate includes an upper bound for measuring welfare change, under the assumption that both producers and consumers are risk neutral, and a lower bound for measuring welfare change under the assumption that both producers and consumers are risk averse.

"The Partial Adjustment and Adaptive Expectations Hypotheses: A Time Domain Perspective." *Robert D. Weaver, Pennsylvania State University.*

A variety of representations of partial adjustment and adaptive expectation hypotheses have seen extensive application. These applications have maintained specifications rather than testing their validity.

The nonidentifiability and nonnested nature of these hypotheses is demonstrated. An approach to discrimination among alternative specifications of the hypotheses and the optimal transfer function between prices and quantities supplied is introduced. The approach is illustrated in applications for annual and perennial crops in Ghana. Empirical evidence firmly supports rejection of Nerlovian type hypotheses for all crops except coffee, rice, and seed cotton.

ANALYSIS OF CROP INSURANCE AND PROVISIONS OF THE 1990 FARM BILL (Moderator: *Daniel B. Smith, Clemson University*).

"Price Uncertainty, Moral Hazard, and Adverse Selection in Agricultural Insurance." *Jerry Skees and Huoying Wu, University of Kentucky.*

The objectives of this paper are: (1) to illustrate the unique characteristics of crop insurance as compared to other types of insurance, (2) to examine the causes of moral hazard and adverse selection in current FCIC programs with and without considering price uncertainty, and (3) to provide solutions for the current FCIC crop insurance program which suffers from both adverse selection and moral hazard problems.

"An Empirical Analysis of the Demand for Multiple Peril Crop Insurance." *Barry K. Goodwin, Kansas State University.*

Knowledge of the factors affecting farmer purchases of crop insurance is essential for comprehending and evaluating the soundness and profitability of crop insurance programs. This analysis considers an empirical assessment of the demand for crop insurance by Iowa corn producers. The presence of adverse selection in the insured pool suggests that producers with differing levels of loss-risk will have different demand elasticities. Loss-risk is explicitly included in the empirical analysis and is found to significantly influence the elasticity of demand. Results suggest average demand elasticities of about -0.5/-0.7. Implications for the actuarial soundness of the industry are provided.

"A Risk Analysis of Southeastern Farm Response to Flexibility Under Alternative Policy Scenarios." *Anne Pouliquen, Charles Curtis, Larry Bauer, and P. James Rathwell, Clemson University.*

Target MOTAD is used to analyze the risk associated with the various proposals for the 1990 Farm Bill. The results indicate that a higher level of utility could be attained under any of the proposals than

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under the 1985 program. The Senate version offered the best risk-return trade-offs.

"Nonparticipation Options Under the 1990 Farm Act." *Jim Langley, USDA.*

The complexity of the 1990 Farm Act extends to nonparticipants through such provisions as the elimination of cross-compliance and introduction of zero certification. This paper focuses on nonparticipation options for an example cotton/wheat/soybean farm. The examples illustrate the implications of nonparticipation on calculation of base in subsequent years.

"Circle of Poison Legislation." *E. Douglas Beach and Stan Daberkow, USDA.*

Circle of Poison legislation emphasizes export controls to insure a safe food supply and to protect farmers from unfair competition. A unilateral export ban will have limited success in controlling global or U.S. pesticide-related externalities until adequate resources are devoted to pesticide residue detection. While policy alternatives are available, the debate is likely to continue due to insufficient information regarding global pesticide production and consumption, the inability of researchers to estimate pesticide benefits and risks accurately, the controversy over what constitutes a safe food supply, and the use of ethical arguments to justify pesticide export controls.

FEASIBILITY OF ALTERNATIVE PRODUCTS AND TECHNOLOGIES (Moderator: *Larry Bauer, Clemson University*).

"Economic and Financial Feasibility of Dairy Waste Management: Central Texas Representative Dairies." Greg Allen and Ashley Lovell, Texas Agricultural Extension Service; and Bud Schwart, Ron Lacewell, John Schmucker, David Leatham, and James Richardson, Texas A&M University.

The dairy industry in Central Texas has expanded rapidly in recent years. Water quality problems in this area have been perceived by the public as being caused by the dairies, thus resulting in much negative publicity for the dairy industry. Opposition from the public has forced state agencies to adopt regulations specifically for managing dairy waste. The cost to the dairyman to manage this waste could be substantial.

The purpose of this study was to budget the feasibility and financial impact of installing a two-stage lagoon waste management system under different milk production and price levels, and different investment requirements on two representative Central Texas dairy farms.

"Estimating the Potential Benefits of Irrigation Using Subjective Yield Expectations." *Kenneth W. Paxton, Lonnie R. Vandeveer, and David R. Lavergne, Louisiana State University Agricultural Center.*

Recent research has outlined procedures and advantages of developing subjective data for risk modeling; however, fewer studies have used this approach in farm level decision analyses. The general objective of this analysis is to evaluate irrigation using farmer subjective yields. These data provide the basis for developing enterprise gross margin estimates which are evaluated in a Target MOTAD model. Results from an application of this model to a cotton farm in Northeast Louisiana indicate that irrigation offers the potential to increase income and to reduce income variability.

"An Analysis of Ultranarrow Row Technology for Wheat Production." *Francis M. Epplin, John B. Solie, Virginia K. Allread, and Thomas F. Peeper, Oklahoma State University.*

Grain drills used to seed wheat in the Southern Plains have row spacings which are too wide for physiologically efficient wheat seed placement. The purpose of the research reported in this paper was to determine the circumstances under which the use of grain drills with ultranarrow row spacing would be economical.

The economic viability of ultranarrow row technology was estimated for farms of 300 and 1,000 acres. Sensitivity analysis was conducted to estimate the addition to grain yield necessary to offset the additional cost of adopting the technology and the maximum amount farmers could pay for the technology.

"Turfgrass-Sod: Feasibility as a Farm Enterprise." *John L. Adrian, Robert White, and Ray Dickens, Auburn University.*

Recent conditions on farms have caused many operators to seek and evaluate alternative enterprises such as turfgrass-sod. This article evaluates the feasibility of this enterprise using data derived from operating turfgrass-sod farms. A 50-acre example farm generated more net return than is typical for traditional enterprises. However, capital requirements over the seven-year production cycle were substantial.

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"Analysis of the Current and Potential Markets for Florida Aquaculture Catfish Products." *Colleen M. Clancy and Thomas H. Spreen, University of Florida; Surajudeen O. Olowolayemo, Alabama Agricultural Experiment Station; and David J. Zimet, North Florida Agricultural Research Education Center.*

A spatiotemporal linear programming model (GAMS) was constructed to simulate the catfish marketing system in the U.S. in order to study the economic feasibility of Florida's entering the aquaculture catfish industry. Model results and the sensitivity analysis were used to identify constraints to the potential expansion of the catfish industry in Florida. Results indicated that production and processing costs were important; however, production costs were the force driving the model. Processing capacity, storage costs and capacity, and transportation costs were also identified as possible constraints to expansion of a catfish marketing system in Florida.

"Measuring Variability Among Individual Swine Producers." *Michael A. Boland and George F. Patrick, Purdue University.*

Detailed quarterly data on 61 swine producers obtained from a private feed company was analyzed to determine variability of production factors. A price index was created to adjust changing prices and quantify marketing premiums. It found that there were considerable differences among producers during a single period and over time. Returns to labor varied almost twice as much for the bottom as for the top third of producers. Total expenses were the most important determinant of returns to labor with feed and facility expenses accounting for most of the variability. Marketing premiums were of limited importance.

LIVESTOCK AND MEAT MARKETING (Moderator: *Roger Hinson, Louisiana State University*).

"Vector Autoregression Analysis of Price Differentials in the Alabama Cattle Market." *Pierre-Justin Kouka, Patricia A. Duffy, and Neil R. Martin, Jr., Auburn University.*

Vector autoregression techniques were applied to the Alabama cattle market. It was found that an increase in the price of feed would result in higher slaughter cattle prices, but lower feeder cattle prices.

"The Value of Genetic Traits in Purebred Dairy Bull Services." *Juan A. Espinosa, North Carolina State University; and Ted C. Schroeder and Barry K. Goodwin, Kansas State University.*

Considerable differences exist among prices for purebred dairy bull services. Much of this variation in prices can be explained by differences in heritable production and offspring physical type traits. The specific values associated with individual heritable traits in dairy bull semen are estimated. Total performance index, production transmitting ability type index, milk production, fat and protein content, production reliability, and certain udder and physical type traits were significant semen price determinants.

"Reputation Selling in Feeder Cattle Teleauctions." *Steven C. Turner and John McKissick, University of Georgia; and Nancy S. Dykes, USDA.*

Recent research to identify significant factors which influence feeder cattle prices has focused on cattle and market characteristics. This research utilized data from Georgia teleauctions from 1976 to 1988 to investigate the possible impact of seller's reputation on price. Both significant premium and discount sellers were identified for each of the three teleauction organizers. The teleauction organization that transferred the least amount of information about the cattle had the greatest number of reputation sellers.

"Values of Beef Carcass Characteristics in Japan." *Biing-Hwan Lin, USDA; and Hiroshi Mori, Senshu University.*

The 1988 Japanese Beef Market Access Agreement provided U.S. beef exporters easier access to the high-valued beef market niches in Japan. A better understanding of values associated with beef carcass characteristics in Japan can assist U.S. producers in developing profitable feeding programs for the Japanese market. Characteristics and prices of beef carcasses auctioned in Tokyo are analyzed to generate buyer's willingness to pay for various carcass characteristics. The analysis also points out some problems inherent in the Japanese beef grading system.

"A Case Study of Entry in the Lamb Slaughtering Industry: Implications for Public and Private Strategies." *Warren P. Preston and Jeffery G. Reeves, VPI and State University.*

A likely potential entrant in the red meat packing industry, a poultry processor, failed in its attempt to enter the lamb slaughtering industry. This research focuses on the difficulties the operation encountered in securing adequate supplies of lambs for slaughter

and further processing. Although an important focus is to derive implications for antitrust enforcement policy, lessons are also drawn for firms that may consider entry into the lamb slaughtering industry. Importantly, results refute the notion that lamb slaughtering satisfies the assumptions of contestable markets.

WATER QUALITY, CHEMICAL USE, AND SOIL CONSERVATION (Moderator: *Richard Ready, University of Kentucky*).

"Perceptions of Water Quality and Willingness to Pay for Quality Improvements." *Jeffrey L. Jordan and Abdelmoneim H. Elnagheeb, University of Georgia.*

The objectives of this paper are to explore people's perceptions of water quality and their support for policies that improve water quality. Specifically, survey results will be used to show how people perceive water quality, what factors influence people's willingness to pay for improvements in water quality, and how much people are willing to pay. Using the cumulative relative frequency as a function of offered bids, results indicated that the median amount people were willing to see their water bills increased to improve water quality was $6.51 per month or $78.12 per year.

"Estimating the Dynamic Impacts of Insecticide Regulations in the Presence of Pesticide Resistance." *Richard F. Kazmierczak, Jr., Louisiana State University; and George W. Norton, VPI and State University.*

An empirical, dynamic bioeconomic model was used to estimate the welfare impacts associated with the interaction between regulation and resistance. Results indicate that regulation-induced resistance can significantly decrease the flow of benefits derived from a production system.

"Restricting Nitrogen and Pesticide Use: A Regional Policy Analysis." *H. P. Mapp, D. J. Bernardo, G. J. Sabbagh, S. Geleta, K. B. Watkins, R. L. Elliott, and J. F. Stone, Oklahoma State University.*

This study develops and applies a regional programming model linked with crop yield, chemical movement, and aquifer models to evaluate potential impacts of water quality protection policies in part of the Central High Plains. A one-third reduction in total nitrogen applications has substantial impacts on dryland production relative to irrigated. A per acre restriction reduces nitrogen utilization on each irrigated crop by more than 30 percent relative to the baseline, and also reduces percolation and runoff losses. Policies eliminating particular chemicals must assess tradeoffs between eliminating all losses of target chemicals and increasing losses of substitute chemicals.

"An Analysis of Farmer Characteristics Associated with the Adoption of a Soil Conservation Technology." *S. R. Londhe, S. Sureshwaran, and P. Frazier, South Carolina State College; and N. Pascual, Visayas State College of Agriculture-Philippines.*

Studies on soil conservation decisions by farmers in developing countries and/or farmers cultivating steep lands is almost nonexistent. For upland farmers in the tropics, the Sloping Agricultural Land Technology (SALT) may be an appropriate means of soil conservation. SALT provides manifold long-run and short-run benefits, including the reduction of soil erosion and increase in farm income. A logit model is used to obtain quantitative estimates of the influence of selected socioeconomic variables on the decision to adopt SALT. Policy implications for further dissemination of SALT are discussed.

"A Profile of Missouri CRP Participants Interested in Agroforestry and Reforestation." *M. J. Monson, Robert Lenkner, and David Redhage, University of Missouri.*

Participants in the Conservation Reserve Program (CRP) in Missouri were surveyed regarding interest in applying agroforestry on CRP land. Of 547 respondents, 94 (18 percent) indicated that they would enroll 7,900 acres in an agroforestry program with a 75 percent cost share for trees. If an additional $25 per acre were added to this program, 191 respondents (33 percent) indicated they would enroll 29,734 acres. The total acreage in CRP for the sample was 98,127 acres. Extrapolation indicates 450,000 acres (30 percent) of Missouri's CRP land might be enrolled in agroforestry if a suitable program were available. These responses are cross-tabulated with demographic and financial characteristics.

DAIRY POLICY, OUTPUT, AND MARKETING (Moderator: *Mary Marchant, University of Kentucky*).

"A Multiordered Response Analysis of Southern Dairy Farmers' Opinions Toward Milk Marketing Cooperatives." *Dale H. Carley and Stanley M. Fletcher, University of Georgia.*

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Southern dairy farmers were asked to express opinions on the performance and services offered by milk marketing cooperatives. A multiordered probit model was used to estimate the relationships. Providing an assured market had the highest probability of being rated excellent of the services offered. Farmers selling to bargaining-operating cooperatives had higher probabilities of ranking services offered as excellent than did those selling to bargaining cooperatives. Providing a better price was important to bargaining cooperative members while providing better farm service was important to bargaining-operating members. Market assurance and service may be as important to farmers as prices received.

"The Impact of Government Stocks on Dairy Product Price Variability." *Delton C. Gerloff, Joe L. Outlaw, and Ronald D. Knutson, Texas A&M University.*

In evaluating inventory management programs for the dairy industry, two criteria are reducing stocks and stabilizing prices. Evidence is given that the level of government stocks and support prices are negatively related to price variability in the cheese and nonfat dry milk industries. No such evidence is found in the butter industry. A positive relationship between the level of private stocks and price variability is found in all three industries.

"An Interregional Dairy Policy Analysis: An Application of Optimal Control-Stochastic Coefficient Approach." *Rodolfo V. Tanjuakio, Conrado M. Gempesaw, and G. Joachim Elterich, University of Delaware.*

An 11-region stochastic coefficient econometric model is estimated and used in an optimal control framework to evaluate the effectiveness of the dairy support and the marketing orders in reducing and stabilizing government purchases of dairy products. The results show significant pressure on the reduction of the support price both in the presence and absence of Class I differentials. The optimal control model also showed that the drop in the price support levels did not dramatically alter the regional distribution of milk production.

"Dairy Output Strategy Under a Production Quota: The Case of German Farms." *C. M. Gempesaw II, V. A. Shivani, and J. G. Elterich, University of Delaware; and D. A. Lass, University of Massachusetts.*

This paper discusses the use of financial simulation and regression approaches to estimate dairy output strategy under a production quota. Dairy producers face financial penalties if they produce over or under the quota. Overshooting the quota means higher costs and zero revenue for quantity produced over the quota. Undershooting the quota implies lower costs but also lower revenue. By specifying dairy output to be stochastic, a financial simulation model was applied to German dairy farms to estimate the financial loss of producing under or over the quota. The simulation results were then used in a dummy variable regression model to evaluate optimal dairy output strategy under a production quota.

"The Determinants of Mailbox Prices for Dairy Farmers." *J. Lee and R. Kilmer, University of Florida; and D. Carley, Georgia Experiment Station.*

A switching regression model was estimated to study the mailbox price received by dairy farmers. The results show that net returns of farmers depend on types of milk handlers and the characteristics of the farmer. The mailbox prices are positively related to the size of dairy operation.

DEVELOPMENT ISSUES IN INTERNATIONAL AGRICULTURAL ECONOMICS (Moderator: *Fred Ruppel, Texas A&M University*).

"The Technical Efficiency of Rice Production in Mali: The Office du Niger." *Bakary Kante, PRISAS INSAH; and Steven E. Kraft, Southern Illinois University.*

Survey data from 60 farmers located in four villages on land controlled by the Office du Niger (a parastatal corporation) are used to assess the extent of technical efficiency among rice farmers. Corrected ordinary least squares regression shows that farmers are technically efficient but that the level of efficiency differs among farmers based on planting methods. Results are discussed in terms of Malian rice policy.

"Exchange Rate Misalignment and Agricultural Export Performance in Developing Countries." *Daniel H. Pick and Thomas L. Vollrath, USDA.*

This paper quantifies the effects of exchange rate misalignment on developing-country agricultural export performance in selected commodities. Empirical results show that exchange rate misalignment, defined as the ratio of the actual real exchange rate to the long-run real equilibrium rate, had a negative impact on agricultural export performance.

This impact was statistically significant in four of the 10 countries examined. These findings provide evidence of the importance to developing-country exporting sectors of sustainable macroeconomic policies which prevent exchange rates from becoming overvalued.

"Assessing the Results of Trade Liberalization: An Alternative Perspective." *Peter S. Liapis, USDA.*

Empirical analyses of agricultural trade reform have been conducted using either partial equilibrium or computable general equilibrium models. This paper presents results from a model that expands the commodity coverage of other partial equilibrium models by including factors of production. The model is derived from a multiple output, multiple input technology. Assumptions regarding production technology significantly affect the results of trade reform.

"U.S.-Mexico Free Trade Agreement Economic Impacts: Projections for the Border Region." *Lonnie L. Jones and Teofilo Ozuna, Jr., Texas A&M University; and Mickey Wright, Texas Comptrollers Office.*

Recent trade liberalization measures between the U.S. and Mexico have been accompanied by improvements in the economic welfare of both countries, most noticeably Mexico. Further economic improvements are expected under a U.S.-Mexico FTA. Certain regions and economic sectors of each country, however, may be impacted more than others, and returns to certain resources may increase or decrease with the new trading arrangement. The signing of a U.S.-Mexico FTA will likely affect capital and labor resources of the two countries. Investment is expected to increase in Mexico, and the U.S. could benefit as increased investment in Mexico further stimulates the demand for U.S. produced goods. In the labor market, the FTA is expected to affect wage rates and the migration of labor. Most of the wage adjustments will take place in Mexico. In the U.S., skilled workers and owners of capital will benefit while unskilled workers will experience a reduction in real income. On balance, an FTA will have a number of conflicting economic impacts on the U.S.-Mexico border region. Retailing jobs and border horticultural crop producers on the U.S. side will probably be negatively impacted. The border will probably still remain an attractive region for the maquiladoras. Capital investments, however, will likely be required in the border region for infra-

structure, food processing plants, and other types of businesses.

PRODUCER LEVEL DECISION MAKING
(Moderator: *Ken Paxton, Louisiana State University*).

"The Lease-Purchase Decision for Agricultural Assets." *Stephen A. Ford and Wesley N. Musser, Pennsylvania State University.*

The decision to lease or purchase an asset is addressed using methodology from corporate finance literature that is new to agricultural economics. The methodology allows the determination of a break-even lease payment using a minimum of information. Symmetry between the lessee and lessor is also examined. A numerical example using a dairy cow lease illustrates the technique. The effects of changes in the discount and marginal tax rates on the break-even lease payments are examined analytically and numerically. Analysis of the lessee-lessor relationship identifies conditions under which markets for leasing arrangements will exist.

"A Stochastic Evaluation of Swine Breeding Systems." *Joseph E. Williams, Oklahoma State University; and Raymond E. Massey, University of Nebraska-Lincoln.*

The after-tax net present values for 27 swine breeding systems composed of Duroc, Hampshire, and Yorkshire breeds are simulated and ordered using stochastic dominance analysis. For producers not currently using the dominant system, estimates of the allowable present value cost of adoption are reported and used to explain diverse production practices.

"A Simulation Approach to the Economics of Space Allocation for Grower-Finisher Hogs." *Timothy A. Powell, Michael C. Brumm, and Raymond E. Massey, University of Nebraska-Lincoln.*

The economics of animal space allocation for grower-finisher hogs in a confinement facility with partial slats was examined using a simulation model. Additional crowding over that previously recommended may be warranted based on results from the model. The pig performance penalty is more than offset by spreading the fixed costs over greater output.

"An Intraseasonal Dynamic Optimization Model to Allocate Limited Irrigation Water Between Competing Crops." *Kelly J. Bryant, James W.*

Mjelde, and Ronald D. Lacewell, Texas A&M University.

When irrigation water is limited, producers face intraseasonal decisions regarding allocation of water between crops. This paper presents a dynamic programming model that allocates irrigations between competing crops while allowing for stochastic weather patterns and temporary or permanent abandonment of one crop in dry periods. Soil water in each field and condition of each crop serve as state variables. Fifteen intraseasonal irrigations are allocated between corn and sorghum fields on the southern Texas High Plains. Broad rules of thumb implied by the results suggest irrigating the driest field in any stage unless soil water is close to field capacity on both fields or below wilting point on corn. Optimal irrigation allocation between the two crops varies with weather pattern.

"Cost of Machine Overcapacity in East-Central Nebraska." *Hisham el Osta, USDA; and Glenn A. Helmers and Muhammad T. Javed, University of Nebraska.*

In this study, costs were estimated for maintaining crop machinery overcapacity in the face of uncertain farm growth. An Integer Programming model was used to select long-run machine complements, crop mix, and labor sets for field preparation and planting operations. The costs of using those machine sets for smaller acreages were then examined. The results demonstrated slight to minor cost sacrifices of overcapacity.

"Simultaneous vs. Extended Use of Crop Machinery—Effect on Optimum Sets and Cost." *Glenn Helmers and Muhammad T. Javed, University of Nebraska; and Hisham el Osta, USDA.*

The objective of this analysis was to evaluate the economies of two-person crop farms using machinery beyond the normal working day (extended use) vs. within a working day (simultaneous use). The analysis was directed to field preparation and planting decisions but excluded harvesting operations. A mixed integer programming model was used in the selection of optimal machinery, crop mix, and labor sets. Two types of depreciation assumptions were examined, use based vs. age related. The results demonstrated almost no difference in costs between the two settings.

EXTENSION METHODS AND SOFTWARE APPLICATIONS (Moderator: *Josef Broder, University of Georgia).*

"Evaluation of a Multimedia Extension Program in Honduras." *Michael J. Martin and Timothy G. Taylor, University of Florida.*

A logistic regression is used to analyze the effectiveness of a multimedia extension program in Honduras. Farmers' decisions to adopt technologies that vary across crops and regions are examined as a function of communication type, human capital, and institutional factors. Survey design allowed learning sources to be identified directly rather than inferred from site visits. Results suggest that personal contact, land quality, and community involvement are influential in increasing adoption rates.

"Explaining Differences Among County Extension Agents' Knowledge and Attitudes about Risk Management Strategies." *Fred J. Benson, Jan C. Buzby, and Jerry R. Skees, University of Kentucky.*

This study examines county agricultural Extension agent attitudes, knowledge, and programs of risk management. Logistic regression procedures tested the influence of agent training and experience along with selected county characteristics on agent and farmer knowledge of and perceived need for risk management strategies. Agent training consistently influenced results.

"FINYEAR—Financial Statement Preparation Software That Conforms to the Farm Financial Standards Task Force Guidelines." *J. Shannon Neibergs, James M. McGrann, and John Parker, Texas A&M University.*

Development of accurate financial schedules and statements is an important process for the farm/ranch manager. Financial schedules categorize the firm's assets and liabilities. Financial statements not only help in meeting the documentation requirements for a loan request but are also valuable management tools. FINYEAR is a computer program that was created to assist in developing a set of financial schedules and statements. FINYEAR was developed in conformance with the Farm Financial Standards Task Force guidelines. The FFSTF's guidelines created a number of accounting issues that are discussed relative to the development of the FINYEAR program.

"Ranch Management Information System (Ranch-MIS)." *James McGrann and Lawrence Falconer, Texas A&M University.*

This paper describes the Ranch-MIS, which is an integrated software system that is designed to organize relevant data and generate usable information

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reports in an efficient and timely manner to facilitate the commercial beef cow-calf or stocker cattle operator's decision-making process. The Ranch-MIS software will assist the beef cow-calf or stocker cattle ranch manager by providing a means to effectively retrieve relevant data and information to help select and analyze alternatives, and to evaluate results of operational decisions.

NATURAL RESOURCE MANAGEMENT
(Moderator: *Pat Norris, Oklahoma State University*).

"Disparity Between Hunters' Willingness to Pay and Willingness to Accept Compensation: An Empirical Example." *Gary R. Stratton and Webb M. Smathers, Jr., Clemson University; and Robert Gooding, South Carolina Wildlife and Marine Resources.*

Willingness-to-pay (WTP) and willingness-to-accept (WTA) compensation models were estimated for hunters using a portion of the Clarks Hill Wildlife Management Area during 1989-1990. Hunters' WTA values ranged from 2.8 to 8 times more than WTP. Income and wealth effects, as well as property rights, clearly contributed to this disparity in WTP and WTA compensation for the right to hunt in the Wildlife Management Area. Responding hunters spent an average of $750 for hunting-related activities or about 5 percent of their disposable income.

"Residential Flood Control Benefits of Aquatic Plant Control." *Eric M. Thunberg and C. Norman Pearson, University of Florida.*

Management of nonnative species of aquatic plants is an ongoing problem throughout the United States. This paper reports the findings of a simulation analysis of the flood control benefits of aquatic plant control in a case study area. The results show that substantial flood control benefits exist at current levels of plant management in the case study area. Adjusted for seasonal fluctuations in groundwater levels the benefit-cost ratio for aquatic plant control for the case study is 120:1. The simulation model developed for the study may be adapted to other areas and is currently being developed for cooperative extension purposes.

"Quality as a Latent Variable in a Fee Based Recreation Access Analysis." *E. Jane Luzar and Christopher Gan, Louisiana State University; and Mark L. Messonnier, University of Georgia.*

Recreation trends indicating an increasing demand for quality recreation experiences suggest the need for special consideration of quality in analysis of fee access recreation. By viewing quality as a subjective latent variable, this paper uses a simultaneous equation framework to evaluate the use of subjective appraisals of quality in fee based recreation access analysis.

"Sustainable Agricultural Development: Implications for Evaluating Technical and Institutional Change." *George W. Norton and Jeffrey Alwang, VPI and State University.*

This paper considers the implications of sustainable agricultural development for evaluating technical and institutional changes. It focuses on the need to reconcile multiple objectives, the importance of and methods for accounting for market failure, and the need to assess the cost effectiveness of alternative technical and institutional changes for meeting objectives. A means is suggested for conceptualizing the magnitude and distributional effects of technical change in the presence of environmental externalities. The implications of transactions costs and collective action for sustainable agricultural development are discussed.

ECONOMIES OF CHEMICAL USAGE IN AGRICULTURE (Moderator: *Lynn Reinschmiedt, Mississippi State University*).

"Reduced Chemical Input Agriculture: The Case of Organic Agriculture in Ohio." *Marvin T. Batte, Fred J. Hitzhusen, and D. Lynn Forster, Ohio State University.*

This paper evaluates farm-level profitability for organic farmers relative to "conventional" farms by statistical comparison of random samples of all Ohio farmers and of Ohio certified organic producers. Results suggest that organic farmers receive premium commodity prices, realize reduced yields, have smaller farm units, and have reduced expenditures for chemical inputs. Net farm income and rate of return on investment also are smaller for organic farms.

"Substitutability of Crop Rotations for Farm Chemicals." *Biing-Hwan Lin, LeRoy Hansen, and Stan Daberkow, USDA.*

Production practices among corn farmers in the 10 major producing states were analyzed to delineate agrichemical use patterns among different cropping systems. The continuous corn cropping system had

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higher per acre levels of insecticide use than alternative practices. Per acre insecticide use for continuous corn averaged 0.80 pounds per acre of active ingredients as compared to 0.14 pounds per acre for the corn-soybean rotation, an 80 percent reduction. Furthermore, by rotating soybeans with corn, increased land fertility could significantly reduce nitrogen applications, according to a preliminary econometric analysis of corn input-output relationships.

"Trade-Offs Between Quality and the Economic Impacts of Low-Input Agriculture in the Coastal Plain of Virginia." *Penelope L. Diebel, Kansas State University; and Daniel B. Taylor and Sandra S. Batie, VPI and State University.*

Agricultural activities have been identified as a major contributor to nonpoint pollution entering the Chesapeake Bay. Low-input agricultural practices are being considered to reduce pollution in areas adjoining the Chesapeake Bay. A multiperiod mathematical programming model was used to examine the potential adoption of low-input practices and to assess the environmental consequences of these activities under different policies. The results of these analyses indicate that trade-offs exist among the types of nonpoint pollution produced. Only policies which retired productive agricultural land reduced all pollutant types.

"Evaluation of Soybean Stink Bug Control Alternatives for the Southeastern United States." *David Chyen, Michael E. Wetzstein, William D. Givan, and Mark L. Messonnier, University of Georgia; and Robert M. McPherson, Coastal Plain Experiment Station.*

Methyl parathion is a highly toxic chemical used for controlling stink bugs in soybean production. For environmental and human health considerations, investigating alternative less toxic chemicals for control is desired. Research based on field experimental data for three states, Florida, Georgia, and Louisiana, are employed for this investigation. Results indicate that alternative currently available and less toxic chemicals may dominate methyl parathion in terms of improved profits.

MARKET EFFICIENCY AND FIRM BEHAVIOR (Moderator: *Jon Brandt, University of Missouri).*

"The Short-Run Behavior of Forward-Looking Firms." *Sergio H. Lence, Dermot J. Hayes, and William H. Meyers, Iowa State University.*

A theory of short-run competitive firm behavior allowing for random input and output prices, and forward trading and storage of final goods and material input is introduced. If the firm is a nonmyopic risk-averse expected-utility maximizer, separation of production and storage from hedging is obtained. Comparative static results are derived regarding production, purchases, and sales. The hypotheses advanced are tested with monthly data from the U.S. soybean processing industry. The results support the model and suggest that in stationary equilibrium, futures prices of the soybean complex had little influence on crushings or production but were important determinants of inventories.

"Reliability of Soybean and Corn Option-Based Probability Assessments Derived Assuming No Functional Form." *Elvira Maria Sousa Silva, Pennsylvania State University; and Kandice H. Kahl, Clemson University.*

The reliability of option-based probability assessments derived assuming no distributional form is evaluated. During 1985-1990 and 1985-1987, soybean and corn assessments were found to be unreliable. During 1988-1990, soybean and corn assessments were found to be reliable. Previous research assuming a lognormal distribution found soybean assessments to be unreliable and corn assessments to be reliable during 1985-1988. These results do not support the hypothesis that the finding that soybean assessments were unreliable was caused by the lognormality assumption. The results support the hypothesis that assessments become reliable as option markets mature.

"Cointegration and Market Efficiency in Regional Cash Markets." *Ourania Korka, University of Maryland.*

Intertemporal factors inherent in cash and futures prices describe and give information for equilibrium relationships and market efficiency. Moreover, these prices and their differences play an important role in grain marketing decision making and in the price discovery process. The purpose of this study is to analyze aspects of the interaction between cash and futures markets for corn and soybeans in the State of Maryland. Existence of any long-run relationships between spot and futures prices are examined, and then the efficiency of local spot markets is investigated. Results indicate that spot-futures and local spot-spot prices are cointegrated and, thus, should move together in the long run. Regional cash markets were found to be nonconsistent with market effi-

ciency due to a risk premium and/or the irrational use of information.

"A Structural Investigation of Biotechnological Impacts on cotton Quality and Returns." *George T. Chiou, Dean T. Chen, and Oral Capps, Jr., Texas A&M University.*

This study develops a structural quality/quantity choice model to evaluate the impact of improved fiber quality and the resulting economic surplus under alternative biotechnological scenarios. Two major biotechnology scenarios, trend growth and rapid biotechnological advancement, are considered for a comparative analysis of fiber quality improvement across U.S. production regions. The results show substantial impact of biotechnology on fiber quality improvement and economic returns.

"The Effects of Alternative Cow Freshening Distribution on Milk Production in Florida." *Richard Kilmer, John Morrill, Thomas Spreen, and Michael A. DeLorenzo, University of Florida.*

Seasonal swings in milk production in Florida result in a need to import large quantities of milk on a seasonal basis. A linear programming analysis is used to analyze alternative milk procurement solutions and project the cost savings to Florida dairy cooperatives from reduced milk imports.

QUANTITATIVE METHODS (Moderator: *Stephan Goetz, University of Kentucky*).

"A Test to Determine the Acceptability of Mean-Variance Analysis." *Carl R. Dillon, University of Arkansas.*

Necessary and sufficient conditions for decision variables to satisfy location and scale criteria are derived under a discrete and equivalent number of states of nature common to many mean-variance (E-V) models. This allows an empirical test to be developed which addresses the consistency of E-V analysis with expected utility theory. It is necessary and sufficient that the net returns, when sorted in ascending order, be linear functions of one another for E-V analysis. A correlation matrix of ranked decision variables allows statistical testing of this requirement. An empirical example of dryland soybean and wheat production in Arkansas illustrates the procedure.

"Human Capital and the Distribution of Farm Income: A Multinomial Logit Analysis." *Stephan J. Goetz, Huoying Wu, and Jerry R. Skees, University of Kentucky.*

A multinomial analysis is used to discern the *independent* effects of human capital, off-farm employment, and other exogenous variables on farm income inequality. While education, fixed assets, and ownership of tobacco quota are found to widen income disparities, off-farm income reduces inequality, as postulated in the earlier literature; experience in agriculture does not affect the distribution of income for the farmers sampled. Changes in the distribution of the exogenous variables over the population are also simulated and presented in figures.

"An Examination of Appropriate Price Patterns to Employ in Stochastic Dynamic Programming Models." *Minkang Zhu and Daniel B. Taylor, VPI and State University.*

Methods of including price in stochastic dynamic programming models are examined. The implication of the methods on the dynamic nature of models is mathematically derived. A scheme is presented to help researchers select the appropriate method of price inclusion. Using an inappropriate method is shown to bias the analysis.

"Censored Regression Modeling in Agricultural Economics: Theory and Applications." *Andrew Tan and Teofilo Ozuna, Jr., Texas A&M University.*

Censored regression models are prevalent in areas of application where observations of the dependent variable are limited to some particular value, usually zero. This paper discusses the econometrics (theoretic and applied) of censored regression modeling. Alternative estimation techniques, misspecification effects and tests, and nonparametric estimators as well as new developments with respect to the censored regression model, are presented. Applications of censored regression models to agricultural economic issues are also reviewed and discussed.

"An Empirical Illustration of Impulse Response Functions from Cointegrated Models." *Hector O. Zapata, Louisiana State University.*

Engle-Granger two-step procedure and full information maximum likelihood estimators of a fully specified error-correction model are studied in a U.S. egg price model for the period January, 1981-December, 1990. Different dynamic specifications are suggested by both approaches; however, the impulse response functions, after imposing the cointegration constraints, reveal a similar time path in response to

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a shock in either price series. A shock in farm price stabilizes after two months. A shock in retail price does not significantly affect either farm or wholesale prices.

RURAL AND COMMUNITY DEVELOPMENT
(Moderator: *Mike Woods, Oklahoma State University*).

"An Econometric Analysis of Teacher Mobility." *Eric Bempah, Michael S. Kaylen, Donald D. Osburn, and Bob Birkenholz, University of Missouri-Columbia.*

Teacher migration is analyzed using Missouri mentor teacher survey data. A simultaneous equations model involving qualitative and limited dependent variables is developed. Earnings equations which account for self-selectivity are estimated for migrant and nonmigrant teachers. They support the conventional human capital theory of migration. They also show that migrant teachers increase their earnings by about 1 percent over what they would be without migration. Nonmigrant teachers would decrease their earnings by about 0.6 percent if they migrated. Teacher migration is most strongly influenced by earnings differentials.

"Reducing Transportation Costs for Rural Schools." *Gordon Sloggett, Gerald Doeksen, and Robert Oehrtman, Oklahoma State University.*

Rural school bus routes are generally the result of trial and error and historical precedent. BusRoute is a computer program (IBM PC or compatible) designed to minimize school bus route miles for rural schools. The BusRoute software and Operator Manual are written for the novice computer operator. A complete tutorial in the manual takes the BusRoute user from data collection and entry, to completing computerized bus routes for the current year, to developing routes for future years. During the 1990-1991 school year, BusRoute was delivered to 32 rural Oklahoma schools and resulted in an estimated average annual savings of nearly $7,000 per school.

"The Benefits and Costs of Rural Fire Protection: Four Case Studies." *Wempie Uguy and Lynn Reinschmiedt, Mississippi State University.*

Initial investment, annual costs, and benefits in terms of annual premium savings of fire insurance of establishing and operating rural fire departments were analyzed for selected Mississippi communities. The magnitude of costs and benefits differs among communities as a result of factors that are specific in each selected community. The provision of fire protection generated net benefits to the communities. Benefit-cost ratios of 2.9 to 8.8 were estimated. The results indicate that communities without fire protection can generate substantial economic savings in insurance premiums by providing minimum levels of fire protection.

"Supporting and Preserving Rural Areas: Looking at Selected German Institutional Responses." *Terence J. Centner, University of Georgia.*

A comparison of German and American institutions concerning support mechanisms for rural areas discloses several distinguishable objectives. The Germans place greater emphasis on preservation of the rural landscape, unique property rights, and the facilitation of positive externalities affecting the environment. Despite significant differences between the agriculture and rural areas of the two countries, the German institutional responses offer ideas for addressing perceived problems involving the rural economy. As pragmatic approaches for promoting greater sustenance of rural areas, Americans might develop a more precise mechanism to thwart incompatible nonagricultural uses and implement more effective state legislation to limit the liability of property owners for injuries arising from recreational usage of rural lands.

AGRIBUSINESS AND FINANCIAL ANALYSIS
(Moderator: *John VanSickle, University of Florida*).

"The Adequacy of Trucking Services for Produce: Trends in the 1980s." *Richard Beillock, University of Florida; and Bill Dutton, Paul Kepner, and Richard Weldon, USDA.*

Trends during the 1980s in the adequacy of trucking services for interstate produce haulage are examined for five production regions throughout the U.S. This is accomplished by analyzing changes in real freight rates and the time shippers must wait to arrange haulage. The results suggest that there have been no erosions in trucking services.

"A Stochastic Financial Analysis Simulation Model for Small-Scale Farm-Raised Catfish Processors." *Daniel S. Tilley and William Branch, Oklahoma State University.*

A stochastic simulation of the costs and returns from the operation of a small-scale catfish processing plant are presented. Results from two analyses indicate that: (1) under no combination of various operating capacity (70 to 100 percent) and price paid

for live fish distributions (0.65 to 0.72 dollars per pound) is the plant able to cover its operating costs given an associated set of processed product sales and price distributions based on 1990 industry averages; and (2) cyclical patterns in revenue and cost generation imply the need for a financial planning strategy to be implemented by the processor.

"Computerization in the United States Ornamental Nursery Industry." *Lewell F. Gunter and Steven C. Turner, University of Georgia.*

This research analyzes the determinants of computer application adoption by U.S. nurseries. A log-linear model, commonly used for the analysis of contingency tables, was adapted to the problem. This approach allowed the computer adoption and application adoption decisions to be considered together and permitted the modeling of the effect of adopting a given computerized application on the probability of adopting another.

"An Illustration of Modelling Perennial Crop Planting Response." *A. Elnagheeb and W. J. Florkowski, University of Georgia.*

Two approaches were applied to the perennial crop planting response problem. Both methods mitigate limitations on data on new plantings, while allowing for trees to be categorized as nonbearing and bearing. The modified French-Matthews approach directly accounted for new plantings while the second approach measured indirectly the impact of new plantings on quantity supplied. Empirical application of the two approaches was illustrated using data from the U.S. pecan industry. Past price changes and yield-tree age relationships influenced planting decisions. Results were validated using past information on new pecan plantings. The second approach provided accurate estimates in the case of the pecan industry.

"An Industry Perspective of Alternative Ports of Entry for Latin American Fruit and Vegetable Imports." *Roger A. Hinson, Bruce Lambert, and David H. Picha, Louisiana State University.*

Trade is a venue for economic development and diversification. While U.S. advocates have focused on exports, trade goes both ways. Imports of counterseasonal produce items stimulate port activity and may develop a marketing infrastructure for use by a fledgling domestic produce industry. While it appears that Gulf of Mexico ports could conserve transportation time and mileage for products destined for the Southern and Midwestern U.S., most products enter at Miami or along the Delaware River. This paper reports results of a survey designed to reveal industry perceptions of the physical and marketing infrastructure, and marketing advantages and constraints, offered by selected Gulf ports.