

Selected Papers

Session: Groundwater Quality. Moderator: Richard Howitt (University of California, Davis).

"Effects of Selected Production Practices on Groundwater Quality and Farmer's Profit: Texas Seymour Aquifer." Manzoor E. Chowdhury, Kelly J. Bryant, and Ronald D. Lacewell (Texas A&M University).

Using partial budgeting and a simulation model, the nature of tradeoffs between nitrate percolation and net returns are investigated for the Seymour aquifer area of north-central Texas. The results indicate that potential remains where a lower percolation level could be achieved without a significant reduction in farmer's profit.

"Economic and Environmental Impacts of Broad-Based versus Targeted Nitrogen Restrictions." D. J. Bernardo, H. P. Mapp, G. S. Sabbagh, S. Gelata, B. K. Watkins, and R. L. Elliott (Oklahoma State University).

A three-part modeling framework is presented for evaluating the economic and environmental effects of broad-based versus targeted nitrogen restrictions in the Central High Plains. Nitrogen application restrictions on furrow irrigated acreage achieve a large reduction in nitrate percolation, while minimizing income loss. Soil-targeted restrictions perform poorly in achieving significant reductions in nitrate loadings.

"Managing Nitrate Groundwater Pollution from Irrigated Agriculture." W. Marshall Frasier (Washington State University), Seik Oh (Korean Rural Economic Institute), and Norman K. Whittlesey (Washington State University).

A two-stage mathematical model incorporating uniformity of irrigation application was developed to determine optimal management strategies for a representative farm under various policy options. Results indicate that improved management practices could reduce nitrate emissions by 40% without loss of farm income. Input-related policies may provide additional abatement.

"Regulating Groundwater Pollution: Effects of Geophysical Response Assumptions on

Economic Efficiency." Ronald A. Fleming and Richard M. Adams (Oregon State University).

Most studies of agricultural groundwater pollutants assume that nitrogen fertilizer instantaneously leaches into an underlying water aquifer. In reality, there are time lags between fertilizer application and nitrate contamination. Such a lag complicates efficient regulation. This paper uses dynamic programming to test empirically the effects of such lags on regulatory efficiency.

Session: International Trade. Moderator: Thomas I. Wahl (Washington State University).

"Source-Differentiated Import Demand Models: The Case of U.S. Beef Import." Jung-Hee Lee, B. Wade Brorsen, and David Henneberry (Oklahoma State University).

A nonnested test was used to discriminate between the double-log and AIDS models as alternatives to the Armington model using source-differentiated U.S. beef import data. The nonnested test failed to reject either the double-log or the AIDS model. However, the estimated elasticities using the AIDS model were more plausible than those using the double-log model.

"Trade Creation and Diversion Effects of the U.S.-Canadian Free Trade Agreement." Won W. Koo and David Karemera (North Dakota State University).

The economic benefits of the U.S.-Canadian Free Trade Agreement (FTA) were empirically estimated and evaluated. The import demand elasticities from a dynamic demand model were used to estimate, for both countries, the amount of trade expansion under the FTA. Findings suggest that U.S. imports from Canada are more sensitive to domestic, import, and world prices than are Canadian imports from the U.S.

"U.S. Import Demand for Beef under Quantity Restrictions." James L. Seale, Jr., Gary F. Fairchild (University of Florida), and Vincent Atkins (CARICOM Secretariat).

A U.S. import demand system for beef (fresh, frozen, and chilled) by source suggests relatively low own-quantity but high own-price elasticities. Price responsiveness to total expenditure changes is unitary or elastic. Allais intensities indicate strong substitutability between Latin America and rest-of-the-world beef imports.

“Japan’s Import Quota: The Impact of an Increase on U.S. Peanut Exports.” Ping Zhang, Stanley M. Fletcher, and Dale H. Carley (University of Georgia).

The impact of increasing the Japanese raw peanut quota on U.S. peanut exports was investigated using the Rotterdam model. Results indicate that U.S. raw peanut exports may not increase. Furthermore, U.S. peanut butter and roasted peanut exports could fall if the increased quota leads to a decline in peanut product imports.

Session: Time Series Methods. Moderator: James A. Vercammen (University of British Columbia).

“Selection of the Dependent Variable in Canadian Meat Demand Analysis: A Vector Autoregression Approach.” Rakhal C. Sarker (Forestry Canada, Ontario Region).

The vector autoregression analysis is used to determine the predeterminedness of price and quantity in the demand functions for beef, pork, and chicken in Canada. The results suggest that for both beef and chicken, quantity determines price. For pork, however, price determines quantity.

“Multi-Market Arbitrage Using System Theoretic Time-Series Forecasts.” Kenneth A. Foster (Purdue University), Arthur M. Havenner (University of California, Davis), and Allan M. Walburger (Purdue University).

Multivariate time-series forecasts of weekly live cattle prices in six different geographic markets were developed using a procedure based on the principles of linear systems theory, extended to nonstationary processes. These forecasts were found to be informative. Further, it was shown that arbitrage possibilities exist which could be profitable.

“Testing Spatial Market Performance.” Md. Habibur Rahman (Kansas State University)

and Barry K. Goodwin (North Carolina State University).

Integration and bivariate cointegration models fail to incorporate spatial dependence and transport costs and suffer from misspecification. Spatial variables are jointly endogenous and multivariate procedures are appropriate to study them. Two market integration models and Johansen’s multivariate cointegration model are applied to Kansas wheat prices. The results indicate that prices are spatially linked.

“Wheat Prices and Money Supply: An Empirical Causal Investigation.” Neil L. Meyer and Ken Hart (University of Idaho).

Relationships between wheat prices and U.S. money supply are reported. Granger causality tests are used to identify lag length and direction. Results indicate that money supply changes cause white wheat price changes, with a lag of four to six months and no feedback. No causality with all-wheat prices was detected.

Session: Commodity Markets. Moderator: Shida Rastegari Henneberry (Oklahoma State University).

“Price Volatility and Seasonality of Different Alfalfa Hay Qualities.” Russell Tronstad and Satheesh Aradhyula (University of Arizona).

Seasonal volatility in alfalfa prices was modeled with a GARCH(1,1) process and smooth sine function. Results suggest that different alfalfa qualities are different markets and that it is inappropriate to model differences in hay quality by just a dummy variable. Good hay was most volatile during harvest, the opposite of off-grade.

“Pricing Behavior in the British Columbia Wine Industry.” Derek Adams and James A. Vercammen (University of British Columbia).

A structural model of the British Columbia wine industry is constructed and estimated to test the hypothesis that wine producers behaved less than competitively between 1957 and 1986. The hypothesis is supported by showing that the estimated conjectural variation parameter is statistically different from the perfect competition benchmark.

"Factors Influencing Consumer Purchase Intentions for Beef and Beef Steaks: An Application of an Attitude-Behavior Model." Dale J. Menkhaus, Glen D. Whipple, Pierre M. L. Pelzer, and Damien P. M. Colin (University of Wyoming).

An attitude-behavior model was used to identify factors responsible for individual consumer purchase intentions for beef and steaks. Results suggest health-related attributes of beef, particularly cholesterol, negatively influenced the purchase intentions for beef and steaks. The attitude-behavior model provides a useful alternative to the traditional economic formulation.

"Composite Price Expectations and the U.S. Soybean Market." Duncan M. Chembezi (University of Tennessee).

This study investigated the use of rational, naive, and composite expectations in the soybean market. Empirical results suggest composite expectations are more consistent with the soybean data used, implying both rational and naive expectations exist in the market. Naive expectations, however, are biased predictors of actual prices.

Session: Agricultural Finance. Moderator: Penelope L. Diebel (Kansas State University).

"A Proposed Profit and Loss Sharing Equity Market for Agriculture." Laurence M. Crane (North Dakota State University) and David J. Leatham (Texas A&M University).

An institutional arrangement and contracting procedure where the demand for farm equity potentially could be satisfied by external suppliers in a profit and loss sharing arrangement is outlined. An accounting schedule for calculating the equity division of owner and external equity is developed and presented.

"Net Value Added for the U.S. Agricultural Sector: An Entropy Approach." Richard Weldon (University of Florida), Kenneth Erickson (USDA, Economic Research Service), and Charles Moss (University of Florida).

This paper examines the national and regional distribution of net value added for the United States. The Theil Measure of

Inequality (TMI) measures the changes in net value added for the period 1960-91. This entropy-based measure quantifies the inequality for the U.S., and then decomposes the U.S. inequality into between-region and within-region differences.

"An Examination of Financial Stress in U.S. Agriculture, 1960-91: Implications from Options Pricing Models." Charles B. Moss, Richard N. Weldon (University of Florida), and Kenneth Erickson (USDA, Economic Research Service).

This study examines financial stress in U.S. agriculture using implications from options pricing models. Specifically, the instantaneous variance is estimated for an application of the Black-Scholes pricing model. The empirical results require an alternative specification based on the options pricing framework to examine financial stress over time.

"A Comparison of Taxation Burdens for Major Dairy States." Mary C. Stoff, Gregory M. Perry (Oregon State University), and Clair J. Nixon (Texas A&M University).

A comparison was made of federal, state, and local tax burdens in 11 states for the 1991 tax year. Study focus was on differences in taxes among states, with five different farm sizes examined to determine how tax levels vary by income. Among the states analyzed, Oregon consistently had one of the highest tax burdens and Missouri one of the lowest.

"The Effects of Including Taxes in Dynamic Investment Decisions." Frank Novak (University of Alberta), Russell Tronstad (University of Arizona), and Gary D. Schnitkey (Ohio State University).

The effects of including taxes in a dynamic model of off-farm investment decisions were analyzed using a stochastic dynamic programming model (SDP). Although taxes influence optimal decisions toward the end of the tax year, ignoring taxes resulted in only slightly lower wealth levels and higher probabilities of bankruptcy.

Session: Environmental Economics. Moderator: Larry W. Van Tassell (University of Wyoming).

"Mixed Environmental Regulations and Transfer Payments under Incomplete Enforcement: A Multiple-Principals Agent Approach." Chung-Huang Huang (National Tsing Hua University, Taiwan).

A multiple-principals agency model is established to explore the determination of equilibrium transfer payments from legislator and firm to the regulator under mixed regulations with incomplete enforcement. The optimal enforcement, policies, and firm's response to changes in policy instruments also are analyzed.

"Evidence of Compliance Bias in Dichotomous Choice Contingent Valuation." Robert Berrens and Joe Kerkvliet (Oregon State University).

This study asks whether individuals directly questioned about their willingness to pay for a public good, in a setting of apparent social pressure, respond differently than those provided with additional anonymity. The traditional direct questioning format for dichotomous choice contingent valuation is compared against a randomized response questioning format.

"Converting Willingness to Pay into Public Revenues: Evidence from a Pheasant Stocking Program." Richard M. Adams and Robert Berrens (Oregon State University).

This study continues the investigation of a fee-access public stocking program. Following a 1986 contingent valuation (CV) survey, an experimental "put-and-take" program was initiated. A unique opportunity exists for performing an ex post evaluation of a CV. Results indicate the importance of pricing policy in commodity specification.

"Environmental Liability: The Rule of Negligence versus Strict Liability." Terry F. Glover (Utah State University).

This paper extends previous literature on the application of strict liability in the control of environmental hazards to the cases of post-discharge mitigation and the possibilities of reducing the risk of discharge. Application of the negligence rule yields nonoptimal cleanup and prevention expenditures and output. Strict liability induces optimality.

"Has the 1990 Farm Bill Improved Erosion Targeting of the Conservation Reserve Program in the West?" Amos Bechtel, Roger Coupal, and Douglas L. Young (Washington State University).

Results for California, Idaho, Oregon, and Washington show the 1990 Farm Bill Conservation Reserve Program (CRP) has been more successful than the 1985 CRP in concentrating enrollment in erodible counties. Fixed bid caps in the 1985 CRP often directed enrollment to counties with lower productivity and modest erodibility which reduced cost effectiveness.

"Comparison of Social and Private Returns from Wheat Tillage Systems in Oklahoma." Arthur L. Stoecker and Aden Aw-Hassan (Oklahoma State University).

Tillage systems were compared under social prices and under the current farm program. The current farm program was found to create more current wheat production and higher rates of erosion than was the case under social prices, and to provide insufficient incentives for adoption of reduced tillage equipment.

"Short-Run Onsite Erosion Damages in Missouri." Feng Xu and Tony Prato (University of Missouri, Columbia).

This study examines onsite cost of erosion damage using estimated production relationships. A nonnested test is used to determine whether the corn yield is in linear, Mitscherlich-Spillman, or logistic functional form in topsoil depth. Results indicate that nonlinear functions are appropriate and onsite cost of erosion damage is higher on shallow soil.

"Adoption of Environmentally Beneficial Agricultural Practices (EBAPs): What Roles Do Information and Education Play?" Robert D. Weaver and Nii Adote Abrahams (Pennsylvania State University).

The roles of information and education in adoption of environmentally beneficial agricultural practices (EBAPs) were examined. Adoption of both specific EBAPs and general types of EBAPs were examined. Results based on a survey of Pennsylvania farmers indicate that only innovation-specific information from trusted sources influenced adoption of EBAPs.

Session: Erosion Economics. Moderator: M. L. Lerohl (University of Alberta).

Session: U.S. Farm Policy. Moderator: D. J. Bernardo (Oklahoma State University).

"An Analysis of Kansas Farmers' Attitudes and Policy Preferences for Free Trade." Terry L. Kastens (Kansas State University) and Barry K. Goodwin (North Carolina State University).

This study evaluates the attitudes of Kansas farmers regarding "free-trade" and "free-market" policy environments. In contrast to earlier studies, nonspecific policy attitudes are evaluated. A direct measure of farm program benefits is also included. Attitudes are shown to significantly vary with several farm and operator characteristics.

"Analysis of Private Lease Rates and Non-Fee Costs in Idaho, New Mexico, and Wyoming." Larry Van Tassell (University of Wyoming), Neil Rimbey (University of Idaho), Allen Torell (University of New Mexico), and Tom Bartlett (Colorado State University).

The value of western rangeland forage on private leases and the non-fee costs of utilizing that forage are examined for Idaho, New Mexico, and Wyoming. Services provided by the lessor and lessee are examined and regression analysis is utilized to determine a "non-serviceable" lease rate.

"Effect of Corn Acreage Reduction Program and Deficiency Payments on Farm Portfolio Diversification: A Risk Programming Approach." E. B. Mafoua-Koukebene, Robert H. Hornbaker, and Bruce J. Sherrick (University of Illinois).

A risk programming model is used to derive risk-efficient optimal portfolios which maximize expected equity under uncertainty. Results indicate that hog production and financial securities diversify away some risk associated with crop production. Deficiency payment programs for corn change the optimal mix of assets as the agent adjusts other activities.

"Impacts of Commodity Programs on Sustainable Agriculture." Glenn A. Helmers, Kevin J. Bernhardt, Matt F. Spilker (University of Nebraska, Lincoln), and Joseph A. Atwood (Montana State University).

The impact of commodity programs on sustainable agriculture is analyzed by determining the effect of target price, base acreage, and set-aside elimination on acreage

decisions. Target price elimination, by itself, does not impact acreage decisions, while set-aside and base acreage elimination does alter crop mix.

Session: Quantitative and Research Methods. Moderator: James Eales (University of Alberta).

"On Aggregation in the Not-So-Ideal Inverse and Direct Demand Systems." Ron C. Mittelhammer and Thomas I. Wahl (Washington State University).

This paper examines aggregation (over consumers) properties for the recently introduced Almost Ideal Demand System (ALIDS)-like inverse demand system. The aggregation properties of the ALIDS model of Deaton and Muellbauer are also reexamined from both a theoretical and an empirical perspective.

"Marshallian and Hicksian Demands and the CPI." Julian M. Alston and James A. Chalfant (University of California, Davis). Deflating prices and income by the CPI is *never* the correct approach for obtaining compensated price responses in a double-log model. Deflating money income (but not prices) by Stone's price index yields a Hicksian double-log demand model. A specification test for the correct functional form of single-equation demand models is implied.

"An Examination of the Krinsky-Robb Procedure for Approximating the Statistical Properties of Elasticities." J. S. Shonkwiler (University of Nevada) and G. S. Maddala (Ohio State University).

The Krinsky-Robb method for deriving moments of a nonlinear function of estimated parameters may yield inconsistent results when applied to functions involving reciprocals of parameters. However, the alternative asymptotic approximation of the second moment may overstate precision. A small sample approximation of this problem is developed and illustrated.

"Modeling Management of Agricultural Ecosystems Using Fuzzy Set Theory: Methodological Issues." Robert Flick and G. C. van Kooten (University of British Columbia).

This paper presents a fuzzy set approach for

modeling environmental concerns in agricultural production systems. Differences between the fuzzy concept of possibility and probability (Bayesian and inferred) are examined. The extension of the fuzzy set approach to the management of agricultural systems in dryland cropping regions is discussed.

Session: Futures Markets. Moderator: Mary Bohman (University of British Columbia).

"Hedging with Commodity Options and Safety-First Rules." James Vercaemmen and Victor Gaspar (University of British Columbia).

A model of hedging with commodity futures and option contracts is constructed under the assumption that hedgers use safety-first rules for decision making under uncertainty. Options are shown to be extremely useful for these types of agents despite conventional results which indicate that options may not be useful for hedgers.

"Growing Season Futures Positions for Missouri Wheat Producers." Richard K. Rudel and Francis McCamley (University of Missouri, Columbia).

Optimal growing season futures contract positions were estimated for two locations using mean-variance and Target MOTAD formulations (two target levels). The positions differed between the two locations because of differences in average per acre yields and differences in relationships among the distributions of yields, cash prices, and futures prices.

"Live Cattle Futures and the Maximum Bid Hypothesis for Feeder Cattle." Chris T. Bastian and Dale J. Menkhaus (University of Wyoming).

A structural economic model was used to test a proposed hypothesis that cash prices for feeder cattle would be lower if live cattle futures were not available as a risk transfer mechanism to the cattle-feeding complex. Results of this study do not support this hypothesis.

"Revenue and Risk Associated with Alternative Slaughter Cattle Marketing Methods." Dillon M. Feuz, John J. Wagner, and Scott W. Fausti (South Dakota State University).

Revenue-risk tradeoffs of alternative cattle marketing methods are examined using stochastic dominance. Marketing preference changes from grade and yield to dressed weight to live weight marketing as risk aversion increases. There is a significant risk premium being paid by the sellers when marketing on a live weight basis.

Session: Water Rights and Marketing. Moderator: W. Marshall Frasier (Washington State University).

"Seasonal Water Markets: Empirical Measures of the Direct and Indirect Benefits and Costs." Richard E. Howitt (University of California, Davis).

The direct and indirect economic impacts of a seasonal water market in California are analyzed. The paper uses results from a two-county region that sold one-quarter of the water traded. The primary and secondary impacts on farms and the regional economy are measured using an optimization model and primary survey results.

"Collectively Managing the Interdependent Water Rights of the Columbia-Snake River Basin." Christine L. Hill and Stephen C. Cooke (University of Idaho).

Hydropower development in the Columbia-Snake River Basin has continued with little regard for laws intended to mandate equal consideration for fish affected by water development projects. Using Ostrom's theory of collective action to measure the Northwest Power Planning Council's potential for success, we found that the weak use-rights boundaries and the lack of graduated sanctions make the Council vulnerable to failure.

"An Integrated Economic and Hydrologic Modeling Approach for Instream Flow Management." David B. Willis and Norman K. Whittlesey (Washington State University).

An integrated economic and hydrology model is used to evaluate the agricultural cost of six instream flow policies in an irrigated river basin. The impacts of stochastic water supply and consumptive demand are modeled. Findings suggest that a policy combining conjunctive water management

and water markets is the preferred policy in the study area.

“Measuring Angling Quality in Count Data Models of Recreational Fishing: A Non-nested Test of Three Approaches.” Jeffrey Englin and David Lambert (University of Nevada).

This paper investigates three alternative specifications of the relationship between recreational angling demand and water quality. These three alternatives include only chemicals, biological stress indices based on the chemicals, and one based on catch per unit effort. The three alternatives are differentiated using a likelihood ratio non-nested testing procedure.

Session: Agricultural Business. Moderator: Dale J. Menkhous (University of Wyoming).

“Strategic Management in the Cut Flower Industry: A Case Study of Hawaii Producers.” C. A. Ferguson and M. S. Hamilton (University of Hawaii).

This case study identifies two strategic groups among Hawaii tropical flower producers. Firm and operational variables related to competitive strategy are analyzed. Results show marked differences in production technology, and the extent of post-harvest and marketing activities. Implications for the development of higher-value agribusiness opportunities are discussed.

“Product and Service Attributes Related to Marketing Western Nursery Stock.” Larry D. Makus, John C. Foltz, Joseph F. Guenther, and Robert R. Tripepi (University of Idaho).

Survey data from 311 garden centers, landscapers, and combined garden center/landscaping firms in selected western U.S. trade centers were analyzed. Findings identified important product and service attributes used in respondent decisions to purchase nursery stock. Efforts to segment this market using firm size, business type, and geographic location were unsuccessful.

“Technological Change in Meat and Poultry Packing and Processing.” David K. Lambert (University of Nevada).

Nonparametric procedures are used to compare technological change in meatpacking

(SIC 2011), and poultry slaughter and processing (SIC 2015). There has been a greater increase in total factor productivity in poultry than in the red meats. Evidence also suggests recent differences in the bias of this technological change, with production changes being labor using in poultry and labor saving in meatpacking.

“The Economic Feasibility of Segregating Wheat in the Pacific Northwest: Implications for Wheat Exports.” Cathy J. Schaeffer and Thomas I. Wahl (Washington State University).

The cost of segregating low-protein, soft white wheat at subterminals and country elevators is evaluated, with sensitivity analyses considering different throughput levels and protein premiums. Segregation costs range from .06–26¢ per bushel, depending on the annual throughput in each of four models. Economic feasibility occurs at elevator premiums of .119–13.93¢.

Session: Optimal Fertilizer and Herbicide Application. Moderator: Philip R. Wand-schneider (Washington State University).

“Preliminary Economic Assessment of Variable Rate Technology for Applying P and K in Corn Production.” John D. Hibbard, David C. White, Chad A. Hertz, Robert H. Hornbaker, and Bruce J. Sherrick (University of Illinois).

Using actual Illinois field data, a preliminary economic analysis is performed on the use of variable rate technology for applying fertilizer. It is found that the appropriate analytical framework to fully assess the economics of VRT is highly sensitive to the assumptions of the model. The analysis suggests that VRT provides marginal first-year benefits, but that increasing sampling intensity costs eventually outweigh benefits.

“A Bioeconomic Decision Model for Weed Management in Winter Wheat.” Tae-Jin Kwon and Douglas L. Young (Washington State University).

A bioeconomic decision model was estimated to find optimal herbicide rates for multiple weed species in winter wheat grown under various tillage systems and crop rotations. The results demonstrate significant herbicide reductions at optimal use. An ag-

gregated weed competition index was developed to simplify the model.

"Economics of Adjusting Nitrogen Rates for Early-Harvest Sugarbeets." Paul A. Burgener, Larry J. Held, Joseph G. Lauer, and Dale J. Menkhaus (University of Wyoming).

Field experiments were conducted to examine benefits of adjusting nitrogen rates for early-harvest sugarbeets. Compared to applying 200 pounds per acre with no regard to harvest time, reducing nitrogen by 12 to 14 pounds per acre for each week of earlier harvest increased net returns by up to \$13.71 per acre.

"Estimated Implications of Agricultural Practices on Profit and Water Quality: White River, Indiana." Bharat Mainali, Kelly Bryant, Ronald Lacewell (Texas A&M University), Verel Benson (USDA/SCS, Temple, Texas), Jimmy Williams (USDA/ARS, Temple, Texas), and John Lee (Purdue University).

Reduction of nitrogen fertilizer use, improved water quality, and farmer income are concerns to environmentalists, policymakers, and farmers. Per acre estimates of a multi-crop/multi-year simulation model suggest that higher water quality can be achieved with lower nitrogen use without a major effect on net returns.

Session: Community and Regional Economics. Moderator: Stephen C. Cooke (University of Idaho).

"Application of Count Data Procedures to Estimate Thresholds for Rural Commercial Sectors." T. R. Harris and J. S. Shonkwiler (University of Nevada).

This paper extends previous research to estimate minimum demand thresholds for rural commercial sectors by employing count data procedures. Advantages of count data procedures are contrasted with the traditional double-log model. Incorporation of results from count data procedures into a rural commercial sector development strategy is discussed.

"Regional Economic Linkages to Metropolitan and Nonmetropolitan Nevada: A Vector Autoregression Analysis." G. W.

Smith (Washington State University) and T. R. Harris (University of Nevada).

A vector autoregression model examines whether metropolitan and nonmetropolitan Nevada dynamically interact, and link to California and the nation. An optimal non-sequential lag structure permits inclusion of relevant long lag effects. Variance decomposition results reveal Nevada's regions exhibit minimal interaction, and their linkages to the U.S. and California differ.

"Economic Viability in the Great Plains: The Determinants of County Population Change, 1970-89." Nicole L. Klein and Andrew P. Barkley (Kansas State University).

County-level data for 617 counties in seven Great Plains states were used to identify and quantify the determinants of local population change. Regression results confirmed the movement of people from rural to metropolitan areas. Education levels were positively associated with county population growth, indicating a need for education policy analysis.

"Economic Impacts of Nature-Based Tourism at Ramsey Canyon Preserve and the San Pedro Riparian National Conservation Area, and Implications for Adjacent Rural Communities." Julie P. Leones, Bonnie G. Colby, and Kristine Crandall (University of Arizona).

Economic impacts of bird watching near Sierra Vista, Arizona, were \$2.1 million in output for fiscal 1991-92 based on visitor expenditures of \$1.2 million. High rural expenditures resulted from the preferred time of day of the activity and the age and income characteristics of visitors.

Session: Technical Change in U.S. Agriculture. Moderator: Robert D. Weaver (Pennsylvania State University).

"A Yield Sensitivity Analysis of Conventional and Alternative Whole-Farm Budgets for Northeast Kansas." Penelope L. Diebel and Richard Llewelyn (Kansas State University).

This analysis compares net returns of whole-farm budgets for conventional and alternative agricultural systems in northeast Kansas. Three alternative systems and two transitional systems are more profitable than

the conventional system. Yield sensitivity analysis reveals that the economic feasibility of the alternative systems is relatively stable despite severe yield penalties.

"Technology Adoption Under Uncertainty." Atanu Saha, Alan Love, and Robert Schwart, Jr. (Texas A&M University).

This paper presents a model of divisible technology adoption under output and input price uncertainty. The model analyzes the objective factors and subjective perceptions that affect adoption decisions. A mixed dichotomous-continuous estimation framework is proposed. The application of the empirical model uses data on the Texas dairy industry.

"Measuring Technical Change and Bias in U.S. Agriculture Using Generalized Flexible Least Squares." Margaretha V. Rudstrom and Kenneth A. Foster (Purdue University).

A two-output, three-input translog cost function and its derivatives are estimated for U.S. agriculture using generalized flexible least squares for the period 1950 to 1982. Flexible parameter estimates indicate that U.S. agriculture exhibited technical change that was biased toward capital and non-labor variable inputs.

"Rates and Sources of Productivity Gains in the U.S. Broiler Industry: 1957-91." Richard K. Perrin and Kelly D. Zering (North Carolina State University).

A model is presented to allocate total factor productivity (TFP) changes to specific technological improvements by examining experimental data. An empirical example is presented using industry and experimental data on commercial broiler production in the United States. Genetic improvements accounted for twice as much TFP change as improvements in rations.

Session: Decision Making and Risk. Moderator: Kelly D. Zering (North Carolina State University).

"The Impact of Selected Risk Management Strategies on Gross Revenue Forecast Error: Implications for Using Aggregated Data." Kendall S. Claassen and Robert O. Burton, Jr. (Kansas State University).

Single-period revenue risk in southeast Kansas crop production is measured at two

decision periods. The impacts of selected risk-reducing strategies on forecast error are analyzed. Results indicate that crop diversification and hedging help reduce variability in gross revenues, but that aggregated data mask the risk-reducing potential of crop insurance.

"Testing for Behavioral Objective and Aggregation Opportunities in U.S. Agricultural Data." Shon P. Williams and C. Richard Shumway (Texas A&M University).

To guide formulation of an aggregate model of U.S. agricultural production, this paper reports nonparametric test results for behavioral objective and aggregation level. Three types of nonparametric tests are implemented to determine empirical support for simplified analytical structures. This is the first known implementation to agricultural data of the nonparametric tests for homothetic separability.

"Applying Stochastic Dominance Criteria to Enterprise Mixture Problems for Risk-Preferring Producers." Francis McCamley and Richard K. Rudel (University of Missouri, Columbia).

Studies which elicit risk preferences often find that some decision makers have mild to moderate preferences for risk. Strategies for applying several stochastic dominance criteria, which are consistent with such preferences, to a specific class of enterprise mixture problems are discussed. The criteria are then applied to a simple problem.

"The Value of Wheat Growth Stage Information in the Wheat Grazing Enterprise." A. R. Tarrant, D. J. Bernardo, E. G. Krenzer, and G. W. Horn (Oklahoma State University).

Producers who utilize winter wheat forage to graze cattle must consider possible adverse effects of extended grazing on grain yield. A stochastic dominance approach is used to estimate the value of jointing date information to wheat-stocker producers. Results indicate that decision makers, regardless of risk preference, do place value on accurate jointing date information.

Session: International Marketing. Moderator: Gary F. Fairchild (University of Florida).

"Monthly versus Annual Price Impacts of Feeder Cattle Import Changes Due to NAFTA." Derrell S. Peel (Oklahoma State University), W. Terry Disney (USDA/ERS, Agr. Trade Analysis Div.), and Laura Cockerham (Oklahoma State University).

Two empirical approaches are used to illustrate how average national price impacts may produce a variety of local market impacts depending on more detailed assumptions about the intertemporal distributions of changing levels of feeder cattle imports. The average annual price impact on U.S. feeder calf price (4-500 pounds) is calculated over a range of changes in feeder calf import levels. These average annual price impacts are then compared with monthly price impacts for the Southern Plains under three different assumptions about the intertemporal flow of Mexican feeder calf imports.

"A Hedonic Price Analysis of the Quality Characteristics of Japanese Wagyu Beef." Thomas I. Wahl, Hong Shi, and Ron C. Mittelhammer (Washington State University).

Understanding the implicit valuations of beef characteristics in the Japanese market has important policy implications for the U.S. beef industry. In this paper, hedonic price analysis was used to estimate beef characteristics values in Japan. Japanese Wagyu beef auction data were used in the analysis.

"An analysis of the Effectiveness of U.S. Nonprice Promotion Programs: The Case of Red Meats in Japan." Shida Rastegari Heneberry and Marco A. DeBrito (Oklahoma State University).

The effectiveness of U.S. government non-price export promotion activities for red meats in Japan was analyzed using an extended Armington model. Results suggest that promotion activities had a significant impact on U.S. market share of beef offals in Japan. Returns per dollar of promotion were calculated.

"Growth Export Markets for Meat Products." Arnella Trent and Clement Ward (Oklahoma State University).

This article identifies growth markets for exports of meat products from the United States over the period 1980 to 1990 and suggests reasons for the increased growth.

The technique used, shift-share analysis, takes into account market size as well as relative growth rate for the products considered.

Session: Teaching, Extension, and Professional Affairs. Moderator: G. W. Smith (Washington State University).

"Economics Education in an International Setting: Lessons Learned in Poland." Dama G. Doye (Oklahoma State University).

As economists become increasingly involved in development assistance in emerging democracies, it becomes important to document their professional experiences to serve as references for future volunteers. Here, lessons learned in Poland while serving as an economics educator and Extension advisor are shared.

"Student Perceptions of the Relevance of Departmental Courses and Degree Plans." John Schmitz and Larry W. Van Tassell (University of Wyoming).

Revisions of degree plans and courses are endless tasks, especially when combined with decreasing budgets and changing enrollments. Students in agricultural economics classes were surveyed in order to incorporate their views and concerns into this process. The implications of general requirement and course offering concerns are presented.

"Can County Governments in Idaho 'Grow Out' of Property Tax Reductions Resulting from the One-Percent Initiative?" Stephen C. Cooke and Neil L. Meyer (University of Idaho).

This study concludes that county governments cannot 'grow out' of the effects of the One-Percent Initiative. It is more likely that the property tax reductions will increase through time for the typical Idaho county. It is also likely that counties such as Blaine and Teton, which may initially be unaffected by the One-Percent Initiative, will 'grow into' property tax reductions from the Initiative.

"Teaching Agricultural Economics with an Experiential Learning Tool: The 'Packer-Feeder Game.'" S. R. Koontz, D. S. Peel,

J. N. Trapp, and C. E. Ward (Oklahoma State University).

Teaching agricultural economics is challenging because of the abstract nature of many of the concepts. A high level of ab-

straction can create problems for students. Use of experiential learning tools is an alternative to traditional lecture or case-study approaches taken in most agricultural economics courses.