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Selected Papers

Financial Management in Agriculture. Moderator: Vince Smith (Montana State University)

"A Profitability Analysis of Bank Participation in Farmer Mac." Brian H. Schmiesing (Southwest State University), Steven C. Blank (University of California, Davis), and Scott D. Below (University of Kentucky)

Local banks were surveyed to identify the financial characteristics of agricultural real estate loans eligible for Farmer Mac. Stochastic simulation was used to determine a case study loan's net present value (NPV). Participation in the Farmer Mac secondary market was found to significantly reduce the loan's NPV.

"Economic Efficiency of Western Farm Credit System Associations." Bob Collender, Richard Nehring, and Agapi Somwaru (USDA/ERS, Washington DC)

A profit frontier approach was used to measure the economic efficiency of Farm Credit System associations. Evidence of operating inefficiencies was found among associations in three Western Farm Credit System districts. Results indicate that public policies that promote further consolidation of relatively inefficient farm credit lending institutions may result in savings to farmers and taxpayers.

"A Tobit Analysis of Commercial Bank Lending to Agriculture in Texas." Eustacius N. Betubiza and David J. Leatham (Texas A&M University)

This study shows that bank holding company affiliates and rural banks have enjoyed a higher return on assets compared to nonaffiliated banks and urban banks, respectively, after deregulation, suggesting a positive impact on agricultural lending. However, higher interest-sensitive time and savings deposits are likely to decrease agricultural lending in Texas.

"Rates of Return in the Farm and Nonfarm Sectors: How Do They Compare?" Kenneth W. Erickson (USDA/ERS, Washington DC)

Newly released data are used to estimate and compare rates of return in the farm and nonfinancial corporate sectors, 1970-87. Relative profitability depends upon numerous factors, including estimation methods, which "farms" are considered, whether returns from capital gains are included, and the time period chosen.

Community and Regional Economics. Moderator: Julie Leones (University of Arizona)

"Implications for Integrating Kenaf into the Southern Plains' Winter Wheat-Stocker Cattle Enterprise." Michael Dicks, Raleigh Jobes, Bob Wells, and Jun Zhang (Oklahoma State University)

Kenaf, a new forage crop, can be integrated into the wheat-stocker enterprise common to the Southern Plains. An estimated 1.6 million acres in the Southern Plains could produce kenaf by 1995 adding \$52 million to farm income and increasing the economic viability of many farm-dependent communities.

"Revisiting State-Level Project Evaluation: Estimating the Direct and Indirect Net Benefits of Irrigation." J. A. Weber (Massey University) and N. K. Whittlesey (Washington State University)

The authors critically examine the proper role and use of benefit-cost (B-C) analysis and input-output analysis in state-level project evaluation. They evaluate a proposed expansion of the Columbia Basin Project from the perspective of Washington state decision makers. Overall economic efficiency of the expansion measured by a B-C ratio ranges from 0 to .78.

"A Regional Analysis of the Role of Off-Farm Income in the Size Distribution of Personal Income." Hisham S. El-Osta and Mary C. Ahearn (USDA/ERS, Washington DC)

The importance of income from off-farm sources to the size distribution of total income is measured by region using the concept of the Gini coefficient. While incremental increases in such incomes are shown to reduce income inequality, with the exception of income from nonfarm business, income from off-farm employment is found to contribute the most toward such reduction, although regional variation is also found.

"How Good is IMPLAN?: A Comparison of Survey vs. Secondary Data Input-Output Models at the County Level." Edward C. Waters and Bruce A. Weber (Oregon State University)

A comparison of IMPLAN and a survey-based input-output model of Clatsop County, Oregon, suggests that while IMPLAN-direct coefficient and total coefficient estimates are quite different from those

of the survey model, the IMPLAN multipliers differ from survey multipliers by less than 5% on average.

Quantitative Methods. Moderator: Larry Held (University of Wyoming)

"Joint Estimation of Contingent Valuation Survey Responses." Timothy A. Park (University of Nebraska) and John Loomis (University of California, Davis)

The utility difference model proposed by Hanemann for the dichotomous choice contingent valuation method is modified to account for interrelationships between responses to a set of contingent valuation questions. Mean willingness-to-pay estimates for three alternative scenarios for valuing changes in the quality of California deer hunting were uniformly lower for the joint logit model compared to a set of independent logit models.

"Characteristics of the Set of Dual Solutions of the Target MOTAD Model." James B. Kliebenstein (Iowa State University) and Francis McCamley (University of Missouri)

Selected characteristics of solutions to the dual of the Target MOTAD model are discussed. Although the values of the dual variables are not valid measures of the marginal values of resources, they can be adjusted to provide valid measures. Lack of uniqueness can pose interesting interpretation questions.

"On Modeling Truncation via the Logistic Distribution with an Application to Land Markets." Feng Xu (University of Missouri), Ron C. Mittelhammer, and Paul W. Barkley (Washington State University)

This study presents an empirical method of modeling truncation using the logistic distribution. A simple test for the significance of truncation is provided. The method is applied in estimating land market hedonic price functions. Results show that truncation is significant in half of the cases analyzed.

"A Simpler Treatment of the Samuelson-Shephard Duality Theorem." Deqin Cai and William G. Brown (Oregon State University)

Understanding most treatments of duality theory requires an advanced mathematical background. Consequently, such treatments are often not helpful to many applied economists and economics students. Therefore, the authors propose a much simpler proof of the important Samuelson-Shephard duality theorem, requiring only knowledge of differential calculus and homogeneous functions.

Food Consumption and Safety. Moderator: Tom Wahl (Washington State University)

"Effects on Farm Income and Prices of the U.S. Food Stamp Program." Praveen M. Dixit and Steve W. Martinez (USDA/ERS, Washington DC)

The authors point out that each dollar spent on the Food Stamp Program expands a recipient's food expenditures by 29¢ and raises net farm income by 7¢. The price and income effects could be larger if other food assistance programs are included.

"The Role of Habit Formation in the Demand for Meat." David K. Lambert (University of Nevada, Reno)

The role of habit in consumer choice has generally been ignored in studies of U.S. meat demand. The AIDS model is modified to include the effects of past consumption. Past consumption is found to be significant in all equations, suggesting future avenues of research into the dynamic aspect of consumer meat demand.

"Salmonella Elimination in Poultry Feed: An Economic Analysis of Alternatives." Jack E. Houston, Scott Addy, Gene M. Pesti (University of Georgia), and Leroy C. Blankenship (USDA)

Food safety in processed poultry products can be improved by eliminating pathogens from feed—the primary entry vehicle for colonization in broilers. Required premiums for *Salmonella*-free poultry feed are estimated to be less than .6¢ and .2¢ per pound of dressed meat with and without extended shelf life, respectively.

"Modeling Consumer Preference for Organic Produce with Selectivity Bias." Chung L. Huang and Sukant K. Misra (University of Georgia)

A sequential probit model is postulated to estimate consumer preference for organic produce. The first equation estimates the probability of respondent's intention to purchase organic produce. The second equation corrects for sample selectivity bias and estimates the probability that a consumer would buy organic produce with apparent sensory defects.

Agricultural Inputs. Moderator: Steven Blank (University of California, Davis)

"Evaluating Risky Input Decisions in Crop Response Analysis." Donna J. Lee (University of Hawaii)

The relationship between input use and farm risk is an important issue in crop response analysis. Empirical risk analysis, however, is often hindered by a dearth of adequate data. The author suggests a

method for generating empirical probability distributions from small samples. Results for corn response to nitrogen fertilizer and irrigation water are presented.

"The Impact of Chemical Restrictions on Agricultural Output and Input Markets." Pei-Chi Peggy Chen and Christopher S. McIntosh (University of Georgia)

The number of legislative restrictions on the use of agricultural chemicals is increasing. A full-equilibrium framework is developed to examine interactions between agricultural output and input markets. Technical agricultural production relationships are estimated using a dual approach. The results suggest that large social costs may result from legislative restrictions.

"Lemons, List Prices, and Other Problems with Measuring Economic Depreciation Rates for Agricultural Machinery." Joseph A. Atwood, Vincent H. Smith, and Myles J. Watts (Montana State University)

A new flexible functional form is used to estimate remaining value equations for combine harvesters. Results indicate that list prices are discounted and "market for lemons" problems exist for relatively new combines. Depreciation rates are shown to be linear functions of age if asset prices are adjusted for salvage values.

"Optimal Replacement and Management Strategies for Beef Cows." W. Marshall Frasier (Washington State University), George H. Pfeiffer, and Azzeddine M. Azzam (University of Nebraska)

Management strategies for beef cow herds are analyzed using stochastic dynamic programming. Optimal policies for winter nutrition level, length of breeding season, and cow replacement are presented for a case herd using criteria of cow age, body condition, and date of calving with sensitivity analysis for price and nonprice parameters.

Policy Modeling. Moderator: Brian Adam (Oklahoma State University)

"Multivariate Cointegration Tests and the Law of One Price in International Wheat Markets." Barry K. Goodwin (Kansas State University)

Multivariate cointegration testing procedures are used to evaluate the law of one price (LOP) for five different international wheat markets. The results indicate that the LOP fails as a long-run equilibrium relationship when transportation costs are ignored. However, if wheat prices are adjusted for freight rates, the LOP is supported.

"Testing Trade and Efficiency Effects of Domestic Content in the Australian Tobacco and Cigarette Industries." John C. Beghin (North Carolina State University) and C. A. Knox Lovell (University of North Carolina, Chapel Hill)

This paper provides an empirical investigation of trade and domestic market efficiency effects of the physical domestic content requirement in the Australian tobacco leaf-growing and cigarette manufacturing industries. Results suggest that the content requirement has restricted imports of U.S. leaf. However, the data are consistent with the efficient contract hypothesis.

"A Multilevel Aquaculture Policy Model: Application to Net-Pen Salmon Farming." Gilbert Sylvia (Oregon State University) and James Anderson (University of Rhode Island)

A numerical multilevel policy model was formulated for salmon aquaculture development. Using nonlinear programming and regression analysis, the aquacultural sector's problem was solved, the dynamic response function was estimated, and the policy problem was parameterized. Socioeconomic and institutional information was generated for three problems and summarized in the form of dynamic policy frontiers.

"Time Inconsistency and Rational Expectations Equilibrium in Public Stock Holding." H. Alan Love and Steven T. Buccola (Oregon State University)

Time inconsistency in an optimal storage policy is investigated. The U.S. government's incentive to deviate from announced wheat policies is found to be substantial. The authors derive a rational expectations equilibrium policy which is fully consistent with agents' expectations and government's optimal behavior.

Weed and Insect Management. Moderator: Kurt Klein (University of Lethbridge)

"Economic Analyses of Alternative Grasshopper Control Treatments on Rangelands." Robert M. Davis and Melvin D. Skold (Colorado State University)
Historically, the economic threshold for publicly supported grasshopper control programs has been eight grasshoppers per square yard. A simulation model of the range forage-grasshopper-ranch system shows that the economic threshold should vary with rangeland productivity, precipitation, and treatment option.

"A Risk Analysis of Insect Control Strategies in Stored Wheat." Phil Kenkel, Brian D. Adam, Gerrit

Cuperus, and W. Scott Fargo (Oklahoma State University)

A biophysical insect growth model is used along with dominance criteria to select risk-efficient insect control strategies in commercially stored wheat. Seven strategies used by Plains elevators are simulated. Not all the strategies are efficient, suggesting that managers need more information and that firm-specific factors should be considered.

"An Economic Analysis of Labor-Saving Planting and Weed Control Practices in Western Sugarbeet Production." Paul A. Burgener, Larry J. Held, K. James Fornstrom, and Stephen D. Miller (University of Wyoming)

Field trials were conducted at experimental sites in Wyoming to examine the economics of planting sugarbeets to stand (vs. overseeding) in terms of reduced labor thinning costs and applying labor-saving herbicides. Results suggest that even with conservative wage rates, labor intensive sugarbeet production does not appear to be economical.

"Computer-Aided Decisions for Weed Management in Corn." Donald W. Lybecker (Colorado State University), Edward E. Schweizer (USDA/ERS/ARS, Washington DC), and Philip Westra (Colorado State University)

Soil applied and postemergence weed management models for irrigated corn are described. Data from two years of pilot tests with the models suggest that increased gross margins and reduced herbicide loading can be achieved with the weed management models compared to farmer weed management decisions.

Agricultural Policy. Moderator: Gordon Carriker (Kansas State University)

"Crop Rotations, Program Participation, Net Farm Income, and the Food, Agriculture, Conservation, and Trade Act of 1990." Sean A. Coady, Richard T. Clark, Joel P. Schneckloth, Norm L. Klocke, and Gary W. Hergert (University of Nebraska)

Two dynamic mixed integer linear programming models were developed to compare the 1985 Food Security Act with the 1990 Farm Bill using a hypothetical farming situation in southwestern Nebraska. Results suggest greater flexibility in cropping practices were achievable under the new bill, but with slightly lower income and increased income variability.

"Do Corn Farmers Have Too Much Faith in the Sugar Program?" C. Matt Rendleman (USDA/ERS,

Washington DC) and Thomas W. Hertel (Purdue University)

The sugar program is found to have a positive but small impact on the price of corn. Because the import quota on raw sugar affects corn prices only indirectly through the high fructose corn syrup market, it has the potential of changing corn prices less than 4¢ per bushel.

"Pareto-Optimal Welfare Redistribution and the European Community's Common Agricultural Policy." David S. Bullock (University of Illinois)

A methodology for finding a set of Pareto-optimal welfare redistribution policies in a multiple-interest group, multiple-policy instrument framework is set forth. This methodology is then applied to a simple simulation of the European Community's wheat market where an empirical estimation of Pareto-optimal policies is made.

"Factors Influencing Producer Support for a State Mandatory Seed Law: An Empirical Analysis." Larry D. Makus, Joseph F. Guenther, and Biing-Hwan Lin (University of Idaho)

A probit model identified characteristics influencing Idaho potato producer support or opposition to a state mandatory seed law. Economic factors seemed to be the most important influences. Current users of certified seed and growers of certified seed were strong supporters. The concern about seedborne disease and the type of farm were not important.

International Development and Trade. Moderator: Nancy Cottrell (University of Nebraska)

"Total Imports and Import Patterns of Barley into Japan." Biing-Hwan Lin and Larry D. Makus (University of Idaho)

A two-stage budgeting procedure is employed to estimate the Japanese barley import demand and the allocation of imports by country. The estimated models are combined to forecast Japanese barley imports under two scenarios: when Japanese beef producers face stiff competition after April 1991, and if barley prices are changed.

"The Impact of a U.S.-Mexico Free Trade Agreement on Agriculture." Mary Burfisher (USDA/ERS, Washington DC)

In this paper, current tariff and nontariff barriers in U.S.-Mexican agricultural trade are analyzed. The types of barriers that present the major impediments to trade and the commodities in which protection is highest are identified. Highly protected sectors will face the greatest adjustment challenges under a free trade agreement.

"The Impact of Remittances on Rural Distribution and Social Welfare: The Importance of the Institutional Context." Julie P. Leones (University of Arizona)

Comparing the impact of remittances on income distribution and social welfare in a Philippine and two Mexican villages indicates important differences in who can migrate from the two countries. High placement fees and education requirements limit participation of lower-income families in foreign migration from the Philippines.

"Common Property and Uncertainty: Compensating Coalitions by Mexico's Pastoral *Ejidatarios*." Paul N. Wilson and Gary D. Thompson (University of Arizona)

Caution must be exercised in applying privatization arguments to Mexico's communal grazing lands. Ecological uncertainty may make a common property regime a rational choice while compensating coalitions can be formed to offset behavioral uncertainty within the village. On these marginal lands, the transaction and distributional costs of modifying a property regime must be compared to the expected benefits.

Risk Analysis. Moderator: Donna Lee (University of Hawaii)

"Optimal Leverage Choice and Total Farm Risk when Interest Rates Are Variable." David J. Leatham and Eustacius Betubiza (Texas A&M University)

U.S. agriculture has become more export oriented and thus more vulnerable to interest rates. A capital structure model was developed with stochastic interest rates. Results show that, contrary to past research, a reduction in business risk can lead to a reduction in overall risk.

"Comparative Performance of Individual and Area Measured Crop Insurance." Gordon L. Carriker, Jeffery R. Williams, and G. Art Barnaby, Jr. (Kansas State University)

In this study the effectiveness of two area-yield insurance programs are compared to an individual farm-yield insurance plan similar to the current FCIC multiperil program with alternative coverage levels. Results indicate that the individual crop insurance program has more than twice the average reduction in gross return variability as the area programs with equivalent total expenditures for indemnity payments.

"Risk-Return Relationships for Mountain Valley Ranching Systems: A Target-MOTAD Analysis."

Larry J. Held (University of Wyoming), Dillon M. Feuz (South Dakota State University), and Elizabeth R. Edens (University of Wyoming)

Target-MOTAD is used to examine risk-income relationships between alternative range livestock organizations. Stocker systems were most profitable but also most risky. Cow-yearling systems were least risky. Relative to cow-yearling, cow-calf performed poorly, yielding lower returns, higher income variability, and greater target risk.

"Growing Season Futures Positions for Corn and Soybean Producers at Selected Missouri Locations." Francis McCamley and Richard K. Rudel (University of Missouri)

Optimal growing season futures positions are computed using data which are reasonably appropriate for individual producers. These futures positions are compared with futures positions based on county and state-level data and with the futures positions reported in a recent study. Some of the reasons for the differences are discussed.

Natural Resource Economics. Moderator: Doug Larson (University of California, Davis)

"Could Oregon's Land Use Plan Save Agriculture in California's Mid-Central Valley?" Carole Frank Nuckton (Oregon State University)

Planners in the agriculturally rich central portion of California's Great Central Valley face inevitable changes to nonagricultural uses but lack criteria to guide development away from the best agricultural lands. Oregon is developing a program to identify its secondary resource lands. This model, adapted to Central Valley conditions, could prove useful.

"Reallocating Drought Risks through Contingent Water Use Contracts." Bonnie G. Colby (University of Arizona)

Western water is being bought, sold, leased, exchanged, "borrowed" during droughts, stored in "water banks" for future use, and speculated upon by investors. An overview of voluntary market transfers of water in response to drought is provided, followed by a discussion of innovative arrangements that could reallocate risks of water supply shortfalls and institutional changes that could enhance the use of voluntary transfer for drought management.

"Low-Input Agriculture as a Groundwater Protection Strategy." Penelope L. Diebel (Kansas State University), Daniel B. Taylor, and Sandra S. Batie (Virginia Polytechnic Institute and State University)

Protection of groundwater quality is of great importance to local, state, and federal governments. Mathematical programming is used to evaluate the effectiveness of low-input agriculture as a groundwater quality management strategy. The results indicate that low-input agriculture alone may not be an effective protection strategy.

"Comparing the Cost of Erosion Damage in Idaho with a Nonlinear Yield Function." D. J. Walker (University of Idaho), M. Peng (former graduate student, University of Idaho), and J. R. Hamilton (University of Idaho)

A formal statistical test of linear versus nonlinear crop yield response to eroding topsoil depth was conducted. The significantly nonlinear estimated relationship was employed to compare the cost of erosion damage in two Idaho regions. The results have important implications for soil and water conservation policy.

Import Policy. Moderator: H. Alan Love (Oregon State University)

"The Substitutability of Imports from Different Sources: Empirical Estimates for U.S. Agriculture." Brad McDonald and Miranda Otradosky (USDA/ERS/ATAD, Washington DC)

Many agricultural policy simulation models use the Armington assumption of product differentiation by region of origin. Despite the fact that the Armington parameter values are key in determining simulation results, econometric estimates of the parameters are often unavailable. The aim of this paper is to begin building a larger database of Armington elasticity estimates for U.S. agricultural goods.

"Some Theoretical and Empirical Notes on the Armington Model." Nancy H. Cottrell (University of Nebraska) and George C. Davis (North Carolina State University)

The authors demonstrate that the current methods used to estimate an Armington model in agricultural applications have not reflected the true theory of the model. Specific suggestions are made as to how the Armington estimation procedure can be amended to be more in line with the Armington theory.

"The Japanese Beef Policy Political Preference Function." Thomas Wahl (Washington State University), Dermot Hayes (Iowa State University), and Andrew Schmitz (University of California, Berkeley)

The conditions for the Japanese government to act

as an optimal middleman in the beef import market are derived, and the weights implicit in the political preference function are estimated. The results indicate that the recently agreed upon tariff is close to the predicted tariff when the optimizing government approach is used.

"Japanese Demand for Beef Imports by Source of Supply: A Differential Approach to Import Allocation." Dave D. Weatherspoon and James L. Seale, Jr. (University of Florida)

The Working/Rotterdam model is fit to data of four beef exporters to Japan. Australian beef exports to Japan are more expenditure and own-price elastic than those of the U.S. However, expenditures and own-price elasticities of demand for U.S. beef exports have increased in magnitude (absolutely) over time.

Farm Level Decision Making. Moderator: Russ Tronstad (University of Arizona)

"Psychological Type and Its Influence on Farm/Ranch Decision Making." James A. Crumly and H. Douglas Jose (University of Nebraska)

Psychological characteristics of farm and ranch operators influence business decisions. The rural population studied was found to have different psychological preferences than the general population. These differences affect decision processes and have implications for effective education programs, acceptable public policies, and the most effective way to work with farm families.

"The Effect of Size of Operation and Business Organization on the Woman's Role in Farm Task Participation and Decision Making." Rebecca S. Lafferty and Burton Pflueger (South Dakota State University)

The authors investigate the woman's role in farm task participation and decision making based on the size of the farm operation and farm business organization. The results from the "1990 South Dakota Farm Woman Survey" are analyzed to determine the woman's role and to suggest reasons for the variation.

"Forging a Biotechnology Link: Information for Extension Agents." J. E. Hobbs (Scottish Agricultural College, Aberdeen), W. A. Kerr (University of Calgary), and K. K. Klein (University of Lethbridge)

A survey of extension agents was carried out in 1990 in order to gain a clearer understanding of their perceptions of biotechnology. The results suggested that few agents had a clear definition of biotechnology, and they required improved access to reli-

able and "unbiased" scientific and economic data about biotechnological products.

"A Field-Level Analysis of Land Diversion Decisions." Bruce A. Babcock (Iowa State University), William E. Foster, and Dana L. Hoag (North Carolina State University)

Field-level data are used to test if the farm distribution of soil quality influences diversion decisions. Characteristics that increase the proportion of a field placed in diversion are a low-mean soil quality, a high quality variability, and a large amount of low quality land relative to average quality.

Livestock Marketing. Moderator: James Mjelde (Texas A&M University)

"Economics of Alternative Beef Cattle Management/Marketing Systems." Gerald Marousek and Leroy Stodick (University of Idaho)

A MOTAD expected-mean (E-M) income model was used to determine risk efficiency of short-run production/marketing alternatives for a western U.S. cattle ranch. Income and risk varied directly but not proportionately. Among seven management plans, the maximum E-M income difference was 9.5%, while mean absolute deviation in income reached 30%.

"Supply Response and Input Demands in the U.S. Beef Sector." Arunava Bhattacharyya and David K. Lambert (University of Nevada, Reno)

Beef production has undergone tremendous changes in the last several decades. Beef supply is modeled as a dynamic optimization problem, applying dynamic duality to investigate structural change in supply and demand equations. The data support a significant change in industry structure between the periods 1940-67 and 1968-87.

"A Simultaneous Equation Model of Fluid Milk Advertising in Ontario." Meenakshi Venkateswaran and Henry W. Kinnucan (Auburn University)

The relationship between Ontario fluid milk sales and advertising is examined in a simultaneous equation framework. Consistent parameter estimates were obtained using a two-stage least squares estimator. Results indicate milk sales and advertising to be mutually dependent and jointly determined in a simultaneous system.

"The Impact of Cash Forward Contracting of Fed Cattle on Cash Prices." Emmett Elam (Texas Tech University)

This research indicates that for each increase of 1,000

head of contract cattle shipments in a given month, the U.S. average cash price of fed cattle will decline by 3-6¢/cwt. The greatest negative impact from contracting is in Kansas, while the least negative impact is in Texas.

Environmental Economics. Moderator: Keith Knapp (University of California, Riverside)

"Nonparametric Consistency Tests for Nonmarket Data." Douglas M. Larson, Cassandra Klotz, and Yu-Lan Chien (University of California, Davis)

The authors develop and demonstrate a method of testing nonparametrically whether individuals' observed demand for, and reported valuations of, a nonmarket good can be reconciled by a single underlying utility function. The number of underlying functions required to rationalize the data can be easily determined.

"Measuring Supply-Side Option Price: Estimates for Preserving the Northern Spotted Owl." Yu-Lan Chien and Douglas M. Larson (University of California, Davis)

Supply-side option prices (*ex ante* compensating variations) for changes in probability that a good will be supplied can be estimated from utility-theoretic choice frameworks. The approach is illustrated using willingness to pay for preserving the Northern Spotted Owl. The respondent's prior probability of owl survival is jointly estimated.

"A Bayesian Decision Model for Profit Maximizing and Environmentally Sound *Lygus* Control in Lentils." James Cox (Washington Agricultural Statistics Service), David Walker (University of Idaho), John Ellis, and Douglas Young (Washington State University)

A Bayesian decision model for Dimethoate applications to control *Lygus* bug damage in Pacific Northwest lentils was constructed. Results showed no treatment maximized net returns for a wide range of prior damage distributions and price discounts for damage. The decision model showed potential for both grower and environmental gains.

"Economics of Sequestering Carbon in Canada: Reforestation of Denuded Forestlands and Afforestation of Agricultural Lands." G. C. Van Kooten (University of British Columbia)

Sequestration of carbon in forest stocks is one approach to reducing atmospheric CO₂, but its cost effectiveness needs to be compared with that of alternative strategies. This is done by comparing carbon sequestration resulting from reforestation and

afforestation with strategies for reducing carbon emissions from automobiles.

Land and Irrigation Economics. Moderator: G. C. Van Kooten (University of British Columbia)

"Effects of Farmland Cash Leasing Rates on Crop Selections of Owners and Tenants: A Portfolio Analysis." Steven C. Blank (University of California, Davis)

Portfolio theory is used to evaluate the effects of cash leasing rates on the cropping decisions of farmland owners and tenants. Differences in crop selection opportunities may prevent tenants from choosing the risk-efficient crop portfolio available to land owners. The decision-making processes of owners and tenants are virtually identical, but differences in land wealth give tenants lower returns and higher risk exposure on average.

"Empirical Analysis of Seller, Mortgage, and Equity Financing Impacts on Farmland Sale Price, 1978-87." Larry Janssen (South Dakota State University) and David Lehmkuhl (First National Bank, Brookings SD)

Empirical analysis of farmland financing models applied to 353 South Dakota farmland tracts sold from 1978 to 1987 indicates: (a) contract value of favorable financing is fully bid into the price of farmland and (b) farmland financing source (seller, mortgage, and cash) has no differential impact on farmland price except for contract value.

"Irrigation Management and Investment under Saline, Limited Drainage Conditions." Keith C. Knapp (University of California, Riverside)

A dynamic optimization model for soil salinity is formulated. The model includes crop rotations, spatially variable irrigation and soil salinity, and investment in irrigation systems. Optimal decision rules are concave in mean soil salinity; soil salinity state variables converge to a rotation-averaged steady state.

"Sprinkler Irrigation Efficiency in Southeast Wyoming." Dennis Kaan, Jim Jacobs, Larry Held, Jim Fornstrom, Larry Pochop, Brian Briggs, and Greg Kerr (University of Wyoming)

Pumping plant efficiency tests conducted in southeast Wyoming show considerable cost savings can be achieved if pumping plants are improved to the Nebraska Pumping Plant Performance Criterion of 66% efficient. Application tests conducted show large variations in application efficiency based on Heermann and Hein's Coefficient of Uniformity.

Crops Marketing. Moderator: Mike Dicks (Oklahoma State University)

"Wheat Price Determinants." Stephanie Mercier and C. Edwin Young (USDA/ERS, Washington DC) Variability both for wheat prices on average and also between classes has been of great concern to farmers in recent years. Using cross-sectional data, relative wheat prices by class are estimated using own-class stocks-to-use ratios and grain quality characteristics.

"Qualitative Forecast Evaluation: A Comparison of Two Performance Measures." Christopher S. McIntosh and Jeffrey H. Dorfman (University of Georgia)

The standard turning point analysis, using ratios of successful to unsuccessful predictions, is compared to the nonparametric test of the null hypothesis of no information on the direction of price movements. The inability of the turning point ratio method to correctly evaluate a series with a trend is demonstrated.

"A Sequentially Updated Price and Basis Forecasting System for White Wheat." Robert P. King (University of Minnesota) and Larry S. Lev (Oregon State University)

A microcomputer-based forecasting system that sequentially updates price and basis forecasts for Pacific Northwest white wheat is described. Parameters are estimated by sequential regression. Model selection is based on out-of-sample forecast performance. Preharvest and postharvest strategies using system-based forecasts outperform fixed marketing strategies.

"Market Windows for Characteristics: A Hedonic Price Analysis of the Apple Industry." Russell Tronstad, Lori Stephens, and Eric Monke (University of Arizona)

A hedonic price function that included crop year, seasonality, region, variety, size, grade, storage methods, and a variable to measure the effect of the Alar scare was estimated. Results suggest that size, grade, seasonal, and storage factors are the most important elements for influencing the price of apples.

Livestock Production Economics. Burton Pflueger (South Dakota State University)

"Impacts of the Tax Laws on Marketing Rangeland Calves and Yearlings." James W. Mjelde, J. Rich-

ard Conner, and Clair J. Nixon (Texas A&M University)

A dynamic programming model of marketing calves and yearlings from a rangeland cow-calf operation is developed. The optimal strategy indicates that in the fall, enough yearlings should be sold to cover the current year's tax deductions. Further, differences are noted between marketing strategies that consider and don't consider taxes.

"The Optimal Prebreeding Target Weight for Replacement Beef Heifers." Dillon M. Feuz (South Dakota State University)

The nutritional development of replacement beef heifers prior to first breeding is very important to their subsequent reproductive performance and economic value. Animal science research data is analyzed to develop biological production functions, and production theory is used to determine the optimal prebreeding weight for replacement beef heifers.

"Lactation Curve Estimation for Use in Economic Optimization Models in the Dairy Industry." Timothy J. Richards (University of Lethbridge) and Brian Freeze (Agriculture Canada)

A three-stage least squares lactation curve model was estimated for milk production, fat content, protein content, and body weight change in lactating Holstein cattle. The study found that the simultaneous procedure is preferred both theoretically and empirically for constructing lactation curves relevant for use in dairy economic optimization models.

"The Structure of Wisconsin Milk Production: A Dynamic Analysis." Lydia Zepeda and Jean-Paul Chavas (University of Wisconsin)

A dynamic model is developed to examine structural change in the Wisconsin dairy industry. Estimation procedures are chosen to overcome the problem of imperfectly observed data by size category. The model is used to determine the nature of structural change over time and to test hypotheses on factors affecting it.