# Selected Paper Abstracts

**SESSION A-1:** *International Trade and Development Policy.* **Moderator: Travis Lybbert (Cornell Univ.).**

**"Reducing Trade Barriers in the Presence of Preferential Trade Agreements and Intra-Industry Trade: Examining EU Trade Policy in the Processed Tomato Industry." Brad J. Rickard and Daniel A. Sumner (Univ. of Calif., Davis).**

The European Union (EU) both imports and exports processed tomato products. Production subsidies (about 40%) apply to processing tomatoes, and import tariffs (about 14%) apply to processed tomato products. Using a multi-stage, multi-output model, we simulate effects on prices, quantities, trade, and welfare from removing EU import tariffs for processed tomato products and EU domestic subsidy for processing tomatoes. Preliminary results show that, for types of processed tomato products imported into the EU, removing the import tariff would increase EU imports by about 44%. Removing domestic subsidy payments would increase EU imports by about 58%.

**"Trade Policy Under Imperfect Competition: An Assessment of the TRQ on Lamb Meat." Philip L. Paarlberg, John G. Lee, and James S. Eales (Purdue Univ.).**

The United States imposed a tariff-rate quota (TRQ) on lamb meat in July 1999. Early analysis suggested the possibility that lamb growers could lose welfare via the creation of packer market power. This paper considers how subsequent events modify that analysis. Observed prices suggest reduced passthrough. Lamb prices are unchanged and more stable. Using an annual quota instead of a quarterly quota reduces the opportunity for market conduct switching. Early termination of the TRQ to comply with the WTO rulings magnifies any welfare loss. Assistance payments prevent welfare losses to growers with little impact on the market.

**"Regional Economic Development in China, from the Neoclassical Perspective." Xiang Ao (Univ. of Nebr.).**

A neoclassical growth model is adopted and tested using panel data of per capita GDP, per capita income, investment in fixed capital, and population growth rates for all of China's 30 pro-

vinces from 1978 to 1998. An equation is then formulated for testing convergence as a dynamic panel data model, and fixed-effect estimators are used to estimate the equation. Income convergence is detected among the provinces, and reasons behind this finding are discussed.

**SESSION A-2:** *Agribusiness Organization and Market Structure.* **Moderator: Jennifer Grannis (Colo. State Univ.).**

**"Time Integration: Agribusiness Structure for Competitive Advantage." Paul N. Wilson and Gary D. Thompson (Univ. of Ariz.).**

Traditional views and models of perishable food suppliers fail to capture the fundamental role of time integration in firm-level organization. A two-phase research design of major grower-shipper firms of lettuce, tomatoes, and melons reveals a diverse distribution of firms across the time integration continuum. Most firms use more than one microclimate to extend product availability. Decision makers are encouraged to understand the implications of these temporally integrated organizations on agricultural and trade policy.

**"Evaluating Changes in Agricultural Market Structure." Ashley Wood Renck (Miss. State Univ.).**

Literature related to vertical coordination and integration is reviewed and synthesized. This allows a better understanding of the motivation for the changes occurring in the agricultural sector. A discussion is provided of market coordination alternatives and related literature is summarized. Two theories of motivation for alternative forms of coordination are considered, along with criteria for choosing different governance structures. The vein of research relating to the consequences and implications of increased vertical coordination in agriculture is discussed. Finally, an attempt is made to infer how this material can be incorporated into agricultural economics research.

**"Value Differentiation: Modeling Changes in the Organization of the Agrofood Chain." Rachael E. Goodhue (Univ. of Calif., Davis) and Gordon C. Rausser (Univ. of Calif., Berkeley).**

An analytical model of value differentiation is introduced that uses supermodularity. We show that exogenous shocks which increase the marginal

values of the core value components will have a favorable effect on value differentiation. While unit cost-reducing technological innovations may benefit inventors, users, and others, their effect on value differentiation is determined by how they impact firms' decisions regarding these processes, not by their effect on the cost of producing units of a given degree of differentiation.

**"Bilateral Trading and the Curse of Knowledge: An Experimental Economics Study." Dale J. Menkhaus (Univ. of Wyo.), Alla V. Yakunina (Saratov State Socio-Economic Univ., Russia), and Owen R. Phillips (Univ. of Wyo.).**

This research investigates the impacts of reporting different kinds of trade information to buyers and sellers in laboratory markets, in which exchange is made through bilateral bargaining. Results suggest public information may improve the bargaining position of buyers relative to sellers when there is spot delivery. In some cases, sellers earn less than in the no-information baseline. There is evidence of a curse of knowledge for sellers in our information experiments when quantity traded for the entire market is known. The mandatory price reporting of all trades does not improve the income of sellers.

**"Seasonal Market Power and Structural Change in the U.S. Pear Industry." Paula Gutman (American Express) and Jill J. McCluskey (Wash. State Univ.).**

A simultaneous system of supply and demand equations was estimated to recover the industry conduct parameter for the Northwest pear industry. It was hypothesized that the industry has had some market power when flows of shipments from other pear varieties were low, and the empirical findings were consistent with this hypothesis. A moderate degree of price distortion was found to prevail from November through February of each year, a degree that is consistent with a Cournot equilibrium. The industry is beginning to face a more competitive environment in which there may be fewer opportunities to exercise market power. To date, the industry has been able to maintain positive economic profits (not risk adjusted) by slightly increasing prices above marginal cost, during some months of the marketing season.

**SESSION A-3: *Valuing Land Development and Conservation Efforts.* Moderator: John Loomis (Colo. State Univ.).**

**"Land Development and Endogenous Regulations." Seong-Hoon Cho (Univ. of Ga.) and JunJie Wu (Oreg. State Univ.).**

An empirical model is developed to analyze the interactions among residential development, land use regulations, and public financial impacts. A simultaneous equations system with self-selection and discrete dependent variables is estimated to determine the interactions for counties in the five western states. The results show that county governments are more likely to impose land use regulations when facing rapid land development, high public expenditures, and property taxes. The land use regulations, in turn, decrease land development, long-run public expenditures, and property taxes at the cost of higher housing prices and short-run property taxes.

**"Territorial Use Rights: A Rights-Based Approach to Spatial Management." Keith R. Criddle (Utah State Univ.), Mark Herrmann, and Joshua A. Greenberg (Univ. of Alaska, Fairbanks).**

The advantages of increasingly fine scale management of fisheries may be offset by increased enforcement and management costs, reduced catch-per-unit-effort and increased costs for harvesters, and an intensification of the race for fish. An alternative to regulated open access would be to lease, or permanently transfer, spatially defined harvest privileges. Individual and community based spatial use privileges have been used to stint access to some fish and shellfish resources. This paper explores the potential economic and management consequences of transferable and nontransferable, individual and community based spatial use privileges in the context of the Aleutian Islands golden king crab (*Lithodes aequispinus*) fishery.

**"Spatial Differences of Land Use Changes Within Oklahoma's Wheat Belt." Mark Leonard, Mike Dicks, and Francisca Richter (Okla. State Univ.).**

Elimination of planting restrictions in the Federal Agricultural Improvement and Reform (FAIR) Act of 1996 was hypothesized to induce a change in the use of marginal cropland from wheat production to forage, but not affect principal wheat production areas. Analysis of Farm Service Agency crop reporting records indicated that both marginal and principal production areas experienced a reduction of 20% in harvested wheat acres as a result of the new farm legislation.

**SESSION A-4:** *Quantitative Tools for Agricultural Economics.* **Moderator: J. Michael Bowker (USDA/Forest Service, Athens, Ga.).**

**"Adaptive Estimation, Truncation, and Maximum Entropy." Thomas L. Marsh (Kans. State Univ.) and Ron C. Mittelhammer (Wash. State Univ.).**

An adaptive estimator is proposed to optimally estimate unknown truncation points of the error support space for the general linear model. The adaptive estimator is specified analytically to minimize a risk function based on the squared error loss measure. It is then empirically applied to a generalized maximum entropy estimator of the linear model using bootstrapping, allowing the information set of the model itself to determine the truncation points. Monte Carlo simulations are used to demonstrate performance of the adaptive entropy estimator relative to maximum entropy estimation coupled with alternative truncation rules, and to ordinary least squares estimation.

**"Shadow Price Implications of Several Stochastic Dominance Criteria." Francis P. McCamley and Richard K. Rudel (Univ. of Mo., Columbia).**

Stochastic dominance criteria are seldom explicitly applied to problems having continuous variables. A previously developed model is modified to facilitate exploration of sets of shadow price vectors consistent with decreasing (non-increasing) absolute risk aversion stochastic dominance (DSD), a combination, TGSD, of third degree stochastic dominance (TSD) and generalized stochastic dominance (GSD), and a combination, DGSD, of DSD and GSD. The model is applied to two risk-efficient (primal) solutions of a problem by Anderson, Dillon, and Hardaker. Selected aspects of the sets of shadow price vectors are discussed.

**SESSION B-1:** *Organized Symposium on Experimental Auctions.* **Moderator: Dillon M. Feuz (Univ. of Nebr.).**

**"Experimental Auctions to Elicit Value for Product Attributes." Wendy J. Umberger and Dillon M. Feuz (Univ. of Nebr.).**

A sealed-bid, fourth-price Vickrey-style auction was used to measure consumers' willingness to pay for flavor in beef steaks. Consumers from Chicago and San Francisco participated in the experimental auctions. Consumers appeared to express true relative value differences for different product attributes. Market price levels were influenced by the number of participants in a panel, by individual consumers' tastes and preferences, and perhaps by the size of the monetary payment for participating in the experiment. Relative auction value differences are credible values reflecting different consumer values. However, absolute auction values can be altered by experimental design.

**"External Validity of Alternative Experimental Auctions." Jayson L. Lusk (Miss. State Univ.).**

This paper addresses several methodological issues in experimental valuation. Systematic variation in valuations may result when using competing demand-revealing auctions such as the Vickrey 2nd price, English, random $n$th price, and BDM auctions. Further, differences in valuation may result by simply varying procedural protocol. Because valuations are conducted in non-induced value settings, no reference point is available to judge the reliability of competing estimates. Thus, procedures are discussed which may be used to compare experimental results to retail behavior, with the intention that retail behavior be used as the benchmark for appropriateness of a particular experiment.

**"Rationality Crossovers." Todd L. Cherry (Appalachian State Univ., Boone, NC) and Jason F. Shogren (Univ. of Wyo.).**

This paper explores whether the power of arbitrage to induce more rational behavior in market and nonmarket settings extends to diverse decision-making tasks over preferences for gambles. We examine how arbitrage in a preference reversal setting affects behavior for the valuation of low probability food safety risks, the Allais Paradox, and the Ellsberg Paradox. We design a three-stage experiment that elicits choices and values over gambles, with and without the experience of arbitrage. Out results suggest that arbitrage in one setting can cross over to impact the choices in unrelated tasks. Stated values for safer food dropped by 20 to 50%, and the frequency of the Allais Paradox is cut in half. Rationality crossover has its limits, however, in that the frequency of the more distinct Ellsberg Paradox, the most distinct decision environment, remained the same. We also found that the type of arbitrage, real market-like experience or a cheap-talk (i.e., hypothetical) version, did not affect the results.

**SESSION B-2:** *The Role of Uncertainty in Agricultural Markets.* **Moderator: Jill J. McCluskey (Wash. State Univ.).**

**"Decomposing Producer Price Risk: An Analysis of Livestock Markets in Northern Kenya." Christopher B. Barrett and Winnie K. Luseno (Cornell Univ.).**

This paper introduces a simple method of price risk decomposition that determines the apportions of producer price risk among volatile intermarket margins, intraday variation, intraweek (day of week) variation, and seasonality. We apply the method to northern Kenya livestock markets, where dramatic price volatility is a current policy concern. Large, variable intermarket basis is the single most important factor in explaining producer price risk in animals typically traded between markets. Local market conditions explain most price risk in other markets, in which traded animals rarely exit the region. Seasonality accounts for relatively little price risk faced by Kenyan pastoralists.

**"Disentangling Cash Flow and Risk to Develop New Financial Instruments." Alejandra Engler-Palma and Dana Hoag (Colo. State Univ.).**

We demonstrate that risk is not the only source of variability which affects decision behavior. The variability of the expected income, or cash flow, also plays an important role. Furthermore, cash flow variability can be confused with risk. Our objective is to show how farmers' preferences for a stable expected income path may be a barrier to long-run investments such as trees, and how a reverse-equity mortgage could meet farmers' stability preferences.

**"Respecification of the Resources of Production Agriculture: Profits and Risk." David M. Saxowsky and Cheryl J. Wachenheim (N. Dak. State Univ.).**

The traditional list of resources of production agriculture, including land, labor, capital, and management, is respecified. Management becomes a specialized type of labor, and two additional resources—information and the willingness and ability to bear risk—are added. It is argued that profits accrue not to management, but to those willing and able to bear the risk inherent in production agriculture. The strategy of equity diversification is presented as a means for farmers to provide this resource and thus earn economic profits.

**SESSION B-3:** *Herd Management.* **Moderator: Jay Parsons (Colo. State Univ.).**

**"Managing Herd Composition of Range Cattle: Sale Weight and Seasonal Factors." Trent Teegerstrom and Russell Tronstad (Univ. of Ariz.).**

We estimate the weight gain for range calves as a polynomial function of calf age accounting for weather, sex, lagged calf weights relative to the growth function, and compensatory gains. This function is then used to determine the economic tradeoff between cow numbers, calf sale weights, and feeding supplement, for both spring and fall sale dates. Using prices from 1980 to 1998, results indicate that the most profitable herd mix, sale date, and feeding protocol is 450 lb. calf sales with no supplemental feeding and sales occurring in May. Sales in November and 450 lb. calves are a close second. Although feeding supplement was not associated with the most profitable outcome, supplement increased the average return by $45 to $70 per AUY for sale weights above 550 lbs.

**"Weather Impacts on Feedlot Cattle Performance." Darrell R. Mark and Ted C. Schroeder (Kans. State Univ.).**

Although the influence of weather on livestock has been studied on an individual head or single weather event basis, combined effects of multiple weather conditions observed during conventional cattle feeding periods have not been quantified. This research explores the relationships between several weather variables and average daily gain of over 17,000 pens of cattle fed over 20 years in two western Kansas feedyards. Results indicate that overall production performance of cattle fed in western Kansas is most sensitive to thermal stress. Steers generally withstand performance losses better than heifers in response to weather stress.

**"A Dynamic Analysis of Spring and Summer Calving Systems." Richard Clark, Glenn Helmers, Chris Hoegemeyer, and Don Adams (Univ. of Nebr.).**

A discrete stochastic programming model was constructed to analyze sell vs. hold decisions for calves at various time points in three cow-calf systems. The systems were spring calving, summer calving, and a yearling system using summer calving. Data from a University of Nebraska experimental ranch for the 1997–99 period were incorporated into the model. Livestock price data for 1992–99 for various cattle weights were used

to develop price levels, price/probability intervals. The results favored the yearling system which provided for conditional sell vs. hold decisions at four weight intervals.

**"An Economic Analysis of Regular vs. Late Weaning of Calves in the Western Plains." Larry Van Tassell (Univ. of Idaho), Michael D. MacNeil, Robert E. Short, and Elaine E. Grings (USDA/ARS, Ft. Keogh, Miles City, Mont.).**

This study examines weaning and supplementation alternatives for beef cattle. Two weaning dates, two supplementation alternatives for calves, and two supplementation schemes for dams were evaluated. Variation in output and input prices along with production differences were modeled using stochastic simulation techniques. Optimal weaning alternatives were dependent upon forage production, price levels, and calf genotype. For Hereford sired calves, the most profitable alternative was to wean in December regardless of dam supplementation. For Charolais sired steer calves, it was more profitable, on average, to late wean calves while not supplementing the cows.

**SESSION B-4:** *Analytical Methods for Resource Economics.* **Moderator: Maria Loureiro (Colo. State Univ.).**

**"Combining WTP and WTA Dichotomous Choice Responses Using a Pooled Estimator: Comparison of Single- and Double-Bounded Models." Laura Nahuelhual, John Loomis, and Maria Loureiro (Colo. State Univ.).**

A few public programs provide a joint public good and bad in which some individuals would pay for the program, while others would have to be compensated. We provide two approaches to estimate *net* willingness to pay (WTP of gainers minus WTA of losers) for these nonrejectable mixed public-good/public-bad programs when there are insufficient observations to estimate the WTP and WTA functions separately. The models are applied using data on prescribed burning which produces smoke (the bad) but reduces risk of wildfire (the good). We test the equality of net benefit estimates for the two approaches.

**"Multiple Criteria Bayesian Analysis of Adaptive Ecosystem Management and Planning for Protected Areas." Tony Prato and Zeyuan Qiu (Univ. of Mo., Columbia).**

An ex post adaptive ecosystem management (AEM) model is used to determine whether the current state of an ecosystem complies with biophysical and social carrying capacities, and an ex ante multiple-attribute scoring test of capacity (MASTEC) is used to determine the best management action for achieving compliance. The AEM model minimizes the likelihood of decision errors by using Bayes' rule to determine the state of an ecosystem. The MASTEC method determines the best management action for bringing an incompliant ecosystem into compliance with carrying capacities by maximizing the manager's expected utility function subject to stochastic carrying capacity constraints.

**"Demand Modeling with Revealed and Stated Preferences: A Travel Cost Model with Contingent Choke Prices." J. M. Bowker (USDA/ Forest Service, Athens, Ga.), T. A. Park (Univ. of Ga.), and V. R. Leeworthy (USDC/NOAA, Silver Spring, Md.).**

A variant of the travel cost method is employed to estimate the use value of snorkeling in the Florida Keys. Previous models have combined actual price and trip information with intended trip information resulting from price or site quality changes. We extend these studies by combining revealed price and trip data with stated choke price. Standard and choke-augmented demand models were estimated for a sample of 460 divers with truncated and untruncated negative binomial specifications, respectively. Per trip consumer surplus from the standard TNB model was $545 +/– 120, while for the choke-augmented NB model it was $718 +/– 143. Own-price elasticities were – 0.35 and – 0.34, respectively. Our results suggest that standard TNB models may result in underestimating the value of the snorkeling experience.

**SESSION C-1:** *Current Issues for Agricultural Cooperatives.* **Moderator: James Vercammen (Univ. of British Columbia).**

**"The Survival of Rural Cooperatives: Driving Factors Behind Mergers, Acquisitions, Joint Ventures, and Strategic Alliances in Colorado and Indiana Agricultural Cooperatives." Jennifer M. Vandeburg, Joan R. Fulton (Purdue Univ.), Susan Hine (Colo. State Univ.), and Kevin T. McNamara (Purdue Univ.).**

As farms become larger and fewer in number, each individual farmer-customer is more critical. Competition is also consolidating, creating a fiercer marketplace where "survival of the fittest" is the norm. In response to these conditions, local

cooperatives are engaging in a variety of business arrangements, including strategic alliances, joint ventures, mergers, and acquisitions. This paper has two objectives. The first is to examine the driving forces that motivate local cooperatives to get involved in strategic alliances, joint ventures, mergers, and acquisitions. The second objective is to examine the relative importance of factors in the success of these new business arrangements.

**"Utilizing the Latest Marketing Institutions in the Peanut Industry: A Benefit-Cost Analysis of a new Generation Peanut Cooperative." Sam Hancock, Stanley M. Fletcher, and William A. Thomas (National Center for Peanut Competitiveness, Univ. of Ga.).**

This paper examines the feasibility of forming a New Generation Peanut Cooperative through a benefit-cost approach. The research is based on the idea of forming a new cooperative. The overall capital requirement for this venture is approximately $34 to $37 million. This estimate was calculated with varying assumptions depending on the scenario parameters. A portion (25% to 30%) of this capital can be raised from the sale of stock to those wishing to join the cooperative. A lending institution will finance the remainder. For this cooperative to remain efficient, it must contract about 69,000 tons of peanuts.

**"Analyzing the Economic Efficiency of Pricing Incentives Paid by a Turkey Cooperative to Its Members." Ruby A. Ward and E. Bruce Godfrey (Utah State Univ.).**

Cooperatives which are vertically integrated pay customers incentives to encourage production of certain products. In our analysis of a turkey cooperative, it was found that the incentives which had been used were not economically efficient. For example, it was thought that toms and hens were equally profitable. This is only the case if the same number of flocks are produced each year. However, hens have a shorter life and more flocks are produced each year. These findings highlight the need to identify how incentive programs affect individual growers.

**SESSION C-2:** *International and Regional Resource Issues.* **Moderator: Christopher B. Barrett (Cornell Univ.).**

**"Does Resource Commercialization Induce Local Conservation? A Cautionary Tale from Southwestern Morocco." Travis J. Lybbert, Christopher B. Barrett, Jon Conrad (Cornell**
**Univ.), and Hamid Narjisse (Institut Agronomique et Veterinaire, Rabbat, Morocco).**

Ecotourism, bioprospecting, and non-timber product marketing have been promoted recently as market-based instruments for environment protection, but without a sound understanding of the resulting net conservation effects. We present evidence on the local conservation effects of recent argan oil commercialization in Morocco, which seems a promising case study in conservation through resource commercialization. Our empirical analysis shows, however, that resource commercialization is not creating strong net conservation incentives because assumptions implicit in the prevailing logic prove incorrect in this case. Generally, the experience of southwestern Morocco provides a cautionary tale about the assumed efficacy of conservation strategies founded on resource commercialization.

**"Intra-Regional Wealth-Deforestation Relationships in the Brazilian Pantanal: An Examination of the Environmental Kuznets Curve Hypothesis." Andrew F. Seidl (Colo. State Univ.).**

The Environmental Kuznets Curve (EKC) describes the relationship between an environmental pollutant and per capita income. Here, the hypothesis is applied to deforestation in the Brazilian Pantanal. It contributes on several dimensions: (a) an intra-regional rather than international approach, (b) deforestation rather than industrial pollutants, and (c) land and cattle wealth serve as proxies for wealth and income. Results imply that smaller operations are more closely associated with deforestation than are larger operations. However, very large operations are also more likely associated with higher levels of deforestation pressure than are large operations, and the wealth range associated with decreasing deforestation is relatively high.

**"Evaluating the Impact of Integrated Pest Management on Agriculture and the Environment in the Texas Panhandle." W. Arden Colette, Lal Khan Almas, and Greta L. Schuster (West Texas A&M Univ.).**

Since integrated pest management (IPM) was introduced in the Texas High Plains in 1976, many practices have been adopted for the four major crops: corn, cotton, sorghum, and wheat. Using the reduction in production cost as a measure of the economic benefit, and contingent valuation to estimate the value of the environmental benefit, the IPM practices adopted have

produced more than $173 million in economic benefits, and more than $99 million in reduced environmental costs per year. The total value of the economic and environmental benefits accruing to the Texas High Plains exceeds $272 million per year.

**"The Economic Impacts of Solid Waste Disposal and Diversion in California." Aya Ogishi and George Goldman (Univ. of Calif., Berkeley).**

This study develops economic impact models of solid waste systems in California and determines statewide and regional economic impacts of waste disposal and diversion. We estimate that in 1999, the California solid waste systems generated $21 billion in output impacts, $11 billion in value-added impacts, and 179,000 additional jobs. If all waste generation were disposed instead of being diverted at the 1999 rates, the statewide economic impacts would be lower by 17% to 20%. While relative impacts for individual regions vary with differences in material flows and industrial infrastructures, generally, diversion in California generates larger economic impacts than disposal.

## SESSION C-3: *Analysis of Livestock Production Issues.* Moderator: Dale Menkhaus (Univ. of Wyo.).

**"Cattle Cycles." David M. Aadland (Utah State Univ.).**

This paper builds a dynamic forward-looking model describing the approximate 10-year cattle cycle. The theoretical model improves on existing models by (*a*) allowing cow-calf operators to make investment decisions on both the cow and calf margins, (*b*) formally recognizing the age distribution of the capital stock, and (*c*) considering a mixed scheme of rational and naive expectations. The model is then calibrated and used to simulate artificial data that endogenously generate 10-year cycles in the total stock of cattle.

**"Open Cow Replacement Decisions: An Application of Asset Replacement Theory." Gregory Ibendahl (Univ. of Ky.) and John Anderson (Miss. State Univ.).**

Beef producers must decide what to do with a cow that fails to conceive during the breeding season. Keeping the open cow results in a year's expenses without any revenue. Replacing the open cow with a bred heifer provides immediate revenue, although it will take a few years before the heifer reaches peak productivity. A net present value framework is employed to examine this decision. The problem is unique because the open cow and the replacement heifer have different life spans. Finding a common time frame is impossible since both alternatives will eventually employ replacement heifers if a long enough time frame is considered.

**"Economics of Variable Swine Growth." Jay R. Parsons, Dana L. Hoag, and Stephen R. Koontz (Colo. State Univ.).**

This paper addresses the impacts of variable animal growth on market timing decisions. Marketing decisions based solely on the pen average are determined to be sufficiently close to optimal for a case study data set of 350 swine. However, different economic penalties are determined to be associated with overfinishing versus underfinishing an animal. These differences provide potential benefits associated with using the entire distribution to determine market timing. Sensitivity analysis is conducted on the model results to provide an estimate of these benefits in the presence of increased animal variability and discount pricing schemes.

**"Formula-Derived versus Observed Market Prices: An Application for Segregated Early Weaned Pigs." Kevin C. Dhuyvetter (Kans. State Univ.).**

A formula for deriving the price of segregated early weaned (SEW) pigs using corn, soybean meal, and market hog prices was estimated based on equating return on investment for the different phases of swine production. USDA reported prices were compared with formula-derived prices. Based on RMSE and MAE accuracy measures, the estimated formula was better at predicting spot-market prices than several other reported formulas. Developing pricing formulas based on the equal returns on investment framework has merit for establishing prices in the absence of publicly reported information; however, users of the formula need to understand the conceptual framework of how and why it was developed.

**"Commercial Cow Herd Culling and Replacement Strategies." Jasper Fanning, Thomas Marsh, and Rodney Jones (Kans. State Univ.).**

Cow ownership costs represent a large component of the total costs in a cow-calf enterprise, and therefore impact profitability. Annualized cow costs are determined in large part by the price or cost of that cow when it entered the herd. We find in Kansas that ownership costs, and in turn cow-herd profitability, can be significantly

impacted by heifer replacement strategies. Rate (number of heifers purchased), timing (point within the cattle cycle), and method (raise or purchase) are important considerations.

## SESSION C-4: *Agricultural Economics Education and Technology.* Moderator: Dawn D. Thilmany (Colo. State Univ.).

**"What's in a Degree Name? Plenty, if It's Agricultural." Jill J. McCluskey (Wash. State Univ.), Maria L. Loureiro (Colo. State Univ.), and Philip Wandschneider (Wash. State Univ.).**

As the number of students with farm backgrounds continues to decline, agricultural and applied economics programs must be able to attract students with different backgrounds in order to survive. A problem is that degree names incorporating the terms "agricultural" or "agribusiness" turn off many students with nonfarm backgrounds. All undeclared undergraduate students at a U.S. Land Grant University were surveyed in order to evaluate their potential interest in a proposed environmental and resource economics degree and their perceptions and preferences for degree names. Undergraduates were asked a variety of questions related to their subject interests, background, and demographic information, and were confronted with different potential degree names. Results suggest degree names that do not mention the term "agricultural," such as "Environmental and Resource Economics and Management," have broader appeal compared with degrees that include the term "agricultural."

**"Technology in the Agricultural Economics Classroom: Are We on the Right Path?" Roger A. Dahlgran (Univ. of Ariz.).**

This paper surveys the extent and application of internet-enhanced course instruction in agricultural economics. We find roughly 30% of agricultural economics courses have websites and the purpose of these websites is to distribute course documents. We argue that this application substitutes readily for traditional teaching methods. According to production economics principles, introduction of an input that substitutes readily for an existing input will not increase production. Therefore, we would not expect course websites used in this manner to greatly enhance learning. We briefly discuss internet-based tools which offer greater potential benefits than simple document distribution.

**"A 'Module' Approach to the Integration of Computer Applications Throughout the Agribusiness Curriculum." Jeri Stroade and Bryan Schurle (Kans. State Univ.).**

Currently, computer applications in agribusiness at Kansas State University are taught in two courses, an orientation course and a computer applications course at the sophomore or junior level. A Higher Education Challenge Grant was obtained to facilitate the process of integrating the teaching of these applications, with a primary objective of developing computer application materials relevant for many courses throughout the agribusiness and agricultural economics programs. Modules that contain both audio and video (and play like a movie on the computer monitor), and that demonstrate the use of the computer to solve a variety of problems, have been developed to help students master the techniques. The modules are made available to students on the local network, and soon will be available to instructors at other institutions. The methods used to develop and disseminate the modules are discussed in the paper.

**"An Analysis of Online Examinations in College Courses." Andrew Barkley (Kans. State Univ.).**

This research evaluates the use of online examinations in college courses from both instructor and student perspectives. Instructional software was developed at Kansas State University to administer online homework assignments and examinations. Survey data were collected from two classes to measure the level of student support for online examinations. The determinants of the level of student support for online testing were identified and quantified using logistic regression analysis.

**"Building and Maintaining a Website On-Location." Cheryl Wachenheim (N. Dak. State Univ.).**

Rapid advances in communication technologies make it possible for students to share their experience in an international study program with their support network at home. Doing so by means of a web page built on-location $(a)$ motivates students to increase their awareness of, and participation in, their surroundings; $(b)$ changes how students view their surroundings and activities in which they participate; $(c)$ increases content learning; $(d)$ extends the number of people involved in the international study program; and $(e)$ results in a professional written and visual documentary.

**SESSION D-1:** *Economic Analysis of Production Inputs.* **Moderator: Murat Isik (Miss. State Univ.).**

**"Optimal Production Inputs with Varying Quality and Yield Components: Irrigation Termination of Upland." Russell Tronstad (Univ. of Ariz.).**

High, medium, and low values for cost of water, lint prices, and quality discount/premiums were applied to the lint yield and quality differentials realized from 198 irrigation termination experiments conducted in central Arizona for the crop years of 1991, 1992, 1994, 1995, 1996, 1997, and 2000. The progression of each crop was analyzed using heat units (86/55°F). Significant yield variation from extending the season was found. In addition, agronomic signals for predicting micronaire changes were very important for determining profitability since quality is impacted for both the base and any additional yield attained. These are the primary reasons why agronomic factors were found to be more influential than the economic factors considered for explaining the profitability of extending the season for upland.

**"Economic Impacts of Banning Subtherapeutic Use of Antibiotics in Swine Production." B. Wade Brorsen, Terry Lehenbauer, Dasheng Ji (Okla. State Univ.), and Joe Connor (consulting veterinarian, Missouri).**

Public health officials and physicians are concerned about possible development of bacterial resistance and potential effects on human health which may be related to the use of antimicrobial agents in livestock feed. This research aimed to determine the economic effects subtherapeutic bans of antimicrobials would have on both swine producers and consumers. The results show that a ban on growth promotants for swine would be costly, totaling $242.5 million annually. If a ban affected poultry as well as pork production, the total costs would expand to $586 million per year.

**"Economics of Variable Rate Nematicide for Sugar Beets." Larry J. Held, Tina J. Opp, David W. Koch, Fred A. Gray, and Jeffery W. Flake (Univ. of Wyo.).**

The benefit of applying fumigant for control of the sugar beet nematode on a variable versus uniform rate basis is examined. Compared to fumigating an entire field at a constant full-label rate, variable rate application provides a savings ranging from $31/acre (heavily infested field) to $69/acre (lightly infested field).

**"Fertilizer and Fertilizer-Crop Diversification." Glenn Helmers (Univ. of Nebr.), Joseph Atwood, and Saleem Shaik (Mont. State Univ.).**

This research compares the risk consequences of the often recommended practice of maximizing the expected value among different fertilizer levels to fertilizer diversification. This issue is examined using experimental yield data for dryland corn, grain sorghum, and soybeans in Nebraska, along with appropriate costs and product prices. A MOTAD model was used to examine the consequences for each crop and crop combinations. The results demonstrated risk benefits from fertilizer diversification for corn, little for grain sorghum, and none for soybeans. For corn and soybeans grown together, fertilizer diversification was beneficial.

**"Profitability of Variable Rate Nitrogen Application Assuming Different Rules for Uniform Rate Application." Roland K. Roberts and Burton C. English (Univ. of Tenn.).**

A methodological approach is developed to estimate the profitability of VRT compared to URT. This method incorporates crop and input prices, additional costs of VRT versus URT, spatial variability, yield response variability, and the decision rule used to determine the URT rate. In the corn/nitrogen example, we found that knowledge of yield response to an input is essential. Because yield response is important, more effort should be placed on developing methods for estimating site-specific yield response functions. Meta-response functions estimated using crop growth simulation models approximate site-specific yield response functions. The farmer's rule determining the uniform rate will affect VRT profitability versus URT.

**SESSION D-2:** *Consumer Demand for Agricultural Products: Current Issues.* **Moderator: Karen Klonsky (Univ. of Calif., Davis).**

**"National Demand for Organic and Conventional Baby Food." Gary D. Thompson (Univ. of Ariz.) and Lewrene K. Glaser (Specialty Crops Branch, ERS).**

National scanner data from two commercial sources were used to evaluate sales of organic and conventional baby foods. Shelf-stable foods sold in mid-size jars were selected for analysis because over 90% of organic baby foods, by volume, were sold in those jars during the sample periods, 1988–96 and 1997–99. Baby food items were ag-

gregated into five broad categories: dinners, fruits and desserts, vegetables, wet cereals, and juices. Descriptive analysis of the two samples indicates market shares of baby food dinners have grown more rapidly than all other categories. Elasticity estimates for a quadratic almost-ideal system of expenditure shares revealed distinct patterns in consumer reactions to prices. Future decreases in organic baby food prices could result in large increases in organic baby food purchases, yet decreases in conventional baby food prices will likely have almost no effect on conventional baby food purchases.

**"Shopping for Meat: Empirical Demand Estimation for Natural Beef Across Store Choices." Jennifer Grannis, Dawn Thilmany, and Ed Sparling (Colo. State Univ.).**

Tomato trade between the U.S. and Mexico has grown significantly during the past decade. This increased trade, together with major structural changes in U.S. produce marketing channels, has increased the complexity of conducting analysis of market integration and equilibrium. We implement an extended parity bounds model (EPBM), following the work of Baulch, and Barrett and Li, to analyze fresh tomato trade relationships between major shipping points and terminal markets. Findings suggest that, although markets seem relatively integrated and efficient, there exists some potential for claims of inefficient or overly competitive behavior. As expected, the more complex the marketing channels between producer and wholesaler (distance or international boundaries), the more likely markets operate suboptimally.

**"U.S. Consumers' Acceptance and Willingness to Buy Irradiated Food." Arsen Poghosyan, Rodolfo M. Nayga, and John P. Nichols (Tex. A&M Univ.).**

This study examines consumer willingness to pay for irradiated beef products. About 58% of respondents indicated they are willing to pay a premium for irradiated beef. An ordered probit with sample selection model was estimated. Marginal effects' standard errors were estimated using the bootstrap method. Our preliminary findings suggest that females and those who think improper handling contributes to food poisoning are more likely to pay a premium of 50¢ per pound of irradiated beef than others, ceteris paribus. Those who trust the irradiation technology are also more likely to pay a premium of between 5¢ and 25¢ per pound for irradiated beef.

**"Rethinking Colorado Wines: Implications of Local and Environmentally Friendly Labels." Maria L. Loureiro (Colo. State Univ.).**

New wine production areas are encountering difficulties in creating a reputation for a high-quality product. Numerous labeling programs claiming local origin and environmentally friendly practices have been implemented in order to help these new wine-growing areas. In this study, consumers' response toward Colorado and environmentally friendly Colorado wines is researched. In spite of the current efforts by the Colorado Wine Industry Development Board (CWIDB) to strengthen quality, it was found that consumers are willing to pay only small premiums for Colorado wines. Using an interval probit model, the mean willingness to pay (WTP) or premium for Colorado environmentally friendly and Colorado regular wines was estimated at 48¢ and 32¢, respectively, over the initial price of $10 per bottle.

**SESSION D-3: *Valuing Recreation and Open Space Preferences.* Moderator: George Goldman (Univ. of Calif., Berkeley).**

**"Valuing Open Space Attributes in Colorado: Evidence from a Hedonic Analysis of Public Purchases." John Loomis, Vicki Rameker, and Andrew Seidl (Colo. State Univ.).**

This paper develops and applies a public hedonic model that disaggregates the price per acre of open space paid by public agencies into implicit prices for eight attributes of open space. The model is implemented using over 100 public agency purchases of open space in Colorado. The model explains over half the variation in price per acre. The mean price per acre was $13,800, and the presence of lakes or rivers on the property or access to such water increases the price per acre by $10,589.

**"Preferences for Agricultural Land Preservation in Moffat County, Colorado." Donald McLeod, Amy Bittner, Roger Coupal (Univ. of Wyo.), Andrew Seidl (Colo. State Univ.), and Kate Inman (Univ. of Wyo.).**

Moffat County, Colorado, is similar to many rural counties in the intermountain West. Ranches are being fragmented for rural residences. Preferences for various land uses and controls were collected from mail surveys conducted in the county and are as follows: conservation of agricultural lands; avoiding negative externalities associated with residential development of rural lands; public involvement in the management of private

lands; locating proposed development next to existing development; and approval for land use districts, development fees, and purchase of agricultural conservation easement programs. These items demonstrate opportunities for analysis in a variety of policy referenda and policy valuation contexts.

**"The Value of Sportfishing in the Snake River Basin of Central Idaho." Donn M. Johnson (Quinnipiac Univ.), John R. McKean (Ag Enterprises, Inc., Masonville, Colo.), and R. Garth Taylor (Univ. of Idaho).**

The value of sportfishing in the Snake River Basin in central Idaho was measured using a two-stage/disequilibrium travel cost model. In contrast to traditional equilibrium labor market travel cost models, this model does not require monetizatioon of recreationists' travel time. The model was estimated using Poisson regression, appropriate for count data when overdispersion is absent, and adjusted for endogenous stratification (self-selection bias). Contrary to expectations that anglers living close to the sites with low values would be over-represented in the sample, the endogenous stratification adjustment caused estimated consumer's surplus to decline from $42 per person per trip before adjustment for endogenous stratification to $35 after adjustment. The average number of sportfishing trips per year was 6.72, resulting in an average annual willingness to pay of $236 per year per angler.

## SESSION E-1: *Environmental Policy.* Moderator: Andrew Seidl (Colo. State Univ.).

**"Environmental Policy Implications of Safety-First Models." Zeyuan Qiu, Francis McCamley, Tony Prato, and Vernon Lansford (Univ. of Mo., Columbia).**

Agricultural nonpoint source pollution is stochastic in nature. This study evaluates how the implications of safety-first can be incorporated into environmental policies such as negative pollution taxes or penalties to control agricultural nonpoint source pollution. We compare the tax rate functions implied by three environmental safety-first models in an agricultural watershed. The models are a parametric chance-constrained programming model, an upper partial moment model, and a mixed integer programming model. Although consistent tax rate functions can be derived from all three models, the one derived from the upper partial moment model has the most appealing properties.

**"Reputation and the Control of Pollution." Arthur J. Caplan (Utah State Univ.).**

This paper investigates the effectiveness of reputation in inducing a polluting firm to self-regulate its emissions when consumers have imperfect information. In particular, we ask to what extent must consumers reward and punish the firm before it chooses self-regulation as its dominant strategy? We find that if payoffs in the state game are such that both the consumer and the polluting firm have mixed beliefs which are consistent with each other's behaviors, then the firm has a positive probability of playing clean in each period of a finite game. Further, we find that a weak reward/punishment scheme may have an adverse effect on the environment, and that there are both environmental and welfare gains associated with strengthening the scheme.

**"Environmental Policy Influences on Livestock Stocking and Location Decisions." Dooho Park, Andrew Seidl, and Stephen Davies (Colo. State Univ.).**

We explore the relationship between state-level environmental regulations and stocking and location decisions in the U.S. livestock industry. We focus upon the overall size of the livestock industry (expressed in animal units) and the size of industry found on large, medium, and small operations by state (48) and over time (29 years). Results indicate that industry may drive policy rather than the converse. However, since we also find that existing policy rules have differential impacts on the industry by operation size, we conclude that structural change in the industry may be driven by size or legal structure discriminating regulations.

## SESSION E-2: *Current Consumer and Marketing Issues.* Moderator: Ruby Ward (Utah State Univ.).

**"Identifying Pure Age, Cohort, and Period Effects in Food Consumption: A Case of a Rapidly Aging Population." Dennis Clason (N. Mex. State Univ.), Hiroshi Mori (Senshu Univ., Tokyo), William Gorman, and Rene Acuna (N. Mex. State Univ.).**

This paper defines cohort effects in consumption models, and proposes a modification of Nakamura's methods for identifying cohort effects. The informed use of Akaike's Information Criterion (AIC) for model selection is addressed, as the AIC represents one way of coping with the identification problem in cohort analysis. These methods are

then applied to Japanese food consumption data, obtaining estimated age-, period-, and cohort-specific effects for traditional Japanese commodities (sake and fish) and substitute foods (beer and fresh meat). The adverse effect of cohort contamination on elasticity estimates is also examined. Finally, method limitations are discussed. We specifically note that good estimates require at least three cohort cycles of annual data.

**"Option Contracts as a Solution to the Holdup Problem in Agri-Food Markets." James Vercammen (Univ. of British Columbia).**

It is well known that incomplete contracts, together with asset-specific investment, can result in investment holdup because of opportunistic behavior by either the commodity producer or the processor. Several recent papers have shown how contracts which explicitly account for ex post renegotiation can reduce or eliminate the holdup problem. Of particular interest is the case where a simple option contract is awarded to the upstream producer. Results show that if the source of risk is with respect to the value of the processed commodity, then the option contract must be awarded to the processor rather than the producer to eliminate the holdup problem. A simple example is used to illustrate the main findings.

## SESSION E-3: *International Trade Analysis.* Moderator: Susan Hine (Colo. State Univ.).

**"Factors Influencing the Propensity for Cross-Border Trade." Satheesh Aradhyula and Russell Tronstad (Univ. of Ariz.).**

We estimate a simultaneous bivariate qualitative choice model of Arizona agribusiness firms' propensity to trade and visit as a tourist with the cross-border state of Sonora, Mexico. Simultaneity arises since both trade and tourist visits are hypothesized to influence one another. Results indicate that tourist visits have a greater influence on whether firms trade than traditional variables considered like firm age and size. Venture business visits, quantified through the tourism equation, were also found to have a greater impact on an agribusiness firm's propensity to trade than traditional variables. Our results suggest that communities seeking to develop and expand cross-border trading activities should target entrepreneurs with an exploratory and venture spirit first, and then target firms that are fairly established (over 15 years in age) and desire to diversify their production risk through multiple geographic production regions.

**"Japanese Demand for Wheat Characteristics: A Market Share Approach." Joe Parcell (Univ. of Mo.) and Kyle Stiegert (Univ. of Wisc., Madison).**

This research took from the work of Kohli and Morey in the economics literature to apply a quality derived market share demand function to the international wheat market. Specifically, a Japanese wheat import demand market share model was derived using data for Hard Red Winter, Hard Red Spring, Canadian Western Red Spring, and Australian Standard White wheat. Results indicate that the four wheat classes analyzed here are relatively good substitutes for one another, the own-price elasticity for each wheat class is elastic, and the own-characteristic protein elasticity for Hard Red Winter 13% protein wheat increased over the period analyzed.

**"Tradability and Market Equilibrium for U.S.-Mexico Fresh Tomatoes." Luz Padilla-Bernal, Dawn Thilmany, and Maria Loureiro (Colo. State Univ.).**

Tomato trade between the U.S. and Mexico has grown significantly during the past decade. This increased trade, together with major structural changes in U.S. produce marketing channels, has increased the complexity of conducting analysis of market integration and equilibrium. This study implements an extended parity bounds model (EPBM), following the work of Barrett and Li, to examine fresh tomato trade relationships between major shipping points and terminal markets for Mexican imported and Florida and California tomatoes. Findings suggest that, although markets seem relatively integrated and efficient, there exists some potential for claims of inefficient or overly competitive behavior. As expected, the more complex the marketing channels between producer and wholesaler (distance or international boundaries), the more likely markets operate suboptimally.

**"Forecasting Mexican Live Cattle Exports to the United States." Rhonda Skaggs (N. Mex. State Univ.), Diana Mitchell (USDA/APHIS, Ft. Collins, Colo.), William Gorman (N. Mex. State Univ.), Terry Crawford, and Leland Southard (USDA/ERS, Washington, DC).**

Mexican feeder cattle enter the U.S. through several ports-of-entry. The objective of this research was to construct models to predict monthly U.S. live cattle imports from Mexico by port-of-entry. Simple econometric models were developed for the nine highest volume ports. Selection of

independent variables was based on port-of-entry characteristics, economic theory, characteristics of regions in Mexico where the cattle originate, and statistical significance. USDA/APHIS is evaluating delivery of inspection services, and this research can aid the agency in optimizing its use of resources. This research provides insight into data needs for future, improved research on U.S.-Mexican beef cattle trade.

### SESSION E-4: *Topics in Risk and Uncertainty Management.* Moderator: B. Wade Brorsen (Okla. State Univ.).

**"Crop Insurance Under Quality Uncertainty."** **E. William Nganje, Napoleon M. Tiapo, and William W. Wilson (N. Dak. State Univ.).**

Quality-related yield and price losses have had significant impact on producer income and risks, and in some instances exceeded yield and price losses covered by conventional insurance instruments. However, there are no effective third-party quality risk transfer mechanisms especially for barley. We develop a framework to incorporate quality-related risk in crop insurance programs. Specifically, we derive optimum coverage levels and risk premiums that suppliers of insurance and producers would be willing to provide when the yield and revenue insurance instruments explicitly incorporate quality losses. The methodology illustrates how quality impacts could be incorporated into crop insurance types of contracts. We explicitly incorporate the correlation effects of yield and price shortfalls due to quality. Though applied here in the case of malting barley and scab, this approach could be applied similarly in many regions, crops, and quality factors.

**"Microeconomic Evaluation of Farm Risk Management Decisions in Kentucky." Murali Kanakasabai, Carl Dillon, and Jerry Skees (Univ. of Ky.).**

The primary objective of this research was to integrate various avenues of risk management to provide a unified risk management strategy for the Kentucky producer. The optimal insurance purchasing behavior and the impact of moral hazard on the optimal decisions across risk levels are also examined. The overall design of the study, integrating biophysical simulation modeling with quadratic programming, allows for uncertainty in crop yields, along with field day risk, to be modeled. While producers were found to employ multiple avenues to manage risk, the study showed evidence of moral hazard in the choice of production practices and land types.

**"Pacific Northwest Grain Growers' Income Risk Management." Bingfan Ke and H. Holly Wang (Wash. State Univ.).**

Optimal farm income risk management strategies in the Pacific Northwest are identified for two rotation systems (winter wheat/summer fallow, and winter wheat/spring barley/summer fallow) under expected utility maximization. Strategies studied include the currently available wheat futures market, and yield and revenue insurance (APH, IP, and CRC for both wheat and barley). Results indicate that revenue insurance (CRC and/or IP for wheat, and IP for barley) combined with a hedging position in the wheat futures market is the most effective risk management portfolio. Revenue insurance programs are effective but imperfect substitutes for the combination of yield insurance and futures hedging.

**"An Economic Analysis of Intensive Dryland Cropping Systems for the Central Great Plains." Paul A. Burgener (Univ. of Nebr.), Dennis A. Kaan (Colo. State Univ.), Daniel O'Brien (Kans. State Univ.), and Dillon M. Feuz (Univ. of Nebr.).**

Changes in dryland crop production and agricultural policy have increased interest among Central Great Plains producers in intensive crop rotations. The winter wheat-fallow production system is compared to intensive cropping systems. The differences in production costs and crop diversity are used to evaluate the economic returns associated with each cropping system. Annualized net returns are used to determine profitability of each cropping system, while stochastic dominance is employed to evaluate risk. There is little difference from the most profitable to least profitable of the systems, but the risk evaluation favors the low-cost rotations including wheat, proso millet, and fallow.

### SESSION F-1: *The Role of Risk in Adoption Decisions.* Moderator: Cheryl Wachenheim (N. Dak. State Univ.).

**"Stochastic Technology, Risk Preferences, and Adoption of Site-Specific Technologies." Murat Isik (Miss. State Univ.) and Madhu Khanna (Univ. of Ill.).**

A model is developed to jointly estimate risk and technology parameters and examine the extent to which uncertainties about the performance of site-specific technologies (SSTs) impact the value of SSTs. The availability of uncertain soil information and weather uncertainty can lead

risk-averse farmers to apply more fertilizer. Ignoring the impact of uncertainty and risk preferences leads to overestimation of economic and environmental benefits of SSTs. The model that accounts for uncertainties and risk preferences provides an explanation for the low observed adoption rates of SSTs. Improvements in the accuracy of SSTs have the potential to increase the incentives for adoption.

**"Farmer Goals and Management Styles: Implications for Adoption of Sustainable Agriculture." Karen Klonsky and Sonja Brodt (Univ. of Calif., Davis).**

In this study, 40 farmers were each asked to sort a set of 48 statements, each designed to express a general value or management goal. The resulting statement scores (ranging from +5, "most like my point of view," to −5, "least like my point of view") were analyzed using the PQ method. The farmers were divided into three groups, denoted: "Environmental Stewards," who are most interested in managing resources in cooperation with nature; "Production Maximizers," who strive for high yields and quality; and "Networking Entrepreneurs," who showed the greatest interest in off-farm activities. All groups valued the preservation of farming for future generations.

**"Biotechnology Seed (Roundup Ready Soybeans): An Economic and Environmental Tradeoff: A Case Study of Mississippi Producers." Fatimah Kari, Walaiporn Intarapapong, Somporn Meerungruang, and Warren Couvillion (Miss. State Univ.).**

Agricultural practices have been identified as a major source of nonpoint pollution (NPP) in the U.S., mainly due to an increase in agricultural input used. The advent of transgenic seed in the form of Roundup Ready (RR) technology provides effective weed control through genetic resistance introduced into soybeans, cotton, and corn seeds. The translog cost function and EPIC (Erosion/Productivity Impact Calculator) procedure is employed to assess the profitability and environmental benefit in using Roundup Ready technology. Preliminary results suggest RR technology is beneficial in reducing chemical application costs and runoff in certain areas, while an increase in runoff is observed in other regions. The between-year chemical cost advantage for the RR seed declined to about $17.7/acre in 1999, as compared to an average of $20.40/acre in 1997–98. Based on the EPIC simulation, Roundup Ready soybeans result in a reduction in pesticide runoff by 29%, 36%, 38%, and 41%, respectively, in the Delta, Black Belt, Upper Coastal Plain, and Lower Coastal Plain.

**SESSION F-2:** *Topics in Futures Market Use and Analysis.* **Moderator: Tyler Bowles (Utah State Univ.).**

**"Lessons Learned from Research with the *Fed Cattle Market Simulator*." Clement E. Ward (Okla. State Univ.), Stephen R. Koontz (Colo. State Univ.), Derrell S. Peel, and James N. Trapp (Okla. State Univ.).**

The *Fed Cattle Market Simulator* (*FCMS*), or "packer-feeder game," has been used for teaching, extension, and research for over 10 years. Five formal experiments have been conducted and data from the simulator have been used to address four other research questions. This paper provides a synopsis of each research project and an assessment of the *FCMS* as a laboratory research tool. The *FCMS* has provided a unique opportunity to understand market dynamics and buyer-seller behavior while providing data that are difficult or impossible to obtain in the real-world fed cattle market. However, limitations are noted.

**"The Response of Corn Futures Markets to Agro-Biotechnology News." Joe Parcell, Nicholas Kalaitzandonakes, and Leonie Marks (Univ. of Mo., Columbia).**

Consumer perceptions and opinion regarding development and use of transgenic products have caused melee at times in the food marketing chain. This has prompted some firms to publicly announce that grains and oilseeds produced using transgenic seed will not be used as inputs. This research found little to support the notion that agro-biotechnology news and/or recall/nonuse announcements affected the CBOT corn futures market. This result suggests that the market for non-transgenic corn is small relative to aggregate corn supply and demand, which the CBOT corn futures market represents.

**"Hedging Wholesale Beef Cuts." Ted C. Schroeder and Xiaolou Yang (Kans. State Univ.).**

Live cattle futures markets do not offer much opportunity for effective hedging of wholesale beef cuts. If a Choice-to-Select price spread futures contract were introduced, this would enhance hedging effectiveness although likely not enough to encourage cross-hedging. If a Choice boxed beef futures contract were introduced, hedging Choice

wholesale beef cuts would be less risky and the addition of a Choice-to-Select price spread would enhance hedging effectiveness, especially for Select wholesale beef cuts.

**"Seller and Buyer Satisfaction and Participation in Turkey's Wheat Exchanges." Cumhur Buguk (Gaziosmanpasa Univ., Turkey) and B. Wade Brorsen (Okla. State Univ.).**

This study uses data from a survey of wheat sellers and buyers in Turkey to gain a better understanding of seller and buyer satisfaction with the current exchange system and factors that influence exchange participants' decisions to choose exchanges over other ways of selling wheat. The results indicate most sellers and buyers have a few problems with the current system. The major dissatisfaction with exchanges are prices and fees. The Tobit model results show great potential for a new grading system and legally enforceable warehouse receipts.

## SESSION F-3: *Economics of Water and Protected Areas.* Moderator: Donald McLeod (Univ. of Wyo.).

**"Costs of Wetland Restrictions to Kansas Agricultural Producers." Brett R. Gelso and John A. Fox (Kans. State Univ.).**

We survey 982 Kansas farmers to investigate the effect of wetlands on land rental values. Cost associated with wetlands was calculated as the difference between willingness to pay for land containing wetlands and a given rental rate for land with no wetlands ($35/acre). We find that costs vary directly with wetland coverage, frequency of wetness, and dispersion of wetland areas. Costs range from $2.50/acre for land with 1% wetland in a single contiguous area to $17/acre for land with 4% total wetland dispersed throughout the holding.

**"Feasibility of Wetland Restoration to Reduce Flood Damage in the Red River Valley." Steven Shultz and Jay Leitch (N. Dak. State Univ.).**

The economic feasibility of alternative wetland restoration activities to store water and reduce flood damage was evaluated in the Maple River Watershed, North Dakota. With benefit-cost ratios ranging from 0.71 to 0.24, neither simple wetland restoration based on plugging existing drains, nor restoration with outlet control devices, nor complete restoration intended to provide a full range of wetland-based environmental services was economically feasible over a 20-year future period.

Peak flood stages and flood damage would need to be reduced by at least 3.4% to 9.6% in order for wetland restoration options to break even.

## SESSION G-1: *Resource Implications for Production Agriculture.* Moderator: Eric Schuck (N. Dak. State Univ.).

**"Changing U.S. Farm Structure and Factor Productivity." Chong S. Kim and Ashok K. Mishra (ERS/USDA).**

Using a decomposed negative binomial regression model, we test three hypotheses associated with U.S. farm structural changes, including economies of scale, government farm programs, and public agricultural research. Results indicate that government farm programs have at least helped to keep marginal farmers in business, and publicly funded agricultural research has been geared to capital-intensive and large-scale farming. These measures failed to work, however, for low-income farmers. Furthermore, there exist economies of scale for small farms with annual sales less than $100,000, but no evidence of economies of scale for farms with annual sales greater than $100,000.

**"Livestock Waste Land Application: Regulation and Producer Practices in Oklahoma." Mark Metcalfe (Univ. of Calif., Berkeley), Jonathan K. Yoder, Joseph Williams, and Rita Carreira (Okla. State Univ.).**

Land application of livestock waste has received increasing attention in the last decade with the increased concentration of swine production. This paper presents results of a pilot survey of Oklahoma swine producers regarding waste management. We find that relatively few producers incorporate effluent into the ground during application, most producers own all the land upon which manure is applied, that recent phosphorous soil tests on fields nearest barns are positively correlated with hog operation size, and that phosphorous levels tend to be higher on fields nearest barns than on fields farthest from barns.

**"Environmental Implications of Taxing Agricultural Chemical Inputs: The Case of Cotton Production in the Mississippi Delta." Somporn Meerungruang (Univ. of Nebr.).**

Cotton production in the Mississippi Delta was selected as a representative for measuring the expected amount of chemical reductions and chemical runoff due to an input tax scheme. Chemical reductions were estimated by using a translog

cost system function derived through the duality relation. The SWOT (Soil and Water Assessment Tool) was used to estimate runoff as a result of an input tax increase at the watershed level.

### SESSION G-2: *Farmer Income and Wealth: Structure and Policy Implications.* Moderator: Clem Ward (Okla. State Univ.).

**"Changes in the Distribution of Farm Wealth in the United States." Ashok K. Mishra (ERS/ USDA), Charles B. Moss (Univ. of Fla.), and Kenneth W. Erickson (ERS/USDA).**

This paper examines the changes in farm sector wealth from 1950–1999. The study uses Theil's entropy-based measure of inequality of farm equity by 10 regions of the U.S. The entropy measure is then used to decompose U.S. inequality into within-region and between-region differences. Results show that for the period 1950–93, relative to the number of farms per state, farm wealth in the U.S. became more equally distributed. Further, our findings indicate that inequality in wealth may be on the rise in recent years.

**"The Relationship Between Incomes, Farm Characteristics, Cost Efficiencies, and Rate of Return to Capital Managed." Jerry W. Dunn and Jeffery R. Williams (Kans. State Univ.).**

Farm-level, cross-section, and panel data were used to examine relationships between variability in the rate of return to capital managed and explanatory variables including government payments per crop acre, gross crop income, gross livestock income, costs, efficiency measures, and other socioeconomic characteristics. Increasing the standard deviation of gross revenue and government payments and decreasing the variability of labor, crops and equipment, livestock, and interest costs increased the variability in rate of return to capital managed. The panel data results indicated that annual changes in rate of return also had a positive relationship with increases in gross revenues, government payments, and decreased changes in costs.

**"Rates of Return in the Farm and Nonfarm Sectors: A Time-Series Comparison." Kenneth W. Erickson, Ashok K. Mishra (ERS/USDA), and Charles B. Moss (Univ. of Fla.).**

Many economists have suggested that agriculture in the United States suffers from persistently low factor returns. However, an alternative hypothesis has been advanced–namely that the rate of return to well-managed agricultural enterprises is comparable to the rate of return on assets in other business enterprises. We examine the relationship between the rate of return to agricultural assets by first developing the USDA/ ERS data series on the rate of return on agricultural assets. Next, we examine the implications of comparing rates of return between sectors. 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.

**"Farm Household Wealth: Measurement, Structure, and Determinants." Tyler J. Bowles and Ryan C. Bosworth (Utah State Univ.).**

The Survey of Consumers' Finances (SCF) and the Health and Retirement Survey (HRS) data sets are used to document in detail the differences between farm and nonfarm household wealth structure and to explain the source of these differences, with particular attention on households where the head is at or near retirement. The SCF and HRS, respectively, yield net worth estimates of farm households of approximately $650,000 and $435,000 in 1992, with corresponding nonfarm household estimates of $180,000 and $260,000. However, both surveys indicate farm households hold less wealth in financial assets within retirement accounts than do nonfarm households. Differences in income, inheritances, and age do not appear to explain the difference in mean net worth between the two groups. We attribute higher farm household wealth to the saving behavior of farm households.

**"Characteristics of Farm Borrowers in Colorado." Jerry Eckert, Fred Rossi, and Norm Dalsted (Colo. State Univ.).**

Records from nearly 5,000 farm loans were provided by Colorado's largest commercial lender. Statistical and econometric analysis was used to search for determinants of borrowing behavior. Leverage was used to capture producers' current risk status. Borrowers were stratified by leverage and examined for common patterns. A predictive equation was developed estimating leverage for individual producers. Total liabilities, total assets, current ratio, and producer age surfaced as independent variables which "fleshed out" an equation that satisfactorily fit all areas of Colorado west of the Continental Divide. Borrowing behavior differentials were compared between farm groups classified by primary enterprise and by region.

**SESSION G-3:** *Topics in Marketing and Demand Analysis.* **Moderator: Joe Parcell (Univ. of Mo., Columbia).**

**"Demand Estimation for Agricultural Processing Co-Products." Patrick Novak, Eric A. DeVuyst, David Lambert, and Cheryl Wachenheim (N. Dak. State Univ.).**

A lack of historical price information prohibits the use of positive time-series techniques to estimate demand for some agricultural co-products. Linear programming is used as a normative technique to estimate step function demand schedules for three co-products by individual livestock classes within a region. Regression is then used to smooth step function demand schedules by fitting demand data to generalized Leontief cost functions. Seemingly unrelated regression is used to estimate factor demand first adjusted for data censoring using probit analysis. Demand by individual livestock classes is aggregated over the number of livestock within a region.

**"Value of Increasing Kernel Uniformity." B. Sam Yoon (Korean Futures Assoc.), B. Wade Brorsen (Okla. State Univ.), and Conrad P. Lyford (Tex. Tech Univ.).**

Kernel uniformity is an important physical quality attribute that can now be measured at low cost. This study analyzes the profitability of sorting to increase wheat kernel uniformity. Optimal grain sorting strategies are developed that could be used to increase kernel uniformity. Nonlinear programming is used to sort grain loads to maximize flour yield, by increasing uniformity of kernel size and kernel hardness. Increases in flour yield due to higher kernel uniformity are not enough to outweigh the costs of sorting.

**"Evaluating a Marketing Loan Program for Wool and Mohair." David P. Anderson, Edward G. Smith, James W. Richardson, and Joe L. Outlaw (Tex. A&M Univ.).**

The wool and mohair industries have been in a radical transition over the last few years. This paper reports an analysis of a proposed wool and mohair marketing loan program. Two potential loan rates–$1.00 and $1.20 per pound grease for wool, and $5.25 and $4.20 per pound for mohair–are evaluated. Government costs under the $1.20 per pound wool loan rate average about $19 million dollars per year. Loan deficiency payments under the $4.20 and $5.25 loan rates for mohair average about $1.4 and $3.7 million per year, respectively.