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Abstracts of Invited and Selected Papers and Organized Symposia

WAEA Annual Meetings, San Francisco, California
July 6–8, 2005

Invited Paper Abstracts

WAEA PRESIDENTIAL ADDRESS

“Economic Principles for Saving the Cooperative Extension Service.” Dana L. Hoag (Colo. State Univ.).

The Cooperative Extension Service is an outstanding success story for education, but a model whose value is now in question. In this presentation, I focus on economic principles that apply to the question: *Is it time to end Extension, and if not, how can it be saved?* Six principles are identified: public goods, competitive advantage, privatization, long-run sustainability, business practices, and political economy. There is cause to support Extension, but leadership is needed to establish a common direction and to implement changes. Strategic planning would be helpful to identify these changes and to make Extension’s value known to clientele and policy makers. [Note: The full presidential address is published in this journal issue.]

KEYNOTE GUEST ADDRESS

“Global Food System Trends and Collaboration and Coordination in Agricultural Economics Research.” Cornelius (Corny) Gallagher (Agribusiness Executive, Bank of America).

This presentation examines the global challenges, opportunities, and trends facing the western U.S. food and agribusiness sector, and the need for coordination and collaboration in research to address these industry issues. The three key food system challenges currently facing the food and agribusiness sector are air and water regulations, agricultural markets and trade, and reduced funding in agricultural research.

In 2005, seven important food system trends were identified by the Food Foresight panel process (of which I am a member):

- The public increasingly sees agriculture as big business.
- Food safety and insecurity are redefining “routine” ag practices.

- Innovations from competitors around the world will continue to challenge the markets of U.S. agriculture.
- Concerns about public health—both real and perceived—are making unprecedented demands on the agri-food chain.
- Higher healthcare costs, a huge wave of genetic science, and changing consumer preferences are redefining nutrition and pharmaceuticals, heralding a revolution in the way consumers view and choose food.
- While consumers feel their “cup runneth over” with choices, they are still looking for more.
- Consumer demands for bold flavors and global cuisines are sweeping the retail skyline.

These trends offer guidance to the industry by serving to highlight key food system opportunities. Specifically, there is a clear need for innovations in sustainability and specialty crops, environmental solutions and improvements, and coordination and collaboration in research to seek solutions.

In closing, the following stakeholder recommendations are offered:

- Improve national, state, and educational systemwide responsiveness, teamwork, and collaboration among industry, educators, AES scientists, campus specialists, and county advisors in addressing high-priority issues affecting the future viability, sustainability, and competitiveness of commercial agricultural production, processing, and marketing.
- Form university-industry partnerships that bring resources and focus to high-priority issues. Improve the information delivery system to more efficiently and effectively transfer new research, technology, and practices.
- An excellent example of a national collaborative effort to address industry issues is the National Grape and Wine Initiative. (Learn more online at <http://www.ngwi.org/>.)

Selected Paper Abstracts

SESSION: Resource and Environmental Economics. Chair: Hayley Chouinard (Wash. State Univ.).

“Nitrogen as a Capital Input and Stock Pollutant: A Dynamic Analysis of Corn Production and Nitrate Leaching Under Non-Uniform Irrigation.” Kurt A. Schwabe and Keith C. Knapp (Univ. of Calif., Riverside).

A spatially dynamic programming model of nonuniform irrigation is developed to investigate the nitrogen leaching problem associated with irrigated agriculture. We evaluate the importance of temporal and spatial elements in (a) appropriately modeling the interseasonal corn production problem with nitrogen carry-over and leaching under nonuniform irrigation, and (b) adequately evaluating alternative policy instruments for pollution control. Comparisons of the time profiles under spatially variable nitrogen levels arising from nonuniform irrigation are provided along with an evaluation of three different price-based policy instruments for reducing nitrogen leaching.

“Comparing Revealed and Stated Preferences in a Random Utility Model of Unique Site Closure: The Case of Yellowstone Snowmobiling.” Christopher T. Bastian (Univ. of Wyo.) and John B. Loomis (Colo. State Univ.).

We investigate respondents' abilities to reallocate multiple trips across a large number of sites when faced with unique recreation site closure in a stated preference (SP) context as compared to revealed preference (RP) data. We estimate RP, SP, and joint (RP-SP) random utility models. Preference homogeneity was rejected between the RP and SP models. We conclude RP models may underestimate changes in visitation for a non-marginal impact such as closure of a unique recreation site.

“Integrating Wind Power in Electricity Grids: An Economic Analysis.” G. Cornelis van Kooten, Hui Zhu, and Jia Liu (Univ. of Victoria).

Wind power is considered an environmentally friendly and low-cost alternative to fossil fuels, nuclear and hydro power. In Europe, countries are required to achieve 15% of their energy from wind by 2010. We use a mathematical programming model of an electrical grid to examine wind's presumed low cost and effectiveness at reducing CO₂ emissions. Results indicate that, at low levels of penetration, wind power can provide CO₂ migration benefits at low cost, but, as the degree

of penetrability increases, the costs of reducing CO₂ emissions rise rapidly because of the spinning reserves required in the coal- and gas-fired power plants.

“Poverty and Pollution: Economic Effects on Households in Oil-Producing Areas of Ondo State, Southern Nigeria.” T. G. Apata (Univ. of Ibadan) and O.O. Odeh (Kans. State Univ.).

This paper examines the economic effects of oil pollution on households in the crude oil-producing areas of southern Nigeria. Survey data from households in polluted and non-polluted areas show significantly higher returns for households in the non-polluted areas. Farming households in polluted areas show higher levels of diversification and higher poverty incidence.

SESSION: Agri-Marketing, Demand, and Price Analysis. Chair: Joe Parcell (Univ. of Mo.).

“Consumers' Willingness to Pay in Response to Apples' Internal Attributes.” Ying Hu, Jill J. McCluskey (Wash. State Univ.), and Cathy Durham (Oreg. State Univ.).

To evaluate consumers' willingness to pay (WTP) for Washington apples, the effects of firmness and sweetness as the representative sensory attributes are investigated in addition to those of consumer demographics and preferences. A tasting survey was conducted in Portland, Oregon, on Gala and Red Delicious apples. This study finds that firmer and sweeter apples induce more WTP. Age is also an important factor affecting WTP for apples. Survey respondents' education, eating frequency, and race affect WTP in the Gala model, but not the Red Delicious.

“Does Altruism Play a Role in Determining U.S. Consumer Preferences and Willingness to Pay for Natural and Regionally Produced Beef?” Wendy J. Umberger, Dawn D. Thilmany (Colo. State Univ.), and Amanda R. Ziehl (Univ. of Tenn.).

Interest in developing targeted markets for differentiated beef products continues to grow. One area of increasing differentiation relates to the source-of-origin and types of production methods used to raise the animals. Data collected from a 2004 national online survey are used to estimate the probability that a consumer will purchase and pay a premium for two natural and regionally produced beef products: ribeye steak and ground beef. Results indicate the probability a consumer will pay a premium depends on purchase behavior and shopping location, stated importance of production attributes, awareness, and interest in private and civic agricultural issues.

“A Decomposition of Willingness to Pay for Environmental Attributes Embedded in Pork Products: Evidence from a Second-Price Auction.” Sean P. Hurley (Cal Poly, San Luis Obispo) and James B. Kliebenstein (Iowa State Univ.).

Due to a structural change in the hog industry where individual pork producers have expanded their operations to more confined spaces to capture economies of size, there have been increasing concerns regarding the effect of pork production on the environment. This study examines evidence from a Vickrey auction as to whether it is beneficial for producers to incorporate multiple environmental attributes into a single product or sell multiple products with a single environmental attribute. Evidence suggests that there is no significant gain in revenue from selling pork with multiple environmental attributes and premiums for environmental attributes are additively separable.

“Valuing Fed Cattle Using Slice Shear Force Measurements.” John Michael Riley, Ted C. Schroeder (Kans. State Univ.), and Tommy L. Wheeler (USDA/Animal Research Center).

Marketing fed cattle using grid pricing has become a popular way to sell cattle. One of the most important beef characteristics, according to consumers, is beef tenderness. USDA quality grades are poor predictors of meat tenderness. However, mechanical shear force does objectively measure tenderness. This study illustrates how problematic USDA quality grades are at assessing accurate beef tenderness, and proposes and evaluates a tenderness-based valuation system based on slice shear force technology. We show that cattle of all quality grades are substantially over- or undervalued when using a grid relative to a tenderness-based valuation system.

“Hedonic Price Analysis of Washington Organic Apples.” Joe Sherburn, Larry Makus, Garth Taylor (Univ. of Idaho), and H. Holly Wang (Wash. State Univ.).

A hedonic price model for Washington State apples evaluates price impacts of quality characteristics for the five dominant apple varieties (Red Delicious, Golden Delicious, Gala, Fuji, and Granny Smith) during the 2000 through 2003 marketing season. Twenty hedonic regressions are estimated to reflect each individual variety and season. Organic apples are an alternative to conventional apples, rather than a separate commodity. In the hedonic price function, all multiplicative interactions variables between organic and other quality characteristics are extensively assessed. The interaction variable coefficients are

consistently insignificant, suggesting the impact of quality characteristics is equivalent between conventional and organic apples.

SESSION: Agricultural Industry Organization.
Chair: Jason Winfree (Univ. of Mich.).

“A Dynamic Logit Model of Firm-Level Price and Product Line Rivalry.” Timothy J. Richards and Paul M. Patterson (Ariz. State Univ. East, Mesa).

Consumer product manufacturers often compete in dynamic, multi-firm oligopolies using multiple strategic tools. While existing empirical models of strategic interaction typically consider only parts of the more general problem, this paper presents a more comprehensive alternative. Marketing decisions are dynamically optimal, consistent with optimal consumer choice, and responsive to rival decisions. Using ready-to-eat cereal scanner data, we test several hypotheses regarding the nature of strategic interaction among several rival manufacturers. Findings reveal that cereal manufacturers price and introduce new brands cooperatively in a static sense, but behave more competitively when dynamic reactions are included.

“Dynamic Externalities in U.S. Agriculture Industries.” Hanas A. Cader, Abdullah Al-Hawwas, and Sreedhar Upendram (Kans. State Univ.).

Localization and urbanization are commonly used to measure intra- and inter-industry spillovers, respectively. Dynamic externalities deal with the role of prior information, which can be used to measure the strength and direction of spillovers. We use data from the Small Business Administration (SBA) to describe the pattern of dynamic externalities in the U.S. agriculture industry. Specialization positively impacts number of establishments, while industry diversity has a negative impact on establishments having less than 100 employees.

“The Importance of Agglomeration, Space, and Amenities in the Expansion and Location of the Hog Industry in the U.S.” Derek G. Brewin (Univ. of Manitoba), Martin L. Shields, and Kenneth B. Kephart (Penn State Univ.).

Hog production is an important part of many rural economies in America. This paper examined the location of, and recent changes in, that production. Input price and availability variables were found to be important drivers of the original density of hogs and of recent growth. Agglomera-

tion economies did not appear to be causing recent growth in hog densities. Possibly due to congestion regarding land for manure disposal, this study found that counties with high starting densities saw less growth than those with low starting densities. Increases in regulatory stringency also had a negative impact on recent hog density growth.

SESSION: Agri-Marketing, Demand, and Price Analysis. Chair: Cathy Durham (Oreg. State Univ.).

“Sorting and Blending Under Quality Uncertainty: Application to Wheat Protein.” Demcey Johnson (USDA/ERS, Field Crops Branch).

Quality uncertainty is of considerable interest to the grain industry. In this paper, uncertainty is incorporated in a model of grain blending decisions. A mixed-integer, nonlinear optimization problem is developed. Simulations illustrate the effect of crop quality on blending decisions, and the effect of blending activities on the distribution of protein within a wheat marketing channel.

“Impacts of Identity-Preserved Grains on Grain Car Allocations.” Tosmai Puenpatom and Eric Jessup (Wash. State Univ.).

The demand for identity-preserved (IP) grains has increased considerably during the last decade due to growing consumer health concerns and food manufacturing requirements. IP shipments increase logistical challenges for grain transportation since marketing of IP grains requires strict segregation—containerized shipments must be maintained throughout the marketing chain. We investigate the impact of IP grains on the railcar scarcity problem by comparing between two general equilibrium scenarios: the conventional non-IP grain transportation market versus the modified model with IP grain shipment features.

“Hedonic Models for Wine.” Marco Costantigro, Jill J. McCluskey, and Ron C. Mittelhammer (Wash. State Univ.).

Estimating a single hedonic price function for wine imposes the assumption that the implicit prices of each attribute are the same across price categories. We argue that an aggregation bias might exist. In this paper, we segment wine data based on price, and estimate hedonic regressions for different price categories. Findings confirm that implicit prices for attributes differ across these price categories. We conclude that at least two radically different wine classes exist,

designated in our study as “consumption wines” and “collectible wines.” These classes identify separate products which fulfill different needs and should be considered separately.

“Demands for Food Products Across the Development Spectrum: An Application of a Rank Four Demand System.” J. A. L. Cranfield (Univ. of Guelph).

A rank four AIDS model (RAIDS) is estimated for consumer demands in countries spanning the development spectrum. RAIDS is used as it provides more general price and expenditure responses and it nests the Quadratic and nonlinear AIDS models. Results indicate selection of nested functional form differs by subsample. AIDS is elected for the low per capita expenditure countries, while QUAIDS is selected for the middle and high per capita expenditure countries, and when the whole sample is considered. Parameter estimate differences manifest themselves in price and Engel elasticities, and warrant caution when using global demand systems to undertake policy analysis.

“Measuring Impacts of Gluten Imports on U.S. Wheat Food Use by Class.” Caiping Zhang and Thomas L. Marsh (Wash. State Univ.).

We investigate impacts of gluten imports on U.S. wheat food use demanded as input into the flour industry. Quarterly data for five classes of wheat ranged from 1990 to 2003. Our findings suggest that domestic wheat demand not only varies over years, but also is seasonal in nature. Moreover, the domestic demand for hard red spring and hard red winter wheat was significantly influenced by gluten imports. Gluten elasticities for all five classes of wheat increased over the study period, especially for hard red spring wheat.

SESSION: Resource and Environmental Economics. Chair: Thomas L. Marsh (Wash. State Univ.).

“A Bayesian Examination of Cheap Talk and Anchoring Bias in Constructed Markets.” David Aadland, Owen R. Phillips (Univ. of Wyo.), and Arthur J. Caplan (Utah State Univ.).

This study presents a theory for understanding the relationship between anchoring bias, hypothetical bias, and cheap talk in non-market valuation surveys. In our theory, interviewers provide agents with signals such as cheap talk and bid values, causing agents to revise their

prior distributions over the value of the good. Previous empirical studies have found mixed results when assessing the effects of cheap talk in reducing hypothetical bias. Our theory predicts that cheap talk will appear to be more effective for relatively large bids. The results from an experiment, as well as several recent empirical studies, are consistent with the theory.

“Economic Modeling of Livestock Disease Control: The Case of a Potential Foot-and-Mouth Disease Outbreak in California.” Mimako Kobayashi, Bradley F. Dickey, Tim E. Carpenter, and Richard E. Howitt (Univ. of Calif., Davis).

Management of infectious livestock diseases is considered in a bio-economic optimal control framework. Facing the dynamics of disease spread across herds and the consequences of disease management options (slaughter, vaccination, and animal movement restrictions), the social planner chooses the cost-minimizing daily strategies. The conceptual model is applied to a potential foot-and-mouth disease (FMD) management problem in central California. The epidemiologic specifications of the empirical model are successfully validated against the detailed FMD simulation model developed for the same region. A model result suggests that limited vaccine should be used for high-valued dairy herds, which agrees with the view among local practitioners.

“Perceived Water Prices and Estimated Water Demand in the Residential Sector of Windhoek, Namibia: An Analysis of the Different Water Market Segments.” Selma T. Kavezeri-Karuaihe, Philip Wandschneider, and Jonathan Yoder (Wash. State Univ.).

We develop a demand model for the water market of Windhoek, Namibia, and segment the market by income. The model uses the perceived price concept developed by Shin (1985). Results confirm the Shin hypothesis that consumers don't know actual prices, but respond to perceived prices. The average price and covariates have the expected signs. However, the marginal price (MP) coefficient is positive. Shin's perception parameter (k) is negative in two of three income segments. In the Shin model, this implies consumers respond to MP (through perceived prices). Ambiguities about prices warrant further investigation.

SESSION: Production Economics and Farm/Ranch Management. Chair: Jeffrey T. LaFrance (Univ. of Calif., Berkeley).

“Shifting Rice and Shrimp Production Possibilities: The Case of Water Salinity Manage-

ment in the Mekong Delta, Vietnam.” Jonathan D. Kaplan (Calif. State Univ., Sacramento) and Tran Thi Ut (Nong Lam Univ.).

In the 1990s, the Vietnamese government constructed gates, embankments, and sluices along the coast of Bac Lieu Province in the Mekong Delta to prevent saline coastal waters from entering the delta, thereby improving rice-growing conditions. Recently the gates were opened, increasing salinity and improving conditions for shrimp production. This paper evaluates changes in household and hired labor productivity with changes in salinity levels and the ability of village households to reallocate household and hired labor to improve their well-being. To do so, we estimate rice and shrimp production under alternative salinity conditions for five villages throughout Bac Lieu Province.

“Indirect Utility Under Risk: A Heterogeneous Panel Application.” Yucan Liu and C. Richard Shumway (Wash. State Univ.).

Previous work on the refutable implications of expected utility maximization are extended to the case of price and quantity uncertainty. An important theoretical finding results. Empirical tests of the hypotheses are conducted for state-level aggregates using traditional methods as well as recently developed techniques for testing unit root and cointegration in heterogeneous panels. The same conclusions are obtained from both models: while most of the refutable hypotheses are not rejected, the symmetry condition and two restrictive risk preference hypotheses are rejected. At individual observations, data for states are largely (but not totally) consistent with actions of expected utility-maximizing firms.

“Alternative Indices in Weather-Based Crop Insurance Contracts.” Raphael N. Karuaihe, H. Holly Wang, and Douglas L. Young (Wash. State Univ.).

Weather index-based crop insurance is a convenient alternative to mitigate production risk, especially for developing countries that lack government subsidized crop insurance programs and high-quality yield records. In this paper, we analyze weather-based crop insurance theoretically and empirically for a South African corn case. This study examines the structure of several weather indices and evaluates farmers' demand and benefit with alternative risk preferences using these instruments. Results show that the risk management efficiency of a contract depends on the index. A combination of two weather variables tend to describe production risk better than any single variable, and farmers with low risk aversion even prefer to sell short such contracts if the premium is loaded.

SESSION: Resource and Environmental Economics. Chair: Jonathan Yoder (Wash. State Univ.).

“The Effectiveness of a Groundwater Extraction Tax versus a Quota Policy to Achieve Groundwater Conservation in the Texas High Plains.” Biswaranjan Das and David B. Willis (Texas Tech Univ.).

A dynamic economic optimization model for the 19 Texas High Plains counties that account for 97% of all Texas groundwater withdrawals from the Southern Ogallala Aquifer was linked to the MODFLOW hydrologic model of the region to analyze the conservation effectiveness of two legislatively approved policies over a 50-year planning horizon. The maximum \$1 per acre-foot extraction fee reduced groundwater use by 0.34% relative to the existing baseline, and the quota restriction policy designed to conserve 50% of initial stored groundwater reserves decreased groundwater use by 2.52%. Available policy tools are more suited for preventing physical exhaustion than economic exhaustion.

“An Econometric Test of the Endogeneity of Institutions: Water Markets in the Western United States.” Kristiana Hansen, Richard Howitt, and Jeffrey Williams (Univ. of Calif., Davis).

In the western United States, the tremendous spatial and temporal variation in rainfall suggests that there are substantial gains from trade to be had through water markets. Due to variability in the relative importance of water supply uncertainty and trading impediments, markets are forming differently across the West. Trades may be permanent water rights transfers or temporary leases, where underlying property rights remain unaffected. Our econometric analysis of transactions reported in the *Water Strategist* over 1993–2003 supports the conclusion that institutions have influenced not only whether water trades occur, but also whether trades are permanent or temporary water rights transfers.

“A Stochastic-Dynamic Model of Costly Reversible Technology Adoption.” Kenneth A. Baerenklau and Keith C. Knapp (Univ. of Calif., Riverside).

A dynamic model of micro-level technology adoption generalizes previous literature by incorporating technology age, reversible investment, variable input and output levels, and stochastic input and output prices. Simulations are conducted for irrigated cotton production in California’s San Joaquin Valley. Results demonstrate a significant vintage capital effect in the optimal

investment rules which contributes to delayed technology diffusion. A portion of the investment hurdle rate derived by option value models is explained by the artificial assumption of irreversible investment. The impact of uncertainty on the investment decision is clarified and shown to decline with technology age.

“Do We Know the Real Gains to Groundwater Management? A Closer Examination of Hydrological and Behavioral Assumptions in the Study of Non-Cooperative Extraction Behavior.” Siwa Msangi (IFPRI, Washington, DC) and Richard E. Howitt (Univ. of Calif., Davis).

The current literature on non-cooperative groundwater extraction makes gross simplifications of the underlying hydrology, and assumes user behavior that conforms to the highly stylized assumption of time-additive separability of intertemporal net benefits. This paper examines how the measured gains to management change when this assumption is relaxed in favor of a more generalized recursive utility specification. Application of this framework to the empirical case of Kern County, California, shows that the difference in measured management gains is significantly larger than that which is measured under the assumption of time-additive separability, even when maintaining the single-cell representation of the aquifer.

SESSION: Agri-Marketing, Demand and Price Analysis. Chair: Sean Hurley (Cal Poly, San Luis Obispo).

“The Impacts of ‘Right of First Refusal’ on Competitiveness of Fed Cattle Markets: Results from an Economic Experiment.” Stephen R. Koontz (Colo. State Univ.).

Market power is often found in agricultural markets, but the follow-up question of what to do about it is often not addressed. This paper examines use of the institution “Right of First Refusal” on fed cattle markets. A producer may grant this right to a packer. The packer then has the right to procure cattle at the price agreed to between the producer and another packer. The hypothesis is that the right makes the other packer give serious bids. Alternatively, the right may cause the other packer to avoid trading with the producer. The institution is low-cost relative to other policy solutions. The institution is examined in an experimental economics market. The Right of First Refusal is found to be competition enhancing. Producer prices are higher and production efficiency is greater than without the institution.

“Transmission of Demand for Quality in the U.S. Cotton Marketing System: Are Government Incentives Consistent with Mill Demand?” Conrad P. Lyford and Sangnyeol Jung (Tex. Tech Univ.).

Quality incentives in the U.S. cotton marketing system are analyzed to evaluate the effectiveness of information provided by the government relative to end-user demand. Mill-level premiums and discounts, obtained from hedonic model estimation with daily cotton contracts data, are statistically compared with government loan rates and daily spot market quotations. The results show that a substantial disconnect exists between end-user demand and upstream cotton quality incentives. Suggestions for improving market responsiveness are provided.

“Consumer Responses to Recent BSE Events.” Kamina Johnson, James Pritchett, Dawn D. Thilmany, Wendy Umberger (Colo. State Univ.), and William F. Hahn (USDA/ERS).

Recent BSE (a.k.a. mad cow disease) discoveries in Canadian and U.S. beef cattle have garnered significant media attention, which may have changed consumers' meat purchasing behavior. Consumer response is hypothesized and tested within a meat demand system in which response is measured using dummy variables and media indices that count positive and negative meat industry articles. Parameters are estimated using retail scanner data, and cross-species price elasticities are calculated. Results suggest that the BSE events negatively impacted ground beef and chuck roasts, while positively impacting center cut pork chop demand. Dummy variables explained the variation in meat budget shares better than media indices.

“Estimating the Impact of Voluntary Labeling of Trans Fats on the Market Demand for Processed Foods: A Generalized AIDS Model Approach.” Steven S. Vickner (Utah State Univ.).

The principal empirical objective of this paper is to estimate the impact of voluntary trans fat labels on the market demand for crackers using national-level, weekly point-of-purchase scanner data and a generalized almost ideal demand system (AIDS). Autocorrelation is purged from the model using the method prescribed by Berndt and Savin, and the impact of the label is assessed using a likelihood ratio test.

SESSION: *International Trade*. Chair: Kathy Baylis (Univ. of Brit. Columbia).

“The Bioterrorism Act of the USA and International Food Trade: Evaluating WTO Conformity and Effects on Bilateral Imports.” Christine Wieck (Wash. State Univ.), Bettina Rudloff (Univ. of Bonn), and Thomas Wahl (Wash. State Univ.).

The September 11th event focused the world's attention on the threat of bioterrorism to the food chain. As a consequence, the United States implemented the Bioterrorism ACT (BTA). These new administrative import rules will be evaluated regarding WTO conformity and trade impact. This analysis is based on an inventory approach systematizing the BTA, and a trade flow analysis. The BTA does not significantly deviate from WTO rules; however, the findings are driven by existing flexibility in international administrative import guidelines. Results of the trade analysis reveal that products and countries with prior expedited or less regulated procedures and small import quantities are affected.

“China's Trade Surplus with the United States: The Role of Exchange Rates.” Guedae Cho and Won W. Koo (N. Dak. State Univ.).

The error component two-stage least squares (EC2SLS) estimation method is used to examine the effects of the Sino-U.S. bilateral exchange rate and the bilateral trade liberalization on the trade patterns between the two countries. Our study suggests that the pegged exchange rate system has contributed to China's increased trade surplus with the United States. China imported intermediate goods from the Asian countries, produced final goods using its cheap labor, and exported those goods to the United States. Our study also reveals that the U.S. bilateral trade balance could improve if China appreciates its currency (Yuan) against the U.S. dollar.

“Testing a Political Economic Theory of the Media: The Case of the Lumber Tariff Dispute.” Pat Kuzyk and Jill J. McCluskey (Wash. State Univ.).

The political economy of groups suggests that policies are more likely to be implemented if the benefits are concentrated and the costs are dispersed. The importance of the role of media in society changes the classic models. Media can awaken the sleeping masses to the dispersed costs of a policy and raise resentment toward the group who benefits. Thus, the content of media coverage can affect policy. We find empirical support with content analysis of the lumber tariff dispute for the theoretical finding that newspaper space devoted to an issue should rise with the number of people affected.

“Interactions Between Domestic and Trade Policy: A Strategic Trade Model of U.S. Wheat Programs.” Andrew Barkley (Kans. State Univ.).

The objective of this study is to determine conditions when domestic and international trade policies in wheat markets are aligned. A two-nation, two-firm model is developed for a homogeneous good in two markets. The model is a three-stage noncooperative game where firms make political contributions to gain support for trade policies, and compete by determining output levels. The model shows that in the global wheat market, producers could gain by increasing market share through competitive free trade, with reductions in political payments. The results are developed, and implications for the current Doha round of trade negotiations are discussed.

“Perceived Need and Actual Demand for Health Insurance Among Rural Chinese Residents.” H. Holly Wang and Robert Rosenman (Wash. State Univ.).

Although a risk-averse decision maker should buy full coverage of insurance if it is priced actuarially fair, there are situations when the decision makers are underinsured or uninsured. Such situations include a very tight income constraint relative to the subsistence consumption level, or when insurance purchase is lumpy. This paper develops a model to differentiate the subjective need and the actual demand of health insurance, and empirically investigates rural health insurance demand in China. We find that factors such as children, education, and wealth affect the need differently from the way they affect demand.

SESSION: Resource and Environmental Economics. Chair: Kurt Schwabe (Univ. of Calif., Riverside).

“An Econometric Model of Wildfire Suppression Productivity.” Mariam D. Lankoande and Jonathan K. Yoder (Wash. State Univ.).

We estimate a model of suppression productivity based on a national database of individual fires. Suppression productivity is measured in terms of the reduction in wildfire losses as defined in wildfire incidence reports. Estimation results evaluated at sample means show that at the margin, a dollar increase in suppression expenditures reduces resource damage by 12¢, while the marginal dollar of preparedness expenditures reduces suppression expenditures by \$3.76. These results suggest that there is an over-allocation of fire management funds to suppression activities relative to preparedness.

“Analyzing Heterogeneity in Discrete Choice: A Latent Segmentation Approach.” James Hilger and Michael Hanemann (Univ. of Calif., Berkeley).

Standard willingness to pay (WTP) estimates for environmental improvements are often characterized by biased estimates and information loss due to systematic preference heterogeneity. Analysis of a Southern California beach recreation data set with the Finite Mixture Logit (FML) model addresses heterogeneity by estimating preferences for several different user types. WTP estimates for improvements in water quality indicate the existence of four representative preference types, which can be weighted across individuals to calculate individual specific welfare measures. Welfare measures from the FML bound population mean estimates from traditional models, and have the advantage of highlighting the distribution of the sample's preference heterogeneity.

“Determinants of Demand for Water Used in Texas Communities.” David R. Bell and Ronald C. Griffin (Tex. A&M Univ.).

A panel of monthly water demand data for Texas communities is analyzed for sensitivity to price specification, representation of seasonality, functional form, and estimation assumptions. Parameter estimation is improved by allowing for cross-sectional heteroskedasticity and time-series autocorrelation.

“Maximum Contaminant Level Regulation and Its Violation: An Econometric Analysis of Water Utility Companies in Arizona.” Mini Kohli, Tauhidur Rahman, Sharon Megdal, and Jacqueline Moxley (Univ. of Ariz.).

The principal objectives of this paper are to determine the type of water utility companies more likely to violate maximum contaminant level (MCL) regulations, to identify the factors that influence the occurrences of MCL non-compliance by a water utility company, and to ascertain policy implications for future MCL regulations and their monitoring. Using a unique data set on MCL violations by water utility companies in Arizona, results indicate water utility companies that serve communities and are small in operation are more likely to violate MCL regulation. However, our results do not provide an unambiguous answer to what type of ownership is more efficient in terms of meeting MCL requirements. Both public and private utility companies which are small in operation are more likely to violate MCL regulations, irrespective of their ownership type.

“Economic Performance and Environmental Stewardship of Farm Households: The Case of Corn Farms.” Jorge Fernandez-Cornejo (USDA/ERS) and Jiayi Li (Penn State Univ.).

This paper presents the results of a 2001 farm-level probability-based survey of nearly 3,000 U.S. corn producers in the major U.S. corn-growing states who were asked about their adoption of environmentally beneficial practices as well as their structural and socioeconomic characteristics. In addition, results are presented of a Poisson regression analysis that identifies the influence of significant operator and farm structure characteristics (such as farm size, off-farm work, and livestock production) on the likelihood of adoption of environmentally preferable practices. Three categories of practices are included: nutrient, soils and land, and pest management.

SESSION: Production Economics and Farm/Ranch Management. Chair: Richard Shumway (Wash. State Univ.).

“Farm-Level Parametric and Nonparametric Efficiency Analysis of Measurement Error.” Sreedhar Upendram (Kans. State Univ.).

Measurement error causes biased estimates of regression and increases variability in the regression. It is important to know the magnitude of deviation to determine the severity of the measurement error. This paper evaluates the severity of measurement error in input quantities in terms of efficiency using parametric and non-parametric techniques. The number of violations for profit maximization were found to be far more than the number of violations for cost minimization. Also, small amounts of measurement error in quantity variables are translating to large error in the efficiency estimates.

“Landlord Influence on More Intensive Rotations or No-Till Adoption in Eastern Washington.” Cory G. Walters and Douglas L. Young (Wash. State Univ.).

Logit regression analysis of a small exploratory survey conducted in eastern Washington State indicated that size of farm was the only characteristic significant at the 10% level related to farmers' perceptions about landlords' feelings toward no-till or more intensive spring cropping. Percentage of the farm in wheat and having a cash lease had significance levels between 10% and 15%. Farm size and percentage of the farm in wheat were both negatively related to the dependent variable, while having a cash lease was positively related. Overall, relationships between farmer characteristics and farmers' perceptions of

landlord attitudes on no-till were not high for this sample.

“Is Precision Fertilization of Irrigated Sugarbeets Profitable?” Larry J. Held, Sully Taulealea (Univ. of Wyo.), Bart Stevens (USDA/ARS/NPASRL, Sidney, MT), and Edward B. Bradley (Univ. of Wyo.).

Variable rate nitrogen (N) studies were conducted for Wyoming irrigated sugarbeets (2001, 2002). Uniform N rates (UR) were based on field-average soil tests. Variable N rates (VR) were calculated at separate grids. Findings revealed that VR was more profitable than UR (\$23 ac⁻¹ and \$65 ac⁻¹) at two of the three sites.

“The Impact of Rising Energy Prices on Representative Farms in the Western United States.” J. Marc Raulston, Joe L. Outlaw, David P. Anderson, and James W. Richardson (Tex. A&M Univ.).

Recent increases in natural gas and fossil fuel based energy sources have had a large negative impact on the financial condition of agricultural producers across the nation. In addition to higher fuel costs for trucks, equipment, and irrigation motors, the cost of nitrogen fertilizer is closely linked to energy prices and has also increased significantly. Agriculture is especially vulnerable to increases in input costs due to the narrow profit margins realized for most commodities. This study quantifies the impacts of these increases on the economic viability of various types of agricultural producers in the western United States.

SESSION: Teaching and Extension Issues. Chair: Andrew Barkley (Kans. State Univ.).

“Issues Related to Offering a Web-Based Course on Futures and Options to Distant and Resident Students.” Larry D. Makus (Univ. of Idaho).

A web-based course on futures and options was designed using WebCT as the delivery platform. The course has been delivered for two 15-week semesters to both on-campus and off-campus students in Idaho. Students have generally performed well in the course based on a pre- and post-testing procedure. While student evaluations are generally positive, they are less positive from on-campus students. Although a significant time commitment was involved in course development (25–35 hours of faculty time for each weekly module), the time needed to deliver the course is slightly below that for a conventional course.

“Student Expectations and Preferences of Distance Course Delivery Methods.” Penelope L. Diebel and Laura R. Gow (Oreg. State Univ.).

Students in courses offered through a variety of distance and on-campus methods were surveyed to determine student expectations and post-evaluation of courses, student demographics, and student experiences and preferences with technology and delivery methods. The response group was primarily comprised of degree-seeking upper-classmen, taking a required course, equally split by gender and by delivery location. Student expectations of workload and content difficulty were incorrect for all delivery methods. We found that students expected difficulty with technology but little was actually encountered. E-mail with the instructor was one of the primary means of contact. All students preferred a live class delivery method.

“Economic Evaluation of Cropping Systems for Russian Wheat Aphid and Greenbug Control in the Great Plains.” Cheryl Halstead, Paul A. Burgener, David Christian, Sean Keenan, and Dillon M. Feuz (Univ. of Nebr.).

An area-wide IPM project has been initiated to evaluate the use of pest management tactics for small grains to control Russian Wheat Aphid (RWA) and greenbug in the Great Plains. RWA has caused over \$1.2 billion in damages since 1986, while annual greenbug losses exceeded \$400 million. Presently, RWA and greenbug control is nearly all chemical insecticides. Dryland producers will be interviewed to learn which IPM strategies are used within dryland systems. The results of this study will assist entomologists in economically sustainable RWA and greenbug control recommendations and extension program delivery over the Great Plains.

SESSION: Resource and Environmental Economics. Chair: Eric C. Schuck (Colo. State Univ.).

“Hedonic Pricing of Wyoming Agricultural Lands and Property Tax Assessments: The Importance of Environmental Amenities.” James Wasson, Donald M. McLeod, and Christopher T. Bastian (Univ. of Wyo.).

A hedonic price model, using geographic information systems data, is estimated as price per acre determined by productivity and environmental amenity characteristics. The estimation accounts for heteroskedastic and spatial autoregressive influences. This analysis indicates an

improved accounting for the high priced/low productivity lands with environmental amenities (in western Wyoming), compared to the State’s approach. The model also provides useful information for land sellers/purchasers, land use planning efforts, and tax assessment.

“Insecticide Resistance, Population Dynamics, and the Economics of Invasive Species Management: The Greenhouse Whitefly in California Strawberries.” Gregory McKee, Colin A. Carter, James A. Chalfant, Rachael E. Goodhue, and Frank G. Zalom (Univ. of Calif., Davis).

The greenhouse whitefly is a recent pest invader of California’s strawberry fields. We assess how insecticide use regulations interact with pest biology and agricultural production decisions to affect the optimal timing of insecticide applications to control this invasive species. A simulation model is used to determine the optimal tradeoff between current-year control and future reduction in pest resistance. We find the current regulations may lead growers to under-spray, leaving larger whitefly populations than a grower would otherwise choose. The restrictions also result in higher whitefly populations at the end of the season, which, all other things equal, lead to larger populations in subsequent seasons.

“Groundwater Quantity and Quality Management: Agricultural Production and Aquifer Salinization over Long Time-Scales.” Keith C. Knapp (Univ. of Calif., Riverside).

An economic model of agriculturally induced groundwater salinization is developed. Water table elevation and salt concentration are endogenous. Starting from an initially full aquifer, theoretical and empirical analysis demonstrates a period of initial exploitation of the resource via water extractions, an intermediate period of exploitation as a waste disposal sink, and a final period of drainage. Drainage is initially accomplished by source control and reuse; however, increasing groundwater salinity eventually culminates in disposal via evaporation ponds and a system steady-state. Under the conditions analyzed here, this process occurs over a very long time period, but is order-of-magnitude consistent with historical observation. Dynamic economic efficiency exhibits similar time-series characteristics as common property; however, quantitative magnitudes differ substantially. Groundwater management benefits are significantly increased when salinization is considered, and regulatory pricing instruments for water and salt flows to and from the aquifer are developed that support the efficient allocation under competitive conditions. The

system is not sustainable under either CP or PV-optimality in that agricultural net returns are generally declining over time.

SESSION: Agricultural Finance. Chair: F. Bailey Norwood (Okla. State Univ.).

“The Impact of State Tax Alternatives on Texas Agriculture.” Steven L. Klose and Jason Morris (Tex. A&M Univ.).

The Texas legislature has struggled recently with the political desires of lower property taxes and increased funding for public schools. Both goals necessitate the difficult creation or increase of another tax. Agricultural producers remain interested in the potential impacts of tax tradeoffs. This study outlines the impacts of proposed tax changes on 185 actual Texas farm and ranch participants in the FARM Assistance program of Texas Cooperative Extension. The study analyzes the value of existing exemptions enjoyed by agricultural producers as well as the impact of business taxes based on payroll expenses, net income, and net worth.

“Perspectives on the Investment Patterns of U.S. Farm Households.” Stephen P. Davies (Colo. State Univ.), Ken Erickson (USDA/ERS), Steven S. Vickner (Utah State Univ.), Dana Hoag (Colo. State Univ.), and Richard Nehring (USDA/ERS).

Farm households' investment patterns provide key insights into how farm and off-farm income affect the overall well-being of farm households. These patterns could vary by commodity, region, and size of farm, and may reveal interesting correlations to changing macroeconomic conditions and variations in relative rates of return of different assets. This paper examines farm household investment patterns using farm-level data from the USDA's ARMS survey. It adapts a linear land allocation model (Holt, *JARE*, December 1999) to the allocation of investment funds by farm households into various asset types and highlights the importance of different classes of assets to farm household well-being.

“Demand for Coverage Levels in Crop Insurance.” Saleem Shaik (Miss. State Univ.).

An extension of the insurance demand incorporating the four moments of yield risk information in the choice of coverage levels and premium rate equation is proposed. A two-step simultaneous equation econometric model is applied to U.S. barley, corn, cotton, sorghum, soybeans, and wheat producers who purchased crop insurance during 1998.

“Is Inverse Demand Perverse?” Carlo Russo, Navin Yavapolkul, and David Zetland (Univ. of Calif., Davis).

Our nonrepresentative sample of 245 undergraduates had significantly lower scores on questions presented in the standard heterogeneous form (i.e., Direct Demand equation and Inverse Demand graph) than on questions presented in nonstandard homogeneous forms. This result, which holds for advanced students, highlights one reason why 95% of students in economics principles classes do not enter the major—economics can be *gratuitously* mathematical. We argue that the Inverse Demand standard hurts rather than helps economics when it is used in early courses, but that professors have no incentive to change their methods. We recommend early classes use either no graphs or a homogeneous combination of graph and equation. The “standard” should be introduced later, when benefits outweigh costs.

“Financial Impacts of a Bovine Spongiform Encephalopathy Outbreak on North Dakota Producers and Banks.” Cheryl DeVuyst, Eric DeVuyst (N. Dak. State Univ.), and Ryan Anderson (Bremer Bank).

Catastrophic events, including but not limited to animal disease outbreaks such as BSE and foot-and-mouth disease (FMD), can cause major losses to North Dakota's economy. Given the history of BSE occurrences worldwide and in the U.S., there is a need to study the potential short- and long-term market impacts an outbreak would have on North Dakota banks given their small asset sizes, compositions of loan portfolios, and highly concentrated areas of beef cattle production. Simulation models were developed to determine how agricultural producers and financial institutions in North Dakota would be impacted financially by a BSE outbreak. Operating- and term-credit scoring models were utilized to determine the current credit risk exposure of the data set containing 482 North Dakota producers. Agricultural loan portfolios of representative North Dakota banks were simulated to account for asset size and location throughout the state. A range of beef cattle price factors were derived to account for BSE outbreaks occurring throughout the cattle cycle. BSE outbreak scenarios were applied to the model to determine the diminished credit quality of North Dakota producers and asset quality ratings of the representative banks' agricultural loan portfolios. The fluctuations in asset quality are reflected by the necessary increase in the allowance for the agricultural loan loss reserve account and the diminished value of available collateral for securing loans.

SESSION: Applied Econometrics. Chair: Jeffrey T. LaFrance (Univ. of Calif., Berkeley).

“AIM Application to Kansas Farm Data.” Molly Brant, Allen M. Featherstone (Kans. State Univ.), and Thomas L. Marsh (Wash. State Univ.).

A semi-nonparametric production system based on a multivariate version of the Muntz-Szatz series expansion, which is called the Asymptotically Ideal Model (AIM), is estimated. The model is applied to agriculture production for two outputs and eight inputs. Results from the first- and second-order AIM expansions show that both models violate curvature. A likelihood ratio test indicates the first-order expansion is the preferred expansion. Differences in the economic effects also exist between the first-order and second-order expansions.

“Fuzzy Logic and Preference Uncertainty in Non-market Valuation.” Lili Sun and G. Cornelis van Kooten (Univ. of Victoria).

In CVM, individuals have trouble trading off non-market goods against a monetary measure. Valuation in these circumstances can best be described as fuzzy—in terms of the amenity valued, perceptions of property rights, and numbers chosen to reflect values. We provide a fuzzy clustering approach for incorporating preference uncertainty using follow-up certainty confidence information, and develop a Fuzzy Random Utility Maximization framework where an individual's perceived utility belongs to each cluster to some degree. The model is applied to a survey of forest conservation, with results from our fuzzy models compared with those obtained using usual techniques of valuation.

“Determinants of Farmer Adoption of Organic Production Methods in the Fresh-Market Produce Sector in California: A Logistic Regression Analysis.” Jamie B. Anderson, Desmond A. Jolly, and Richard Green (Univ. of Calif., Davis).

This research uses binomial and multinomial logistic regression models to identify the factors that influence farmers' adoption of organic technology. Using a sample of 175 farmers growing fresh-market produce in three California counties, the first model examines farmers' choice between conventional-only and organic-only production. The second model compares conventional-only and “dual-method” (combined conventional and organic) production, while the third model employs all three choices in a multinomial model. These results, which indicate that gross sales,

direct marketing, number of crops and acres, farmer age, and computer usage are significant determinants, have implications on policies that regulate the organic foods sector.

“Is the U.S. Losing Its Competitiveness in the Global Chicken Markets? A Spatial Equilibrium Analysis.” Harjanto Djunaedi (Middle Tenn. State Univ.).

Although the last 40 years of data have shown positive U.S. chicken export growth, this growth trend is currently slowing. Other countries, such as Brazil—the United States' main competitor in the global chicken trade—have been able to expand their market shares in recent years. Simulation results suggest the United States will play an important role in future global chicken trade providing that U.S. firms are willing to accommodate the non-tariff trade barriers imposed by major importing countries.

SESSION: International Development. Chair: Thomas I. Wahl (Wash. State Univ.).

“Efficiency of Thai Public Hospitals After the Introduction of a National Health Insurance Program: What Lessons Can We Learn?” R. Amy Puenpatom and Robert Rosenman (Wash. State Univ.).

Thailand introduced the National Health Insurance Program in 2001. This paper provides the first analysis of how universal coverage in a developing country affects efficiency in the Thai health care system. A two-stage analysis is utilized: Data Envelopment Analysis (DEA) and a censored Tobit model. Ninety-two large provincial and regional hospitals were chosen because they have been significantly affected by financial pressure of the reform. Results from the DEA analysis indicate that hospital efficiency appears to have decreased slightly. The regression shows that hospitals with higher numbers of patients in major wards are associated with lower efficiency.

“Evaluation of Factors Influencing U.S. Foreign Direct Investment.” Dileep Birur, Stephen Devadoss, and Murat Isik (Univ. of Idaho).

This study analyzes the host country characteristics which determine U.S. foreign direct investment (FDI), affiliate income, and employment. Our results reveal that GDP growth, market size, exchange rate stability, aircraft departures, trade openness, unemployment rate, and population density of the host country attract U.S. FDI. Wages and salaries, taxes, and inflation rate influence U.S. FDI negatively. Affiliate sales in

the local market and other countries are important sources of affiliate net income rather than sales back to the United States. U.S. foreign direct investment in a host country significantly reduces the unemployment rate.

“The Impact of Brazil and Argentina’s Currency Devaluation on U.S. Soybean Exports.” Jose Andino, Kranti Mulik, and Won W. Koo (N. Dak. State Univ.).

This study analyzed the effects of Brazil and Argentina’s currency devaluation on the U.S. soybean import demand from major importing countries. Results indicate that nominal exchange rates between the United States and importers affect the U.S. soybean export market. Additionally, evidence was found that currency depreciations have favored soybean exports from Argentina and Brazil at the cost of reduced imports from the United States. Finally, increased world soybean demand has promoted export sales from major producers, affecting export prices.

“The Determinants of Labor Allocation and Non-Timber Forest Products Extraction: The Case of Xate in Frontera Corozal, Mexico.” Alejandro Lopez-Feldman (Univ. of Calif., Davis).

During the last 15 years, the commercial extraction of non-timber forest products from tropical forests has been considered as a strategy to promote forest conservation and at the same time alleviate poverty. This paper examines the determinants behind households’ decisions regarding non-timber forest products extraction when natural resources are common property. Data from Mexico are used to estimate labor allocated to xate palm (*Chamaedorea* spp.) extraction in the Lacandona Rainforest. Results show that individuals with low levels of human capital are more likely to extract wild xate than other individuals; the same is true for individuals from poor households.

SESSION: Consumer and Household Economics. Chair: Kynda R. Curtis (Univ. of Nev., Reno).

“Regulation, Stakeholder Control, and Performance of Microfinance Institutions.” Valentina Hartarska (Auburn Univ.) and Denis Nadolnyak (Univ. of Ga., Griffin).

This paper evaluates the impact of governance structure on outreach and sustainability of microfinance institutions (MFIs) using newly released cross-country data and a framework of optimal allocation of control rights among equity holders,

debt holders, and a regulator. Because regulatory status is time-invariant, and because MFI characteristics are correlated with the unobserved managerial quality, the empirical analysis employs a modification of the random effects model proposed by Hausman and Taylor. Results indicate that equity and debt holders efficiently monitor MFI sustainability, but that regulatory involvement has no direct effect on MFI performance.

“Prices versus Information: Policy Impacts on Calcium Intake.” Timothy Beatty (Univ. of Brit. Columbia) and Hayley Chouinard (Wash. State Univ.).

Calcium intake has been the focus of considerable policy debate, as the health care costs associated with calcium deficiency are considerable. We investigate the effectiveness of different policies in modifying calcium intake: informational programs, which promote the benefits of calcium, or policies that reduce calcium’s implicit price. We apply a conditional logit model to scanner data for calcium-enriched and non-enriched orange juice. Findings indicate price and information are both effective in increasing the likelihood of purchasing calcium. Consumers already purchasing enriched juice are less price sensitive and are more responsive to informational policies than those who purchase non-enriched juice.

SESSION: Food Agricultural Policy. Chair: Timothy Beatty (Univ. of Brit. Columbia).

“Causes of Multifunctionality: Pollution or Politics?” Kathy Baylis, Stephen Peplow (Univ. of Brit. Columbia), Gordon Rausser, and Leo Simon (Univ. of Calif., Berkeley).

The European Union has argued that agriculture is “multifunctional” and subsidies are needed to provide the optimal amount of externalities (both positive and negative). The United States has raised the concern that multifunctionality is primarily an argument to transfer income to producers. In this paper, we ask whether externalities or political economy variables determine agri-environmental payments. Results indicate that variance in expenditure cannot be explained by the difference in negative externalities, nor are the payments substituting for traditional agricultural subsidies. However, demand for environmental services and political variables seem to be driving a country’s decision to spend money on agri-environmental programs.

“A General Equilibrium Analysis of Production Subsidy in a Harris-Todaro Developing Economy: An Application to India.” Abdul

Razack (Wash. State Univ.), Stephen Devadoss (Univ. of Idaho), and David Holland (Wash. State Univ.).

Since the 1950s, India has advocated "import-substituting industrialization" policies to promote its manufacturing sector. Because of the resulting higher wages in the manufacturing sector, rural/agricultural sector laborers have migrated to the urban sector—a typical characteristic of the Harris-Todaro (H-T) developing economy. To address this crisis, the Indian government recently initiated policies to boost agricultural production to curb labor migration and improve the welfare of the rural population. In this study, we develop a computable general equilibrium (CGE) model for India by incorporating H-T economic characteristics of unemployment, labor migration, farm-dependent population, and labor-intensive agriculture. The model is used to analyze the effects of agricultural production subsidy policies on employment, factor price, output price, output levels, and welfare in agricultural and manufacturing sectors. Findings show that agricultural production subsidy increases agricultural production, reduces unemployment, raises the wage rate in the agriculture sector, augments the consumption among rural and urban households, and increases the rental rate for capital in the agricultural sector.

"Political Allocation of Agriculture Disaster Payments by Assistance Program." Sridar Komar, Thomas L. Marsh (Wash. State Univ.), and Thomas A. Garrett (Fed. Reserve Bank, St. Louis).

We attempt to identify the factors determining the allocation of agriculture disaster payments in the United States by assistance program (i.e., by category and commodity). Non-political factors such as temperature, precipitation, and farm acreage are significant. A significant and positive relationship is also found between membership on the House Agriculture Committee and disaster allocations.

"Factors Influencing Producers' Perceptions About the Importance of Government Support Programs: Application of a Semi-Parametric Ordered Response Model." Roderick M. Rejesus (Tex. Tech Univ.), Bruce J. Sherrick, Gary D. Schnitkey (Univ. of Ill.), and Cesar L. Escalante (Univ. of Ga.).

This study examines factors affecting producers' perceptions toward the relative importance of government support programs in agriculture. Specific attention is placed on determining the effect of crop insurance usage on farmers' views about the importance of government program pay-

ments. Results from a semi-parametric ordered response model show that producers who use yield- or revenue-based crop insurance products also tend to view government programs with higher importance, suggesting that crop insurance and direct government support programs tend to be complements rather than substitutes.

"Estimating the Impacts of Differing Price-Risk Management Strategies on the Net Income of Salinas Valley Lettuce Producers: A Stochastic Simulation Approach." Roland J. Fumasi (Cal Poly, San Luis Obispo).

While government safety-net programs are used to mitigate the price risk for commodity producers, limited programs exist for specialty crop producers. Specialty crop producers utilize forward contracts to reduce downside price risk. In order to estimate the method of price-risk management, if any, which is preferable to selling at market determined prices, a stochastic simulation model was constructed. The completed simulation model was used to estimate probability distributions for Salinas Valley net income under different pricing scenarios. Probabilities of reaching various net income thresholds were compared. Results indicate that Salinas Valley lettuce producers should maximize profitability by using forward contracts.

SESSION: Community and Regional Economics. Chair: Marco Costanigro (Wash. State Univ.).

"Fiscal Impacts of Rural Residential Development and Rural-to-Urban Spillovers in Colorado." Roger Coupal, Donald M. McLeod (Univ. of Wyo.), and Andrew Seidl (Colo. State Univ.).

A set of time-series, cross-sectional econometric models are developed that predict revenue and expenditures for local governmental units in each county of Colorado. The models indicate that rural population growth negatively affects the fiscal position of all local government units. Preliminary estimates suggest that the conversion of rural private land to rural residences has a negative effect on all levels of government, spilling over onto associated municipalities as well.

"Potential Economic Impacts of Chronic Wasting Disease on Ontario's Economy." Marca Hagenstad (Stratus Consulting, Inc.), Richard C. Bishop (Univ. of Wisc.), Jeffrey K. Lazo (Nat. Ctr. for Atmospheric Res.), and David Chapman (Stratus Consulting, Inc.).

Chronic wasting disease (CWD) is a degenerative neurological illness affecting elk and deer.

CWD can cause large economic impacts to regional economies. This analysis estimated primary economic impacts of the disease on free-roaming deer and captive deer and elk, and secondary impacts on other sectors of the Ontario economy. Hunters' social welfare losses were determined by estimating consumer surplus (WTP) losses. The economic impact analysis was undertaken using an input-output model developed specifically for natural resource decision making in Ontario. Results revealed that discovery of CWD in Ontario could easily lead to tens of millions of dollars in provincial economic losses.

“Consumer Willingness to Pay for ‘Nevada Grown’ Native Plants and Seeds.” Margaret W. Cowee, Kynda R. Curtis, and Klaus Moeltner (Univ. of Nev., Reno).

Recent increases in consumer disposable income have led to the introduction of credence attributes, which can only be conveyed to consumers through certification and labeling practices. One such credence attribute is a product's destination of origin. Recent studies have shown that consumers place value on information derived from labels and may be willing to pay a premium for this information. Currently, out-of-state companies are supplying the majority of native plant and seed products in Nevada. This study seeks to find consumer willingness to pay (WTP) for “Nevada Grown” native plant and seed products bearing labels that certify them as having been produced in the state of Nevada. This information was derived through a mail survey of residents in Reno, Nevada, using a multiple bounded discrete choice (MBDC) contingent valuation (CV) bidding structure.

SESSION: Agribusiness. Chair: Cheryl S. DeVuyst (N. Dak. State Univ.).

“Value-Added Strategies of Palouse Grains: The Case of Palouse Grain Growers, Inc., Pearled Barley Production.” Armenak Markosyan (Wash. State Univ.), Fabio Chaddad (IBMEC Bus. School, Sao Paulo, Brazil), Thomas I. Wahl, and Kenneth D. Duft (Wash. State Univ.).

The results of a market feasibility study for a small grain cooperative in Washington State are presented. The cooperative, concerned with decreasing profit margins, purchased pearling facilities to process its barley into pearled barley, which is used mostly in soups, as a rice substitute, and turned into flour. The cooperative lacks the ability to better identify, access, and capitalize on an expanding market for pearled barley.

The pearled barley industry is analyzed using Porter's Five Forces model, and factors that determine the success of value-added cooperative ventures are discussed including developing channel relationships to reach intended consumer segment groups.

“The Economic Impact of California Specialty Crops: A Regional Perspective.” Lynn Hamilton (Cal Poly, San Luis Obispo).

A study on Fresno, Tulare, Monterey, Kern, and San Diego counties showed that specialty crops, which are concentrated in those areas, contribute heavily to the regional economic activity. Most of the companies are vertically integrated, and in all but San Diego County, contribute between 9% and 16% of the jobs in their respective counties. Specialty crops in San Diego contribute relatively little (1.2%) due to the diverse nature of the economy. Survey data indicate that full-time workers in specialty crop industries make higher wages than the regional average agricultural wages, while part-time workers earn slightly less than the average.

“Nerlovian Hedonic Models for Three Different Container Sizes of Fluid Milk.” Matthew C. Stockton and Oral Capps, Jr. (Tex. A&M Univ.).

The Nerlovian quantity-dependent hedonic model was applied to the estimation of hedonic prices of fluid milk by quart, half-gallon, and gallon container sizes. The characteristics for all three container size models were fat content, container type, and brand designation. It is shown that the interpretation of the quantity-dependent model is quite different from the conventional price-dependent hedonic model. While each model ascertains consumer willingness to pay for the characteristics of a given good, the *ceteris paribus* assumptions are different, resulting in conditions where the valuation of those characteristics differed in magnitude and/or sign.

“Canadian Supply Management: A Study of Government Protection Within the Dairy Industry.” Lia Nogueira (Wash. State Univ.), Richard R. Barichello, Kathy Baylis (Univ. of Brit. Columbia), and Hayley Chouinard (Wash. State Univ.).

Canadian supply management protects farmers by increasing the price of industrial milk paid to producers. Due to pressure from trade agreements, the supply management system has undergone a number of significant changes in the last decade, nominally limiting the trade distortions it causes. However, it is uncertain what effect these

changes have had on Canadian dairy production, competitiveness, and trade. We outline the changes undertaken by the Canadian supply management system for dairy production from its establishment to date, and ask what has been the effect of these changes on the effective rate of protection provided to Canadian dairy farmers. We find that the policy changes have had little effect on dairy farmers' perceived level of protection.

SESSION: Production Economics and Marketing. Chair: Richard Howitt (Univ. of Calif., Davis).

"Adoption and Use of Internet Services by U.S. Organic Farmers." Luanne Lohr, Daniel Ngugi, and XiangRong Yin (Univ. of Ga.).

Approximately 78% of U.S. organic farmers have internet access. Rates of internet use (intensity) are lower than rates of internet access (adoption), suggesting that uses are jointly chosen by contribution to farm management goals. We model a portfolio of internet uses that maximizes utility with equations for marketing and production applications estimated as Poisson (robust) SUR. The internet is used primarily for production information-gathering for organic farmers—buying inputs, getting weather information, and finding answers to production problems. Marketing information, such as organic commodity prices, remains difficult to find on the internet, which prevents optimal technology use.

"Wheat Nitrogen Response Based on Last Year's Yield and Rainfall During the Growing Season." B. Wade Brorsen and Emílio Tostão (Okla. State Univ.).

Soil sampling for nitrogen has proven unprofitable, and thus there is an interest in using alternative means to determine the optimal level of nitrogen in a given year. This paper looks at the possibility of using last year's yield and rainfall prior to spring topdressing of winter wheat to determine optimal levels of nitrogen. Less nitrogen is needed following years with high yields, and less nitrogen is needed when rainfall is high. Use of this information could result in small increases in profit.

"The Economics of Carcass Weight: A Weighty Matter for the Cattle Industry." Dillon Feuz (Univ. of Nebr.).

Carcass weight has been increasing five pounds per year for 25 years. This paper examines producer incentives to add weight to fed cattle, and the industry impact. The rate of gain, fat deposition, and marbling change with weight. There is an individual producer incentive to add more weight than current industry average if selling live or dressed weight. If selling on a grid, the incentive is to sort cattle to ultimately sell more total weight. Increased weight on fed cattle increased beef supply. Since beef demand is inelastic, producer revenue decreases when all cattle are marketed at heavier weights.

"Hedging with Off-Farm Income: Implications for Production and Investment Decisions Across Farm Sizes." Steven C. Blank (Univ. of Calif., Davis).

This study uses portfolio theory to evaluate the effects of off-farm income on the labor allocation and production decisions of American farmers. It finds that hedging with off-farm income makes markets more risky, although the effects decrease for larger farm sizes. Farmers respond to increases in off-farm income opportunities by producing more-risky crops, but they produce using a smaller percentage of available household labor. Empirically, off-farm income is significant in raising the wealth of only mid-sized farms. It appears that hedging with off-farm income effectively reduces farm households' risk exposure level, but it creates a need for new agricultural policies.

"Golfers in Colorado: The Role of Golf in Recreational and Tourism Lifestyles and Expenditures." Joshua Wilson and Dawn Thilmany (Colo. State Univ.).

Tourism, and specifically golf, continues to be a major driver to the Colorado economy, especially in relatively high natural amenity areas. However, it is not clear that tourism promotion and broader golf marketing strategies are effectively aimed at the appropriate golf consumers. This research develops a set of golfer profiles for Colorado to assist in the development of promotional strategies targeted at in-state and traveling golfers. Traveling golfers appear to have much different interests and spending patterns than local golfers, and among travelers there are some differences in how they choose their golf course, and how much is spent.

Organized Symposia

SESSION: Advising Undergraduates: Help from Stated Preference Surveys. Organizer and Chair: F. Bailey Norwood (Okla. State Univ.).

Presenters: Darrell Mark (Univ. of Nebr.); Bailey Norwood and Shida Henneberry (Okla. State Univ.). Discussants: Jill J. McCluskey (Wash. State Univ.) and Dan Tilley (Okla. State Univ.).

A college education is an investment. Students obtain attributes during college that make them desirable to employers. This symposium concerned how to measure the value of these attributes in terms of higher starting salaries for recent college graduates. The symposium centered around two stated preference surveys administered to estimate these values.

In the first survey, employers of agricultural undergraduates are presented with hypothetical job candidates with different attributes and salaries, and are asked which candidate, if any, they would hire. The employer choices are then used to estimate the additional salary they will pay for undergraduates with certain attributes. Students are administered similar surveys where they indicate which hypothetical candidate they think will be hired, which can be used to estimate students' perceived salary increase associated with each attribute. Employers' stated values are then compared to students' perceived values to identify any misperceptions regarding the monetary return of select attributes. The second survey is similar, except that it concerns a specific job: assistant feedlot manager. Feedlot managers are administered surveys containing hypothetical job candidates, with different qualifications and salaries, and are asked to rank each candidate. The rankings can then be used in a random utility framework to determine the impact of each qualification on salary. A panel of experts was then invited to comment on the survey, with special attention focused on how these survey methods can be improved.

SESSION: Economics of Invasive Weeds: Modeling and Data Issues. Organizer and Chair: Elwin G. Smith (Agriculture & Agri-Food Canada).

Presenters: Mark Eiswerth (Univ. of Wisc., Whitewater), G. Cornelis van Kooten (Univ. of Victoria), Elwin G. Smith (Agriculture & Agri-Food Canada), Douglas L. Young

(Wash. State Univ.), and Linda Fernandez (Univ. of Calif., Riverside). Discussion led by Chair.

Mark Eiswerth and Cornelis van Kooten present a dynamic model that allows for learning to evaluate control of yellow star thistle (YST) (*Centaurea solstitialis* L.). Because dynamic optimization models break down if controls depend on the complexity of past controls, or non-uniform or scale-dependent spatial attributes, a system that allows learning may be preferred. Three models are compared for control of YST: (a) a stochastic dynamic programming model, (b) a reinforced-based, experience-weighted attraction (EWA) learning model, and (c) an EWA model that also includes stochastic forage growth and penalties for repeated use of harmful control techniques. Results indicated the EWA learning model may be appropriate for invasive weed control.

Elwin Smith and Douglas Young present an investment model approach to evaluate the control of leafy spurge (*Euphorbia esula* L.) by bio-control agents on rangeland in the northern Great Plains. For many invasive weeds, there remains considerable uncertainty of the biological relationships required for modeling the dynamic system. The model is used to show the sensitivity of results to initial weed density, the productivity of the weed-free range, and the recovery of the forage after control. It is several years before there are benefits from the introduction of a bio-control agent. The net benefits from control can also be low, especially on low productive land, land with a high initial infestation, and if forage recovery is low after the invasive weed has been controlled.

Linda Fernandez models NAFTA countries deciding on abatement of marine invasive weeds with asymmetric effects. Ports and shippers are involved in the abatement and require incentives be derived through a game model. Cooperation with the ability to share net benefits and lower damages is optimal. Preventative and early response abatement in combination reduce the size and impact of the invasion. Conditions are examined under which various invasive species management programs are optimal given the goal of minimizing social costs of shipping, including potential environmental impacts. Fernandez shows that an incentive mechanism consisting of two subsidies (a per unit ballast water and a lump sum), and depending on the shipper's anticipated liability share of the damage, a socially optimal mix of ballast management and bio-fouling management can be achieved.

SESSION: *The Future of Agricultural Economics Graduate Programs.* Organizer and Chair: Joe L. Parcell (Univ. of Mo.).

Presenters/Discussants: Ron Mittelhammer (Wash. State Univ.), Gary Brester (Mont. State Univ.), and Ted Schroeder (Kans. State Univ.).

Many changes are occurring within the agricultural economics profession: development of specialty tracks within professional organizations, department name changes, mergers between complementary departments, the desire of some departments to seek personnel skill-sets outside of agricultural economics, a shift from hard dollar to soft dollar funding, etc. At the crossroads of these changes lie agricultural economics graduate programs. In addition to graduate program changes due to the factors mentioned above, a shrinking demand for tenure and professional track faculty at domestic institutions, increased global interest in the agricultural economics doctorate degree, and increased demand for terminal professional degrees offer unique opportunities and challenges for the profession.

Ron Mittelhammer discussed the role of graduate education in the merger of agricultural economics and economics departments into the School of Applied Economic Studies at Washington State University. **Gary Brester** highlighted the pros and cons of M.S.-only programs. **Ted Schroeder** discussed department names and how a department name is used as a marketing tool to reflect the focus of the faculty.

The session then led into a discussion on competition for graduate students, with some institutions offering assistantships greater than \$30,000 annually for Ph.D. students, followed by a discussion on the challenges of sourcing assistantship funding due to increased emphasis on grant dollars, and the required skill sets that new Ph.D. students should exhibit. Thoughts from the audience participants included the lack of availability of job candidates with practical agriculture experience, the ten-year outlook being favorable for many job openings within the profession, the challenges institutions are placing on personnel to obtain grants that in turn manifest into hiring research associates in place of graduate students, and lack of practical training provided to graduate students in extension activities and grant writing.

SESSION: *County-Level Analysis of Farm Operator Household Financial Performance: Findings from the Census of Agriculture.*

Organizers: Kenneth W. Erickson (USDA/ERS) and Dawn Thilmany (Colo. State Univ.).

Co-Authors: Paper #1—Kenneth Erickson (USDA/ERS), Steven Blank (Univ. of Calif., Davis), and Penelope Korb (USDA/ERS); Paper #2—Stephen P. Davies, Dawn D. Thilmany, and Philip Watson (Colo. State Univ.); Paper #3—Kenneth Krupa, Marlow Vesterby, and Kenneth Erickson (USDA/ERS). Discussant: Steven Blank (Univ. of Calif., Davis).

Since agriculture is not homogeneous, it is important to identify regional areas where agriculture is most likely to prosper under the pressure of current global economic conditions, or to consider business approaches that may improve profitability. Examination of such alternatives may require a move from state and federal analyses down to the county or producer level. Through three presentations using the 1992, 1997, and 2002 *Census of Agriculture*, and an informative discussant, this symposium illustrated that, using county-level net returns data, there are significant differences in the well-being of farm operator households and in the ensuing structural changes in production agriculture across and within geographic regions.

The first paper, "Profit Patterns, Convergence of Net Cash Returns, and the Well-Being of Farm Operator Households," tested the hypothesis that (average) net cash returns across U.S. production regions are converging over space and time. Although there was evidence of convergence across regions, county-level data indicate net returns vary considerably by farm size, farm type, region, and states.

The second presentation, "County-Level Analysis of Net Farm Income: Crop Mix, Marketing Channels, and Locational Factors," explored regional aspects of net farm incomes through analysis of county-wide sales and net farm income (indexed by acres in production and asset values). By examining farm financial performance as a function of (a) the county's cropping mix, (b) sales of livestock and specialty crops, (c) direct marketing, and (d) locational factors (urban proximity code and climate indices), the paper provided some unique insights into what strategies and production practices of agriculture are performing well, and where. Findings revealed better financial performance was associated with producing specialty crops (horticulture, fruits, and vegetables), selling a large share of output through cooperatives, and farming in temperate climates. Findings also revealed a spatial persistence even after controlling for place-specific factors.

The final paper, "Hidden Truths About Farm Dynamics and Economic Well-Being," examined the sustainability of Western agriculture in urbanizing, "fast-growth" counties (FGCs). This presentation showed that (as Dr. Blank had posited) urban growth pressure may lead agriculture in nearby areas to transition to relatively more profitable enterprises, or agriculture may find new markets to tap with a larger, local consumer base.

SESSION: *Spatial Analysis in Federal Crop Insurance: Challenges and Opportunities.*
Organizer: Joseph Atwood (Mont. State Univ.).
Chairs/Discussants: David Buschena and Myles Watts (Mont. State Univ.).

Co-Authors/Presenters: Paper #1—Joseph Atwood (Mont. State Univ.) and Jude Kastens (Univ. of Kans.), "Spatial Analysis in Crop Insurance"; Paper #2—Jeffrey T. LaFrance (Univ. of Calif., Berkeley), "Efficient Learning over Space and Time"; Paper #3—Saleem Shaik (Miss. State Univ.) and Joseph Atwood (Mont. State Univ.), "Spatial and Temporal Analysis in Examining Asymmetric Issues in Crop Insurance."

The federal crop insurance program has emerged as a leading risk management tool and as the farm commodity program that protects producers against adverse natural events. Federal crop insurance is a \$40 billion program covering more than 218 million acres and over

100 commodities under 22 existing crop insurance plans. Existing crop insurance plans make limited use of spatial analyses in the estimation of yield, price, or acreage distributions; premium rate estimation; or addressing asymmetric information issues. This principal paper session: (a) examined the challenges and opportunities in the use of spatial analysis in federal crop insurance programs, and (b) addressed several spatial issues related to distribution estimation, premium rate estimation, and asymmetric information.

Joseph Atwood and Jude Kastens (paper #1) presented a discussion of the potential role and application of spatial analysis and remote sensing in crop insurance. They provided overviews from two studies examining distance-weighted catastrophic loading and remote-sensing yield tracking. **Jeffrey LaFrance** (paper #2) presented a paper on the use of efficient learning procedures in estimating producer-specific yield distributions while incorporating spatially related information from other producers and regions. Efficient estimates of the individual-specific crop yield distributions enable the potential for accurate, individual-specific, separating equilibrium insurance premiums. **Saleem Shaik and Joseph Atwood** (paper #3) discussed the use of spatial analysis in addressing asymmetric information issues in crop insurance. Their paper demonstrated the potential usefulness of spatial, temporal, and residual error decomposition procedures when attempting to identify potential moral hazard and adverse selection.