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## ABSTRACTS

### PAPERS PRESENTED

**Annual Meeting, SAEA, Nashville, Tennessee, February, 1994**

#### COMMUNITY AND RURAL

**DEVELOPMENT** (Moderator: *David W. Hughes, Louisiana State University*).

**"Agricultural Diversity and Cash Receipt Variability for Individual States"** *Loren Tauer and Tebogo B. Seleka, Cornell University*.

Changes in individual states' agricultural production diversity and variance of cash receipts were measured over the 30-year period 1960-1989. Diversity was measured using a general index, of which the inverse Herfindahl and the Entropy are special cases. Cash receipt variability was measured using a heteroscedasticity correction process. Although 38 states experienced an increase in cash receipt variability, only 14 states also experience a decrease in diversification.

**"A Frontier Economic Growth Model for U.S. States: 1950-90"** *Stephan J. Goetz and Richard C. Ready, University of Kentucky*.

A Barro-type economic growth model is estimated for U.S. states using decade-level data for the period 1950-90. Frontier estimation techniques are used to test for inefficiencies in the process whereby growth occurs in individual states. Our results suggest inefficiencies in achieving economic growth do exist, but that states are on average becoming more efficient in affecting economic growth over time.

**"The Economic Impact of a Proposed National Wildlife Refuge on a Rural County in West Virginia"** *Steven N. Zaricki, University of Kentucky and Dennis K. Smith, West Virginia University*.

A study was conducted to determine the potential economic impacts of the proposed Canaan Valley National Wildlife Refuge on Tucker County, West Virginia. Economic impacts on employment, income, and output from expenditures related to refuge construction, operation and maintenance, and

visitation activities were estimated using the IMPLAN model. Depending upon alternative visitation scenario assumptions, annual impacts ranged from 4.3 to 8.3 percent increases in resident employment 3.3 to 6.3 percent increases in incomes, and 5.0 to 9.6 percent increases in county population.

**"Retirement Counties as a Strategy for Rural Development: Thinking About the Future"** *Judith I. Stallmann, Virginia Tech and Paul B. Siegel, University of Tennessee*.

The impacts of migrating retirees differ by the type of retiree and the type of community. The paper discusses long term demographic, income, and living preference trends and their likely impact on different types of retirement communities. Future retirees may not have the asset and pension income of current retirees, and may be less likely to migrate to rural areas. Although the percentage of retirees who migrate may decline, absolute numbers may increase because of the size of the baby boom.

#### AGRICULTURAL BUSINESS-I

(Moderator: *Steven C. Turner, University of Georgia*).

**"Comparison of Selected Management Characteristics and Demographics of Independent and Contract Swine Producers Using a Qualitative Limited Dependent Variable Estimation"** *Vern L. Pierce, University of Maine and Nicholas Kalaitzandonakes, University of Missouri*.

This paper offers empirical evidence from producer surveys regarding selected production and management characteristics of producers who contract (growers) and those who are independent producers. The paper evaluates selected management characteristics for proportional differences between growers and independent producers. These variables are then used in a qualitative limited dependent variable dependent variable model to evaluate their

significance in improving the probability of a producer being a contract grower. Overall, the results show the types of management and demographic characteristics that differentiate growers and independent producers.

**"Optimal Location of Grain Cleaning Activity: A Mixed Integer Programming Model of the U.S. Sorghum Sector"** *H. Ziari, S. Fuller, W. Grant, and V. Sutaria, Texas A & M University.*

Recent legislative initiatives call for studies to evaluate costs and benefits of cleaning U.S. grains. This paper reports on a study which developed a mixed-integer model of the U.S. sorghum sector to determine the optimal geographic location for new cleaning investment at the country, terminal, and port elevator stages of the marketing system and to measure additional marketing costs associate with implementing the proposed standards. Results show the optimal cleaning location to be at country, and terminal elevators in excess supply regions. Implementing the proposed standard would increase system costs about two percent.

**"The Management Factor in Developing Country Agriculture: Argentina"** *Marcos Gallacher, University of Kentucky.*

This paper discusses the economics of non-owner management of medium and large-scale farms in Argentina. The first section of the paper shows that management by non-owners increases at a diminishing rate with farm size. For equal farm sizes as measured by output, large variations in the importance of nonowner management is detected. It is hypothesized that these differences are caused by the relative importance of land versus capital and labor inputs used in production. The second section analyzes production efficiency of farms with non-owner versus owner management. Non-owner managed farms appear to be more efficient, however this difference is not statistically significant.

**"Quality Characteristics and U.S. Wheat Performance"** *Alan Webb, Daniel Pick, Erin Dusch, and Karl Gudmunds, ERS-USDA.*

The quality of U.S. grain exports has been a very contentious issue over the past decade. Nowhere is the issue more hotly debated than for wheat. This paper quantifies purchasers perceptions on the importance and supply of wheat characteristics. It provides a quantitative measure of the performance of American and Canadian wheat in meeting each of several desired characteristics as viewed by the importers. Results generally point to the fact that American wheat has not performed as well as Canadian wheat. Only in the price characteristic category did U.S. wheat perform as well as Canadian wheat.

**INTERNATIONAL TRADE** (Moderator: *Curtis M. Jolly, Auburn University*).

**"The U.S. - Canadian Softwood Lumber Trade Dispute: The U.S. Countervailing Duty Process and the Welfare Impacts of the Memorandum of Understanding"** *Giridhar Myneni and Glenn C.W. Ames, University of Georgia.*

In the 1980's, U.S. softwood lumber industry petitioned the International Trade Commission for protection from alleged import subsidies inherent in Canadian stumpage fees. In 1986, the U.S. and Canada agreed that Canada would voluntarily impose a 15% export tax on softwood lumber destined to the U.S. After five years, the Canadian government unilaterally terminated the Memorandum of Understanding on October 4, 1991. Welfare impacts of the Canadian 15% export tax were analyzed and evaluated. Results indicated that the export tax increased softwood lumber prices, reduced imports, and consumer welfare while increasing softwood lumber producers' welfare. Efficiency and deadweight losses were minimal.

**"Canadian Import Demand for Fresh Fruits: A Differential Demand System Approach"** *Rebecca H. Chung, Mark G. Brown, and Jong-Ying Lee, Florida Department of Citrus.*

The synthetic Rotterdam/CBS model developed by Barten was used to estimate Canadian fresh fruit import demand for the period 1973-1987. Results suggest that most imported fruits are substitutes to each other; the import demand for fresh grapefruit was neutral with respect to income changes; and import demands for fresh grapefruit and oranges were insensitive to their own-price changes.

**"Substitution Possibilities Among Coffee Varieties: A Solution to Issues in New Coffee Agreements"** *Adama Coulibaly and Nicholas Kalaitzandonakes, University of Missouri.*

This paper used an alternative approach to consumer demand theory to examine the degree of substitutability among the Robustas (ROB), the Columbian Milds (CMA), the Other Milds (OMA), and the Brazils and Other Arabicas (BOA) for the period 1965/66-1987/88 covering the member market of International Coffee Agreements (ICA) and the nonmember market. The results indicate that OMA, CMA, BOA and ROB are substitutes for one another in terms of consumption. This study also provides the price responsiveness of demand for specific varieties of coffee and support for new quota shares within a new ICA.

**"Overseas Expansion of U.S. Food Companies"** *Yulin Ning and Michael Reed, University of Kentucky.*

This paper analyzes factors affecting the globalization and regionalization of the world food system and their ramifications on strategic management of US multinational food firms. Competition in the food industry will focus on geographic coverage, foreign market entry mode choices, and brand strength to face challenges. Entry mode choice is found to be strongly host-country related. However, exports, competitive alliances, mergers, acquisitions, and consolidation

will continue to reshape the food industry in order to achieve scale economies and increase efficiencies.

**"Domestic and Export Supply of Fresh Oranges in the Gaza Strip"** *Mahmoud El-Jafari, Islamic University of Gaza and David S. Bullock, University of Illinois.*

This study determines empirically the farm and export markets of fresh oranges in Gaza Strip. It has been signified that, the Gaza Strip growers are relatively more responsive to changes in lagged farm prices of oranges and vegetables as well as lagged export prices of oranges in the Jordanian and Israeli markets compared with changes in other lagged farm and export prices. However, the Gaza Strip exporters have been found highly responsive to changes in export prices of oranges in the Jordanian market compared to other markets. Results indicate that the quality of orange production in the Gaza Strip has been deteriorated by environmental factors such as average of temperatures in January, rainfall and the interaction between quality of soil, tree productivity and saline water used in irrigation.

## **MODELING THE ADOPTION/PARTICIPATION**

**PROCESS** (Moderator: *Tony Prato, University of Missouri*).

**"Regulatory Control and Technology Adoption"** *Gary D. Lynne, C. Franklin Casey, Alan W. Hodges, and Mohammad Rahmani, University of Florida.*

Natural resource regulatory policy affecting (farmers) growers is tending toward more direction and control of technology choices. This paper isolates the role of perceived control (volition) on the decision to adopt drip irrigation technology, and on the amount invested in this technology for strawberry growers in Florida. The statistical significance demonstrated in both the logit and tobit models suggests that the volition is an important component of the decision to adopt new technology.

Directing growers to sue certain types of technologies could well be counter-productive.

**"Evidence of Computer Adoption and its Perceived Usefulness by Some North Carolina Commercial Farmers"** *William A. Amponsah and Anjana S. Pai, North Carolina A & T State University.*

Even though computer technology continues to proliferate, available evidence shows a very slow adoption rate for farmers. By using a random sample of North Carolina commercial farmers and multinomial logit technique, the study seems to suggest that computer adoption continues to be low. However, older farmers were found to be less likely to adopt computers or find them useful. The size of farms was positively associated with adoption, but educational attainment was found to be the most significant rationale for adoption and perceived usefulness of computers.

**"Factors Influencing Technology Adoption in a Louisiana Aquaculture System"** *Rex H. Caffey and Richard F. Kazmierczak, Louisiana State University.*

A highly significant multinomial logit model was estimated and used to analyze the impact of various producer characteristics on the adoption of flow-through and recirculating technology in soft-shelled crab production. Because of the industry's geographic isolation and high turnover rate, data were collected by personal interviews in 1991. Results suggest that increased adoption might be fostered by targeting education programs towards full-time, family-operated businesses in non-traditional production regions. However, development of effective education programs may be hindered by the tendency of producers to rely on non-formal information sources when adopting the most advanced, recirculating technology.

**"Rural Household Recycling: Explaining Participation and Volume Generation"** *Paul M. Jakus, Kelly Jo Tiller, and William M. Park, University of Tennessee.*

A behavioral model explaining household recycling decisions is developed and implemented

using household data collected in a rural portion of a Tennessee county. Models of participation and volume generation are estimated for five materials: aluminum, glass, paper, plastic, and tin. The effectiveness of recycling information and education in inducing households to recycle is evaluated. Participation and volume models indicate recycling behavior is very responsive to the implicit price of recycling. Because nonrecyclers perceive the time costs to be greater than experienced recyclers, education programs should emphasize to nonrecyclers that the time requirements for participation are less than they perceive.

## CONSUMER DEMAND ANALYSIS

(Moderator: *Rudy Nayga, Rutgers University*).

**"Meat Demand in Mexico"** *James Mintert, Carol Snyder, Kansas State University, Barry Goodwin, North Carolina State University, and Gary Brester, Kansas State University.*

An LA/AIDS model of Mexican meat demand was estimated using annual data from 1975 through 1991. Results suggest that beef and poultry demand in Mexico are inelastic with respect to own price. Demand for beef and lamb are also inelastic with respect to income. Negative income elasticities were found for both pork and poultry. The demand model estimated here suggests that consumption of beef and lamb in Mexico will increase as consumers' incomes increase. However, it does not appear that Mexican consumers' meat consumption is more responsive to income changes than U.S. consumers' consumption.

**"Assessing the Consumption and Attitudes Toward Specialty Meat: Rabbit, Goat, and Quail"** *Patricia McLean-Meyinsse and Jianguo Hui, Southern University.*

Empirical results show that there is a current and potential market for rabbit, goat, and quail meat. Farmers, processors, or retailers need to explore the specialty meat market further. These markets are significantly affected by demographic and socioeconomic factors such as geographic area, gender, age, education, marital status, religion, race

and income. Therefore, in targeting specific market segments, demographic and socioeconomic characteristics would play key roles in any strategies to expand the market for rabbit, goat, and quail meat.

**"The Demand for Meat in the U.S.: An Exploration of the Potential Impacts of a Relatively New Beef Product"** *S.O. Olowolayemo and N.R. Martin, Auburn University.*

Inverse Almost Ideal Demand System and Linear Double-Long price dependent demand models are specified for meat products with/without the inclusion of lean ground beef. Results are generally comparable from both models. Cross price flexibilities of lean beef to other meat products are relatively stronger than from other products to lean beef.

**"Shrimp Consumption Patterns of South Louisiana Residents"** *Steven T. Yen, Nicholls State University and Lynn Dellenbarger and Alvin R. Schupp, Louisiana State University.*

Cragg's double hurdle model is generalized to allow more flexible distributional assumptions than the commonly used truncated normal and log-normal specifications. The truncated normal specification is found acceptable, but the nested Tobit parameterization and homoscedasticity of errors are rejected. We find that shrimp is an inferior good for south Louisiana residents but the income elasticity is small. Household size and other characteristics also have significant impacts on consumption.

**AGRICULTURAL POLICY** (Moderator: *Lynn Reinschmiedt, Mississippi State University.*)

**"The Optimal Announcement Lead of Agricultural Policies"** *George C. Davis, University of Tennessee.*

The paper determines the optimal announcement lead of agricultural policies in terms of economic welfare. We show that if the objective

is to maximize aggregate welfare change over the announcement interval, the optimal announcement lead is infinity (zero), if the policy increases (decreases) prices. When distributional effects are considered there is no unique optimal announcement lead across market participants. By choosing a specific announcement lead, the policy maker cannot simultaneously optimize the change in consumer, producer and speculator surplus.

**"The Ranch Level Impacts of Proposed Public Land Grazing Fees"** *David P. Anderson, James W. Richardson, Ronald D. Knutson, and Brian T. Young, Texas A & M University.*

In August, 1993 the Department of the Interior proposed a new, higher grazing fee for federal land. The whole farm simulation model, FLIPSIM, was used to quantify the impacts of the proposed fee on five representative public land ranches. Results indicate that net cash farm income declines \$400 to \$6,400 per year depending on the level of dependence on public land and debt level. None of the representative ranches analyzed goes out of business due to the higher fee. Ranches more dependent on public land than those presented and/or with higher debt levels will be more adversely affected.

**"Wheat Acreage Response Under the Government Price Support Program"** *Jun Zhang, Daniel S. Tilly, and Michael R. Dicks, Oklahoma State University.*

U.S. wheat acreage has been significantly influenced by government programs. This paper analyzes the impacts of the government price support program on wheat farmers' price expectations. The empirical results indicate that government involvement in the wheat market affects farmers' rational price expectations. Short - and long-run supply elasticities for U.S. wheat estimates are 0.20 and 0.48, respectively.

**"An Evaluation of Participation in Tennessee's Stewardship Incentive Program"** *Caroline D. Bell, Burton C. English, and Roland K. Roberts, University of Tennessee.*

This study determines the likely effect of cost-share incentives on participation in the

Tennessee Stewardship Incentive Program and identifies other factors that may contribute to participation. An indirect-utility-function approach is used to determine the probability that a landowner will choose to participate in the program. A binary choice model is specified to represent the dichotomous decision. Data are obtained from mail surveys of 4000 randomly selected landowners and a logit procedure is used to fit the model. Results indicate that attitudes and knowledge of forestry programs may be more influential in a landowner's decision to participate than monetary incentives.

**"Impacts of Dairy Waste Management Regulations on the South"** *John W. Miller, Joe L. Outlaw, Ronald D. Knutson, Robert B. Schwart, and James W. Richardson, Texas A & M University.*

Regulation of dairy waste has become a very controversial issue. The impacts of imposing more strict environmental compliance standards are analyzed for nine representative dairy farms in the South. The results indicate that large dairies in Texas and Florida can remain economically viable. Added costs hasten the decline for moderate Texas, Georgia, and Florida dairies.

## COMMODITY MARKETING STRATEGIES, MARKET ANALYSIS

(Moderator: *Stephen R. Koontz, Oklahoma State University*).

**"Virginia Versus Midwest Hog Prices"** *David Kenyen and Ted Earles, Virginia Tech.*

The three state region of North Carolina, Virginia, and Pennsylvania has historically imported five million head of hogs per year. With North Carolina's rapid growth since 1987 and the consolidation of the packaging industry to three firms, the Virginia and North Carolina price of hogs has declined relative to Midwest prices by \$2.50 cwt. since 1970. Since 1992, the weekly change in Virginia prices is less correlated with Midwest hog price changes. These changes in price relationships are related to regional supply and demand changes rather than increased contract production and buyer concentration.

**"Determinants of Agricultural Commodities Futures Contracts"** *N'Zue F. Fofana and B. Wade Brorsen, Oklahoma State University.*

The objective of this study was to determine the factors affecting volume of trade of agricultural commodity futures contracts. Commodities with futures markets were selected and analyzed with respect to their characteristics (price variability, relative residual risk, liquidity cost, and the size of the cash market). Cash market size, price variability, relative residual risk, and liquidity cost determine the success or failure of futures contracts (at least for agricultural commodities).

**"Risk Efficient Swine Marketing Alternatives for Eastern Nebraska Producers"** *George H. Pfeiffer, Todd A. Smith, and James G. Kendrick, University of Nebraska.*

A Target MOTAD model was used to examine alternative swine marketing strategies for Eastern Nebraska. Results indicate that effective use of marketing strategies can increase income and reduce risk when compared to simple cash sales of hogs. However, results suggest that the cost of maximum risk reduction is very high. Both small and large producers benefitted from the appropriate choice of marketing strategies, refuting assertions that only large producers can benefit from advances in marketing tools.

**"Satisfaction Evaluation of Milk Handlers by Southern U.S. Dairy Farmers"** *David M. Sayers, Richard L. Kilmer, and Jonq-Ying Lee, University of Florida.*

An ordered probit model is used to investigate the factors that determine post-choice satisfaction of southeastern U.S. dairy farmers with their marketing agencies. Concepts for the analysis are based on Lancaster's attribute utility theory and Winterfeldt and Edwards' multi-attribute utility theory. Dairy farmers' post-choice satisfaction levels are influenced by the marketing agencies' attributes and farmers' expectations, farm locations, and the

socioeconomic status of the farmers. The implications are that, once it is feasible, farmers will switch from an inefficient agency if they think that they would raise their level of satisfaction.

**"The Case for a Hermeneutical Approach to the Study of Agricultural Commodity Markets"**

*Wayne M. Gauthier, Louisiana State University.*

A hermeneutical approach to the study of agricultural commodity markets enhances the capacity to tell more meaningful stories. The case for the hermeneutical economics approach was developed around the primacy of language, the role of attention, and the enduring agricultural commodity market attributes of human actions, communications, and coordination. Contributions of the hermeneutical approach are attributed to the absence of the limiting assumptions, the uniqueness of the role assigned to language and the non-scarcity view of the human resource. The hermeneutical approach accommodates multiple perspectives.

**QUANTITATIVE METHODS-I**

(Moderator: *Eduardo Segarra, Texas Tech University*).

**"Price Linkages in Selected Agricultural Industrial, Financial, and Foreign Exchange Futures Markets"** *Viswanath Tirupattur, Philip Garcia, and Raymond L. Leuthold, University of Illinois.*

This study explores price relationships and linkages among different markets using futures prices of corn, soybeans, live hogs, crude oil, Treasury bills and deutsche marks in both the short and long runs using time series techniques. Results suggest that price linkages consistent over time are extremely limited.

**"Testing Spatial Market Integration: A Nonparametric Approach"** *Md. Habibur Rahman, Kansas State University.*

Spatial economic variables are jointly endogenous because of spatial dependence.

Different parametric models such as integration and bivariate cointegration models fail to incorporate spatial dependence and transport costs and suffer from mis-specification. A nonparametric approach is proposed that explains the market performance of homogenous commodity over different geographically separated market. Two market integration models and one nonparametric model are applied to Kansas wheat prices and results are compared.

**"The Effect of Government Payments on Real Asset Values in Agriculture: A Cointegration Approach"** *Sri Devi Deepak and Charles B. Moss, University of Florida.*

This study determines the effect of government payments on agricultural asset values using the cointegration technique developed by Johansen. The results indicate that in the long run agricultural asset values are positively affected by government payments and market income discounted at different rates.

**"Sensitivity of Rankings of Inter-Firm Efficiency Measurement to Model Specification"** *Madhab R. Khoju and Bruce L. Dixon, University of Arkansas.*

Researchers estimating stochastic frontier models are usually confronted with choosing the approximating parametric form for the production frontier and the one-sided distribution for the inefficiency part of the composed error term when using maximum likelihood estimators. Different specifications result in different estimates and, therefore, different inter-firm efficiency rankings. A Monte Carlo approach is used to evaluate the comparative accuracy of four different functional forms and three different stochastic assumptions in ranking firms in a sample. Cobb-Douglas is found to be superior to translog but accuracy of rankings depends crucially on size of inefficiency errors compared with pure random noise.



**"Ex Ante Forecasting of Technology Adoption for Environmental Compliance: Does Uncertainty and Irreversibility Make a Difference?"** Amy P. Pagano, William G. Boggess, Charles B. Moss, and John Holt, *University of Florida*.

Uncertainty about costs and requirements for environmental compliance is an important determinant of dairy producers' investment behavior. Ex ante forecasting of how uncertainty and irreversibility are likely to affect producers' responsiveness to agricultural technologies has implications for the design of environmental policies. Empirical analysis focused on Texas producers' propensity to adopt free stall dairy housing. Free stall investments offer both productivity-enhancement and pollution-abatement advantages. This is the first known application of the theory of investment under irreversibility and uncertainty to agricultural technology adoption. Implications of this ex ante paradigm for policy design and implementation are discussed.

**INTERNATIONAL AGRICULTURE AND DEVELOPMENT** (Moderator: Paul B. Siegel, *University of Tennessee*).

**"The Throes of Adjusting to a Market Economy: The Polish Dairy Industry"** Robert L. Beck, *University of Kentucky*.

Since the initial decisive step by Poland to restore a market economy, the Polish dairy industry has faced major adjustments. Because of the transition to a market environment, the industry continues to face adjustments in milk production and in the processing and distributing dairy products. Some of the issues are a function of the transition while others relate to the structure of the dairy industry and only indirectly affect the transition. This study focused on identification and analysis of the impacts of both structural and transition issues on the industry.

**"Land Tenure and Market Integration: The Case of Tunisian Olive Producers"** Lokman Zaibet, *University of Missouri*.

This paper tests the relationship between land tenure and market integration. Nuclear family

ownership is assumed to yield profit maximizing behavior and high market integration. Sibling ownership results in a risk minimizing behavior and low market integration. The collective ownership system leads to a "prestige" objective function and very low market integration. Large farms are assumed to have better effect on market integration than small farms. Nitrogen purchasing, labor hiring and machinery renting are defined as binary variables reflecting the level of market integration. Logit model is used in the analysis and the empirical results broadly support the above hypotheses.

**"Technology Adoption on Limited-Resource Farms: Statistical Evidence from a South African Homeland"** E.F. Kolajo and N.R. Martin, Jr., *Auburn University*.

Sustainability of limited-resource farms depends on adopting appropriate technologies to guarantee food security. The objective of this study was to characterize factors determining technology adoption on limited-resource farms in Lebowa. The adoption patterns of the following cultural practices were examined: certified seeds, fertilizer applications, and conservation practices. Ten socioeconomic factors were statistically tested against the cultural practices. The results give little credence to the sequential adoption hypothesis, but the adoption pattern of cooperative societies' members supports the simultaneous adoption hypothesis. The results suggest that technological packages should be targeted to groups of farmers for successful implementation and adoption.

**"Technical Change Assessment in Mali's Cotton Production Region"** Ntam Baharanyi and Adama Coulibaly, *Tuskegee University*.

Technical change was assessed in the Mali's cotton production region by relying on Hayami and Ruttan's induced innovation model, and using the Generalized Least Squares (GLS) and the Ordinary Least Squares (OLS) estimation techniques. The results indicated positive distribution parameters for alpha, beta, and gamma. The substitution parameters of 4.105, 1.475 and -40.904 for p1, p2, and p, respectively, were greater

than zero in the regressions of the first level. They were significantly greater and negative at the second level. These findings were suggestive of the fixed factors proportion production function with machinery and chemical inputs being limiting factors compared to labor and land, respectively.

**"A Flexible Multioutput Cost Function: Economies of Scope and Scale in Chinese Agriculture"** *Shangnan Shui, Eric Wailes, and Gail L. Cramer, University of Arkansas.*

A composite multioutput cost model is estimated by the two-stage estimation method using a subsample of Chinese National Rural Household Survey data to investigate the effects of output diversification and farm size on production efficiency in Chinese agriculture. The estimated results reveal the presence of economies of scope and scale for Chinese family farms. Regression analysis on sources of scope economies indicates the important effect of sluggishness of land movement on the output diversification.

**AGRICULTURAL PRODUCTION ECONOMICS** (Moderator: *Sukant Misra, Texas Tech University*).

**"Regional Supply Elasticity and Change in Cropping Patterns"** *Duncan Chembezi, University of Tennessee.*

Farm programs have had different impacts on controlled and uncontrolled commodities, influencing their production location. The estimates reported in this paper vary considerably regions, reflecting geographical differences. Rice acreage exhibits considerable inelasticity due, in part, to lack of crop substitutability and also high entry costs. A brief evaluation of regional changes in cropping pattern shows dramatic decline in soybean acreage in the Southeast while cotton and rice gain marginally.

**"Examination of Differences Between Research and Extension Hypotheses and Actual Ratoon Crop Rice Yields and Quality"** *Troy N. Thompson, M. Edward Rister, Warren Grant, et al, Texas A & M University.*

A multi-disciplinary team of scientists formulated hypotheses regarding input effects on rice yield and quality. Following a three year mail-survey for data collection, multiple regression procedures were used to identify principal variables responsible for variation in producers' rice yields and associated quality. Calculated results were contrasted with a priori hypotheses in order to verify/reject current rice theory/knowledge. In several cases, scientists' hypotheses matched producers' responses; however, there are instances of disagreement, especially for quality model variables. The results indicate Texas rice farm level responses to several variables vary depending upon producers' individual circumstances.

**"The Influence of the Southern Oscillation on Sorghum Yields in Selected Regions of the World"** *Keith Keplinger and James W. Mjelde, Texas A & M University.*

The link between the Southern Oscillation (SO) and global weather patterns has been documented, suggesting that agriculture, which is highly dependent on climatic conditions, should also be affected by the SO. This study develops explanatory models of sorghum yields in four areas of the world where SO precipitation effects are strong and consistent. Statistically significant relationships are found between the low phase of the SO (El Nino) and sorghum yields in three of the four models; while statistically significant relationships between the high phase of the SO (La Nina) and sorghum yields are found in two of the models.

**"Government Intervention and Optimal Cropping Water Strategies in Egypt"** *M. Ragy Darwish and Eduardo Segarra, Texas Tech University.*

Six dynamic optimization models were developed to determine the optimal irrigation

strategies for the three main agricultural regions in Egypt over a 30-year planning horizon. These models evaluated the current agricultural policies and compared them to a situation in which these policies were eliminated (deregulation policies), under different water supply levels. Optimal decision rules under each model were determined and analyzed. The results obtained indicate that the elimination of the current agricultural policies would lead to higher revenues and an increase in the water use efficiency. Also, deregulation would lead to a reduction in the variation of regional and intertemporal water allocation.

**"An Economic Analysis of Catfish and Hybrid Striped Bass Pond Effluent Control in the Southeast"** *Pierre-Justin Kouka, Carole Engle, University of Arkansas at Pine Bluff and Gayle Pounds, University of Missouri.*

An economic analysis of two management practices, fishpond water for crop irrigation and filter-feeding fish, to reduce aquacultural effluents was conducted. A linear programming model was developed to determine the profit-maximizing effluent management strategies for varying levels of allowable effluent discharge for catfish and hybrid striped bass in the event that regulations would enforce either fixed levels or taxes on effluent discharges. Large farms were found more efficient in internalizing the costs of treating effluent than small farms. Furthermore, it was shown that the treatment method selected depends upon the fish species that are being produced.

## AGRICULTURAL BUSINESS - II

(Moderator: *Surendra P. Singh, Tennessee State University*).

**"Supermarket Patronage: An Analysis of Customer Counts Among Outlets within a Geographical Area"** *David B. Eastwood, Morgan Gray, and John R. Brooker, University of Tennessee.*

As new supermarket management tools are introduced, the need for an improved understanding of store patronage is growing. Weekly customer

counts for five supermarkets located in a southeastern metropolitan area covering 261 weeks are analyzed. Descriptive statistics indicate that food shopper patterns vary by outlet. Regression equations are estimated for each location. Results point to store specific relationships. The indicate that evaluation of television and radio ads and double coupons can be quite involved.

**"Factors That Affect Commodity Transportation Decisions"** *Bruce Lambert and Roger Hinson, Louisiana State University.*

Location decisions are made by firms. Factors that influence these decisions have been research because they can be important to economic development efforts. Decisions about which water and airports handle perishable agricultural products, particularly fruits and vegetables, have not been extensively studied. This article reports on a study designed to identify priority placed on location factors by industry participants. Literature on transportation decisions was used to identify appropriate factors, and the importance of those factors to companies that handle produce items was evaluated using data obtained from an industry survey. Generally, though port and service users assert that cost of service is most important, results indicate that respondents more frequently identified service factors as important considerations in the decision.

**"Supply Elasticities for Organic Produce"** *Luanne Lohr and Timothy Park, University of Georgia.*

Supply elasticities for six organic crops, broccoli, carrots, celery, romaine lettuce, strawberries, and watermelons, are estimated along with the rates at which farmers adjust output in response to changes in price premiums. Rates of adjustment range from nearly instantaneous (carrots) to somewhat slow (lettuce) which may be due to differences in marketing channels, access to price information, or perishability of crops. In the short run, inelasticity of supply for organic produce suggests maintenance of market niche and limited distribution channels may limit farmers' responsiveness to price changes. Conventionally

grown produce is more inelastic than organic, indicating that the option of marketing in both certified and noncertified markets gives organic farmers greater flexibility in responding to price signals.

**"Gross Rating Points and Advertising Impact: A Case Study of the Demand for Oranges"** *Jong-Ying Lee, Mark G. Brown, and Robert M. Behr, Florida Department of Citrus.*

This study examines the use of GRP and advertising expenditure as measures of orange juice advertising effort. Based on the observations presented in this study, it was difficult to determine whether GRP is a better measurement for advertising effort than advertising expenditure, or the other way around. The empirical study of generic advertising on the demand for orange juice presented in this study demonstrated that the results obtained from using GRP as the measurement of advertising effort are reasonable.

**AGRICULTURAL CREDIT AND FINANCE** (Moderator: *Roger Hinson, Louisiana State University*).

**"Life Insurance Company Farm Mortgage Lending in the United States: Coping with Change"** *Jerome M. Stam and Steven R. Koenig, ERS-USDA.*

This paper examines the current role of life insurance companies in providing agricultural capital in the wake of farm sector financial stress in the 1980's and the advent of the Farmer Mac secondary market for farm mortgage loans. Today there are fewer life insurance companies offering new farm loans. Portfolios are more diversified, loans are larger, and lending has shifted to the southwest and west. Life insurance companies have been key players in the first loan pools guaranteed by Farmer Mac. This lessens their involvement with direct farm loan activities, but it allows a wider flexibility in managing their agricultural investment portfolios.

**"Option Pricing Assessment of the Columbia Farm Credit System District"** *Sean Chance, Richard Weldon, and Charles Moss, University of Florida.*

The Columbia District of the Farm Credit system came out of the 1980's in a relatively strong financial position compared to other districts. An option pricing model is used to assess the riskiness of agricultural in the Columbia District. The measure of riskiness, a diversification measure and government payments are used to determine which of the underlying agriculture explains the financial health of the Columbia bank during the period of 1960-1987. The model shows that the variables explain a large magnitude of the variation in the financial health of the Columbia district.

**"Heteroscedasticity and Parameter Stability in Credit Scoring Models"** *Brian Roe, University of Maryland.*

The predictive ability of a probit credit scoring model is improved upon by correcting for multiplicative heteroscedasticity and updating the model's parameters on a yearly basis. A likelihood ratio test is used to diagnose the multiplicative heteroscedasticity in the models created from cross sectional data from Wisconsin Farm Credit Service customers and to reject parameter stability over the data's four year period. The annually updated model's predictive capacity is more consistent than the non-updated model whose prediction consistency may depend upon the degree of land and agricultural product price stability over the time period that the model is used.

**"Explaining Farm Credit System Restructured and Nonaccrual Loans: Farm Financial Conditions or Jurisdictional Laws?"** *Charles B. Dodson, ERS-USDA and Krisha Mason, Texas Tech.*

The impact of farm financial characteristics and jurisdictional laws on FCS nonaccrual and restructure loans was examined using an option pricing framework. Empirical results indicated the proportion of debt held by low equity farms had a significant impact on nonaccrual loans while jurisdictional laws had no significant impact.

Jurisdictional laws were found to have a significant influence on the level of loans restructured.

**"Credit Rationing and Machinery Investment: Evidence from Kansas Farm Records"** *Ralph Bierlen, Kansas State University.*

The null hypothesis that farm machinery investors do suffer from credit rationing is tested using non-credit constrained and credit constrained Euler investment equations. The data are taken from 256 Kansas farms for the 1976-1991 period. The non-credit constrained results indicate that only large farms, which also have better financial ratios, are not credit constrained. Small and medium sized farms are credit constrained. The results suggest that only high asset farms are free from credit constraints and that liquidity, the ability to self-invest, and asset size are important determinants of credit rationing.

## **FARM MANAGEMENT AND PRODUCTION ECONOMICS**

(Moderator: *Tesfa Gebremedhin, University of West Virginia*).

**"Logit Analysis of Producer Preferences for Utilizing Manure"** *Barbara Bonner, S.H. Amosson, and W.L. Harman, Texas A & M University.*

In the past 25 years the cattle feeding industry in the Texas high plains has undergone tremendous growth. The resultant increase in manure production combined with a slower growth in demand by farmers for manure has created a stockpiling problem. The objective of this study was to identify characteristics of users and non-users of manure. More importantly, identify factors that influence the use of manure. A mail survey of 2,500 producers was conducted in counties with feedlots. Producers identified cost, weed seed, and distance as important, while a logit analysis indicated perceived knowledge and distance as significant factors.

**"Economics of Poultry Litter Management for Rice Production"** *Mark J. Cochran, Ramu Govindasamy, David M. Miller, and Richard J. Norman, University of Arkansas.*

This paper identifies optimal combinations of nitrogen in the form of urea, fresh litter, and composted litter for rice production. Traditional cost minimization techniques using data from experimental results conducted at four sites in Arkansas during 1991 have been employed. Comparisons between different scenarios indicate that the trade-off between the use of poultry litter and urea nitrogen depends upon such factors as soil fertility, the yield response to litter application and the relative price of nitrogen and litter. The use of litter is usually more economical at higher target yields than at low target yields.

**"Evaluation of Cage Catfish Culture as an Alternative Enterprise on Small Farms in South Carolina"** *S. Sureshwaran, S. Kyereme, S.R. Londhe, and E. Walters, South Carolina State University.*

Past beneficiaries of research and extension projects in aquaculture have been large farmers using pond culture systems. Additional studies based on sound knowledge of empirical behavior, are needed to identify alternative technologies and aid in the management decisions of small farms. A mixed integer, multiperiod linear programming model and survey data are used to analyze the profitability of caged catfish culture. Results suggest that only a limited number of farmers may be able to adopt cage culture as an alternative farm enterprise. Profitability is sensitive to assumed product prices. Feeding rates and harvest weights for alternative prices are also provided.

**"Economic Feasibility of Plastic Mulch as a Land and Labor Savings Technology for Limited Resource Farmers"** *Constance Ileko Mugalla, Curtis M. Jolly, and Neil R. Martin, Auburn University.*

Economic feasibility of plastic mulch was evaluated as a land or labor savings technology for limited resource farmers. A farming systems

approach and a farm simulation model were used for the analysis. Plastic mulch was economically feasible for limited resource farmers, but required a substantial initial investment. Beyond 5 acres, with a capital limit of \$11,000, it was neither a labor nor capital saving technology.

**"An Economic Evaluation of the Effects of Synovex-C Implants on Replacement Heifers"**

*Paul H. Gutierrez, Norman L. Dalsted, Kenneth Odde, and Larry Corah, Colorado State University.*

This analysis evaluates the economic affect of utilizing Synovex-C implants in the development of replacement heifers as compared to no implants. The analysis addresses the value of increased gain and weight versus the value opportunity cost due to reduced reproductive efficiency. Pregnant heifers valued at \$900 per head, a 12 percent replacement rate, and no implant affect on pregnancy rates, exhibit a net revenue increase of \$3.50 per exposed cow. At higher replacement rates, 20 percent or greater, substantial economic and financial risk results from implanting replacement heifers due to decrease in reproductive performance. A 20 percent replacement rate and 10 percent decrease in pregnancy rates results in an economic loss of <\$10.26> per exposed cow.

**TEACHING AND EXTENSION**

(Moderator: *Kenneth Young, University of Arkansas*).

**"Management Information Strategies--A Survey of Oklahoma Farmers and Ranchers"** *Damona G. Doye and Odell L. Walker, Oklahoma State University.*

An important role of farmers in the information age is to efficiently collect, interpret, and react to timely quality information. This article summarizes the results of a survey of Oklahoma farmers and ranchers on record keeping tools and resources used and their perceptions of the importance of various kinds of information. Survey results indicate that information strategies vary with farmers' age, education, and size of business. Educational programs may be needed to assist

farmers in determining appropriate management uses and values of alternative information records, especially when computer technology is available to facilitate information management.

**"Lanzones: A Marketing Game"** *Barry W. Bobst and Joseph Salvacruz, University of Kentucky.*

A marketing game is a dynamic simulation of the actual marketing operations of a firm, farm, or individual where students assume various decision making roles for the entity's operations. The usefulness of this instructional tool in the field of agricultural marketing is discussed. This paper presents an example of a marketing game applicable to an agricultural product--lanzones--a fruit indigenous to Asia. It demonstrates universal applicability of the students' acquired knowledge and skills in the discipline. Exposure to this game should prove to be useful to many students who pursue their teaching careers in developing countries.

**"Pricing Strategy under Monopoly Conditions: An Experiment for the Classroom"** *Robert G. Nelson, Auburn University.*

This classroom experiment allows students to explore several of the pricing strategies available to the monopolist. Students are given full information on costs but know nothing about demand except that it is simulated by the instructor. They submit their price-asked and quantity-offered records on one day and receive the quantity-sold response from the instructor the next day, continuing this routine until they discover the profit maximizing price and quantity. One of the objectives is to demonstrate that search strategies based on economic principles ( $MC = MR$ ) can be more efficient than trial and error.

**"Using Commercial Accounting Software and Experiment Station Crop Budgets as a Farm Budgeting and Record Keeping System"** *Steve Murray, Mississippi State University.*

Agricultural experiment stations and extension services throughout the U.S. routinely

prepare crop enterprise budgets for use by farmers in their states. Many low cost accounting packages are currently available which run on inexpensive microcomputers. Farmers can use the enterprise budgets to develop charts of accounts for the accounting software. The use of enterprise budgets in this manner will result in improved on-farm record systems.

### **"Economic Cost of Errors in the Manual Mixing of Agri-Chemicals: Some Preliminary Results"**

*C. Robert Stark, Teresa Chung Stark, and Suhas R. Ghate, University of Georgia*

Errors made during the manual mixing of agri-chemicals can result in sizable economic costs when considered with the recommended application rates, estimated acreage treated, and prevailing chemical prices per unit. This paper estimates the direct economic costs which would be expected for selected agri-chemicals by taking the magnitude of manual mixing errors found in a simple mixing exercise and applying the error to recommended application rates and product cost estimates for three major herbicides used on peanut acreage in south central Georgia.

## **ENVIRONMENTAL ECONOMICS**

(Moderator: *E. Jane Luzar, Louisiana State University*).

### **"A Sulfur Dioxide (SO<sub>2</sub>) Futures Contract?"**

*Andrew G. Keeler, Donna L. McLemore, and Steven C. Turner, University of Georgia*

This paper examines the potential success of the futures contract in sulfur dioxide emissions allowances. The uncertainties of air pollution and public utility regulation, emission control technology, electricity demand, and the need for an allowance of a price discovery mechanism in risky, long-range compliance planning by electric utilities will help to ensure the success of the futures contract. If the market is successful, there is some scope for expanding this trading into rights for other pollutants. However, sulfur dioxide is almost uniquely suited to a national market, so even if successful, it may be difficult to duplicate.

### **"Wetland Regulation Impacts on Agricultural Land Prices in Two Oklahoma Counties"**

*Patricia E. Norris, Katherine E. Ahern, and Stephen R. Koontz, Oklahoma State University*

Agricultural landowners have expressed concern that wetland regulations are restricting land use options and reducing the value of land. Federal Land Bank land sales data were combined with data from county ASCS and SCS offices to estimate that impact of wetland regulations on land prices for two Oklahoma counties. The counties were selected based on a large volume of land sales, a significant number of wetlands, and the availability of data needed. Maximum likelihood estimation of land price models with heteroskedastic errors indicated that prices are not reduced by exposure to wetland regulations.

### **"Making Market Based Environmental Policy: The Example of Scrap Tire Management"**

*Leonard A. Shabman and Gerald D. Stedje, Virginia Tech.*

Market based environmental policy has gained support recently, as is evidenced by the support lent to it by all the major candidates in the last presidential election. However, policy makers have been narrow in their application of market principles to environmental regulation, and have emphasized on the direct alteration of price signals through taxes and subsidies. This paper examines an alternative market based approach to environmental policy development--alteration of the property rights and liability structure which gave rise to the initial environmental problem. This argument is illustrated by the case of scrap tire management in the state of Virginia.

### **"Estimation of Economic and Environmental Tradeoffs"**

*Tony Prato, Feng Xu, and Jian C. Ma, University of Missouri*

This study proposes an empirical method for estimating economic and environmental tradeoffs. Economic and environmental tradeoff frontiers are estimated using data generated from a multiobjective programming model for a case study farm in Missouri. Results indicate that tradeoffs

exist between economic and environmental objectives and between two selected environmental objectives. Therefore, it is necessary to account for all relevant economic and environmental effects of farming systems in farming system evaluations.

**"Optimizing the Seller's Reserve Price in Renewable Resource Auctions"** *Douglas R. Carter, University of Florida.*

This research develops a model for examining the effects of altering the seller's reservation price in federal timber auctions. A simultaneous equation model is proposed that simulates the impact of increasing reservation price on the market value, given a sold offering, and the probability that an offering will sell, in the presence of strategic bidding behavior by auction participants. The model is tested on 370 national forest timber sales in North Carolina between 1979 and 1991. Simulations indicate, *ex post*, that increasing reservation price 37 percent could increase total revenue by as much as 7.6 percent on the national forests in North Carolina.

**TECHNICAL EFFICIENCY AND AGRICULTURAL PRODUCTION**

(Moderator: *Troy N. Thompson, Texas A & M University*).

**"Technical Efficiency - An Industry Success Story"** *Jason L. Johnson, Hector O. Zapata, and Arthur M. Heagler, Louisiana State University.*

Input and output data obtained from the population of Louisiana sugar processors is used to examine the technical efficiency of factories operating in the industry. Alternative model specifications are employed with stochastic frontier methods to measure the technical efficiency of individual sugar factories. Results indicate that no significant technical inefficiency exists in the industry. An efficiency index is constructed to measure the relative efficiency of individual factories in relation to the most efficient factory. Results suggest that any future increases in efficiency must either derive from the introduction

of new technology or an improvement with regard to allocative efficiency.

**"A Simulation Study of Nonparametric Technical Efficiency with K Firms and N Inputs"** *Feng Xu and Tony Prato, University of Missouri.*

Nonparametric firm efficiency is simulated and metamodels of simulated prices increase incentives to handle larger volumes of manure. Results show that firm efficiencies from data envelopment analysis are affected by the number of firms and inputs in simulations. The less the number of firms and the more the number of inputs, the higher the overall firm efficiency and the higher the percentage of firms being measured as completely efficient.

**"Assessment of Physical Economic Parameters that Affect the Response of Rice to Nitrogen Fertilization in Louisiana"** *Qiyu Chu and Arthur Heagler, Louisiana State University.*

Data from ongoing nitrogen fertilization studies on rice grown at three locations in Louisiana between 1986-1988 were analyzed from an economic perspective to determine which nitrogen level and split application result in maximum net returns. Econometric methods were used in the development and selection of the physical response surfaces for six major cultivars of rice. Dummy tests showed the model structure changes between different years and locations. Using the error component model, optimal nitrogen rates were calculated in each of the three study areas. Various rice prices and nitrogen costs were considered. Elasticities of input demand were also calculated.

**"Technical Efficiency Gains as an Indicator of the Sustainability on Missouri Farms"** *Mark W. Jenner and Nicholas Kalaitzandonakes, University of Missouri.*

Specialization has historically led to increased technical efficiency. Contrary to specialization toward a single enterprise is the systems approach to increasing agricultural productivity. Outputs of some enterprises become



inputs for others thereby increasing the overall technical efficiency of the system. In this study diversified farms in Missouri are found to be as equally technically efficient as specialized farms. Thus, no apparent gains in efficiency are realized from a systems production approach. One apparent reason for the lack of such gains in efficiency is the mismanagement of nutrient flows by diversified farms.

**"Total Factor Productivity for Nonseparable, Nonhomothetic, Multiple Output Technologies: Evidence for U.S. Agriculture"** *Robert D. Weaver and Atsushi Chitose, Pennsylvania State University.*

This paper re-examines the measurement of total factor productivity and proposes a new approach which does not require the restrictions of input-output separability or constant returns-to-scale. The proposed methodology is applied for illustration to annual data for U.S. agriculture over the period 1948-83.

## INTERNATIONAL ECONOMICS

(Moderator: *Eric J. Wailes, University of Arkansas*).

**"Locational Determinants of the U.S. Direct Foreign Investment in Food and Kindred Products"** *Michael R. Reed and Yulin Ning, University of Kentucky.*

This paper investigates locational determinants of U.S. direct foreign investment in food and kindred products by using data from six industrialized countries from 1983 to 1989. The results support the psychic distance, exchange rate speculation, market size and locational theories for direct foreign investment.

**"Endogenous Technological Progress and International Agricultural Trade"** *Joseph C. Salvacruz and Michael R. Reed, University of Kentucky.*

An international trade model which utilizes relative technological progress and factor

endowments to determine agricultural trade patterns was presented. The model was tested in the U.S., the Asian Newly Industrializing Countries (NICs), and a group of lesser-developed ASEAN countries. Sources of technological progress were identified, and endogenous technological progress was found to determine trade patterns of the U.S., but not the other countries. The major issues discussed include the impact of U.S. foreign aid outflows on the American trade position, and the necessity of improving financial support system in the lesser developed Southeast Asian countries.

**"Sources of Real Exchange Rate Variability: The Case of Trinidad and Tobago"** *Ligia Soto-Urbina, Roland Roberts, and Greg Pompelli, University of Tennessee.*

The effect of real exchange rate risk on the demand for agricultural imports by developing countries has important implications for U.S. exporters because of the potential for expanded trade. This study investigates the role of monetary and real factors in explaining real exchange rate variability between the United States and Trinidad and Tobago, and Brazil. The results correspond with those of other studies and indicate that the main sources of variation differ depending on the commodity and country studied.

**"The Effect of Price Policies on Agricultural Productivity: A Case Study"** *Nicholas Kalaitzandonakes, Christoph Schmitz, and Maury E. Bredahl, University of Missouri.*

The study investigates the relationship between protectionism and productivity growth. It is hypothesized that within a competitive environment, protectionism might generate inefficiencies that could reduce or even completely offset any positive effects from technical change. Empirical estimates derived from 8 New Zealand beef/sheep production regions strongly support these notions. For that particular industry, liberalization efforts induced not only large positive efficiency gains, but also a decline in technical progress. However, efficiency gains dominated the decline in technical change.

**"The Net Benefits of Cleaning U.S. Export Wheat"** *Stephen L. Haley and Susan Leetmaa, ERS-USDA and Alan Webb, University of Arkansas.*

This analysis shows that there could be net gains to the U.S. wheat industry if all U.S. export wheat were to be cleaned to a dockage level between 0.35 to 0.40 percent. These results are based on survey results of major importers of U.S. wheat, and a model of world wheat trade. Larger benefits to the U.S. wheat industry would be possible from cleaning only wheat destined to countries that demand higher quality U.S. wheat. However, these gains in export revenue from selling cleaner wheat could be offset if other exporters, especially Canada, responded in ways that would maintain their market value.

**DEMAND ANALYSIS** (Moderator: *Dewitt Jones, Southern University*).

**"Estimating Elasticities in a Two-Stage Demand System"** *Mark G. Brown and Jonq-Ying Lee, Florida Department of Citrus.*

The Rotterdam model was used to demonstrate the differences between conditional and unconditional demand parameters and the importance of selecting group quantity and price indices. Using Canadian fruit and juice consumption data, this study found that the conditional demand elasticity estimates are smaller than the unconditional demand elasticity estimates and that using different group quantity and price indices results in different upper-stage and unconditional demand parameter estimates.

**"Demand Analysis and Soft-Rationing: An Urban Chinese Household Food Demand Analysis"** *X.M. Gao, Eric Wailes, and Gail Cramer, University of Arkansas.*

This paper proposes using a mixed demand system for consumer behavior analysis under non-binding rationing, where a household can purchase limited amounts of a living necessity, such as a food stuff from the government distribution system at subsidized prices and buy additional quantities from the free market. The mixed demand approach does

not need to make the sub-optimal assumption the strict binding rationing models have to make, and is in conformity with the market clearance reality of parallel market. A level version Rotterdam mixed demand system is applied to China urban household food demand data and shows promising potential for future research.

**"Specification of a Timber Demand Function: A Case Study for Douglas Fir"** *Mary Marchant and Yulin Ning, University of Kentucky.*

This research developed a derived demand function for Douglas fir. It contributes to the literature by disaggregating traditional demand functions for Douglas fir and incorporating specific underlying economic variables such as the mortgage rate, the demographic structure of home buyers, and substitute products. Empirical results indicate that these variables significantly affect the derived demand for Douglas fir.

**"On the Allocation of Wealth in Demand Systems"** *Raymond Kirby and Oral Capps, Jr., Texas A & M University.*

Within a demand systems context, we consider not only the allocation of total expenditure among aggregate consumption categories but also the allocation of wealth among these categories. Wealth, or total available funds, is defined as lines of credit less outstanding balances, income, savings, and other financial assets. Household budget data from the 1989 Survey of Consumer Finances and the 1989 BLS Consumer Expenditure Survey are used to estimate a quadratic expenditure system (QES) for the aggregate categories of food at home, food away from home, housing, apparel, transportation, energy, health care, miscellaneous expenditures, and savings/debt repayment. The own-price elasticities in the model pertaining to the allocation of total expenditure and in the model pertaining to the allocation of wealth were quite similar. However, notable differences were evident in the expenditure elasticities.

**FOOD SAFETY, LABELING,  
NUTRITION, AND RISK** (Moderator:  
*Mark L. Messonnier, University of Georgia*).

**"Contingent Valuation Data in Cost-benefit Analysis: A Case Study of Risk Reduction from Pesticide Residues"** *Jean C. Buzby, Richard C. Ready, and Jerry R. Skees, University of Kentucky*.

This study uses contingent valuation data for a specific food safety risk reduction from pesticide residues in a cost-benefit analysis. This analysis focuses on banning a post-harvest pesticide from use in fresh grapefruit packing houses. On the demand side, benefits are consumers' aggregated willingness to pay (WTP) for safer grapefruit. A national food safety survey obtained the WTP data. On the supply side, grapefruit supply originates in Florida and costs were determined with data from a grapefruit model. Results indicate that the benefits of the ban outweigh the costs.

**"Seafood Wholesaler Attitudes Toward Generic Advertising, Seafood Inspection, and Nutritional Labeling of Fresh Fish and Seafood Products"** *J.R. Bacon, C.M. Gempesaw II, and U.C. Toensmeyer, University of Delaware*.

Logit models are estimated to analyze the attitudes of seafood wholesalers toward generic advertising, seafood inspection, and nutritional labeling. Support for generic advertising is most likely to come from wholesalers located outside of the larger metropolitan markets and who purchase from watermen. Wholesalers from Delaware and Maryland purchasing from importers favored seafood inspection greater than wholesalers from New York. Wholesalers purchasing from each other and local fish farmers had greater support for nutritional labeling. Wholesalers who favored seafood inspection and generic advertising also had a higher probability of favoring nutritional labeling.

**"Consumer Perceptions of Selected Means of Reducing Food Safety Problems"** *Harold Potakey, Alvin R. Schupp, Margaret Younathan, and Donna Montgomery, Louisiana State University*.

Household and food store manager perceptions of the acceptance of four means of

reducing the incidence of the severity of food safety hazards were estimated using data from mail surveys in 1992. Households gave limited acceptance to use of vacuum packaging, irradiation, organic production, and pesticide-free production as means of reducing food safety hazards. Education of the household head was the only socio-economic characteristic statistically impacting household acceptance of these four activities. Store manager perceptions of their customers' reactions to these procedures were statistically less favorable than those of households. Irradiation was more consumer acceptable than previous research has shown.

**"An Economic Investigation of Genetically Engineered Grain in the Production of Lower Saturated Fat Pork"** *Catherine K. Halbrendt, Shalabh Goel, and Sue Snider, University of Delaware*.

Consumption of fat derived from vegetable oils has increased at the expense of animal derived fat. Most animal fats are composed of saturated and unsaturated fatty acids. The consumption of saturated fat is associated with an increased cholesterol level. This study examines the economic impacts of lower saturated fat fresh pork on market demand, price, and economic gains. Specifically, three issues have been discussed: willingness to consume, willingness to pay, and the net economic gain from lower saturated fat product acceptance. The own price elasticity of demand coupled with quality change (lower saturated fat) is also estimated.

**HEDGING AND PRICE ANALYSIS**

(Moderator: *Wayne M. Gauthier, Louisiana State University*).

**"The Cost to Hedge Fed Cattle Using Live Cattle Futures and the Return from Hedged Cattle Feeding"** *Emmett Elam and Stephen Njukia, Texas Tech*.

The cost of hedging feedlot cattle includes the futures commission cost, futures execution cost, and the risk premium paid to speculators for assuming price risk. The total hedge costs were

calculated for three, four, and five month feeding periods. The risk premium was determined as the major cost of hedging fed cattle, with commission costs and execution costs playing a minor role. The total cost of a hedge was found to exceed the mean return for unhedged cattle feeding, thus it appears that hedged cattle feeding is not profitable.

**"Strategic Rollover Hedging"** *Steven C. Turner, Bin Huang, and Jack Houston, University of Georgia.*

Previous research has examined sequential rollovers of annual futures as a means of long-term hedging. This study developed a simple strategy to determine when to enter and exit rollover hedges. The expected prices and standard deviations from strategic rollover hedging, using corn and soybean futures data, were compared to cash sales, routine annual hedging, routine rollover hedging, and strategic single-year hedging. Results of an out-of-sample simulation demonstrated that a strategic rollover hedge generated prices substantially greater than the other alternatives considered.

**"Optimal Hedge Ratios for Oklahoma Feeder Cattle"** *James E. Jones, Stephen R. Koontz, and Derrell S. Peel, Oklahoma State University.*

Optimal hedge ratios are calculated for six weight groups of Oklahoma steers and Heifers. The optimal hedge measures the size of the futures position relative to the cash position necessary to minimize price risk. The optimal hedge estimates are not largely different from the traditional one-to-one hedge, but are significantly different between sex and weight groups. Hedging should effectively manage price risk. The results show how hedging strategies should be modified for the different price volatility and basis behavior accompanying different types of feeder cattle. Results also show cash settlement has improved hedging effectiveness for Oklahoma feeder cattle.

**"Multivariate Versus Univariate Forecasting of Selected Vegetable Crop Prices"** *Zaach I. Olorunnipa, Florida A & M University.*

This paper examines the relative accuracy of multivariate time series models versus a

univariate time series model (ARIMA) in forecasting tomato, potato, and onion prices. The influence of updating the parameter of the models on forecast accuracy was also examined. For all models and for all crops, better forecasts were obtained when model parameters were updated. In general, the Bayesian VAR model substantially outperformed the unrestricted VAR model. Very close competition was observed between the Bayesian VAR and the ARIMA models.

**"Forecasting Monthly Alfalfa Hay Prices: An Appraisal of Econometric and Time Series Models"** *B. Wade Brorsen and Jun Zhang, Oklahoma State University.*

Monthly alfalfa hay prices are forecasted with three alternative forecasting models. Forecasting abilities of the univariate ARIMA, the bivariate VAR, and the econometric model are evaluated based on 24 out-of-sample observations. The combined annual and monthly econometric model has the lowest root mean-squared error.

## QUANTITATIVE METHODS - II

(Moderator: *Stephen T. Yen, Nicholls State University*).

**"Specification of a Poisson Regression Model Applied to Fed Cattle Bidding Data"** *Rodney Jones and Brian Dietz, Virginia Tech and Ted Schroeder and James Mintert, Kansas State University.*

The number of bids received on pens of fed cattle is viewed as discretely distributed count data. A Poisson Regression model is used to analyze factors expected to influence the number of bids. A Comparison with a previous study which viewed the data somewhat differently reveals that the results are sensitive to model specification. Many factors such as quality do not appear to significantly influence bidding activity. Feeders may influence the number of bids received by carefully selecting which feedyard to place cattle with and by holding out for more bids until later in the week.

**"Using the Analytic Hierarchy Process to Prioritize Regional Aquaculture Growth Constraints for the Hybrid-Striped Bass Industry"** *Rhonda Aull-Hyde, Catherine K. Halbrendt, and D.A. Dukas University of Delaware.*

Expert opinions were solicited regarding production items and services required to sustain growth of the United States hybrid-striped bass aquaculture industry. Using data supplied from a group of experts, this study used the Analytic Hierarchy Process to prioritize production inputs and services that potentially constrain growth of regional hybrid-striped bass aquaculture industries.

**"The Effect of Conditional versus Unconditional Probabilities in a Discrete Stochastic Programming Model of Irrigation Decisions"** *Tariq Javed and Glenn A. Helmers, University of Nebraska, Joseph A. Atwood, Montana State University, and Maurice Baker, University of Nebraska.*

The effect of conditional vs. unconditional probabilities between stages in a Discrete Stochastic Programming Model is examined. The model is for sequential irrigation decisions including a safety-first component to insure remaining stream flows. The results indicate sizable advantages of conditional probabilities.

**"Empirical Comparison of Mean Variance and Target Motad Analysis for Arkansas Soybean Production"** *Carl R. Dillon and Mark J. Cochran, University of Arkansas.*

A multi-period chance-constrained programming model was used to estimate the changes in farm-level returns associated with constraints on pesticide leaching. Limits on leaching losses to a critical level 80, 90 and 95 percent of the time were considered. The CMLS simulation model was used to develop distributions of leaching for peanut pesticides. Results indicate that constraints reduce farm-level returns relative to the unconstrained baseline. In addition, increases in marginal costs observed with incrementally higher levels of safety. A statistical comparison of the performance of mean-variance (E-V) and Target MOTAD (TM) mathematical programming models

using the Chow F-test for the empirical case of Arkansas soybean production is conducted for mean-variance, mean-total negative deviations (TND) from mean, mean-TND from targets and mean-minimum relationships. E-V outperforms TM for mean-variance and from the mean. Other comparisons (minimum returns and TND from target) depend on the target level used. While either method can be justifiably utilized, caution against misuse is needed especially for Target MOTAD.

**"Utility-Consistent Discrete-Continuous Choices in Soil Conservation"** *Timothy Park and Luanne Lohr, University of Georgia.*

A theoretically consistent discrete continuous model of participation in environmental programs is developed. The model is applied to farmers' participation in the filter strip program of the Conservation Reserve Program and the acreage enrollment decision. The specification of the utility difference model for the participation decision allows the application of Roy's identity to derive the continuous choice on acreage enrolled. The econometric model is designed to incorporate information on crop production practices that vary across counties along with economic variables and farming practices that are shared across counties. The functional form is justified on economic grounds and verified for its consistency with utility theory in the econometric tests.

## **RISK AND DECISION ANALYSIS**

(Moderator: *Richard F. Kazmierczak, Louisiana State University*).

**"Ground Water Quality Protection and Acceptable Risk: An Estimate of Farm Level Costs in Oklahoma"** *J. Waylon Ramming, University of Kentucky and Patricia E. Norris, Oklahoma State University.*

A multi-period chance-constrained programming model was used to estimate the changes in farm level returns associated with constraints on pesticide leaching. Limits on leaching losses to a critical level 80, 90, and 95 percent of

the time were considered. The CMLS simulation model was used to develop distributions of leaching for peanut pesticides. Results indicate that constraints reduce farm-level returns relative to the unconstrained baseline. In addition, increases in marginal costs observed with incrementally higher levels of safety.

**"Economics of the Intra-Seasonal Crop Production Strategy in a Risky Decision Environment: A Dynamic Process Simulation-Strategy Experimentation Analysis for Cotton in Southwest Oklahoma"** *James A. Larson, University of Tennessee and Harry P. Mapp, Oklahoma State University.*

This study examines how information, as depicted by Antle, influences the risk-preferred intraseasonal production strategy. Dynamic crop simulation and strategy experimentation employing profit maximization and game theory criteria are used to update decision rules with planting, irrigation, and harvest information. Updated or revised strategy net income is evaluated using stochastic dominance value of information criteria. The value of updating the risk-preferred strategy is influenced by production system dynamics and the synergistic or pejorative effects of information between production stages. Information is more effective at positively influencing probability distributors associated with profit maximization and maxi-max than with maxi-min.

**"A Risk and Returns Analysis of Farmland Values: A Case Study"** *Boubaker Ben-Belhassen and Kevin C. Moore, University of Missouri.*

The objectives of this study are to determine whether risk associated with returns to land is a factor that explains some of the variation in farmland values and to determine if the farmland market captures the influence of the differences in risk and returns. The Capital Asset Pricing Model (CAPM) is used to quantify risk and the B-approach is utilized to compute risk adjusted rates of return. The results indicate that the differences in risk explain "a portion" of the differences in farmland values between Iowa and Missouri and that actual prices do reflect the differences in risk and returns.

**"A Decision Analysis of Synchronization and Insemination Methods in Beef Heifers"** *Lisa Offenbach and John Galland, Kansas State University.*

Decision analysis is a systematic approach to decision making under conditions of uncertainty. The purpose of the decision analysis used here is to help beef producers select the most profitable synchronization and insemination method for their heifer breeding program. Each method has a unique cost and value that can be determined depending on the probabilities of a series of possible events that occur before the heifer becomes pregnant. Results of sensitivity analyses show an increasing average weaning weight of calves produced as percent of heifers in good body condition increases and, for methods using artificial insemination, as technician quality increases.

**"Evaluation of Risk for Alternative Farming Systems in Missouri"** *Cho-Min Lin, Feng Xu, and Tony Prato, University of Missouri.*

This study analyzes crop portfolio selection using a simple index model for a Missouri farming systems research area. Confusion that exists in the literature regarding the determination of the nonsystematic risk is clarified. Nonsystematic risks as computed from two different methods are compared and the differences are substantial. Systematic and nonsystematic risk costs are derived from the estimated single index models using the algebraically correct formula. Results indicate that the designed farming systems have different risk and benefits for diversification can be substantial.

**CONTINGENT VALUATION** (Moderator: *E. Jane Luzar, Louisiana State University.*)

**"Reservoir Recreational Use Values Under Alternative Aquatic Plant Management Scenarios"** *Mark L. Messonnier, John C. Bergstrom, and R. Jeff Teasley, University of Georgia.*

Reservoir managers have recognized the growing importance of recreation as a reservoir use.

Factors such as water level and prevalence of aquatic weeds affect the quality and value of reservoir recreation. The effects of aquatic plants on annual recreational use value of a Tennessee Valley Authority reservoir in Alabama were estimated under five different plant management alternatives. Mean net economic value per visitor was estimated via the contingent valuation method for each alternative. The measure was estimated for fishers and non-fishers and reflects their somewhat divergent preferences for plant management.

**"Comparing Three Approaches that Generate Bids for the Referendum CVM"** *Abdelmoneim H. Elnagheeb and Jeffrey L. Jordan, University of Georgia.*

A Monte Carlo willingness-to-pay (WTP) model, was constructed to compare three approaches that generate bids for the referendum CVM. These approaches are Boyle, et al's approach, Cooper's approach, and a third approach as representative of current practice. Some properties of Cooper's approach were discussed. Estimates of average WTP from the three approaches were compared to the true average. Results indicated that Boyle, et al's approach was preferred when variation in WTP was low, while Cooper's approach was preferred when variation was high. The estimates from the three approaches became more comparable as sample size increased.

**"The Endowment Effect and WTA: A Quasi-Experimental Test"** *H. Findley MacDonald, University of Georgia, J.M. Bowker, USDA Forest Service, and Mark L. Messonnier, University of Georgia.*

This paper reports on an empirical test for the presence of an endowment effect in a CVM analysis of air pollution. Regression techniques are used to test whether the presence of prechange property rights significantly influence WTA or WTP. Our results corroborate previous work alleging the existence of an endowment effect on WTA.

**"Agricultural Producers Willingness to Pay for Real-time Mesoscale Weather Information"** *Phil Kenkel and Patricia E. Norris, Oklahoma State University.*

The perceived usefulness of various weather parameters, weather forecasts and weather related decision products is examined. The willingness of the producers to pay to access improved weather information which would be provided by a real-time mesoscale weather network is also examined using the contingent valuation technique. The results indicate that despite the high level of past weather related losses and the perceived usefulness of weather data producers are not willing to pay a significant fee to access improved weather data.

**INPUT DEMAND AND PRODUCTIVITY** (Moderator: *William G. Boggess, University of Florida*).

**"A State-Level Demand for Nitrogen Fertilizer in Corn Production with Implications for Policy"** *Okwudili Onianwa, University of Arkansas at Pine Bluff and Richard Alderfer, University of Minnesota.*

The efficacy of a tax strategy to curb nitrogen fertilizer use in corn production was examined using a state-level translog cost function. The results indicate that taxation measures will be ineffective in changing producers' behavior. Other policies such as quotas or education should be explored for an effective policy prescription. The derived elasticity estimates were consistent with those of other studies. Therefore, the policy implications can be generalized to be applicable to other regions.

**"Developing a Manure Value Function"** *Fritz M. Roka, North Carolina State University and Dana L. Hoag, Colorado State University.*

A manure value function is developed for swine manure. Value is defined for a given stock of manure and is determined by a joint set of decisions including treatment level, crop type, and transport technology. Using North Carolina data, it was found

that manure value increases with manure quantity. This positive relationship was attributable to economies of scale in irrigation. Value functions were compared for different crop (corn) price assumptions. When crop prices are low, manure values are higher with lower quantities of manure. Higher crop prices increase incentives to handle larger volumes of manure.

**"Input Factor Demand Subject to Economic and Environmental Risk: N-Fertilizer in Corn Production"** *Gordon L. Carriker, Kansas State University.*

Economic and environmental risks associated with nitrogen fertilizer management are examined relative to N-fertilizer demand. Both nominal and environmental damage adjusted net returns distributions are evaluated using stochastic dominance analysis. Results suggest that, in the absence of environmental risk, N demand is more elastic, as expected, as farmers become more risk averse. When environmental risk is introduced to the decision-making process, N demand is even more elastic.

**"Estimating the Derived Demands for Livestock Feeds: A Translog Cost Function Approach"** *Gary M. Adams and Nicholas Kalaitzandonakes, University of Missouri.*

The derived demands for the major livestock feeds are estimated using a translog cost function approach. The estimation covers the period 1950-1990. Making use of this time period will allow the analysis of elasticity changes over time. Also, the approach is theoretically motivated and not *ad hoc* in nature.

**"The Productivity of Agricultural Pesticides In the United States, 1949-1991"** *Mark Teague and B. Wade Brorsen, Oklahoma State University.*

A growing concern exists about the steady increase of pesticide use in the United States and the possible negative impacts of this trend. This paper provides an economic response to this issue by specifying an aggregate production function and

obtaining estimates of production elasticities and marginal value products of agricultural inputs. A pooled cross-section (48 continental states) time-series (1949-1991) model should determine the long-run marginal value product of pesticides in the United States. The estimated MVP of pesticides is \$5.32 per dollar spent on pesticides which is within the general range of \$3 to \$6 found by other studies done for cross-sectional units at specific points in time.

**TRADE POLICY AND AGRICULTURE**  
(Moderator: *Ntam Baharanyi, Tuskegee University*).

**"Economic Implications from U.S. Regionalization of Broiler Exports Under Quarantine Conditions"** *W. Terry Disney and Mark A. Peters, ERS-USDA.*

Many countries who import broilers from the U.S. follow the USDA lead in establishing policies for import of livestock and meat products from countries known to be infected with certain animal diseases. USDA currently prohibits or severely restricts the importation of live animals or meat products from anywhere within an affected country. This will change with the passage of GATT and NAFTA agreements. These agreements commit signatory countries to recognize disease free zones and regions and allowing trade to occur from those areas. This concept is known as regionalization. This paper examines the economic consequences of a major avian influenza outbreak in the U.S. under both current treatment and proposed regionalization. The most likely benefit to regionalization will be the preservation of existing U.S. trade in broilers. This benefits U.S. broiler producers outside the region of disease outbreak, but probably hurts U.S. consumers.

**"U.S. Peanut Supply and Demand Estimation and the Effects of NAFTA on the U.S. Peanut Market"** *Curtis M. Jolly, Auburn University and Pierre-Justin Kouka, University of Arkansas at Pine Bluff.*

Demand and supply models were developed for the U.S. peanut industry, using a market



disequilibrium model and maximum likelihood estimation. The effects NAFTA may have on the industry were evaluated. Own price and price of substitutes significantly affected demand. Technology, government programs, weather, and price influenced supply. NAFTA had no serious effects on price, demand, and supply.

**"Hyperinflation in Bolivia: Monetary Effects of Stabilization Policies"** *Victor De La Barra, Mary A. Marchant, and Aida Isinida, University of Kentucky.*

During the 1980's, Bolivia faced an economic crisis culminating in hyperinflation, where monthly inflation rates exceeded 50 percent and the annual rate was over 8,000 percent. A new administration sought to overcome hyperinflation through stabilization policies which implemented drastic economic reforms. This research estimates the demand for money during both the hyperinflation and stabilization periods and tests for structural change. Results indicate that structural

change in the demand for money occurred after stabilization policies were implemented, indicating that the new government's objectives were met.

**"Devaluation and U.S. Apple Exports: Exchange Rate Pass-Through and Competitive Pricing"** *Robert D. Weaver and Kathleen Trask, Pennsylvania State University.*

A general theory of imperfectly competitive pricing of imports was presented which allows explicit examination of the noncompetitive pass through of exchange rates. While past studies of the law of one price have directly examined identities derived from the purchasing power parity theorem, this paper presents a framework which explicitly states how prices are formed. Quantity differentiation is allowed and a more general theory of oligopoly pricing is presented. Results of an application to the U.S. apple export prices in the U.K. confirm the power of this approach for examining market pricing and exchange rate pass through.

## ORGANIZED SYMPOSIA ABSTRACTS

### Annual Meeting SAEA, Nashville, Tennessee, February, 1994

**"Restructuring Agribusiness Curriculum and Development of Teaching Strategies at Selected 1890 Land Grant Institutions"** (Moderator: *Kerry K. Litzenberg, Texas A&M University*).

**Organizer:** *Surendra P. Singh, Tennessee State University.*

**Presenters:** *Suresh R. Londhe, South Carolina State University, Zacch Olorunnipa, Florida A & M University, Surendra P. Singh and Sammy Comer, Tennessee State University, J. Befecadu, E. Fails, H. Jones, J. Richardson, and G. Wheelock, Alabama A & M University, Isaac O.C. Abara, Florida A & M University.*

In the food and fiber sector the need for well-trained agribusiness graduates is becoming increasingly important but this need is not being adequately met. Also, the shortage of minorities in agriculture and agribusiness has been well documented. Several institutions are in the process

of restructuring their curriculum to meet the needs of agribusinesses. The major purpose of the proposed symposium is to highlight various aspects of curriculum restructuring, strategies used, problems encountered, and their solutions.

**"Southern Economists and Wetlands and Endangered Species Issues"** (Moderator: *Verne W. House, Clemson University*).

**Organizer:** *Verne W. House, Clemson University.*

**Presenters:** *David A. Cleaves, Southern Forest Experiment Station, Amy Purvis Pagano, Bion Technologies, Webb Smathers, Clemson University, Verne House, Clemson University.*

Southerners are sharply divided over the issues of wetlands and endangered species issues. Scientists, both biological and social, are not so much divided as worlds apart. Little research has