ABSTRACTS

SELECTED PAPERS

DEMAND ANALYSIS AND POLICY IMPLICATIONS (Lee Myers, USDA).

"Additional Evidence on the Changing Demand Structure for Meats in the United States." Roger A. Dahlgran, Iowa State University.

This paper presents and estimates a system of flexibility equations for beef, pork, and chicken. The empirical model is estimated in accordance with a theoretical income-constrained utility maximization model of consumer behavior. Empirical results are unable to refute the theoretical constraints. The model is used, together with the cumulative sum of squares technique, to detect structural change in retail markets for beef, pork, and chicken. Findings of this study suggest that, since 1973: (1) meat demands have become more variable; (2) chicken production has had a greater effect on retail beef and pork prices; and (3) beef and pork production have had a greater effect on retail chicken prices. These findings suggest that chicken has become a closer substitute for beef and pork in the post-1973 period.

"Effectiveness of Generic Milk Advertising: A Ten Region Study." Ronald W. Ward and William F. McDonald, University of Florida.

A pooled cross sectional-time series model points to the positive impact of advertising fluid milk in a 10-market region. The model provides an empirical base for simulating the impact over levels of advertising expenditures. In 1983, the rate of return to advertising was 1.6629 for each dollar spent and consumption increased 4.470 percent over what would have occurred without the generic advertising.

"The Demand for Fruit Juices: Market Participation and Quantity Demanded." Mark G. Brown, Florida Department of Citrus and University of Florida.

The quantity demanded in a market can be decomposed into two components: the number of purchasers and the quantity per purchaser. Focusing on these components, demands for different types of single flavor fruit juice commodities were analyzed. The approach allowed the market demand elasticities to be estimated as the sum of the elasticity estimates for the numbers of purchasers and the elasticity estimates for the quantities per purchaser. The method of seemingly unrelated regressions was employed to estimate the equations for the two demand components for the different types of juice. It was shown how the results could be useful in examining changes in market shares and, in general, market diversity through the concept of entropy.

"A Study of Bargain Hunters Among COJ Consumers." Jong-Ying Lee, Florida Department of Citrus and University of Florida.

This study used a Type 2 Tobit model to study the influence of household characteristics on using special deals when purchasing chilled orange juice (COJ). Results show that the amount of special deals obtained by COJ purchasing households is affected by a set of selected household characteristics and the price of COJ.

"Estimation of Food Expenditure Patterns in the South." Chung L. Huang, Robert Raunikar, and Holly L. Tyan, University of Georgia.

This study identifies expenditure patterns for eight food groups in the South from the 1977-78 USDA Nationwide Food Consumption Survey. The Linear Expenditure System was used to estimate each expenditure pattern separately as conditional on total food expenditure to circumvent the problem of nonpurchase present in survey data and hence, allowing the retention of most of the observations for empirical analysis. Flour, cereal, and bakery products, and red meats were consistently considered as necessity and luxury items, respectively, among southern households. Three simulated experiments were discussed.

"Home Production and Time Allocation: The Case of Grocery Shopper Gender." David M. Smallwood and James R. Blaylock, USDA.

A household production model including human capital is developed to examine the intrafamily allocation of human resources to grocery shopping. The determinants of a household's choice of shopper (male, female, or both) are examined via a multinomial logit model using data from the 1977-78 USDA, National Food Consumption Survey.

Opportunity costs of time and direct money expenditures are found to be important determinants. Other determinants include the number of children under age 13 in the household, education levels, and urban and regional location of the household's residence.

MARKETING ALTERNATIVES FOR AGRICULTURAL PRODUCERS (Ed Fryar, University of Arkansas).

"Forward Cash Contracting of Cotton." Stephen E. Miller, Clemson University.

This paper extends previous models of optimal forward pricing to include forward cash contracting as a forward pricing tool with applications to cotton data. Models are developed which estimate optimal contracting levels based on either bales produced or acreage in the face of price and yield uncertainty within a mean-variance framework. Empirical applications of the models to cotton data for selected states indicate optimal direct hedging levels exceed optimal cash contracting levels for infinite risk aversion.

"An Evaluation of Pricing Strategies Used by Soybean Producers." Mack N. Leath, ERS, USDA.

Research and extension programs have placed much emphasis on grain marketing and pricing strategies in recent years. This paper presents results of a recent survey of soybean producers in 21 states to determine methods actually used in pricing and marketing their crops. The pricing opportunities that existed in the survey years are presented along with an evaluation of ownership costs associated with deferred pricing arrangements during the survey years.

"Analysis of Grain Marketing/Pricing Strategies." Steven Riggins and Michael Reed, University of Kentucky.

Nine corn and soybean marketing strategies were compared for price performance and price variability over a 13-year time period. Five of the strategies utilized no current marketing information; sales dates were predetermined by historical price data. The remaining four strategies utilized some form of current marketing information to trigger the pricing decision. Three of these four strategies incorporated fundamental and/or technical analysis to make the pricing decision. Results indicated that strategies which use both fundamental and technical information not only increase net price, but also reduce price risk.

"Effects of Put Options and Futures on Income Risks in Soybean Production." Geraldo Plato and Richard Heifner, USDA.

Stochastic simulation is used to compare the probability distributions of Iowa soybean producers under three pricing alternatives: (1) cash sales at harvest; (2) selling futures at planting; and (3) buying put options at planting. With unbiased futures prices, probabilities of very low gross incomes (lowest 5 percent of those expected with cash sales) are less with optimal hedging in futures than with buying at-the-money put options. However, futures prices rose by an average of 5 percent over the growing season from 1960 to 1983, the period used in the analysis. Such price increases substantially lower average incomes relative to cash sales for both options and futures.

"Risk-Efficiency Analysis of Alternative Marketing Strategies for Mixed Crop Farms in North Florida." Kwabena A. Anaman and William G. Boggess, University of Florida.

Cumulative probability distributions of income for different management scenarios involving marketing strategies are subjected to stochastic dominance analysis to determine risk-efficient sets of scenarios for different groups of farmers in North Florida. Results show that farmers behave differently in their choice of marketing strategies according to their risk attitudes. Highly risk-averse farmers use some forward contracting while low-risk averse and risk-loving farmers use only the cash sales at harvest time strategy. Use of the futures market leads to both higher income and more risk than with forward contracting. However, it results in less income and risk than cash sales.

"Returns and Risks of Farm Storage of Grains and Soybeans." Stephen L. Ott, University of Georgia.

To test the economics of constructing on-farm drying and storage facilities for grains and soybeans in Georgia, a simulation model was developed that generates cumulative distributions of costs. Using stochastic dominance theory to rank the distributions, it was

found that building on-farm drying and storage facilities is stochastic dominant over direct marketing at harvest only when two or more crops are stored per year and if the farmer hedges to take advantage of the change in basis.

SOIL CONSERVATION (Linda Lee, USDA).

"Soil Conservation Benefits of the USDA's 1983 PIK and Acreage Reduction Program." A. Barbarika, Jr. and D. Colacicco, USDA.

The soil conservation benefits of the USDA's Payment-In-Kind and Acreage Reduction Programs of 1983 were analyzed based on a survey of more than 4,500 farms in 227 counties. Reduced soil erosion as a result of diversion was estimated at 135 million tons per year, an average of 1.8 tons per acre per year over the 80 million acres idled. Withdrawn land was not found to be more erodible or of poorer capability than U. S. cropland in general. Results are used to discuss implication for future programs.

"Soil Conservation Technical Support and the Conservation Adoption Decision." Gary D. Lynne and Leandro R. Rola, University of Florida.

A significant part of the soil reducing effort by the U. S. Soil Conservation Service (SCS) has been technical assistance provided farmers. One more contact by SCS technical personnel with Florida Panhandle farms having at least 12 years of formal education increased the probability of adopting an annual practice by 2 percent. With an average of two contacts in 1983, probability improvements suggested the practices had to have an expected net benefit of at least $577, to as high as $7,527 per farm to justify technical assistance, dependent upon the level of formal education.

"Tenure and Effort to Control Soil Erosion: A Matched-Pair Analysis." J. Dixon Esseks and Steven E. Kraft, Southern Illinois University.

Data from a survey of 661 farmers in six diverse agro-ecological areas are analyzed to determine the effects of tenure on soil conservation effort. Farmers both owning and renting land are studied using matched pair analysis. Results were that farmers treat owned land significantly better than rented land. Regression results indicated that farm size, age, percent of rented land under cash lease, percent of land farmed which was owned, and perception of erosion problems were significant in accounting for the differences in conservation on owned and rented land.

"What Really is Soil? Policy Implications for the South." Mitch Renkow, Dana Hoag, and Ray Daniels, North Carolina State University.

Recent research suggesting that marginal yield response to topsoil depth in the South is increasing at low topsoil depths is examined. The yield-soil response function has been hypothesized as convex due to mixing of clayey subsoil with topsoil beyond a certain level of erosion. Proper definition of topsoil is found to generate globally concave response functions. However, if clay is a limiting factor on yield, the time path of yield is convex beyond the point when mixing begins. This implies that the marginal benefits of soil conservation are maximized at intermediate topsoil depths.

"Factors Influencing the Adoption of Soil Conservation Practices: A Virginia Case Study." Patricia E. Norris and Sandra S. Batie, Virginia Polytechnic Institute and State University.

Using the results of a study of farm operators in two Virginia counties, factors which impact farmers' soil conservation practice adoption decisions are examined. Results indicate that financial factors are the most important influences on farmers' use of conservation practices. However, a number of other factors were found to influence conservation expenditures. Factors influencing conservation tillage acreage differed somewhat from those influencing expenditures for other conservation practices. These results are discussed in terms of their implications for conservation programs.

"Productivity Benefits of Erosion Control." Daniel Colacicco and Alexander Barbarika, Jr., USDA.

Long-term productivity benefits per ton of soil, defined as the yield, fertilizer, and lime effects of maintaining topsoil, were estimated using a recently developed soil loss/yield response model, national resource inventories, and crop yield data. The average value of productivity benefits in the United States was 40 cents per ton of erosion reduction, ranging from a high of $1.11 in the Northeast

to 12 cents in the Southeast. These estimates were applied to the erosion reduction estimates from a sample of installations of federally subsidized practices to generate dollar benefit estimates. These per ton values were also applied to erosion estimates. Results indicate a nationwide damage estimate due to erosion of $900 million for 1982.

FARM DEBT CRISIS AND RELATED AGRICULTURAL FINANCE ISSUES (Deborah Markley, University of Tennessee).

"Financial Stress and Debt Use: A Microeconomic Management Study." Gregory D. Hanson, USDA, and Kenneth Moss and William E. Hardy, Auburn University.

Income variability, enterprise diversification, and debt management issues are examined for a 1978-82 microeconomic farm sample. Descriptive statistics indicated substantial declines in investment, consumption, profitability, and net worth. Debt management behavior was analyzed with a quadratic regression model that illustrated the importance of government programs, specialization, investment, and cost structure. Elasticities and critical (benchmark) values were developed and the ability of farmers to control debt levels was examined by relating the regression results to trends in the sample data.

"Some Evidence on U. S. Farm Credit Demand and the Current Debt Crisis." Craig A. Witt and Donald W. Reid, University of Kentucky.

This paper develops and empirically tests an aggregate model of farm credit demand. Of particular interest is the rationality of farmer behavior in acquiring debt during the 1970s. Results of the model indicate that farmer debt acquisition patterns are explainable and the farmers did not act irrationally in debt acquisition during the 1970s. However, it appears that farmers base their expectations on events in recent history.

"A Financial Leverage Model for Estimating Firm Production Related Growth, Required Growth, and Financial Risk." Lonnie R. Vandeveer, Louisiana State University.

Farm financial conditions have received much attention throughout the country. A financial leverage model is developed to estimate the maximum financial leverage level for a farm firm where maximum financial leverage is estimated in terms of the ratio of debt-to-equity and is defined where the rate of growth in equity capital equals the firm's required growth in equity capital. The model also provides a means for estimating financial risk. Application of the model to a 320-acre irrigated cotton farm indicates the farm could not meet its financial commitments when the proportion of debt in its capital structure exceeds 48.6 percent.

"FmHA's Efforts Against Delinquent Borrowers: Property Interests and Transaction Costs." Terence J. Centner and Fred C. White, University of Georgia.

The Farmers Home Administration (FmHA) has employed a nonjudicial foreclosure proceeding in some states in order to protect its investment in mortgaged properties. A recent judicial interpretation of property interests precluding FmHA from using this remedy may be expected to lead to increased transaction costs. An economic supply and demand model for local real estate is used to show a "hold-up" problem creating a market inefficiency.

"Impact of Bank Structure on Farm Debt Formation." William G. Colclough, University of Wisconsin and Mark D. Lange, Louisiana State University.

Uncertainty with regard to the performance of U. S. agricultural credit markets and farm operator survivability has reached proportions unmatched since the early 1930s. The impact of bank structure is investigated in this paper. Differential patterns of debt formation across states are shown to be attributable to state banking regulations, as well as to federal deregulation of the banking industry.

COMMODITY PRICE ANALYSIS (David Kenyon, Virginia Polytechnic Institute and State University).

"An Analysis of U. S. Coffee Inventories, Interest Rates, and Futures Prices." Alejandro Reyes and Glenn C. W. Ames, University of Georgia.

This study used the ratio of inventories to processing requirements for measuring the sensitivity of coffee stocks to real interest rates. The model reveals a significant inverse relationship between inventories of coffee for processing and the real rate of interest. Also,

the role of futures prices in inventory adjustment relative to processing requirements was investigated. There was a positive relationship between the futures price lagged two quarters and the ratio of inventories to coffee roastings, indicating that as price rose on the futures markets, processors acquired inventories in expectation of higher prices.

"Money Supply, Interest Rates, and Cattle Prices: A Causal Relationship." Soumendra N. Chosh and DeeVon Bailey, Utah State University.

Granger causality tests were employed to determine the dynamic relationships between money supply (M1), interest rates (26-week Treasury Bills), and fat cattle prices. Interest rates were found to significantly impact on cattle prices. While no direct causal link was established between the money supply and cattle price, the money supply was determined to cause interest rates indicating a spurious or indirect causal relationship between cattle prices and the money supply.

"Estimating Implicit Marginal Prices of Quality Characteristics of Peaches." Jeffrey L. Jordan, R. L. Shewfelt, S. E. Prussia, and W. C. Hurst, University of Georgia.

A model for estimating the implicit prices for selected quality factors of fresh peaches at the wholesale and retail stages of the U. S. food distribution system is developed. A hedonic price function was developed using a flexible functional form. The estimation of hedonic prices is proposed as a method of evaluating changes in the postharvest system. Those quality characteristics of highest value that most affect the price of peaches can help determine the economic feasibility of alternative handling techniques or new technologies.

"Price Determination in the U. S. Shrimp Market." Charles M. Adams, Fred J. Prochaska, and Thomas H. Spreen, University of Florida.

The dynamic price determination process must be known to formulate effective regulatory policy and to make business decisions regarding price at each market level. The objective of this study was to examine monthly and quarterly price determination processes for two sizes of raw-headless shrimp for three market levels. The causal direction of price determination was assessed between prices representing adjacent market levels using Haugh-Pierce, Sims, and Granger methods. Price dependent models containing empirically determined lead/lag relationships were estimated.

"Estimation of Implicit Prices for Green Pepper Quality Attributes Using an Hedonic Framework." Edmund Estes, North Carolina State University.

Marginal implicit prices for selected green pepper quality attributes were estimated using conventional linear regression techniques within an hedonic framework. Results indicated that cooler product temperatures and larger sized fruit were important physical attributes valued by wholesale buyers operating on Atlanta Farmers' Market during the 1985 summer period. In general, marginal implicit valuations for temperature and fruit size did not change appreciably over the marketing season.

"Quantitative Analyses of Asian Rice Economies." Shoichi Ito, Texas A & M University; Eric J. Wailes, University of Arkansas; and Warren R. Grant, USDA.

This study investigates the Asian rice economies and quantitatively analyzes them, focusing on major rice producing and consuming countries using annual data between 1962 and 1981. Results of this study provide quantitative estimates on price elasticities of yield, area harvested, production, and consumption, and income elasticities for demand in these countries. The relationship between the proportion of rice expenditures in Gross Domestic Product (GDP) and income elasticity is analyzed.

INPUT DEMAND AND TAXATION ISSUES (Lonnie Jones, Texas A & M University).

"Effect of Selected Tax Policies on Farm Firm Growth and Management Practices: A Multiperiod Programming Analysis With Emphasis on Catfish." Henry Kinnucan and Oscar Cacho, Auburn University.

A multiperiod programming model was used to simulate the effects of lower marginal income tax rates, the soil and water conservation deduction, and the cash tax accounting option on firm growth for a "representative" farm operating in the Alabama Black Belt region. Results show the lowered marginal income tax rates associated with the Economic Recovery Tax Act (ERTA) of 1981

providing a positive growth stimulus to the modeled firm as measured by accumulated net worth over a 10-year planning horizon. The soil and water conservation deduction in general provided greater tax relief to the modeled firm than either the ERTA income tax rate changes or the cash tax accounting provision. Important complementary and substitute relationships were found to exist between marginal income tax rates and the various tax provisions studied, implying that extreme care must be exercised when attempting to evaluate the actual impact on affected farm firms of changes in tax policy.

"Effects of Inflexible Income Tax Depreciation Provisions." Donald W. Reid and Jerry R. Skees, University of Kentucky.

The Accelerated Cost Recover System (ACRS) of the Economic Recovery Tax Act of 1981 restricted choice of tax depreciation method and life for depreciable assets. This paper demonstrates that the inflexibility of ACRS does not severely impact the absolute or relative position of farms. For the various farm sizes examined, the 5-year straight-line method allowed more wealth accumulation (wealth-gain) than the other statutory rates and lives. The most severe relative restriction was on the smallest farm (300-acres), which caused the wealth-gain to decrease by 0.26 percent from the life and method (10-year, straight-line) yielding the highest wealth-gain.

"Income Tax Considerations in the Lease vs. Purchase Decision." Marcia L. Tilley and James S. Plaxico, Oklahoma State University.

A microcomputer spreadsheet model was developed to analyze the income tax consequences of leasing and purchasing farm equipment and to compute breakeven lease values. This model differs from prior models in that it accounts for adjustments to marginal tax rates which result from the purchase or lease and places a ceiling on tax benefits equal to the pre-purchase or pre-lease tax liability. Results from the model are compared to results using a fixed marginal tax rate assumption. The model is also used to analyze the impact of recent tax reform proposals on breakeven lease values.

"Plant Nutrient Demand Functions for Tennessee with Prices of Jointly Applied Nutrients." Roland K. Roberts, University of Tennessee.

Several studies have estimated plant nutrient demand functions for N, P_2O_5, and K_2O. All included own-price effects but excluded prices of jointly applied nutrients. In this study, nutrient demand functions, which include prices of other nutrients, are estimated for Tennessee by seemingly unrelated regression. Results suggest that prices of other nutrients are important in determining plant nutrient demand, at least in the case of Tennessee. Also, it was found that multicollinearity need not be a hindrance in all cases to including prices of other nutrients in plant nutrient demand models.

"Estimated Input Demand Functions for Rice Producers in Louisiana." Patricia E. McLean-Meyinsse, Southern University.

A generalized Leontief dual cost function is used to derive the system of demand equations for rice producers in Louisiana. Five major inputs (labor, capital, fertilizers, chemicals, and seeds) are considered for the years 1960-1983. Results show that an aggregate nonhomothetic production function for rice exists. Increases in rice yields are associated with economies of scale and factor-augmenting technical change. Estimates for own-price elasticities of demand are less than one (inelastic) in absolute value.

"Using Capitalization Theory to Model Urban Land Prices." Valerie L. Vantreese and Michael R. Reed, University of Kentucky.

Knowledge of how various factors affect urban land rents and land values is important in understanding land-use changes. Based on capitalization theory, this study utilizes an asset-pricing model to incorporate the structural relationships among interest rates, inflation, and urban land rents in order to estimate urban land values. This approach provides empirical results that compare the capitalized value of certain land characteristics and the rent associated with those characteristics.

PRICE ANALYSIS AND EXPORT DEMAND (Robert Raunikar, University of Georgia).

"Monetary Controls and U. S. Cotton Exports: A Vector Autoregression Approach." Mechel S. Paggi, Texas A & M University.

The influence of exports of cotton on producer returns are well documented. Information regarding factors which affect cotton

exports is important to those interested in the well-being of Southern agriculture. Much attention has been focused on macroeconomic policy and its effect on U. S. agricultural exports. A great deal of this literature focuses on the role exchange rate variation has played in agricultural trade. One factor which affects the level of the value of the U. S. dollar is the rate of growth in the money supply which is regulated by the Federal Reserve Board. This paper tests the hypothesis that the rate of growth in the money supply has an econometrically measurable impact on U. S. export sales of cotton. Results indicate that in addition to the rate of growth in the money supply, other factors have a strong influence on export sales of U. S. cotton in the short run.

"Price and Value Effects of Pecan Crop Forecasts, 1971-1984." Carl E. Shafer, Texas A & M University.

Pecan price equations based on first differences of USDA October crop estimates or final production and carry-in stocks provided reasonable and useful formulations for price explanation and forecasting. The September-December season's average price appears more dependent on crop estimates than final reported production. USDA October crop forecasts exceeded final production 10 of the 14 seasons, probably yielding prices and crop values slightly lower than had the estimates equalled actual reported production. Quite larger variations in annual pecan production suggests difficulty in making accurate early season crop forecasts. Prices may have been much lower in the absence of the generally reliable October crop forecasts.

"Price Forecasting and Trigger Price Probability Estimation: The Single Equation Approach." S. M. Fletcher, J. E. Epperson, and M. F. Collins, University of Georgia.

The purpose of this paper is to show how probability estimation can be incorporated with price prediction from a single equation to enhance the usefulness of forecast information and provide intuitive appeal in its use. Empirical application encompasses forecasting in the watermelon industry to demonstrate the power and appeal of the approach.

"Farm-To-Retail Price Linkages for Sugar." Noel Blisard, USDA.

This research reports on how changes in farm level prices are transmitted to the retail level. Two questions are addressed: (1) what is the retail price adjustment process given a change in farm commodity prices? and (2) does retail price respond asymmetrically to changes in commodity price? Two case studies were conducted for sugar sold at retail and ice cream. The underlying commodity of interest is raw sugar. For sugar sold at retail, the results indicate that changes in raw sugar prices are completely passed through the system and the price response is symmetrical. No statistical evidence was found to link changes in ice cream price to changes in raw sugar prices.

"An Investigation of the Role of Exchange Rates on U. S. Exports of Selected Agricultural Products: 1968-1983." Nathan W. Childs and Michael D. Hammig, Clemson University.

An econometric partial equilibrium trade model of the U. S. corn, wheat, soybean, cotton, and tobacco markets is developed for the yearly periods of 1968-1983. The effect of real exchange rates, real price, and demand factors on the exports of each commodity is examined to test the hypothesis that monetary factors can affect the agricultural sector. An examination of the elasticities of real price, real exchange rate, and real income indicate an extremely inelastic response to both price movements and exchange rate adjustments. Foreign buying power is the strongest explanatory variable. An exchange rate linkage with the agricultural sector is not substantiated.

PRODUCTION ECONOMICS (Jim McGrann, Texas A & M University).

"Costs of Production on Varying Sized General Crops Farms in the Delta Region of Mississippi." B. R. Eddleman, J. A. Musick, and J. G. Hamill, Mississippi State University.

Technical economies to size and pecuniary gains from input purchases and/or farm commodity sales through vertical cooperative and corporation integration were analyzed for varying sizes of general crops farms in the region. Economies to size were found for cotton and soybean production due to differences in: (1) management practices and costs in production and associated crop yields, (2) ownership costs of "lumpy" machinery and equipment investments, and (3) specialization and division of labor. Rice pro-

duction did not exhibit any general pattern of decreasing costs throughout the range of farm parcel sizes. Pecuniary gains from cooperative integration in buying and selling activities of farms were related to the size of farming operation.

"Economic Effects of Johne's Disease Control; Vaccination and Calf Removal in Dairy Herds—A Dynamic Simulation Approach." James Kliebenstein and Kevin Walker, University of Missouri-Columbia.

Simulation is used to estimate economic impacts of alternative Johne's (paratuberculosis) control methods in dairy herds. Control methods evaluated are vaccination of newborn calves, immediate removal of calves from dams at birth with replacements raised separately from the milking herd, or a combination of both methods. Disease epidemiology is incorporated into the simulation model. Three disease prevalence rates and three levels of efficiency of disease control dynamics are evaluated. Vaccination was an effective control method with low prevalence rates.

"An Evaluation of Farm Operator Attitudes Towards Reduced Agricultural Chemical Application." Robert Dubman, Webb M. Smathers, Jr., and Lewell Gunter, University of Georgia.

Farmer's attitudes toward reducing agricultural chemical use were investigated using ordinal probit analysis. Farm size, education, age, and current practice had strong influences. Risk aversion is a factor in not eliminating use of fertilizer and pesticides. Age had a decreasing and then increasing effect on willingness to reduce chemical use.

"Technical Efficiency of Illinois Grain Farms: An Application of a Ray-Homothetic Production Function." Krishna Belbase, Cornell University, and Richard Grabowski and Steven Kraft, Southern Illinois University.

The extent of technical inefficiency for a sample of Illinois grain farms using the corrected ordinary least squares method (COLS) was measured. However, instead of assuming a Cobb-Douglas production function, a linear form of the ray-homothetic production function was used. Results show a significant amount of technical inefficiency among all the farms in the sample with large farms being more technically efficient than small farms.

"A Re-examination of Risk, Farmer Characteristics, and the Adoption Process." E. Jane Luzar, Randall A. Kramer, and Steven C. Turner, Virginia Polytechnic Institute and State University.

Recent efforts to measure risk preferences along with efforts to explain these preferences in terms of socio-economic attributes are reviewed. Explanations dealing with conceptual and empirical issues are offered for the consistently poor performance of models previously reported in the literature. Within the context of the adoption process, this paper used an abbreviated elicitation method to further analyze the relationship between risk attitudes and selected socio-economic characteristics for 229 farmers in Southwest Georgia. The research suggests the need for new directions for this area of investigation.

"Microcomputer Software for Forecasting U. S. Regional Soybean Yields." Diane K. Willimack, USDA.

Microcomputer software has been developed enabling convenient use of soybean yield forecast equations for the Corn Belt, the Delta, and the Southeast. Yield forecasts are based primarily on weather information during the growing season and can be adjusted as often as every week using regional weather data from a reliable source. The equations have been programmed into LOTUS 1-2-3 spreadsheets for use on IBM or compatible personal computers with DOS 2.0 and 520K workspace. Upon input of the relevant temperature and precipitation values, the software provides calculation of each region's yield point forecast, as well as the 95-percent forecast interval.

IMPORT COMPETITION AND GOVERNMENT INTERVENTION

(Alvin Schupp, Louisiana State University).

"Import Excise Taxes and the Florida Citrus Industry." Gary F. Fairchild, Dan L. Gunter, and Jong-Ying Lee, Florida Department of Citrus, University of Florida.

The equalization tax was found to have a positive effect on both price and quantity of orange juice sold. Elimination of the tax would likely lead to reduced orange juice demand and industry revenue. Elimination of the tax would not likely lead to a substantially

improved competitive position given Brazil's flexibility in pricing. Neither the Florida citrus industry nor the State of Florida would benefit from elimination of the tax.

"Government Intervention and Technological Change in the Sweetner Industry: A Welfare Analysis." Suchada V. Langley and James A Zellner, USDA.

Welfare effects of government programs in the sugar market on consumers, producers, and taxpayers were analyzed. Consumer and producer surpluses were estimated from a corn-sugar-high fructose corn sweetner model. Sugar programs during 1967-1984 created a wide wedge between domestic and world prices. Domestic consumers lose the most from the policies. The higher domestic sugar price encouraged production of sugar substitute products. Introduction of HFCS as a substitute for sugar resulted in lower consumer costs of the sugar program. Domestic and foreign sugar producer gains were reduced as a result of HFCS market penetration.

"Implications of the Canadian Tariff to the Aggregate Income and Marketing Strategy of Southeast Fresh Peach Producers." James C. O. Nyankori, C. Parr Rosson, and P. J. Rathwell, Clemson University.

The redistributive effect of the Canadian tariff on aggregate regional income of U. S. fresh peach producers was computed using results from a spatial price equilibrium model of the Canadian-U.S. fresh peach trade. Regional income of producers in the Southeast and West increased but the income of producers in the Midwest, Northeast, and Southwest decreased with the tariff. Implications to export promotional activities by Southeastern producers in the Canadian market were explored. The general conclusions were that the marginal returns to promotional investments by Southeastern producers are likely to offset the marginal income effects of the tariff.

"An Analysis of the Impact of Changes in Hog and Pork Imports on the U. S. Pork Industry." Jon A. Brandt, Purdue University, and Robert E. Young, II and Shamsul Alain, University of Missouri.

A large econometric model of the U. S. livestock sector is used to analyze the impact of pork and live hog imports on the U. S. swine industry for the periods 1983-1985 and 1986-1992. Results indicate producers have suffered substantial revenue losses over the recent period due to increased imports through both reduced production and lower prices. Consumers have benefited only modestly from lower prices. Over the future period, producers are expected to experience continued large losses in revenue, although less than during the 1983-85 period, if pork imports remain at the current levels. Consumers will be relatively unaffected.

"Canadian Hog and Pork Imports: Potential Cause and Price Impact." John Rowsell and David Kenyon, Virginia Polytechnic Institute and State University.

A price model is estimated to determine the impact of imports of Canadian hogs and pork products on the U. S. seven market price for live hogs. Supply models for Eastern and Western Canada are estimated to determine if federal and provincial income stabilization programs are responsible for increased production of hogs in Canada. The analysis shows that the stabilization payments have not increased production substantially. Increased hog production is related to government programs restricting supply in dairy and poultry. The large increases in Canadian exports in 1984-85 are related to changes in exchange rates.

"Assessing Foreign Competition in the Winter Fresh Tomato Industry." Emil Belibasis and John J. VanSickle, University of Florida.

Florida and West Mexico are major competitors for the United States winter fresh tomato market. Previous studies have shown Florida gaining a competitive advantage over West Mexico in producing tomatoes for the United States domestic market. A reassessment of the competitive situation for the 1984-85 season shows Florida continuing to possess a cost competitive advantage. The primary reason for Florida holding a competitive advantage is the high cost of marketing Mexican tomatoes in the United States. Florida growers incur marketing costs of only $0.15 per carton compared to $2.28 per carton for Mexican growers.

RESEARCH TOPICS (Scott Shonkwiler, University of Florida).

"Value of Pretests for Estimating Underlying Technologies Using Dual Profit Functions." Margot Anderson, Univer-

sity of Illinois, and Bruce L. Dixon and Phillip Garcia, University of Arkansas.

Usefulness of testing for and maintaining basic theoretical properties of dual profit functions is examined in a Monte Carlo framework. The translog and generalized linear models are selected as approximating forms. Results of testing for the equality of common parameters among the profit function and derived demand equations are uniformly misleading. Tests of monotonicity and convexity hypotheses are found to be indifferent indicators of goodness of fit. Enforcing convexity in the translog model enhances accuracy of estimating parameters of the true, underlying technology.

"Modeling Growth for Economic Analysis of Dynamic Agricultural Systems." Thomas Johnson, North Carolina State University.

A review is given of one variable growth equations and multivariate growth systems. It is shown that Savageau's multivariate generalization of Bertalanffy's equation can be both flexible and interpretable. Results of a recently developed method are shown for estimating parameters of such systems of stochastic differential equations.

"A Flexible Accelerator Model for U. S. Agriculture." Uptal Vasavada, University of Georgia.

A stochastic optimal control model that incorporates adjustment costs and adaptive expectations is specified. Parameter estimates for a multivariate flexible accelerator model are presented. A sequence of hypothesis tests are performed to discern the dynamic structure of aggregate U. S. agricultural production. Test results reject the hypotheses of quasi-fixity for intermediate materials and the univariate flexible accelerator. Estimates of the adjustment coefficients are used to compare the performance of U. S. agriculture with the manufacturing sector. Both labor and capital stocks adjust slower in U. S. agriculture than in other sectors. This is construed as evidence of high adjustment costs for this sector.

"Multicollinearity Revisited: A Comparison of Selected Diagnostic Tools for Agricultural Economic Research." Stephen Leong, Louisiana State University.

The problem of collinearity that degrades the coefficients of the estimates and makes hypotheses testing and forecasting unreliable has concerned researchers for many years. The symptoms of low t values and high standard error of estimates have helped to detect its presence. The correlation matrix may confirm its presence but it is unable in itself to specify the nature of the dependency in multivariate analysis. Remedial actions include prior knowledge and assumptions. Empirical tests showed that the Eigen-system approach to diagnosing collinearity problems provides a more effective technique to identify the precise collinear variables and their dependencies.

"Farm Level Corn Acreage Response Estimation: Using Pooled Time Series and Cross-Sectional Data." Perry J. Nutt, Jerry R. Skees, and Michael R. Reed, University of Kentucky.

This study departs from previous acreage response work which has relied upon aggregate data by using farm level data. Another strength of the study is use of subjective data regarding relative risks of alternative crops. Farm level acreage response functions are used for those interested in behavioral models at the farm level.

"A Monte Carlo Analysis of Alternative Estimators of a U. S. Pork Sector Model Characterized by Autocorrelation." Gopal Naik, University of Illinois, and Bruce L. Dixon, University of Arkansas.

Monte Carlo analysis of the performance of alternative estimators of simultaneous system's coefficients in the presence of autocorrelation is performed. The "true" underlying model is an estimated, three equation, monthly model of the United States pork market. Estimators for *ex post* forecasts are also compared. Multicollinearity is found to be a salient characteristic which is possibly adversely affecting estimator performance. Results show that correcting for autocorrelation is desirable when levels of autocorrelation are high for both parameter accuracy and *ex post* forecasting. However, the best structural coefficient estimator for high levels of autocorrelation is not the best estimator for *ex post* forecasting.

CROP YIELDS AND PRODUCTION RESPONSE (David Laughlin, Mississippi State University).

"Soybean Yield Plateaus in the Corn Belt States: An Application of a Non-Nested Hypothesis Test." Matthew T. Holt and

Stanley R. Johnson, Iowa State University.

Yield models containing appropriate price, weather, and technology variables are constructed for each of the five Corn Belt states. Several alternative specifications of technology are evaluated to test the hypothesis that soybean yields are reaching a plateau. A nonnested hypothesis test is employed to discriminate between the alternative functional forms. Results indicate that soybean yields are reaching a plateau in Iowa while the tests were largely inconclusive for the remaining states.

"Impact of Weather Variability On Cropping Patterns." Glenn D. Schaible, USDA, and Raymond J. Supalla and F. Charles Lamphear, University of Nebraska.

Three-stage least squares was used to estimate a system of simultaneous equations for determining cropping pattern shifts due to weather variability. Planting season temperatures and precipitation were found to significantly affect cropping patterns, with large geographic variations in the nature and magnitude of the impacts.

"Comparing Objective and Subjective Yield Estimates: An Empirical Study in Western Kentucky." Jerry R. Skees, University of Kentucky.

Two basic questions are examined by comparing subjective and objective information from the same set of farms: (1) do producer's subjective assessments correspond to objectively developed pdf's and (2) does the triangular procedure provide consistent results between crops for the same producer?

"Wheat and Sorghum Yield Responses in the Southern Plains: Implications for Production." Mark Ash and William Lin, USDA.

Wheat and sorghum yield repsonses in the Southern Plains are analyzed to statistically determine whether the structural relations of the responses have shifted in the last decade as farmers in the region have planted more wheat and less sorghum. The Chow test which was employed in the analysis to evaluate this confirms that this was the case.

"Optimal Levels of Fertilization Under Uncertainty: An Analysis Based on Subjective Producer Yield Expectations." S. SriRamaratnam, M. Edward Rister, and David A. Bessler, Texas A & M University.

Optimal nitrogen fertilizer levels are computed for a sample of Texas Coastal Bend grain sorghum producers based on their assessed subjective conditional yield expectations, expected price probabilities, risk aversion measures, and cost information. Producers' mean yield expectations were substantially greater than experimental yield responses and their perception of the effects of nitrogen on yield variability was contrary to usual characterization of nitrogen as a risk increasing input. Producers' revisions of initial yield expectations based on experimental data were not uniform across all levels of nitrogen and were more pronounced for levels less commonly used by producers. Optimal levels based on expected utility maximization represent actual fertilizer use somewhat better than expected profit maximization.

"An Analysis of Field Crop Productivity in Louisiana: 1957-1983." Mark D. Lange and Thomas P. Zacharias, Louisiana State University.

A total value product index is used to analyze productivity growth in Louisiana's field crop sector. The period 1957-1983 was divided into two equal periods for comparison. Productivity increased 87 percent in the first half of the period and 31.2 percent in the second half. Decomposition of the index indicated the components of productivity growth in terms of area, yield, crop mix, and yield-crop mix interaction. Results suggest that the state's agricultural productivity has been closely tied to the expansion of soybean acreage.

RISK AND STOCHASTIC DOMINANCE APPLICATIONS (Dana Hoag, North Carolina State University).

"An Empirical Investigation of Output Variability, Nitrogen Use, and Input Risk." Paul W. Teague, Bruce A. McCarl, John G. Lee, and John R. Ellis, Texas A & M University.

The input risk definitional and related literature tends to assume that an input is either risk increasing or risk reducing, but not both. Further, there is the presumption that traditional production function forms restrict the possible signs of the effect of input usage on the variance of output. The purpose of this study is to examine the nature by which input usage affects output variability allowing an input to potentially exhibit both risk increasing and risk decreasing characteristics over the range of input usage. This will involve both production function estimation as well as examination of input usage in a whole farm utility maximizing context. Specifically, nitrogen was found to be both risk increasing and risk decreasing, depending on the input use level.

"Evaluation of Production and Financial Risks: A Stochastic Dominance Approach." John G. Lee, John R. Ellis, and Ronald D. Lacewell, Texas A & M University.

As producers make the transition from irrigated to dryland crop production, the impact on net returns and owner equity is uncertain. This study estimates, via a daily crop growth simulation model and a lender's response function, the profit distributions under alternative weather conditions for four dryland crop rotations. Stochastic dominance with respect to a function is utilized to rank each rotation for different risk averse intervals. Solutions from the model indicate that financial risks relative to production risks increase as the firm's leverage rates increase and both components of risk vary across crop rotations.

"Decreasing a Stochastic Dominant Efficient Set with Gini's Mean Difference." Philip I. Szmedra and Michael E. Wetzstein, University of Georgia.

Gini's mean difference (GMD) is suggested as an alternative to convex stochastic dominance (CSD) and stochastic dominance with respect to a function (SDWRF) for reducing a risk efficient set. The risk efficient set associated with GMD is shown to be a subset of CSD and second degree stochastic dominance. The GMD summary statistics are almost as easily generated as the mean and variance in EV analysis, as shown in a pest management empirical application.

"Alternative Conditions for First and Second Degree Stochastic Dominance Efficiency of Enterprise Mixtures." Francis McCamley and James B. Kliebenstein, University of Missouri-Columbia.

Tauer has stated a sufficient condition for SSD efficiency of enterprise mixtures. An analogous sufficient condition for FSD efficiency can be based on a safety-first model. Necessary conditions for FSD efficiency and for SSD efficiency have also been stated. This paper presents necessary and sufficient conditions for FSD efficiency of mixtures and necessary and sufficient conditions for SSD efficiency. There are alternative ways of stating each set of conditions. One alternative statement of the FSD efficiency conditions involves a multiple target safety-first model. Likewise, one statement of the SSD efficiency conditions involves a multiple Target MOTAD model.

"Alternative E-V Parameter Specification in Risk Programming Using Non-Contemporaneous Time Series Data." Bernard V. Tew, University of Kentucky; G. Scott Smith, University of Georgia; and Wesley N. Musser, Oregon State University.

Agricultural economists have recently devoted considerable attention to the consequences of different assumptions in the estimation of variance-covariance matrices for risk programming applications. Alternative E-V frontiers are constructed using contemporaneous and non-contemporaneous yield and price data under independence and dependence assumptions. The non-contemporaneous, dependence scenario resulted in the E-V efficient frontier.

"Risk Efficiency of Beef-Forage Stocking Rates Under Weather Uncertainty." Lucas D. Parch and Otto J. Loewer, University of Arkansas; and David H. Laughlin, Mississippi State University.

A biophysical model is used to simulate beef-forage performance for steers summer-pastured on common bermudagrass in Western Arkansas. Low, medium, and high stocking rates were simulated over 10 "states of

nature" using historical weather data. Empirical cumulative distributions of net returns were developed and the impact of weather variability on animal weight gain and economic performance was assessed. The risk-efficient stocking rate strategies are identified for five risk intervals using generalized stochastic dominance.

FARM STRUCTURE AND AGRICULTURAL POLICY ISSUES

(William Park, University of Tennessee).

"An Essay on the Definition of a Farmer." L. Leon Geyer and Ron Croushorn, Virginia Polytechnic Institute and State University.

As farmers have become increasingly commercialized, the definition of the farmer as a simple tiller of the soil is insufficient to separate farmers from non-farmers. A definition of a farmer based on status of the production of a farm product is developed. A farmer is a person who assembles either titles or claims to the resources (labor, capital, and management) used in the production and marketing of one or more agricultural products. A farmer is the person who bears the legal, physical, and price risks of producing an agricultural product.

"Structural Change in Southern Agriculture, 1974-78: Longitudinal Data from the Census of Agriculture." Matthew G. Smith and R. Neal Peterson, USDA.

A unique longitudinal data base constructed from Census records allows study of changes on individual East South Central farms between 1974 and 1978. The majority of continuing farms exhibited little change in acreage, sales, or tenure class during the period, but a few farms showed dramatic growth or decline. Markov analysis suggests that the 1974-78 pattern of changes in size in acres on individual farms reveals little tendency in the aggregate toward dramatic longrun structural change. A more detailed longitudinal data set covering the 1978-82 period is under development.

"An Analysis of Alternative Farm Policies for Cotton." Patricia A. Duffy, Auburn University; James W. Richardson and Michael K. Wohlgenant, Texas A & M University.

An econometric model of the world cotton market was estimated and used to develop a simulation model for the analysis of alternative farm programs for cotton. The model was used to compare current policy with the Administration's proposal.

"Changes in Selected Characteristics of U. S. Farms During the 1970s and Early 1980s: An Investigation Based on Current and Constant Dollar Sales Categories." Carl R. Zulauf, Ohio State University.

Changes since 1970 in the distribution of selected farm characteristics among constant and current dollar farm sales categories were examined. In general, the same trends emerged but changes were less dramatic after adjusting for inflation. The increasing concentration of net farm income among farms with sales exceeding $500,000 was attributed in part to their continuing high ratio of gross farm income to expenses (approximately 145 percent). Farms with sales between $10,000 and $500,000 became more dependent on nonfarm income. This is postulated to result from a farm income treadmill and use of nonfarm income to cope with the treadmill.

"Impact of Eliminating Farm Price Supports on Net Returns for Major Crops: A Regional Analysis." Alan J. Webb and Shwu-Eng H. Webb, USDA.

A regionalized LP model is used to analyze the impact of eliminating farm price and income supports on net returns for four major crops: wheat, corn, soybeans, and cotton. Results indicate that wheat and cotton producers will be affected most. The Southeastern, Great Plains, Mountain, and Pacific states will be the regions with the highest proportion of land accruing negative returns as a result.

"Impact of Evolving Bio and Information Technologies on the Structure of Dairy Farming: Some Policy Implications." Robert D. Yonkers, James W. Richardson, Ronald D. Knutson, and Boyd M. Buxton, Texas A & M University.

Potential effects of three types of technological change on the future structure of the dairy industry are analyzed. The economic activity of eight representative farms over 10 years was simulated using a farm level dairy simulation model. Results indicate that emerging technologies and their rate of adoption will have a major effect on the structure of the dairy industry and traditional regional milk production patterns. Implications of new

technology information dissemination programs and milk pricing are discussed.

EVALUATION AND ADMINISTRATION OF AGRICULTURAL PROGRAMS (Joe Purcell, University of Georgia).

"Benefits of Agricultural Research and Extension in Peru." George W. Norton, Virginia Polytechnic Institute and State University; and Victor G. Ganoza and Carlos Pomareda, North Carolina State University.

Benefits of research and extension (R&E) for five major commodity programs undertaken by the National Agricultural Research and Extension Institute (INIPA) in Peru are examined. The analysis extends previous research evaluation studies by explicitly considering the effects of demand shifts over time and the influence of government pricing policies on the benefits of agricultural R & E. The study includes benefits not yet realized using information derived from a survey of researchers and extension workers.

"An Alternative Measure of Professional Productivity: Are Implied Differences Real?" Francis M. Epplin, Raymond Joe Schatzer, and Randall A. Reese, Oklahoma State University.

Rankings of departments of agricultural economics based upon output in terms of journal articles have two shortcomings. First, the single criterion may not be an adequate description of productivity or output. Second, the rankings have not been tested to determine if the differences implied are statistically significant. A ranking based upon output in terms of papers selected for presentation at meetings of the American Agricultural Economics Association indicates that six of the top ten ranking schools are in the Southern region. However, the differences in output for the schools which ranked second through tenth are not statistically different.

"Distribution of Agricultural Research Benefits by Farm Size." Fred C. White and Jackie Langston, University of Georgia.

A major research policy issue relates to how agricultural research affects farm structure. The objective of this paper was to measure the distribution of benefits for agricultural research among farms of different sizes. While previous studies measured only aggregate effects, recent developments from duality theory make it possible to measure distributional effects. Duality theory was used as the basis for a translog cost function in which production levels for farms of different sizes were handled as multiple outputs. Results indicated that benefits from agricultural research did not accrue only to large farms but contributed to such farms becoming relatively more important.

"On a Name Change for the *Journal*." J. E. Epperson, C. L. Huang, T. T. Fu, and S. M. Fletcher, University of Georgia.

Membership of the Southern Agricultural Economics Association (SAEA) was polled to ascertain the strength of support for changing the name of the *Southern Journal of Agricultural Economics (SJAE)* to eliminate the regional connotation. The general view was that a name change is unwarranted. The overall impression of our profession is that the *SJAE* is a high quality journal and that the name is not the crucial factor in promulgating this image but rather that the continued striving for excellence is paramount. A profile was developed for those who favored a name change.

"Employer Assessments of Agricultural Economics and Other Grauduates from Colleges of Agriculture." Josef M. Broder and Jack E. Houston, University of Georgia.

Major findings of a survey of employers of agricultural economics/business and other graduates are reported. General characteristics of employers are described along with their assessments of current graduates. Employers cited communications skills as the most important and most lacking trait in new recruits. Grades and references were of secondary importance, while computer skills were not found lacking. Model estimates found that starting salaries were positively associated with company size, involvement in sales, engineering, and international markets, and negatively associated with involvement in agricultural chemicals, production, and social science activities. Implications for recruiting, counseling, and placement are discussed.

"Intra- and Inter-State Transferability of Soybean Variety Research." Steven A. Henning and B. R. Eddleman, Louisiana State University.

An example of agricultural research technology transfer and implications for the fiscal coordination and conduct of agricultural research programs is presented. An analysis of Uniform Soybean Tests conducted in four southern states estimated the potential for transferability of soybean variety research among homogeneous sub-areas. Results indicated a high degree of transferability among delineated homogeneous sub-areas. Results suggest coordinated management of soybean variety research by states included in this study could potentially provide more effective expenditure of soybean breeding research investments. Additionally, the concept of research transferability may potentially be applied to other areas of soybean research.

ANALYSIS OF IRRIGATION AND DROUGHT (Joe Atwood, Auburn University).

"Derived Demand for Irrigation Water and Five Pump Energy Sources for the Delta Region of Northeast Arkansas." Jerry Don Clark, J. Martin Redfern, and Mark J. Cochran, University of Arkansas.

A linear programming model was used to derive the demand for irrigation water and pump fuel for 12 counties in northeast Arkansas. Within the cost ranges examined (125 percent to +300 percent of base energy price), demands for irrigation water and fuel sources tended to be inelastic. At high prices, demands became elastic.

"An Economic Analysis of Supplemental Irrigation in a Humid Region: The Case of Soybean Irrigation in Southwest Louisiana." Brian E. McManus, Thomas P. Zacharias, and James L. Griffin, Louisiana State University.

Soybeans produced in rotation with flood-irrigated rice in Louisiana are currently grown under dryland conditions. The purpose of this paper is to investigate supplemental irrigation of soybeans using existing rice irrigation systems. Four irrigations strategies and a non-irrigated soybean activity are compared using enterprise budgets and stochastic dominance. The analysis was conducted using experimental data for the period 1981-84. Irrigation at the pod-fill stage of growth was marginally profitable and was a risk-efficient choice for owner-operators. Risk neutral tenants would not prefer supplemental irrigation although irrigation was not an inefficient choice for all tenants.

"A Mixed Integer MOTAD Model for Irrigation Evaluation." L. Upton Hatch, William E. Hardy, Jr., Rebecca L. Pickren, and Eugene W. Rochester, Auburn University.

A mixed integer MOTAD linear programming model was developed to evaluate the economic advantage of using irrigation. Peanut production was used to illustrate the procedure. Results of the analysis indicated that for low required income levels, the least risky alternative for a given land resource was to rent it out at a fixed price. As required incomes were increased, the optimal solutions indicated that irrigated peanuts would be the best option. At the highest income levels, dryland peanuts came into solution, thus reducing irrigated acreage. A typical E-V frontier with higher risk levels associated with increased incomes was found.

"Economic Prospects for Sprinkle Irrigation of Rice in the South: A Texas Case Study." Michael R. Parker, M. Edward Rister, and Ronald C. Griffin, Texas A & M University.

Economic feasibility of investing in sprinkle irrigation technology for rice production was investigated using linear programming and capital budgeting to identify the net annual benefits and net present value. Groundwater and both flat rate and volumetrically priced surface water sources of irrigation water were analyzed. Under typical practices occurring in rice production operations in the Texas Rice Belt, sprinkler irrigation technology was not profitable at current water costs. Operations using volumetrically priced surface water had the greatest incentive to consider sprinkler irrigation, but water prices must increase by more than 200 percent for the investment to become attractive.

"An Empirical Bayes Approach to Modeling Drought." P. J. Chamberlain, Texas A & M University.

This paper illustrates an alternative approach to estimating the occurrence of drought. The empirical Bayes methodology was developed because of deficiencies in time series and regression analyses with respect to prediction of drought. This manuscript is comprised of: (1) a discussion of "classical" and Bayes estimators of probability density (or mass) functions, (2) a description of the model, and (3) a comparison of the performances of the empirical Bayes and two

classical estimators in predicting the elapsed time until drought. The Bayes value (incorporating both *a priori* and data information) was found to be superior to the traditional estimates.

"An Analysis of the Economics of Irrigation Pumping Efficiencies Using the Existing Irrigation System Microcomputer Cost Generator: A Nevada Example." Michael K. Glover, Texas A & M University; and Clint R. Ulrich and Thomas R. Harris, University of Nevada-Reno.

A microcomputer irrigation system cost generator program was developed to analyze effects on costs and net returns from declining pumping plant efficiencies for existing irrigation systems. Using this program and an alfalfa-water production function, the investment a Nevada producer can afford to undertake to improve his pumping efficiency can be derived.

TOPICS IN AGRICULTURAL POLICY (Patricia Duffy, Auburn University).

"An Alternative Approach to Defining and Assessing Poverty Thresholds." James R. Blaylock and David M. Smallwood, USDA.

A new approach to defining poverty thresholds is proposed. The approach is based on the minimum income for a household to purchase food supplies that are evaluated in society as being at least barely adequate. The method is especially useful for evaluating and comparing poverty thresholds derived from different procedures, such as the Orshansky procedure, as well as for comparing thresholds across households of different sizes. A simple empirical example is provided.

"An Analysis of the Economic Impact of Employing Farm Women in the Farm Labor Force." Kathryn A. Broussard and Arthur M. Heagler, Louisiana State University.

An underestimation of the rural female labor force has resulted in the misallocation of farm firm resources. In the Southwest Louisiana rice area, this free labor resource has been identified. A linear programming model is used to determine the recombination of farm firm resources when this labor resource is exploited. A cost analysis provided a means to estimate the opportunity costs associated with on-and off-farm employment of the free labor resource. Results indicate that those farm firms utilizing spouse labor are more financially stable than those utilizing only hired labor.

"An Economic Analysis of Cotton Variety Selection in Louisiana." Abiodun O. Ojemakinde and Kenneth W. Paxton, Louisiana State University.

The relationship between selected quality factors and yields for various varieties of cotton adapted to Louisiana are analyzed. Theoretically, several combinations of yield and quality factors may yield a given revenue; i.e., high quality can offset poor yield. Analysis of variance was used to investigate differences in yield and quality factors among commonly grown cotton varieties. Ordinary least squares was used to estimate annual discounts for various measures of quality which were combined with yield expectations to examine the trade-off between yield and quality. Results of the analysis indicated that the quality characteristics of certain varieties were sufficient to offset the yield advantage of other varieties.

"The Farmer-Owned Reserve Program for Wheat and Sorghum: Grain Price Enhancement Or Stabilization?" Joseph Glauber, William Lin, and Linwood Hoffman, USDA.

This study assesses effects of the farmer-owned wheat and sorghum reserve programs on monthly state grain price enhancement and stabilization during 1978-84. Results show that in all selected states and for wheat and sorghum, the programs have enhanced monthly state grain prices but have had little effect on stabilizing monthly grain prices.

"Benefits to Soil Conservation and Commodity Programs From Establishing a Conservation Reserve." Shwu-Eng H. Webb, Clayton W. Ogg, and Wen-Yuan Huang, USDA.

A land group criterion which links productivity with potential soil erodibility is developed to define erodible land. There are about 32 million acres of erodible land in major crop production. The conservation reserve program of retiring all erodible land will complement some commodity program goals and yield a saving in Government deficiency and storage payments of about $2.5 to $6.5 billion. It is estimated to cause prices

of corn, sorghum, barley, oats, and soybeans to increase about 20 to 30 percent. The prices of wheat and cotton will not rise above support levels. Soil savings are substantial and most of the damaging soil erosion from U. S. cropland will be treated.

"Extent and Implications of Double-Cropping in the South." Frederick J. Nelson, USDA.

Compared to other farms in the 1982 Census of Agriculture, those with double-cropped wheat and soybeans were larger, more specialized, more productive, rented more land, chemically treated more acres for pests and weeds, and irrigated more. Contrary to expectations, they also participated more in acreage reduction programs. Analyses of such programs suggest double-cropping reduces participation and increases USDA program costs. Cost implications depend on the acreage of wheat double-cropped, an amount estimated to be from 5.7 to 8.2 million acres in 1982. A $1.00 increase in expected soybean price could increase wheat program costs by $34 million.

RESOURCE ECONOMICS AND RURAL DEVELOPMENT (Martin Redfern, University of Arkansas).

"Impacts of Soil Conserving Enterprises on Part-Time Operator's Income." Patrick R. McColloch and Daniel D. Badger, Oklahoma State University.

Analyses were directed at: (1) determining if the adoption of recommended low risk management practices can increase the part-time farmer's income over a period of years and (2) selecting those best management practices for soil conservation and/or those enterprises that will reduce current levels of soil erosion on these part-time farms. Results indicated that reducing soil loss by converting native pasture to an improved state (fescue or bermuda) is not financially feasible with current cattle prices. Thus, there is a problem with inducing farmers to invest in soil conserving enterprises on a purely short-run economic basis. This problem is accentuated for part-time operators who depend less on farm income for their livelihood.

"Choices to Consider When Acquiring and Using Input-Output Models for Regional Economic Analysis." Sharon M. Brucker and Steven E. Hastings, University of Deleware.

Over the past decades, experiment station and cooperative extension personnel have become increasingly involved in the analysis of economic growth and/or decline in rural communities and regions. This has led to their increased use of analytic models to assess economic impacts. During the same time period, regional input-output analysis has been facilitated by many improvements in estimation techniques and by the availability of some "ready-made" models for regional researcher and extension personnel. Thus, choices are greater both as to sources of models and as to techniques. The purpose of this paper is to enlighten potential users as to these choices and their costs and benefits.

"Conflicts in Residential Water Demand Across Rural and Urban Areas." Jacqueline K. Langston and Josef M. Broder, University of Georgia.

Conflicts in residential water demand across rural and urban areas are examined. Residential water demand models, developed for the analysis, expressed residential water consumption as a function of income, household size, price of water, and average annual rainfall. Data on community water systems were delineated into rural and urban systems and estimated as "seemingly unrelated regressions" to test for differences in rural-urban demand. Elasticities of demand were examined and implications for pricing and revenue policies were discussed.

"Comparison of Discrete Choice Models for Estimating Recreation Activity Participation." Gene L. Brothers and Howard A. Clonts, Auburn University.

Traditional demand theory utilizes price and quantity relationships to determine market conditions. The demand for recreational activities lacks a precise market price. Hence, discrete choice variables generally are used to estimate quantity demanded. Available models for discrete choice analysis include ordinary least squares, generalized least squares, probit, and logit. These models are compared for power in predicting and explaining variation in participation in recreational activities. Comparisons are made between models and across a variety of recreational activities. Strengths and weaknesses of models are demonstrated using empirical data.

"Economic Feasibility of Rural Recycling: A Case Study." Deborah M. Markley and William M. Park, University of Tennessee.

Economic feasibility of a rural Tennessee recycling center was evaluated. The center generated benefits in the form of waste disposal cost savings, aesthetic improvements, and income generation. Using regression analysis, distance was found to negatively affect per capita payments from the recycling operation, with per capita payments declining as distance from the center increased. Consequently, economic feasibility of operating a collection substation was evaluated using this model. Although subsidies enhance the center's feasibility, evidence from this experience suggests that rural recycling can be viable without large subsidies, particularly when the system's design accounts for a dispersed rural population.

MATHEMATICAL ANALYSIS OF FARM ENTERPRISE COMBINATIONS (Bruce Dixon, University of Arkansas).

"Cash Flow Analysis When Adding Vegetable Enterprises to Limited Resource Farms." Raymond Joe Schatzer, Michael C. Wickwire, and Daniel S. Tilley, Oklahoma State University.

Farmers are considering vegetable crops as a way to increase farm income in Oklahoma. One of the potential problems they face is obtaining the credit needed to produce vegetables. This study examines the changes in cash flow needed to raise vegetables. Results indicate that vegetable enterprises can significantly increase incomes without increasing the needed credit line and can actually decrease total interest payments.

"A Target MOTAD Analysis of a Crop and Livestock Farm in Jefferson County, Florida." David J. Zimet and Thomas H. Spreen, University of Florida.

An analysis of a typical crop and livestock farm in North Florida is presented which incorporates the potential competition and complementarity among crop and beef cattle enterprises. A Target MOTAD model is developed to account for risk in the decision framework. Results indicate that when income risk is ignored, peanuts, watermelons, and stocker cattle are the only enterprises included in the optimal solution. When income risk is heavily weighted, the optimal solution includes peanuts, watermelons, stocker cattle, cow-calf production, and irrigated soybeans. Results suggest that the persistence of cow-calf production may be explained as a stabilizer of income.

"Impact of Value of Leisure Time and Alternative Technologies on Returns to Small Vegetable Farms." Roger Hinson and Luis Vanegas, Louisiana State University.

This study examines factors that influence enterprise returns and combinations on small vegetable farms: demand for nonwork time expressed through a reservation price of family labor and alternative production technologies. A programming model was constructed to isolate optimal solutions to labor and land availabilities, technologies, and objective functions. A zero price for family labor produced a solution better representing combinations on farms. Total return was greater for the higher technology, but return per hour was higher for the low technology. In terms of intensity of resource use, actual farm combinations did not approach that necessary to maximize return.

"Landlord-Tenant Lease Efficiency: A Risk-Income Analysis." Glenn A. Helmers, University of Nebraska; Joseph Atwood, Auburn University; and Roger V. Sahs, Oklahoma State University.

Expected income-risk frontiers are developed using on-farm data for both landlords and tenants with alternative leasing arrangements. Certain leasing arrangements which are very attractive from the landlord's viewpoint are very unattractive from the tenant's perspective and vice versa. If both parties are willing to accept lower expected returns and slightly increased risk as contrasted to their individually preferred alternatives, a jointly acceptable lease alternative is identified. This alternative is the most commonly utilized leasing arrangement in the two-county study area from which the data were collected.

"Analyzing Tenure Arrangements and Crop Rotations Using Farm Simulation and Probit Analysis." Gregory M. Perry, M. Edward Rister, and James W. Richardson, Texas A & M University; and Warren R. Grant, USDA.

Usefulness of linking whole farm simulation analysis and econometric analysis to

simultaneously evaluate land tenure ar-arrangements and crop rotations was explored. Probability of survival, ending equity position, and net present value of farming earnings were assessed for a representative Texas Upper Gulf Coast rice/soybean farm. Probit analysis was then conducted to determine the impact of net cash farm income, land tenure arrangement, and crop rotation on probability of survival. This application of the methodology proposed suggests that while simulation analysis is appropriate for ranking available alternatives, probit analysis is valuable in diagnosing the specific aspects of existing tenure arrangements which, conditional on the crop rotations considered, need to be altered to improve or equate producers' preferences for the available alternatives.

"The BCDP Linear Programming Self-Tutorial: A Microcomputer Software Package." Richard Beilock, Catherine Correal, Evan Drummond, Jim Pheasant, and Wayne Wolfe, University of Florida.

The basic features of a microcomputer package, BCDP, which is a self-tutorial to teach the Simplex algorithm, are explained. The package can be used to augment lecture and text materials in the introductory linear programming courses or as a review for advanced mathematical programming courses. The role of the microcomputer in instruction is also discussed.

LIVESTOCK MANAGEMENT ISSUES Kary Mathis, Texas Tech University).

"Impacts of Animal and Feed Quality on the Economic Efficiency of Cattle Backgrounding." Wayne Prewitt, Missouri Cooperative Extension Service, and Duane R. Reneau, University of Arkansas.

This study focuses on the impacts that frame size and energy level of the feed program have upon the economic efficiency associated with backgrounding steers and heifers. Live weight gain, feed intake, and associated costs and returns were simulated using technical intake and gain equations, ration information, and price data for various sex, frame size, and feed energy level combinations. An analysis of the results of this simulation determined that feed cost efficiency and relative profitability shown by breakeven purchase price are significantly influenced by frame size, ration quality, and sex of the animal fed.

"Alternatives to Increase Economic Efficiency of Ranch Firms in the Western Rio Grande Plains of Texas." Lee Garoian, J. R. Conner, and W. T. Hamilton, Texas A & M University.

Net ranch income and return to investment have typically been low in ranching. Low returns in South Texas result in part from extensive management methods and poor range condition associated with excessive brush cover. A 15-year dynamic linear programming model is developed to evaluate alternative livestock production practices and range improvements on a representative ranch. Grazing systems and brush treatments are considered as possible alternatives for increasing range productivity and ranch profitability. Net ranch returns would be increased by adoption of a rotational type grazing system, while brush treatments do not appear to be viable means of increasing economic efficiency.

"Modeling Calf Production in the Texas Rolling Plains." L. W. VanTassell, J. R. Conner, and R. K. Heitschmidt, Texas A & M University.

Functional relationships between calf weights and various managerial and environmental factors were developed using data from the Texas Experimental Ranch. Calf weights at branding time were a function of the grazing treatment, presence of winter supplementation, age of calf, previous fall precipitation, and winter temperatures. Weights at weaning were additionally dependent upon the presence of broomweed and the accumulated spring and summer precipitation. R^2 values for the equations were .72 and .66, respectively. Using historical precipitation and cattle prices data, returns for each grazing system were generated for 100, 15-year iterations. Net-present-values were highest for the short duration grazing strategy followed by the heavy continuous and Merrill deferred strategies.

"Analysis of Sale Prices of Performance Tested Bulls." G. M. Clary, C. E. Thompson, and H. W. Webster, Clemson University.

This study identified characteristics of performance tested bulls that accounted for price

differences. Results should assist future buyers and sellers to determine the relative value of bulls offered for sale. Producers paid the highest prices for bulls exhibiting rapid growth and the genetic ability to pass such traites to their offspring. Weight per day of age and adjusted yearling weight ratio were performance measures determined to influence bull prices. Each of these factors exhibited a positive relationship with price.

"Hedging Cattle with Market Adjusting Technical Trading Systems: A Simulation Analysis." William R. Whitehead and Alvin R. Schupp, Louisiana State University.

The stressed financial condition of many agricultural producers increases their vulnerability to price risk. Hedging production with the aid of technical analysis may help the producer transfer price risk to others. Technical trading systems that detect and adjust to changing pricing patterns were developed and evaluated in the simulated hedging of four cattle production alternatives over the 1974-83 period. The market adjusting models use an intraday extreme price channel combined with either a lagged outside range or a prior close oscillator. In general terms, the market adjusting models outperformed a two moving average crossover, traditional hedging, and unhedged cash strategies.

MARKETING AND TRANSPORTATION ISSUES (Gary Fairchild, University of Florida).

"Optimal Structure of Fluid Milk Processing Plants in the Southwest." Cary W. Herndon, Mississippi State University, and Leo V. Blakley, Oklahoma State University.

The purpose of this research was to determine the optimals size, number, and location of fluid milk processing plants in the Southwestern portion of the United States. A heuristic algorithm determined the plant configuration which minimized the total costs of: (1) assembly, (2) processing, (3) raw milk, and (4) distribution of fluid milk. Three market situations were evaluated for the year 1982 and one for 1990. The existing 1982 plant configuration costs were only 1.1 percent, or $12.3 million, higher than the optimal 1982 plant structure. The optimal 1982 system contained fewer plant locations (21) than the existing system (60); however, there was a trade-off between lower processing costs and higher distribution costs under the optimal solution.

"Grain Port User Fees: Welfare Analysis of a Transportation Policy Issue." Hector Viscencio-Brambila and Stephen Fuller, Texas A & M University.

The anticipated impact of port user fees on the welfare of various economic agents involved in the grain export marketing system is evaluated with emphasis on U. S. production agriculture. The issue of port fees was raised by legislative initiatives introduced to recent sessions of the U. S. Congress that seek to recover from commercial users federal government's funds spent to operate, maintain, and improve U. S. deep-draft navigation facilities. Results indicate that imposition of port user fees would have a fairly small effect on the well-being of all involved parties. However, U. S. producers are most affected by port fees.

"Analysis of Market Potential for Selected Fresh Vegetable Crops." Michael E. Zwingli, John L. Adrian, and William E. Hardy, Auburn University.

The market potential for 17 spring-summer and 10 fall fresh vegetable crops at six wholesale markets (Atlanta, Baltimore, Chicago, Cincinnati, New Orleans, and St. Louis) is evaluated. Cost versus price relationships were analyzed by crop and market in order to determine the number of weekly price quotations during the harvest season which were above the breakeven cost for 100 and 70 percent yield levels. Risks related to price, income, yield variability were also examined. Results indicated that varying degrees of market potential exist for a number of vegetable crops assuming Tennessee Valley producers can overcome the often large barriers to market entry.

"Development of Computer Aided Marketing in the Produce Industry." John J. Vansickle, University of Florida.

Computer aided marketing of agricultural products has received considerable attention in recent years. A feasibility study for computerized marketing in the produce industry indicated a potential for successful implementation for a computer aided marketing system that would benefit the produce industry. A National Advisory Committee of industry representatives assisted with re-

search that resulted in conceptualizing a system that was subsequently adopted by a private company. Several potential benefits that contribute to improve marketing efficiency have also been identified that should result from successful implementation of the computer aided marketing system.

"Exploring the Variation in Barge Rates through Canonical Correlation Analysis." Jeffrey Beaulieu, Southern Illinois University.

In August 1978, the Merchants Exchange of St. Louis initiated a daily barge freight trading session in which river segment specific barge rates were established. The relationship between these barge rates and selected market factors is explored using Cannonical Correlation Analysis (CCA). CCA extends simple correlation analysis to multiple variable sets, i.e., a set of barge rates and the set of market factors. Results indicate, in total, the proportion of the variation in the set of barge rates accounted for by the set of market factors and the relative importance of each market factor to that relationship.

"Demand Uncertainty, The Plant Variety Protection Act, and the Structure of the Seeds Handling Industry." Jack E. Houston and Winston Morgan, University of Georgia.

A survey of seed handling firms in Georgia was conducted by mail questionnaire to elicit market structure and conduct information. Firms were found to have diversified into complementary inputs and services in response to increased uncertainty of demand for seed varieties, income flow requirements, and competitive pressures. Structural change in the seeds handling industry has been influenced by the Plant Variety Protection Act (1970), though many firms remain unaware of its full implications on their operations.

COMMODITY FUTURES MARKETS (Steve Miller, Clemson University).

"Factors Affecting Deliveries on the CME Live Cattle Contract: An Economic Assessment." Michael A. Hudson, Thomas A. Hieronymus, and Stephen R. Koontz, University of Illinois.

Deliveries on the CME live cattle contract for the period from January 1975 through April 1985 responded to the delivery month basis, the spread between the expiring and the next nearby futures contract, discounts for yield grade 4 beef carcasses, and seasonal influences. Modification of the contract to tighten quality standards for delivery decreased mean deliveries on the contract. The certificate delivery system appears to have had no significant impact on delivery numbers. Deliveries in all markets respond to the same economic factors, although the markets east of the Mississippi River do not appear to have responded to contract modifications.

"An Analysis of the South Carolina Corn Basis." Kandice H. Kahl and Charles E. Curtis, Clemson University.

Understanding the basis can help the agricultural industry make more informed marketing and procurement decisions. Theoretical expectations were developed regarding basis magnitude and direction in a grain deficit state. An empirical model of the corn basis in three regions of South Carolina was developed based on the theory and incorporating the interdependence among the three markets. Empirical results indicate that the basis is negatively related to the log of corn stocks and storage costs and positively related to the stocks of competing commodities, the cash price, transportation costs, and the number of grain consuming animals.

"An Analysis of Factors Affecting Agricultural Futures Price Volatility." David Kenyon, Kenneth Kling, Jim Jordan, William Seale, and Nancy McCabe, Virginia Polytechnic Institute and State University.

Option pricing formulas assume futures price volatility is constant over time. This paper demonstrates that volatility for grains is not constant. Several models are developed and estimated that explain changes in futures price volatility across seasons and years.

"Pricing Inefficiency and Long-Term Profits in Soybean Futures." Emmett W. Elam and Edward O. Fryar, Jr., University of Arkansas.

Pricing inefficiency existed in the soybean futures market from 1974-85 as evidenced by the tendency for high (low) futures prices before maturity. A simple trading strategy was designed to illustrate this pricing inefficiency. The strategy was to sell futures when the price was above the longrun average price and buy futures when the price was below the longrun average price. Over the 11-year

period, profits ranging from $10.90 to $44.04 per bushel were made using this strategy to trade soybean futures.

"Performance of Live Cattle Options in a Hedging Portfolio, Texas Panhandle." Thomas L. Sporleder and Jim R. Winder, Texas A & M University.

Commodity options offer a new means of price risk management. For producers who are short hedgers, either buying puts or writing calls are new strategies, unavailable prior to the advent of commodity options. Both new options strategies are evaluated in an optimal portfolio framework for live cattle. Results of monthly simulated hedges for the 1980-1984 period indicate that the maximum profit portfolios using options could increase net income by 53 percent compared to unhedged fat cattle production and by 107 percent compared to routine hedging with short futures.

https://doi.org/10.1017/S0081305200005501 Published online by Cambridge University Press