

**ARKANSAS
AGRICULTURE
2003
SITUATION AND OUTLOOK**

*Bruce L. Ahrendsen,
Eric J. Wailes,
Bruce L. Dixon,
Michael Popp,
Pat Manning, and
Tony E. Windham*

ARKANSAS AGRICULTURAL EXPERIMENT STATION
Division of Agriculture University of Arkansas
September 2003 Research Series 508

This publication is available on the Internet only at www.uark.edu/depts/agripub/publications

Technical editing and cover design by Cam Romund; Cover photo: Pecan alley near England, Arkansas, by John Crone, ASLA

Arkansas Agricultural Experiment Station, University of Arkansas Division of Agriculture, Fayetteville. Milo J. Shult, Vice President for Agriculture and Director; Gregory J. Weidemann, Dean, Dale Bumpers College of Agricultural, Food and Life Sciences and Associate Vice President for Agriculture–Research, University of Arkansas Division of Agriculture. Web/QX6. The University of Arkansas Division of Agriculture follows a nondiscriminatory policy in programs and employment. ISSN:1051-3140 CODEN:AKAMA6

ARKANSAS AGRICULTURE 2003 SITUATION AND OUTLOOK

Bruce L. Ahrendsen¹

Associate Professor – University of Arkansas

Eric J. Wailes¹

Professor – University of Arkansas

Bruce L. Dixon¹

Professor – University of Arkansas

Michael Popp¹

Associate Professor – University of Arkansas

Pat Manning¹

Research Specialist – University of Arkansas

Tony E. Windham¹

Section Leader - Agricultural Economics

Extension Economist - Management

Cooperative Extension Service

**Arkansas Agricultural Experiment Station
Fayetteville, Arkansas 72701**

¹ Drs. Ahrendsen, Wailes, Dixon, and Popp and Mr. Manning are associate professor, professor, professor, associate professor, and research associate in the Department of Agricultural Economics and Agribusiness, University of Arkansas and Dr. Windham is section leader - agricultural economics and extension economist - management, Cooperative Extension Service, University of Arkansas. Drs. Ahrendsen and Dixon are principals of the Center for Farm and Rural Business Finance, which is jointly sponsored by the University of Arkansas and University of Illinois. Dr. Wailes is a principal in the Arkansas Global Rice Policy project, jointly funded with the Food and Agricultural Policy Research Institute-University of Missouri. The authors gratefully acknowledge the research assistance of Ms. Diana Danforth, Mr. Nathan Kemper, Mr. Kyle Tobiason, and Ms. Leisha Vance.

SUMMARY

The purpose of this research series is to highlight the situation of Arkansas farmers and to offer an outlook for 2003. The research emphasizes the production, price, income, policy, financial, farmland value, and interest rate outlook for Arkansas farmers and considers the impact of the macro economy on agriculture. In addition, the advantages and disadvantages of biodiesel as an alternative to petroleum diesel are discussed.

Key Words: Crop, Livestock, Catfish, Poultry, and Horticulture Production, Price, Income, Financial Situation, Farmland Value, Macro Economy, Interest Rate, Petroleum Diesel, and Biodiesel

Arkansas Agriculture 2003 Situation and Outlook

CONTENTS

| | |
|---|----|
| Executive Summary | 1 |
| Production and Price Situation and Outlook | 2 |
| Field Crops | 2 |
| Livestock | 4 |
| Catfish | 11 |
| Poultry | 11 |
| Horticultural Crops | 11 |
| Farm Income and Financial Situation and Outlook | 13 |
| Credit Conditions Survey | 18 |
| Summary | 21 |
| Macroeconomic Impacts on Agriculture | 21 |
| Unemployment and Interest Rates | 21 |
| Exchange Rates and Exports | 22 |
| Production Costs and Land Values | 22 |
| Summary | 23 |
| Special Article: Biodiesel... An Alternative Fuel Option for Agriculture? | 24 |
| Literature Cited | 25 |

LIST OF FIGURES

| | |
|---|----|
| Fig. 1. Market value shares of Arkansas agriculture in 2002 | 4 |
| Fig. 2. Market value shares of Arkansas field crops in 2002 | 4 |
| Fig. 3. Market value shares of Arkansas livestock and catfish sales in 2002 | 11 |
| Fig. 4. Market value shares of Arkansas poultry sales in 2002 | 11 |
| Fig. 5. Market value shares of Arkansas horticultural sales in 2002 | 14 |
| Fig. 6. Arkansas net farm income | 17 |
| Fig. 7. U.S. net farm income | 17 |
| Fig. 8. Arkansas program crop receipts | 17 |
| Fig. 9. USDA farm resource regions | 19 |
| Fig. 10. Distribution of farm businesses with negative net cash income by resource region, 2001-2003f..... | 19 |
| Fig. 11. Arkansas farmland values | 23 |

ARKANSAS AGRICULTURE 2003 SITUATION AND OUTLOOK

*Bruce L. Ahrendsen, Eric J. Wailes, Bruce L. Dixon,
Michael Popp, Pat Manning, and Tony E. Windham*

EXECUTIVE SUMMARY¹

□ Price prospects in 2003 for Arkansas crops are mixed. For the major crops produced and marketed by Arkansas farmers—rice, soybeans, and cotton—all crop prices are expected to be close to or above 2002 prices. Soybean prices are expected to increase due to a contraction in supply following last year's record supply. A steep decline in the supply of cotton is expected, influenced by last year's dismal cotton prices leading to conversion of land to other crops. New crop futures prices facing farmers as of mid-February compared to the previous three years are:

| Crop | Contract month | 2003 | 2002 | 2001 | 2000 |
|----------------|----------------|--------|--------|--------|--------|
| Soybeans (CBT) | September | \$5.49 | \$4.48 | \$4.56 | \$5.33 |
| Rice (CBT) | November | \$2.87 | \$2.45 | \$2.76 | \$3.02 |
| Cotton (NYBOT) | October | \$0.59 | \$0.41 | \$0.59 | \$0.61 |
| Wheat (CBT) | July | \$3.23 | \$2.84 | \$2.90 | \$2.94 |
| Corn (CBT) | September | \$2.44 | \$2.25 | \$2.36 | \$2.47 |

□ Income prospects for Arkansas crop farmers in 2003 will be influenced by the respective crop's price outlook, loan deficiency payments (LDP), and other direct government payments under the 2002 farm bill. Based on normal yields and projected 2003 market prices and LDP, the projected net returns per acre to farmers for non-land assets and management are:

| Crop | Projected 2003 net returns | Typical range |
|---------------------|----------------------------|-------------------|
| Soybeans, dryland | \$ -6/acre | \$ 60 to 100/acre |
| Soybeans, irrigated | \$ 55/acre | \$ 80 to 120/acre |
| Rice | \$ -1/acre | \$ 40 to 90/acre |
| Cotton, dryland | \$ -43 to \$22/acre | \$ 20 to 80/acre |
| Cotton, irrigated | \$ -12 to \$58/acre | \$ 20 to 80/acre |
| Corn, irrigated | \$ -25/acre | \$ 50 to 110/acre |
| Sorghum, dryland | \$ -5/acre | \$ 5 to 25/acre |
| Sorghum, irrigated | \$ 25/acre | \$ 10 to 40/acre |

□ The 2002 Farm Bill has an income safety net through the target price - deficiency payment mechanism. The farm bill also has decoupled direct, previously AMTA, fixed payments along with the loan rates and loan deficiency payments. Loan deficiency payments and market loan gains during the 2002 crop year total approximately \$450 million, indicating a heavy reliance on payments by Arkansas producers.

□ The total market value or gross revenues of Arkansas agriculture in 2003 are projected to be \$5.2 billion, an increase of almost 11% compared to 2002. An improvement in the market value of crops, poultry, and livestock is expected with horticulture products only expected at slightly below 2002 levels.

| | Market value of Arkansas agriculture | | | | |
|--------------|--------------------------------------|--------------------|---------------------|---------------------|-----------------------|
| | 2000 Million \$ | 2001 Million \$ | 2002P Million \$ | 2003F Million \$ | 2003/2002 % Change |
| Field Crops | 1,558 | 1,542 | 1,724 | 1,890 | 9.6% |
| Livestock | 740 | 757 | 655 | 750 | 14.5% |
| Poultry | 2,482 | 2,750 | 2,247 | 2,500 | 11.3% |
| Horticulture | 78 | 82 | 75 | 74 | -1.3% |
| Total | 4,859 | 5,136 | 4,701 | 5,214 | 10.9% |

□ The net income and financial conditions of Arkansas farmers are forecast to improve in 2003 based on USDA forecasts.

- U.S. net farm income is forecast to be \$46.2 billion in 2003, which is 53% higher than the 2002 forecast of \$30.2 billion. Much of the increase is from a jump in government payments from \$11.8 billion in 2002 to \$21.4 billion in 2003, similar to the levels of 1999-2001.
- Direct government payments are forecast to be 39% and 46% of U.S. net farm income in 2002 and 2003.
- Government payments since 1990 have been more important to Arkansas farmers than U.S. farmers on average.
- In three USDA production regions that cover portions of

¹ Estimates and forecasts for 2002 were made prior to the passage of the Farm Security and Rural Investment Act (Farm Bill) of 2002.

Arkansas, farm business net cash income is forecast to increase by 4%, 9%, and 23% from 2002 to 2003. The average levels of farm business net cash income for each of the regions covering Arkansas are less than the average for the United States.

- Large percentages of farms in the three regions covering Arkansas are forecast to have negative net cash incomes, 37%, 39%, and 46%, compared to 36% of farms for the entire United States. These percentages are similar to those from last year.
- 14%, 13%, and 13% of farms in the three regions represented in Arkansas are forecast by USDA to have debt repayment difficulties in 2003, which are similar percentages as 2002.

□ Arkansas agricultural loan officers' opinions regarding farm credit conditions are presented and discussed.

- Credit conditions for eastern Arkansas production agriculture turned weaker in 2002, however, credit conditions will tend to be better in 2003 than 2002. Most loan officers in the rest of Arkansas indicated stable credit conditions, although there are some areas of concern.
- Although collateral requirements were unchanged, lenders reported a tightening in credit standards for approving new agricultural loans.
- In general, the lenders indicated the demand to acquire farmland is much stronger for non-farmer investors than it is for farmers.
- Lenders' outlooks for net cash farm earnings, including government payments, are generally more optimistic for crop farmers than livestock and poultry farmers. Forty-three percent of eastern lenders expect crop net cash income to increase in 2003, while 75% of western lenders expect livestock net cash income to be unchanged or decrease in 2003 from 2002.

□ The macro economy affects unemployment, interest rates, exchange rates, exports, production costs, and land values, which are important to agriculture.

- The news on the macroeconomic front for agriculture is guardedly optimistic.
- Unemployment continued to increase in 2002 and the first half of 2003. Many farm households, particularly those with small farms, rely on off-farm income. Thus, if these households fall into the unemployment ranks, their ability to meet farm expenses will be greatly diminished.
- Because of the slow U.S. economy, the Federal Reserve continued to decrease the federal funds rate to a low of 1.00% through mid-2003, resulting in lower credit costs for farmers and others.
- A weakening of the U.S. dollar in 2002 and early 2003 should assist U.S. exports.
- Fertilizer and energy costs are expected to increase in 2003.

- Arkansas pasture land values jumped 9.3% and cropland values increased only 1.7% in 2002.

□ Advantages and disadvantages of biodiesel as an alternative to petroleum diesel are discussed.

- Lower pollution emissions, reduced dependence on foreign energy supplies, and bolstered demand for agricultural commodities are advantages of biodiesel.
- Initial production investment, additional distribution channels, and currently being more expensive than petroleum diesel are all disadvantages of biodiesel.

PRODUCTION AND PRICE SITUATION AND OUTLOOK

Arkansas has an extremely diverse production agriculture. This section of the report discusses the production and price situation and outlook for four categories of agricultural production in Arkansas: field crops, livestock and catfish, poultry, and horticultural crops. Field crops include soybeans, rice, cotton, wheat, corn, and grain sorghum and had a 37% share of the market value of Arkansas agriculture in 2002 (Fig. 1).² Livestock and catfish include feeder calves, milk, feeder pigs, and catfish and account for 14% of the market value of Arkansas agriculture. Poultry includes broilers, turkeys, and eggs and has a 47% share of market value. Finally, horticultural products included in this study are tomatoes, watermelons, pecans, apples, grapes, blueberries, and peaches. With the floriculture and nursery business, horticulture accounts for a 2% share of the market value of the Arkansas agricultural economy. Discussion of horticultural crops in this study does not include all products produced in Arkansas, since some products such as nursery and ornamental products are necessarily omitted because of a lack of published data.

Field Crops

The price outlook for most of the 2003 Arkansas crops has improved since last fall. Commodity futures prices for most field crops are above the commodity loan rates or are expected to move above loan rates. Price supports through the loan deficiency payment (LDP) program have been important for cotton, rice, and soybeans. Cotton and rice have also benefitted from loan activity through the marketing loan gains.

Projected average net market returns for the 2003 Arkansas crops, based on current price projections and Arkansas Cooperative Extension Service cost of production estimates, are shown in Tables 1 and 2. Table 1 shows market returns to Arkansas producers at specified market prices for various 2003 yields. The net return estimates presented are calculated as the difference between revenue and variable costs of production and a return to land, based on a 25 per-

² It should be noted that market value is determined by multiplying market price by production and government payments are excluded. The share for field crops relative to others would increase substantially if government payments were included.

cent crop share rent. Net returns above operating costs and rent reflect payment for non-land assets (including tractors and equipment) as well as payment for management and other fixed costs such as taxes. Table 2 reflects market risk by presenting the market returns to producers at a specified yield for alternative prices. The price situation for Arkansas crops is improved from 2002 prices. Weather-related problems across Arkansas, namely above average rains have occurred and will heavily influence crop prices during 2003.

The market value shares of Arkansas field crops in 2002, excluding government payments, are presented in Fig. 2. Soybeans leads the way with a 30% share of market value followed by cotton (23%), rice (20%), hay (12%), wheat (7%), corn (5%), and sorghum (3%).

Soybeans. Arkansas is the 9th leading soybean producing state making up about 4% of the value of total production in the U.S. in 2002. Arkansas soybean production in 2002 increased to 96.5 million bushels, more than five percent higher than in 2001. With an expected average farm price of \$5.65, the expected market value for the 2002 crop is \$545 million. This is well above the 2001 crop value, although it is less than the market values of the early to mid-1990's (Table 3). Arkansas harvested soybean acreage in 2002 was 2.88 million. The average yield in 2002 was 33.5 bu/acre, up 1.5 bushels from the previous year. Soybean harvested acreage in Arkansas for 2003 is expected to decrease from 2.88 million acres in 2002 to 2.85 million acres.

Soybean planted area in the late 1990s increased sharply. According to FAPRI, in 2003 U.S. soybean planted area will decline for the third year in a row. Strong returns from corn and other competing crops contribute to the 2003 soybean area decline. An expected return to normal yields will likely offset the decline in area. 2003 soybean prices are projected to be marginally above levels that would trigger Counter Cyclical Payments (CCPs).

With average rainfall, non-irrigated soybeans with yields of 25 bushels at \$5.40/bu can be expected to give a net return of -\$6/acre (Table 1). The price range (market + LDP) used in Table 2 for soybeans is \$5.00 to \$5.80/bu. An assumed yield of 25 bu/acre for non-irrigated soybeans results in negative or break even net returns in the range of -\$13 to \$2 per acre. An assumed yield of 45 bu/acre for irrigated soybeans gives positive returns in the range of \$42 to \$68/acre.

Rice. Arkansas is the leading rice producing state, accounting for almost 46% of the value of all U.S. rice output in 2002. In 2002, Arkansas farmers harvested 1.5 million acres, lower than the 1.621 million a year prior. Yields averaged 143 bu/acre and total output of 215 million bushels. The average Arkansas rice price is projected to decrease slightly to \$1.89/bu for the 2002 crop compared to a price of \$1.91/bu for the 2001 crop. The market farm value of 2002 Arkansas rice production is anticipated to be approximately \$406 million, the lowest value in the past 10 years.

The outlook for the 2003 crop is strongly influenced by the spring weather conditions which have led to low prospective supplies and much higher expected prices. Also, rice futures prices are higher than 2002 and on the rise. According to information from the Arkansas Agricultural Statistics Service, Arkansas rice harvested acreage is expected to decrease to 1.436 million acres in 2003. Normal weather would place average yields at 143 bu/acre for a total 2003 crop estimate of 205 million bushels.

Cotton. Arkansas ranked 4th among states in value of cotton production for 2002. Cotton acreage harvested has been variable since the 1991 crop year, ranging from a low of 900 thousand in 1998 to a high of 1.110 million acres in 1995 (Table 3). The annual value of the crop at the farm level has averaged \$369 million for 1997-2001. Prices well below the loan rate of \$0.420/lb over the past year have resulted in a projected farm market value for 2002 of only \$336 million.

The market prices in 2003 are expected to strengthen to around \$0.55/lb due in part to a contraction of production as a result of last year's low prices. Arkansas area harvested is expected to decrease from 920 thousand acres in 2002 to 915 thousand in 2003. The projected market price of \$0.55/lb will result in market returns of \$396 million.

Corn and Grain Sorghum. Corn and grain sorghum have had average farm level values in Arkansas from 1997 to 2001 of \$43 million and \$21 million, respectively (Table 3). Corn harvested area peaked at 260 thousand acres in 2002 with a yield of 134 bushels/acre. An expected 2002 season average market price of \$2.40/bu will result in a market value for Arkansas corn of \$84 million. Sorghum acreage increased in 2002 to 230 thousand acres from 170 thousand in 2001. However, yields decreased to 77 bu/acre in 2002 from 86 bu/acre in 2001. The large increase in acreage resulted in production of 17.7 million bushels at an expected season average price of \$2.46/bu which will generate a market value of \$44 million for the 2002 crop.

An increase in area planted to corn and a decrease for sorghum is projected for Arkansas in 2003. The market value of corn is expected to be higher in 2003, primarily because the increase in acreage. However, market value of sorghum is expected to decrease in 2003 due to lower acreage and lower price. The projected values of the crops are \$101 million for corn and \$38 million for sorghum.

Wheat. Arkansas produces soft-red winter wheat which has had an annual farm level value of \$127 million from 1997 to 2001 (Table 3). Area harvested in 2002 was 840 thousand acres, less than the 970 thousand acres in 2001. Production in 2002 was 38.6 million bushels valued at \$2.90/bu for a total market value of \$112 million.

Hay. Arkansas Agricultural Statistics Service estimates the 2003 hay crop area harvested at 1.375 million acres, the same as 2002. Yield is forecast to decrease to 2.2 tons/acre, which should lead to a smaller crop and, with similar prices of \$61/ton, a lower market value of \$184 million for 2003.

² It should be noted that market value is determined by multiplying market price by production and government payments are excluded. The share for field crops relative to others would increase substantially if government payments were included.

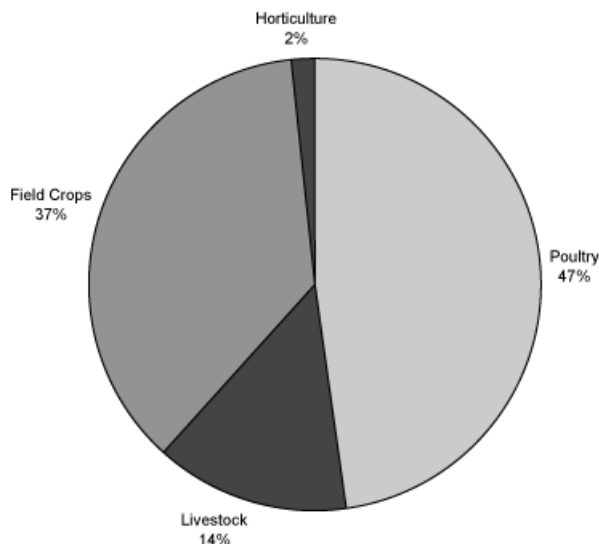


Fig. 1. Market value shares of Arkansas agriculture in 2002.

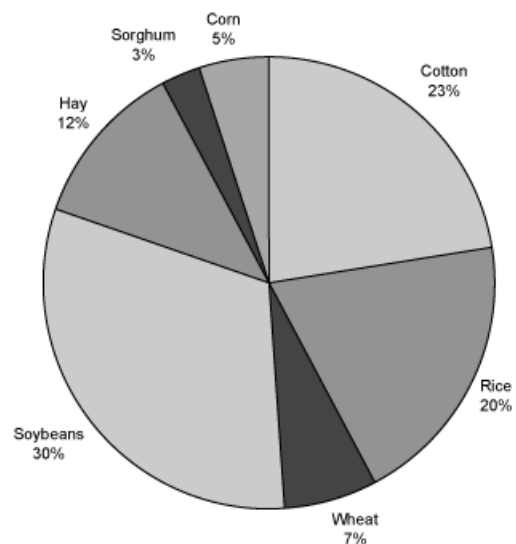


Fig. 2. Market value shares of Arkansas field crops in 2002.

Livestock

Prices in the livestock and poultry sector are expected to rise in 2003 as the total red meat and poultry production drops 1-2 percent from 2002. Total exports are expected to rise which should provide additional price support. Beef production is expected to drop about 4 percent from 2002. Tight forage supplies and uncertain water supplies are leading to the result of a continuing inventory decline. U.S. broiler production is expected to be up less than 1 percent from last year. There are currently a number of trade and disease issues affecting the U.S. poultry industry. The resolutions of these issues most likely will have an impact on both short-term and long-term outlooks, especially regarding poultry exports. Hog prices revisited 1998-99 levels in 2002 due to large supplies plaguing the pork sector. Recent reductions in the sow herd indicated reduced pork supplies and higher prices for the next two years. Milk production grew by over 2.5% in the U.S. in 2002 due to an increase in the dairy herd and in milk per cow. The Milk Income Loss Contract (MILC) program included in the 2002 farm bill should result in approximately \$1.20 per cwt on producer's eligible milk marketings between 2002 and 2005. Catfish sales in 2002 were mixed with higher volumes and lower prices. Sales are expected to increase in 2003.

The market value shares of Arkansas livestock and catfish in 2002 are presented in Fig. 3. The livestock categories include cattle and calves with a share of 64%, hogs and pigs at 19%, and milk at 8%. Catfish had a 9% share.

Pork. Arkansas producers rank 17th in hog and pig production in the U.S. Since 1994, the Arkansas breeding herd inventory on December 1 remained constant at 110 thousand head, but declined to only 100 thousand head in 2002 (Table 4). Annual sow farrowings (December-November) declined to 200 thousand in 2002 with an average litter size of 9.5 pigs. The pig crop in 2002 was 1.905 million head. A forecast of hog and pig production in Arkansas is not provided

because a major adjustment in production took place in the latter half of 2002 as the result of a large number of production contract terminations.

Beef Cattle. Beef cows and heifers inventory in Arkansas on January 1, 2003 was 949 thousand head, slightly above the previous year. Arkansas ranks 17th in cattle and calves in the U.S. The number of cattle and calves on farms in the U.S. declined for the seventh consecutive year in 2003 due to the continuation of unusually dry conditions over much of the U.S. These conditions have hindered producers' efforts to rebuild the cattle herd. FAPRI projections indicate inventory numbers are expected to begin to increase in 2006 and are expected to grow for the following several years. Increases in the amount of beef per cow is also expected. Higher than expected production in 2002 led cattle prices to decline for the first time since 1998. With the forecasted declining beef productions through 2005, prices should accordingly strengthen. Domestic demand for beef is the main factor in determining future price levels. A weaker economy or consumer fears could limit price gains from reduced supplies. Expected hay prices and strong producer prices should provide positive returns. Positive returns in the range of \$35 to \$60 per cow are expected for the next three to four years.

Dairy Cattle. The Arkansas dairy industry continues to experience a decline in its average annual milk cow inventory (Table 4). The herd size throughout 2002 was 32 thousand head, averaging 12,281 pounds of milk per cow for total production of 393 million pounds. Lower milk prices in 2002 led to even more of a decline in cow numbers which are expected to be 30 thousand in 2003. Slightly higher milk output per cow in 2003, at 12,367 pounds, will only partially offset the decline in cow numbers, with total production expected to fall to approximately 371 million pounds. The market value of milk production is projected to decrease slightly in 2003 primarily due to the reduction in cow numbers.

Table 1. Returns to Arkansas producers at specified market prices plus LDP for alternative yield levels.

| Item | Returns at various yields | | | | | |
|--|----------------------------------|-----------------------------|----------|----------|----------|--|
| Soybeans - Dryland | | Price =\$5.40/bushel | | | | |
| Yield (bushels/acre) | 15 | 20 | 25 | 30 | 35 | |
| Specified Operating Costs | \$105.45 | \$106.20 | \$106.95 | \$107.70 | \$108.45 | |
| Returns Above Operating Costs ¹ | \$-24.45 | \$1.80 | \$28.05 | \$54.30 | \$80.55 | |
| Returns Above Operating + 25 % Rent ² | \$-44.70 | \$-25.20 | \$-5.70 | \$13.80 | \$33.30 | |
| Soybeans - Irrigated | | Price =\$5.40/bushel | | | | |
| Yield (bushels/acre) | 35 | 40 | 45 | 50 | 55 | |
| Specified Operating Costs | \$125.78 | \$126.53 | \$127.28 | \$128.03 | \$128.78 | |
| Returns Above Operating Costs | \$63.22 | \$89.47 | \$115.72 | \$141.97 | \$168.22 | |
| Returns Above Operating + 25 % Rent | \$15.97 | \$35.47 | \$54.97 | \$74.47 | \$93.97 | |
| Rice | | Price =\$3.00/bushel | | | | |
| Yield (bushels/acre) | 115 | 125 | 135 | 145 | 155 | |
| Specified Operating Costs | \$301.83 | \$303.33 | \$304.83 | \$306.33 | \$307.83 | |
| Returns Above Operating Costs | \$43.17 | \$71.67 | \$100.17 | \$128.67 | \$157.17 | |
| Returns Above Operating + 25 % Rent | \$-43.08 | \$-22.08 | \$-1.08 | \$19.92 | \$40.92 | |
| Corn | | Price =\$2.19/bushel | | | | |
| Yield (bushels/acre) | 130 | 140 | 150 | 160 | 170 | |
| Specified Operating Costs | \$264.79 | \$267.99 | \$271.19 | \$274.39 | \$277.59 | |
| Returns Above Operating Costs | \$19.91 | \$38.61 | \$57.31 | \$76.01 | \$94.71 | |
| Returns Above Operating + 25 % Rent | \$-51.27 | \$-38.04 | \$-24.82 | \$-11.59 | \$1.63 | |
| Grain Sorghum - Dryland | | Price =\$3.87/cwt | | | | |
| Yield (cwt/acre) | 20 | 30 | 40 | 50 | 60 | |
| Specified Operating Costs | \$115.49 | \$118.19 | \$120.89 | \$123.59 | \$126.29 | |
| Returns Above Operating Costs | \$-38.09 | \$-2.09 | \$33.91 | \$69.91 | \$105.91 | |
| Returns Above Operating + 25 % Rent | \$-57.44 | \$-31.12 | \$-4.79 | \$21.53 | \$47.86 | |
| Grain Sorghum - Irrigated | | Price =\$3.87/cwt | | | | |
| Yield (cwt/acre) | 40 | 50 | 60 | 70 | 80 | |
| Specified Operating Costs | \$143.68 | \$146.38 | \$149.08 | \$151.78 | \$154.48 | |
| Returns Above Operating Costs | \$-11.12 | \$47.12 | \$83.12 | \$119.12 | \$155.12 | |
| Returns Above Operating + 25 % Rent | \$-27.58 | \$-1.25 | \$25.07 | \$51.40 | \$77.72 | |
| Cotton Southeast BWE Zone - Dry | | Price = \$0.55/lb | | | | |
| Yield (lbs/acre) | 400 | 500 | 600 | 700 | 800 | |
| Specified Operating Costs | \$290.20 | \$290.20 | \$290.20 | \$290.20 | \$290.20 | |
| Returns Above Operating Costs | \$-70.20 | \$-15.20 | \$39.80 | \$94.80 | \$149.80 | |
| Returns Above Operating + 25 % Rent | \$-125.20 | \$-83.95 | \$-42.70 | \$-1.45 | \$39.80 | |

Table 1. cont'd: Returns to Arkansas producers at specified market prices plus LDP for alternative yield levels.

| Item | Returns at various yields | | | | |
|--|---------------------------|----------|----------|----------|----------|
| Cotton Southeast BWE Zone - Irrigated Price = \$0.55/lb | | | | | |
| Yield (lbs/acre) | 700 | 800 | 900 | 1000 | 1100 |
| Specified Operating Costs | \$383.42 | \$383.42 | \$383.42 | \$383.42 | \$383.42 |
| Returns Above Operating Costs | \$1.58 | \$56.58 | \$111.58 | \$166.58 | \$221.58 |
| Returns Above Operating + 25 % Rent | -\$94.67 | -\$53.42 | -\$12.17 | \$29.08 | \$70.33 |
| Cotton Central BWE Zone - Dry Price = \$0.55/lb | | | | | |
| Yield (lbs/acre) | 400 | 500 | 600 | 700 | 800 |
| Specified Operating Costs | \$282.78 | \$282.78 | \$282.78 | \$282.78 | \$282.78 |
| Returns Above Operating Costs | -\$62.78 | -\$7.78 | \$47.22 | \$102.22 | \$157.22 |
| Returns Above Operating + 25 % Rent | -\$117.78 | -\$76.53 | -\$35.28 | -\$5.97 | \$47.22 |
| Cotton Central BWE Zone - Irrigated Price = \$0.55/lb | | | | | |
| Yield (lbs/acre) | 700 | 800 | 900 | 1000 | 1100 |
| Specified Operating Costs | \$374.68 | \$374.68 | \$374.68 | \$374.68 | \$374.68 |
| Returns Above Operating Costs | \$10.32 | \$65.32 | \$120.32 | \$175.32 | \$230.32 |
| Returns Above Operating + 25 % Rent | -\$85.93 | -\$44.68 | -\$3.43 | \$37.82 | \$79.07 |
| Cotton Ridge BWE Zone - Dry Price = \$0.55/lb | | | | | |
| Yield (lbs/acre) | 400 | 500 | 600 | 700 | 800 |
| Specified Operating Costs | \$264.91 | \$264.91 | \$264.91 | \$264.91 | \$264.91 |
| Returns Above Operating Costs | -\$44.91 | \$10.09 | \$65.09 | \$120.09 | \$175.09 |
| Returns Above Operating + 25 % Rent | -\$99.91 | -\$58.66 | -\$17.41 | \$23.84 | \$65.09 |
| Cotton Ridge BWE Zone - Irrigated Price = \$0.55/lb | | | | | |
| Yield (lbs/acre) | 700 | 800 | 900 | 1000 | 1100 |
| Specified Operating Costs | \$352.39 | \$352.39 | \$352.39 | \$352.39 | \$352.38 |
| Returns Above Operating Costs | \$32.61 | \$87.61 | \$142.61 | \$197.61 | \$252.61 |
| Returns Above Operating + 25 % Rent | -\$63.64 | -\$22.39 | \$18.86 | \$60.11 | \$101.36 |
| Cotton Northeast - Dry Price = \$0.55/lb | | | | | |
| Yield (lbs/acre) | 400 | 500 | 600 | 700 | 800 |
| Specified Operating Costs | \$225.59 | \$225.59 | \$225.59 | \$225.59 | \$225.59 |
| Returns Above Operating Costs | -\$5.59 | \$49.41 | \$104.41 | \$159.41 | \$214.41 |
| Returns Above Operating + 25 % Rent | -\$60.59 | -\$19.34 | \$21.91 | \$63.16 | \$104.41 |
| Cotton Northeast - Irrigated Price = \$0.55/lb | | | | | |
| Yield (lbs/acre) | 700 | 800 | 900 | 1000 | 1100 |
| Specified Operating Costs | \$313.61 | \$313.61 | \$313.61 | \$313.61 | \$313.61 |
| Returns Above Operating Costs | \$71.39 | \$126.39 | \$181.39 | \$236.39 | \$291.39 |
| Returns Above Operating + 25 % Rent | -\$24.86 | \$16.39 | \$57.64 | \$98.89 | \$140.14 |

¹ Estimated returns include LDP's but not direct, previously AMTA, payments and do not include ownership and overhead costs.

² Returns above operating plus 25% rent are return to non-land assets and management.

BWE = Boll Weevil Eradication

Source: Authors computations based on University of Arkansas Cooperative Extension Service budgets.

Table 2. Returns to Arkansas producers at specified yields for alternative market prices plus LDP.

| Item | Returns at various prices | | | | |
|--|----------------------------------|----------------------------|----------|----------|----------|
| Soybeans - Dryland | | Yield =25 bu/acre | | | |
| Price (\$/bu) | \$5.00 | \$5.20 | \$5.40 | \$5.60 | \$5.80 |
| Specified Operating Costs | \$106.95 | \$106.95 | \$106.95 | \$106.95 | \$106.95 |
| Returns Above Operating Costs ¹ | \$18.05 | \$23.05 | \$28.05 | \$33.05 | \$38.05 |
| Returns Above Operating + 25 % Rent ² | \$-13.20 | \$-9.45 | \$-5.70 | \$-1.95 | \$1.80 |
| Soybeans - Irrigated | | Yield =45 bu/acre | | | |
| Price (\$/bu) | \$5.00 | \$5.20 | \$5.40 | \$5.60 | \$5.80 |
| Specified Operating Costs | \$127.28 | \$127.28 | \$127.28 | \$127.28 | \$127.28 |
| Returns Above Operating Costs | \$97.72 | \$106.72 | \$115.72 | \$124.72 | \$133.72 |
| Returns Above Operating + 25 % Rent | \$41.47 | \$48.22 | \$54.97 | \$61.72 | \$68.47 |
| Rice | | Yield =135 bu/acre | | | |
| Price (\$/bu) | \$2.50 | \$2.75 | \$3.00 | \$3.25 | \$3.50 |
| Specified Operating Costs | \$304.83 | \$304.83 | \$304.83 | \$304.83 | \$304.83 |
| Returns Above Operating Costs | \$32.67 | \$66.42 | \$100.17 | \$133.92 | \$167.67 |
| Returns Above Operating + 25 % Rent | \$-51.71 | \$-26.39 | \$-1.08 | \$24.23 | \$49.55 |
| Corn | | Yield =150 bu/acre | | | |
| Price (\$/bu) | \$1.99 | \$2.09 | \$2.19 | \$2.29 | \$2.39 |
| Specified Operating Costs | \$271.91 | \$271.91 | \$271.91 | \$271.91 | \$271.91 |
| Returns Above Operating Costs | \$27.31 | \$42.31 | \$57.31 | \$72.31 | \$87.31 |
| Returns Above Operating + 25 % Rent | \$-47.32 | \$-36.07 | \$-24.82 | \$-13.57 | \$-2.32 |
| Grain Sorghum - Dry | | Yield =40 cwt/acre | | | |
| Price (\$/cwt) | \$3.47 | \$3.67 | \$3.87 | \$4.07 | \$4.27 |
| Specified Operating Costs | \$120.89 | \$120.89 | \$120.89 | \$120.89 | \$120.89 |
| Returns Above Operating Costs | \$17.91 | \$25.91 | \$33.91 | \$41.91 | \$49.91 |
| Returns Above Operating + 25 % Rent | \$-16.79 | \$-10.79 | \$-4.79 | \$1.21 | \$7.21 |
| Grain Sorghum - Irrigated | | Yield =60 cwt/acre | | | |
| Price (\$/cwt) | \$3.47 | \$3.67 | \$3.87 | \$4.07 | \$4.27 |
| Specified Operating Costs | \$149.08 | \$149.08 | \$149.08 | \$149.08 | \$149.08 |
| Returns Above Operating Costs | \$59.12 | \$71.12 | \$83.12 | \$95.12 | \$107.12 |
| Returns Above Operating + 25 % Rent | \$7.07 | \$16.07 | \$25.07 | \$34.07 | \$43.07 |
| Cotton Southeast BWE Zone - Dry | | Yield = 600 lb/acre | | | |
| Price (\$/lb) | \$0.35 | \$0.45 | \$0.55 | \$0.65 | \$0.75 |
| Specified Operating Costs | \$290.20 | \$290.20 | \$290.20 | \$290.20 | \$290.20 |
| Returns Above Operating Costs | \$-80.20 | \$-20.20 | \$39.80 | \$99.80 | \$159.80 |
| Returns Above Operating + 25 % Rent | \$-132.70 | \$-87.70 | \$-42.70 | \$2.30 | \$47.30 |

Table 2. cont'd: Returns to Arkansas producers at specified yields for alternative market prices plus LDP.

| Item | Returns at various prices | | | | |
|--|----------------------------------|----------|----------|----------|----------|
| Cotton Southeast BWE Zone - Irrigated Yield = 900 lb/acre | | | | | |
| Price (\$/lb) | \$0.35 | \$0.45 | \$0.55 | \$0.65 | \$0.75 |
| Specified Operating Costs | \$383.42 | \$383.42 | \$383.42 | \$383.42 | \$383.42 |
| Returns Above Operating Costs | \$-68.42 | \$21.58 | \$111.58 | \$201.58 | \$291.58 |
| Returns Above Operating + 25 % Rent | \$-147.17 | \$-79.67 | \$-12.17 | \$55.33 | \$122.83 |
| Cotton Central BWE Zone - Dry Yield = 600 lb/acre | | | | | |
| Price (\$/lb) | \$0.35 | \$0.45 | \$0.55 | \$0.65 | \$0.75 |
| Specified Operating Costs | \$282.78 | \$282.78 | \$282.78 | \$282.78 | \$282.78 |
| Returns Above Operating Costs | \$-72.78 | \$-12.78 | \$47.22 | \$107.22 | \$167.22 |
| Returns Above Operating + 25 % Rent | \$-125.28 | \$-80.28 | \$-35.28 | \$9.72 | \$54.72 |
| Cotton Central BWE Zone - Irrigated Yield = 900 lb/acre | | | | | |
| Price (\$/lb) | \$0.35 | \$0.45 | \$0.55 | \$0.65 | \$0.75 |
| Specified Operating Costs | \$374.68 | \$374.68 | \$374.68 | \$374.68 | \$374.68 |
| Returns Above Operating Costs | \$-59.68 | \$30.32 | \$120.32 | \$210.32 | \$300.32 |
| Returns Above Operating + 25 % Rent | \$-138.43 | \$-70.93 | \$-3.43 | \$64.07 | \$131.57 |
| Cotton Ridge BWE Zone - Dry Yield = 600 lb/acre | | | | | |
| Price (\$/lb) | \$0.35 | \$0.45 | \$0.55 | \$0.65 | \$0.75 |
| Specified Operating Costs | \$264.91 | \$264.91 | \$264.91 | \$264.91 | \$264.91 |
| Returns Above Operating Costs | \$-54.91 | \$5.09 | \$65.09 | \$125.09 | \$185.09 |
| Returns Above Operating + 25 % Rent | \$-107.41 | \$-62.41 | \$-17.41 | \$27.59 | \$72.59 |
| Cotton Ridge BWE Zone - Irrigated Yield = 900 lb/acre | | | | | |
| Price (\$/lb) | \$0.35 | \$0.45 | \$0.55 | \$0.65 | \$0.75 |
| Specified Operating Costs | \$352.39 | \$352.39 | \$352.39 | \$352.39 | \$352.39 |
| Returns Above Operating Costs | \$-37.39 | \$52.61 | \$142.61 | \$232.61 | \$322.61 |
| Returns Above Operating + 25 % Rent | \$-116.14 | \$-48.64 | \$18.86 | \$86.36 | \$153.86 |
| Cotton Northeast - Dry Yield = 600 lb/acre | | | | | |
| Price (\$/lb) | \$0.35 | \$0.45 | \$0.55 | \$0.65 | \$0.75 |
| Specified Operating Costs | \$225.59 | \$225.59 | \$225.59 | \$225.59 | \$225.59 |
| Returns Above Operating Costs | \$-15.59 | \$44.41 | \$104.41 | \$164.41 | \$224.41 |
| Returns Above Operating + 25 % Rent | \$-68.09 | \$-23.09 | \$21.91 | \$66.91 | \$111.91 |
| Cotton Northeast - Irrigated Yield = 900 lb/acre | | | | | |
| Price (\$/lb) | \$0.35 | \$0.45 | \$0.55 | \$0.65 | \$0.75 |
| Specified Operating Costs | \$313.61 | \$313.61 | \$313.61 | \$313.61 | \$313.61 |
| Returns Above Operating Costs | \$1.39 | \$91.39 | \$181.39 | \$271.39 | \$361.39 |
| Returns Above Operating + 25 % Rent | \$-77.36 | \$-9.86 | \$57.64 | \$125.14 | \$192.64 |

¹ Estimated returns include LDP's but not direct, previously AMTA, payments and do not include ownership and overhead costs.

² Returns above operating plus 25% rent are return to non-land assets and management.

BWE = Boll Weevil Eradication

Source: Authors computations based on University of Arkansas Cooperative Extension Service budgets.

Table 3. Production, prices, and market value of Arkansas crops, 1992-2003.

| Item | 92/93 | 93/94 | 94/95 | 95/96 | 96/97 | 97/98 | 98/99 | 99/00 | 00/01 | 01/02 | 02/03P | 03/04F |
|-------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Soybeans | | | | | | | | | | | | |
| Acres harvested, thous | 3,160 | 3,550 | 3,400 | 3,400 | 3,500 | 3,600 | 3,400 | 3,300 | 3,150 | 2,850 | 2,880 | 2,850 |
| Yield, bushels | 33 | 26 | 34 | 26 | 32 | 30.5 | 25 | 28 | 25.5 | 32 | 33.5 | 34 |
| Production, thous bu | 10,4280 | 92,300 | 115,600 | 88,400 | 112,000 | 109,800 | 85,000 | 92,400 | 80,325 | 91,200 | 96,480 | 96,900 |
| Price, \$/bu | 5.64 | 6.65 | 5.69 | 6.85 | 7.36 | 6.88 | 5.38 | 4.79 | 4.73 | 4.37 | 5.65 | 5.40 |
| Market value, thous \$ | 588,139 | 613,795 | 657,764 | 605,540 | 824,320 | 755,424 | 457,300 | 442,596 | 407,680 | 398,544 | 545,112 | 523,260 |
| Rice | | | | | | | | | | | | |
| Acres harvested, thous | 1,380 | 1,230 | 1,420 | 1,340 | 1,170 | 1,390 | 1,485 | 1,625 | 1,410 | 1,621 | 1,503 | 1,436 |
| Yield, bushels | 122 | 112 | 127 | 121 | 137 | 127 | 129 | 130 | 136 | 141 | 143 | 143 |
| Production, thous bu | 168,667 | 138,033 | 179,867 | 162,289 | 159,900 | 176,067 | 191,387 | 211,231 | 191,360 | 228,550 | 214,983 | 205,348 |
| Price, \$/bu | 2.67 | 3.59 | 2.93 | 4.11 | 4.59 | 4.44 | 3.99 | 2.57 | 2.52 | 1.91 | 1.89 | 2.93 |
| Market value, thous \$ | 450,087 | 495,057 | 527,729 | 667,403 | 733,839 | 781,901 | 763,920 | 542,758 | 482,227 | 437,147 | 406,318 | 600,703 |
| Cotton | | | | | | | | | | | | |
| Acres harvested, thous | 980 | 970 | 970 | 1,110 | 990 | 965 | 900 | 960 | 950 | 1,065 | 920 | 915 |
| Yield, pounds | 823 | 541 | 877 | 635 | 793 | 837 | 645 | 714 | 720 | 826 | 871 | 787 |
| Production, thous bales | 1,681 | 1,094 | 1,772 | 1,468 | 1,636 | 1,683 | 1,209 | 1,428 | 1,425 | 1,833 | 1,669 | 1,500 |
| Price, \$/lb | 0.557 | 0.572 | 0.677 | 0.734 | 0.707 | 0.657 | 0.635 | 0.472 | 0.549 | 0.280 | 0.420 | 0.550 |
| Market value, thous \$ | 449,432 | 300,369 | 575,829 | 517,206 | 555,193 | 530,751 | 368,503 | 323,528 | 375,516 | 246,355 | 336,470 | 396,000 |
| Corn | | | | | | | | | | | | |
| Acres harvested, thous | 95 | 90 | 90 | 85 | 230 | 185 | 215 | 100 | 175 | 185 | 260 | 340 |
| Yield, bushels | 130 | 91 | 120 | 115 | 125 | 125 | 100 | 130 | 130 | 145 | 134 | 135 |
| Production, thous bu | 12,350 | 8,190 | 10,800 | 9,775 | 28,750 | 23,125 | 21,500 | 13,000 | 22,750 | 26,825 | 34,840 | 45,900 |
| Price, \$/bu | 2.29 | 2.53 | 2.31 | 3.10 | 2.65 | 2.51 | 1.85 | 1.74 | 1.75 | 2.02 | 2.40 | 2.19 |
| Market value, thous \$ | 28,282 | 20,721 | 24,948 | 30,303 | 76,188 | 58,044 | 39,755 | 22,620 | 39,813 | 54,187 | 83,616 | 100,521 |

Table 3. cont'd: Production, prices, and market value of Arkansas crops, 1992-2003.

| Item | 92/93 | 93/94 | 94/95 | 95/96 | 96/97 | 97/98 | 98/99 | 99/00 | 00/01 | 01/02 | 02/03P | 03/04F |
|-------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Sorghum | | | | | | | | | | | | |
| Acres harvested, thous | 410 | 215 | 245 | 185 | 220 | 150 | 130 | 125 | 140 | 170 | 230 | 215 |
| Yield, bushels | 76 | 58 | 75 | 71 | 74 | 74 | 53 | 78 | 71 | 86 | 77 | 82 |
| Production, thous bu | 31,160 | 12,470 | 18,375 | 13,135 | 16,280 | 11,100 | 6,890 | 9,750 | 9,940 | 14,620 | 17,710 | 17,630 |
| Price, \$/bu | 2.14 | 2.31 | 2.03 | 2.91 | 2.95 | 2.57 | 1.88 | 1.69 | 1.64 | 2.00 | 2.46 | 2.15 |
| Market value, thous \$ | 66,682 | 28,806 | 37,301 | 38,223 | 48,026 | 28,527 | 12,953 | 16,478 | 16,302 | 29,146 | 43,637 | 37,904 |
| Wheat | | | | | | | | | | | | |
| Acres harvested, thous | 850 | 1,040 | 880 | 1,000 | 1,240 | 820 | 900 | 920 | 1,100 | 970 | 840 | 580 |
| Yield, bushels | 46 | 40 | 46 | 47 | 54 | 48 | 51 | 56 | 54 | 52 | 46 | 50 |
| Production, thous bu | 39,100 | 41,600 | 40,480 | 47,000 | 66,960 | 39,360 | 45,900 | 51,520 | 59,400 | 50,440 | 38,640 | 29,000 |
| Price, \$/bu | 3.51 | 2.86 | 3.20 | 3.61 | 4.38 | 3.49 | 2.73 | 2.24 | 2.35 | 2.36 | 2.90 | 3.05 |
| Market value, thous \$ | 137,241 | 118,976 | 129,536 | 169,670 | 293,285 | 137,366 | 125,307 | 115,405 | 139,590 | 119,038 | 112,056 | 88,450 |
| Hay | | | | | | | | | | | | |
| Acres harvested, thous. | 1,200 | 1,180 | 1,125 | 1,050 | 1,175 | 1,225 | 1,175 | 1,240 | 1,250 | 1,320 | 1,375 | 1,375 |
| Yield, tons | 2.33 | 2.03 | 2.23 | 1.92 | 2.01 | 2.02 | 1.91 | 1.92 | 2.30 | 2.12 | 2.61 | 2.20 |
| Production, thous tons | 2,796 | 2,390 | 2,505 | 2,011 | 2,360 | 2,470 | 2,250 | 2,380 | 2,879 | 2,792 | 3,595 | 3,020 |
| Price, \$/ton | 55.50 | 60.00 | 59.00 | 61.50 | 64.00 | 59.00 | 61.00 | 60.00 | 58.50 | 62.50 | 61.10 | 61.00 |
| Market value, thous \$ | 145,175 | 134,890 | 135,700 | 115,359 | 134,300 | 138,560 | 126,245 | 130,920 | 164,374 | 171,488 | 198,835 | 184,220 |

P = projected, F = forecast.

Source: USDA, NASS for historical data. Projections for 2003/04 are estimated using baseline projections published by FAPRI and USDA and current market reports.

Catfish

The Arkansas catfish industry has been one of the fastest growing sectors of the Arkansas agricultural economy, but according to forecasts water surface area is projected to decrease in 2003. Relatively low feed prices, strong domestic demand, and low interest rates have fueled past profitability in catfish production. Sales in 2002 were 99 million pounds, up slightly from 2001 sales of 97 million. The value of Arkansas catfish sales in 2003 is expected to be close to \$62 million.

Poultry

The market value shares of Arkansas poultry are presented in Fig. 4. Broilers dominate the poultry category with 2002 sales of \$1.7 billion and a 78% share of Arkansas poultry revenue. Eggs (13% share) and turkeys (9% share) had market values in 2002 of \$297 million and \$198 million, respectively.

Broilers. Arkansas broiler production continues to expand as both domestic and export markets grow after a one-year reduction in 2001. Production in 2002 was up slightly at 5.81 billion pounds (Table 5). Despite weaker broiler prices in 1999 and 2000, low feed prices helped to maintain profitability in the industry. Lower prices in 2002 resulted in lower returns. Hatchery egg sets in early 2003 suggest that an expansion in production is likely in 2003. Slightly higher prices are projected and market value in 2003 is estimated to be \$1.9 billion.

Turkeys. Arkansas producers increased production in 2002 (Table 5). Even though prices weakened slightly, the market value of Arkansas turkey production increased to \$198 million in 2002 because of increased production. Production in 2003 is expected to increase slightly, however prices are likely to remain close to 2002 levels, resulting in a

slight increase in the market value of Arkansas turkeys in 2003.

Eggs. Approximately 60 percent of the Arkansas egg production is for hatching rather than table use. As a result, the average price received for Arkansas eggs is typically much higher than the average table egg price in the U.S. Arkansas egg production ranks 8th in the overall share of U.S. total egg production. A slight expansion in the egg production industry is expected in 2003 with production reaching nearly 3.4 billion eggs. Average prices are expected to strengthen by four cents to \$1.11 per dozen and the market value of the Arkansas egg industry is projected to reach \$372 million in 2003.

Horticultural Crops

In 2002, Arkansas total horticultural sales (floriculture, nurseries, fruits, vegetables and nuts) had a market value of \$75 million. Apples, blueberries, grapes, peaches, pecans, and strawberries account for nearly all of the fruit and nut market sales in Arkansas. Tomatoes and watermelons accounted for \$17.5 million of the commercial vegetable sales (Table 6).³ Acreage in horticultural crops in general has declined slightly over the past decade by approximately 10 percent. Leading the decline in area production are grapes, watermelons, blueberries, and apples. Tomatoes and peaches have experienced expanded acreage and have become the highest value Arkansas horticultural crops with 20% and 4% shares, respectively (Fig. 5). Following tomatoes and peaches in terms of market value shares in 2002 are watermelons (4%), grapes (3%), blueberries (2%), pecans (1%) and apples (1%). Floriculture, turf farms and nursery businesses however are dominant in the horticulture industry in Arkansas. These business activities account for 65% of the horticulture sector sales.

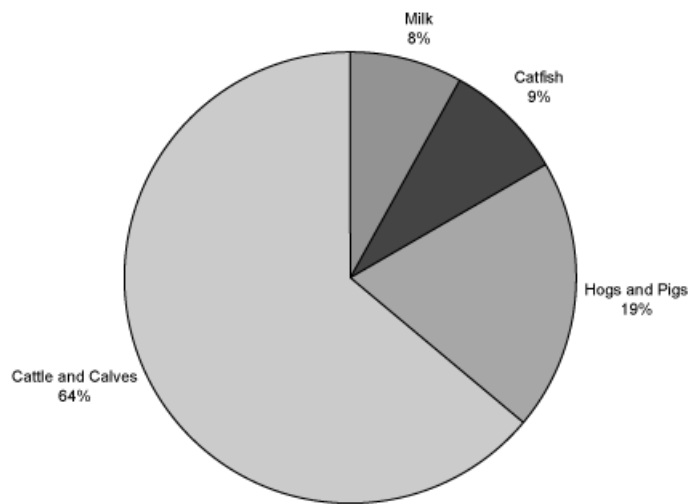


Fig. 3. Market value shares of Arkansas livestock and catfish sales in 2002.

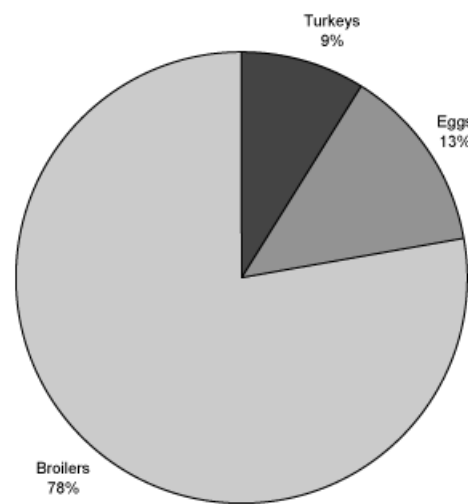


Fig. 4. Market value shares of Arkansas poultry sales in 2002.

³ The only horticultural crops included in this study are crops with available data. For example, nursery crops and turf grass are not included because data are not available.

Table 4. Production, prices, and market value of Arkansas livestock and catfish, 1994-2003.

| Item | 94 | 95 | 96 | 97 | 98 | 99 | 00 | 01 | 02P | 03F |
|-----------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Hogs and Pigs | | | | | | | | | | |
| Hog Inventory, December 1 | | | | | | | | | | |
| Breeding inventory, 000 head | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 100 | na |
| Sows farrowed, 000 head | 203 | 209 | 217 | 225 | 225 | 223 | 221 | 215 | 200 | na |
| Pigs per litter | 8.92 | 9.30 | 8.63 | 8.45 | 8.48 | 8.48 | 8.83 | 9.18 | 9.54 | 8.86 |
| Pig crop, 000 head | 1,810 | 1,944 | 1,872 | 1,901 | 1,907 | 1,891 | 1,951 | 1,973 | 1,905 | na |
| Market value of pig crop, mil.\$ | 46.88 | 45.88 | 52.04 | 74.14 | 47.29 | 60.60 | 88.44 | 116.53 | 90.27 | na |
| Value per head, \$ | 57 | 75 | 100 | 79 | 46 | 68 | 69 | 63 | 68 | 70 |
| Production, thous lbs | 368,455 | 358,328 | 307,077 | 254,014 | 281,086 | 266,244 | 282,047 | 286,311 | 294,042 | na |
| Marketings, thous lbs | 388,271 | 357,171 | 296,454 | 260,945 | 296,330 | 281,002 | 292,708 | 310,819 | 330,114 | na |
| Price, \$/cwt. | 38.00 | 40.00 | 50.00 | 48.00 | 30.00 | 28.60 | 39.10 | 40.70 | 30.70 | 34.26 |
| Gross income, thous. \$ | 153,418 | 148,447 | 156,090 | 148,951 | 109,612 | 98,860 | 130,206 | 150,930 | 123,791 | na |
| Cattle and Calves | | | | | | | | | | |
| Cow inventory, Jan 1, 000 head | | | | | | | | | | |
| Cow value, \$/cwt | 43.30 | 37.20 | 28.30 | 33.70 | 31.90 | 32.20 | 34.50 | 34.50 | 40.20 | 40.00 |
| Calf crop, 000 head | 850 | 860 | 870 | 830 | 840 | 850 | 840 | 820 | 850 | 845 |
| Calf value, \$/cwt | 79.80 | 58.40 | 51.40 | 78.80 | 77.80 | 84.20 | 96.00 | 101.00 | 86.00 | 95.00 |
| Market value of calf crop, mil.\$ | 271.32 | 200.90 | 178.87 | 261.62 | 261.41 | 286.28 | 323.33 | 331.28 | 282.40 | 321.10 |
| Production, thous lbs | 603,830 | 563,335 | 534,035 | 550,522 | 537,659 | 567,543 | 565,659 | 558,414 | 570,201 | 553,095 |
| Marketings, thous. lbs | 599,000 | 639,600 | 607,100 | 680,600 | 573,250 | 620,200 | 655,800 | 592,140 | 611,440 | 597,000 |
| Cattle price, \$/cwt. | 58.20 | 49.20 | 42.10 | 53.90 | 53.00 | 56.40 | 66.00 | 68.30 | 63.90 | 71.00 |
| Gross income, thous. \$ | 370,933 | 325,367 | 265,730 | 392,094 | 328,114 | 378,624 | 459,873 | 437,969 | 414,937 | 448,132 |
| Dairy Cattle | | | | | | | | | | |
| Ave. inventory, Jan. 1, 000 head | | | | | | | | | | |
| Milk per cow, lbs | 12,344 | 12,150 | 12,054 | 11,981 | 12,000 | 12,381 | 12,436 | 12,343 | 12,281 | 12,367 |
| Production, mil. lbs | 753 | 729 | 675 | 635 | 540 | 520 | 485 | 432 | 393 | 371 |
| Price/cwt | 13.51 | 13.48 | 15.64 | 14.18 | 15.22 | 14.81 | 13.24 | 16.10 | 12.94 | 12.9 |
| Gross income, thous. \$ | 102.7 | 98.9 | 106.4 | 90.6 | 82.7 | 77.8 | 64.6 | 67.9 | 51.2 | 48.62 |
| Catfish | | | | | | | | | | |
| Water surface acres | 19,000 | 19,500 | 23,000 | 28,500 | 25,000 | 31,000 | 33,000 | 37,500 | 33,500 | 34,000 |
| Sales, 000 lbs | 47,754 | 51,137 | 63,417 | 76,113 | 72,450 | 90,920 | 85,260 | 99,261 | 105,000 | 100,000 |
| Price per lb | 0.77 | 0.80 | 0.82 | 0.73 | 0.78 | 0.78 | 0.77 | 0.57 | 0.59 | 0.56 |
| Market value, mil. \$ | 36.81 | 41.03 | 52.21 | 55.51 | 56.26 | 70.59 | 65.74 | 56.38 | 61.95 | 55.44 |

P = projected, F = forecast.

na = not available, a major adjustment in the production of hogs and pigs took place in Arkansas in the latter half of 2002.

Source: USDA, NASS for historical data. Projections for 2003 are estimated using baseline projections by FAPRI and USDA and current market reports.

Apples. Arkansas has a bearing acreage of 900 acres and ranked 32nd in value of apple production in the U.S. in 2002. Yields in Arkansas in 2002 were 5.0 thousand pounds per acre, over 18% lower than in 2001 (Table 6). Total utilized production in 2002 was 3.4 million pounds. Average market value was \$0.28 per pound, up from 2001 by 3 cents per pound, and resulted in total market sales of \$952 thousand. The production outlook for 2003 is highly dependent upon weather conditions. Assuming 900 acres and yields of 6,000 pounds per acre, utilized production is projected to be 5.0 million pounds. At \$0.25/lb, total market value is projected to increase to \$1.25 million for 2003.

Grapes. Arkansas vineyards have declined in area from 2,200 acres in 1993 to 1,400 in 2002. Yields have fluctuated between 1.8 and 5.6 tons per acre (Table 6). However in 2002, average yield recovered from the 2001 low of 1.8 tons per acre, to 4.0 tons per acre. Total utilized production was 5,400 tons. This rapid recovery of yield per acre led to a lower average Arkansas market price of \$462/ton in 2002, closer to the U.S. average than in 2001, for a total market value of \$2.5 million. The 2003 outlook is based on an area of 1,500 acres with a projected yield of 3.5 tons/acre and utilized production of 4,500 tons. At \$550/ton, the market value for the Arkansas grape crop in 2003 is projected to be \$2.475 million.

Blueberries. Production area of blueberries in Arkansas has declined from a level of 700 acres in 1994-95 to only 400 in 2001, but increased slightly to 450 in 2002. Yields have fluctuated from a low of 1,670 lbs per acre in 1996 to a high of 3,000 lbs in 1997. Yields in 2002 reached 2,960 lbs per acre. Total production utilized in 2002 was 1,330 thousand lbs. All of Arkansas blueberries were marketed into the fresh market. The average price for Arkansas blueberries averaged \$1.15/lb. Projections for 2003 are based on a constant acreage of 450, with a resulting utilized production of just under 1 million lbs and market value of \$1.2 million.

Peaches. Bearing acreage of peaches in Arkansas has increased from 2,700 in 1994 to 3,000 in 2001 and back down to 2,800 in 2002 (Table 6). The randomness of freezing temperatures during or after the flowering period causes yields of peaches to be highly variable in Arkansas. The yield range over the past eight years has been as low as 440 lbs/acre in 1996 to a high of 9,600 lbs/acre in 1993. Average yields in 2002 were 3,570 lbs/acre for a total utilized production of 7.8 million lbs. Arkansas peach producers experienced a high price in 2002 at \$0.43/lb, above the U.S. average. The 2003 outlook for peaches assumes peach orchard acreage of 2,800 and a yield of 4,000 lbs/acre, projected utilized production is 11.2 million lbs. The projected value of the Arkansas peach crop in 2003 based on a price of \$0.40/lb is \$4.5 million.

Tomatoes. Area harvested declined to 1,200 acres in 2002 from a recent high of 1,500 acres in 2000 (Table 6). Over the past seven years, yields have ranged between 100 and 290 cwt/acre. In 2002 yields were 280 cwt/acre. Total 2002 production was 336 thousand cwt. The crop was valued at an average market price of \$44/cwt up nine dollars

from 2001. Total value of the crop in 2002 was \$14.8 million. The outlook for 2003 Arkansas tomatoes is based on a harvested area of 1,300 acres, yields of 250 cwt/acre for a total output of 325 thousand cwt. Total projected value of Arkansas tomato production in 2003 based on a price of \$38/cwt is \$12.4 million.

Watermelons. Area harvested of watermelons has declined from 3,400 acres in 1993 to only 2,200 acres in 1998, increased to 3,000 in 2001 and decreased to 2,500 in 2002. Yields have ranged between 100 and 185 cwt/acre over the past nine years. Average prices have increased the past two years from \$4.20/cwt in 2000 to \$5.70/cwt in 2002. Total market value of the 2002 crop was \$2.6 million based on an average yield of 185 cwt/acre and total production of 463 thousand cwt. Production in 2003 is projected to be 425 thousand cwt based on acreage of 2,500 and an average yield of 170 cwt/acre. Priced at an average market value of \$5.10/cwt the total projected value of Arkansas watermelons in 2003 is \$2.17 million.

Pecans. Production of pecans in Arkansas in 2002 was 1.7 million pounds, down 900 thousand pounds from 2001. Producers in Arkansas received \$0.57/lb for a total crop value of \$970 thousand. Production in nuts typically declines markedly following a year of high output and then increases in the subsequent year. The 2003 outlook for Arkansas pecan production is expected to increase to 2.0 million pounds. This production pattern is expected nationwide for pecan output and therefore prices are expected to fall. With a projected price of \$0.55/lb, the value of the Arkansas pecan crop in 2003 is \$1.1 million.

FARM INCOME AND FINANCIAL SITUATION AND OUTLOOK

USDA does not provide net farm income forecasts for individual states. However, USDA has published Arkansas' net farm income through 2001 (Fig. 6). Arkansas net farm income has gone from \$2.021 billion in 1996 to \$1.400 billion in 2001, a 31% decline. The decline in Arkansas net farm income would have been much more severe if it had not been for government payments. Without government payments, Arkansas net farm income would have fallen from \$1.659 billion in 1996 to \$567 million in 2001, a 66% drop. Much of this decline has been the result of depressed prices for program crops. Direct government payments have been extremely important to Arkansas farmers the last several years, particularly crop farmers. Arkansas farmers received 53% of their net farm income from direct government payments for 1999-2001 as opposed to 35% for the last ten years. However, these government payments are primarily received by crop farmers producing rice, cotton, soybean, wheat, corn, and sorghum in the eastern part of Arkansas. Loan officers from that portion of the state have indicated that government payments have accounted for about 100% of net farm income in certain years. Thus, these farmers would have had no farm income without government payments.

U.S. net farm income has also trended downward since

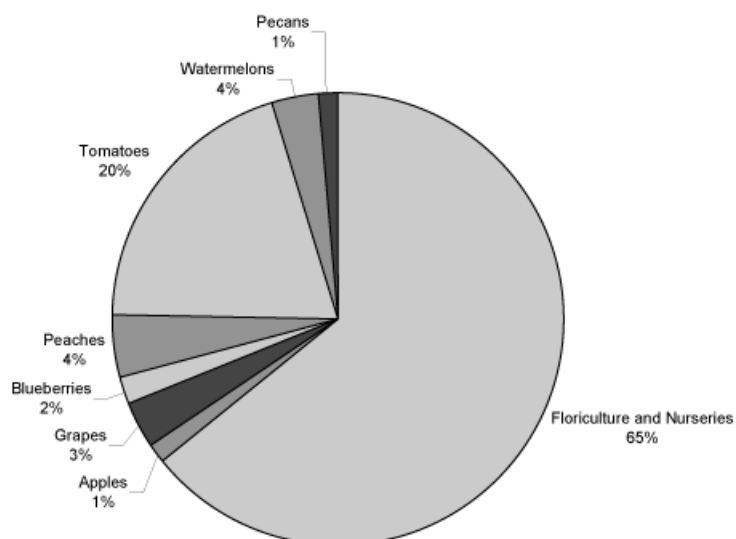


Fig. 5. Market value shares of Arkansas horticultural sales in 2002.

Table 5. Arkansas poultry production, prices, and market value, 1995-2003.

| | 95 | 96 | 97 | 98 | 99 | 00 | 01 | 02P | 03F |
|-----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Broilers | | | | | | | | | |
| Production, mil. lbs | 4,983 | 5,660 | 5,599 | 5,619 | 5,861 | 5,839 | 5,737 | 5,813 | 5870 |
| Price, ¢/lb | 35.5 | 37.5 | 37.5 | 38.0 | 37.0 | 33.0 | 39.0 | 30.0 | 31.4 |
| Market value, mil. \$ | 1,769 | 2,122 | 2,096 | 2,135 | 2,191 | 2,158 | 2,238 | 1,744 | 1932 |
| Turkeys | | | | | | | | | |
| Production, mil. lbs | 536 | 526 | 525 | 496 | 491 | 498 | 472 | 521 | 526 |
| Price, ¢/lb | 45.0 | 44.0 | 41.0 | 40.0 | 0.44 | 0.44 | 0.40 | 0.38 | 0.39 |
| Market value, mil. \$ | 241 | 232 | 215 | 198 | 216 | 219 | 189 | 198 | 205 |
| Eggs | | | | | | | | | |
| Production, mil. | 3,608 | 3,433 | 3,215 | 3,233 | 3,458 | 3,559 | 3,431 | 3,329 | 3,362 |
| Table eggs, mil. | 1,481 | 1,311 | 1,071 | 1,116 | 1,238 | 1,352 | 1,305 | 1,232 | 1,244 |
| Hatch eggs, mil. | 2,127 | 2,122 | 2,144 | 2,117 | 2,220 | 2,207 | 2,122 | 2,097 | 2,118 |
| Price, cents/dozen | 97.9 | 105.0 | 103.0 | 114 | 111 | 106 | 106 | 107 | 111 |
| Market value, mil. \$ | 294 | 300 | 276 | 307 | 320 | 314 | 303 | 297 | 372 |

P = projected,

F = forecast

Source: USDA, NASS for historical data. Projections for 2003 are estimated using baseline projections by FAPRI, USDA, and current market reports.

Table 6. Production, prices, and market value of Arkansas horticultural crops, 1994-2003.

| Item | 94 | 95 | 96 | 97 | 98 | 99 | 00 | 01 | 02P | 03F |
|----------------------|-------|--------|-------|--------|--------|--------|--------|--------|--------|--------|
| Apples | | | | | | | | | | |
| Area harvested, acre | 1,000 | 900 | 900 | 900 | 900 | 900 | 900 | 900 | 900 | 900 |
| Yield, lbs/acre | 8,000 | 10,000 | 7,000 | 8,000 | 5,000 | 6,000 | 8,000 | 6,110 | 5,000 | 6,000 |
| Production,* 000 lbs | 7,500 | 9,500 | 5,800 | 7,100 | 3,600 | 4,200 | 3,400 | 4,300 | 3,400 | 5,000 |
| Price, \$/lb | 0.164 | 0.143 | 0.178 | 0.289 | 0.227 | 0.238 | 0.252 | 0.25 | 0.28 | 0.25 |
| Market value, 000 \$ | 1,228 | 1,357 | 1,031 | 2,053 | 816 | 1,001 | 856 | 1,076 | 952 | 1,250 |
| Grapes | | | | | | | | | | |
| Area harvested, acre | 2,000 | 2,000 | 1,600 | 1,400 | 1,300 | 1,400 | 1,400 | 1,500 | 1,400 | 1,500 |
| Yield, tons/acre | 3.00 | 4.00 | 5.63 | 4.64 | 3.50 | 3.50 | 3.00 | 1.80 | 4.00 | 3.5 |
| Production, tons | 5,500 | 7,000 | 8,000 | 5,500 | 4,430 | 4,800 | 3,900 | 2,500 | 5,400 | 4,500 |
| Price, \$/ton | 476 | 634 | 629 | 586 | 497 | 473 | 560 | 541 | 462 | 550 |
| Market value, 000 \$ | 2,619 | 4,438 | 5,035 | 3,225 | 2,202 | 2,268 | 2,185 | 1,353 | 2,495 | 2,475 |
| Blueberries | | | | | | | | | | |
| Area harvested, acre | 700 | 700 | 600 | 550 | 500 | 450 | 400 | 400 | 450 | 450 |
| Yield, lbs/acre | 2,430 | 2,430 | 1,670 | 3,000 | 1,800 | 2,510 | 2,650 | 2,030 | 2,960 | 2,200 |
| Production, 000 lbs | 1,700 | 1,700 | 1,000 | 1,650 | 900 | 1,130 | 1,060 | 810 | 1,330 | 950 |
| Price, \$/lb | 0.972 | 1.060 | 1.480 | 0.998 | 1.000 | 1.050 | 1.190 | 1.450 | 1.150 | 1.25 |
| Market value, 000 \$ | 1,652 | 1,800 | 1,480 | 1,646 | 902 | 1,182 | 1,262 | 1,171 | 1,533 | 1,188 |
| Peaches | | | | | | | | | | |
| Area harvested, acre | 2,700 | 2,700 | 2,700 | 2,700 | 2,800 | 2,800 | 3,000 | 3,000 | 2,800 | 2,800 |
| Yield, lbs/acre | 2,960 | 7,410 | 440 | 5,300 | 4,460 | 4,290 | 6,000 | 4,000 | 3,570 | 4,000 |
| Production, 000 lbs | 8,000 | 18,000 | 1,100 | 14,300 | 11,100 | 10,500 | 15,700 | 10,300 | 7,800 | 11,200 |
| Price, \$/lb | 0.245 | 0.177 | 0.155 | 0.290 | 0.328 | 0.340 | 0.370 | 0.410 | 0.430 | 0.40 |
| Market value, 000 \$ | 1,960 | 3,189 | 171 | 4,142 | 3,639 | 3,575 | 5,811 | 4,193 | 3,336 | 4,480 |
| Tomatoes | | | | | | | | | | |
| Area harvested, acre | 1,100 | 1,000 | 1,000 | 1,100 | 1,400 | 1,500 | 1,500 | 1,300 | 1,200 | 1,300 |
| Yield, cwt/acre | 290 | 260 | 130 | 210 | 240 | 225 | 100 | 230 | 280 | 250 |
| Production, 000 cwt | 319 | 260 | 130 | 231 | 336 | 338 | 150 | 299 | 336 | 325 |
| Price, \$/cwt | 31.00 | 42.00 | 38.00 | 34.00 | 34.50 | 41.80 | 26.00 | 35.00 | 44.00 | 38.00 |
| Market value, 000 \$ | 9,889 | 10,920 | 4,940 | 7,854 | 11,592 | 14,128 | 3,900 | 10,465 | 14,784 | 12,350 |
| Watermelons | | | | | | | | | | |
| Area harvested, acre | 3,000 | 2,400 | 2,600 | 2,700 | 2,200 | 2,400 | 2,700 | 3,000 | 2,500 | 2,500 |
| Yield, cwt/acre | 180 | 100 | 110 | 150 | 145 | 115 | 150 | 170 | 185 | 170 |
| Production, 000 cwt | 540 | 240 | 286 | 405 | 319 | 276 | 405 | 510 | 463 | 425 |
| Price, \$/cwt | 4.70 | 8.00 | 6.00 | 5.00 | 6.50 | 7.50 | 4.20 | 4.90 | 5.70 | 5.10 |
| Market value, 000 \$ | 2,538 | 1,920 | 1,716 | 2,025 | 2,074 | 2,070 | 1,701 | 2,499 | 2,639 | 2,168 |

Table 6. cont'd: Production, prices, and market value of Arkansas horticultural crops, 1994-2003.

| Item | 94 | 95 | 96 | 97 | 98 | 99 | 00 | 01 | 02P | 03F |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Pecans | | | | | | | | | | |
| Production, 000 lbs | 1,500 | 1,600 | 1,200 | 3,500 | 550 | 3,800 | 900 | 2,600 | 1,700 | 2,000 |
| Price, \$/lb | 0.960 | 1.140 | 0.900 | 0.671 | 1.030 | 0.590 | 0.930 | 0.550 | 0.57 | 0.55 |
| Market value, 000 \$ | 1,440 | 1,820 | 1,080 | 2,349 | 565 | 2,241 | 1,445 | 1,430 | 970 | 1,100 |

P = projected, F = forecast. Source: USDA, NASS. Projections are based on USDA and FAPRI baseline study and current market reports.

Note: The only horticultural crops listed are crops that have data available. For example, nursery crops are not listed because data are unavailable.

*Production reported in this table is the output utilized, i.e., the amount sold plus the quantities used at home or held in storage. It excludes unharvested production and quantities harvested but not sold, used at home, or in storage.

1996 decreasing from \$54.8 billion to a forecast of \$46.2 billion in 2003 (Fig. 7). The 2003 forecast is actually 53% higher than the 2002 forecast of \$30.2 billion of net farm income. Much of this increase is from a jump in government payments from \$11.8 billion in 2002 to \$21.4 billion in 2003, similar to the levels of 1999-2001. Some of these government payments had been expected to be received by farmers in 2002, but instead, were moved into 2003 as a result of a delay in farmers' program sign-up decisions. Besides the increase in government payments, the rest of the net farm income increase from 2002 to 2003 is from increased production and improved market forecasts.

As was mentioned earlier, the problem with discussing Arkansas net farm income when considering the impact of government payments is that net farm income includes income from livestock, poultry, program crops, and other crops. To get a better handle of the effect of direct government payments on Arkansas program crop farms, only program crop cash receipts are considered.⁴ Since 1996, program crop cash receipts for Arkansas have fallen nearly 38% from \$2.362 billion in 1996 to \$1.475 billion in 2001 (Fig. 8). Although increases in government payments have softened the fall in total cash receipts, expenses have undoubtedly increased over the period resulting in falling net farm income from producing program crops.

Although the USDA has not provided an income forecast for Arkansas, it has provided income forecasts for regions of the United States that include portions of Arkansas. The USDA constructed a set of regions depicting geographic specialization in production of U.S. farm commodities (Fig. 9). Arkansas farms fall into three regions: Mississippi Portal, Eastern Uplands, and Southern Seaboard.

The Mississippi Portal region is perhaps the best region for grouping farms with similar production specialities. The region is dominated by crop farms producing rice, cotton, and soybeans. The Mississippi Portal region also happens to be the smallest geographical region in the United States (Fig. 9). The Mississippi Portal includes the eastern third of Arkansas, which corresponds to Arkansas statistical reporting districts 3, 6, and 9.

The largest area of Arkansas is represented in the Eastern Uplands region, which includes the mountainous areas of the United States east of the Rocky Mountains (Fig. 9). The Eastern Uplands includes the western third and much of central Arkansas, which corresponds to Arkansas statistical reporting districts 1, 2, 4, 5, and 7. Typical farms in the Eastern Uplands region produce cattle, poultry, and burley tobacco. Although there is little tobacco production in Arkansas, there is plenty of cattle and poultry production.

The smallest area of Arkansas is represented in the Southern Seaboard region. The Southern Seaboard includes the south central portion of Arkansas, which corresponds to Arkansas statistical reporting district 8. The Southern Seaboard region is a large and diverse area (Fig. 9) and is said by USDA to include cattle, poultry, and general field crop farms, which is a fair description of production agriculture in south-central Arkansas.

The USDA forecasts farm business net cash income for farms located in the Mississippi Portal, Eastern Uplands, and Southern Seaboard with the exclusion of rural residence farms—limited resource, retirement, and residential/lifestyle farms. All U.S. farm businesses are forecast to average \$39,900 of net cash income in 2003, a 10% increase from \$36,400 per farm in 2002, yet still below the 1997-2001 average of \$43,400 (Table 7). All three regions to which portions of Arkansas belong have less net cash farm income than the United States. The difference is particularly striking for the Eastern Uplands. At \$14,700, the Eastern Uplands region has the lowest average net cash income per farm of any region in the United States for 1997-2001, and at \$16,800, it has the second lowest forecast for 2003. Although still below the U.S. average, the Mississippi Portal region is forecast to have a 23% increase in net cash income to \$38,600 in 2003 from a low \$31,300 in 2002. The Southern Seaboard region is forecast to have \$30,300 of net cash income per farm in 2003, which is 9% more than the \$27,700 in 2002, but similar to the \$30,000 average for 1997 through 2001.

On average, all U.S. commodity specialization categories, with the exception of dairy and other livestock, are forecast to have higher net cash income in 2003 than in 2002.

⁴ Program crops include food grains, feed grains except hay, cotton and oil crops. USDA does not publish estimates of expenses that are directly associated with program crops at the state level.

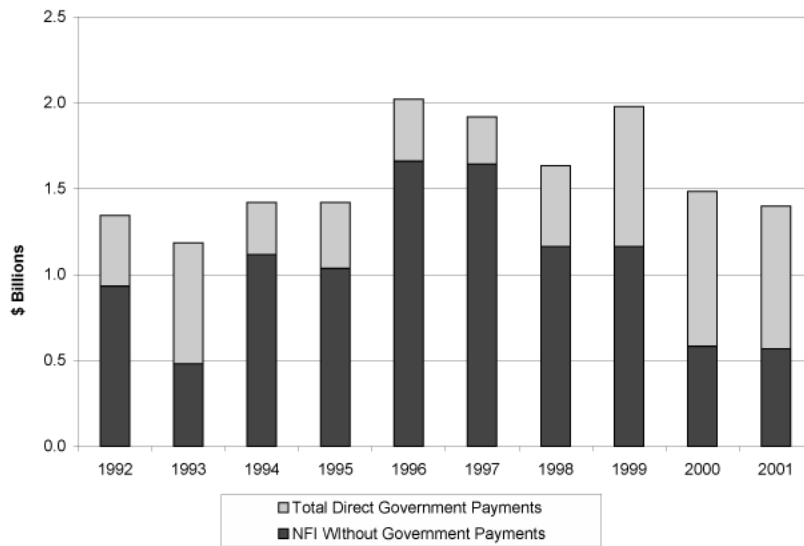


Fig. 6. Arkansas net farm income.

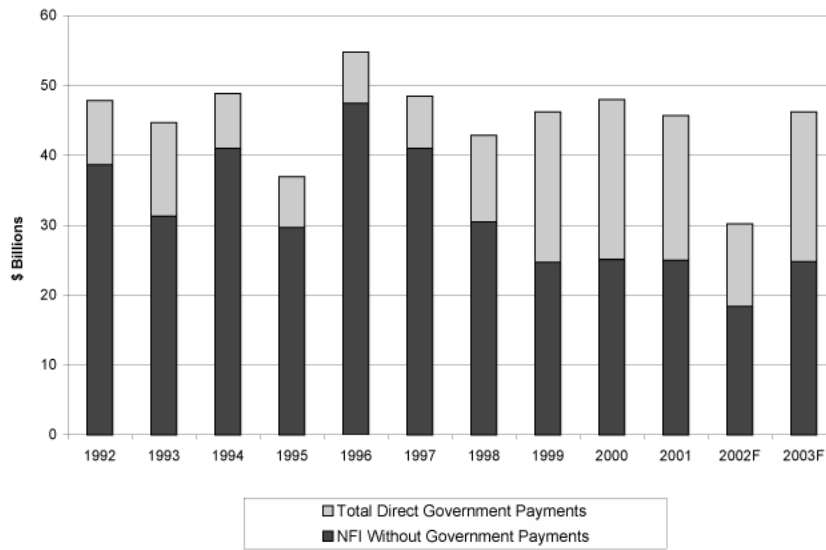


Fig. 7. U.S. net farm income.

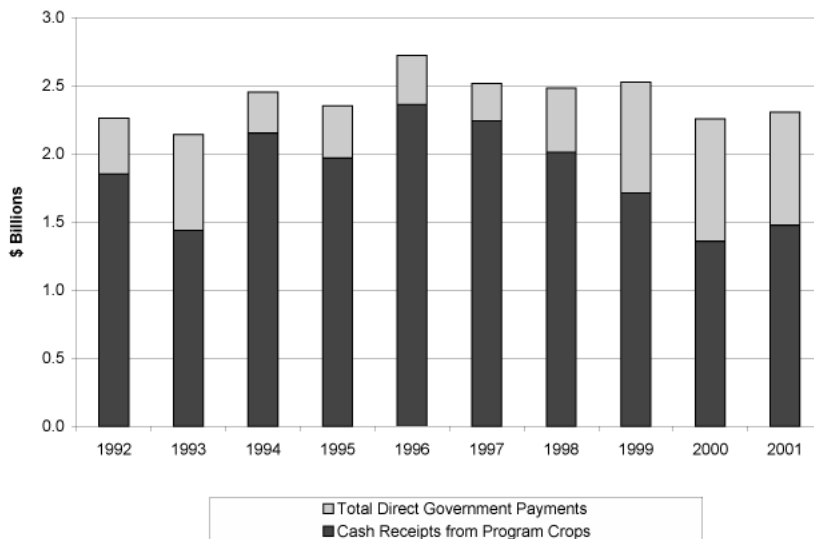


Fig. 8. Arkansas program crop receipts.

Most of these same farms: mixed grain, wheat, corn, soybeans, tobacco, cotton, and peanuts, other crops, beef cattle, hogs, poultry, and dairy experienced lower net cash incomes in 2002 than 2001. So it is not that 2003 is forecast to be that great of a year for net cash income, instead 2002 was just that bad of a year for many farms. In fact, wheat, corn, soybeans, tobacco, cotton, and peanuts, other crops, beef cattle, hogs, poultry, dairy, and other livestock are forecast to have lower net cash income in 2003 than they averaged for 1997 through 2001.

Fig. 10 shows the percentages of farm businesses with negative net cash income for various regions of the United States that have significant program crop production. Although all regions of the United States are forecast by the USDA to have large percentages of farms with negative net cash income, the Eastern Uplands is essentially tied with the Prairie Gateway for the region with the highest percentage at 46%. Thus, nearly one out of every two farm businesses in the region are forecast to have negative net cash income in 2003. The Mississippi Portal region is forecast to have a slight decrease in the percentage of farm businesses with negative cash income in 2003, yet at 39%, it is still higher than that for the United States at 36% (Table 7).

Many farmers have experienced several years of negative net cash income from the farm. Most of them are relying on non-farm income to pay family expenditures and to maintain the farm business. However, some of them may be eroding their farm equity by borrowing increasing amounts against farm assets in an effort to cover farm cash shortages and family living expenses. This latter situation of eroding farm equity is not sustainable.

Significant percentages of farms in each region of the United States are experiencing debt repayment difficulties as a result of low income and/or high debt. Four of the nine regions in the United States are forecast to have slightly greater percentages of farms with debt repayment difficulties in 2003 than 2002, including the Mississippi Portal. For the regions that include Arkansas farmers—the Mississippi Portal, Eastern Uplands, and Southern Seaboard—the percentages of farms forecast to have debt repayment difficulties in 2003 are 14%, 13%, and 13% (Table 7). Farms expected to have debt repayment difficulties are farms with high debt repayment obligations relative to the amount of farm income available to service those obligations. Farmers having debt repayment difficulties will not necessarily be forced to liquidate their farming operations and quit farming, although some may. It does mean, however, that these farmers will likely need to renegotiate their repayment plans with creditors.

Credit Conditions Survey

Informal survey responses from 30 Arkansas agricultural loan officers at commercial banks and Farm Credit Services offices were collected by telephone during the first week of March 2003. They were contacted to ask their opin-

ions regarding farm credit conditions. Many lenders had very strong opinions, particularly in eastern Arkansas. The loan officer responses were divided into two regions to see if there are any regional or crop/livestock differences. One region corresponded to the Mississippi Portal region of eastern Arkansas where crop agriculture dominates and the other region corresponded to the Eastern Uplands and Southern Seaboard regions of the rest of Arkansas.

Credit conditions for eastern Arkansas production agriculture turned weaker in 2002 according to loan officers located in that part of the state, however, they tended to indicate that 2003 will be better than 2002. Loan officers in the rest of Arkansas primarily indicated stable credit conditions, although there are some areas of concern. Loan demand in the east picked up a bit last year, while it softened in the west. The responses to the question on changes in the rate of loan repayment were highly variable for loan officers in the east. Nearly an equal number of officers indicated the rate of repayment by their farm borrowers had increased, decreased, or remained the same from a year earlier. Most of the loan officers in the west indicated the rate of repayment had stayed the same. The number of loan renewals or extensions increased slightly in eastern Arkansas and remained relatively stable in the west. Last year at this time lenders in eastern Arkansas indicated additional collateral for loans would be required. This year lenders from both eastern and western Arkansas indicate collateral requirements will remain the same.

Lenders reported a tightening in credit standards for approving new agricultural loans, although collateral requirements were unchanged. Of the lenders surveyed across the state, 43% indicated tighter credit standards and none reported an easing of standards. Lenders on average reported that 4% of their farm loan borrowers had major repayment problems requiring more collateral and/or long-term workouts. This is down from an estimate of 11% last year. Also, the lenders reported this year that about 2% of their borrowers had severe repayment problems which will likely result in loan losses and/or require forced sales of borrowers' assets. This is down slightly from the 3% reported last year. About 2% of their borrowers receiving operating credit last year are not likely to qualify for new loans this year. The percentages of farm borrowers with major or severe repayment problems were somewhat higher for lenders from eastern Arkansas than from the rest of the state.

The lenders outlooks for the demand to acquire farmland by farmers and non-farmer investors are quite striking. Sixty-three percent of Arkansas lenders expect no change in the demand to acquire farmland by farmers, with 27% expecting a decrease and only 10% expecting an increase. However, the outlook for the demand to acquire farmland is much different for non-farm investors. Twenty-seven percent of lenders expect no change in non-farmer demand, with only 7% expecting a decrease in demand and 67% expecting an increase in demand by non-farmers. In general, eastern

⁴ USDA does not publish estimates of expenses that are directly associated with program crops at the state level.

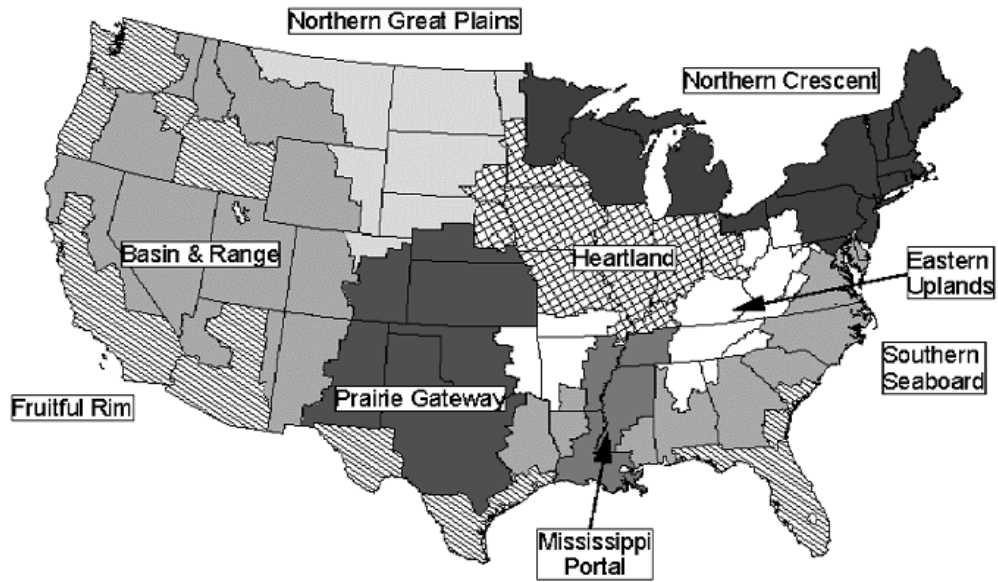


Fig. 9. USDA farm resource regions.

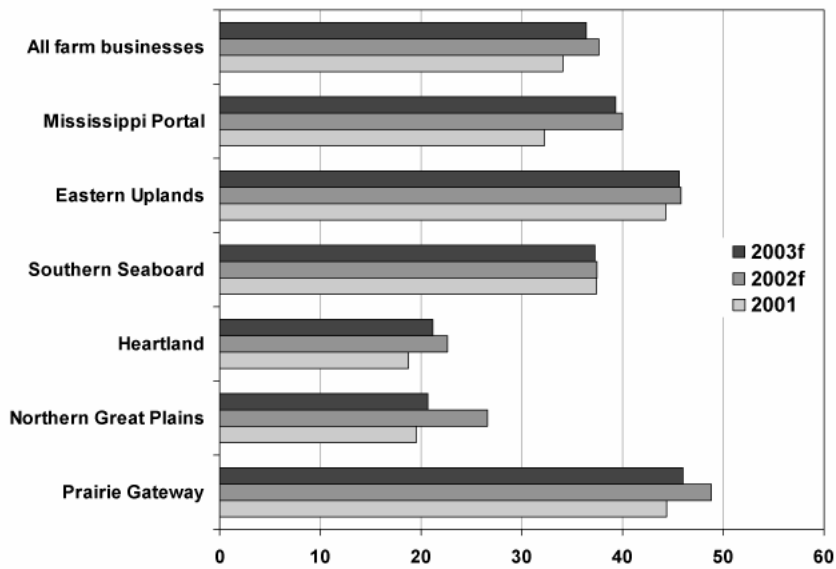


Fig. 10. Distribution of farm businesses with negative net cash income by resource region, 2001-2003f.

Table 7. Farm business average net cash income and percent of farms with debt repayment problems.

| Farm Regions | Average | | | |
|---|-----------|------|-------|-------|
| | 1997-2001 | 2001 | 2002F | 2003F |
| <i>Net cash income per farm in \$1,000s</i> | | | | |
| Farms ¹ in: | | | | |
| United States | 43.4 | 44.8 | 36.4 | 39.9 |
| Mississippi Portal | 43.2 | 41.9 | 31.3 | 38.6 |
| Eastern Uplands | 14.7 | 18.9 | 16.2 | 16.8 |
| Southern Seaboard | 30.0 | 30.9 | 27.7 | 30.3 |
| <i>Percent of farms with negative net cash income</i> | | | | |
| United States | | 34 | 38 | 36 |
| Mississippi Portal | | 32 | 40 | 39 |
| Eastern Uplands | | 44 | 46 | 46 |
| Southern Seaboard | | 37 | 37 | 37 |
| <i>Percent of farms with debt repayment problems</i> | | | | |
| United States | | 17 | 20 | 19 |
| Mississippi Portal | | 12 | 13 | 14 |
| Eastern Uplands | | 12 | 14 | 13 |
| Southern Seaboard | | 13 | 13 | 13 |

Source: USDA, Economic Research Service internet website and personal communication with USDA economist Mitch Morehart, March 6, 2003.

¹ Farm businesses excluding rural residence farms (limited resource, retirement, and residential/lifestyle farms).

F = forecast.

Arkansas lenders expect an increase in the volume of farmland transfers, with half expecting an increase and 7% expecting a decrease in volume.

Lenders were asked about what trends they see for forced and voluntary sales or liquidation of farm assets during the year. A forced sale or liquidation is presumably the result of farm financial stress. A voluntary sale or liquidation is for any other reason, such as retirement, career change, divorce, medical expenses, etc. Although there were more lenders in eastern Arkansas (39%) than western Arkansas (31%) that thought there would be an increase in forced and voluntary sales this year, eastern Arkansas at least had some lenders (11%) expect a decrease in sales as opposed to western Arkansas which did not have any (0%). Also, more eastern Arkansas lenders (62%) responding to last year's survey expected an increase in forced and voluntary sales than did respondents to this year's survey (39%). In addition, fewer western Arkansas lenders from last year's survey (23%) expected an increase in forced and voluntary sales than did this year's respondents (31%). Therefore, the gap between the perceptions of eastern and western Arkansas agricultural lenders about farm borrower financial difficulties has narrowed. The degree of farm financial difficulties perceived by eastern Arkansas lenders has decreased while it has increased for western Arkansas lenders.

Much of the difference between the responses of lenders located in eastern and western Arkansas is undoubtedly the result of the difference in the type of agriculture that dominates each area. Program crop production dominates eastern Arkansas and livestock and poultry production dominates western Arkansas. Lenders' outlooks for net cash farm earnings, including government payments, for crop farmers and livestock and poultry farmers are consistent with their responses concerning credit conditions. Forty-three percent of eastern lenders expect crop net cash income to increase in 2003, while 75% of western lenders expect livestock net cash income to be unchanged or decrease in 2003 from 2002.

Summary

Credit conditions of Arkansas farmers appear to have improved in some areas and deteriorated in some others. In general, agricultural lenders in eastern Arkansas tended to be slightly less concerned about the financial status of their farm customers, although there are some lenders that are still clearly concerned. This somewhat improved outlook for this year relative to last year is likely the result of the passage of the 2002 Farm Bill. When lenders were surveyed in 2002, the uncertainty of the particulars of the Farm Bill or if there would actually be a Farm Bill in 2002 or if farmers would receive emergency supplemental payments as in several previous years made for an extremely apprehensive outlook. This uncertainty made it extremely difficult for farmers and their lenders to make plans for 2002. This year a Farm Bill is in place and farmers and their lenders are in a better position to plan for the year.

The credit conditions of western Arkansas farmers, or at least the outlook for these farmers by their lenders, may have deteriorated somewhat. Several of the lenders that responded to the survey indicated that they had customers with production pork contracts that had been terminated in 2002. The loss of revenue from these contracts makes it extremely difficult, at the best, to be able to repay their loans that are often in the hundreds of thousands of dollars. The termination of these pork production contracts has also led some lenders to wonder about the stability of poultry production contracts that support loans they have made. Also, the potential for increased regulation of animal production agriculture and the water quality discussions that have filled the newspapers have created an environment where farmers and their lenders are concerned and cautious.

MACROECONOMIC IMPACTS ON AGRICULTURE

The news on the macroeconomic front for agriculture is guardedly optimistic. In calendar year 2002 real growth in gross domestic product (GDP) was 2.4% according to Bureau of Economic Analysis (BEA) data. Growth in the fourth quarter was revised upward from the initial release of 0.7% to 1.4%. The GDP growth in 2002 was very uneven with the first and third quarters having rates of 5.0% and 4.0%, respectively, with the second and third quarters having 1.3% and 1.4%. Coupled with the positive growth rate in the fourth quarter of 2001, it appears that the dip in growth in 2001 is over. However, with the lingering effects of the war with Iraq and uncertainty of energy prices, the likelihood of this growth continuing is not a certainty.

The 2.4% real GDP growth rate is surely much better than a negative rate. The 2002 growth easily surpasses the 0.3% rate of 2001 but is below the 3.8% of 2000. Hence one hears that the current economy is sluggish or no growth. It is more accurate to say the economy is growing but not as strongly as in recent memory. The strong points of GDP are consumption growing at 3.1% in 2002 and government expenditures growing at 4.4%. The weak points are investment and net exports. Overall private investment grew at only 1% in 2002 which, while anemic, is a recovery from the dismal 10.7% decrease in 2001. The weakness in investment is in nonresidential structures, down 16.4% in 2002. Residential construction was up a brisk 3.9% for the year. Net exports (exports less imports) were negative with exports declining by 1.5% and imports growing by 3.7%. This disparity contributed to a record \$422.4 billion trade deficit on the goods and services portion of the current account.

Unemployment and Interest Rates

For most people the most disappointing feature of the current recovery is the unemployment rate. The Bureau of Labor Statistics (BLS) reports the 2002 national unemployment rate at 5.8% compared with 4.8% and 4.0% in 2001 and 2000, respectively. The unemployment rate has increased to

6.2% during the second quarter of 2003 from 5.8% for the same period a year ago, which is not encouraging. The relatively stable unemployment rate at higher than full employment levels is probably reflective of the uncertainty about the economy in general. In Arkansas total non-farm employment increased from 1.147 million in June of 2002 to a preliminary estimate of 1.150 million in December 2002. The unemployment rate in Arkansas was 5.4% in June 2002 and increased to 5.6% in June 2003.

For agriculture the biggest factors coming from the domestic macro economy are interest rates and exchange rates. Interest rates are historically low. The federal funds rate, which the Federal Reserve targets in determining the money supply started 2002 at 1.75%. The Federal Reserve decreased this rate a half point on November 6, 2002, to 1.25% and again on June 25, 2003, to 1.00%. The federal funds rate began 2001 at 6.5%! Other short-term interest rates have fallen accordingly. Data in the February 2003 Economic Report of the President indicate that the prime rate had a high-low spread of 4.75%-4.75% in January 2002. The spread fell to a 4.25%-4.25% spread in December 2002. Longer term rates declined even more. Ten-year U.S. securities adjusted for constant maturities started 2002 at 5.04% and ended the year at 4.03%. Although long-term rates continued to fall to a low of 3.33% in June 2003, these rates began to increase in July. Farm interest rates are also low. Interest rates on real estate loans dropped by a half to a whole percent and non real estate loans dropped by 0.1% to 0.2%.

Last year we thought it unlikely the Fed would drop rates further but they did. It is not clear if the Fed will do so again. The federal funds rate is lowered by the Fed buying bonds and that means increases in the money supply. Those increases may lead to increased inflation. Despite a year of a very low federal funds rate, inflation was only 1.6% in 2002. But preliminary estimates in the President's Report indicate the three money supply aggregates for 2002 are up between 3.4% and 6.5% for the year. These are less than the previous year but still in considerable excess of the growth rate for GDP. Future inflation remains a concern. The bottom line for production agriculture is that interest rates should remain steady and at comparative lows for 2003.

Arkansas agricultural interest rate changes mirrored those for the economy as a whole. During the first week of March 2003 a number of loan officers at commercial banks and Farm Credit Service branches were informally surveyed about their current interest rates on agricultural loans. Loans were divided into two categories: operating loans and farm real estate loans. In total, 30 offices were contacted throughout the state with 14 from the eastern part of the state and 16 from the western and central sections. Respondents were asked to state their current rates and what they thought these rates would be next year.

Rates were fairly uniform across the state. For operating loans, current rates ranged from 5.45% to 8.5%, indicating that there are some price differences. The average rate was 6.38%, and this did not differ significantly when comparing the east with the rest of the state. The average rate is some-

what lower than the 6.81% reported in a similar survey in 2002. This is consistent with reductions in the Federal funds rate that were made by the Federal Reserve in 2002 in an effort to prevent a recession. The average operating loan interest rate projected by the lenders for next year was 6.54% indicating a slight increase from current rates.

In March 2003, farm real estate loans ranged from 5.45% to 8% according to the loan officers. Some of this variation can likely be attributed to different types of arrangements such as length of the loan. The mean rate for the 30 institutions was 6.52% with a projection of 6.67% next year. As with the operating loans, there was no noticeable association with rate levels and geographical location.

Exchange Rates and Exports

Exchange rates are somewhat of a mixed bag. With falling interest rates one would expect exchange rates to weaken as capital seeks more rewarding returns. The broad index (adjusted for inflation) of the U.S. dollar against foreign currencies indicates a stable dollar during 2002. But this masks the more than 10% fall in the dollar versus the euro during 2002 and a continued slide for much of the first half of 2003. The USDA's February 2003 baseline projections forecasts that developing economies will provide good markets for U.S. agricultural exports. The recent decline in the dollar against the euro should aid the trade effects.

Agricultural exports for fiscal 2002 were \$53.3 billion, up about \$595 million from 2001. Arkansas had an increase in agricultural exports to \$962 million for fiscal 2002 from \$905 million in 2001. USDA's Economic Research Service (ERS) forecasts a rise in U.S. agricultural exports to \$57 billion in fiscal 2003 with agricultural imports increasing by about \$2 billion to \$43 billion so that the agricultural trade surplus will grow. However, ERS does not see robust, worldwide economic growth for 2003 although they predict a slight improvement to 2% compared with 1.6% for 2002. The three biggest economies are the U.S., Japan and European Union. While the U.S. might be emerging from its recession, the same cannot be said for Japan while growth for the European Union is likely to be weak. Growth is most likely in Asian developing countries except that much of their growth is dependent on their ability to export to the U.S. and Japan according to ERS.

Production Costs and Land Values

Costs of production agriculture could be rising due, in part, to the increases in oil prices. ERS forecasts a 3.8% rise in costs of production. Fertilizer expenses will probably be the largest percentage increase due to the rising price of natural gas. ERS forecasts a rise in fertilizer prices of 9.2% in 2003. Fuel expenses are forecast by ERS to rise 4.1% with a 2.8% rise in fuel prices. However, with the uncertainty in oil markets and the severity of the winter in the U.S., it would not be surprising to see even higher fuel prices. Farm wage rates are forecast by ERS to rise by 2.3% and overall wage compensation by 3.8% due to greater use of labor in labor-

intensive farm operations. However, given the softness in overall labor markets, labor supplies should be adequate.

Land values in agriculture continue to rise. Nationally, the January 1, 2002 farm real estate values were \$1,210 per acre and increased to \$1,270 as of January 1, 2003. In Arkansas the value of farm real estate, including all land and buildings, went from \$1,370 in 2002 to \$1,470 in 2003, a 7.3% increase (Fig. 11). So the value of production agriculture's primary asset is not decreasing and has increased in real value when deflated by the consumer price index. However, the changes in cropland and pasture values are quite different. Arkansas cropland went from \$1,160 per acre in 2002 to \$1,180 in 2003, a 1.7% increase. Irrigated cropland increased at a slightly lower rate of 1.5% (\$1,310 to \$1,330) than did non-irrigated cropland which increased 1.9% (\$1,030 to \$1,050). According to National Agricultural Statistics Service estimates, Arkansas pasture values increased from \$1,080 to \$1,180, a robust 9.3%. This may be due to continued pressure from non-agricultural development on many rural areas of Arkansas where pasture land is found.

Real estate markets often vary considerably depending on where the real estate is located and what income is available to support it. This is certainly apparent when viewing the responses from the Arkansas agricultural loan officers informally surveyed in early March 2003 about farmland values and credit conditions.

Of the loan officers that responded from the eastern third of Arkansas, none of them expect a downward trend in farm-

land values for the next year and 43% of them expect an upward trend. In the western-central two-thirds of Arkansas, only 6% of the loan officers expect an upward trend in farmland values for the next year and the rest of them expect stable values. This is in sharp contrast to the responses to this question last year. Last year loan officers from the eastern part of the state were much less optimistic than their counterparts in the rest of the state. Much of this less optimistic outlook by eastern Arkansas lenders last year compared with this year is likely due to last year's less favorable price outlook and uncertainty of government payments associated with the 2002 Farm Bill that had not yet been passed.

Summary

The national and international economies are growing though not at a sparkling rate as in some recent years. The low interest rates, moderate wage costs, and economic growth in Asian developing countries and slightly elevated unemployment rates are likely to be positive for agriculture. However, persistent unemployment is disastrous for individuals who lose jobs or communities that have experienced large layoffs. As recently documented by an exhaustive ERS study, most farm household income is not from the farm but from off-farm work. Consumer spending continues to grow but dramatically rising fuel costs could dampen this major source of GDP. Agricultural exports should increase by 8% from 2002 and perhaps more with a weak dollar.

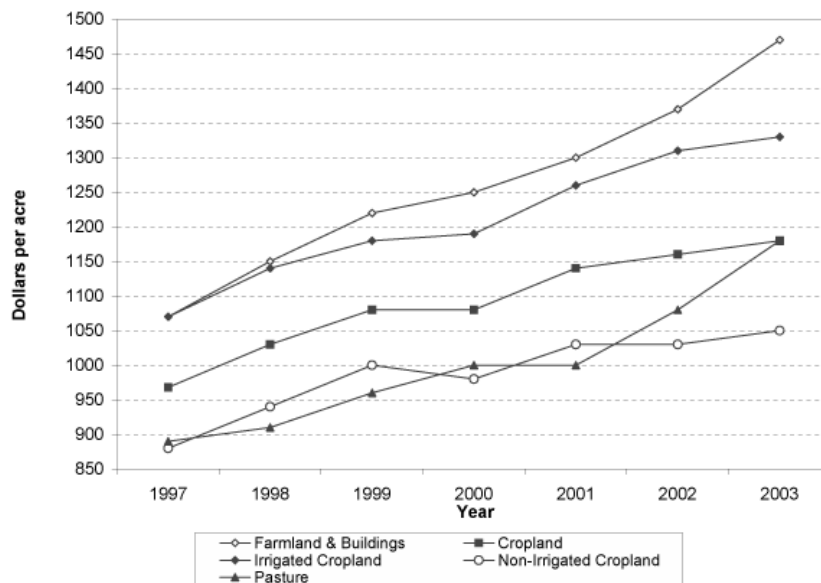


Fig. 11. Arkansas farmland values.

**SPECIAL ARTICLE:
BIO DIESEL... AN ALTERNATIVE FUEL
OPTION FOR AGRICULTURE?**

Alternatives to petroleum diesel and gasoline have been given much more attention in recent years. The benefits of these alternative fuels include lower pollution emissions and/or reduced dependence on foreign energy supplies. Another benefit of the use of some of these fuels, such as ethanol, is that the production of these fuels bolsters the demand for agricultural commodities. Some disadvantages of alternative fuels are that these fuels are often more expensive than the traditional transportation fuels, existing equipment might need to be modified to use these fuels, or new equipment may be required for their use. A relatively new alternative fuel called biodiesel is produced from agricultural commodities in a manner similar to ethanol.

Biodiesel is a substitute for, or additive to, petroleum diesel fuel. While many feedstocks can be used to produce biodiesel, the majority of biodiesel in the United States is produced from soybean oil. The Energy Tax Incentives Act of 2002 defines biodiesel as "the monoalkyl esters of long chain fatty acids derived from virgin vegetable oils for use in compression-ignition (diesel) engines. Such terms shall include esters derived from vegetable oils from corn, soybeans, sunflower seeds, cottonseeds, canola, crambe, rapeseeds, safflowers, flaxseeds, rice bran, and mustard seeds." In addition to these feedstocks, biodiesel can be produced from animal fats and recycled cooking oil.

A major advantage of biodiesel compared to other alternative fuels is that it can be used in existing diesel engines with no modifications and requires no special storage requirements. Generally, manufacturers' warranties are still applicable as long as the fuel meets certain industry standards and blends contain less than 20% of biodiesel. Biodiesel can be used in any blend ratio with petroleum diesel although blends with more than 20% biodiesel are not commonly used. B2 (2% biodiesel) and B20 are common blends. Since biodiesel, however blended, can be used in existing engines, it can be used immediately to reduce the United States' dependence on foreign petroleum. Other alternative fuel technologies such as hydrogen fuel cell vehicles show great promise but are unlikely to be in widespread use in the near future. In addition, biodiesel has superior lubrication properties compared to petroleum diesel and therefore shows promise as a fuel additive. This may become especially important if or when lower sulfur diesel fuels are mandated. Finally, it is safe to handle and store since it is non-toxic and biodegradable.

Biodiesel is also a renewable resource that is domestically produced. It can contribute significantly to reducing the United States' dependence on foreign energy supplies and reduces nearly all regulated pollutants. It contains no sulfur and therefore no sulfur dioxide is produced. The use of B20 reduced total hydrocarbons by up to 30%, carbon monoxide up to 20%, and particulate matter up to 15% compared to

petroleum diesel fuel. NO_x emissions increase slightly, however.

The production and use of biodiesel could thus contribute significantly to the agricultural economy. Soybean growers, processors, and related industries will all derive some benefit from the growth of this industry. Several Midwestern states are beginning to support the use of biodiesel. In fact, the Minnesota legislature has passed a bill mandating that all diesel fuel sold in the state will have to be B2. An estimate of the benefits to the agriculture economy if biodiesel was blended at a 1% level into all U.S. on-road diesel fuel are: i) utilization of 250 million bushels of soybeans; ii) addition of a minimum of \$0.35 to the value of a bushel of soybeans; and iii) more than a \$900 million improvement in gross farm income.

Finally, one other potential benefit of agriculturally derived fuels compared to petroleum fuels is the potential for differences in price cycles and thereby the possibility of input price risk mitigation. Since sources for price variation in petroleum fuel prices may be different than those for agricultural commodities, risk reduction through diversification of input use may allow for reductions in diversifiable risk. Based on recent prices, there is a trade-off between achieving the lowest average price and the lowest variation in the overall diesel price. Therefore an optimal blend level can be determined that will satisfy the dual objective of cost and input price risk minimization.

One advantage biodiesel has over petroleum diesel fuel is that it is biodegradable. However, if the biodiesel is going to be stored for a substantial period of time, this "advantage" could be a detriment. A review of the published literature suggests that degradation of biodiesel is somewhat dependent on the feedstock used to produce it. Most of the published research was conducted on biodiesel from rapeseed or used cooking oil.⁵ One study indicated that storage in a closed container for 6 months is generally acceptable and still meets the specifications to be considered an acceptable fuel. Another study stored rapeseed biodiesel under various conditions (inside/outside, closed/open containers) for up to 2 years and found very little difference in short-term engine performance. More analysis of soybean oil-derived biodiesel is desirable, but these studies suggest that degradation of biodiesel fuel is not an issue for most applications/environments.

Obviously, there are no guarantees that biodiesel production and use will raise the price of soybeans by a certain percentage. FAPRI estimates that if biodiesel (and ethanol) use is increased due to mandates for pollution control and/or reduced U.S. dependence on foreign petroleum supplies such that an additional 2 billion pounds of soybean oil is demanded, then soybean prices would increase by 3% (using a 10 year average price, this would be about \$0.15/bu).

How will this impact a soybean producer using their "own" product? In other words, how much would soybean prices have to rise to make it worthwhile for a farmer to use

⁵ Most of this research was conducted in Europe where the biodiesel industry is more established. Most U.S. biodiesel is derived from soybean oil.

more expensive, blended biodiesel on their own farm? If a farmer uses B5 at an on-farm, blended price of \$0.065/gal more than petroleum diesel (petroleum diesel costs \$1.20/gal and biodiesel trades at \$2.50/gal in this example), averages a 30 bu yield using approximately 12.5 gallons of fuel per acre (a weighted average on irrigated and rain-fed soybean), he would have a return of \$0.6875/ac if soybean were to trade \$0.05/bu higher because of biodiesel demand for soybean. Alternatively, given the same assumptions, he would need an extra \$0.027/bu to break even.

It can be seen from this example that a slight increase in soybean prices due to increased demand from biodiesel production would justify the on-farm use of biodiesel at low blend percentages. Whether this price increase will materialize is dependent on the growth of the biodiesel industry either from voluntary (e.g. farmers using their own product) or mandatory (e.g. a federal renewable fuels standard) actions. The bottom line is that on-farm biodiesel use by farmers makes sense if the above assumptions are not outlandish. There is evidence that a biodiesel or ethanol plant in an area will raise the local basis for soybean or corn. One study estimates the impact of Missouri's first ethanol plant to have added \$0.09/bu to the local basis for the nine-county surrounding area. However, the effect on local basis will probably be quite variable for differing geographic locations. For example, if one is considering building a relatively small biodiesel plant (possibly more of a demonstration project than a commercially-viable enterprise) in an area that produces a large quantity of soybean, then the effect on local prices because of this biodiesel plant is likely to be small while it could be quite significant if the plant were large and most producers in the area supplied their beans to the plant. Further, on the demand side, an individual farmer choosing to use biodiesel blends will not necessarily affect nation-wide or local soybean prices. However, if farmers collectively choose to adopt biodiesel blends, then the impact can be dramatic. Note also that it may not matter what feedstock is used to produce biodiesel since all agricultural commodities part and parcel of the vegetable oil and animal fats sectors will experience an increase in demand resulting in upward price pressure. So even if a soybean farmer burns biodiesel generated from animal fats he is likely to notice a price increase in soybean (albeit a potentially smaller price effect). Through the use of their "own" products, farmers can thus generate demand for their products. A situation that is not often available in the market place.

Currently in Arkansas, a person cannot just drive down to the local coop or gas station to fill-up with biodiesel.⁶ However, biodiesel is available to anyone who is interested. Companies exist that will ship small quantities (five gallon pails or 55 gallon drums) or large quantities directly to a customer or through your existing fuel supplier. Fuel suppliers in Iowa and Missouri are selling biodiesel (B2 and B10) to farmers for about \$0.05 more a gallon than petroleum diesel.

When buying in large quantities, the rule of thumb is that for each percent of biodiesel blended with petroleum diesel, the overall fuel price will increase approximately \$0.01 per gallon.

Finally, Arkansas has recently passed legislation to encourage biodiesel production and distribution in the State, although no economic incentives for biodiesel use were specified. This legislation applies to tax years beginning on or after January 1, 2003, however the State's budget has not yet been fully ratified and therefore, there is still some uncertainty regarding the appropriations for these incentives, as of April 30, 2003. These incentives include a tax credit for biodiesel suppliers (a tax credit of 5% of biodiesel facility construction and equipment cost, allowing a three-year carry forward period) and a production subsidy for biodiesel producers (granting as much as \$0.10 per gallon of biodiesel fuel produced with a limit to the first 5 million gallons produced annually).

In conclusion, biodiesel offers an environmentally friendly, agriculturally based alternative fuel that may well represent an opportunity for agricultural producers to improve their bottom line. Various pieces of legislation as well as increasing consumer concerns about petroleum based diesel may also aid in the quick adoption of this relatively new fuel option that would reduce the nation's dependence on foreign energy supplies.

LITERATURE CITED

- AG Environmental Products LLC. Internet website. www.soygold.com/biodiesel, August 1, 2002.
- CENEX Product Information. Internet website. www.cenex.com, August 1, 2002.
- Council of Economic Advisers. 2003. Economic Report of the President. United States Government Printing Office, Washington, D.C.
- Doane's Agricultural Report Newsletter. St. Louis, Missouri. Vol. 66, No. 17-6, April 25, 2003.
- Food and Agricultural Policy Research Institute (FAPRI), University of Missouri and Iowa State University. Impacts of Increased Ethanol and Biodiesel Demand. FAPRI-UMC Report #13-01. October 2001. Columbia, Missouri.
- Food and Agricultural Policy Research Institute, University of Missouri and Iowa State University. FAPRI 2002 U.S. Baseline Briefing Book. FAPRI-UMC Technical Data Report 02-02. March 2003. Columbia, Missouri.
- Food and Agricultural Policy Research Institute, University of Missouri and Iowa State University. FAPRI U.S. and World Agricultural Outlook for 2003. Internet Website. www.fapri.org, June 3, 2003
- Mittelbach, M., and S. Gangl. "Long Term Stability of Biodiesel Made from Rapeseed and Used Frying Oil." *J. of the Association of Oil Chemists Society*. 78, 6 (June 2001): 573-577.

⁶ It should be noted that biodiesel is quickly becoming more readily available in several surrounding states. The number of regular truck stops/convenience stores carrying biodiesel blends is increasing relatively quickly given the infancy of this industry.

- National Biodiesel Board. "Fact Sheets." Internet Website. www.biodiesel.org, August 1, 2002.
- State of Arkansas. Act 1287. S.B. 363, to be codified as AR ST § 15-4-2805.
- Thompson, J.C., C.L. Peterson, D.L. Reece, and S.M.Beck. "Two-Year Storage Study with Methyl and Ethyl Esters of Rapeseed." *Transactions of the American Society of Agricultural Engineers*. 41, 4 (July/August 1998): 931-939.
- U.S. Department of Agriculture, Economic Research Service. Internet Website. Farm Business Economics Briefing Room. www.econ.ag.gov/Briefing/FarmIncome, June 4, 2003.
- U.S. Department of Agriculture, Economic Research Service. Feed Outlook. FDS-0503. May 2003. Washington DC.
- U.S. Department of Agriculture, Economic Research Service. Internet Website. www.ers.usda.gov, June 3, 2003
- U.S. Department of Agriculture, Economic Research Service. Aquaculture Outlook. LDP-AQS-17. March 2003. Washington DC.
- U.S. Department of Agriculture, Economic Research Service. Wheat Outlook. WHS-0503. May 2003. Washington DC.
- U.S. Department of Agriculture, Economic Research Service. Livestock, Dairy and Poultry Situation and Outlook. LDP-M-106. April 2003. Washington DC.
- U.S. Department of Agriculture, Economic Research Service. Rice Outlook. RCS-0403, RCS-0503, RCS-0603. April-June 2003. Washington DC.
- U.S. Department of Agriculture, Economic Research Service. Cotton and Wool Outlook. CWS-0403. April 2003. Washington DC.
- U.S. Department of Agriculture, Economic Research Service. Oil Crops Outlook. OCS-0403. April 2003. Washington DC.
- U.S. Department of Agriculture, Farm Service Agency. Internet Website. www.fsa.usda.gov, June 4, 2003.
- U.S. Department of Agriculture, National Agricultural Statistics Service. 1997 Census of Agriculture. Washington, DC.
- U.S. Department of Agriculture, National Agricultural Statistics Service. Arkansas Agricultural Statistics Internet Website. www.nass.usda.gov/ar, June 4, 2003.
- U.S. Department of Agriculture, National Agricultural Statistics Service. Internet Website. www.nass.usda.gov, June 4, 2003.
- U.S. Department of Agriculture, National Agricultural Statistics Service. Meat Animals Production, Disposition, and Income 2002 Summary. Mt An 1-1 (03). April 2003. Washington, DC.
- U.S. Department of Agriculture, National Agricultural Statistics Service. Poultry - Production and Value. Pou 3-1 (03). April 2003. Washington DC.
- U.S. Department of Agriculture, National Agricultural Statistics Service. Cattle. Mt An 2 (2-03). February 2003. Washington, DC.
- U.S. Department of Agriculture, National Agricultural Statistics Service. Agricultural Prices. February 2003. Washington, DC.
- U.S. Department of Agriculture, National Agricultural Statistics Service. Prospective Plantings. Cr Pr 2-4 (3-03). March, 2003. Washington, DC.
- U.S. Department of Agriculture, National Agricultural Statistics Service. Agricultural Land Values and Cash Rents. Sp Sy 3 (03). August 2003. Washington, D.C.
- U.S. Department of Agriculture, Office of the Chief Economist. USDA Agricultural Baseline Projections to 2011. Staff Report WAOB-2003-1. February 2003. Washington, DC.
- U.S. Department of Commerce, Bureau of the Census. Census of Agriculture. Washington, DC. 1978, 1982, 1987, and 1992 issues.
- University of Arkansas, Division of Agriculture, Cooperative Extension Service. "Estimating 2003 Costs of Production." Various issues of AG publications by Tony E. Windham, Kelly J. Bryant, and Jennifer Sills. Little Rock. February 2003.

UofA

UNIVERSITY OF ARKANSAS

DIVISION OF AGRICULTURE