## AMERICAN AGRICULTURE: WHAT WE CAN EXPECT

## National Symposium On The Future Of American Agriculture

University of Georgia: August 1999

AFPC Policy Working Paper 99-7

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#### AMERICAN AGRICULTURE: WHAT WE CAN EXPECT

## National Symposium On The Future Of American Agriculture

**University of Georgia; August 1999** 

Edward G. Smith Ronald D. Knutson James Richardson

The Agricultural and Food Policy Center (AFPC) of the Texas A&M University System is pleased to be invited to address this symposium addressing the future of U.S. agriculture. As a participant in the FAPRI consortium, AFPC monitors the economic conditions of U.S. agriculture at the farm and ranch level. To accomplish this, AFPC maintains approximately 80 crop, dairy, beef and pork representative farms throughout the nation.

In the interest of time, this paper will focus only on the economic condition of the 41 feed grain/oilseeds, wheat, cotton and rice farms through the year 2002. Anyone interested in the livestock operations, or more detail on the crop farms, are directed to the AFPC web site at <a href="http://afpc1.tamu.edu">http://afpc1.tamu.edu</a>. The publications included at this site provide greater detail about the process AFPC employs to develop the representative farms, their structure and their financial characteristics.

The AFPC representative crop farms are located in the major production regions of the U.S. (Figure 1). The location of each farm was made in consultation with the staff of both the U.S. House and Senate Agricultural Committees and the Land Grant systems in the respective states. The information necessary to simulate the economic and financial conditions at the farm level are obtained primarily from the following sources:

Figure 1





- Farmer panels are convened in each location to provide the data and verify that the economic modeling is consistent with their farming experience in the area. In all locations a panel of farmers representative of moderate size full-time commercial farm operations are convened. In most regions, a separate panel of farmers that operate farms two to three times the scale of the moderate size farms are convened as an indicator of economies of size.
- Future projections of input and output prices and yield are obtained from the FAPRI team at the University of Missouri and Iowa State. AFPC participates in this baseline development process in a review or reactive mode.
- The state land grant faculty, and other USDA agency representatives such as FSA, RMA, and ERS supply additional program and historical data that are important to the analysis.
  The information above is then utilized in the FLIPSIM model, developed and maintained by AFPC, to simulate the economic and financial performance for each farm over the 1996-2002 time period. Actual prices and yields are incorporated for 1996-1998. For the period 1999-2002 the FLIPSIM model incorporates the historical yield and price risk experienced by the farms to develop probabilistic projections for the key economic and financial variables in the out years.

#### **Major Assumptions**

In conducting this analysis the following major assumptions were incorporated:

- Each farm begins in 1996 with a 20 percent debt to asset position for both real estate and intermediate term assets.
- The farms fully participate in the available farm programs and are structured in ways that current payment limits are not binding.
- The farms availed themselves of the flexibility freedoms allowed by the 1996 FAIR Act, but only with the set of crops currently grown on the operations.
- The farms collected their share of the production flexibility contract payments as provided by the FAIR Act.
- The 1998 market assistance payments were incorporated in 1998, while benefits from the 1998 disaster provisions were accrued in 1999. No payments were assumed based on the disaster assistance packages currently being debated in Washington.
- All farms are analyzed assuming they purchase multi-peril crop insurance at the 50/100 level. In describing the economic and financial condition of the representative crop farms this paper employs three performance variables:
- **Probability of a Cash Flow Deficit** is the percentage of times the farms annual net cash farm income does not exceed cash requirements for family living, principal payments, taxes (income and self-employment), and realized machinery replacement expenses (not depreciation). This probability is reported for 1999 and 2002 to indicate whether the cash flow risk for a farm increases or decreases over the planning horizon.

- **Probability of Refinancing Deficits** the probability that cash flow deficits are greater than available cash reserves. This probability is reported for 1999 and 2002 to indicate whether the financial risk for a farm increases or decreases over the planning horizon.
- **Probability of Losing Real Net Worth** the probability that real net worth is less than the initial net worth in 1996. This probability is reported for 1999 and 2002 to indicate whether the equity risk is increasing or decreasing over the planning horizon.

For each of the above financial variables AFPC color-codes the results. It has been our experience that if the farm projects less than 20 percent probability of occurrence for each of these variables the farm is in a good economic position. Therefore, we color it green. If the probability of the adverse event is between 20-40 percent then the farm is borderline for economic and financial survival and we classify it yellow. For probabilities greater than 40 percent it is colored red and it is our experience that the farm will likely not be sustainable over the long-term without significant restructuring or dependence on off farm wealth to subsidize the operation.

## Results

The following presentation discusses the results by sector: feed grains/oilseeds, wheat, cotton and rice. A brief description of the farms location and structure is included in the appendix.

## **Feed Grain/Oilseed Farms**

Probably one of the most telling indicators of the position of U.S. crop agriculture is revealed by the farms in our feed grain/oilseed complex (Table 1). Eleven of the thirteen farms are red in term of cash flow over the 1999 to 2002 period. The other two farms are yellow.

							P(Real Net Worth Declines)			
Farm Name	P(Cas	sh Flow D	eficit)	P(Ref	inance D	eficit)				
	1999	2002	Color	1999	2002	Color	1999	2002	Color	
IAG950 Y	59	53	R	26	23	Y	1	9	G	
IAG2200 Y	53	45	R	6	16	G	2	6	G	
NEG800 R	95	99	R	95	99	R	54	74	R	
NEG1575 R	72	82	R	54	74	R	16	30	Y	
MOCG1700 Y	38	46	R	1	1	G	1	1	G	
MOCG3300 Y	45	49	R	2	7	G	1	1	G	
MONG1200 R	91	99	R	91	98	R	24	65	R	
TXNP1600 R	55	63	R	16	28	Y	32	40	Y	
TXNP5500 G	34	39	Y	10	5	G	15	5	G	
TNG900 R	80	89	R	80	83	R	63	76	R	
TNG2400 Y	43	58	R	4	15	G	14	23	Y	
SCG1500 R	48	63	R	26	38	Y	32	34	Y	
SCG3500 G	28	29	Y	1	1	G	1	1	G	

Table 1. AFPC Representative Feed Grain/Oilseed Farms

\*

G

Y

R

= Green has less than a 20% chance of occurrence

= Yellow has from 20-40% chance of occurrence

= Red has over 40% chance of occurrence

Seven of the farms will likely have to seek off farm sources to refinance their cash flow deficits either from commercial lenders or off farm wealth. In addition, seven of the farms have a high probability of losing real net worth by 2002. This financial picture is "telling" because the feed grain/oilseed complex has traditionally been our strongest crop sector. AFPC now classifies 11 of the 13 farms as struggling given current FAPRI price projections (5 yellow and 6 red).

## Wheat Farms

Nine of the ten wheat operations are under substantial cash flow pressure from 1999 through

2002 (Table 2). Eight of the 10, however, will likely be able to accommodate the cash flow

deficits from farm reserves. Only two of the farms are projected to have trouble in maintaining

Farm Name	P(Cash Flow Deficit)			P(Refinance Deficit)			P(Real Net Worth Declines)		
	1999	2002	Color	1999	2002	Color	1999	2002	Color
WAW1500 R	79	67	R	1	35	Y	1	20	Y
WAW4250 Y	63	50	R	1	4	G	1	2	G
NDW1760 Y	51	34	Y	1	4	G	14	23	Y
NDW4850 G	56	36	Y	1	5	G	1	3	G
KSSW1385 Y	58	52	R	1	1	G	1	1	G
KSSW3180 G	20	11	G	1	1	G	1	1	G
KSNW2325 R	84	74	R	4	43	R	1	19	G
KSNW4300 Y	74	56	R	1	15	G	1	8	G
COW2700 G	54	23	Y	4	7	G	1	1	G
COW5420 G	46	27	Y	2	2	G	1	1	G

\*

G

Y

R

= Green has less than a 20% chance of occurrence

= Yellow has from 20-40% chance of occurrence

= Red has over 40% chance of occurrence

firm wealth over the 1999-2002 period. AFPC classifies six of the ten farms as struggling (4 yellow and 2 red) based primarily on the large probability of having cash flow deficits.

## **Cotton Farms**

Seven of the nine cotton farms are classified red indicating a high probability of experiencing a cash flow deficit over the 1999-2002 period (Table 3). The other two farms are yellow. Only the two California and the large Texas South Plains (TXSP3697) operations appear capable of handling the cash flow deficits internally. The four farms that have a very high probability of losing equity over the period are in the Texas Rolling Plains (TXRP2500), the Texas Coastal Bend (TXCB1700) and the two Tennessee operations. When considering all factors AFPC classifies eight of the nine cotton farms as under substantial pressure (4 yellow, 4

Table 3. AFPC Representative Cotton Farms
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Farm Name	P(Cas	P(Cash Flow Deficit)			P(Refinance Deficit)			P(Real Net Worth Declines)		
	1999	2002	Color	1999	2002	Color	1999	2002	Color	
CAC2000 Y	58	58	R	1	16	G	1	1	G	
CAC6000 Y	39	51	R	1	5	G	1	2	G	
TXSP1682 Y	53	55	R	53	37	Y	3	3	G	
TXSP3697 G	3	23	Y	1	3	G	1	1	G	
TXRP2500 R	75	92	R	70	86	R	52	75	R	
TXBL1400 Y	37	37	Y	29	26	Y	1	1	G	
TXCB1700 R	97	99	R	97	99	R	75	96	R	
TNC1675 R	70	97	R	58	93	R	35	87	R	
TNC3800 R	79	87	R	22	81	R	1	43	R	

\* G Y

R

= Green has less than a 20% chance of occurrence

= Yellow has from 20-40% chance of occurrence

= Red has over 40% chance of occurrence

red). Only the large Texas Southern Plains farm is projected green over the period, but even then a growing probability of cash flow deficits is troubling.

## **Rice Farms**

With low (\$6.00/cwt) rice prices projected for 1999 all nine rice farms are expected to have a high probability of a cash flow deficit (Table 4). Six of the nine are projected to continue to experience significant cash flow deficits through 2002. The diversified Arkansas farms appear in the best position to handle the economic situation throughout the period. Overall AFPC classified six of the nine farms as struggling (5 red, 1 yellow).

## Summary

All crop sectors (37 of 41 farm operations) are projected to be under substantial cash flow pressure from 1999-2002. These conditions are a result of low projected commodity prices and

Farm Name	P(	Cash Flow D	eficit)	P(f	Refinance I	Deficit)	P(Real Net Worth Declines)		
	1999	2002	Color	1999	2002	Color	1999	2002	Color
CAR424 R	98	89	R	47	84	R	8	17	G
CAR1365 R	96	61	R	37	45	R	8	19	G
TXR2118 G	75	19	G	1	1	G	1	2	G
TXR3750 Y	84	53	R	14	24	Y	5	8	G
MOR1900 R	99	99	R	99	99	R	95	99	R
MOR4000 R	89	95	R	63	94	R	16	54	R
ARR2645 G	40	10	G	1	1	G	1	1	G
ARR3400 G	39	2	G	1	1	G	1	1	G
LAR1100 R	97	99	R	73	99	R	79	91	R

Table 4. AFPC Representative Rice Farms

\* G = Green has less than a 20% chance of occurrence Y = Yellow has from 20-40% chance of occurrence R = Red has over 40% chance of occurrence

in some cases, primarily in the South, from carryover debt due to adverse weather in 1996 and 1998. Over 50 percent of the farms (21 of 41) will likely have to refinance these cash flow deficits from off-farm sources.

Approximately 40 percent (16 of 41) of the farms experience a high probability of losing real equity over the 1999-2002 period. Since FAPRI projects annual increases in land values that exceed the projected rate of inflation through 2001, the projected real increases in real estate values offset some of the liquidity problems facing the majority of farms.

Here in lies the current problem. When forecasting through the life of the 1996 Farm Bill, the representative crop farms are in as bad of shape for liquidity and the related need to refinance as AFPC has seen in the last 10-15 years, including the 1980's. Given stable land values, our representative farms have a greater ability to sustain net worth than in the 1980's. Therefore, addressing the shorter-term liquidity needs of US program crop producers appears to be a greater concern than declining collateral.

# APPENDIX

## CHARACTERISTICS OF AFPC'S REPRESENTATIVE CROP FARMS

### **1999 CHARACTERISTICS OF PANEL FARMS PRODUCING FEED GRAINS**

- IAG950 A 950-acre Northwestern Iowa (Webster County) moderate size grain farm that plants 475 acres of corn, and 475 acres of soybeans. The farm receives 56 percent of its receipts from corn. **IAG2200** A 2,200-acre Northwestern Iowa (Webster County) large grain farm that plants 1,100 acres of corn, and 1,100 acres of soybeans. The farm generates 58 percent of its receipts from corn. **NEG800** A 800-acre South Central Nebraska (Phelps County) moderate size 100 percent irrigated grain farm that plants 770 acres of corn, and 30 acres of alfalfa. The farm also has 100 breeding cows. The farm generates 87 percent of its receipts from corn. **NEG1575** A 1,575-acre South Central Nebraska (Phelps County) large 100 percent irrigated grain farm that plants 1,575 acres of corn. The farm generates about 97 percent of its receipts from corn. **MOCG1500** A 1,500-acre Central Missouri (Carroll County) moderate size grain farm with 250 acres of wheat, 550 acres of corn, and 700 acres of soybeans. This farm is located in the Missouri river bottom and supplies feed to the livestock producers in the region at a premium to other areas of Missouri. Corn generates 45 percent of the farm-s receipts. **MOCG3000** A 3,000-acre Central Missouri (Carroll County) large grain farm with 300 acres of wheat, 1,350 acres of corn, and 1,350 acres of soybeans. This farm is located in the Missouri river bottom and supplies feed to the livestock producers in the region at a premium to other areas of Missouri. The farm generates about 56 percent of its total revenue from corn. **MONG1200** A 1,200-acre Northern Missouri (Nodaway County) diversified grain farm with 525 acres of corn, 525 acres of soybeans, and 150 acres of hay. The farm also has 150 breeding cows and 80 breeding sows. The farm generates about 46 percent of its total revenue from corn and soybeans, 31 percent from hogs, and 22 percent from cattle. **TXNP1600** A 1,600-acre Northern High Plains of Texas (Moore County) moderate size, 100 percent irrigated, grain farm with 642 acres of wheat, 280 acres of sorghum, 470 acres of corn, and 208 acres fallow. The farm generates 70 percent of its total receipts from feed grains. **TXNP5500** A 5,500-acre Northern High Plains of Texas (Moore County) large, 85 percent irrigated, grain farm with 1,675 acres of irrigated wheat, 800 acres of dryland wheat in the corners of all pivot irrigated fields, 275 acres of irrigated sorghum, 2,200 acres of irrigated corn, and 550 acres fallow. The farm generates about 74 percent of its receipts from feed grains. **TNG900** A 900-acre Western Tennessee (Henry County) grain and soybean farm with 400 acres of corn, 500 acres of soybeans, 200 acres of wheat, and 250 acres of hay. The farm generates about 77 percent of its receipts from corn and soybeans. **TNG2400** A 2,400-acre Western Tennessee (Henry County) grain and soybean farm with 1,200 acres of
  - **FNG2400** A 2,400-acre Western Tennessee (Henry County) grain and soybean farm with 1,200 acres of corn, 1,200 acres of soybeans, and 600 acres of wheat. The farm generates about 87 percent of its receipts from corn and soybeans.

### 1999 CHARACTERISTICS OF PANEL FARMS PRODUCING FEED GRAINS (CONTINUED)

- **SCG1500** A 1,500-acre South Carolina (Clarendon County) moderate size grain farm with 750 acres of double cropped wheat and soybeans, 600 acres of corn, and 150 acres of full season soybeans. The farm generates about 64 percent of its total receipts from corn and soybeans. This farm enjoys high returns on double cropped acreage but timing will not allow more than 750 acres.
- **SCG3500** A 3,500-acre South Carolina (Clarendon County) large grain farm with 2,020 acres of double crop wheat and soybeans, 350 acres of cotton, and 1,130 acres of corn. This farm enjoys high returns on double cropped acreage but timing is a limiting factor. The farm generates 57 percent of its receipts from corn and soybeans.

#### 1999 CHARACTERISTICS OF PANEL FARMS PRODUCING WHEAT

- WAW1500 A 1,500-acre Southeastern Washington (Whitman County) moderate size grain farm, updated December 1998, that plants 900 acres of wheat, 300 acres of barley, and 300 acres of peas. Disease problems require a rotation that includes a minimum amount of barley and peas to maintain wheat yields. The farm generates 71 percent of its receipts from wheat.
- WAW4250 A 4,250-acre Southeastern Washington (Whitman County) large size grain farm, updated December 1998, that is harvesting 2,763 acres of wheat, 200 acres of barley, and 1,287 acres of peas. Disease problems require a rotation that includes a minimum amount of barley and peas in order to maintain wheat yields. Winter and spring wheat account for 77 percent of receipts.
- NDW1760 A 1,760-acre South Central North Dakota (Barnes County) moderate size grain farm, updated February 1999, that has 704 acres of wheat, 176 acres of barley, 176 acres of corn, 352 acres of soybeans, and 352 acres of sunflowers. Rotation and disease problems will not allow more than 25 percent of the acres to be planted to sunflowers. The farm receives about 41 percent of receipts from wheat.
- NDW4850 A 4,850-acre South Central North Dakota (Barnes County) large grain farm, updated February 1999, that plants 2,585 acres of wheat, 470 acres of barley, 705 acres of soybeans, 940 acres of sunflowers, and 150 acres of CRP. Rotation and disease problems will not allow more than 25 percent of the acres to be planted to sunflowers. Wheat accounts for about 50 percent of the farms total gross receipts.
- **KSSW1385** A 1,385-acre South Central Kansas (Sumner County) moderate size grain farm, updated February 1999, that plants 928 acres of wheat, 138 acres of soybeans, and 319 acres of grain sorghum. The farm generates about 63 percent of its receipts from wheat.
- **KSSW3180** A 3,180-acre South Central Kansas (Sumner County) large grain farm, updated in February 1999, harvesting 2,258 acres of wheat, 652 acres of grain sorghum, 56 acres of corn, 87 acres of soybeans, and 127 acres of hay. The farm also has 67 breeding cows. The farm generates 67 percent of its receipts from wheat.
- **KSNW2325** A 2,325-acre North Western Kansas (Thomas County) moderate size grain farm, updated January 1999, that plants 775 acres of wheat, 155 acres of grain sorghum, 620 acres of corn, and has 775 acres of fallow. The farm generates 38 percent of its receipts from wheat.
- **KSNW4300** A 4,300-acre North Western Kansas (Thomas County) large grain farm, updated January 1999, harvesting 1,948 acres of wheat, 465 acres of sorghum, 549 acres of corn, 262 acres of sunflowers, 75 acres of hay, and 1,001 acres of fallow. The farm also has 100 breeding cows. The farm generates about 45 percent of its receipts from wheat.
- COW2700 A 2,700-acre Northeast Colorado (Washington County) moderate size grain farm, updated January 1999, that plants 1,127 acres of wheat, 608 acres of millet, and 446 acres of corn, and will leave 519 acres fallow. The farm generates 52 percent of its receipts from wheat.
- **COW5420** A 5,420-acre Northeast Colorado (Washington County) large size grain farm, updated in January 1999, that plants 1,900 acres of wheat, 500 acres of corn, 1,300 acres of millet, 640 acres of CRP, and 1,100 acres in fallow. Wheat produces 59 percent of the farms gross revenue.

#### 1999 CHARACTERISTICS OF PANEL FARMS PRODUCING COTTON

**CAC2000** A 2,000-acre Central San Joaquin Valley California (Kings County) moderate size cotton farm that plants 1,100 acres of cotton, 300 acres of wheat, 300 acres of corn, and 300 acres of hay. The farm generates 64 percent of its gross income from cotton. **CAC6000** A 6,000-acre Central San Joaquin Valley California (Kings County) large cotton farm harvesting 3,000 acres of cotton, 1,500 acres of vegetables, 720 acres of wheat, 240 acres of corn, and 300 acres of hay. Vegetables on this farm vary from year to year depending on the price of the particular vegetable, however, the returns to this 1,500 acres remain relatively stable over time. Cotton generates about 69 percent of this farm-s receipts. **TXSP1682** A 1,682-acre Texas Southern High Plains (Dawson County) moderate size cotton farm, updated December 1998. The farm plants 1,185 acres of cotton (886 dryland and 319 irrigated), 196 acres of peanuts, and has 183 acres in CRP. This farm is just now starting to adopt the irrigation practices of its larger counterpart. The farm generates 62 percent of its receipts from cotton. A 3,697-acre Texas Southern High Plains (Dawson County) large cotton farm, updated December **TXSP3697** 1998. The farm plants 2,665 acres of cotton (2,095 dryland and 570 irrigated), 285 acres of peanuts, and has 214 acres in CRP. Cotton generates 74 percent of this farms receipts. **TXRP2500** A 2,500-acre Texas Rolling Plains (Jones County) cotton farm that plants 1,240 acres of cotton, and 825 acres of wheat. The farm also has 25 breeding cows and uses the wheat acreage to graze the cattle in the winter. About 74 percent of this farms receipts are derived from cotton. This farm represents the consolidation of two previous representative farms. **TXBL1400** A 1,400-acre Texas Blacklands (Williamson County) moderate size cotton and grain farm, updated February 1999, the farm has 350 acres of cotton, 400 acres of sorghum, 550 acres of corn, and 100 acres of wheat. This farm also has 50 breeding cows which are pastured on rented land that cannot be cropped. Cotton generates 38 percent of the farms receipts. **TXCB1700** A 1,700-acre Texas Coastal Bend (San Patricio County) cotton farm, updated January 1999. The farm has 765 acres of cotton, and 935 acres of grain sorghum. Severe disease problems force this farm to plant at a minimum 50 percent of the land to grain sorghum. About 67 percent of this farm-s receipts are cotton receipts. **TNC1675** A 1,675-acre Southwest Tennessee (Fayette County) cotton farm, developed in 1998, with 838 acres of cotton, 670 acres of soybeans, and 168 acres of corn. The farm generates about 68 percent of its cash receipts from cotton. **TNC3800** A 3,800-acre Southwest Tennessee (Haywood County) cotton farm, developed in 1998, with 2,508 acres of cotton, 760 acres of soybeans, 300 acres of wheat, and 532 acres of corn. The farm

generates about 77 percent of its cash receipts from cotton.

#### 1999 CHARACTERISTICS OF PANEL FARMS PRODUCING RICE

**CAR424** A 424-acre Sacramento Valley California (Sutter and Yuba Counties) moderate size rice farm that plants 400 acres of rice. The farm generates 94 percent of its gross income from rice. CAR1365 A 1,365-acre Sacramento Valley California (Sutter and Yuba Counties) large rice farm that plants 1,265 acres of rice. The farm generates about 98 percent of its gross income from rice. **TXR2118** A 2,118-acre West of Houston, Texas (Wharton County) moderate size rice farm that harvests 600 acres of first crop rice, and 510 acres of ratoon rice. The farm receives 98 percent of its gross receipts from rice. **TXR3750** A 3,750-acre West of Houston, Texas (Wharton County) large rice farm that harvests 1,500 acres of first-crop rice, 1,275 acres of ration rice, and 200 acres of hay. The farm also has 200 breeding cows. About 95 percent of the farm-s gross receipts are from rice. **MOR1900** A 1,900-acre Southeastern Missouri (Butler County) moderate size rice farm with 616 acres of rice, 650 acres of soybeans, and 633 acres of corn. Rice accounts for 52 percent of this farms receipts. **MOR4000** A 4,000-acre Southeastern Missouri (Butler County) large rice farm with 1,710 acres of rice, 800 acre soybeans, 1,250 acres of corn, and 240 acres of cotton. About 59 percent of this farm-s receipts are generated from rice. **ARR2645** A 2,645-acre Arkansas (Arkansas County) moderate size rice farm with 175 acres of medium grain rice, 512 acres of long grain rice, 958 acres of soybeans, 230 acres of corn, and 450 acres of wheat. About 54 percent of the farms receipts come from rice. **ARR3400** A 3,400-acre Arkansas (Arkansas County) moderate size rice farm with 325 acres of medium grain rice, 975 acres of long grain rice, 1,700 acres of soybeans, and 500 acres of wheat. About 65 percent of the farms receipts come from rice. LAR1100 A 1,100-acre Louisiana (Jefferson Davis, Acadia, and Vermilion Parishes) moderate size rice farm harvesting 189 acres of medium grain rice, 351 acres of long grain rice, 362 acres of soybeans, and 198 acres of fallow. About 85 percent of this farm-s receipts are generated by rice.