Post-Freedom to Farm Shifts in Regional Production Patterns

AFPC Working Paper 01-6

David P. Anderson
James W. Richardson
Edward G. Smith

AGRICULTURAL & FOOD POLICY CENTER

Agricultural and Food Policy Center
Department of Agricultural Economics
Texas Agricultural Experiment Station
Texas Agricultural Extension Service
Texas A&M University

February 2001

College Station, Texas 77843-2124
Telephone: (979) 845-5913
Fax: (979) 845-3140
Web Site: http://www.afpc.tamu.edu/

Regional Post-Freedom to Farm Shifts in Production Patterns

The FAIR Act of 1996, also known as the Freedom to Farm Act (ACT) dismantled many of the agriculture policy tools in use for the last 25 years. Gone were target prices, deficiency payments, and set asides. In their place were expanded marketing loan programs to effectively include wheat and feed grains and oilseeds in addition to cotton and rice. Full planting flexibility has been popular with farmers who are no longer constrained by base acres. Grain merchants and other volume oriented agribusinesses praise the elimination of set asides. The sharp decline in farm prices for all major program commodities since 1996 has left most farmers questioning the income safety net provisions of the FAIR Act. The flexibility and marketing loan provisions continue to be praised.

Farm program changes in the 1996 farm bill rendered methods of crop supply response estimation based on econometric models, using historic data, difficult at best. Yet it can, and has been, hypothesized that the Act resulted in major shifts in regional crop production patterns.

This paper draws inferences from changes in acres planted among crops for representative farms in the Texas A&M Agricultural and Food Policy Center's (AFPC) farm data base. AFPC has maintained longitudinal data for more than three dozen representative crop farms across states, regions, farm size, and type of farm since 1990. The farms were updated in 1999 as to their crop mix changes following the ACT and the crop mix changes observed in the updates are summarized here. United States aggregate production shifts are identified from NASS data. Implications for future potential acreage changes are identified. The commodity focus includes feedgrains, soybeans, wheat, cotton, and rice.

Literature Review

The 1996 farm bill has been characterized as watershed change in U.S. farm policy (Knutson, et al.). Among the major changes were:

- Elimination of the target price and deficiency payment income support provisions.
- The effective extension of marketing loan provisions to wheat, feed grains and oilseeds from only cotton and rice.
- Elimination of acreage reduction provisions.
- The implementation of transition payments to replace deficiency payments.

The eliminated provisions were the mainstays of coupled domestic farm programs for many years. Those changes meant many new expectations about prices, production, supply response, and price risk and volatility in coming years.

The changes drastically opened up the flexibility available to farmers in terms of what could be planted. Before 1996 major program crop acreage was basically economically bound by base acres. After the 1996 farm bill, base acres no longer applied. The 1990 farm bill allowed limited planting flexibility through the Normal Flexible Acres (NFA) and Optional Flexible Acres (OFA). That flexibility allowed farmers to begin to take advantage of market prices in return for giving up deficiency payments on the 15 to 25 percent of crop acreage base that accounted for the NFA/OFA.

Another analytical effect of this watershed policy change is the relevance of econometric models used to evaluate the impacts of policy changes and models used to evaluate other crop related issues. The change in many of the policy variables that have affected crop production over the relevant past historical period has cast doubt on results of models and supply response estimates using the limited data observed since the passage of the 1996 farm bill.

FAPRI staff report 27-97 examined supply response issues under the FAIR Act. FAPRI's study used acreage, returns and production data following the 1990 farm bill and the NFA acreage data. The results indicated a more elastic supply response since 1996 when compared to the 1982-1995 time period for all of the major program crops. However, some crops did indicate more changes in response than others. Corn exhibited the largest magnitude in supply elasticity change.

Aggregate Acreage Changes

USDA NASS data shows how planted acreage has changed since the 1996 farm bill. Planted acreage for the 8 major crops plus hay in 1996 increased 20.9 million acres over the 218.2 million acres in 1995. Acres planted to corn, sorghum, barley, wheat, soybeans, upland cotton, and rice increased 16.6 million acres to 248.85 million acres, or 7.1 percent, from 1995 to 1996. Since 1996 planted acres to the 8 major crops have declined to 241.2 million acres in 1999 and 244 million acres in 2000. This acreage level in 2000 is about equal to the number of acres planted in 1992. Acres planted to the 8 major crops plus hay declined to 251.1 million acres in 1999, approximately equal to the number of acres planted in 1991.

Figure 1 contains major crop acreage over the 1988-2000 crop years. While acres planted increased sharply when set asides were eliminated, acres have since declined. Its also interesting to note that in 1990, for example, 25.4 million acres were idled and 253.2 million acres were planted. In 1999, 251.1 million acres were planted with no annual acres idled (acreage reduction or set aside). However, planted acres to the 6 major crops (not including soybeans) were 32.5 million acres below the program contract acres.

Representative Farm Data

This study relies, in addition to NASS data, on representative farm data gathered by the Agriculture and Food Policy Center (AFPC). The AFPC has developed a series of representative farms in major production regions of the country. These farms have been in use for more than a decade to analyze the farm level impacts of alternative policies. The farms are developed with a group of local farmers identified primarily by local extension personnel. The farmers develop, by a consensus process, all of the financial and production information for a farm that would be representative of the area. The farm data is updated every three years with the same group of farmers, when possible. Most of the farms were developed initially in 1990 and updated in 1993, 1996, and 1999. The availability of this data allows their use to examine farm level acreage shifts as a result of the 1996 farm bill. The locations of the farms used in this study are contained in Figure 2.

Corn

Table 1 contains the corn acreage information on the representative farms over the 1995-1999 period. Percent of planted acres in 1995 reflect policies in place at that time including base acres, set aside, and flexible acres (NFA and OFA). Percentage of acres planted for each crop are calculated using total farm acres.

The two Iowa farms maintained, basically, a 50-50 corn-soybean rotation before and after the 1996 farm bill. Slightly more soybean acres and fewer corn acres were due to set aside requirements and flexing some NFA to soybeans in 1995.

The Missouri and Texas Northern Plains farms indicated significant increases in corn acres. The moderate and large Missouri farms increased corn acreage from about 25 percent to 40+ percent by 1997. The Texas Northern Plains farms increased corn acreage by more than 20 percentage points. This Texas farm expansion in corn acres comes at the expense of wheat and grain sorghum acres. Grain sorghum acres have continued to decline in part because of the widening corn price premium over sorghum. One reason for this price difference is the market preference of cattle feeders for corn.

The growth of corn acres in the Plains states' representative farms that grow primarily wheat (Colorado, Kansas and North Dakota) are an interesting case. The off-the-cuff reason for the increase in corn acres in North Dakota are loan rate relationships and/or crop insurance. However, recent weather and new varieties have played a large role in these planting decisions, particularly for farms in eastern Colorado. A string of good growing seasons with late freezes has allowed producers to try growing more corn and soybeans. As one North Dakota producer said "an early freeze, which is not unusual, will put an end to this stuff." Varieties with shorter growing seasons are allowing expansion of corn acres into areas where there was no corn earlier, as evidenced by the Colorado wheat farm's expansion into corn.

Soybeans

Expanded soybean acres in the Plains (Kansas and North Dakota) highlights the shifts possible when not tied to base acres (Table 2). Market returns, relative loan rates, shorter season and more drought tolerant varieties are encouraging additional soybean production. Representative farms in traditional corn/soybean producing states indicated smaller acreage changes. The Missouri "Bootheel" region, rice growing representative farms reduced soybean acres by 20 percentage points over the 5 year period.

Wheat

Most of the traditional wheat growing states indicated reductions in wheat acres. Across the Plains the representative farms have reduced wheat acres. The Washington farms increased wheat acres over the five year period. The large South Carolina and Arkansas farms increased their wheat acres. The ability to double crop wheat with soybeans allows farms in the Southeast to increase wheat acreage when conditions are favorable.

Cotton and Rice

The shifts in cotton acreage has been relatively small except for the Texas Blacklands farm. This farm has shifted cotton acres to feedgrains (corn and grain sorghum). The increase in corn acres on this farm from cotton and grain sorghum is also related to the declining corn-sorghum basis relationship. Interestingly, many farmers in the area have planted more corn even with worries about drought and aflatoxin. Grain sorghum simply has had lower expected returns than corn recently for many producers.

The rice farms indicated very little shift in rice acreage. Most changes came in other crops that they grow. While the farmers participating in the panels were contacted to make these acreage changes these farms were not fully updated in 1999, as were the other farms.

Other Crops

The four Texas representative farms reduced grain sorghum acres while the South Central Kansas farms increased grain sorghum acres (Table 5) over the 1995-99 period. For those Kansas farms the 1996 farm bill was a timely event. High feed grain prices and a failed wheat crop due to drought gave the added opportunity to farmers to plant sorghum after wheat. This decision is also critical for these farms because it makes major changes to the farm's rotation. Dryland production in the Plains has often included fallow acres. Smith and Young detail the decline in fallow acres in U.S. agriculture. Barley acreage changes are mixed, but generally declining. That matches the long-term trend in U.S. barley production. Peanut production continues to move West and was added to the Texas Southern Plains representative cotton farms by the producers in the 1996 update. Production also tends to be irrigated with more irrigated cotton acres as well in the Southern Plains.

Summary and Conclusions

The 1996 farm bill added greatly to farmers planting flexibility. In response to high prices and no set asides farmers increased acres planted sharply, but since then planted acres have declined to levels seen early in the 1990s. In major crops, farmers are planting the same number of total acres today as 10 years ago without the ARP.

Some argued during the 1996 farm bill discussions that farmers were limited as to how many acres could shift between crops due to rotational and cultural practice constraints and so farmers were tied closely to current crop mixes. The representative farm data suggests that is not the case. Only the Iowa Corn Belt farms kept crop mixes almost constant. Farms in other regions of the country indicate large potential for shifting acres among crops. Examples include:

- Missouri, Texas, and Colorado farms exhibited double digit percentage point increases in corn area.
- Corn was planted in areas further from traditional production areas (Colorado, South Central Kansas, and Central North Dakota).
- Double digit percentage point increases in soybean acres on the Kansas, Texas, and North Dakota representative farms.
- The representative farms indicated large wheat acreage reductions over the period in traditional wheat production areas of the Great Plains.
- The wheat acreage percentage point declines agree with USDAs reported 18 percent reduction in U.S. wheat acres between 1996 and 2000.

- Cotton farm acreage changes were a mixed bag, with some cutting back and others expanding. However, some farms demonstrated the ability to shift significant acres out of cotton and presumably that shift could be reversed.
- Grain sorghum and barley acres generally declined on the representative farms except for the Kansas farms that diversified away from wheat.

The representative farm observed results are generally consistent with aggregate acreage changes. Aggregate data indicates about a 15 million acre decline in wheat acres and about the same increase in soybean acres. The locations of these changes are not the same. Planted acres have declined in the Plains and expanded elsewhere. These regional changes in crops grown and in supply response may have political implications for these regions. More corn and soybean acres in the Plains could tie producers closer together between regions. Largely different regional supply response elasticities and ability to shift between crops will make future policy proposals more rancorous between regions as the policies will affect them differently. The data certainly suggest that there is greater possibility for acreage shifts than was previously thought by many. That potential for greater supply response will require a closer look at the results and implications of econometric models used for policy and other analyses.

Figure 1. US Planted, Idled, and CRP Acreage for the 8 Major Commodity Crops, 1988-2000

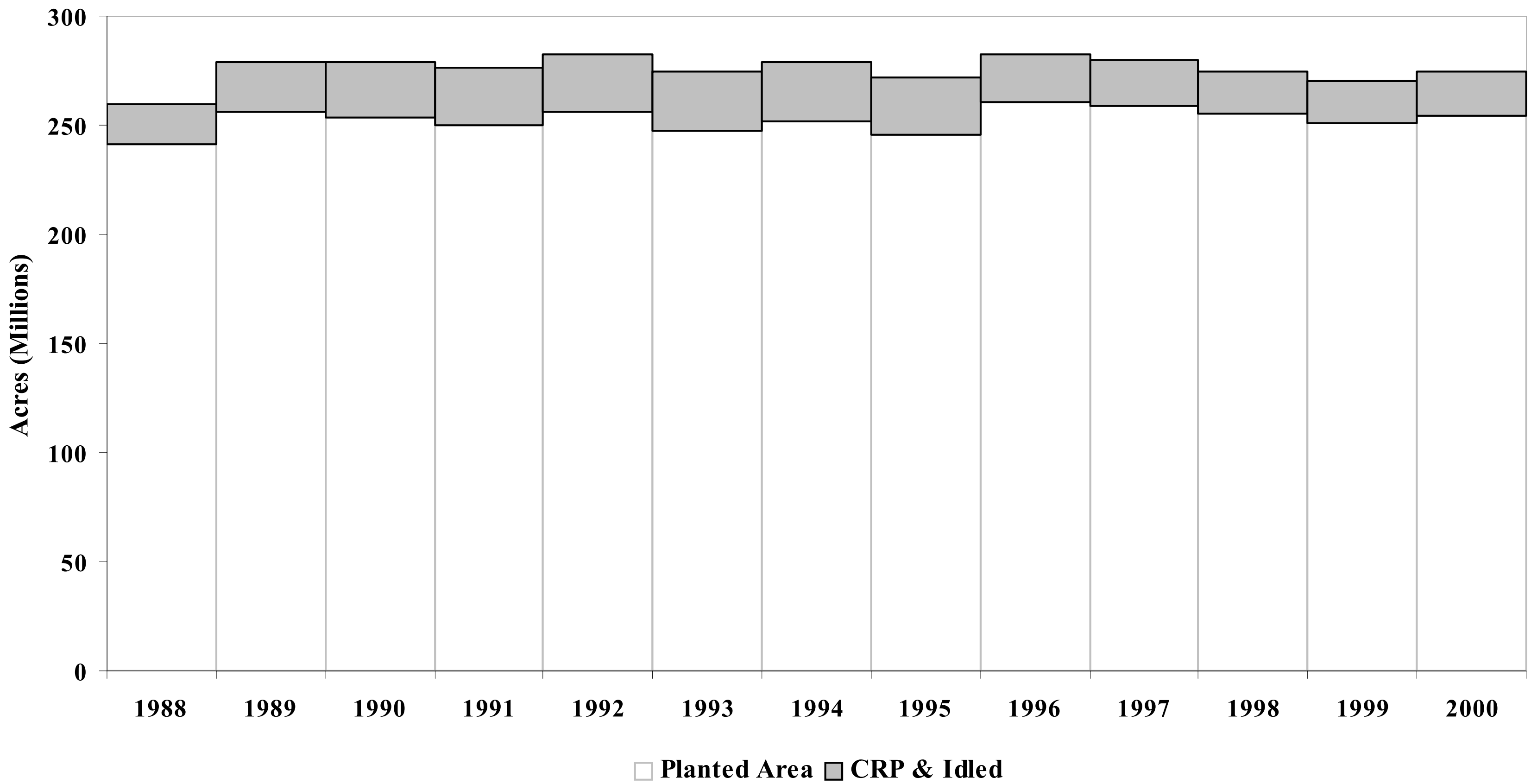

Figure 2. Representative Crop Farms

Table 1. Percent of Representative Farm Acres Planted to Corn, 1995-1999.

Location	Total Acres	Primary Crop Grown	1995	1996	1997	1998	1999
Iowa	950	Feed grain	47	50	50	50	50
Iowa	2400	Feed grain	46	50	50	50	50
Missouri	1700	Feed grain	24	32	48	48	48
Missouri	3300	Feed grain	25	41	40	40	40
TX N. Plains	1600	Feed grain	29	29	29	50	50
TX N. Plains	6700	Feed grain	23	50	50	50	50
S. Carolina	1500	Feed grain	43	40	40	40	40
S. Carolina	3500	Feed grain	43	32	32	32	32
Colorado	2700	Wheat	0	4	8	13	17
Colorado	5440	Wheat	0	0	3	10	9
Kansas SC	1385	Wheat	0	0	0	0	0
Kansas SC	3180	Wheat	0	0	0	2	2
N. Dakota	1760	Wheat	0	0	2	10	10
TX B. Lands	1400	Cotton	0	25	32	39	39
Missouri	1900	Rice	39	33	33	33	33
Missouri	4000	Rice	26	31	31	31	31
Arkansas	2645	Rice	0	9	9	9	9

Table 2. Percent of Representative Farm Acres Planted to Soybeans, 1995-1999.

Location	Total Acres	Major Crop	1995	1996	1997	1998	1999
Iowa	950	Feed grain	48	50	50	50	50
Iowa	2400	Feed grain	51	50	50	50	50
Missouri	1700	Feed grain	55	41	48	48	48
Missouri	3300	Feed grain	57	41	57	57	57
TX NP	6700	Feed grain	0	0	0	0	10
S. Carolina	1500	Feed grain	58	60	60	60	60
S. Carolina	3500	Feed grain	50	58	58	58	58
Kansas SC	1385	Wheat	0	0	10	11	10
Kansas SC	3185	Wheat	0	0	0	7	6
N. Dakota	1760	Wheat	0	0	6	20	20
N. Dakota	4850	Wheat	0	0	5	10	15
Missouri	1900	Rice	34	34	34	34	34
Missouri	4000	Rice	40	20	20	20	20
Arkansas	2645	Rice	43	36	36	36	36

Table 3. Percent of Representative Farm Acres Planted to Wheat, 1995-1999.

Location	Total Acres	Major Crop	1995	1996	1997	1998	1999
Washington	1500	Wheat	48	50	50	60	60
Washington	4250	Wheat	47	75	75	65	65
Colorado	2700	Wheat	44	41	41	41	42
Colorado	5440	Wheat	40	24	24	24	35
Kansas SC	1385	Wheat	94	91	75	75	67
Kansas SC	3185	Wheat	96	84	71	69	71
N. Dakota	1760	Wheat	54	52	53	40	40
N. Dakota	4850	Wheat	61	50	51	53	53
Missouri	1700	Feed grain	14	9	3	3	3
Missouri	3300	Feed grain	14	15	5	5	5
TX N. Plains	1600	Feed grain	40	40	33	33	33
TX N. Plains	6700	Feed grain	37	35	35	35	35
S. Carolina	1500	Feed grain	50	50	50	50	50
S. Carolina	3500	Feed grain	31	48	48	48	48
Arkansas	2645	Rice	9	17	17	17	17

Table 4. Percent of Representative Farm Acres Planted to Cotton and Rice, 1995-1999.

Location	Total Acres	Major Crop	1995	1996	1997	1998	1999
Cotton							
Texas R. Plains	2500	Cotton	41	50	50	50	50
TX S. Plains	1682	Cotton	60	56	56	56	70
TX S. Plains	3697	Cotton	67	76	76	72	72
TX Coastal Bend	1700	Cotton	51	45	45	45	45
TX B. Lands	1400	Cotton	49	29	25	25	25
Missouri	4000	Rice	7	6	6	6	6
South Carolina	3500	Feed grain	7	10	10	10	10
Rice							
California	424	Rice	94	94	94	94	94
California	1365	Rice	78	93	93	93	93
Texas	2118	Rice	28	28	28	28	28
Texas	3750	Rice	28	40	40	40	40
Missouri	1900	Rice	27	32	32	32	32
Missouri	4000	Rice	26	43	43	43	43
Arkansas	2645	Rice	26	26	26	26	26
Louisiana	1100	Rice	45	49	49	49	49

Table 5. Percent of Representative Farm Acres Planted to Other Crops, 1995-1999.

Location	Total Acres	Major Crop	1995	1996	1997	1998	1999
Grain Sorghum							
TX N. Plains	1600	Feed grain	18	18	18	15	15
TX N. Plains	6700	Feed grain	19	5	5	5	5
Kansas SC	1385	Wheat	5	18	22	21	23
Kansas SC	3185	Wheat	4	12	25	22	21
TX B. Lands	1400	Cotton	45	25	29	29	29
TX C. Bend	1700	Cotton	45	55	55	55	55
Barley							
N. Dakota	1760	Wheat	21	23	16	10	10
N. Dakota	4850	Wheat	19	25	20	15	10
Washington	1500	Wheat	11	20	20	20	20
Washington	4250	Wheat	7	10	10	5	5
Sunflowers							
N. Dakota	1760	Wheat	20	20	20	19	19
N. Dakota	4850	Wheat	25	25	23	20	20
Peanuts							
TX S. Plains	1682	Cotton	0	3	3	8	8
TX S. Plains	3697	Cotton	0	6	6	6	12
Peas/Lentils							
Washington	1500	Wheat	39	30	30	20	20
Washington	4250	Wheat	39	15	15	30	30
Millet							
Colorado	2700	Wheat	10	24	24	24	24
Colorado	5440	Wheat	12	15	15	19	23

References

FAPRI. "Acreage Response Under the 1996 FAIR Act." University of Missouri. Staff Report #27-97.

Knutson, R.D., E.G. Smith, J.L. Outlaw, and F.W. Woods. "New Farm Bill: Watershed Change in Policy." Texas Agricultural Experiment Station, Department of Agricultural Economics, Agricultural and Food Policy Center Working Paper, 1996.

USDA, National Agricultural Statistics Service. Prospective Plantings. Various Issues.

Richardson, J.W., D.P. Anderson, E.G. Smith, R.D. Knutson, P. Feldman, K. Schumann, J.L. Outlaw, S.L. Klose, R.B. Schwart, R. Ochoa, and C. White. "Representative Farms Economic Outlook for the January 2000 FAPRI/AFPC Baseline." Texas Agricultural Experiment Station, Department of Agricultural Economics, Agricultural and Food Policy Center Working Paper 00-01, January, 2000.

Smith, E.G. and D.L. Young. "Requiem for Summer Fallow." *Choices*. First Quarter 2000.