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The Economic Climate for the Farm Bill Debate[1]

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The 1996 Farm Bill was debated and passed during one of the best of times in U.S. agriculture and has presided over one of the worst of times in terms of crop prices, market incomes, and government payments. While it is not fair to lay all of crop agriculture's price and income problems at the feet the 1996 legislation, it is fair to assign it much of the blame. Expectations were that the passage of the 1996 Farm Bill marked the dawn of a new era for U.S. agriculture where expanding export markets would fuel agricultural prices and incomes without restraint. Of course these expectations did not materialize. While many suggest a long list of short-run aberrations to blame—the Asian Crisis, exchange rates, trade sanctions, loan rates, emergency payments, etc.—closer examination reveals the fallacy of the supposition that the very nature of crop agriculture had changed. Basic characteristics of crop agricultural markets remain unchanged: the rate of supply growth exceeds demand growth, crop supply is price inelastic, and crop demand is price inelastic. This paper describes the performance of agricultural markets since passage of the 1996 legislation. It also describes and illustrates the basic characteristics of crop agriculture that must be understood to evaluate the policies set forth in 1996. Finally, it summarizes the recent report of the 21st Century Commission and looks at their recommendations in the context of the nature of crop agriculture.

One of The Best of Times

Corn, wheat, and cotton season average prices were at record levels in crop year 1995, the time of the most intense debate on the current farm bill. The $3.24 per bushel corn, $4.55 per bushel wheat, and the 75¢ per pound cotton season average prices for the 1995 crop year resulted from a combination of reduced U.S. production of the crops—because of weather-reduced yields and reduced acreages of corn and wheat—and increased exports.

Actually, the run-up in prices during the months just before 1996 Farm Bill was signed into law were even more dramatic. In fact, it was the run-up in crop prices in early calendar 1996 (but in crop year 1995) that coalesced sufficient legislative support to get the farm bill passed and signed into law April 4, 1996. For example, the closing corn futures for the nearest contract

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1 Paper prepared for presentation at the Fixing the Farm Bill Policy Conference, Washington, D.C., March 27, 2001.

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month increased from about \$2.75 per bushel in September of 1995 to about \$4.00 per bushel in April 1996 to a high of \$5.38 per bushel for the week ending July 12, 1996 (Figure 1). In the case of wheat, its weekly closing futures price for the nearest contract month peaked during the week ending April 26 at \$7.16 per bushel. Cotton's 1996 high was hit in January at 87¢ per bushel but cotton prices had been over \$1 per pound in 1995. Soybean weekly closing futures price topped \$8 per bushel for the week ending July 12, 1996 but rose even further in calendar year 1997.

The summer of 1996 was generally a time of euphoria among farmers and other agricultural stakeholders and politicians. In addition to the high prices at the time, the sky-high export expectations for the future seemed to assure that profitable prices would be available for as much as all farmers could produce. With this anticipated dawning of a new and prosperous era in crop agriculture, the inability of the new farm legislation to influence prices or production levels was not a source of concern. In fact, many viewed the bill's inability to "interfere" with prices or supplies as a cause for celebration, as it removed any barriers to exploding prices.

China was the major reason for the optimistic export expectations during the mid-90s. Figure 2 shows expected Chinese corn imports as projected in early 1996. Note that by 2005 China was projected to import over 750 million bushels of corn. That level of imports would be equivalent to about one-third of current U.S. corn exports. Such projections fueled the euphoria and general optimism about the future crop agriculture exports (Figure 3) and future crop prices and incomes.

For the first two years of the 1996 Farm Bill, agriculture enjoyed healthy prices and incomes. Net farm incomes were at record or near record levels in calendar 1996 and 1997. Major crop prices for the 1996 and 1997 crop years, while less than in 1995, were well above average for the first half of the 1990s. But in retrospect, the inventory build-ups and the price declines that began the first year of the 1996 legislation were harbingers of what was to come.

It is important to note a couple of things. While it is often heard that agriculture was doing fine the first two years of the act and then tanked due of the Asian Crisis and worldwide economic slowdown, grain exports actually were down significantly in 1996 and 1997 compared 1995 (Table 1). Export demand was not the source of crop agriculture's two good years under the new legislation. Secondly, corn and wheat prices declined more in the first two years of the 1996 Farm Bill than in the next two years. They just didn't decline far enough for warning bells to be heard. In the case of cotton, the decline in the first two years of the bill was about the same as the next two years. Soybean prices were actually higher in 1996 than in 1995.

One of the Worst of Times

In 1998, prices continued to decline, causing crop incomes to drop to politically unacceptable levels. Congress's response was, "Let the emergency payments begin." By 1999, government payments (including contract, loan deficiency, market loss assistance payments, etc.) were nearly a third of the total revenue received by major crops and accounted for an equivalent to 48 percent of all net income in agriculture. The 48 percent number represents the direct payment percentage of net income from the production of livestock, fruits and vegetables as well as net income from program crops. No estimate is available for major-crop net income.

Table 2 shows state level data on government payments as a percent of 1999 farm income and 1999 net farm income as a percentage of average 1990-1998 net farm income. The Grain Belt region received the largest share of 1999 government payments and is the most dependent on them. On average, the Grain Belt received the equivalent of all its net farm income from government payments. Payments to Indiana and North Dakota were twice a large as their respective 1999 net farm incomes and government payments were greater than net farm incomes in Missouri, Illinois, and Iowa. The Grain Belt also experienced the greatest reduction in 1999 net farm income compared to 1990 to 1998 income averages. Iowa, Illinois, Indiana, and Missouri had 1999 net incomes that were 35 percent or more below from their respective 1990-98 averages. Figure 4 shows net cash income for the eight major crops computed two ways. The data plotted as squares were computed as the sum of the value of production and government payments less total cash production expenses. The other plotted line excludes government payments. Thus, the vertical distances between the two lines represent direct government payments to farmers by crop year. In the 1999 crop year, about 87 percent of the net cash income to the eight major crops came from government payments. Put another way, government payments were seven times greater than net cash income for the eight major crops.

Total farm program expenditures for fiscal years 1994 through 2001 are shown in figure 5. The portion of each bar denoting additional direct payments includes all payments that were not in the FAIR budget, such as market loss assistance payments, loan deficiency payments, crop disaster payments, and price support operations and interest expenditures. In fiscal 2000, in addition to the scheduled production contract, conservation reserve program and other farm payments, the government expended another $20 billion in direct payments and price support activities. This government-spending pattern is quite different from the stated intent of the legislation's authors which was to replace the cost unpredictability of previous farm programs with a seven-year fixed schedule of prescribed farm program expenditures. What we have experienced is one of the worst of times in terms of government expenditures for farm programs and crop price and net-market-return levels.

The 1996 Farm Bill did not generate the crop price, market income, and government farm payment results that supporters of the bill had expected. So where does the blame lie? Many, if not most, are very willing to blame agriculture's problems on short-term events — perhaps because a change in policy would not be considered necessary. It could be the Asian Crisis, trade sanctions on certain countries, exchange rates, energy prices, interest rates, inflation, deflation or virtually any other disruption that comes along. Others would blame loan rate levels, emergency payments, crop insurance, etc., etc. The implication of these short-run explanations is that once the—fill-in-the-blank-disruption—subsides or is remedied, agriculture will be just fine. So each time crop agriculture falters, we go on a scavenger-hunt desperately searching for short-term disruptions upon which to heap blame. I argue that the overriding reasons why the 1996 Farm Bill did not perform as expected, and why price and income problems occur in general, are rooted in long-known characteristics of crop agriculture.

The Rate of Supply Growth Exceeds Demand

Supply growing faster that demand is the common situation in crop agriculture. But every few years, certain events and a large measure of bandwagon rhetoric convince farmers and other agricultural stakeholders, agricultural economists, and politicians that a new era of export growth is upon us. As mentioned earlier, the conventional wisdom during the mid-1990s was that exports to China and other countries were about to explode. With this expectation, crop prices and incomes would be healthy and the noninterventionist approach of the 1996 Farm Bill would be perfect. But as has always been the case, sooner or later, accelerating export growth as a means of permanently moving agriculture onto a new threshold of prosperity becomes an unfulfilled promise. This time it was sooner. Figure 6 shows the difference between the quantities China was expected to import and the quantities actually exported by China. In 1996, China was projected to import 260 million bushels of corn in 1999. Instead, China exported over 400 million bushels of corn. More recent projections of China's corn export and import activity shows that it is more likely to be a net exporter than a net importer for some time to come.

Figure 7 shows the difference between projected and realized corn exports for the U.S. Annual corn export projections for the 1996 to 1999 marketing year averaged 400 million bushels per year greater than the quantity of corn actually exported. Sustained growth in crop exports for even periods as short as the seven-year tenure of the 1996 Farm Bill have only occurred three times in the last century: once during each of the two World Wars and once during the time from the mid-1970s to early 1980s. Clearly, basing or justifying a fundamental change in farm policy on the expectation that crop agriculture is entering a "new era" characterized by long-term accelerating export growth is extremely risky. Figure 8 shows the trend of corn domestic demand and exports over the last few decades. Not only has corn export demand not accelerated in recent years, it hasn't grown at all. The export trend is flat, while domestic demand has continued to increase.

Price Responsiveness of Supply

Aside from the expectation during the mid-1990s that export growth was about to take-off, another commonly held perception was that crop supply and crop demand had become more price responsive compared to when farm programs were first put into place. While farmers always stand ready to change the mix of crops on their farm in response to changing price or policy signals, farmers generally do not leave cropland unfarmed. While output in other industries is often curtailed to reduce inventories and better match demand, each farmer produces too little to affect total supply and therefore price, so any reduction in his output means less revenue.

Figure 9 shows that combined acreage of the four major crops—the component of crop supply over which farmers have complete control—has remained virtually constant during the tenure of the 1996 Farm Bill even though prices have declined by 40 percent. If revenues per unit of production rather than prices are used, a perfectly inelastic supply curve is still indicated. If the loan rate floor is included and then if the implied revenue impacts of contract payments (including the emergency payments) are included the price declines are 36 and 31 percent, respectively.

Price Responsiveness of Demand

Because food is essential for life—like insulin for a diabetic—price is of little consequence. Once we have enough, we will not buy significantly more total food, no matter how far the collective price of food has dropped. Feed demand has basically the same properties in the ultra short-run. Feed demand is likely becoming less rather than more responsive to low prices because of the high fixed costs of large livestock operations and the reduced number of short-run "inners and outers."

Export demand was expected to provide the kick in demand when prices decline, especially when prices decline over a period of years, which was expected to reduce production and exports of our export competitors. But our export competitors have not reacted as we expected. Figure 10 shows that Brazil soybean acreage increased by 13 percent from 1996 to 2000 while U.S. soybean prices declined 40 percent. At the same time, soybean acreage in this country increased by 13 million acres. Neither a reduced price nor increased U.S. supplies knocked Brazil off its expansion path.

Figure 11 shows how the European Union (EU), our major wheat export competitor, has adjusted its wheat acreage since 1996. EU wheat acreage is just as large today as it was in 1996 but the U.S. wheat price has declined by over 40 percent. Lower wheat prices have not brought the "EU to its knees" as we were so commonly told it would during the policy debates of the mid-1990s. After years of receiving price-depressed wheat export revenue and experiencing continued erosion of our share of world wheat exports, not only were we not successful in reducing wheat exports from the EU over the years, but it now appears that the EU will be capable of exporting wheat without export subsides in the near future.

Increased purchases by our export customers is the other reason exports are expected to increase with lower prices. But importing countries have no more tendency to import more because of a general drop in grain prices in a given year than we have a tendency to eat more total food because prices have dropped. So the total world export pie expands very little in response to lower prices. And since our export competitors tend to export most all their production in excess of domestic use in a given year, we tend to be the residual supplier. Figure 12 shows graphs of Argentina corn production in excess of domestic use and Argentina corn exports. Figure 13 shows the comparable graph for the U.S. We tend to be the residual suppler whether prices are "low" or "high" and regardless of the rate that the dollar exchanges with other currencies.

So What Have We Learned?

We have learned that while crop production is dramatically different today than it was in the 1930s when farm programs were put in place, the characteristics of crop markets remain unchanged. Compared to when farm programs were first instituted, crop agriculture uses vastly different technologies embedded in purchased inputs that are applied with more sophisticated and larger machinery on larger and fewer farms. But the characteristics of supply and demand that cause chronic problems of depressed crop prices and incomes continue and will continue until crop farmers control sufficient supply to appreciably affect the quantity put on the market and hence prices, or crop demand actually does consistently grow faster than supply or crop supply and/or demand becomes significantly more price elastic.

It probably does make sense to blame the 1996 Farm Bill for low prices not seen in three decades, net market returns that approach zero for program crops and record government payments. I say that because routine application of supply management instruments in earlier farm legislation and the use of non-recourse loans rather than marketing loans and loan deficiency payments would have virtually assured higher prices, increased incomes from the market, increased export values and lower government cost. And given the lack of supply and demand response to lower prices in this country and abroad, the downside to using the earlier policies would have been negligible. Furthermore, grains prices paid by livestock producers and other demanders of grains would be less subsidized and more reflective of economic cost.

Summary of the Report of the Commission on 21st Century Agriculture

As requested, I will make a few very brief comments on the Commission's report "Directions for Future Farm Policy: The Role of Government in Support of Production Agriculture" that was recently delivered to the President and Congress. The report emphasizes the price and income volatility associated with the "highly price inelastic" supply and demand of agricultural products but does not explicitly discuss the tendency for supply to shift to the right at a faster pace than demand. By highlighting volatility, the authors set the stage for policy recommendations that work best when the "bad" price and income years are offset by an equal number of "good" price and income years over a five, seven or some finite number of years.

The Commission recommends continuation of the fixed Agricultural Market Transition Act payments, the marketing loan program with the associated loan deficiency payments and marketing loan gains. The Commission supports rebalancing crop loan rates and removing limitations on all government payments to producers. The Commission suggests replacing emergency payments/market loss payments with a Supplemental Income Support (SIS) program. Supplemental payments to producers would be paid when aggregate program crop gross income falls below some percentage of the historical income level calculated over a fixed-base reference period.

As is also the case with transition and emergency payments, revenue insurance, and farm savings accounts, a SIS program works best if the price and income problems are short-term and if prices and incomes have as many ups as downs. Given what we know about the supply and demand characteristics of crop agriculture, SIS and other programs that presume market incomes are normally distributed are likely to routinely run up some very large taxpayer tabs. Yet, income protection to farmers could erode over time since declines in market incomes could decrease computed SIS payments in later years.

Figure 1. Weekly corn futures price for nearest contract month, 1994-1998 *(Source: Chicago Board of Trade)*.

Figure 2. Chinese net corn trade, 1994 and 1996 FAPRI projections of China's net corn trade, 1995-2005 *(Source: USDA PS&D and 1996 FAPRI Baseline)*.

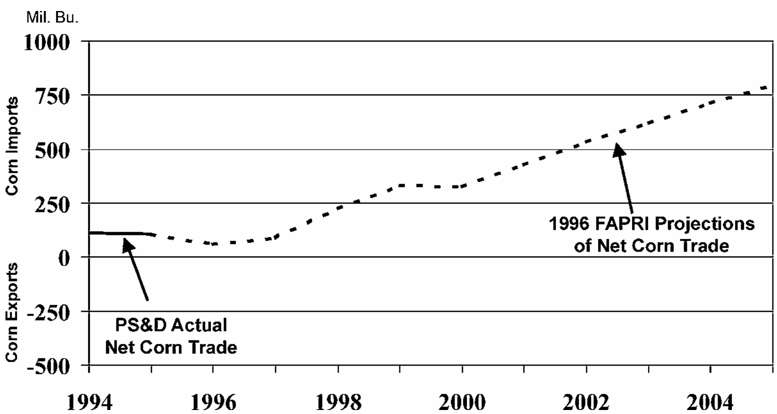

Figure 3. U.S. corn exports, 1993-1994, and USDA 1996 corn export projections, 1995-2005 *(Source: USDA PS&D and 1996 WAOB)*.

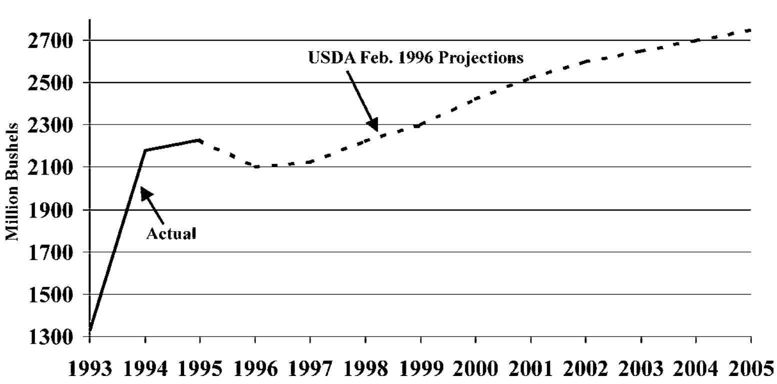

Figure 4. Net cash income for eight major crops (Sum of the value of production and government payments less total cash production expenses for wheat, feed grains, soybeans, upland cotton and rice), 1990–2000. *(Source: USDA Office of Chief Economist).*

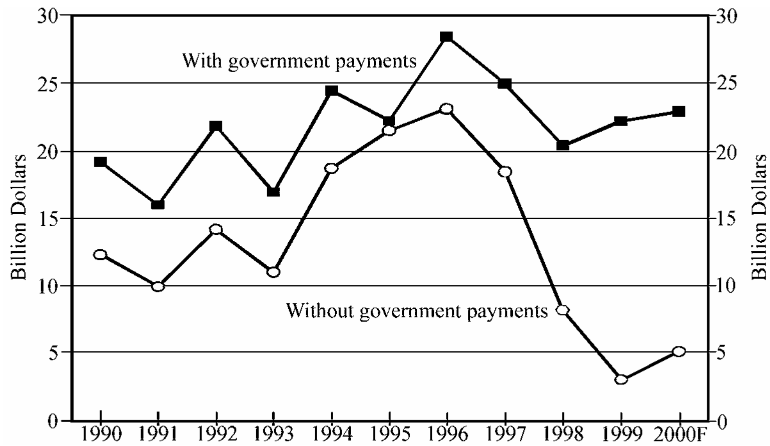

Figure 5. Government outlays by source, 1994–2001 *(Source: USDA).*

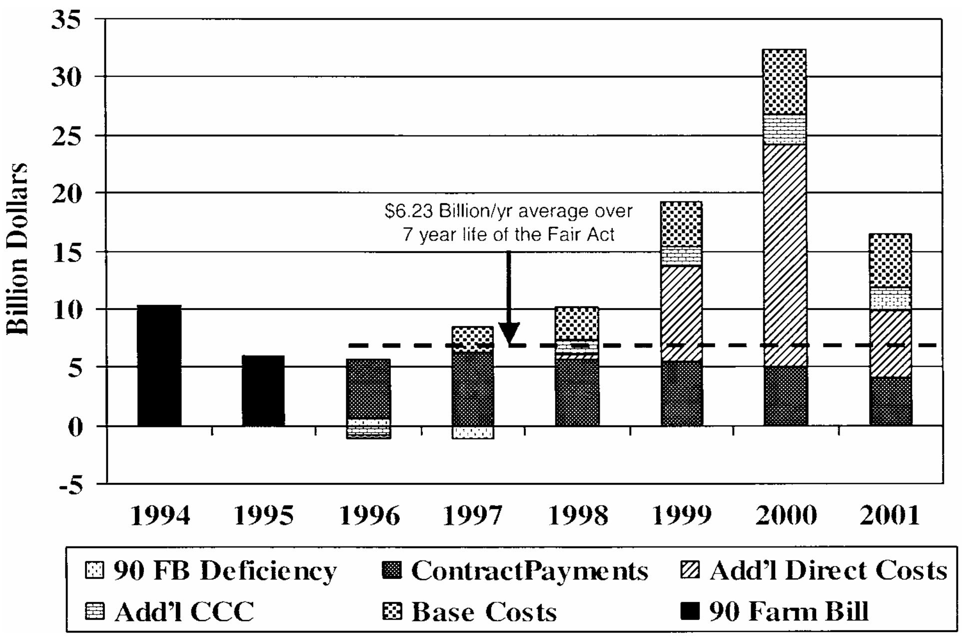

Figure 6. Chinese net corn trade, 1994-1999, 1996 FAPRI projections of China's net corn trade, 1995-2005 and 1999 FAPRI projections of China's net corn trade 2000-2005. *(Source: USDA PS&D and 1996 FAPRI Baseline)*.

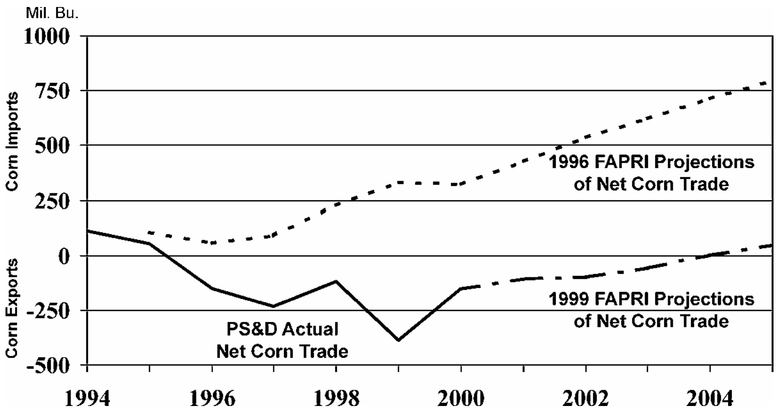

Figure 7. U.S. corn exports 1993-1999, 1996 WAOB projections of U.S. corn exports, 1995-2005, and 1999 WAOB projections of U.S. corn exports, 2000-2005 *(Source: USDA PS&D and 1996 FAPRI Baseline)*.

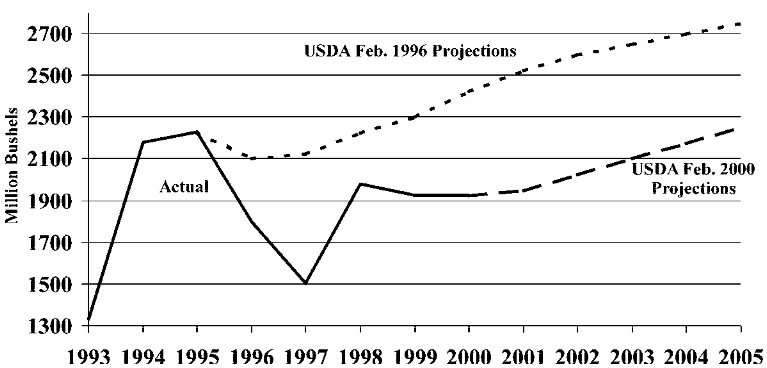

Figure 8. Comparison of U.S. domestic demand for corn and U.S. corn exports, 1976-1999. *(Source: USDA)*.

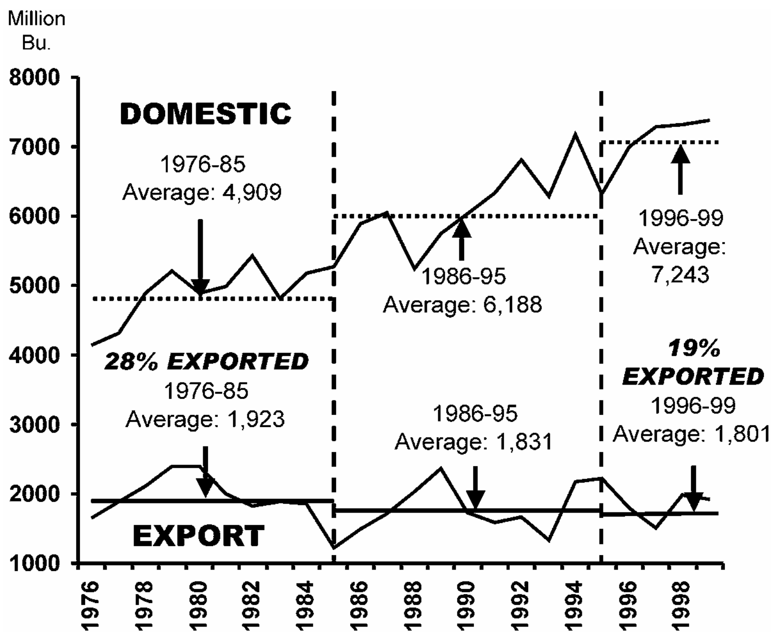

Figure 9. Indexed crop acreage and price with adjustments, crop years 1996 –2000, 1996=100 ***(Source: computed based on USDA published data)*.**

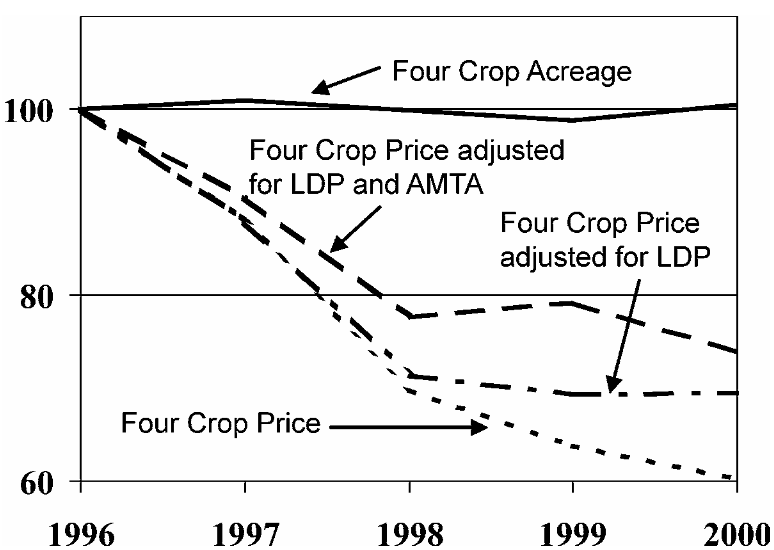

Figure 10. Indexed comparison Brazilian soybean acreage and U.S. price, 1996-2000. *(Source: USDA)*.

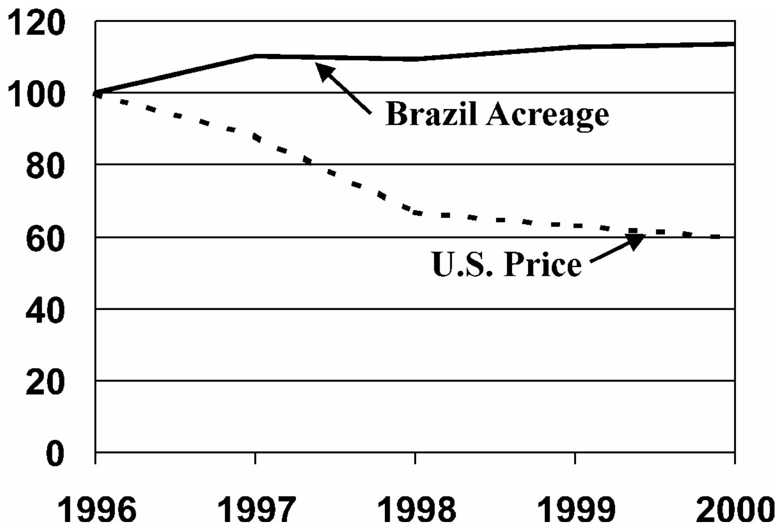

Figure 11. Indexed comparison EU wheat acreage and U.S. price, 1996-2000. *(Source: USDA)*.

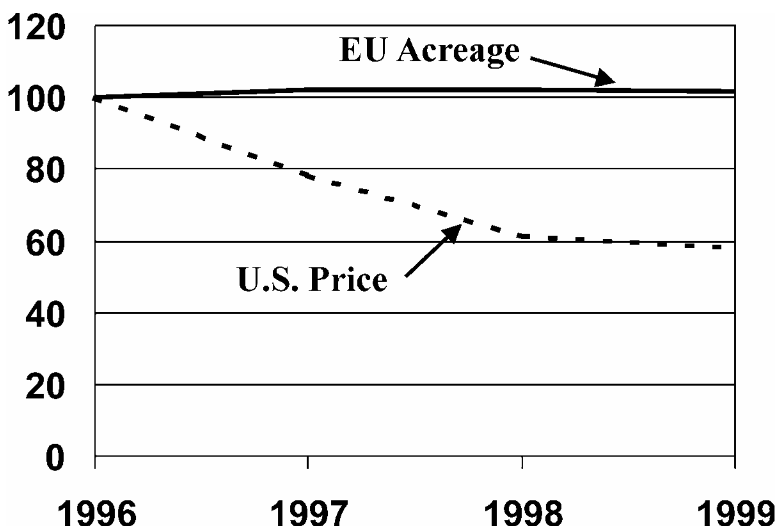

Figure 12. Comparison of Argentinean surplus corn production (production minus domestic demand) and Argentinean corn exports, 1993-1999. *(Source: USDA).*

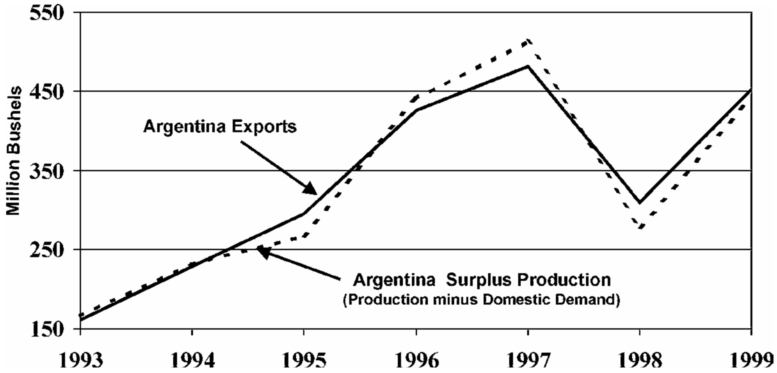

Figure 13. Comparison of U.S. surplus corn production (production minus domestic demand) and U.S. corn exports, 1993-1999. *(Source: USDA).*

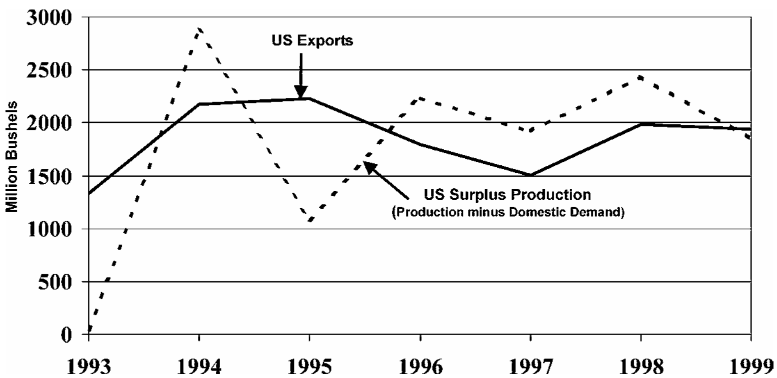

Table 1. U.S. acreage, yield, production, beginning stocks, exports, and farm price for corn, wheat, soybeans and cotton, 1994-1999 crop years

	Production	Beginning Stocks	Exports	Farm Price
Corn	M bu	M bu	M bu	$/bu
1994/95	10,103	850	2,177	2.26
1995/96	7,374	1,558	2,228	3.24
1996/97	9,233	426	1,797	2.71
1997/98	9,207	883	1,504	2.43
1998/99	9,759	1,308	1,981	1.94
1999/00*	9,437	1,787	1,935	1.80
Wheat	M bu	M bu	M bu	$/bu
1994/95	2,321	568	1,188	3.45
1995/96	2,183	507	1,241	4.55
1996/97	2,277	376	1,002	4.30
1997/98	2,481	444	1,040	3.38
1998/99	2,547	722	1,042	2.65
1999/00*	2,299	946	1,090	2.48
Soybean	M bu	M bu	M bu	$/bu
1994/95	2,517	209	838	5.48
1995/96	2,177	335	851	6.72
1996/97	2,382	183	882	7.35
1997/98	2,741	200	805	4.93
1998/99	2,741	200	805	4.93
1999/00*	2,654	348	970	4.65
Cotton	M bales	M bales	M bales	Cnts/lb
1994/95	19.7	3.5	9.4	72.0
1995/96	17.9	2.7	7.7	75.4
1996/97	18.9	2.6	6.9	69.3
1997/98	18.8	4.0	7.5	65.2
1998/99	13.9	3.9	4.3	60.2
1999/00*	17.0	3.9	6.8	45.0

*Estimated

**Source: Economic Research Service, (United States Department of Agriculture).*

Table 2. Net farm income and direct government payments by state and region, calendar 1999. *(Source USDA)*

State	Direct Government Payments *(Thousand $)*	Net Farm Income *(Thousand $)*	% (DGP/NFI) *(%)*	1999 as % of 1990-1998 average *(%)*	1990-1998 Average *(Thousand $)*
Alabama	178,144	1,449,606	12.3	138.2	1,048,900
Arkansas	768,896	1,830,918	42.0	132.2	1,385,000
Delaware	19,615	120,678	16.3	104.8	115,200
Florida	76,914	2,815,328	2.7	124.2	2,266,800
Georgia	360,680	2,099,384	17.2	120.7	1,739,300
Kentucky	229,103	846,974	27.0	73.7	1,149,200
Louisiana	411,864	565,350	72.9	115.1	491,200
Maryland	67,358	337,364	20.0	109.3	308,700
Mississippi	431,096	948,998	45.4	139.9	678,300
North Carolina	284,725	1,966,190	14.5	73	2,693,400
Oklahoma	526,401	1,149,787	45.8	135.5	848,600
South Carolina	127,083	422,469	30.1	107.4	393,400
Tennessee	208,224	141,430	147.2	28.1	503,300
Texas	1,914,139	4,649,677	41.2	143.3	3,244,700
Virginia	98,556	395,968	24.9	63.3	625,500
West Virginia	11,102	13,287	83.6	24.5	54,200
Southern	**5,713,900**	**19,753,408**	**28.9**	**112.6**	**17,545,700**
Alaska	1,766	19,587	9.0	157.6	12,400
Arizona	108,030	707,686	15.3	111.5	634,700
California	651,295	1,830,918	35.6	132.2	1,385,000
Colorado	368,005	922,905	39.9	122.7	752,200
Hawaii	824	63,151	1.3	101.1	62,500
Idaho	208,846	873,776	23.9	102.6	851,600
Montana	487,851	482,022	101.2	97.6	493,900
Nevada	2,674	65,039	4.1	102.4	63,500
New Mexico	92,069	639,839	14.4	136.6	468,400
Oregon	105,499	323,441	32.6	60.5	534,600
Utah	30,089	280,458	10.7	119.9	233,900
Washington	269,452	519,009	51.9	47.8	1,085,800
Wyoming	39,947	172,843	23.1	104.1	166,000
West	**2,366,347**	**6,900,674**	**34.3**	**102.3**	**6,744,500**
Connecticut	8,708	139,290	6.3	96.8	143,900
Maine	11,671	98,152	11.9	92.7	105,900
Massachusetts	10,162	64,853	15.7	47.8	135,700
New Hampshire	3,944	24,691	16.0	86.2	28,600
New Jersey	9,955	127,254	7.8	66.3	191,900
New York	117,168	586,536	20.0	123.4	475,300
Pennsylvania	94,277	627,314	15.0	81.7	767,800
Rhode Island	877	11,762	7.5	42.3	27,800
Vermont	12,242	140,790	8.7	121.8	115,600
Northeast	**269,004**	**1,820,642**	**14.8**	**91.4**	**1,992,500**

Table 2., Continued.

State	Direct Government Payments *(Thousand $)*	Net Farm Income *(Thousand $)*	% (DGP/NFI) *(%)*	1999 as % of 1990-1998 average *(%)*	1990-1998 Average *(Thousand $)*
Illinois	1,711,034	1,007,007	169.9	63.2	1,593,400
Indiana	810,451	420,822	192.6	52.5	801,600
Iowa	1,875,525	1,450,176	129.3	57.6	2,517,700
Kansas	1,382,800	1,547,850	89.3	96.8	1,599,000
Michigan	389,099	658,575	59.1	144.1	457,000
Minnesota	1,256,091	1,257,252	99.9	96.6	1,301,500
Missouri	688,022	404,773	170.0	50.5	801,500
Nebraska	1,322,091	1,650,646	80.1	72.8	2,267,400
North Dakota	951,581	452,137	210.5	66.5	679,900
Ohio	627,715	802,983	78.2	70.8	1,134,200
South Dakota	746,176	1,189,945	62.7	109.1	1,090,700
Wisconsin	484,134	878,986	55.1	119.6	734,900
Grain Belt	**12,244,719**	**11,721,152**	**104.5**	**78.3**	**14,978,800**
United States	**20,593,972**	**40,195,876**	**51.2**	**97.4**	**41,261,500**

Source: ERS State Fact Sheets; December 2000, ERS Government Payments by program and state, 1998 and 1999 - Revised May 1, 2000