

## The Impact of Increased Planting Flexibility on Planting Decisions Across Texas

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## **The Impact of Increased Planting Flexibility on Planting Decisions Across Texas**

### **Abstract:**

Increased acreage planting flexibility granted through the last three farm bills has allowed agricultural producers to make production choices without government programs driving their decisions. This paper uses planted acre data for program crops in seven Texas regions to describe response to varying degrees of flexibility granted through decoupled payments.

### **Introduction:**

The last three farm bills have provided legislation allowing varying levels of freedom with regard to crops grown ranging from marginal flexibility to complete flexibility. Increased acreage planting flexibility over the last fifteen years has allowed agricultural producers to make production choices without government programs driving their decisions. The primary objective of this research is to examine producer response with respect to crops planted after the passage of each piece of legislation that granted increased planting flexibility. Westcott, Young, and Price (2002) took a broader approach at studying the impacts of the 2002 Farm Act on planting decisions of major field crops. This study will focus specifically on planted acreage changes for program crops occurring after the 1990, 1996, and 2002 farm bills were implemented in seven multi-county regions of Texas.

### **Background:**

The Food, Agriculture, Conservation, and Trade Act of 1990 allowed producers to grow any eligible commodity except for fruits and vegetables on a maximum of 25 percent of base

acres. Under that provision, producers did not receive deficiency payments on 15 percent of crop base acres. This 15 percent of base was referred to as normal flex acreage. On the remaining 10 percent of the flexible acreage, producers received deficiency payments only if they planted the original program crop. This acreage was called optional flex acreage. Prior to this legislation, producers were required to grow the original program crop on base acreage to receive government support.

In an effort to further expand planting flexibility, the Federal Agriculture Improvement and Reform Act of 1996 provided for full planting flexibility on previous crop acreage bases, with the only restrictions involving growing fruits and vegetables.

The Farm Security and Rural Investment Act of 2002 retained provisions for full planting flexibility on crop acreage bases.

### **Data and Methods:**

Planted acre data was collected from the National Agricultural Statistics Service database for all program crops grown in seven multi-county regions in Texas. Acreage was collected for program crops including corn, cotton, oats, peanuts, rice, sorghum, soybeans, sunflower, and wheat. The seven regions include the Panhandle (Moore and Sherman Counties), South Plains (Dawson and Gaines Counties), Blacklands (Milam and Williamson Counties), Middle Coast (Colorado and Wharton Counties), Coastal Bend (San Patricio and Nueces Counties), Winter Garden (Zavala and Uvalde Counties) and the Lower Rio Grande Valley (Cameron and Willacy Counties). These regions provide a cross section of major crop production areas across which to examine planted acreage trends

The data were divided by commodity into four time periods (Period 1: 1985 to 1990; Period 2: 1991 to 1996; Period 3: 1997 to 2002; and Period 4: 2003 to 2004) corresponding to passage of major farm bill legislation. Commodities comprising less than 5 percent of total program crop acreage in a given county will not be discussed, but those results are reported in Tables 1 through 7 for each region. Planting trends were examined between these periods to determine how increased planting flexibility has impacted producer decisions in those regions over time. Each period was compared to the previous period to determine if a statistically significant shift in planted acres occurred. Because the numbers of years in the individual periods were not equal, a two sample t test was utilized for this comparison. This distribution comparison test of each data series was used to determine if two periods were statistically different. Depending on the comparison between a calculated test value and a critical value for each series, the test either confirms with 95% confidence the hypothesis that the series are equal or rejects with 95% confidence the hypothesis that the series are equal. Tables 1 through 7 report the program crop acres planted in each of the seven multi county regions. Numbers in bold indicate that a particular series is statistically different from the previous series.

### **Results:**

The majority of the planted acreage shifts occurred between Periods 2 and 3, the years following passage of the 1996 farm bill dubbed “Freedom to Farm”. The changes in acres planted observed between Periods 1 and 2 were a close second. This supports the idea most producer reaction to increased planting flexibility had already occurred before passage of the 2002 legislation. Changes in planting patterns between Periods 3 and 4 are likely responses to climate, growing conditions, expected returns, or other site specific externalities rather than

reactions to an increased level of flexibility provided for in passage of the most recent legislation.

The two regions that experienced the least amount of change in planted acreage were the Lower Rio Grande Valley and the Winter Garden. These are also the major areas of the state already growing fruits and vegetables or other specialty crops, so a removal of the fruit and vegetable planting restriction may have little or no effect on acres planted to program crops in these regions.

Following are results of the comparison by multi-county region, highlighting trends in planted acreage of program crops.

**Blacklands:**

Average acres planted to corn more than doubled from Period 2 to Period 3. Cotton saw a 60 percent decline in average acres planted from Period 2 to Period 3 after experiencing a 37 percent increase from period 1 to 2. Sorghum experienced a 36 percent decline from Period 2 to Period 3 in average acres planted. Wheat saw a similar decline of 43 percent from Period 1 to Period 2.

**Coastal Bend:**

A 67 percent decrease in average corn acres planted from Period 3 to Period 4 is observed. This is only one of three significant shifts occurring in the comparison between Periods 3 and 4. A 47 percent increase in cotton acres occurred from Period 1 to Period 2. A 22 percent increase in total acres planted to program crops occurred between Periods 1 and 2.

**Lower RGV:**

In the Lower Rio Grande Valley, from Period 1 to Period 2, corn experienced a 57 percent decline in planted acres while sorghum experienced a 52 percent increase in average planted acres.

**Middle Coast:**

Cotton average acres planted increased by a magnitude of 2.6 times (160 percent) from Period 1 to Period 2, followed by another significant increase of 46 percent from Period 2 to Period 3. Rice acreage in the region declined by 13 percent from Period 2 to Period 3 as producers were no longer required to plant the crop in order to receive their government payments. Soybeans saw a 145 percent increase in that same time period and have remained at that level of planted acres in recent years.

**Panhandle:**

The Panhandle region as a whole experienced the most significant shifts in average planted acres of program crops. Corn acres effectively doubled from Period 1 to Period 2. They also experienced a 26 percent bump from Period 2 to Period 3. Acres planted to sorghum have experienced a considerable amount of volatility throughout the study period. They experienced a decrease of 42 percent from Period 1 to Period 2 before increasing 36 percent from Period 2 to Period 3. Sorghum acres have declined in recent years (Period 4) by 38 percent as compared with Period 3.

**South Plains:**

The South Plains is a region of Texas where average planted acres of program crops have remained relatively stable. The only significant change was an explosion of peanut acreage from Period 2 to Period 3, effectively tripling the acres planted to peanuts.

**Winter Garden:**

The only significant change occurring in the Winter Garden region concerned a recent 24 percent decline in grain sorghum acreage as compared with Period 3.

**Discussion:**

A variety of factors may contribute to the absence of major shifts in cropping decisions as increased planting flexibility has come about. Limited irrigation water or the prevalence of drought conditions may have limited producers in the Lower Rio Grande Valley on the crops they can plant. The Winter Garden region historically plants less acreage to program crops, as they plant a significant quantity of specialty crops, especially vegetables.

The hope for higher returns on alternative crops which may be riskier given local growing conditions may be identified in certain regions. Corn is becoming increasingly expensive to grow in the Panhandle region as that semi arid area must irrigate the crop. With natural gas prices on the rise, producers are experimenting with growing cotton, a crop traditionally grown in more southern regions of the state. Data was only available through 2004; however, it is expected that planted acres for 2005 and beyond will illustrate an even greater shift to cotton occurring in the Panhandle Region. Along with better adapted cultivars, this is in part made possible due to planting flexibility granted through farm bill legislation.

In addition, the prospect of growing higher valued specialty crops may entice some producers to shift acreage to these crops if certain proposed legislation comes to fruition. Recent WTO rulings against the United States cotton program have brought into question the WTO compliance of the bulk of United States agricultural policies, specifically the aforementioned fruit and vegetable planting exclusion. Recent legislation proposed by Representative Mike Pence (HR2045) provides for even more planting flexibility, as his proposal removes the

planting restriction on program crop base acres, allowing a producer to grow fruits and vegetables as long as they are to be grown for processing.



## References

**Table 1. Acres planted to program crops by commodity for Blacklands Region (Milam and Williamson Counties), 1985-2004.**

	<u>Corn</u>	<u>Cotton</u>	<u>Oats</u>	<u>Sorghum</u>	<u>Wheat</u>	<u>Soybeans</u>	<u>Total</u>
<b>Period 1</b>							
1985	34,200	43,600	22,700	102,500	109,000	-	312,000
1986	30,500	53,200	17,200	113,500	104,000	-	318,400
1987	23,800	59,000	38,500	97,000	65,500	-	283,800
1988	29,300	77,500	41,000	92,000	65,400	-	305,200
1989	31,000	61,500	33,500	113,000	69,200	1,300	309,500
1990	28,100	86,500	30,900	115,100	60,300	1,300	322,200
<b>Average</b>	29,483	63,550	30,633	105,517	78,900	433	308,517
<b>Period 2</b>							
1991	25,100	106,000	35,000	115,000	44,400	1,800	327,300
1992	37,600	87,500	19,600	115,900	40,200	-	300,800
1993	54,900	87,100	21,500	90,100	52,200	-	305,800
1994	65,200	77,600	15,200	90,000	57,600	-	305,600
1995	72,000	96,300	23,200	70,300	53,700	-	315,500
1996	64,300	69,100	14,600	118,600	22,600	-	289,200
<b>Average</b>	53,183	<b>87,267</b>	21,517	99,983	<b>45,117</b>	300	307,367
<b>Period 3</b>							
1997	82,700	48,400	13,000	105,000	49,700	1,100	299,900
1998	140,300	36,300	19,500	55,500	35,300	1,200	288,100
1999	105,700	41,200	29,800	80,200	44,000	-	300,900
2000	129,700	44,000	21,300	60,900	19,500	-	275,400
2001	90,200	27,900	28,500	43,000	13,500	-	203,100
2002	174,800	12,400	16,000	40,300	19,300	-	262,800
<b>Average</b>	<b>120,567</b>	<b>35,033</b>	21,350	<b>64,150</b>	30,217	383	271,700
<b>Period 4</b>							
2003	141,000	30,200	27,300	52,000	25,700	-	276,200
2004	118,200	40,100	26,400	48,600	33,500	-	266,800
<b>Average</b>	129,600	35,150	26,850	50,300	29,600	-	271,500

Source: USDA: National Agricultural Statistics Service

**Table 2. Acres planted to program crops by commodity for Coastal Bend Region  
(San Patricio and Nueces Counties), 1985-2004.**

	<u>Corn</u>	<u>Cotton</u>	<u>Oats</u>	<u>Sorghum</u>	<u>Wheat</u>	<u>Total</u>
<b>Period 1</b>						
1985	60,300	127,200	-	285,000	10,300	482,800
1986	41,700	131,200	1,000	238,500	9,600	422,000
1987	77,600	123,500	-	212,000	9,000	422,100
1988	85,900	184,900	-	209,000	2,800	482,600
1989	52,700	140,000	-	299,000	2,900	494,600
1990	32,700	178,900	1,500	309,900	4,100	527,100
<b>Average</b>	58,483	147,617	417	258,900	6,450	471,867
<b>Period 2</b>						
1991	28,300	236,000	1,600	312,000	3,700	581,600
1992	33,400	202,600	1,500	316,400	2,200	556,100
1993	70,300	200,200	1,300	274,900	-	546,700
1994	70,600	194,200	-	300,600	-	565,400
1995	128,300	244,300	-	207,800	-	580,400
1996	40,600	226,100	-	350,800	3,500	621,000
<b>Average</b>	61,917	<b>217,233</b>	733	293,750	<b>1,567</b>	575,200
<b>Period 3</b>						
1997	50,500	187,400	-	362,900	-	600,800
1998	76,100	179,900	-	311,300	-	567,300
1999	48,100	216,600	-	304,100	-	568,800
2000	51,900	225,500	-	291,200	-	568,600
2001	36,200	276,600	-	249,000	-	561,800
2002	53,700	255,000	3,600	257,900	-	570,200
<b>Average</b>	52,750	223,500	600	296,067	-	572,917
<b>Period 4</b>						
2003	18,000	261,800	1,400	283,900	-	565,100
2004	17,100	140,100	1,400	250,200	-	408,800
<b>Average</b>	<b>17,550</b>	200,950	1,400	267,050	-	486,950

Source: USDA: National Agricultural Statistics Service

**Table 3. Acres planted to program crops by commodity for Lower Rio Grande Valley Region (Cameron and Willacy Counties), 1985-2004.**

	<u>Corn</u>	<u>Cotton</u>	<u>Sorghum</u>	<u>Soybeans</u>	<u>Wheat</u>	<u>Total</u>
<b>Period 1</b>						
1985	49,800	190,300	143,500	-	1,000	384,600
1986	35,600	179,700	127,000	-	2,700	345,000
1987	33,000	178,400	100,000	-	2,300	313,700
1988	61,300	224,300	88,000	-	-	373,600
1989	44,500	168,500	127,000	4,100	-	344,100
1990	29,100	216,500	132,500	-	-	378,100
<b>Average</b>	<b>42,217</b>	<b>192,950</b>	<b>119,667</b>	<b>683</b>	<b>1,000</b>	<b>356,517</b>
<b>Period 2</b>						
1991	34,900	250,800	141,500	-	-	427,200
1992	7,700	195,600	202,000	-	-	405,300
1993	23,200	187,100	174,900	-	-	385,200
1994	15,900	185,200	188,000	-	-	389,100
1995	18,100	221,900	169,700	-	-	409,700
1996	9,500	128,000	215,100	-	-	352,600
<b>Average</b>	<b>18,217</b>	<b>194,767</b>	<b>181,867</b>	<b>-</b>	<b>-</b>	<b>394,850</b>
<b>Period 3</b>						
1997	16,900	111,100	199,600	4,100	-	331,700
1998	22,700	154,100	175,400	5,100	-	357,300
1999	19,700	163,200	196,900	1,900	-	381,700
2000	22,300	164,600	196,400	-	-	383,300
2001	20,000	169,000	200,000	-	-	389,000
2002	13,700	157,200	205,300	-	-	376,200
<b>Average</b>	<b>19,217</b>	<b>153,200</b>	<b>195,600</b>	<b>1,850</b>	<b>-</b>	<b>369,867</b>
<b>Period 4</b>						
2003	14,500	144,700	213,600	-	-	372,800
2004	20,100	143,700	197,000	-	-	360,800
<b>Average</b>	<b>17,300</b>	<b>144,200</b>	<b>205,300</b>	<b>-</b>	<b>-</b>	<b>366,800</b>

Source: USDA: National Agricultural Statistics Service

**Table 4. Acres planted to program crops by commodity for Middle Coast Region (Colorado and Wharton Counties), 1985-2004.**

	<u>Corn</u>	<u>Cotton</u>	<u>Oats</u>	<u>Rice</u>	<u>Sorghum</u>	<u>Soybeans</u>	<u>Wheat</u>	<u>Total</u>
<b>Period 1</b>								
1985	113,600	15,500	5,600	95,000	77,000	18,900	5,000	330,600
1986	76,100	17,700	4,500	85,700	92,500	13,500	2,600	292,600
1987	68,300	17,900	5,200	78,300	55,000	4,700	2,900	232,300
1988	67,500	22,700	4,000	107,800	66,000	9,100	4,000	281,100
1989	76,800	19,000	7,300	99,300	93,000	12,200	1,000	308,600
1990	73,800	30,300	5,700	104,500	92,900	9,100	-	316,300
<b>Average</b>	79,350	20,517	5,383	95,100	79,400	11,250	2,583	293,583
<b>Period 2</b>								
1991	64,100	64,100	6,500	103,300	86,200	6,400	1,400	332,000
1992	65,000	41,200	3,000	106,800	80,500	9,600	1,000	307,100
1993	63,000	42,000	2,800	90,600	64,100	10,400	-	272,900
1994	71,300	40,600	-	110,600	80,500	7,900	-	310,900
1995	62,400	70,700	-	99,900	62,000	5,800	-	300,800
1996	80,500	62,500	-	106,400	94,300	11,500	2,800	358,000
<b>Average</b>	67,717	<b>53,517</b>	2,050	102,933	77,933	8,600	867	313,617
<b>Period 3</b>								
1997	34,300	57,900	1,500	92,000	93,300	28,900	1,200	309,100
1998	70,900	62,800	-	96,800	65,900	21,200	1,000	318,600
1999	47,600	96,400	2,700	93,800	68,400	13,800	-	322,700
2000	45,200	96,400	1,200	86,800	68,300	16,200	-	314,100
2001	52,800	85,800	-	83,800	64,300	23,800	1,800	312,300
2002	65,000	70,500	-	81,100	67,200	22,300	1,900	308,000
<b>Average</b>	52,633	<b>78,300</b>	900	<b>89,050</b>	71,233	<b>21,033</b>	983	314,133
<b>Period 4</b>								
2003	62,900	71,400	-	75,800	71,000	11,200	3,200	295,500
2004	41,300	81,500	-	86,800	52,300	32,900	5,600	300,400
<b>Average</b>	52,100	76,450	-	81,300	61,650	22,050	4,400	297,950

Source: USDA: National Agricultural Statistics Service

**Table 5. Acres planted to program crops by commodity for Panhandle Region (Moore and Sherman Counties), 1985-2004.**

	<u>Barley</u>	<u>Corn</u>	<u>Oats</u>	<u>Sorghum</u>	<u>Soybeans</u>	<u>Sunflower</u>	<u>Wheat</u>	<u>Cotton</u>	<u>Total</u>
<b>Period 1</b>									
1985	12,900	59,500	1,300	147,000	1,900	-	329,900	-	552,500
1986	7,000	50,200	-	117,000	1,000	-	315,500	-	490,700
1987	6,000	50,500	-	80,000	1,200	-	211,200	-	348,900
1988	4,400	60,000	-	64,500	3,100	-	196,400	-	328,400
1989	2,900	76,800	3,600	114,000	3,300	-	204,200	-	404,800
1990	4,600	88,800	4,700	72,100	-	-	221,000	-	391,200
<b>Average</b>	<b>6,300</b>	<b>64,300</b>	<b>1,600</b>	<b>99,100</b>	<b>1,750</b>	<b>-</b>	<b>246,367</b>	<b>-</b>	<b>419,417</b>
<b>Period 2</b>									
1991	3,100	101,700	2,000	67,300	-	2,000	235,200	-	411,300
1992	1,600	111,400	1,200	57,300	-	-	237,800	-	409,300
1993	1,100	127,100	1,500	45,900	-	-	221,800	-	397,400
1994	-	146,700	-	44,200	-	-	231,000	-	421,900
1995	-	142,900	1,400	52,600	-	1,800	237,300	-	436,000
1996	-	146,000	-	75,000	-	-	248,200	-	469,200
<b>Average</b>	<b>967</b>	<b>129,300</b>	<b>1,017</b>	<b>57,050</b>	<b>-</b>	<b>633</b>	<b>235,217</b>	<b>-</b>	<b>424,183</b>
<b>Period 3</b>									
1997	-	158,500	-	70,900	1,900	1,900	253,100	-	486,300
1998	-	165,700	1,300	63,600	5,900	-	220,900	-	457,400
1999	-	182,700	-	71,900	14,100	6,300	251,600	-	526,600
2000	-	187,700	-	85,000	12,700	3,400	227,000	-	515,800
2001	-	131,000	3,700	79,900	3,700	18,900	265,000	-	502,200
2002	-	151,000	3,000	93,500	3,500	6,000	287,000	-	544,000
<b>Average</b>	<b>-</b>	<b>162,767</b>	<b>1,333</b>	<b>77,467</b>	<b>6,967</b>	<b>6,083</b>	<b>250,767</b>	<b>-</b>	<b>505,383</b>
<b>Period 4</b>									
2003	-	138,600	1,300	50,000	2,900	9,600	326,500	2,800	531,700
2004	-	147,400	-	46,800	5,800	6,300	287,000	8,600	501,900
<b>Average</b>	<b>-</b>	<b>143,000</b>	<b>650</b>	<b>48,400</b>	<b>4,350</b>	<b>7,950</b>	<b>306,750</b>	<b>5,700</b>	<b>516,800</b>

Source: USDA: National Agricultural Statistics Service

**Table 6. Acres planted to program crops by commodity for South Plains Region (Dawson and Gaines Counties), 1985-2004.**

	<u>Corn</u>	<u>Cotton</u>	<u>Peanuts</u>	<u>Sorghum</u>	<u>Soybeans</u>	<u>Sunflower</u>	<u>Wheat</u>	<u>Total</u>
<b>Period 1</b>								
1985	-	525,000	-	113,500	-	2,500	94,300	735,300
1986	-	508,500	-	154,500	-	-	81,800	744,800
1987	-	484,100	-	48,000	-	-	97,900	630,000
1988	-	541,400	-	16,000	1,000	-	69,700	628,100
1989	-	457,900	-	33,000	2,000	-	64,500	557,400
1990	-	524,200	-	39,100	-	-	65,900	629,200
<b>Average</b>	-	506,850	-	67,350	500	417	79,017	654,133
<b>Period 2</b>								
1991	-	558,100	-	67,300	-	-	94,900	720,300
1992	-	531,700	-	130,100	-	-	74,400	736,200
1993	-	531,600	36,500	37,900	-	-	72,900	678,900
1994	-	526,600	41,800	29,800	-	-	68,000	666,200
1995	-	593,500	33,900	20,300	-	-	42,000	689,700
1996	-	564,600	61,700	227,500	-	-	34,300	888,100
<b>Average</b>	-	551,017	28,983	85,483	-	-	64,417	729,900
<b>Period 3</b>								
1997	1,600	562,300	81,300	42,600	-	1,300	44,600	733,700
1998	4,100	557,200	101,800	219,200	-	1,200	51,200	934,700
1999	-	586,600	79,700	34,500	1,600	1,800	40,800	745,000
2000	-	593,500	98,600	125,000	1,400	-	68,000	886,500
2001	-	601,500	82,500	238,000	1,400	-	79,000	1,002,400
2002	-	558,800	82,800	101,200	-	1,900	77,500	822,200
<b>Average</b>	950	576,650	<b>87,783</b>	126,750	733	1,033	60,183	854,083
<b>Period 4</b>								
2003	-	531,300	80,800	28,700	-	-	98,500	739,300
2004	1,800	556,300	68,100	31,000	-	1,100	135,500	793,800
<b>Average</b>	900	543,800	74,450	29,850	-	550	117,000	766,550

Source: USDA: National Agricultural Statistics Service

**Table 7. Acres planted to program crops by commodity for Winter Garden Region (Zavala and Uvalde Counties), 1985-2004.**

	<u>Corn</u>	<u>Cotton</u>	<u>Sorghum</u>	<u>Wheat</u>	<u>Oats</u>	<u>Soybeans</u>	<u>Total</u>
<b>Period 1</b>							
1985	32,000	27,100	16,800	31,100	34,700	-	141,700
1986	23,200	18,600	22,300	35,400	23,000	-	122,500
1987	22,600	19,500	17,600	39,600	31,200	-	130,500
1988	24,400	23,300	13,000	34,900	30,600	-	126,200
1989	27,500	12,900	14,500	44,000	33,100	1,800	133,800
1990	23,500	18,500	16,600	42,900	33,500	-	135,000
<b>Average</b>	25,533	19,983	16,800	37,983	31,017	300	131,617
<b>Period 2</b>							
1991	23,600	18,900	15,400	37,000	38,100	-	133,000
1992	25,100	12,800	18,900	35,000	23,000	-	114,800
1993	26,300	11,700	18,300	35,000	39,300	-	130,600
1994	28,200	12,900	26,900	38,000	22,900	-	128,900
1995	25,900	18,900	19,600	31,400	24,800	-	120,600
1996	36,000	5,900	31,800	38,800	46,400	-	158,900
<b>Average</b>	27,517	13,517	21,817	35,867	32,417	-	131,133
<b>Period 3</b>							
1997	33,100	9,100	26,800	44,500	36,500	-	150,000
1998	34,900	10,000	20,400	25,000	33,800	-	124,100
1999	24,500	9,500	23,100	35,000	39,400	-	131,500
2000	28,000	8,600	23,400	30,700	34,400	-	125,100
2001	24,200	8,700	21,200	26,000	45,000	-	125,100
2002	23,300	11,300	18,400	39,900	43,900	-	136,800
<b>Average</b>	28,000	9,533	22,217	33,517	38,833	-	132,100
<b>Period 4</b>							
2003	18,900	16,100	16,600	42,800	34,400	-	128,800
2004	23,100	20,300	17,200	40,600	34,000	-	135,200
<b>Average</b>	21,000	18,200	<b>16,900</b>	41,700	34,200	-	132,000

Source: USDA: National Agricultural Statistics Service