

**PROFITABILITY OF COTTON PRODUCTION IN THE TEXAS HIGH PLAINS FROM 1996 TO 2003****Ginger Elaine Sides, Alyssa Irlbeck, Phillip Johnson and Darcie Schmidt****Texas Tech University****Lubbock, TX****Abstract**

Cotton is the major field crop produced in Texas, accounting for approximately 8.7% of all Texas agricultural commodity cash receipts in 2003 (TASS). However, the continued long-term viability of cotton production in the Texas High Plains (THP) depends on its profitability within farming operations. Therefore, the objective of this study was to evaluate the production costs and profitability of irrigated and dryland cotton production in the THP from 1996 to 2003. In order to accomplish the objective of this study, the Standardized Performance Analysis-Multiple Enterprises (SPA-ME) computer program and the Standardized Performance Analysis (SPA) database is utilized. The data analyzed in this study were generated from financial and production information collected from cotton producers in the THP from 1996 to 2003 for irrigated and dryland cotton produced under crop share rental agreements. The data collected from THP cotton producers consisted of production, marketing, and financial information for the SPA analyses.

**Objective**

Cotton is the major field crop produced in Texas, accounting for approximately 8.7% of all Texas agricultural commodity cash receipts in 2003 (TASS). However, the continued long-term viability of cotton production in the Texas High Plains (THP) depends on its profitability within farming operations. Therefore, the objective of this study was to evaluate the production costs and profitability of irrigated and dryland cotton production in the THP from 1996 to 2003.

**Methods and Procedures**

The methods utilized to accomplish the objective of this study included the Standardized Performance Analysis-Multiple Enterprises (SPA-ME) computer program and Standardized Performance Analysis (SPA) database.

The SPA-ME computer program was used to generate all individual farm analyses used in this study. This program is an analytical tool that utilizes whole farm financial statements to examine true enterprise performance. Additionally, the SPA-ME program allows for specific enterprise assets, liabilities, revenues, and expenses to be separated out from the whole farm financial statements (McGrann, Michalke, and Stone, 1996). From this information, cost determination can be made using actual financial statements from producers. The end result is a true assessment of their enterprise costs and profitability.

Upon completion of the individual analyses, all analyses were compiled into a SPA database using Microsoft Access. The database was designed to compile profitability and production cost data for each individual producer. The SPA database was then utilized to generate aggregated reports to evaluate irrigated and dryland cotton production in the THP. All database observations were under crop share rental agreements.

**Data**

The data utilized in this study was generated from financial and production information collected from cotton producers in the THP from 1996 to 2003 for irrigated and dryland cotton produced under crop share rental agreements. The data collection process involved working with cotton producers to collect primary data including production, marketing, and financial information for the SPA analyses. Production information collected included acres planted, input levels and prices, estimated machinery trips across fields, and crop yields. Financial information necessary to complete the analyses included IRS tax schedules, beginning and ending fiscal year balance sheets, income statements, loan schedules, any equipment or investment purchases or sales, and depreciation schedules. Additionally, the reporting of production, marketing, and financial standards is strictly on an aggregate basis to protect the confidentiality of individual producers.

**Conclusions**

Standardized Performance Analyses of individual farming operations provided 22, 30, 37, 15, 17, 15, 14, and 27 dryland cotton observations from 1996 to 2003, respectively. The aggregate dryland cotton results are presented in Tables 1 and 2.

Gross accrual revenues for dryland cotton production have been on a downward trend from 1996 to 2003 averaging \$191.56 per acre. Total enterprise costs averaged \$189.77 on a per acre basis and \$0.94 on a per pound basis from 1996 to 2003. Additionally, producers, on average, received positive net incomes in 1996 through 1998 and negative net incomes from 1999 through 2003. The average net income for producers in the THP from 1996 through 2003 was \$1.80 per acre. Furthermore, producers had an average enterprise cost of production of \$0.59 per pound from 1996 through 2003. The enterprise cost of production represents the cotton lint price necessary to break-even after accounting for all non-primary product income.

Standardized Performance Analyses of individual farming operations provided 43, 49, 77, 26, 28, 22, 22, and 18 irrigated cotton observations from 1996 to 2003, respectively. The aggregate irrigated cotton results are presented in Tables 3 and 4.

Gross accrual revenues for irrigated cotton production from 1996 to 2003 averaged \$298.13 per acre. Total enterprise costs averaged \$190.33 on a per acre basis and \$0.65 on a per pound basis from 1996 to 2003. Additionally, producers, on average, received positive net incomes in all years evaluated in this study with the exception of 2000. The average net income for producers in the THP from 1996 through 2003 was \$50.63 per acre. Furthermore, producers had an average enterprise cost of production of \$0.45 per pound from 1996 through 2003.

### **References**

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### **Acknowledgements**

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## 2005 Beltwide Cotton Conferences, New Orleans, Louisiana - January 4 - 7, 2005

Table 1. Dryland Cotton Results for the THP from 1996-2003.

		1996	1997	1998	1999	2000	2001	2002	2003	Average
<b>Total Yield</b>		431	452	252	288	216	232	251	198	<b>290</b>
<b>Crop Share Yield</b>		323	339	189	216	162	174	188	149	<b>218</b>
		<b>\$/acre</b>								
<b>Gross Cash Income</b>										
Cotton Lint*		\$ 228.60	\$ 195.99	\$ 110.69	\$ 112.67	\$ 75.74	\$ 64.98	\$ 100.40	\$ 89.36	<b>\$ 122.30</b>
Ag Program Pmts		\$ 19.60	\$ 17.89	\$ 19.82	\$ 48.61	\$ 35.98	\$ 52.57	\$ 17.10	\$ 51.55	<b>\$ 32.89</b>
Crop Insurance		\$ 23.07	\$ 2.05	\$ 1.82	\$ 10.55	\$ 17.80	\$ 4.46	\$ 1.56	\$ 8.47	<b>\$ 8.72</b>
Other Income**		\$ 22.00	\$ 46.18	\$ 40.04	\$ 17.32	\$ 39.87	\$ 23.62	\$ 23.25	\$ 8.87	<b>\$ 27.64</b>
<b>Total Gross Accrual Revenue</b>		<b>\$ 293.27</b>	<b>\$ 262.11</b>	<b>\$ 172.37</b>	<b>\$ 189.15</b>	<b>\$ 169.39</b>	<b>\$ 145.63</b>	<b>\$ 142.31</b>	<b>\$ 158.28</b>	<b>\$ 191.56</b>
<b>Cash Operating Expenses</b>										
Chemicals		\$ 16.36	\$ 17.41	\$ 11.64	\$ 13.75	\$ 23.81	\$ 15.58	\$ 31.79	\$ 15.03	<b>\$ 18.17</b>
Fertilizer		\$ 6.12	\$ 12.48	\$ 13.36	\$ 9.54	\$ 11.26	\$ 5.07	\$ 6.72	\$ 4.88	<b>\$ 8.68</b>
Gas, Fuel, & Oil		\$ 12.41	\$ 9.80	\$ 7.47	\$ 7.02	\$ 15.50	\$ 9.39	\$ 5.99	\$ 11.20	<b>\$ 9.85</b>
Seeds & Plants		\$ 4.30	\$ 4.68	\$ 6.55	\$ 5.63	\$ 11.27	\$ 6.42	\$ 10.09	\$ 8.77	<b>\$ 7.21</b>
Repairs & Maintenance		\$ 17.41	\$ 18.49	\$ 11.16	\$ 18.69	\$ 13.46	\$ 14.57	\$ 7.91	\$ 5.81	<b>\$ 13.44</b>
Hired Labor & Mgt		\$ 22.87	\$ 25.30	\$ 20.16	\$ 32.29	\$ 38.00	\$ 18.07	\$ 22.98	\$ 22.88	<b>\$ 25.32</b>
Irrigation		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	<b>\$ -</b>
Other Operating Exp.***		\$ 47.70	\$ 57.77	\$ 32.12	\$ 44.29	\$ 41.26	\$ 35.40	\$ 59.08	\$ 67.91	<b>\$ 48.19</b>
<b>Total Cash Operating Exp.</b>		<b>\$ 127.17</b>	<b>\$ 145.93</b>	<b>\$ 102.46</b>	<b>\$ 131.21</b>	<b>\$ 154.56</b>	<b>\$ 104.50</b>	<b>\$ 144.56</b>	<b>\$ 136.48</b>	<b>\$ 130.86</b>
Total Interest Exp.		\$ 8.18	\$ 8.84	\$ 5.83	\$ 8.18	\$ 8.28	\$ 11.83	\$ 6.76	\$ 7.98	<b>\$ 8.24</b>
Depreciation Exp.		\$ 27.43	\$ 22.92	\$ 29.09	\$ 25.03	\$ 38.75	\$ 19.67	\$ 13.03	\$ 20.92	<b>\$ 24.61</b>
Operator Labor & Mgt		\$ 34.91	\$ 32.51	\$ 21.81	\$ 28.22	\$ 30.25	\$ 24.56	\$ 17.65	\$ 18.62	<b>\$ 26.07</b>
<b>Total Overhead Expenses</b>		<b>\$ 70.52</b>	<b>\$ 64.27</b>	<b>\$ 56.73</b>	<b>\$ 61.43</b>	<b>\$ 77.28</b>	<b>\$ 56.06</b>	<b>\$ 37.44</b>	<b>\$ 47.52</b>	<b>\$ 58.91</b>
<b>Total Enterprise Cost</b>		<b>\$ 197.69</b>	<b>\$ 210.20</b>	<b>\$ 159.19</b>	<b>\$ 192.64</b>	<b>\$ 231.84</b>	<b>\$ 160.56</b>	<b>\$ 182.00</b>	<b>\$ 184.00</b>	<b>\$ 189.77</b>
<b>Net Income</b>		<b>\$ 95.58</b>	<b>\$ 51.91</b>	<b>\$ 13.18</b>	<b>\$ (3.49)</b>	<b>\$ (62.45)</b>	<b>\$ (14.93)</b>	<b>\$ (39.69)</b>	<b>\$ (25.72)</b>	<b>\$ 1.80</b>

\* Cotton revenue was accrual adjusted to account for the entire crop share yield.

\*\* Other income includes coop distributions, custom hire earnings, and misc. income.

\*\*\* Other expenses include custom hire, insurance, rent, supplies, and misc. expenses.

## 2005 Beltwide Cotton Conferences, New Orleans, Louisiana - January 4 - 7, 2005

Table 2. Dryland Cotton Summary Results for the THP from 1996-2003.

Summary Category	1996	1997	1998	1999	2000	2001	2002	2003	Average
Total Yields	431	452	252	288	216	232	251	198	<b>290</b>
Crop Share Yields	323	339	189	216	162	174	188	149	<b>218</b>
	<b>\$/lb.</b>								
Total Cash Operating Exp	\$ 0.39	\$ 0.43	\$ 0.54	\$ 0.61	\$ 0.95	\$ 0.60	\$ 0.77	\$ 0.92	<b>\$ 0.65</b>
Total Enterprise Cost	\$ 0.61	\$ 0.62	\$ 0.84	\$ 0.89	\$ 1.43	\$ 0.92	\$ 0.97	\$ 1.24	<b>\$ 0.94</b>
Enterprise Cost of Production	\$ 0.41	\$ 0.43	\$ 0.52	\$ 0.54	\$ 0.85	\$ 0.46	\$ 0.74	\$ 0.78	<b>\$ 0.59</b>
Cotton Price Received	\$ 0.71	\$ 0.58	\$ 0.59	\$ 0.52	\$ 0.47	\$ 0.37	\$ 0.53	\$ 0.60	<b>\$ 0.55</b>
	<b>\$/acre</b>								
Net Returns per Acre	\$ 95.58	\$ 51.91	\$ 13.18	\$ (3.49)	\$ (62.45)	\$ (14.93)	\$ (39.69)	\$ (25.72)	<b>\$ 1.80</b>
Non-Primary Product Income	\$ 64.67	\$ 66.12	\$ 61.68	\$ 76.48	\$ 93.65	\$ 80.65	\$ 41.91	\$ 68.89	<b>\$ 69.26</b>

## 2005 Beltwide Cotton Conferences, New Orleans, Louisiana - January 4 - 7, 2005

Table 3. Irrigated Cotton Results for the THP from 1996-2003.

		1996	1997	1998	1999	2000	2001	2002	2003	Average
<b>Total Yield</b>		601	515	552	504	481	613	474	376	<b>515</b>
<b>Crop Share Yield</b>		451	386	414	378	361	460	356	282	<b>386</b>
		<b>\$/acre</b>								
<b>Gross Cash Income</b>										
Cotton Lint*		\$ 301.11	\$ 219.27	\$ 233.88	\$ 200.87	\$ 161.35	\$ 198.34	\$ 210.22	\$ 166.57	<b>\$ 211.45</b>
Ag Program Pmts		\$ 27.30	\$ 24.73	\$ 48.09	\$ 63.99	\$ 53.29	\$ 43.86	\$ 21.63	\$ 117.79	<b>\$ 50.09</b>
Crop Insurance		\$ 7.65	\$ 1.13	\$ 2.14	\$ 6.28	\$ 6.39	\$ 5.58	\$ 1.13	\$ 6.12	<b>\$ 4.55</b>
Other Income**		\$ 23.83	\$ 49.66	\$ 37.27	\$ 17.51	\$ 42.92	\$ 33.31	\$ 37.77	\$ 14.03	<b>\$ 32.04</b>
<b>Total Gross Accrual Revenue</b>		<b>\$ 359.89</b>	<b>\$ 294.79</b>	<b>\$ 321.38</b>	<b>\$ 288.65</b>	<b>\$ 263.95</b>	<b>\$ 281.09</b>	<b>\$ 270.75</b>	<b>\$ 304.51</b>	<b>\$ 298.13</b>
<b>Cash Operating Expenses</b>										
Chemicals		\$ 32.03	\$ 34.48	\$ 33.89	\$ 35.67	\$ 38.78	\$ 28.12	\$ 38.56	\$ 19.66	<b>\$ 32.65</b>
Fertilizer		\$ 16.48	\$ 21.78	\$ 17.39	\$ 13.60	\$ 14.97	\$ 16.37	\$ 8.44	\$ 11.65	<b>\$ 15.09</b>
Gas, Fuel, & Oil		\$ 10.89	\$ 13.53	\$ 11.35	\$ 8.36	\$ 13.74	\$ 10.70	\$ 6.35	\$ 9.01	<b>\$ 10.49</b>
Seeds & Plants		\$ 6.56	\$ 7.41	\$ 12.30	\$ 9.33	\$ 14.23	\$ 11.97	\$ 13.55	\$ 14.38	<b>\$ 11.22</b>
Repairs & Maintenance		\$ 20.31	\$ 24.34	\$ 16.77	\$ 15.79	\$ 23.42	\$ 17.94	\$ 12.40	\$ 14.08	<b>\$ 18.13</b>
Hired Labor & Mgt		\$ 25.02	\$ 29.81	\$ 28.43	\$ 27.36	\$ 26.39	\$ 22.41	\$ 18.66	\$ 19.04	<b>\$ 24.64</b>
Irrigation		\$ 22.67	\$ 22.82	\$ 44.19	\$ 31.68	\$ 46.98	\$ 25.28	\$ 37.72	\$ 37.71	<b>\$ 33.63</b>
Other Operating Exp.***		\$ 41.37	\$ 63.48	\$ 46.94	\$ 31.53	\$ 32.50	\$ 33.47	\$ 49.93	\$ 56.68	<b>\$ 44.49</b>
<b>Total Cash Operating Exp.</b>		<b>\$ 175.33</b>	<b>\$ 217.65</b>	<b>\$ 211.26</b>	<b>\$ 173.32</b>	<b>\$ 211.01</b>	<b>\$ 166.26</b>	<b>\$ 185.61</b>	<b>\$ 182.21</b>	<b>\$ 190.33</b>
Total Interest Exp.		\$ 12.72	\$ 13.14	\$ 11.15	\$ 10.37	\$ 7.50	\$ 9.42	\$ 9.14	\$ 3.93	<b>\$ 9.67</b>
Depreciation Exp.		\$ 30.98	\$ 36.47	\$ 26.69	\$ 22.83	\$ 40.60	\$ 13.43	\$ 21.87	\$ 26.12	<b>\$ 27.37</b>
Operator Labor & Mgt		\$ 32.97	\$ 26.40	\$ 28.19	\$ 16.01	\$ 11.94	\$ 22.29	\$ 11.09	\$ 12.07	<b>\$ 20.12</b>
<b>Total Overhead Expenses</b>		<b>\$ 76.67</b>	<b>\$ 76.01</b>	<b>\$ 66.03</b>	<b>\$ 49.21</b>	<b>\$ 60.04</b>	<b>\$ 45.14</b>	<b>\$ 42.10</b>	<b>\$ 42.12</b>	<b>\$ 57.17</b>
<b>Total Enterprise Cost</b>		<b>\$ 252.00</b>	<b>\$ 293.66</b>	<b>\$ 277.29</b>	<b>\$ 222.53</b>	<b>\$ 271.05</b>	<b>\$ 211.40</b>	<b>\$ 227.71</b>	<b>\$ 224.33</b>	<b>\$ 247.50</b>
<b>Net Income</b>		<b>\$ 107.89</b>	<b>\$ 1.13</b>	<b>\$ 44.09</b>	<b>\$ 66.12</b>	<b>\$ (7.10)</b>	<b>\$ 69.69</b>	<b>\$ 43.04</b>	<b>\$ 80.18</b>	<b>\$ 50.63</b>

\* Cotton revenue was accrual adjusted to account for the entire crop share yield.

\*\* Other income includes coop distributions, custom hire earnings, and misc. income.

\*\*\* Other expenses include custom hire, insurance, rent, supplies, and misc. expenses.

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Table 4. Irrigated Cotton Summary Results for the THP from 1996-2003.

Summary Category	1996	1997	1998	1999	2000	2001	2002	2003	Average
Total Yields	601	515	552	504	481	613	472	376	514
Crop Share Yields	451	386	414	378	361	460	354	282	386
	<b>\$/lb.</b>								
Total Cash Operating Exp	\$ 0.39	\$ 0.56	\$ 0.51	\$ 0.46	\$ 0.58	\$ 0.36	\$ 0.52	\$ 0.65	\$ 0.50
Total Enterprise Cost	\$ 0.56	\$ 0.76	\$ 0.67	\$ 0.59	\$ 0.75	\$ 0.46	\$ 0.64	\$ 0.80	\$ 0.65
Enterprise Cost of Production	\$ 0.43	\$ 0.57	\$ 0.46	\$ 0.36	\$ 0.47	\$ 0.28	\$ 0.47	\$ 0.59	\$ 0.45
Cotton Price Received	\$ 0.67	\$ 0.57	\$ 0.56	\$ 0.53	\$ 0.45	\$ 0.43	\$ 0.59	\$ 0.59	\$ 0.55
	<b>\$/acre</b>								
Net Returns per Acre	\$ 107.89	\$ 1.13	\$ 44.09	\$ 66.12	\$ (7.10)	\$ 69.69	\$ 43.04	\$ 80.18	\$ 50.63
Non-Primary Product Income	\$ 58.78	\$ 75.52	\$ 87.50	\$ 87.78	\$ 102.60	\$ 82.75	\$ 61.66	\$ 137.94	\$ 86.82