



# FARM Assistance



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## Financial Benchmarks for Texas Cotton Producers

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## *One of the objectives... ..is to learn what makes some farmers more successful than others.*

**B**enchmarking of financial performance for cotton producers is essential in the evaluation and implementation of strategies to improve financial returns for Texas cotton farmers. Data collected from over 250 Texas cotton producers who participated in the Texas Financial and Risk Management (FARM) Assistance Program was used to develop a Texas cotton production benchmark tool. The FARM Assistance program collects historical yields and crop mix allocations to project likely outcomes (production and financial) with price and production risk factors incorporated. These producers then utilize the results of the FARM Assistance program simulation to assess existing and alternative production plans. An analysis of this database was conducted in order to identify some key production and financial benchmarks that can be used by individual cotton producers as a management target.

Over the past 50 years, cotton acreage in Texas peaked at 12 million acres in 1951 and dropped to a low of 3.5 million acres in 1967. Since 1970, Texas producers have planted 5 million to 6 million acres of cotton annually. In 2008, Texas planted 5 million acres of cotton, with 1.7 million acres receiving some type of irrigation and 3.3 million acres planted under dryland conditions (United States Department of Agriculture, 2008).

The purpose of this study was to focus on the financial benchmarks of performance as an indicator for management targets and goals. To help assess the various levels of financial performance achieved by a broad collection of Texas cotton producers, the Texas Financial and Risk Management Assistance (FARM Assistance) database was utilized. FARM Assistance is a whole farm computerized decision support system for long-term strategic planning provided by Texas AgriLife Extension. This service provides the ability to deliver information and analyses based upon the assimilation of comprehensive farm level production and financial records. Using actual farm data, the FARM Assistance database can provide a foundation to investigate the impacts of

many policy related issues as well as identify the characteristics of successful producers (Klose, 2007).

One of the objectives of analyzing the financial performance of the FARM Assistance participants is to learn what makes some farmers more successful than others. The idea is to identify the characteristics or factors that are true of the financially successful producer, as well as those characteristics of the financially stressed. No single measure of financial performance is adequate for evaluating a farm business. Evaluation of several financial measures may be more useful in directing the manager to ask the right questions than in providing solutions to the financial issues confronting a business (Love, 2004). Once these critical factors have been determined, the information can be used by all producers to improve financial performance.

The FARM Assistance program results provide numerous financial measures detailing the current financial position related to all aspects of a farm business (liquidity, solvency, profitability, efficiency, and repayment capacity). For the purposes of this study, information related to three separate financial criteria were extracted and analyzed. Financial measures detailing profitability, solvency, and financial efficiency were examined. Each of these criteria measures a different aspect of financial performance.

Profitability is an indication of the level of income produced by the farm business. Measures of profitability indicate the financial performance of the farm over a period of time, usually a year. Net cash farm income represents the returns to unpaid labor, management, and owner equity. Changes in inventory (accrual adjustments) may add to income through increases in accounts receivable, prepaid expenses, cash investments in growing crops, supplies on hand) or decrease income (increases in accounts payable, taxes due, or other liabilities). Net cash farm income comes directly from the income statement and is

calculated by subtracting all farm operating expenses incurred to create revenues, including interest on debt from gross farm revenue. Net cash farm income is a dollar amount and not a financial ratio. Thus, no one standard is appropriate for all farm operations or to make comparisons with other agricultural businesses. Net cash farm income should be positive and sufficiently large to compensate the owner for utilizing their labor, management, and equity capital in the farming operation.

Solvency measures the ability of the farm to pay all debts if the assets of the business are sold. Generally, if the market value of total assets exceeds existing debt obligations against those assets, the business is solvent. The debt to asset ratio measures the proportion of total farm assets owed to creditors. The higher the ratio, the greater the financial risk exposure for the business and those providing loan funds for the business and the less flexibility the operator has to respond to adverse natural or market changes. Although no exact standard for a farm businesses exists, a debt-to-asset ratio greater than 0.50 indicates that a majority of the value of the farm's total assets is contributed by creditors. High debt-to-asset ratios have been interpreted as an indication of "farm financial stress."

Financial efficiency measures the degree of efficiency with which labor, management, and capital are used in the business. Financial efficiency measures help evaluate whether or not farm assets are being used efficiently to generate income. The operating expense to receipts ratio indicates the proportion of total income used to pay expenses. This ratio reflects the extent to which gross farm revenues are expended on farm operating inputs, excluding depreciation and interest. Since total operating expenses are defined without including interest expenses, this ratio compares non-interest, non-depreciation operating expenses to total farm revenues. The higher the ratio, the larger the proportion of gross farm revenues needed



*This implies that the top performing cotton operations (based on net cash farm income) also exhibited lower relative reliance on debt (as a percentage of assets)...*

**Table 1. Financial Performance Screened for Profitability (by quartile) for Texas Cotton Operations (2003-2008)**

Net Cash Farm Income	Top 25%	2nd 25%	3rd 25%	Bottom 25%
Average	\$520,950	\$149,320	\$77,630	\$9,130
Range (\$1,000)	\$207 to \$2,705	\$109 to \$206	\$47 to \$107	-\$162 to \$47
Average NCFI per planted acre	\$131.42	\$101.85	\$71.65	\$34.88
Average Farm Size (planted acres)	4,191	1,831	1,605	1,147
% owned	24%	28%	30%	37%
% leased	76%	72%	70%	63%
Cotton Acres	1,477	805	656	594
Cotton as a % of Planted Acreage	35%	44%	41%	52%
Dryland Cotton	52%	54%	61%	55%
Irrigated Cotton	48%	46%	39%	45%
Average Debt to Asset Ratio	0.3509	0.4673	0.5031	0.5940
Average Operating Expense to Receipts Ratio	0.6398	0.6620	0.6985	0.8594

to offset all operating expenses and the greater the financial risk in periods of low market prices. In general, operating expenses to receipts ratios in the 0.40 to 0.60 range would be relatively efficient, with efficiency declining as the ratio rises. Ratios in the 0.60 to 0.75 range would reflect average efficiency, while ratios of 0.75 or more would reflect marginal efficiency.

## Results

The comprehensive Texas Farm Assistance database of 270 cotton farming operations was examined based on separate screens for net cash farm income, debt to asset ratio, and operating expenses to receipts ratio. In each case, farming operations were classified into performance quartiles: top 25 percent, 2nd 25 percent, 3rd 25 percent, and bottom 25 percent.

Table 1 presents the quartile performance spectrum when farms were screened based on a measure of financial profitability: net cash farm income. The top 25 percent of cotton farming operations averaged net cash farm income of over \$520,000 while the bottom 25 percent of cotton farming operations averaged less than \$9,200. While this might indicate purely the benefits

of large farm size, further investigation shows that this is not the case. The top 25 percent averaged net cash farm income per planted acre of \$131.42 versus only \$34.88 for the lowest performing 25 percent of farms.

Economies of size does play a factor in cotton farming operations as farm average size declined linearly from 4,191 acres, to 1,147 acres as you move down the performance spectrum of quartile performance based

on net cash farm income. Interestingly, owned acreage (as a percentage of total acreage), increased as you move down the performance spectrum. This implies that the top operators relied more heavily on favorable lease arrangements as a critical component of their operation.

When the database was screened based on net cash farm income, the various quartiles also demonstrated linear performance for the other financial measures (debt to asset ratio and operating expenses to receipts ratio). This implies that the top performing cotton operations (based on net cash farm income) also exhibited lower relative reliance on debt (as a percentage of assets) and were able to convert expenses more efficiently into a dollar's worth of crop receipts. In other words, operations that tended to rank higher on net cash farm income also possessed a higher degree of solvency and higher level of financial efficiency.

Table 2 presents the quartile performance spectrum when farms were screened based on a measure of financial solvency: debt to assets ratio. The top 25 percent of cotton farming operations demonstrating the highest financial solvency averaged a debt to asset ratio of 0.16 while the bottom 25 percent (least solvent) averaged a debt to asset ratio

**Table 2. Financial Performance Screened for Solvency (by quartile) for Texas Cotton Operations (2003-2008)**

Debt to Asset Ratio	Top 25%	2nd 25%	3rd 25%	Bottom 25%
Average	0.1601	0.3595	0.5393	0.8735
Range	0.0 to 0.26	0.27 to 0.45	0.46 to 0.63	0.64 to 1.97
Average Farm Size (planted acres)	2,894	2,642	1,801	1,426
% owned	27%	25%	39%	19%
% leased	73%	75%	61%	81%
Cotton Acres	989	1,071	815	681
Cotton as a % of Planted Acreage	34%	41%	45%	48%
Dryland Cotton	53%	69%	44%	47%
Irrigated Cotton	47%	31%	56%	53%
Average Net Cash Farm Income	\$293,920	\$229,660	\$146,600	\$84,590
Average NCFI per Planted Acre	\$86.17	\$88.03	\$100.55	\$64.17
Average Operating Expense to Receipts Ratio	0.6962	0.7142	0.7033	0.7493

*The debt to asset ratio, as a standalone measure, does little to indicate whether or not a particular operation can be profitable while carrying debt.*

**Table 3. Financial Performance Screened for Efficiency (by quartile) for Texas Cotton Operations (2003-2008)**

Operating Expense to Receipts Ratio	Top 25%	2nd 25%	3rd 25%	Bottom 25%
Average	0.5220	0.6646	0.7582	0.8735
Range	0.19 to 0.61	0.61 to 0.72	0.72 to 0.80	0.80 to 1.38
Average Farm Size (planted acres)	2,346	2,134	2,081	2,181
% owned	32%	27%	22%	27%
% leased	68%	73%	78%	73%
Cotton Acres	864	906	789	962
Cotton as a % of Planted Acreage	37%	42%	38%	44%
Dryland Cotton	57%	53%	50%	58%
Irrigated Cotton	43%	47%	50%	42%
Average Net Cash Farm Income	\$307,280	\$233,950	\$166,350	\$48,280
Average NCFI per Planted Acre	\$131.19	\$107.40	\$79.25	\$22.33
Average Operating Expense to Receipts Ratio	0.4060	0.4814	0.4985	0.5253

of 0.87. This means that (on average) only 16 percent of the top 25 percent of operations were owned by creditors versus 87 percent creditor ownership by the bottom 25 percent of operations. In the case of the debt to asset ratio screen, economies of size continued to play a factor as average farm size declined linearly from 2,854 acres to 1,426 acres as you move down the performance spectrum of quartile performance.

When the database was screened based on debt to asset ratio, the various quartiles demonstrated linear performance for net cash farm income, although net cash farm income per acre did not decline linearly as you move down the performance spectrum. Similarly, the average operating expense to receipts ratio did not exhibit linear declines across the performance spectrum. This indicates that attention to financial solvency does not automatically result in improvement in other financial measurements indicating profitability and efficiency. One explanation of this is that the measure used to rank financial solvency (debt to asset ratio) does little to explain the type of debt or the level

of interest expenses associated with debt. In general, if an operation's percentage return on assets is larger than the interest cost of debt, then borrowing can be profitable. The debt to asset ratio, as a standalone measure, does little to indicate whether or not a particular operation can be profitable while carrying debt. That does not imply that attention should not be focused on financial solvency, simply that the measure alone is insufficient to provide a complete picture of overall financial performance.

Table 3 presents the quartile performance spectrum when farms were screened based on a measure of financial efficiency: operating expenses to receipts ratio. The top 25 percent of cotton farming operations averaged an operating expenses to receipts ratio of 0.52 compared to an average of 0.87 for the bottom 25 percent. This means that for every dollar of receipts, the top 25 percent of operations has 48 cents that are available to cover interest expenses, depreciation, principal payments, family living, taxes and capital purchases. Cotton operations falling into the lowest performing quartile group only have

about 13 cents of every dollar of receipts to pay for these same items.

Economies of size is less apparent using financial efficiency as the primary delineator. For each quartile, the average farm size was over 2,000 acres and did not exhibit a linear decline. When the database was screened based on the operating expenses to receipts ratio, the various quartiles also demonstrated linear performance for the other financial measures (net cash farm income and debt to asset ratio). Similarly, net cash farm income per planted acre was also highest for the top 25 percent and declined linearly as the 2nd, 3rd, and bottom 25 percent of operations were examined.

This implies that the top performing cotton operations (based on financial efficiency) also exhibited higher net cash farm incomes (gross and per acre) and less relative reliance on debt (as a percentage of assets). In other words, operations that tended to rank higher in financial efficiency also exhibited higher average financial profitability and solvency.

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