



# FARM Assistance

*Focus*

 Texas Cooperative  
**EXTENSION**  
The Texas A&M University System



## Panhandle Model Farms - Case Studies of Texas High Plain Agriculture

**Diana Jones**  
**Dustin Gaskins**  
**Jay Yates**

Farm Assistance Focus 2005-3  
August 2005



Department of Agricultural Economics,  
Texas Cooperative Extension  
Texas A&M University System

**“Financial and Risk Management (FARM) Assistance is a highly concentrated extension effort initiated by the Texas Legislature to assist agricultural producers with strategic planning and risk management.”**

Texas Agricultural producers frequently need realistic examples of crop and livestock operations. Case studies are often the best way to explain industry concerns to local and state officials as well as commodity associations. To encourage communication between different interest groups, Texas Cooperative Extension risk management specialists and county agricultural agents developed region specific model farms through the FARM Assistance program.

Financial and Risk Management (FARM) Assistance is a highly concentrated extension effort initiated by the Texas Legislature to assist agricultural producers with strategic planning and risk management. The program utilizes a decision support simulation model that projects a farm’s or ranch’s financial performance over ten years, incorporating production and market risk. Specific strategic analyses are provided to Texas producers that assist them with long-range planning and decision-making.

The model farm process is an attempt to illustrate production agriculture in five distinct regions of the Northern Texas Panhandle. Twenty-two counties make up Texas Cooperative Extension, District 1. These counties are grouped into five clusters, representing similar cropping and livestock production systems (Figure 1..

Risk management specialists conducted eight focus group discussions

with fifty- five participants, consisting of county agents, area producers, and agribusiness representatives. In these discussions, participants were asked to develop the structure and characteristics that would describe a viable operation in their respective areas. Final results are presented here to provide a general financial outlook for producers in each county cluster.

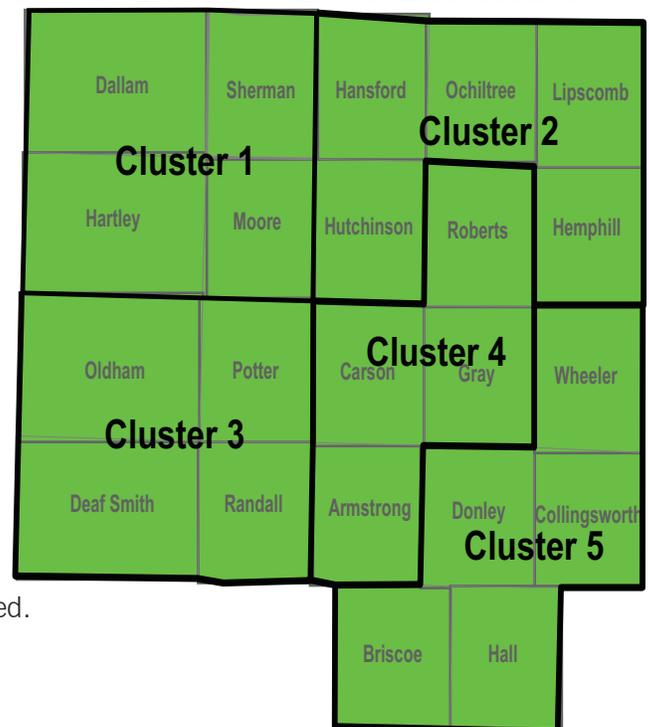
Results are illustrated in terms of the long-term (10 years) financial outlook for each model farm. A poor financial outlook does not necessarily indicate an operation’s demise, but rather identifies problem areas. Changes to farm practices and overall strategies can then be implemented.

**Model Farm Overview:**

Model farms consist of both crop and livestock operations. Characteristics vary greatly by county group, reflecting the diversity of Northern Panhandle agriculture. Five different crops are analyzed, with both dry and irrigated production practices. Many operations also incorporate leased stockers, owned stockers, and/or cow calf herds. All analyses

include a specific equipment replacement strategy during the ten-year projection period. The Food and Agricultural Policy Research Institute (FAPRI) at the University of Missouri provides market price forecasts. Additionally, 2002 Farm Bill provisions are assumed to continue beyond

**Figure 1. Texas Extension District 1 - Panhandle**



2007. These model farms are based on the input of focus group participants. While they appear to be good indicators of regional production, they do not, and are not intended to portray all producers within each region.

**“The model farm process is an attempt to illustrate production agriculture in five distinct regions of the Northern Texas Panhandle.”**

**Cluster 1.** The Northwest Texas Panhandle model operation consists of a 2,500 acre crop farm that is 60% share leased, 40% owned. The share lease agreement is 1/3 on grain and 1/4 on cotton, with the landlord paying a percentage of fertilizer, chemicals, and irrigation. The initial analysis shows an emphasis on corn acreage (1,000 acres) over cotton (500 acres). However, by 2008 the operation’s cropping mix shifts to an equal number of corn and cotton acres (750 acres for both crops). The cotton is custom harvested, and all crops are custom sprayed.

*Table 1. Characteristics of Cluster 1 Model Farm*

Crops	Acres	Yield	Price		Stockers	
Irrg Corn	1,000	220 bu	\$2.50/bu		# Head	500
Irrg Cotton	500	1,000 lbs	\$ 0.40/lb		Lease Rate	\$0.35
Irrg Wheat	500	60 bu	\$3.25/bu		In Weight	450 lbs
Dry Wheat	500	15 bu	\$3.25/bu		Out Weight	650 lbs
<b>Total Acres</b>	<b>2,500</b>				ADG	1.75 lbs

**Cluster 2.** The Northeast Texas Panhandle model operation consists of a 3,000 acre crop farm that is 60% cash leased, 40% owned. The cash lease agreement is \$33/acre on 1,800 acres. While corn and wheat acres remain constant, a sorghum fallow cropping rotation is incorporated from 2005-2014. All crops are operator sprayed and harvested.

*Table 2. Characteristics of Cluster 2 Model Farm*

Crops	Acres	Yield	Price		Stockers	
Irrg Corn	500	200 bu	\$2.60/bu		# Head	750
Irrg Wheat	500	65 bu	\$3.25/bu		Lease Rate	\$0.35
Dry Wheat	1,400	24 bu	\$3.25/bu		In Weight	450 lbs
Dry Sorghum	300	43.75 bu	\$2.18/bu		Out Weight	650 lbs
Fallow	300				ADG	1.50 lbs
<b>Total Acres</b>	<b>3,000</b>					

**Cluster 3.** The Western Texas Panhandle model operation consists of a 2,800 acre crop and cattle enterprise that is 50% share leased, 50% owned. The share lease agreement is 1/3 on wheat and sorghum, with the landlord paying a percentage of fertilizer, herbicide, and harvest. All crops are custom sprayed and harvested.

*Table 3. Characteristics of Cluster 3 Model Farm*

Crops	Acres	Yield	Price		Stockers		Cows	
Irrg Sorghum	280	90 bu	\$2.24/bu		# Head	250	# Head	50
Irrg Wheat	280	45 bu	\$3.40/bu		Lease Rate	\$0.35	Culling Rate	6%
Dry Wheat	430	20 bu	\$3.40/bu		In Weight	450 lbs	Calving Rate	92%
Dry Sorghum	430	27 bu	\$2.24/bu		Out Weight	660 lbs	Weaned lbs	575 lbs
Fallow	380				ADG	1.75 lbs	Weaned \$	\$1.23/lb
Native Pasture	1,000							
<b>Total Acres</b>	<b>2,800</b>							

**Cluster 4.** The Eastern Texas Panhandle model operation consists of a 2,700 acre crop farm that is 60% share leased, 40% owned. The share lease agreement is 1/3 on grain and 1/4 on cotton, with the landlord paying a percentage of fertilizer, chemicals, and irrigation. The cotton is custom harvested, with some custom spraying budgeted.

*Table 4. Characteristics of Cluster 4 Model Farm*

Crops	Acres	Yield	Price	Stockers	
Irrg Corn	500	180 bu	\$2.40/bu	# Head	250
Irrg Cotton	500	750 lbs	\$ 0.40/lb	Purchase lbs	450 lbs
Irrg Wheat	250	50 bu	\$3.00/bu	Purchase \$	\$1.27/lb
Irrg Sorghum	250	90 bu	\$2.10/bu	Sale lbs	700 lbs
Dry Cotton	200	350 lbs	\$ 0.40/lb	Sale \$	\$1.00/lb
Dry Wheat	400	50 bu	\$3.00/bu	ADG	1.80 lbs
Dry Sorghum	200	35.71 bu	\$2.10/bu		
Fallow	400				
<b>Total Acres</b>	<b>2,700</b>				

**Cluster 5.** The Southeast Texas Panhandle model operation consists of a 3,000 acre crop and cattle operation that is 75% share leased, 25% owned. The share lease agreement is 1/3 on irrigated cotton and irrigated peanuts and 1/4 on irrigated wheat and dry cotton, with the landlord paying a percentage of fertilizer, insecticides, and irrigation. All crops are operator harvested, with some custom spraying budgeted.

*Table 5. Characteristics of Cluster 5 Model Farm*

Crops	Acres	Yield	Price	Cows	
Irrg Cotton	250	1,000 lbs	\$ 0.40/lb	# Head	50
Irrg Peanuts	250	1.75 tons	\$375/ton	Culling Rate	10%
Dry Cotton	1,500	350 lbs	\$ 0.40/lb	Calving Rate	86%
Native Pasture	1,000			Weaned lbs	450 lbs
<b>Total Acres</b>	<b>3,000</b>			Weaned \$	\$1.15/lb

*Table 6. Average Financial Performance Indicators for Cluster Farms*

	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Net Cash Farm Income	\$136,200.00	\$187,330.00	-\$73,490.00	\$147,820.00	\$86,180.00
Real Net Worth	\$1,309,110.00	\$1,037,460.00	\$554,970.00	\$1,146,800.00	\$784,060.00
Government Payments	\$140,150.00	\$68,980.00	\$24,560.00	\$128,990.00	\$112,730.00
Working Capital	-\$30,990.00	\$173,090.00	-\$591,780.00	\$211,680.00	-\$172,620.00
Debt to Assets	27.32%	19.95%	56.85%	21.04%	36.54%
Return to Assets	7.61%	10.76%	-4.02%	9.40%	5.10%
Operating Expense to Receipts	82.00%	70.00%	110.00%	78.00%	83.00%
Net Farm Income to Receipts	10.00%	23.00%	-43.00%	17.00%	6.00%

***“ Cluster 2 has some liquidity risk early in the analysis, with a 60% chance of a negative working capital in 2005 (Table 2). This probability falls over the analysis period as cash levels rise and debt levels fall. ”***

## Results

Table 6 provides a projected 10-year average financial performance for each of the Northern Panhandle model farms. Results vary widely by county group. Cluster 1 shows desirable profitability and solvency, and marginal liquidity. Cluster 2 is profitable in both the short and long term, and has strong liquidity levels. Cluster 3 exhibits unacceptable financial measures, with low profitability, large amounts of debt, and negative working capital. Cluster 4 indicates acceptable profitability, solvency, and liquidity measures. Cluster 5 appears to be profitable in the short term. However, due to negative working capital, its long-term viability remains questionable.

Several calculations are used to determine model farm financial position. Net cash farm income (NCFI) measures profitability. It represents the amount of money available for debt repayment, federal tax payments, capital equipment replacement, investment or withdrawal by the owner. Net worth measures equity and represents the dollar amount left over after all assets are sold, and all debts are paid. Net liquidity is measured by working capital. Working capital is calculated by subtracting current assets by current liabilities. It evaluates the ability of a farm to meet its short-term financial obligations. Figure 2 shows the probability of a negative working capital, which represents the operations' overall liquidity risk. The debt to asset ratio, return to asset ratio, operating expenses to receipts ratio,

and net farm income to receipts ratio are also used to determine overall performance.

Cluster 1 projects a relatively stable financial position. Net cash farm income averages \$136,200 from 2005-2014. The operation also exhibits a desirable equity level of \$1.309 million. Profitability seems to be heavily dependent on \$140,150 in average annual program payments. The operation could experience an income reduction if payments fall below projected levels. Cluster 1's ten-year average working capital of -\$30,990 suggests significant liquidity risk. Figure 2 shows the significant high probability of a negative working capital throughout the analysis period. Solvency measures show an acceptable debt to assets ratio of 27.32%, meaning there is \$0.27 in debt for every \$1.00 in assets. Cluster 1 also has a desirable return to assets of 7.61%, and an acceptable profit margin of 10.00%.

Cluster 2 is profitable in both the short and long term. Net cash farm income averages \$187,330, and real net worth averages \$1.0377 million from 2005-2014. Unlike Cluster 1, Cluster 2's profitability is less dependent on program payments. The operation exhibits acceptable liquidity through a ten-year average working capital of \$173,090. Cluster 2 has some liquidity risk early in the analysis, with a 60% chance of a negative working capital in 2005 (Table 2). This probability falls over the analysis

period as cash levels rise and debt levels fall. A debt to assets ratio of 19.95% suggests a strong solvency position. Cluster 2's operating expense to receipts ratio indicates 70% of revenues are used on operating expenses.

Cluster 3 projects the least desirable financial position of all five clusters. The wheat – cattle farming operation cannot support the large amount of budgeted equipment replacement. An operating expense to receipts ratio of 110.00% also suggests that expenses consistently exceed revenues. Cluster 3's average net cash farm income of -\$73,490 shows low profitability levels. An average working capital of -\$591,780 leads to a 99% probability of refinancing from 2005-2014. Cluster 3's debt to assets ratio of 56.85% exceeds acceptable industry ranges. A net farm income to receipts ratio of -43.00% and a return to assets ratio of -4.02% suggests the operation is highly inefficient.

Cluster 4 exhibits desirable financial measures throughout the ten-year analysis period. Net cash farm income is projected to be \$147,820. The operation also has a strong average equity of \$1.146 million. Like Cluster 1, Cluster 4 is heavily dependent on \$128,990 in average annual program payments. A ten-year average working capital of \$211,680 is the greatest among all five clusters. High levels of liquidity suggest virtually no chance of experiencing a negative working capital (Figure 2). Cluster 4 has a low debt to assets

**“Based on focus group model farm characteristics and FARM assistance analyses, the Northeast and Eastern Texas Panhandle (Clusters 2 & 4) have the strongest financial performance.”**

ratio of 21.04%. A net farm income to receipts ratio of 17% suggests that the operation has a \$0.17 profit for every revenue dollar. The operation also shows acceptable financial efficiency with a 9.40% return to assets ratio.

Cluster 5 appears to be profitable in the short term. A negative working capital balance from 2005-2014 suggests it may experience difficulties with long-term viability. The operation’s principal payments and family living withdrawals exceed projected revenues. Cluster 5 has an acceptable average net cash farm income of \$86,180, and average equity of \$784,060. Table 6 suggests significant liquidity risk. Clus-

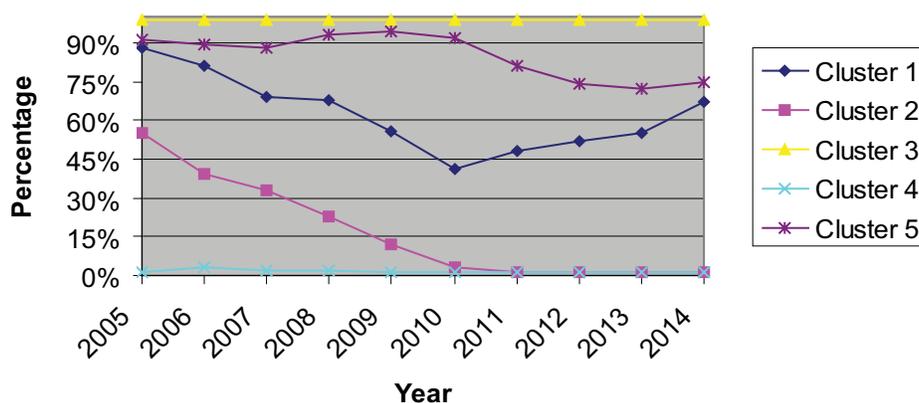
ter 5’s ten-year average working capital of -\$172,620 leads to a high probability of experiencing a negative working capital (Figure 2). Cluster 5 has a marginal debt to assets ratio of 36.54% and return to assets ratio of 5.10%. An operating expense to receipts ratio of 83% suggests the operation may be spending too much on expenses. High costs leads to a low net farm income to receipts ratio of 6%. This profit margin falls below the acceptable industry standard of > 10%.

**Summary**

Case studies for twenty-two Northern Texas Panhandle counties are developed in an effort to facilitate commu-

nication between agricultural producers and their local officials. Based on focus group model farm characteristics and FARM assistance analyses, the Northeast and Eastern Texas Panhandle (Clusters 2 & 4) have the strongest financial performance. These clusters project high profitability, equity, and financial efficiency, accompanied with low debt levels. The Northwest and Southeast Texas Panhandle (Clusters 1 & 5) indicate moderate financial performance, with acceptable profitability and solvency, but higher levels of liquidity risk. The Western Texas Panhandle (Cluster 3) is the only county group to project an unacceptable position across all financial measures.

**Figure 2. Probability of a Negative Working Capital from 2005-2014**



Produced by FARM Assistance, Texas Cooperative Extension, The Texas A&M University System

Visit Texas Cooperative Extension at: <http://texasextension.tamu.edu>

Issued in furtherance of Cooperative Extension Work in Agriculture and Home Economics, Acts of Congress of May 8, 1914, as amended, and June 30, 1914, in cooperation with the United States Department of Agriculture. Edward G. Smith, Director, Texas Cooperative Extension, The Texas A&M University System.