Panhandle Model Farms - Case Studies of Texas High Plains Agriculture

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Texas agricultural producers frequently need realistic examples of crop and livestock operations. Case studies are often the best way to explain agricultural industry concerns to local and state officials as well as commodity associations. To encourage communication between different interest groups, the Texas AgriLife Extension Services’ risk management specialists and county agricultural agents developed region-specific model farms through the FARM Assistance program. Focus groups were conducted and the FARM Assistance producer database was utilized to develop representative operations. These operations attempt to illustrate production agriculture in five distinct regions of the Northern Texas Panhandle.

Financial and Risk Management (FARM) Assistance is a highly specialized Extension effort aimed at helping farmers and ranchers with strategic planning and risk management. The program is a computerized decision support simulation model that uses both farm-level information supplied by participating producers and market price forecasts from the Food and Agricultural Policy Research Institute (FAPRI) at the University of Missouri. It provides a 10-year financial forecast of the individual farm or ranch. An added program benefit is that by using actual participant data, risk management specialists are also able to conduct research on important industry issues such as state tax and federal farm policies. Additional work has focused on identifying the characteristics of successful versus struggling producers.

Model Farm Overview

The model farm process attempts to illustrate production agriculture in the Northern Texas Panhandle. Texas AgriLife Extension District 1 consists of 22 counties in this region. Characteristics vary greatly by county group, reflecting the diversity of Northern Panhandle agriculture. For purposes of this study, the counties are grouped into five clusters, representing similar crop and livestock production systems. Risk management specialists conducted eight focus group discussions with 55 participants, consisting of county agents, area producers, and agribusiness representatives. In these discussions, participants were asked to describe the structure and characteristics of a realistic operation in their respective areas. Model farms consist of both crop and livestock operations. Five different crops were analyzed (both dryland and irrigated). These included corn, cotton, wheat, sorghum, and peanuts. Many operations also incorporated leased stockers, owned stockers, and/or cow-calf herds. All analyses also assumed a specific equipment replacement strategy during the 10-year projection period.

Cluster 1. The Northwest Texas Panhandle model operation consists of a 2,500 acre crop farm and stocker operation. The farm is 60% owned and 40% share leased. The crop share lease agreement is 1/3 on corn and wheat, and 1/4 on cotton, with the landlord paying a percentage of fertilizer, chemicals, and irrigation. The analysis indicates an emphasis on corn and wheat production (1,000 acres each), followed by sorghum (300 acres) and cotton (200 acres). All crops are operator sprayed and harvested. The operation takes in 400 head of stockers annually at a lease rate of $0.40 per pound of gain. The stockers are left on for an average 105 days with an average daily gain of 1.75 lbs.

Figure 1. Texas AgriLife Extension Service District 1 - Panhandle
Five different crops were analyzed. These included corn, cotton, wheat, sorghum, and peanuts. Many operations also incorporated leased stockers, owned stockers, and/or cow-calf herds.

Cluster 2. The Northeast Texas Panhandle model operation consists of a 3,000 acre crop farm and stocker operation. The farm is 40% owned and 60% share leased. The crop share lease agreement is 1/4 on irrigated corn and wheat and 1/3 on dryland wheat and sorghum, with the landlord paying a portion of seed (irrigated only), fertilizer, chemicals, and irrigation. All crops are custom sprayed and owner harvested. The operation takes in 500 head of stockers annually at a lease rate of $0.40 per pound of gain. The stockers are left on for an average 134 days with an average daily gain of 1.5 lbs.

Cluster 3. The Western Texas Panhandle model operation consists of a 3,040 acre crop farm and a stocker operation. The farm is 66% owned and 34% share leased. The crop share lease agreement is 1/3 on all crops, with the landlord paying a percentage of fertilizer, herbicide, irrigation and harvest. Crops are custom sprayed and custom harvested. The operation takes in 325 stockers annually at a lease rate of $0.40 per pound of gain. The stockers are left on for an average of 120 days with an average daily gain of 1.75 lbs.
Cluster 4. The Eastern Texas Panhandle model operation consists of a 2,700 acre crop farm and stocker operation. The farm is 40% owned and 60% share leased. The crop share lease agreement is 1/3 on corn, wheat, and sorghum and 1/4 on cotton, with the landlord paying a percentage of fertilizer, chemicals, and irrigation. The grain crops are custom sprayed and the cotton is custom harvested. The operation also purchases 250 head of stockers annually. Cattle graze for 128 days with an average daily gain of 1.8 lbs.

Cluster 5. The Southeast Texas Panhandle model operation consists of a 4,000 acre crop farm and cattle operation. The farm is 62% owned and 38% share leased. The share lease agreement is 1/3 on irrigated cotton and irrigated peanuts and 1/4 on irrigated wheat, dryland cotton and sorghum with the landlord paying a percentage of fertilizer, insecticides, and irrigation. The wheat is custom sprayed and the cotton is custom harvested. The operation has 50 head of cows and an 85% calving rate. Weaning weight is assumed to be 450 lbs and the 2010 price received is $1.02 for heifers and $1.13 for steers.

Results
Study results are illustrated based on the long-term (10-year) financial outlook of each model farm and represent a general financial outlook for producers in each county cluster. Results vary widely by county group. Study results are illustrated based on the long-term (10-year) financial outlook of each model farm and represent a general financial outlook for producers in each county cluster. Results vary widely by county group.
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Clusters 1 and 2 exhibit strong financial performance in all categories. Of the five clusters, Cluster 4 has the weakest financial performance in all categories.

Cluster 1 exhibits strong financial performance in all categories. In terms of profitability, Cluster 1 has the highest average NCFI per year at $369,930. Real net worth is also highest for Cluster 1 at $2.3 million. Solvency and liquidity are desirable, with an average working capital of $624,580 and an average debt-to-asset ratio of only 19%, meaning there is $0.19 of debt for every $1.00 in assets. Cluster 1 has some liquidity risk early in the analysis as indicated by a 51% chance of a negative working capital in 2010 (Figure 2). This probability improves over the period as cash levels rise and debt levels fall. Return to assets is also strong at 11.2%. Cluster 1’s operating expense to receipts ratio indicates 74% of revenues are used on operating expenses. Meaning, for every $.74 used by the operation, the operation gains $1.00 in receipts.

Cluster 2 also exhibits strong financial performance, with the second highest profitability ($197,830 NCFI), and equity ($1.18 million RNW). Working capital is second amongst the 5 clusters at $128,790. The debt-to-asset ratio is much higher than Cluster 1 at almost 27% as well as the return to assets being lower at 8.30%. Cluster 2’s operating expense to receipts ratio indicates 76% of revenues are used on operating expenses; this is the second most efficient cluster of the five in terms of revenue generation.

Cluster 3 has a lower level of profitability ($102,740 NCFI), keeping a relatively strong average equity position of $1.11 million. Working capital is acceptable, but lower than Clusters 1 and 2 at $118,820. Cluster 3 exhibits liquidity risk for the first year of the analysis, with a 51% chance of a negative working capital in 2010 (Figure 2), but quickly levels out to 30% by 2019. This probability improves over the analysis period as cash levels rise and debt levels fall. The debt-to-asset ratio for Cluster 3 is the lowest of all clusters at 17%. Return to assets is the second lowest of the five groups at 4.13%. Cluster 3 has less expected government payments than the other four clusters, averaging $14,570 over the analysis period. Cluster 3’s operating expense to receipts ratio indicates 81% of revenues are used on operating expenses.

Cluster 4 is by far the least desirable of the 5 clusters. Cluster 4 has extremely poor levels of profitability ($71,760 NCFI), equity ($891,580 million RNW), and liquidity (-$366,520 WC) and a low return on assets of 4.12%. It is important to note that Cluster 4 receives the highest level of government payments of the five cluster groups and would likely experience an income reduction if payments fall below projected levels. Cluster 4’s operating expense to receipts ratio indicates 88% of revenues are used on operating expenses.

Cluster 5 is neither the lowest nor highest performer of all the clusters. It has a net cash farm income ($108,160) and negative average working capital (-$21,940). Cluster 5 also exhibits a moderate debt-to-asset ratio (26%) and a lower return on assets (6%) compared to cluster one. The probability of negative working capital decreases throughout the analysis, starting at 57% in 2010 and declining to 43% by 2019. Real net worth averages $983,490 over the 10-year analysis period. Additionally, Cluster 5 also receives a significant amount of government payments and would likely experience an income reduction if payments fall below projected levels. Cluster 5’s operating expense to receipts ratio indicates 88% of revenues are used on operating expenses.

| Table 6. Average Financial Performance of Cluster Farms |
|---------------------------------|-----------|-----------|-----------|-----------|-----------|
| Net Cash Farm Income ($)        | Cluster 1 | Cluster 2 | Cluster 3 | Cluster 4 | Cluster 5 |
| Real Net Worth in 2019 ($)      | $3,042,280| $1,479,310| $1,316,990| $856,200  | $1,130,640|
| Government Payments             | $68,170  | $36,720   | $14,570   | $76,950   | $67,290   |
| Probability of Negative Capital | 5%       | 22%       | 30%       | 65%       | 43%       |
| Debt to Asset Ratio             | 0.19     | 0.27      | 0.17      | 0.43      | 0.26      |
| Return to Assets (ROA)          | 11.22%   | 8.30%     | 4.13%     | 4.12%     | 6.69%     |
| Expense to Receipts Ratio       | 0.74     | 0.76      | 0.81      | 0.88      | 0.88      |
Operations with the highest percentage of grain crops fared better than cotton and peanut entities. Crop and stocker operations projected more desirable equity levels than those with cow-calf herds.

Summary
Case studies for 22 Northern Texas Panhandle counties were developed in an effort to facilitate communication between agricultural producers and their local officials. Based on focus group model farm characteristics and FARM Assistance analyses, the Northwest and Northeast Texas Panhandle farms (Clusters 1 & 2) have the strongest financial performance. These clusters project high profitability, equity, and financial efficiency, accompanied by low debt levels. The Western and Eastern Texas Panhandle (Clusters 3 & 5) indicate moderate financial performance, with lower but acceptable financial performance measures. The Southeast Texas Panhandle (Cluster 4) is the only county group to project an unacceptable position across all financial measures. A conclusion can be drawn that operations with the highest percentage of grain crops fared better than cotton and peanut entities. It is important to note that 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.