FARM Assistance Focus

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Comparison of Costs and Returns for Alternative Cotton Harvest Methods in the Texas High Plains

Jay Yates
Nicole Gueck
Randy Boman
Mark Kelley
Mark Brown
Steven Klose

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

farmassistance.tamu.edu

The shift to higher yeilding "picker" varieties of better quality has lead many to believe that some of the acreage might be better suited for spindle picker harvest.

Historically, the High Plains Region of Texas has almost exclusively used cotton strippers to harvest its cotton crop. Unfortunately, the stigma of West Texas "stripper" cotton has a distinct negative impact on the final price received by growers. Furthermore, the shift to higher yielding "picker" varieties of better quality has led many to believe that some of the acreage might be better suited for spindle picker harvest. Cotton harvested using a picker typically receives a $0.015 per pound premium compared to stripper cotton. Given the fact that the High Plains of Texas now accounts for 28% of the entire U.S. cotton crop, it is imperative that the cotton harvested in the region be suited to the export market on which the U.S. is dependent. This paper evaluates the five-year financial impact and risk assessment of changing the harvest method of cotton on a model farm using Texas AgriLife Extension Service's Financial and Risk Management (FARM) Assistance program. The FARM Assistance program is a financial planning model used to help producers evaluate alternative management strategies.

Assumptions

Four scenarios were considered in the analysis. The first scenario evaluates the typical High Plains cotton operation with two John Deere 7460 8-row stripper harvesters with field cleaners, two boll buggies, two module builders and four tractors. Scenario 2 assumes ownership of a conventional picker harvester (John Deere 9996), one boll buggy, one module builder and two tractors. Scenario 3 uses the John Deere 7760 on-board moduling system, while Scenario 4 uses the Case IH 625 on-board moduling system.

The performance rate for the stripper technology assumes 10-12 bales per hour, while the rate for picker systems is 24-28 bales per hour.

A focus group consisting of producers in Crosby, Floyd and Lubbock counties helped determine a typical cotton harvesting complement for the operation. The model farm for all four scenarios assumes 3,500 acres of cotton on a 4,000 acre farming operation. Fifteen hundred (1,500) acres are owned by the operator and 2,500 acres are leased from landowners for 25% of production. The farm has the capacity to irrigate 2,100 acres of cotton; 1,400 acres are dryland cotton and the remaining acreage is planted to dryland wheat (150 acres), grain sorghum (150 acres) or fallow (200 acres).

Table 1 compares the necessary equipment, labor and cultural practices, costs, and resulting turnouts for each of the four scenarios. In the first scenario, it is assumed that the producer is ready to trade two existing strippers for two new John Deere 7460 8-row strippers with field cleaners. In Scenarios 2 through 4, it is assumed that the producer trades the existing harvest equipment for the new machinery. The purchase price of all new machines represents (December 2007) list price minus 16% for normal dealer discounts.

Table 1. Assumptions Used to Compare Alternative Cotton Harvest Methods

	Scenario			
Equipment Used	**1**	**2**	**3**	**4**
JD 7460 8 - row Strippers w/ Field Cleaners	2	-	-	
Boll Buggies	2	1	-	
Module Builders	2	1	-	
Tractors	4	4	4	4
JD 9996 6 - row picker		1		
JD 7760 6 - row picker w/ Module Builder			1	
Module Handler			1	
Case IH 625 6 - row picker w/ Module Builder				1
Cost of New Equipment	$354,380	$370,110	$509,740	$462,000
Labor				
Full - time Laborers	3	3	3	3
Seasonal Laborers	3	3	-	-
Labor Cost	$116,250	$115,250	$108,250	$108,250
Regulator/Defoliator Cost/AC	$32.00	$24.00	$24.00	$24.00
Lint Turnout %	32%	35%	35%	35%

Switching from using the typical stripper to the Case IH Module Builder system represents an additional $ 80,580 in farm income per year (on average).

Table 2. Five-year Average Per Acre Financial Indicators for Cotton, Harvest Method Comparison							
Scenarios	2008 -2012 Average Total CashReceipts ($1,000)	2008 - 2012 Average Total CashCosts ($1,000)	2008 - 2012 Average Net Farm Income ($1,000)	2012 Ending Real Net Worth ($1,000)	2012 Ending Debt to Asset Ratio	2012 Ending Cash Reserve ($1,000)	Probability End. Cash <0 (%)
1	1,805	1,480	319	2,401	21	401	20%
2	1,833	1,434	395	2,598	18	590	18%
3	1,833	1,467	367	2,479	19	382	28%
4	1,834	1,430	400	2,599	18	550	20%

In Scenario 1, the irrigated land had a cost of $12.00 per acre for mepiquat chloride (Pix) as a plant growth regulator and $20.00 per acre for harvest aids. In Scenarios 2 through 4, costs for plant growth regulators and harvest aids were reduced by $3.00 and $5.00 per acre respectively. The percent lint turnout for Scenario 1 was assumed to be 32% assuming a burr extractor, with a seed-to-lint ratio of 1.6 pounds. Scenarios 2 through 4 raised the lint turnout to 35%, but used the same seed to lint ratio. The focus group provided a ginning cost of $2.65 per hundredweight of seed cotton, which would include the cost of bagging and ties, module tarping and hauling. This rate is assumed to stay constant across all four scenarios.

Scenarios 1 and 2 assume a six man crew (three of which are seasonal laborers). However, the overall labor cost was reduced by $1,000 in Scenario 2 because using a picker should allow harvest to be completed a few days earlier. Seasonal laborers were not used in Scenarios 3 or 4 since three full-time employees should be able to run the machine in two shifts with the third man to stage modules for pick-up and help with daily servicing. For these two scenarios, labor cost was reduced by $8,000.

Yields were held constant in the picking vs. stripping scenarios due to previous research, which shows no statistically significant difference between the two methods. Given the higher cost of maintaining a picker along with the ability to replace two strippers, it is assumed that the total maintenance and fuel costs are the same across scenarios.

Results

The results of each scenario were compared based on key financial indicators. Table 2 presents the outcomes per acre for these financial projections. While the FARM Assistance model generally analyzes a ten-year planning period, in this study a five-year planning period was used, which represents the normal life cycle of harvest equipment in the Texas High Plains. For the projection, commodity price trends follow projections provided by the Food and Agricultural Research Institute (FAPRI, University of Missouri) with costs adjusted for inflation over the planning horizon.

The five-year average Net Farm Income is $318,930 for Scenario 1, $395,090 for Scenario 2, $367,280 for Scenario 3 and $399,510 for Scenario 4. Switching from using the typical stripper to the Case IH Module Builder system represents an additional $80,580 in farm income per year (on average). Additional annual income amounts to $76,160 by switching from the stripper to the conventional picker. Real net worth at the end of the five-year period is highest for Scenarios 4 and 2 at $2,599,290 and $2,597,890, respectively. This represents a 42% increase in real net worth over five years. Real net worth also increases 32% for Scenario 1 and 38% for Scenario 3. Ending Cash Reserves at the end of the five-year period are also highest for Scenarios 2 and 4, at $589,520 and $549,960, respectively. Ending cash is lowest for Scenario 3 at $381,890. The risk of having a cash shortfall and having to refinance the annual operating line of credit is a key indicator of much risk is associated with alternative levels of debt servicing. The overall average probability of having a shortfall over the five year period is highest for Scenario 3 at 28.4% and lowest for Scenario 2 at 17.6%. The variability in Net Farm Income, Real Net Worth, and Ending Cash Reserves for each of the four scenarios is similar. In other words, it does not appear that any of the scenarios are more 'risky' than another. A comparison of the variability in Net

The conventional JD 9996 picker and the Case IH Module Express 625 had the highest increase in Net Farm Income, Real net worth, and Ending Cash Reserves.

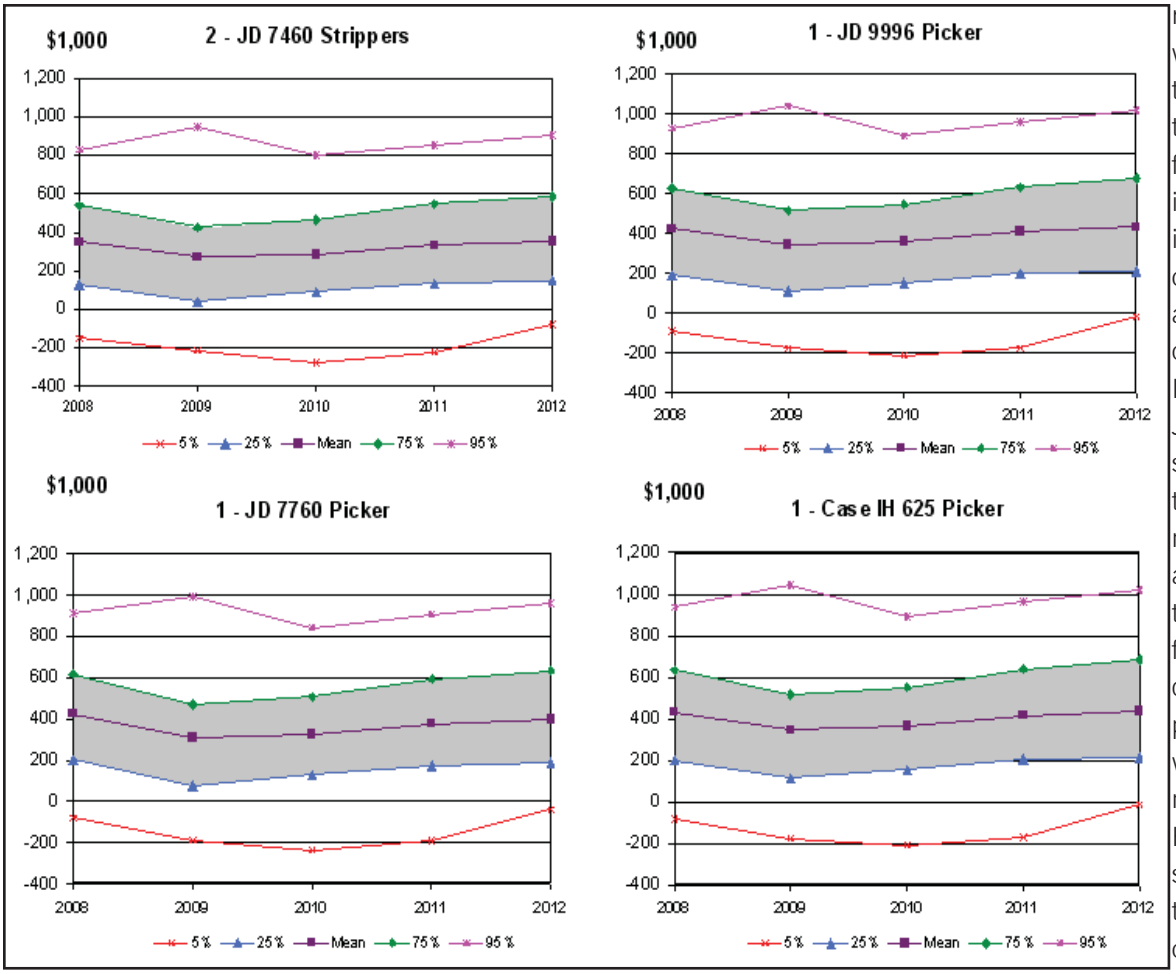

Figure 1. Comparison of Variability in Net Farm Income, All Scenarios

Farm Income for each scenario is shown in Figure 1.

Summary

The conventional JD 9996 picker (Scenario 2) and the Case IH Module Express 625 (Scenario 4) had the highest Net Farm Income, Real Net Worth, and Ending Cash Reserves as well as the lowest ending Probability of Having to Refinance the Operating Note. Although not included in this study, it would be appropriate to assume that the conventional Case IH Cotton Express picker should yield similar results to the JD 9996. It should also be noted from the preceding results that there is tremendous overlap of probable outcomes in each of the financial indicators for all of the alternatives.

This study was done using a model farm developed by a group of farmers and county Extension agents and therefore represents an average with many assumptions that may not apply to an individual farm. Therefore, it is imperative that the individual producer complete a similar analysis using their own specific situation. In defense of the John Deere 7760, it should be noted that the technology has not been commercially available long enough to make assumptions for increased lint value due to the protection provided by the plastic wrap. It should also be noted that in the Texas High Plains, the harvest season and winter is typically the driest time of year with a normal rainfall of less than five inches. The efficiency gained from "non-stop" harvesting is not fully realized in this study because the farm has excess harvest capacity. This would allow the JD 7760 to be used to generate custom harvest income if it were available to make up the difference in purchase price.

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