KANSAS FARM MANAGEMENT ASSOCIATION

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N E W S L E T T E R

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FINANCIAL PERFORMANCE AND FARM TYPE

Financial performance often varies by farm type. This newsletter article documents differences in financial performance among farms in the Kansas Farm Management Association (KFMA) based upon farm type. Labor standards and production units are used to designate farm types. Crop farms have at least 65 percent of their labor, both paid and unpaid, devoted to crop production. Crop/beef cow farms have at least 35% of their labor devoted to beef cow production. Similarly, crop/dairy farms have at least 35% of their labor devoted to dairy production.

To document differences in financial performance, the following measures are used: total expense ratio, adjusted total expense ratio, economic total expense ratio, operating profit margin, and asset turnover ratio. The total expense ratio is computed by dividing accrual expenses (cash costs, accrual cost adjustments, and depreciation) by value of farm production.

A ratio below one indicates that value of farm production has covered all accrual expenses. The adjusted total expense ratio is computed by adding unpaid operator and family labor to the expenses included in the total expense ratio and dividing by value of farm production. A ratio below one indicates that a farm, or group of farms, has covered accrual expenses, and unpaid operator and family labor. The economic total expense ratio is computed by adding the opportunity charge on owned assets to the expenses included in the adjusted total expense ratio and, once again, dividing by value of farm production. Opportunity charges on owned assets, in addition to accrual expenses and unpaid operator and family labor, are covered when this ratio is below one. The operating profit margin is computed by adding interest and subtracting unpaid operator and family labor from net farm income, and dividing the result by value of farm production. A negative operating profit margin ratio typically indicates that a farm, or group of farms, is not able to cover unpaid operator and family labor. The asset turnover ratio is computed by dividing value of farm production by total assets.

Table 1. Summary Statistics for 1,160 KFMA Farms with Continuous Data from 2002-2006 .

Item	Average	Item	Average
Value of Farm Production (VFP)	$259,095	Percent of Farms with VFP less than $100,000	20.34%
Net Farm Income	$51,085	Percent of Farms with VFP between $100,000 and $250,000	41.98%
Interest	$15,686	Percent of Farms with VFP between $250,000 and $500,000	27.76%
Unpaid Family and Operator Labor	$42,423	Percent of Farms with VFP greater than $500,000	9.91%
Total Expense Ratio (TER)	0.803	Percent of Farms with TER less than 1.000	89.57%
Adjusted Total Expense Ratio (ATER)	0.967	Percent of Farms with ATER less than 1.000	48.79%
Economic Total Expense Ratio (ETER)	1.156	Percent of Farms with ETER less than 1.000	11.03%
Total Assets	$880,553		
Total Debt	$268,468		
Debt to Asset Ratio	0.3049	Percent of Farms Financially Stressed	8.79%
Operating Profit Margin Ratio	0.0940	Percent of Farms with Positive Net Cash Flow	93.19%
Asset Turnover Ratio	0.2942	Crop Labor Percentage	77.61%

Source: Kansas Farm Management Association 2006 Databank.

In addition to these financial performance measures, this article also reports the incidence of financial stress; the percent of farms covering accrual expenses and opportunity costs; the percent of labor devoted to crop production; and, information on crop and livestock accrual income.

Average information for 1,160 KFMA farms with continuous data from 2002 to 2006 is presented in Table 1 on the previous page. The average total expense ratio, adjusted total expense ratio, and economic total expense ratio are 0.803, 0.967, and 1.156, respectively. Note that the average adjusted total expense ratio is below one. This indicates that, on average, value of farm production for this group of farms covered accrual expenses, and unpaid operator and family labor. Approximately 49% of the farms are able to cover these expenses. In contrast, only 11% of the farms covered opportunity costs on owned assets, as well. The average operating profit margin is 0.0940 and the average asset turnover ratio is 0.2942. Also note that, on average, these farms devote nearly 78% of their time to crop production.

It is important to compare a farm's financial performance measures with similar farms. With this in mind, Table 2 reports financial performance measures for dryland crop farms, irrigated crop farms, crop/beef cow farms, and crop/dairy farms. The total expense ratio was the highest for the irrigated crop farms and the lowest for crop/livestock farms. In contrast, the irrigated crop farms had a relatively lower average adjusted total expense ratio and economic total expense ratio. Because these ratios include opportunity costs, comparisons among farms using the adjusted total expense ratio and the economic total expense ratio are more appropriate than comparisons among farms using the total expense ratio. It is particularly problematic to compare the total expense ratio between a group of farms with no hired labor and a group of farms with hired labor because, unlike unpaid operator and family labor, hired labor is included in the expenses that make up the total expense ratio. The percent of farms covering accrual expenses and unpaid operator and family labor ranges from 28% for the crop/beef cow farms to 70% for the irrigated crop farms. The range in the percent of farms covering all costs, or with an economic total expense ratio below one, is also quite wide. None of crop/dairy farms covered all costs. Approximately 30% of the irrigated crop farms covered all costs.

The average operating profit margin ranged from 0.0344 (3.44%) for the crop/beef cow farms to 0.1118 (11.18%) for the irrigated crop farms. The average asset turnover ratio ranged from 0.2060 for crop/beef cow farms to 0.3937 for irrigated crop farms. Income generated by each crop and livestock enterprise is also reported in Table 2. It is important to note that the beef and dairy incomes

Table 2. Summary Statistics by Farm Type.

	Farm Type			
Item	Dryland	Irrigated	Crop Beef Cow	Crop Dairy
Number of Farms	698	27	78	30
Value of Farm Production (VFP)	$252,276	$479,264	$150,254	$347,919
Net Farm Income	$48,035	$67,280	$32,353	$73,099
Interest	$13,970	$29,986	$8,568	$14,964
Unpaid Family and Operator Labor	$41,049	$43,678	$35,759	$64,727
Total Assets	$794,260	$1,217,243	$729,392	$1,067,731
Total Debt	$236,158	$520,384	$145,062	$243,923
Total Expense Ratio (TER)	0.810	0.860	0.785	0.790
Adjusted Total Expense Ratio (ATER)	0.972	0.951	1.023	0.976
Economic Total Expense Ratio (ETER)	1.149	1.067	1.334	1.165
Operating Profit Margin Ratio	0.0831	0.1118	0.0344	0.0671
Asset Turnover Ratio	0.3176	0.3937	0.2060	0.3258
Debt to Asset Ratio	0.2973	0.4275	0.1989	0.2284
Percent of Farms with Positive Net Cash Flow	94.84%	88.89%	93.59%	93.33%
Percent of Farms Financially Stressed	10.32%	11.11%	2.56%	6.67%
Percent of Farms with TER less than 1.000	90.11%	88.89%	87.18%	93.33%
Percent of Farms with ATER less than 1.000	49.86%	70.37%	28.21%	56.67%
Percent of Farms with ETER less than 1.000	11.17%	29.63%	3.85%	0.00%
Crop Labor Percentage	92.13%	94.59%	49.16%	23.73%
Wheat Income	$55,959	$47,325	$17,247	$11,529
Corn Income	$44,046	$221,827	$6,909	$11,966
Grain Sorghum Income	$18,848	$2,442	$3,667	$1,382
Soybean Income	$46,633	$24,401	$11,283	$23,148
Hay and Forage Income	$9,594	$25,082	$12,057	$2,030
Beef Income	$26,544	$23,670	$93,969	$4,436
Dairy Income	$176	$8,102	$1,063	$378,002

reported represent value added income measures. Also note that purchased feed is subtracting from value of farm production, but not from beef and dairy income.

Table 3 reports financial performance measures for dryland crop farms by region of the state. The average expense ratios are relatively lower for farms in eastern Kansas. Also, the operating profit margin is relatively higher for farms in eastern Kansas. These results are at least partially due to differences in farm size among regions. The average dryland crop farm in eastern Kansas is relatively larger using value of farm production as a measure of farm size. Other reasons for regional differences include differences in weather, the mix of crops produced, and livestock production among regions.

Table 3. Summary Statistics for Dryland Crop Farms by Region of the State.

	Region		
Item	East	Central	West
Number of Farms	310	302	86
Value of Farm Production (VFP)	$284,723	$234,288	$198,486
Net Farm Income	$59,022	$41,510	$31,346
Interest	$15,518	$13,396	$10,406
Unpaid Family and Operator Labor	$44,385	$39,750	$33,586
Total Assets	$881,681	$706,663	$786,744
Total Debt	$264,353	$226,553	$168,247
Total Expense Ratio (TER)	0.793	0.823	0.842
Adjusted Total Expense Ratio (ATER)	0.949	0.992	1.011
Economic Total Expense Ratio (ETER)	1.122	1.156	1.261
Operating Profit Margin Ratio	0.1059	0.0647	0.0411
Asset Turnover Ratio	0.3229	0.3315	0.2523
Debt to Asset Ratio	0.2998	0.3206	0.2139
Percent of Farms with Positive Net Cash Flow	95.16%	96.03%	89.53%
Percent of Farms Financially Stressed	8.38%	12.58%	9.30%
Percent of Farms with TER less than 1.000	90.32%	90.72%	87.21%
Percent of Farms with ATER less than 1.000	57.10%	44.70%	41.86%
Percent of Farms with ETER less than 1.000	13.87%	9.93%	5.81%
Crop Labor Percentage	90.87%	92.31%	96.03%
Wheat Income	$34,611	$78,047	$55,343
Corn Income	$72,956	$21,028	$20,668
Grain Sorghum Income	$11,344	$27,748	$14,643
Soybean Income	$81,699	$22,594	$4,652
Hay and Forage Income	$7,098	$13,259	$5,723

It is common for farms to want to compare financial performance with farms in the top quartile or top one-third. There are enough dryland crop farms and crop/beef cow farms to make these comparisons. Table 4 presents financial performance measures for dryland crop farms by profit margin quartiles. The difference in expense ratios, operating profit margin, and asset turnover ratio among groups is large. Farms in the top quartile (fourth quartile) have an economic total expense ratio that is 32% lower than that of farms in the bottom quartile. Primarily due to their inability to cover unpaid operator and family labor, farms in the bottom quartile have a negative operating profit margin. In contrast, the average operating profit margin for farms in the top quartile is 0.1862 (18.62%).

Table 4. Summary Statistics for Operating Profit Margin Quartiles, Dryland Crop Farms.[a]

	Profit Margin Quartile			
Item	First	Second	Third	Fourth
Number of Farms	174	175	175	174
Value of Farm Production (VFP)	$109,948	$231,215	$295,479	$372,337
Net Farm Income	$3,704	$26,694	$57,218	$104,594
Interest	$7,113	$14,372	$16,720	$17,658
Unpaid Family and Operator Labor	$29,665	$37,256	$44,371	$52,907
Total Assets	$522,229	$638,607	$889,239	$1,127,313
Total Debt	$119,435	$233,845	$281,439	$309,664
Total Expense Ratio (TER)	0.966	0.885	0.806	0.719
Adjusted Total Expense Ratio (ATER)	1.236	1.046	0.957	0.861
Economic Total Expense Ratio (ETER)	1.529	1.186	1.121	1.037
Operating Profit Margin Ratio	-0.1714	0.0165	0.1001	0.1862
Asset Turnover Ratio	0.2105	0.3621	0.3323	0.3303
Debt to Asset Ratio	0.2287	0.3662	0.3165	0.2747
Percent of Farms with Positive Net Cash Flow	81.61%	97.71%	100.00%	100.00%
Percent of Farms Financially Stressed	12.64%	20.00%	7.43%	1.15%
Percent of Farms with TER less than 1.000	65.52%	94.86%	100.00%	100.00%
Percent of Farms with ATER less than 1.000	0.00%	22.29%	79.43%	97.70%
Percent of Farms with ETER less than 1.000	0.00%	2.29%	8.00%	34.48%
Crop Labor Percentage	91.97%	92.45%	91.52%	92.57%
Wheat Income	$34,569	$50,466	$66,911	$71,858
Corn Income	$10,835	$34,628	$49,216	$81,531
Grain Sorghum Income	$10,164	$17,771	$23,960	$23,472
Soybean Income	$13,206	$40,959	$54,335	$78,022
Hay and Forage Income	$5,652	$14,289	$11,678	$6,720

[a] The first quartile is represented by farms with the lowest operating profit margin ratio. The fourth quartile is represented by farms with the highest operating profit margin quartile.

Table 5, on the following page, presents financial performance measures for crop/beef cow farms by profit margin thirds. As was the case with dryland crop farms, differences in financial performance measures among groups are large. Farms in the top

one-third (third category) have an economic total expense ratio that is 37% lower than farms in the bottom one-third. Moreover, none of the farms in the bottom one-third are able to cover opportunity costs. Approximately 73% and 12% of the farms in the top one-third are able to cover unpaid operator and family labor, and the opportunity cost on owned assets, respectively. The average operating profit margin is negative for farms in the bottom and middle profit margin categories (first and second categories). The average operating profit margin is 0.1653 (16.53%) for farms in the top one-third profit margin category.

Table 5. Summary Statistics for Operating Profit Margin Thirds, Crop and Beef Cow Farms.[a]

	Profit Margin Thirds		
Item	First	Second	Third
Number of Farms	26	26	26
Value of Farm Production (VFP)	$73,445	$148,671	$228,646
Net Farm Income	$2,104	$27,018	$67,937
Interest	$4,017	$7,806	$13,880
Unpaid Family and Operator Labor	$26,602	$36,649	$44,027
Total Assets	$509,692	$746,565	$931,921
Total Debt	$76,571	$128,897	$229,719
Total Expense Ratio (TER)	0.971	0.818	0.703
Adjusted Total Expense Ratio (ATER)	1.334	1.065	0.895
Economic Total Expense Ratio (ETER)	1.805	1.397	1.141
Operating Profit Margin Ratio	-0.2789	-0.0123	0.1653
Asset Turnover Ratio	0.1441	0.1991	0.2453
Debt to Asset Ratio	0.1502	0.1727	0.2465
Percent of Farms with Positive Net Cash Flow	80.77%	100.00%	100.00%
Percent of Farms Financially Stressed	0.00%	3.85%	3.85%
Percent of Farms with TER less than 1.000	61.54%	100.00%	100.00%
Percent of Farms with ATER less than 1.000	0.00%	11.54%	73.08%
Percent of Farms with ETER less than 1.000	0.00%	0.00%	11.54%
Crop Labor Percentage	50.28%	53.45%	43.74%
Beef Income	$44,875	$96,849	$140,185
Number of Cows	84	128	201

[a] The first profit margin one-third is represented by farms with the lowest operating profit margin ratio. The third profit margin one-third is represented by farms with the highest operating profit margin ratio.

In addition to benchmarking using the whole-farm information presented in this newsletter article, it is also important to examine the relative competitiveness of individual enterprises. Enterprise analysis enables a farm to determine whether a particular enterprise is contributing to a farm's relative low or high whole-farm financial performance. Additional information on whole-farm and enterprise benchmarks can found at www.kmar105.com.

Michael Langemeier, Professor
Department of Agricultural Economics
Kansas State University

IRRIGATION EQUIPMENT COST UPDATE

The cost of installing new irrigation systems in western Kansas has increased significantly since 2000. As part of the process of developing irrigated crop budgets for 2008, irrigation equipment dealers in western Kansas were contacted during the fall of 2007 for their input on irrigation equipment cost benchmarks. Tables 1 and 2 correspond to information presented in the Kansas Farm Management Guide publication MF-836, "Irrigation Capital Requirements and Energy Costs".

CAPITAL REQUIREMENTS

Irrigation well, pump, gearhead, and power unit cost estimates from surveys in 2000, 2006 and 2007 are provided in Table 1. The budgeted cost of a newly installed *irrigation well* increased 46% from 2000 to 2006 ($19,000 to $27,700), with a 1% increase in 2007 (to $28,000). The budgeted cost of a newly installed *pump and gearhead* increased by 5% from 2000 to 2006 ($21,000 to $22,000), with a 14% increase in 2007 (to $25,000). *Power unit* cost estimates increased by 238% from 2000 to 2006 ($4,200 to $10,000),

Table 1. Irrigation Capital Requirements

Cost Item	Year	KSU Budget Amount	Equipment Life (Years)
Well	2000	$19,000	15
	2006	$27,700	25
	2007	$28,000	25
Pump & Gearhead	2000	$21,000	15
	2006	$22,000	25
	2007	$25,000	25
Power Unit	2000	$4,200	7
	2006	$10,000	7
	2007	$10,000	7
Water Meter	2000	$1,000	7
	2006	$1,000	7
	2007	$1,200	7
Connectors	2000	$750	7
	2006	$750	7
	2007	$950	7

with no change in 2007. The cost of *water meters* and *connectors* were unchanged from 2000 to 2006 ($1,000 and $750, respectively), but increased by 20% and 27%, respectively, in 2007 (to $1,200 and $950). The expected productive life of irrigation wells, pumps, and gearheads, as represented in these budgets, increased from 15 years in 2000 to 25 years in 2006-07, while the expected useful life of power units, water meters, and connectors has remained at 7 years.

CENTER PIVOT IRRIGATION SYSTEMS

Budgeted cost projections for center pivot irrigation systems from surveys in 2000, 2006 and 2007 are provided in Table 2. The budgeted cost of a newly installed *center pivot system* increased 44% from 2000 to 2006 ($35,500 to $51,000), with no increase in 2007. Newly installed *8" underground pipe* from the center pivot center tower to the field's edge increased in cost by 32% from 2000 to 2006 ($3,159 to $4,550), with no change in 2007. *Electrical wiring* cost increased by 43% from 2000 to 2006 ($2,640 to $3,770), with a 3% increase in 2007 (to $3,900). The *total budgeted cost of a center pivot irrigation system* increased 30% from 2000 to 2006 ($45,474 to $59,320), but increased by only 0.2% in 2007 (to $59,450). The expected productive life for center pivot systems, underground pipe, and wiring represented in the KSU budgets has increased from 10 years in 2000 to 25 years in 2006-07.

Table 2. Capital Requirements: Center Pivot Irrigation System (125 acres)

Cost Item	Year	KSU Budget Amount	Equipment Life (Years)
Standard 7 Tower Center Pivot	2000	$35,500	10
	2006	$51,000	25
	2007	$51,000	25
8" Underground Pipe	2000	1,320 ft x $2.62/ft = $3,459	10
	2006	1,300 ft x $3.50/ft = $4,550	25
	2007	1,300 ft x $3.50/ft = $4,550	25
Electrical Wiring	2000	1,320 ft x $2.00/ft = $2,640	10
	2006	1,300 ft x $2.90/ft = $3,770	25
	2007	1,300 ft x $3.00/ft = $3,900	25
Total Center Pivot System Cost	2000	$45,474	
	2006	$59,320	
	2007	$59,450	

In practical terms, the useful life and salvage value of center pivot irrigation systems was likely underestimated in the 2000 K-State Farm Management Guide budgets. According to the irrigation equipment dealers surveyed, in the current irrigation equipment market, used center pivot systems with 10-15 years of life and in good condition are priced at approximately $15,000-$20,000. There were also indications from those surveyed that center pivot systems in areas with corrosive water problems may require additional investment of as much as $10,000 per pivot for anti-corrosive pipe coating. Without this anti-corrosive system treatment in these at risk areas, the useful life of a center pivot irrigation system will likely be drastically curtailed.

SUMMARY

The cost of irrigation systems in western Kansas has changed only marginally during the last year, but has changed considerably since 2000. The largest change in price occurred in the prices of newly installed wells, power units, and center pivot irrigation systems. Given the dramatic decrease in the number of new wells drilled in Kansas due to regulatory steps taken to conserve available groundwater supplies, inflation in the cost of new wells may not impact most irrigated crop producers. However, markedly increased costs for power units and center pivot systems do have a direct impact upon the costs of irrigated crop producers. The impact of cost inflation in center pivot systems may be mitigated to some degree by the availability of lower cost "good" used center pivot irrigation systems that retain their useful, productive life with reasonable maintenance and refurbishing.

Daniel M. O'Brien
Extension Agricultural Economist
K-State Research and Extension

The Kansas Farm Management Association (KFMA) Newsletter is distributed monthly to provide farm management information to farm decision makers. Further farm management information can be found on the KFMA program website: www.kmar105.com/kfma; and, on the Extension Agricultural Economics website: www.agmanager.info. The Newsletter is edited by Michael Langemeier, Professor; and, Kevin Herbel, Administrator, KFMA Program, Department of Agricultural Economics, Kansas State University.