

## **2009 IRRIGATION CROPLAND LEASE ARRANGEMENTS**

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Grain price volatility and changing crop input costs have affected the equitability of existing irrigated cropland leasing arrangements during the 2006 through 2009 period. It has been challenging for tenants and landowners to maintain equitable cropland leasing arrangements in response to both the historic increases and the following decrease that have occurred in agricultural commodity and crop input prices over the last 3-4 years.

This paper utilizes western Kansas crop enterprise cost of production estimates in the **KSU Lease.xls** program to estimate equitable cropland leasing arrangements for 2009. Cost of production estimates for irrigated corn, sunflowers, grain sorghum, soybeans and wheat were taken from K-State Farm Management Guide budget projections and Kansas Farm Management Association Farm Enterprise budgets. Non-irrigated cost of production estimates for wheat and other crops were used from the same sources. The **KSU Lease.xls** program is a spreadsheet budgeting program developed by Kansas State University Extension Specialists Kevin Dhuyvetter and Terry Kastens that can be used to determine equitable crop share and cash lease rental arrangements. Information on common irrigated and nonirrigated crop leasing arrangements were taken from K-State surveys of irrigated and nonirrigated crop leasing arrangements published in November-December 2008.

The crop budgets, leasing arrangement surveys, and the KSU Lease.xls program are available at [www.Agmanager.info](http://www.Agmanager.info), the website for K-State Extension Agricultural Economics educational information.

## SCENARIO #1: CENTER PIVOT OWNED BY LANDOWNER, SHARING OF SELECTED CROP INPUT EXPENSES

The first analysis of how equitable a common irrigated cropland leasing arrangement is focused on the scenario in which the Landowner owns the center pivot irrigation system and shares the cost of selected crop input expenses. On a 160 acre field, it is assumed that a center pivot irrigation system is used covering 125 acres of irrigated corn. For the nonirrigated corners (35 acres) it was assumed that a wheat-fallow rotation was used.

In this scenario the tenant owned and paid 100% of the cost of the irrigation power unit used. The landowner shared 33% of the cost of fertilizer, herbicides, insecticides, and crop insurance with the tenant. The tenant paid 100% of all other expenses, including seed, crop consulting, machinery, labor, and energy costs. The opportunity cost of farmland ownership for 125 acres of irrigated farmland and 35 acres of nonirrigated farmland (corners) was calculated to be a 5% rate of return. Farmland values were assumed to be those reported in the August 2008 Kansas Farmland Values publication from Kansas Agricultural Statistics. The grain prices used represent bids for the Colby – Goodland area on January 21, 2009. Following are the 2009 crop budgets used for this 160 acre scenario on which irrigated corn is grown.

### CROP BUDGETS SHOWING TOTAL COSTS AND RETURNS

[Link to KSU Farm Management Guides \(crop budgets\)](#)

Crop/System	Corn	Soybean	Oil SF	Milo	Wheat	Wht-Flw	Total	Per Acre	Per Acre
Planted acres of each crop	125.0	0.0	0.0	0.0	0	17.5	142.5	Planted	Tillable
Tillable acres per planted acre	1.00	1.00	1.00	1.00	1.00	2.00	160.0		
<b>INCOME PER ACRE</b>									
A. Yield per acre	200.0	55.0	22.0	120.0	70.0	45.0	--	--	--
B. Price per unit	\$3.57	\$9.15	\$14.25	\$2.83	\$5.38	\$5.38	--	--	--
C. Net government payments	\$32.53	\$32.53	\$32.53	\$32.53	\$32.53	\$16.26	\$4,351	\$30.53	\$27.19
D. Indemnity payments	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0	\$0.00	\$0.00
E. Miscellaneous income	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0	\$0.00	\$0.00
F. Returns/acre ((A x B) + C + D + E)	\$746.53					\$258.36	\$97,838	\$686.58	\$611.48
<b>COSTS PER ACRE</b>									
1. Seed	\$67.20					\$10.40	\$8,582	\$60.22	\$53.64
2. Herbicide	35.54					12.07	4,653	32.65	29.08
3. Insecticide / Fungicide	35.30					0.00	4,412	30.96	27.58
4. Fertilizer and Lime	247.64					73.37	32,239	226.24	201.49
5. Crop Consulting	6.50	6.25	6.50	6.25	6.00	0.00	813	5.70	5.08
6. Crop Insurance	50.00	20.00	20.00	20.00	20.00	12.50	6,469	45.39	40.43
7. Drying	0.00					0.00	0	0.00	0.00
8. Miscellaneous	10.00	10.00	10.00	10.00	10.00	5.50	1,346	9.45	8.41
9. Machinery Expense	148.38					103.98	20,367	142.93	127.30
10. Non-machinery Labor	16.77					11.70	2,301	16.15	14.38
11. Irrigation	210.33					0.00	26,291	184.50	164.32
12. Land Charge / Rent	80.00					83.00	11,453	80.37	71.58
G. SUB TOTAL	\$907.65					\$312.51	\$118,926	\$834.57	\$743.29
13. Interest on 1/2 Nonland Costs	27.38					7.79	3,559	24.97	22.24
H. TOTAL COSTS	\$935.03					\$320.30	\$122,484	\$859.54	\$765.53
I. RETURNS OVER COSTS (F - H)	(\$188.50)					(\$61.94)	(\$24,647)	(\$172.96)	(\$154.04)
J. TOTAL COSTS/UNIT (H/A)	\$4.68					\$7.12	--	--	--
K. RETURN TO TOTAL COST ((I+13)/G)	-17.75%					-17.33%	-20.12%	-20.12%	-20.12%
<i>Delete inputs in columns not being used!</i>									
M. Breakeven price (w/ base crop)	\$3.89	-\$2.87	-\$7.17	-\$1.31	-\$2.25	\$3.97			
N. Breakeven yield (w/ base crop)	220.4	7.0	3.1	18.7	5.7	32.6			

Base crop for breakeven analysis

1      0      0      0      0      1

<sup>1</sup> All "blue values" are inputs, black values are calculated from those inputs

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Crop production input, machinery, labor, and land costs are shown below.

TABLE 1. Production Inputs Used for Budgets

ITEM	Corn				Wht-Flw		\$/unit
Seeding rate (lbs, seeds, etc)	30	150	23.4	6.5	90	65	
Seed price, \$/unit	\$2.24	\$0.25	\$0.91	\$3.16	\$0.16	\$0.16	
Fertilizer:							
82-0-0	270	0	120	150	122	79	\$0.570 /lb
N (dry/liquid)	0	0	0	0	0	0	\$0.850 /lb
P	86	48	44	53	39	26	\$1.090 /lb
K	0	0	0	0	0	0	\$0.620 /lb
Lime	0	0	0	0	0	0	\$0.010 /lb
Herbicide							
RT3	44						\$0.40 /oz
+ Bicep Lite II Magnum	1.5			1.5			\$11.29 /qt
+ Additives	1						\$1.00 /ac
Prowl		3.6					\$3.65 /oz
Glyphosate + Adjuvants		2					\$9.64 /ac
Prowl H2O			3				\$4.19 /pt
Spartan			4				\$3.53 /oz
Marksman				2			\$4.26 /pt
Ally (0.1 oz/ac) + Banvel (4 oz/ac)					1	1	\$2.85 /ac
RT3 (16.5 oz/ac) + 2, 4-D (1 pt/ac)						1	\$9.22 /ac
Insecticide / Fungicide							
Force 3G	5.4						\$4.64 /lb
Capture 2EC	0.08						\$128.00 /lb
Warrior 1 EC			0.05				\$258.46 /lb
Tilt					4		\$3.00 /oz
Irrigation water, inches/acre	18	15	10	12	10	0	\$5.80 /in
Irrigation repairs, \$/acre-inch							\$0.33 /in
Drying cost, \$/unit (bu, cwt, etc)	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	

Delete inputs in columns not being used!

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TABLE 2. Machinery and Land Resources Used for Budgets

ITEM	Corn				Wht-Flw		\$/unit
Drill/Plant, \$/acre	\$12.48	\$12.52	\$12.39	\$12.18	\$10.91	\$10.91	
Tillage and Chemical Applications:							
Chisel	1	1	1	1	0	0	\$11.04 /ac
Disk	1	1	1	1	2	0	\$9.07 /ac
Field cultivate	1	1	1	1	1	1	\$8.29 /ac
Sweep	0	0	0	0	0	3	\$7.62 /ac
Anhydrous application	1	0	1	1	1	1	\$9.68 /ac
Fertilizer application	0	0	0	0	0	0	\$4.80 /ac
Herbicide application	2	2	1	2	1	4	\$5.15 /ac
Insecticide application	1	0	2	0.5	1	0	\$5.14 /ac
Harvest							
Base charge, \$/acre	\$25.33	\$25.87	\$23.89	\$19.96	\$19.28	\$19.28	
Charge for high yields, \$/unit	\$0.188	\$0.181	\$0.002	\$0.182	\$0.183	\$0.183	
High yield	71	28	14	36	21	21	
Hauling, \$/unit	\$0.164	\$0.164	\$0.003	\$0.175	\$0.177	\$0.177	
Non-machinery labor, hr/acre	1.29	0.79	0.80	1.04	0.85	0.90	\$13.00 /hr
Irrigation labor, hr/acre	0.50	0.50	0.50	0.50	0.50	0.00	\$13.00 /hr
Average land value, \$/acre /A	\$1,600	\$1,600	\$1,600	\$1,600	\$1,600	\$830	
Annual return to land, % /A							5.0%
Interest on capital, %							8.0%
Irrigation Equipment							
	Investment, \$		Years		Salvage value, %		
Well, pump and gearhead value	Total	\$/wet ac					
	\$53,000	\$424		25		0%	
Power unit and meter	\$12,250	\$98		7		0%	
Irrigation system	\$59,500	\$476		20		25%	
Price scenarios to consider							
	Corn				Wht-Flw		Use (Y=1, N=0)
Long-run prices (MF-1013)	\$3.36	\$7.36	\$13.33	\$3.02	\$5.02	\$5.02	0
Short-run prices (MF-1013)	\$4.44	\$8.39	\$13.33	\$4.10	\$5.86	\$5.86	0
2009 bids (Colby Cash - 1/21/09)	\$3.57	\$9.15	\$14.25	\$2.83	\$5.38	\$5.38	1

/A -- The annual cost associated with land can either be entered as a Land Value x Rent-to-Value OR as a Cash Rent x 100%. For example, if cash rent in region is \$42 per acre, this can be entered as \$42 in row 94 and 100% in cell K95 OR as \$840 in row 94 and 5% in cell K95 [\$42 x 100% = \$840 x 5%].

The operator's share of production inputs are shown. Here, "-100%" indicates that an expense is equitably shared in the same % as resource contributions.

Landowner =====>	Landowner, Northwest KS, 123-456-8888	01/23/09
Operator =====>	Tenant, Northwest KS, 123-456-9999	8:38 AM
Basis for equitable share calculations: For the entire rotation (L4 = 0), Crop-by-crop (L4 = 1)		L4 ==> 0

OPERATOR'S share of production inputs (enter -100% if equitably shared)							
Crop/System	Corn	--	--	--	--	Wht-Flw	Total
Planted acres	125.0	--	--	--	--	17.5	142.5
Seed	100%	100%	100%	100%	100%	100%	100%
Fertilizer:							
82-0-0	67%	67%	67%	67%	67%	67%	67%
N (dry/liquid)	67%	67%	67%	67%	67%	67%	67%
P	67%	67%	67%	67%	67%	67%	67%
K	67%	67%	67%	67%	67%	67%	67%
Lime	67%	67%	67%	67%	67%	67%	67%
Herbicide							
RT3	67%	67%	67%	67%	67%	67%	67%
+ Bicep Lite II Magnum	67%	67%	67%	67%	67%	67%	67%
+ Additives	67%	67%	67%	67%	67%	67%	67%
Prowl	67%	67%	67%	67%	67%	67%	67%
Glyphosate + Adjuvants	67%	67%	67%	67%	67%	67%	67%
Prowl H2O	67%	67%	67%	67%	67%	67%	67%
Spartan	67%	67%	67%	67%	67%	67%	67%
Marksman	67%	67%	67%	67%	67%	67%	67%
Ally (0.1 oz/ac) + Banvel (4 oz/ac)	67%	67%	67%	67%	67%	67%	67%
RT3 (16.5 oz/ac) + 2, 4-D (1 pt/ac)	67%	67%	67%	67%	67%	67%	67%
Insecticide / Fungicide							
Force 3G	67%	67%	67%	67%	67%	67%	67%
Capture 2EC	67%	67%	67%	67%	67%	67%	67%
Warrior 1 EC	67%	67%	67%	67%	67%	67%	67%
Tilt	67%	67%	67%	67%	67%	67%	67%
Crop consulting	100%	100%	100%	100%	100%	100%	100%
Crop insurance	-100%	-100%	-100%	-100%	-100%	-100%	-100%
Drying cost	-100%	-100%	-100%	-100%	-100%	-100%	-100%
Operator's equitable share (OS%)	68.0%					60.7%	67.7%

Crop/System	Corn	--	--	--	--	Wht-Flw	Total
Planted acres	125.0	--	--	--	--	17.5	142.5
OPERATOR'S share of machinery, labor, irrigation, and land (enter -100% if shared equitably)							
Drill/Plant	100%	100%	100%	100%	100%	100%	100%
Tillage and Chemical Applications:							
Chisel	100%	100%	100%	100%	100%	100%	100%
Disk	100%	100%	100%	100%	100%	100%	100%
Field cultivate	100%	100%	100%	100%	100%	100%	100%
Sweep	100%	100%	100%	100%	100%	100%	100%
Anhydrous application	100%	100%	100%	100%	100%	100%	100%
Fertilizer application	100%	100%	100%	100%	100%	100%	100%
Herbicide application	100%	100%	-100%	-100%	-100%	-100%	-100%
Insecticide application	100%	100%	100%	100%	100%	100%	100%
Harvest							
Harvest	100%	100%	100%	100%	100%	100%	100%
Hauling	100%	100%	100%	100%	100%	100%	100%
Miscellaneous							
Non-machinery labor	100%	100%	100%	100%	100%	100%	100%
Irrigation expenses							
Labor	100%	100%	100%	100%	100%	100%	100%
Fuel and oil	100%	100%	100%	100%	100%	100%	100%
Repair and maintenance	100%	100%	100%	100%	100%	100%	100%
Irrigation investment							
Well, pump and gearhead	0%	0%	0%	0%	0%	0%	0%
Motor	0%	0%	0%	0%	0%	0%	0%
Irrigation system	0%	0%	0%	0%	0%	0%	0%
Land	0%	0%	0%	0%	0%	0%	0%
Cash payment to landowner, \$/acre	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
Operator's equitable share (OS%)	68.0%					60.7%	67.7%
Landowner's equitable share (LS%)	32.0%					39.3%	32.3%

Pre-defined operator's share for income (crop sales and government payments)<sup>1</sup>  
 Operator's share (if > 0, OS% will be over-riden) 0.0%

<sup>1</sup> By entering a pre-defined share for the operator (landowner share is calculated as 100% minus operator share), the calculated equitable share percentage (cell L70) will be over-riden and not used in the Lease Budgets tab.

Operator and Landowner's inputs, shares are based on the equitable concept.

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Shares page

This analysis indicates that the operator is contributing 67.7% and the landowner 32.3% of total resources in this example where the landowner also owns the center pivot. The operator's and landowners costs and returns for this particular crop share leasing arrangement are shown below.

CROP BUDGETS SHOWING OPERATOR'S COSTS AND RETURNS

Tenant, Northwest KS, 123-456-9999		8:38 AM	01/23/09		
Equitable share (OS%) =====>	67.7%	67.7%	67.7%		
Crop/System	Corn	Wht-Flw	Total	Per	Per
Total tillable acre	=====>		160.0	Planted	Tillable
Planted acres of each crop	125.0	17.5	142.5	Acre	Acre
Harvested yield per acre	200.0	45.0	--	--	--
<b>INCOME PER ACRE</b>					
A. Yield per acre	135.3	30.4	--	--	--
B. Price per unit	\$3.57	\$5.38	--	--	--
C. Net government payments	\$22.01	\$11.00	\$2,944	\$20.66	\$18.40
D. Indemnity payments	\$0.00	\$0.00	\$0	\$0.00	\$0.00
E. Miscellaneous income	\$0.00	\$0.00	\$0	\$0.00	\$0.00
F. Returns/acre ((AxB) + C + D + E)	\$505.11	\$174.81	\$66,198	\$464.55	\$413.74
<b>COSTS PER ACRE</b>					
1. Seed	\$67.20	\$10.40	\$8,582	\$60.22	\$53.64
2. Herbicide	23.81	8.08	3,118	21.88	19.48
3. Insecticide / Fungicide	23.65	0.00	2,956	20.74	18.48
4. Fertilizer and Lime	165.92	49.16	21,600	151.58	135.00
5. Crop Consulting	6.50	0.00	813	5.70	5.08
6. Crop Insurance	33.83	8.46	4,377	30.71	27.36
7. Drying	0.00	0.00	0	0.00	0.00
8. Miscellaneous	10.00	5.50	1,346	9.45	8.41
9. Machinery Expense	148.38	97.32	20,251	142.11	126.57
10. Non-machinery Labor	16.77	11.70	2,301	16.15	14.38
11. Irrigation	116.84	0.00	14,605	102.49	91.28
12. Land Charge / Rent	0.00	0.00	0	0.00	0.00
G. SUB TOTAL	\$612.90	\$190.62	\$79,948	\$561.04	\$499.68
13. Interest on 1/2 Nonland Costs	22.53	6.32	2,927	20.54	18.29
H. TOTAL COSTS	\$635.43	\$196.94	\$82,875	\$581.58	\$517.97
I. RETURNS OVER COSTS (F - H)	(\$130.31)	(\$22.13)	(\$16,676)	(\$117.03)	(\$104.23)
J. TOTAL COSTS/UNIT (H/A)	\$4.70	--	--	--	--
K. RETURN TO TOTAL COST (I/H)	-20.51%	-11.24%	-20.12%	-20.12%	-20.12%

CROP BUDGETS SHOWING LANDOWNER'S COSTS AND RETURNS

Landowner, Northwest KS, 123-456-8888		8:38 AM	01/23/09		
Equitable share (100 - OS%) =====>	32.3%	32.3%	32.3%		
Crop/System	Corn	Wht-Flw	Total	Per	Per
Total tillable acre	=====>		160.0	Planted	Tillable
Planted acres of each crop	125.0	17.5	142.5	Acre	Acre
Harvested yield per acre	200.0	45.0	--	--	--
<b>INCOME PER ACRE</b>					
A. Yield per acre	64.7	14.6	--	--	--
B. Price per unit	\$3.57	\$5.38	--	--	--
C. Net government payments	\$10.52	\$5.26	\$1,407	\$9.87	\$8.79
D. Indemnity payments	\$0.00	\$0.00	\$0	\$0.00	\$0.00
E. Miscellaneous income	\$0.00	\$0.00	\$0	\$0.00	\$0.00
F. Returns/acre ((AxB) + C + D + E)	\$241.42	\$83.55	\$31,639	\$222.03	\$197.74
<b>COSTS PER ACRE</b>					
1. Seed	\$0.00	\$0.00	\$0	\$0.00	\$0.00
2. Herbicide	11.73	3.98	1,536	10.78	9.60
3. Insecticide / Fungicide	11.65	0.00	1,456	10.22	9.10
4. Fertilizer and Lime	81.72	24.21	10,639	74.66	66.49
5. Crop Consulting	0.00	0.00	0	0.00	0.00
6. Crop Insurance	16.17	4.04	2,092	14.68	13.07
7. Drying	0.00	0.00	0	0.00	0.00
8. Miscellaneous	0.00	0.00	0	0.00	0.00
9. Machinery Expense	0.00	6.66	117	0.82	0.73
10. Non-machinery Labor	0.00	0.00	0	0.00	0.00
11. Irrigation	93.49	0.00	11,686	82.01	73.04
12. Land Charge / Rent	80.00	83.00	11,453	80.37	71.58
G. SUB TOTAL	\$294.75	\$121.90	\$38,978	\$273.53	\$243.61
13. Interest on 1/2 Nonland Costs	4.85	1.47	632	4.44	3.95
H. TOTAL COSTS	\$299.61	\$123.36	\$39,610	\$277.96	\$247.56
I. RETURNS OVER COSTS (F - H)	(\$58.19)	(\$39.82)	(\$7,970)	(\$55.93)	(\$49.81)
J. TOTAL COSTS/UNIT (H/A)	\$4.63	--	--	--	--
K. RETURN TO TOTAL COST (I/H)	-19.42%	-32.27%	-20.12%	-20.12%	-20.12%

The final summary comparison of alternative estimates of equitable irrigated crop leasing arrangements are shown below.

ALTERNATIVE METHODS OF ESTIMATING CASH RENT				8:38 AM	01/23/09
Crop/System	Corn	Wht-Flw	Total	Per	Per
Total tillable acre	=====>		160.0	Planted	Tillable
Planted acres of each crop	125.0	17.5	142.5	Acres	Acres
<b>A. Landowner's COST</b>					
Land	\$80.00	\$83.00	\$11,453	\$80.37	\$71.58
Irrigation equipment	\$93.49	\$0.00	\$11,686	\$82.01	\$73.04
<b>Total</b>	<b>\$173.49</b>	<b>\$83.00</b>	<b>\$23,139</b>	<b>\$162.38</b>	<b>\$144.62</b>
<b>B. Landowner's EQUITABLE SHARE RENT ---- risk adj factor</b>					
					<b>3.0%</b>
Total income	\$746.53	\$258.36	\$97,838	\$686.58	\$611.48
Landowner's share	32.3%	32.3%	32.3%	32.3%	32.3%
Landowner's income	\$241.42	\$83.55	\$31,639	\$222.03	\$197.74
Landowner operating expense	126.12	40.36	16,471	115.58	102.94
Income less operating expense	\$115.30	\$43.18	\$15,168	\$106.44	\$94.80
Less risk adjustment	3.46	1.30	455	3.19	2.84
<b>Cash rent equivalent</b>	<b>\$111.84</b>	<b>\$41.89</b>	<b>\$14,713</b>	<b>\$103.25</b>	<b>\$91.96</b>
<b>C. Amount tenant CAN AFFORD TO PAY</b>					
Total income	\$746.53	\$258.36	\$97,838	\$686.58	\$611.48
Total operating expense	\$761.54	\$237.30	\$99,345	\$697.16	\$620.91
<b>Return to land and irr equip</b>	<b>(\$15.01)</b>	<b>\$21.06</b>	<b>(\$1,508)</b>	<b>(\$10.58)</b>	<b>(\$9.42)</b>
<b>Comparison of alternative cash rent methods</b>					
Low	(\$15.01)	\$21.06	(\$1,508)	(\$10.58)	(\$9.42)
Average	\$90.11	\$48.65	\$12,115	\$85.02	\$75.72
High	\$173.49	\$83.00	\$23,139	\$162.38	\$144.62
Returns above all costs (profit)	(\$188.50)	(\$61.94)	(\$24,647)	(\$172.96)	(\$154.04)

Part A of this table shows that the landowner's costs for this land, including both the cash and opportunity cost of the irrigation equipment and the opportunity cost of farmland ownership (5% target rate of return) amount to \$144.62 per acre.

Part B indicates that for this example in which the landowner owns the center pivot irrigation system and contributes a 1/3 share of selected crop input costs (fertilizer, herbicides, insecticides and crop insurance), with a 3% risk adjustment factor, the landowner's equivalent share rent is \$91.96 per tillable acre.

Part C shows that the amount the tenant can afford to pay if all resources are valued at their full economic opportunity cost is actually negative (i.e., -\$9.42 per acre). That said, full economic opportunity costs for irrigation equipment, labor and farmland are often not fully covered in such leasing arrangements.

In a comparison of the alternative cash rent calculation methods, the average rent per tillable acre is \$75.72 for the full 160 acre field, with an average of \$90.11 on the irrigated corn acres and of \$45.38 per acre on the dryland acres.

## SCENARIO #2: CENTER PIVOT OWNED BY OPERATOR, SHARING OF SELECTED CROP INPUT EXPENSES

The second analysis of how equitable a common irrigated cropland leasing arrangement is focused on the scenario in which the Operator (i.e., tenant) owns the center pivot irrigation system and shares the cost of selected crop input expenses. All other aspects of the lease are unchanged from the first scenario.

OPERATOR'S share of machinery, labor, irrigation, and land (enter -100% if shared equitably)						
Drill/Plant	100%	100%	100%	100%	100%	100%
Tillage and Chemical Applications:						
Chisel	100%	100%	100%	100%	100%	100%
Disk	100%	100%	100%	100%	100%	100%
Field cultivate	100%	100%	100%	100%	100%	100%
Sweep	100%	100%	100%	100%	100%	100%
Anhydrous application	100%	100%	100%	100%	100%	100%
Fertilizer application	100%	100%	100%	100%	100%	100%
Herbicide application	100%	100%	-100%	-100%	-100%	-100%
Insecticide application	100%	100%	100%	100%	100%	100%
Harvest						
Harvest	100%	100%	100%	100%	100%	100%
Hauling	100%	100%	100%	100%	100%	100%
Miscellaneous						
Non-machinery labor	100%	100%	100%	100%	100%	100%
Irrigation expenses						
Labor	100%	100%	100%	100%	100%	100%
Fuel and oil	100%	100%	100%	100%	100%	100%
Repair and maintenance	100%	100%	100%	100%	100%	100%
Irrigation investment						
Well, pump and gearhead	0%	0%	0%	0%	0%	0%
Motor	0%	0%	0%	0%	0%	0%
Irrigation system	100%	100%	100%	100%	100%	100%
Land						
Cash payment to landowner, \$/acre	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Operator's equitable share (OS%)	72.7%				60.7%	72.2%
Landowner's equitable share (LS%)	27.3%				39.3%	27.8%

Pre-defined operator's share for income (crop sales and government payments) <sup>1</sup>		
Operator's share (if > 0, OS% will be over-ridden)		0.0%
<small><sup>1</sup> By entering a pre-defined share for the operator (landowner share is calculated as 100% minus operator share), the calculated equitable share percentage (cell L70) will be over-ridden and not used in the <i>Lease Budgets</i> tab.</small>		

*Operator and Landowner's income shares are based on the equitable concept.*

Part A of the following table shows that the landowner's costs for this land, including both the cash and opportunity cost of the irrigation equipment and the opportunity cost of farmland ownership (5% target rate of return) amount to \$112.08 per acre.

Part B indicates that for this example in which the operator owns the center pivot irrigation system with the landowner contributing a 1/3 share of selected crop input costs (fertilizer, herbicides, insecticides and crop insurance), with a 3% risk adjustment factor, the landowner's equivalent share rent is \$67.14 per tillable acre.

Part C shows that the amount the tenant can afford to pay if all resources are valued at their full economic opportunity cost is actually negative (i.e., -\$42.96 per acre). As in the previous illustration, full economic opportunity costs for

irrigation equipment, labor and farmland are often not fully covered in such leasing arrangements.

In a comparison of the alternative cash rent calculation methods, the average rent per tillable acre is \$45.75 for the full 160 acre field, with an average of \$52.21 on the irrigated corn acres and of \$45.38 per acre on the dryland acres.

ALTERNATIVE METHODS OF ESTIMATING CASH RENT						11:46 AM	01/23/09
Crop/System	Corn	Wht-Flw	Total	Per Planted Acre	Per Tillable Acre		
Total tillable acre	=====>		160.0				
Planted acres of each crop	125.0	17.5	142.5				
<b>A. Landowner's COST</b>							
Land	\$80.00	\$83.00	\$11,453	\$80.37	\$71.58		
Irrigation equipment	\$51.84	\$0.00	\$6,480	\$45.47	\$40.50		
<b>Total</b>	<b>\$131.84</b>	<b>\$83.00</b>	<b>\$17,933</b>	<b>\$125.84</b>	<b>\$112.08</b>		
<b>B. Landowner's EQUITABLE SHARE RENT ---- risk adj factor 3.0%</b>							
Total income	\$746.53	\$258.36	\$97,838	\$686.58	\$611.48		
Landowner's share	27.8%	27.8%	27.8%	27.8%	27.8%		
Landowner's income	\$207.73	\$71.89	\$27,225	\$191.05	\$170.15		
Landowner operating expense	123.77	38.82	16,151	113.34	100.94		
Income less operating expense	\$83.96	\$33.07	\$11,074	\$77.71	\$69.21		
Less risk adjustment	2.52	0.99	332	2.33	2.08		
<b>Cash rent equivalent</b>	<b>\$81.45</b>	<b>\$32.08</b>	<b>\$10,742</b>	<b>\$75.38</b>	<b>\$67.14</b>		
<b>C. Amount tenant CAN AFFORD TO PAY</b>							
Total income	\$746.53	\$258.36	\$97,838	\$686.58	\$611.48		
Total operating expense	\$803.19	\$237.30	\$104,552	\$733.70	\$653.45		
<b>Return to land and irr equip</b>	<b>(\$56.66)</b>	<b>\$21.06</b>	<b>(\$6,714)</b>	<b>(\$47.12)</b>	<b>(\$41.96)</b>		
<b>Comparison of alternative cash rent methods</b>							
Low	(\$56.66)	\$21.06	(\$6,714)	(\$47.12)	(\$41.96)		
Average	\$52.21	\$45.38	\$7,320	\$51.37	\$45.75		
High	\$131.84	\$83.00	\$17,933	\$125.84	\$112.08		
Returns above all costs (profit)	(\$188.50)	(\$61.94)	(\$24,647)	(\$172.96)	(\$154.04)		

## CONCLUSIONS

These illustrations of equitable leasing arrangements are intended for general illustration purposes. They may or may not be representative of a particular farm or equitable farmland leasing relationship, depending on the degree to which that a particular field, irrigation system, or set of production costs does or does not accurately fit other situations.

Alternative leasing scenarios can be calculated for the irrigated crops, including sunflowers, soybeans, grain sorghum and wheat. In this session at the 2009 Central Plains Irrigation Conference, we will give closer scrutiny to the cost estimates used in these examples, and show the effect of using alternative crops and cropping systems upon the bottom line equitable lease returns. We will also show a number of nonirrigated / dryland crop leasing arrangement examples, and discuss some relevant irrigated equipment – related tax planning issues.