KANSAS FARM MANAGEMENT & MARKETING HANDBOOK

KSU Farm Management Guide MF-284

Kansas Irrigation Leases

Department of Agricultural Economics

K-STATE Kansas State University

Kansas State University Agricultural Experiment Station and Cooperative Extension Service

Daniel M. O'Brien
Extension Agricultural Economist, NW

Irrigation Leases

An irrigation lease is a contract by which property is conveyed for a term of years for a specified rent. This guide illustrates crop-share irrigation lease inputs and costs for center-pivot and flood-irrigation systems.

Lease Contract

The lease contract should be in writing to protect all parties in case of death, divorce, termination of the lease, etc. Written leases clarify to each party (landlord and tenant) their specific responsibilities as to furnishing resources, sharing expenses, sharing receipts, and determining how each party is compensated for unexhausted resources upon termination of the lease.

Equitable Lease

Sharing crops and expenses varies from lease to lease. Variation in leasing arrangements is expected because the ownership of resources by landlords and tenants may vary for different leases. The following examples illustrate different landlord and tenant contributions toward production and the resulting equitable crop share of each party. Generally, variable crop inputs such as fertilizer, herbicides, and drying should be shared in the same proportion as the crop is shared.

Establishing a Crop Share Arrangement

Irrigated farming is a business involving the combination of land, irrigation equipment, machinery, labor, management and other inputs to produce crops. In a lease arrangement, each of these inputs is owned or contributed by different parties. Payment for the inputs should be proportional to the value contributed toward production. Equitable payment to each party is the reason for developing a lease. An equitable lease should be developed using some basic rules or principles. Five important principles include:

1. Variable expenses that increase yields should be shared in the same percentage as the crop.
2. Share arrangements should be adjusted to reflect the effect new technology has on costs.
3. Both landlord and tenant should share total returns in the same proportion as they contribute resources.
4. Tenants and landlords should be compensated at the termination of the lease for the undepreciated balance of long-term investments.
5. Effective communication should be maintained between landlord and tenant.

Irrigation Lease Worksheet and Examples

An irrigation lease worksheet is provided in Table 1 for calculating landlord and tenant expense contributions and crop share percentages. Table 2 illustrates five center-pivot crop share lease situations according to the irrigation components furnished by the landlord or tenant. These scenarios show how landlord and tenant percentage contributions vary when landlords contribute a) land only, b) land and well, c) land, well, pump and gearhead, d) land, well, pump, gearhead and power unit, and e) land, well, pump, gearhead, power unit and irrigation system. In these examples, labor, crop machinery, seed (less a technology fee), crop fuel, miscellaneous and the tenant pays management costs. Given these landlord-tenant expense contributions, to have an equitable lease both the remainder of the variable expenses (lines 27-37) and the crop should be shared in the same percentages as indicated on lines 26 and 39 of Table 1. Table 3 provides the same type of lease analysis information for flood irrigation systems.

Additional Information

For more information on irrigation crop share lease arrangements, see NCR Publication 148 *Irrigation Crop Share and Cash Rental Arrangements for Your Farm*. Additional information on lease arrangements and lease forms can be obtained from Research and Extension offices.

Table 1. Irrigation Lease Worksheet

Irrigation System Type________________________ Location _______________________________________

Line	Value: Total	Value: Per Acre[1]		Rate or Life	Per Acre Charge[2]	Your Farm: Landlord	Your Farm: Tenant
1. Land (Undeveloped)	$______	$______	×	.06	$______	$_______	$_______
2. Land Real Estate Tax			×	.005	$______	$_______	$_______
3. Land Development	$______	$______	×	.06	$______	$_______	$_______
4. Development Real Estate Tax			×	.005	$______	$_______	$_______
5. Well (_____ ft.)	$______	$______	×	.06	$______	$_______	$_______
6. Well Depreciation			÷	15 yr	$______	$_______	$_______
7. Pump	$______	$______	×	.06	$______	$_______	$_______
8. Pump Depreciation			÷	15 yr	$______	$_______	$_______
9. Gearhead	$______	$______	×	.06	$______	$_______	$_______
10. Gearhead Depreciation			÷	15 yr	$______	$_______	$_______
11. Power Unit/Meter	$______	$______	×	.045	$______	$_______	$_______
12. Power Unit/Meter Depreciation			÷	7 yr	$______	$_______	$_______
13. Irrigation System:_________	$______	$______	×	.045	$______	$_______	$_______
14. Irrigation System Depreciation			÷	10 yr	$______	$_______	$_______
15. Irrigation Equipment Repairs[3]	XXX	$______	×	.01-.02	$______	$_______	$_______
16. Irrigation Equipment Insurance[3]			×	.0025	$______	$_______	$_______
17. Labor	XXX	____hrs.	×	$___/hr	$______	$_______	$_______
18. Crop Machinery			×	.045	$______	$_______	$_______
19. Crop Machinery Depreciation[4]	XXX	$______	÷	10 yr	$______	$_______	$_______
20. Machinery Repairs & Insurance			×	.09-.14	$______	$_______	$_______
21. Management[5]	XXX	$______	×	.02	$______	$_______	$_______
22. Seed (less technology fee)[6]					$______	$_______	$_______
23. Crop Fuel					$______	$_______	$_______
24. Miscellaneous Costs					$______	$_______	$_______
25. Cost Subtotal (Lines 1-24)					$______	$_______	$_______
26. Percent Inputs Contributed =	Line 25 Landlord (Tenant) / Line 25 Per Acre Charge				100%	______%	______%
Other Shared Crop Inputs					$______	$_______	$_______
27. Seed Technology Fee[6]	It is suggested that expenses on lines 27-37 are shared in the same proportion as crop inputs are contributed (as indicated on line 26)				$______	$_______	$_______
28. Fertilizer					$______	$_______	$_______
29. Herbicide					$______	$_______	$_______
30. Insecticide					$______	$_______	$_______
31. Irrigation Fuel					$______	$_______	$_______
32. Crop Insurance					$______	$_______	$_______
33. Custom Harvest					$______	$_______	$_______
34. Drying					$______	$_______	$_______
35. Custom Hauling					$______	$_______	$_______
36. Consulting					$______	$_______	$_______
37. Operating Interest					$______	$_______	$_______
38. TOTAL ALL COSTS (Line 25 plus lines 27-37)					$______	$_______	$_______
39. Percent Share of All Input Costs & Crop Share Percent Crop Share = Line 38 Landlord (Tenant) / Line 38 Per Acre Charge					100%	______%	______%

[1] Per acre values are based on number of acres irrigated, which may be 126 acres for a center pivot.
[2] Obtain "Per Acre Charge" by multiplying, or dividing, per acre value by rate or life.
[3] Irrigation equipment repairs and insurance can be calculated using percentages of new cost or actual farm records.
[4] Crop machinery depreciation is calculated using both original and salvage value and assuming a 10 year life. Original value less salvage value divided by 10 years equals the annual machinery depreciation charge. In K-State crop enterprise budgets machinery salvage value is assumed to be 35% of original value.
[5] Management charge based on average investment in land, land development, irrigation equipment, and crop machinery.
[6] Seed technology fee is the additional cost of genetically modified seed over regular seed.

Table 2. Center Pivot Irrigation Crop Share Leases (Example Corn)* Sample Landlord Tenant Share Arrangements

System A indicates landlord contributes only land—Col's B, C, D, and E indicate landlord furnishes additional items. L indicates Landlord's share, T indicates Tenant's share of expenses.

Alternative Scenarios		Value[1]				A		B		C		D		E	
					Per Ac.	Land Only[3]		Add Well		Add Pump and Gearhead		Add Power Unit		Add System	
Line	Item	Total Acres	Per Acre	Rate[2]	Annual Charge	L	T	L	T	L	T	L	T	L	T
1	Land (Undeveloped)	$87,822	$697.00	6.00%	$41.82	$41.82		$41.82		$41.82		$41.82		$41.82	
2	Land Real Estate Tax[4]			0.50%	5.07	5.07		5.07		5.07		5.07		5.07	
3	Land Development														
4	Dev. Real Estate Tax[4]														
5	Well (300')[5]	18,995	150.75	6.00%	9.05		9.05	9.05		9.05		9.05		9.05	
6	Well Depreciation			15 yrs	10.05		10.05	10.05		10.05		10.05		10.05	
7	Pump	17,431	138.34	6.00%	8.30		8.30		8.30	8.30		8.30		8.30	
8	Pump Depreciation			15 yrs	9.22		9.22		9.22	9.22		9.22		9.22	
9	Gearhead	3,570	28.33	6.00%	1.70		1.70		1.70	1.70		1.70		1.70	
10	Gearhead Depreciation			15 yrs	1.89		1.89		1.89	1.89		1.89		1.89	
11	Power Unit/Meter	5,950	47.22	4.50%	2.12		2.12		2.12		2.12	2.12		2.12	
12	Power Depreciation			7 yrs	6.75		6.75		6.75		6.75	6.75		6.75	
13	Irrigation System	45,473	360.90	4.50%	16.24		16.24		16.24		16.24		16.24	16.24	
14	Irr. System Depreciation			10 yrs	36.09		36.09		36.09		36.09		36.09	36.09	
15	Irr. Equipment Repair	832	6.60		6.60		6.60		6.60		6.60		6.60	6.60	
16	Irr. Equipment Insurance		1.80	0.25%	1.80		1.80	0.37	1.43	0.79	1.01	0.90	0.89	1.80	0.00
17	Labor		2.45	10.80	26.46		26.46		26.46		26.46		26.46		26.46
18	Crop Machinery[6]		236.00	4.50%	14.34		14.34		14.34		14.34		14.34		14.34
19	Crop Mach. Depreciation[6]			10 yrs	15.34		15.34		15.34		15.34		15.34		15.34
20	Machinery Repairs & Ins.		26.80		26.80		26.80		26.80		26.80		26.80		26.80
21	Management[7]		1,659	2.00%	33.17		33.17		33.17		33.17		33.17		33.17
22	Seed (less technology fee)[8]				38.08		38.08		38.08		38.08		38.08		38.08
23	Crop Fuel				16.00		16.00		16.00		16.00		16.00		16.00
24	Op. Interest + Misc. Costs				13.37		13.37		13.37		13.37		13.37		13.37
25	Cost Subtotal				340.25	46.89	293.36	66.36	273.89	87.89	252.37	96.87	243.38	156.70	183.55
26	Percent Inputs Contributed					14%	86%	20%	80%	26%	74%	28%	72%	46%	54%
Other Shared Crop Inputs															
27	Seed Technology Fee[8]														
28	Fertilizer				42.48	5.85	36.63	7.14	29.48	7.62	21.87	6.23	15.64	7.20	8.44
29	Herbicide				38.87	5.36	33.51	6.54	26.98	6.97	20.01	5.70	14.31	6.59	7.72
30	Insecticide				39.70	5.47	34.23	6.68	27.55	7.12	20.44	5.82	14.62	6.73	7.89
31	Irrigation Fuel				82.72	11.40	71.32	13.91	57.41	14.83	42.58	12.12	30.46	14.03	16.43
32	Crop Insurance				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33	Custom Harvest[6]				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
34	Drying				18.00	2.48	15.52	3.03	12.49	3.23	9.27	2.64	6.63	3.05	3.58
35	Custom Hauling				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36	Consulting				6.50	0.90	5.60	1.09	4.51	1.17	3.35	0.95	2.39	1.10	1.29
37	Operating Interest (lines 27-36)				11.41	1.57	9.84	2.23	9.19	2.95	8.47	3.25	8.16	5.26	6.16
38	TOTAL ALL COSTS				579.94	79.92	500.01	106.97	441.50	131.75	378.34	133.58	335.59	200.66	235.05
39	Percent Share of All Crop Inputs & Crop Share					14%	86%	20%	80%	26%	74%	28%	72%	46%	54%

** Information obtained from MF-836, "Irrigation Capital Requirements and Energy Costs," and MF-585, "Center Pivot Irrigated Corn Cost-Return Budget." For other crops, change labor and variable cost values.*

[1] Total and per acre values are based on 126 acre center pivot. These values assume the other 34 acres will have dryland crop production, and thus be produced under a dryland crop lease.

[2] Interest charge of 6 percent against investment in land and land development. An interest charge of 4.5 percent against total new investment cost is equal to an interest charge of 10 percent against the average investment cost spread over the useful life of the well, pump, gearhead, power unit, pivot, and crop machinery.

[3] Lease arrangement feasible only for a tenant with long-term written lease.

[4] Real estate tax is computed on the value of land, land development, well, pump, and gearhead. In above example, landlord is assumed to pay all real estate taxes.

[5] Well depths vary from 100 to 600 feet, which will affect pumping costs.

[6] Crop machinery investment includes harvesting and grain hauling equipment. If grain harvesting and hauling is custom hired, include value under the tenant if the cost is not shared. Crop machinery depreciation assumes 35 percent salvage value.

[7] Management fees are calculated as a percentage of total capital managed. In this case total capital managed includes investment in land, land development, irrigation equipment, and crop machinery.

[8] The extra cost of genetically modified seed corn relative to regular seed corn is classified as a "seed technology fee," and designated as an input to be shared. This is done to compensate parties for changes in herbicide or insecticide expenses associated with the use of genetically modified seed.

Table 3. Flood Irrigation Crop Share Leases (Example Corn)* Sample Landlord-Tenant Share Arrangements

Alternative Scenarios

System A indicates landlord contributes only land—Col's B, C, D, and E indicate landlord furnishes additional items. L indicates Landlord's share, T indicates Tenant's share of expenses.

Line	Item	Value[1] Total Acres	Value[1] Per Acre	Rate[2]	Per Ac. Annual Charge	A Land Only[3] L	A Land Only[3] T	B Add Well L	B Add Well T	C Add Pump and Gearhead L	C Add Pump and Gearhead T	D Add Power Unit L	D Add Power Unit T	E Add System L	E Add System T
1	Land (Undeveloped)	$122,240	$764.00	6.00%	$45.84	$45.84		$45.84		$45.84		$45.84		$45.84	
2	Land Real Estate Tax[4]			0.50%	5.07	5.07		5.07		5.07		5.07		5.07	
3	Land Development														
4	Dev. Real Estate Tax[4]														
5	Well (300')[5]	19,000	118.75	6.00%	7.13		7.13	7.13		7.13		7.13		7.13	
6	Well Depreciation			15 yrs	7.92		7.92	7.92		7.92		7.92		7.92	
7	Pump	17,440	109.00	6.00%	6.54		6.54		6.54	6.54		6.54		6.54	
8	Pump Depreciation			15 yrs	7.27		7.27		7.27	7.27		7.27		7.27	
9	Gearhead	3,560	22.25	6.00%	1.34		1.34		1.34	1.34		1.34		1.34	
10	Gearhead Depreciation			15 yrs	1.48		1.48		1.48	1.48		1.48		1.48	
11	Power Unit/Meter	5,950	37.19	4.50%	1.67		1.67		1.67		1.67	1.67		1.67	
12	Power Depreciation			7 yrs	5.31		5.31		5.31		5.31	5.31		5.31	
13	Irrigation System	5,258	32.86	4.50%	1.48		1.48		1.48		1.48		1.48	1.48	
14	Irr. System Depreciation			10 yrs	3.29		3.29		3.29		3.29		3.29	3.29	
15	Irr. Equipment Repair	672	4.20		4.20		4.20		4.20		4.20		4.20	4.20	
16	Irr. Equipment Insurance		0.79	0.25%	0.79		0.79	0.29	0.50	0.62	0.17	0.71	0.08	0.79	0.00
17	Labor		3.05	10.80	32.94		32.94		32.94		32.94		32.94		32.94
18	Crop Machinery[6]		239.00	4.50%	14.52		14.52		14.52		14.52		14.52		14.52
19	Crop Mach. Depreciation[6]			10 yrs	15.54		15.54		15.54		15.54		15.54		15.54
20	Machinery Repairs & Ins.		25.40		25.40		25.40		25.40		25.40		25.40		25.40
21	Management[7]		1,323	2.00%	26.46		26.46		26.46		26.46		26.46		26.46
22	Seed (less technology fee)[8]				38.08		38.08		38.08		38.08		38.08		38.08
23	Crop Fuel				17.19		17.19		17.19		17.19		17.19		17.19
24	Op. Interest + Misc. Costs				13.68		13.68		13.68		13.68		13.68		13.68
25	Cost Subtotal				283.12	50.91	232.21	66.24	216.87	83.19	199.93	90.27	192.85	99.32	183.80
26	Percent Inputs Contributed					18%	82%	23%	77%	29%	71%	32%	68%	35%	65%
Other Shared Crop Inputs															
27	Seed Technology Fee[8]														
28	Fertilizer				42.48	7.64	34.84	8.15	26.69	7.84	18.85	6.01	12.84	4.50	8.33
29	Herbicide				38.87	6.99	31.88	7.46	24.42	7.18	17.25	5.50	11.75	4.12	7.63
30	Insecticide				39.70	7.14	32.56	7.62	24.94	7.33	17.61	5.62	12.00	4.21	7.79
31	Irrigation Fuel				71.19	12.80	58.39	13.66	44.73	13.14	31.58	10.07	21.51	7.55	13.97
32	Crop Insurance				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33	Custom Harvest[6]				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
34	Drying				18.00	3.24	14.76	3.45	11.31	3.32	7.99	2.55	5.44	1.91	3.53
35	Custom Hauling				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36	Consulting				6.50	1.17	5.33	1.25	4.08	1.20	2.88	0.92	1.96	0.69	1.28
37	Operating Interest (lines 27-36)				10.84	1.95	8.89	2.54	8.30	3.18	7.65	3.46	7.38	3.80	7.04
38	TOTAL ALL COSTS				510.69	91.83	418.86	110.37	361.35	126.39	303.74	124.39	265.73	126.09	233.36
39	Percent Share of All Crop Inputs & Crop Share					18%	82%	23%	77%	29%	71%	32%	68%	35%	65%

** Information obtained from MF-836, "Irrigation Capital Requirements and Energy Costs," and MF-578, "Flood Irrigated Corn Cost-Return Budget." For other crops, change labor and variable cost values. [1] Total and per acre values are based on 160 acres flood irrigation. Per acre charges rounded. [2] Interest charge of 6 percent against investment in land and land development. An interest charge of 4.5 percent against total new investment cost is equal to an interest charge of 10 percent against the average investment cost spread over the useful life of the well, pump, gearhead, power unit, pivot, and crop machinery. [3] Lease arrangement feasible only for a tenant with long-term written lease. [4] Real estate tax computed on the value of land, land development, well, pump, and gearhead. In above example, landlord is assumed to pay all real estate taxes. [5] Well depths vary from 100 to 600 feet, which will affect pumping costs. [6] Crop machinery investment includes harvesting and grain hauling equipment. If grain harvesting and hauling is custom hired, include value under the tenant if the cost is not shared. Crop machinery depreciation assumes 35 percent salvage value. [7] Management fees are calculated as a percentage of total capital managed. In this case total capital managed includes investment in land, land development, irrigation equipment, and crop machinery. [8] The extra cost of genetically modified seed corn relative to regular seed corn is classified as a "seed technology fee," and designated as an input to be shared. This is done to compensate parties for changes in herbicide or insecticide expenses associated with the use of genetically modified seed.*

Publications from Kansas State University are available on the World Wide Web at: http://www.oznet.ksu.edu

Kansas State University Agricultural Experiment Station and Cooperative Extension Service

MF-284 October 2000