



2017 Kansas County-Level Cash Rents for Irrigated Cropland

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Mykel Taylor, K-State Ag Economics, (785) 532-3033, mtaylor@agecon.ksu.edu
Leah Tsoodle, K-State Ag Economics, (785) 532-1517, ltsoodle@k-state.edu

Department of Agricultural Economics, Kansas State University

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Please Note:

The rental rate estimates provided in this publication are calculated for a newly negotiated, equitable lease for the 2017 crop year. **The rental rate estimates reflect what a typical producer could afford to pay, given expected profitability in 2017.** They do not necessarily reflect what people are paying for leased land or to what rental rate the market will ultimately adjust, if farm profitability remains low.

Rental Rate Market Overview

Profitability in the Kansas farm sector has declined dramatically in the past two years. According to Kansas Farm Management Association (KFMA) data, net farm income per operator declined statewide from \$122,190 in 2014 to \$4,568 in 2015 (Figure 1). The 2016 crop year is likely to be similar, although the impacts of low profitability are varied across the state. Counties with a higher proportion of wheat production, while enjoying above-average yields in 2016, faced low cash prices due to basis levels well below historic averages. Counties with a relatively high proportion of soybean production, however, had a good year of high yields and prices. The diversity of expected profitability for 2017 manifests in the rental rate estimates shown in this publication, with rental rate estimates holding steady from 2016 for the central third of the state and a decline in rental rate estimates for the western third of the state.

The rental rate estimates reflect what producers could pay for rented ground, based solely on expected yields, commodity prices, and production costs. Ignored in these calculations is the ability of producers to pay rent on leased ground using profits gained in previous crop years and/or available equity from owned assets. These factors will come into play when rental rates are negotiated for the 2017 crop year and are likely to keep rental rates above the estimated rates shown in this publication. The difference between the K-State and the U.S. Department of Agriculture-National Agricultural Statistics Service (USDA-NASS) estimates in Table 2 reflect a transition process from high to relatively low rents that will occur as long as profitability in the farming sector stays low for the next several years.

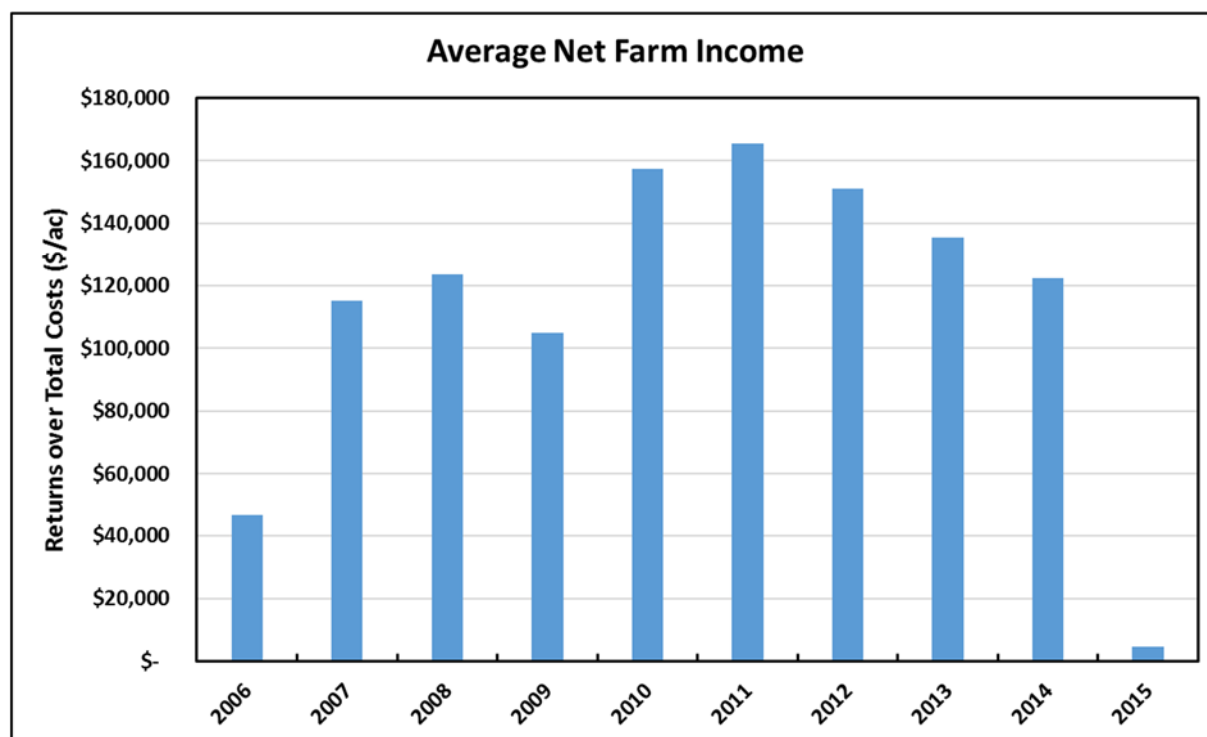


Figure 1. Average net farm income in Kansas, 2006-2015.

The recent decline in farm profitability puts producers in a difficult situation. Producers do not want to lose land if they can possibly afford to keep it, because the capital investment (e.g. machinery purchases, breeding herd size) and labor decisions they made over the past several years were based on the amount of land they had to farm. This will lead many to pay more for the land than estimates of expected profitability suggest they can pay and keep rental rates from falling at an accelerated rate, at least in the short-term. Over a longer period of time, if profitability remains low, rental rates will continue to decline as producers burn through existing working capital or equity and are unable to continue to pay higher rates.

It is worth noting that not all farmers have the same amount of working capital or equity in owned land available to them for paying rental rates above expected profit levels. Producers who started farming in the last 5-10 years are less likely to own most of the land they operate, making it difficult to subsidize high rental rates with returns from land they own. Similarly, a producer who employed an aggressive growth strategy in the past decade may also have trouble paying high rents due to borrowing costs on land they purchased. The impact of a farm recession on producers' ability to pay rents above expected profits will not be uniform.

Rental Rate Calculations

The first step in the cash rent estimation process is to determine equitable crop share percentages for the landowner and the operator. The decision aid used to guide these calculations is the *KSU-Lease.xls* Excel spreadsheet available at the AgManager.info website (<http://www.agmanager.info/land-leasing/land-rental-rates>). The basic premise of the approach in *KSU-Lease* is that a lease is considered to be equitable if the income from the lease is shared proportionally to the value of the inputs (costs) contributed by both parties.¹

The *KSU-Lease* spreadsheet requires input of production cost data for a given crop mix, expected yields, and expected commodity prices. Costs of production and farming practices are based on information in the Farm Management Guides (projected crop budgets published annually and available at <http://www.agmanager.info/farm-management-guides/2017-farm-management-guides-non-irrigated-crops>). The crop enterprise mix for each of six regions (NW, SW, NC, SC, NE, and SE) of the state is determined using average acres estimates from 2012-2015 from the KFMA database (<http://www.agmanager.info/kfma>). The crop mix is limited to wheat, corn, soybeans, and grain sorghum, where wheat is either summer-fallow or continuous. Expected yields for these same crops are estimated from the KFMA database using a 20-year trend-adjusted yield. Expected commodity prices are based on 2017-2019 harvest futures contracts (July for wheat, December for corn, and November for soybeans) and the average daily prices during the month of November 2016. To get at expected cash prices for each of the regions, 3-year historical (2014-2016) harvest-time basis levels are added to the average futures prices.

Other inputs required in the *KSU-Lease* spreadsheet are seed, fertilizer, chemical, land, and machinery costs. Prices of seed, fertilizer, and chemicals (herbicide, insecticide, and fungicide) are based on current costs. Machinery costs are based on region-specific projected custom rates for 2016, using a diesel price of \$2.00 per gallon, multiplied by typical farming operations in the region. Custom rates are used as a proxy for machinery costs. Land cost in the *KSU-Lease* spreadsheet is set at a level that results in an economic profit of \$0 per tillable acre. This is consistent with the economic theory that competitive industries, such as commodity farming, will have average economic profits close to zero in the long run. This happens because when profits are positive across most farms, those profits are used to bid up the price of fixed

¹ For a further discussion of the principles behind how leases are determined see publications NCFMEC-01 and NCFMEC-02 also available at www.AgManager.info.

assets like land. Likewise, if profits are negative, there will be economic pressures for land values (and rents) to decline.

Given the completed crop budgets in *KSU-Lease* for each of the four regions where irrigated crop production is common, the next step was to identify who provided each of the contributions and calculate the resulting equitable crop share percentages for the landowner and the operator. The equitable shares were calculated based on a net share lease (i.e., no inputs being shared by the landowner) with an adjustment to account for 100% of government payments going to the operator.² It is important to recognize that the calculated equitable crop share percentages are based on the relative contributions of the inputs, which may (or may not) reflect what people have traditionally done in the region. That is, the calculated values reflect what is equitable based on current costs and not necessarily what people have historically done.

The expected commodity prices, crop acreage mix, historic yields, and landowner's crop share percentage averaged to the regional level are presented in Table 1.³ A distinction in the net share percentage going to the landowner is made to account for ownership of the center pivot sprinkler. The percentage of the crop going to the landowner is higher when they own both the land and the sprinkler, reflecting a greater contribution on their part to the costs of production. It was assumed for all the regions that the well, pump, and gearhead was owned by the landowner. The difference in crop share splits across the regions reflects the relative productivity of land, production costs, and expected prices for the coming year.

The second step in the cash rent estimation process was to use the equitable crop share percentages determined in step one to calculate the expected return to the landowner, given price and yield expectations for the 2016 crop year for each county.⁴ To do this, the estimated crop share split was applied to 8-year historical county-level yields (2009-2016), as reported by USDA-NASS, and the expected commodity price forecasts shown in Table 1 to determine an estimate of expected landowner crop share revenue at the county level. The crop rotation (i.e., crop mix) was based on county level data from the 2002

² The completed versions of the *KSU-Lease* files include numerous details that are not presented here to save space. However, the files are available from the authors upon request.

³ These values will deviate from what might be "typical" in a region for two primary reasons. First, these values reflect what is equitable based on current land values and farming practices. Second, these values have been adjusted to account for the operator receiving 100% of government payments.

⁴ For counties in the West Central, and Central regions, the average crop share percentage for the corresponding northern and southern regions was used.

Table 1. Input Values Used to Estimate Cash Rental Rates for Irrigated Land

Region	Price, \$/bu	Crop Enterprise Mix, % of acres*	20-Year Adjusted Trend Yields*	Landowner's Crop Share	
				Tenant-Owned Pivot	Landowner-Owned Pivot
Northwest				10.4%	17.1%
Wheat	3.89	76.4	63.0		
Corn	3.18	14.2	239.0		
Soybeans	7.80	8.8	62.0		
Grain Sorghum	2.69	0.5	105.0		
Southwest				8.8%	18.0%
Wheat	3.95	42.5	65.0		
Corn	3.45	16.9	216.0		
Soybeans	7.92	27.7	57.0		
Grain Sorghum	2.78	12.9	110.0		
North Central				14.6%	23.5%
Wheat	3.99	56.3	62.0		
Corn	3.02	40.1	220.0		
Soybeans	7.97	1.9	65.0		
Grain Sorghum	2.74	1.6	112.0		
South Central				15.0%	25.6%
Wheat	4.02	54.0	66.5		
Corn	3.22	32.6	202.0		
Soybeans	8.09	10.6	57.0		
Grain Sorghum	2.79	2.8	114.0		

* Crop enterprise mix and trend yields presented here are averaged across the KFMA region. However, county-level values for both of these variables were used to calculate the county-level rental rates.

and 2007 Census of Agriculture. **Counties with less than 5,000 acres of irrigated farmland, according to the Census, were excluded from the estimates.**

The K-State estimates, shown in Table 2 for tenant-owned pivot lease arrangements and Table 3 for landowner-owned lease arrangements, of the 2017 crop year are down from estimates for the 2016 crop year for most counties (publication available at <http://www.agmanager.info/farmmgmt/land/lease>). Also presented are the survey-based rental rates for 2016 from USDA-NASS. The rental rates for irrigated land from USDA-NASS do not denote who owns the irrigation equipment, making direct comparisons to the K-State estimates difficult.

Table 2. Estimated Irrigated Cropland Rents (\$/ac) for Tenant-Owned Pivot

Region	County	2014	2015	2016	2017	2016 NASS					2016 NASS Rent (\$/ac) ²		
						2016 NASS Rent (\$/ac) ²	Region	County	2014	2015		2016	2017
NW	Cheyenne	179.00	112.00	82.00	42.00	215.00	NC	Clay [^]	245.00	171.00	78.00	58.00	149.00
	Decatur [^]	168.00	106.00	76.00	39.00	118.00		Cloud [^]	240.00	167.00	78.00	56.00	149.00
	Graham [^]	143.00	90.00	65.00	33.00	118.00		Jewell [^]	250.00	174.00	81.00	59.00	149.00
	Norton [^]	176.00	111.00	80.00	42.00	118.00		Mitchell [^]	223.00	156.00	72.00	52.00	149.00
	Rawlins	170.00	107.00	77.00	39.00	157.00		Osborne [^]	210.00	146.00	67.00	49.00	149.00
	Sheridan	203.00	128.00	93.00	48.00	155.00		Ottawa [^]	--	--	--	--	149.00
	Sherman [^]	196.00	123.00	90.00	46.00	118.00		Phillips [^]	251.00	175.00	82.00	59.00	149.00
	Thomas	198.00	125.00	91.00	47.00	149.00		Republic	262.00	182.00	85.00	62.00	199.00
								Rooks [^]	--	--	--	--	149.00
								Smith [^]	--	--	--	--	149.00
							Washington [^]	238.00	166.00	77.00	56.00	149.00	
	Average:	179.13	112.75	81.75	42.00	143.50	Average:	239.88	167.13	77.50	56.38	155.25	
WC	Gove	136.00	78.00	59.00	32.00	138.00	C	Barton	202.00	126.00	67.00	57.00	112.00
	Greeley [^]	153.00	88.00	67.00	36.00	131.00		Dickinson [^]	156.00	97.00	51.00	44.00	98.00
	Lane [^]	105.00	60.00	45.00	24.00	131.00		Ellis [^]	--	--	--	--	98.00
	Logan [^]	146.00	84.00	64.00	34.00	131.00		Ellsworth [^]	--	--	--	--	98.00
	Ness [^]	--	--	--	--	131.00		Lincoln [^]	--	--	--	--	98.00
	Scott [^]	146.00	84.00	64.00	34.00	131.00		Marion [^]	--	--	--	--	98.00
	Trego [^]	--	--	--	--	131.00		McPherson	193.00	120.00	63.00	55.00	112.00
	Wallace	165.00	95.00	73.00	39.00	140.00		Rice [^]	194.00	121.00	64.00	55.00	98.00
	Wichita [^]	136.00	78.00	59.00	31.00	131.00		Rush [^]	171.00	107.00	57.00	47.00	98.00
								Russell [^]	--	--	--	--	98.00
							Saline [^]	--	--	--	--	98.00	
	Average:	141.00	81.00	61.57	32.86	132.78	Average:	183.20	114.20	60.40	51.60	101.11	
SW	Clark [^]	--	--	--	--	105.00	SC	Barber [^]	141.00	74.00	49.00	52.00	128.00
	Finney	139.00	71.00	59.00	34.00	139.00		Comanche [^]	--	--	--	--	128.00
	Ford [^]	142.00	73.00	61.00	36.00	105.00		Edwards	170.00	89.00	60.00	63.00	122.00
	Grant [^]	134.00	69.00	57.00	33.00	105.00		Harper [^]	--	--	--	--	128.00
	Gray	148.00	76.00	63.00	37.00	102.00		Harvey	143.00	75.00	49.00	53.00	123.00
	Hamilton	99.00	51.00	41.00	24.00	103.00		Kingman	132.00	69.00	46.00	48.00	95.50
	Haskell [^]	153.00	79.00	65.00	38.00	105.00		Kiowa	154.00	81.00	54.00	57.00	139.00
	Hodgeman [^]	106.00	55.00	45.00	26.00	105.00		Pawnee [^]	147.00	77.00	51.00	54.00	128.00
	Kearny	155.00	79.00	66.00	39.00	117.00		Pratt	167.00	88.00	59.00	62.00	132.00
	Meade	174.00	89.00	74.00	44.00	169.00		Reno [^]	139.00	73.00	48.00	52.00	128.00
	Morton [^]	114.00	58.00	48.00	27.00	105.00		Sedgwick [^]	142.00	74.00	49.00	53.00	128.00
	Seward [^]	153.00	79.00	65.00	38.00	105.00		Stafford	159.00	84.00	56.00	59.00	131.00
	Stanton	143.00	73.00	61.00	35.00	95.50		Sumner [^]	130.00	68.00	45.00	49.00	128.00
	Stevens	154.00	79.00	66.00	38.00	87.00							
		Average:	139.54	71.62	59.31	34.54	110.54	Average:	147.64	77.45	51.45	54.73	126.04

¹ KSU Rental Rate is based on using KSU-Lease and a risk-adjusted equitable crop share approach. KSU-Lease.xls is available at <http://www.agmanager.info/farmmg/land/lease/default.asp>

² NASS rental rates available at www.nass.usda.gov (individual values were reported for 22 of 66 counties, the remaining 44 are multi-county averages indicated with "[^]" following county name). Ownership of the pivot is not reported in the NASS survey data.

Table 3. Estimated Irrigated Cropland Rents (\$/ac) for Landowner-Owned Pivot

Region	County	2014	2015	2016	2017	Region	County	2014	2015	2016	2017
NW	Cheyenne	208.00	145.00	106.00	69.00	NC	Clay	279.00	205.00	104.00	94.00
	Decatur	195.00	133.00	99.00	65.00		Cloud	273.00	200.00	103.00	90.00
	Graham	166.00	113.00	84.00	55.00		Jewell	285.00	209.00	107.00	94.00
	Norton	205.00	139.00	103.00	69.00		Mitchell	254.00	187.00	95.00	84.00
	Rawlins	198.00	135.00	100.00	65.00		Osborne	239.00	176.00	89.00	79.00
	Sheridan	236.00	161.00	121.00	79.00		Ottawa	--	--	--	--
	Sherman	227.00	155.00	116.00	75.00		Phillips	286.00	210.00	108.00	94.00
	Thomas	231.00	157.00	118.00	77.00		Republic	298.00	218.00	112.00	99.00
						Rooks	--	--	--	--	
						Smith	--	--	--	--	
						Washington	271.00	199.00	102.00	90.00	
	Average:	208.25	142.25	105.88	69.25		Average:	273.13	200.50	102.50	90.50
WC	Gove	165.00	107.00	81.00	59.00	C	Barton	236.00	159.00	92.00	94.00
	Greeley	185.00	120.00	92.00	66.00		Dickinson	182.00	124.00	70.00	73.00
	Lane	127.00	83.00	62.00	45.00		Ellis	--	--	--	--
	Logan	176.00	114.00	87.00	62.00		Ellsworth	--	--	--	--
	Ness	--	--	--	--		Lincoln	--	--	--	--
	Scott	177.00	114.00	88.00	63.00		Marion	--	--	--	--
	Trego	--	--	--	--		McPherson	226.00	153.00	87.00	91.00
	Wallace	199.00	129.00	100.00	71.00		Rice	227.00	153.00	88.00	91.00
	Wichita	164.00	106.00	81.00	58.00		Rush	199.00	135.00	78.00	78.00
								Russell	--	--	--
						Saline	--	--	--	--	
	Average:	170.43	110.43	84.43	60.57		Average:	214.00	144.80	83.00	85.40
SW	Clark	--	--	--	--	SC	Barber	171.00	104.00	71.00	88.00
	Finney	176.00	109.00	86.00	71.00		Comanche	--	--	--	--
	Ford	181.00	112.00	89.00	73.00		Edwards	207.00	126.00	86.00	108.00
	Grant	170.00	105.00	83.00	67.00		Harper	--	--	--	--
	Gray	188.00	116.00	92.00	76.00		Harvey	173.00	105.00	71.00	91.00
	Hamilton	125.00	77.00	61.00	49.00		Kingman	160.00	97.00	66.00	83.00
	Haskell	194.00	120.00	96.00	79.00		Kiowa	187.00	114.00	77.00	97.00
	Hodgeman	135.00	83.00	66.00	54.00		Pawnee	178.00	108.00	74.00	92.00
	Kearny	196.00	121.00	97.00	79.00		Pratt	203.00	124.00	85.00	106.00
	Meade	221.00	137.00	109.00	90.00		Reno	168.00	103.00	69.00	88.00
	Morton	144.00	89.00	71.00	56.00		Sedgwick	172.00	105.00	71.00	91.00
	Seward	194.00	120.00	96.00	78.00		Stafford	193.00	118.00	80.00	101.00
	Stanton	181.00	112.00	89.00	73.00		Sumner	158.00	96.00	65.00	83.00
Stevens	196.00	121.00	97.00	79.00							
	Average:	177.00	109.38	87.08	71.08		Average:	179.09	109.09	74.09	93.45

1 KSU Rental Rate is based on using KSU-Lease and a risk-adjusted equitable crop share approach. KSU-Lease.xls is available at <http://www.agmanager.info/farmmg/land/lease/default.asp>