



2016 Kansas County-Level Cash Rents for Irrigated Cropland

February 2016 (available at www.AgManager.info)

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

2016 Kansas County-Level Cash Rental Rates for Irrigated Cropland

Mykel Taylor and Leah Tsoodle
 Department of Agricultural Economics
 February 2016

Rental Rate Market Overview

The situation in the farm economy facing producers and landowners for 2016 can best be described as bleak, relative to the high profitability years experienced recently. Data from the Kansas Farm Management Association (KFMA), shown in Figure 1, capture the sudden downturn in commodity grain prices that began in late 2013 and shows little sign of letting up for this upcoming crop year. The KFMA data from 2015 will be released later this spring, but expectations are that results will be similar to the 2014 profits.

The sudden decline in profitability of crop farms puts participants in the rental rate market in a difficult situation. On one hand, rental rates should decline relative to estimates from the past two years to align what farmers can afford to pay based on expected profitability. A decline in expected revenues, due to lower commodity prices, with little to no change in costs of production puts downward pressure on rental rates based on farmer profit margins. The flip side to this argument is that rental rates will likely stay where they are because, despite a decline in

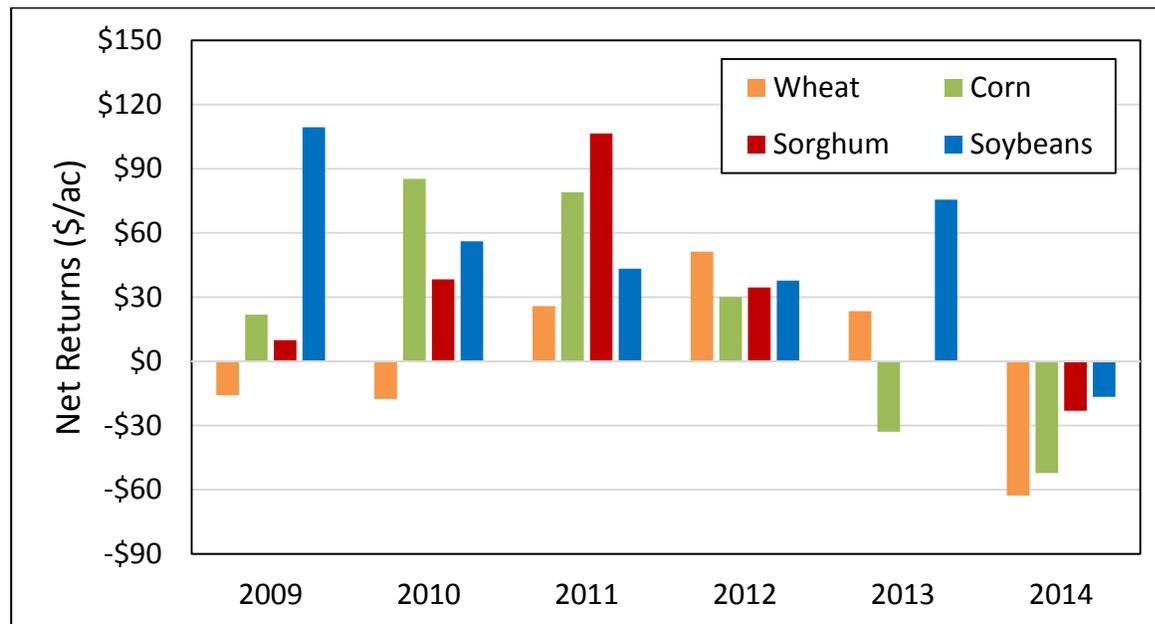


Figure 1. Profitability of wheat, corn, soybean, and grain sorghum enterprises in north-central Kansas, 2009 to 2014.

expected profitability for 2016, farmers do not want to underbid and lose leased ground. So they will draw from any working capital (i.e. cash on hand) they acquired during the previous high profitability years and pay more than the expected profitability suggests they can afford. These countervailing forces are causing ‘stickiness’ in the rental rate market and leave many people unsure of how to negotiate cash rents to avoid locking in rental rates that will prove to be unsustainable if commodity prices stay low.

Rental Rate Estimates - Yesterday and Today

This is the third edition of rental rate estimates for irrigated land in Kansas. This process has revealed some interesting aspects of how calculated values line up with peoples’ opinions of where rental rates are currently or where they are headed. The first year of this report (2014), the primary comparison was to rental rates published by the U.S. Department of Agriculture’s National Agricultural Statistics Service (USDA-NASS). At that time, rental rates estimated by surveys lagged the market and did not reflect the repeated years of profitability that were driving newly negotiated leases to record rental rates. The K-State estimates were considerably higher than the USDA-NASS values and it forced people to reconsider what was going on in the market and how aggressive bidding for leased land was becoming.

The 2015 report gave the first indications that expectations of profitability were declining. The prices used to calculate the estimates in this report are based on the average of the November trading days for the wheat, corn, and soybean harvest-time futures contracts. So in the fall of 2015, harvest-time contracts were showing weakening prices and the estimated rental rates dropped significantly from the 2014 values. This happened again for the 2016 report. Prices for each of the crops declined and the impact on expected profitability was negative. For the 2016 report, all the estimated rental rates from this report are shown for each Kansas county, as well as an average of these rental rates. The motivation for showing the previous years is to remind people that we have likely experienced both a record high and a record low in profitability over the span of a few short years. While commodity prices will adjust quickly to new market conditions, it may take a year or two for rental rates to fully adjust to the current conditions. This is due to both the stickiness described above and the use of multi-year contracts (typically 3 to 5 years) where the rental rate is fixed across several crop seasons.

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/farmmgmt/land/lease>). 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 were based on information in the Farm Management Guides (projected crop budgets published annually and available at <http://www.agmanager.info/farmmgmt/fmg/nonirrigated>). The crop enterprise mix for each of four regions (NW, SW, NC, and SC) of the state were determined using average acres estimates from 2010-2012 from the Kansas Farm Management Association (KFMA) database (<http://www.agmanager.info/kfma>). The crop mix was limited to wheat, corn, soybeans, and grain sorghum. Expected yields for these same crops were estimated from the KFMA database using a 20-year trend-adjusted yield. Expected commodity prices were based on 2016-2018 harvest futures contracts (July for wheat, December for corn, and November for soybeans) and were the average daily prices during the month of November 2015. To get at expected cash prices for each of the regions, 3-year historical (2013-2015) harvest-time basis levels were added to the average futures prices.

Other inputs required in the *KSU-Lease* spreadsheet are seed, fertilizer, chemical, land, irrigation equipment, pumping, and machinery costs. Prices of seed, fertilizer, and chemicals (herbicide, insecticide, and fungicide) were based on current costs. Machinery costs were 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 were used to proxy for machinery costs. Land cost in the *KSU-Lease* spreadsheet was set at a level that resulted 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 farmers, they

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.

use those profits to bid up the prices of fixed 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 (2008-2015), as reported by the National Agricultural Statistics Service (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. Prices, Acreages, and Crop Share Percentages Used to Estimate Cash Rental Rates

Region	Price, \$/bu	Crop Enterprise Mix, % of acres*	20-Year Adjusted Trend Yields*	Landowner's Crop Share	
				Tenant-Owned Pivot	Landowner-Owned Pivot
Northwest				16.5%	21.4%
Wheat	5.07	76.4	65.0		
Corn	3.92	14.2	239.0		
Soybeans	7.97	8.8	61.0		
Grain Sorghum	3.74	0.5	106.0		
Southwest				12.2%	17.9%
Wheat	5.20	42.5	64.3		
Corn	4.21	16.9	211.4		
Soybeans	7.99	27.7	55.0		
Grain Sorghum	3.80	12.9	108.4		
North Central				17.1%	22.6%
Wheat	5.18	56.3	57.6		
Corn	3.70	40.1	215.7		
Soybeans	8.18	1.9	64.9		
Grain Sorghum	3.76	1.6	113.9		
South Central				11.9%	17.1%
Wheat	5.26	54.0	60.0		
Corn	3.91	32.6	180.0		
Soybeans	8.27	10.6	51.0		
Grain Sorghum	3.79	2.8	105.0		

* 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 2016 crop year are down from estimates for the 2015 crop year (publication available at <http://www.agmanager.info/farmmgmt/land/lease>). The biggest difference in the calculations between these two estimates is the significant drop in futures prices between November 2015 and November 2016. The volatility of crop prices translates back to volatility in ability to pay for leased land and may affect the length of leases landowners and tenants are willing to negotiate. More volatile prices will give the incentive to negotiate rental rates more often to avoid situations where farmers are overpaying or landowners are receiving less than market value for their cropland.

Remember, the K-State rental rate estimates reflects what might be expected for a newly negotiated rent for 2016 between two parties negotiating an equitable lease and reflecting what a producer could afford to pay, given expected profitability. They do not necessarily reflect what all people are paying for leased land or where the rates the market will ultimately adjust to if farm profitability remains low.

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

Region	County	2014	2015	2016	Average	Region	County	2014	2015	2016	Average
NW	Cheyenne	179.00	112.00	82.00	124.33	NC	Clay	245.00	171.00	78.00	124.50
	Decatur	168.00	106.00	76.00	116.67		Cloud	240.00	167.00	78.00	122.50
	Graham	143.00	90.00	65.00	99.33		Jewell	250.00	174.00	81.00	127.50
	Norton	176.00	111.00	80.00	122.33		Mitchell	223.00	156.00	72.00	114.00
	Rawlins	170.00	107.00	77.00	118.00		Osborne	210.00	146.00	67.00	106.50
	Sheridan	203.00	128.00	93.00	141.33		Ottawa	--	--	--	--
	Sherman	196.00	123.00	90.00	136.33		Phillips	251.00	175.00	82.00	128.50
	Thomas	198.00	125.00	91.00	138.00		Republic	262.00	182.00	85.00	133.50
						Rooks	--	--	--	--	
						Smith	--	--	--	--	
						Washington	238.00	166.00	77.00		
	Average:	179.13	112.75	81.75	124.54		Average:	239.88	167.13	77.50	122.43
WC	Gove	136.00	78.00	59.00	91.00	C	Barton	202.00	126.00	67.00	96.50
	Greeley	153.00	88.00	67.00	102.67		Dickinson	156.00	97.00	51.00	74.00
	Lane	105.00	60.00	45.00	70.00		Ellis	--	--	--	--
	Logan	146.00	84.00	64.00	98.00		Ellsworth	--	--	--	--
	Ness	--	--	--	--		Lincoln	--	--	--	--
	Scott	146.00	84.00	64.00	98.00		Marion	--	--	--	--
	Trego	--	--	--	--		McPherson	193.00	120.00	63.00	91.50
	Wallace	165.00	95.00	73.00	111.00		Rice	194.00	121.00	64.00	92.50
	Wichita	136.00	78.00	59.00	91.00		Rush	171.00	107.00	57.00	82.00
								Russell	--	--	--
						Saline	--	--	--	--	
	Average:	141.00	81.00	61.57	94.52		Average:	183.20	114.20	60.40	87.30
SW	Clark	--	--	--	--	SC	Barber	141.00	74.00	49.00	61.50
	Finney	139.00	71.00	59.00	89.67		Comanche	--	--	--	--
	Ford	142.00	73.00	61.00	92.00		Edwards	170.00	89.00	60.00	74.50
	Grant	134.00	69.00	57.00	86.67		Harper	--	--	--	--
	Gray	148.00	76.00	63.00	95.67		Harvey	143.00	75.00	49.00	62.00
	Hamilton	99.00	51.00	41.00	63.67		Kingman	132.00	69.00	46.00	57.50
	Haskell	153.00	79.00	65.00	99.00		Kiowa	154.00	81.00	54.00	67.50
	Hodgeman	106.00	55.00	45.00	68.67		Pawnee	147.00	77.00	51.00	64.00
	Kearny	155.00	79.00	66.00	100.00		Pratt	167.00	88.00	59.00	73.50
	Meade	174.00	89.00	74.00	112.33		Reno	139.00	73.00	48.00	60.50
	Morton	114.00	58.00	48.00	73.33		Sedgwick	142.00	74.00	49.00	61.50
	Seward	153.00	79.00	65.00	99.00		Stafford	159.00	84.00	56.00	70.00
	Stanton	143.00	73.00	61.00	92.33		Sumner	130.00	68.00	45.00	56.50
	Stevens	154.00	79.00	66.00	99.67						
		Average:	139.54	71.62	59.31		90.15		Average:	147.64	77.45

 Note: Estimates of rental rates are based on using *KSU-Lease.xls* available at <http://www.agmanager.info/farmmg/land/lease/default.asp>

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

Region	County	2014	2015	2016	Average	Region	County	2014	2015	2016	Average
NW	Cheyenne	208.00	145.00	106.00	153.00	NC	Clay	279.00	205.00	104.00	154.50
	Decatur	195.00	133.00	99.00	142.33		Cloud	273.00	200.00	103.00	151.50
	Graham	166.00	113.00	84.00	121.00		Jewell	285.00	209.00	107.00	158.00
	Norton	205.00	139.00	103.00	149.00		Mitchell	254.00	187.00	95.00	141.00
	Rawlins	198.00	135.00	100.00	144.33		Osborne	239.00	176.00	89.00	132.50
	Sheridan	236.00	161.00	121.00	172.67		Ottawa	--	--	--	--
	Sherman	227.00	155.00	116.00	166.00		Phillips	286.00	210.00	108.00	159.00
	Thomas	231.00	157.00	118.00	168.67		Republic	298.00	218.00	112.00	165.00
						Rooks	--	--	--	--	
						Smith	--	--	--	--	
						Washington	271.00	199.00	102.00		
	Average:	208.25	142.25	105.88	152.13		Average:	273.13	200.50	102.50	151.64
WC	Gove	165.00	107.00	81.00	117.67	C	Barton	236.00	159.00	92.00	125.50
	Greeley	185.00	120.00	92.00	132.33		Dickinson	182.00	124.00	70.00	97.00
	Lane	127.00	83.00	62.00	90.67		Ellis	--	--	--	--
	Logan	176.00	114.00	87.00	125.67		Ellsworth	--	--	--	--
	Ness	--	--	--	--		Lincoln	--	--	--	--
	Scott	177.00	114.00	88.00	126.33		Marion	--	--	--	--
	Trego	--	--	--	--		McPherson	226.00	153.00	87.00	120.00
	Wallace	199.00	129.00	100.00	142.67		Rice	227.00	153.00	88.00	120.50
	Wichita	164.00	106.00	81.00	117.00		Rush	199.00	135.00	78.00	106.50
								Russell	--	--	--
						Saline	--	--	--	--	
	Average:	170.43	110.43	84.43	121.76		Average:	214.00	144.80	83.00	113.90
SW	Clark	--	--	--	--	SC	Barber	171.00	104.00	71.00	87.50
	Finney	176.00	109.00	86.00	123.67		Comanche	--	--	--	--
	Ford	181.00	112.00	89.00	127.33		Edwards	207.00	126.00	86.00	106.00
	Grant	170.00	105.00	83.00	119.33		Harper	--	--	--	--
	Gray	188.00	116.00	92.00	132.00		Harvey	173.00	105.00	71.00	88.00
	Hamilton	125.00	77.00	61.00	87.67		Kingman	160.00	97.00	66.00	81.50
	Haskell	194.00	120.00	96.00	136.67		Kiowa	187.00	114.00	77.00	95.50
	Hodgeman	135.00	83.00	66.00	94.67		Pawnee	178.00	108.00	74.00	91.00
	Kearny	196.00	121.00	97.00	138.00		Pratt	203.00	124.00	85.00	104.50
	Meade	221.00	137.00	109.00	155.67		Reno	168.00	103.00	69.00	86.00
	Morton	144.00	89.00	71.00	101.33		Sedgwick	172.00	105.00	71.00	88.00
	Seward	194.00	120.00	96.00	136.67		Stafford	193.00	118.00	80.00	99.00
	Stanton	181.00	112.00	89.00	127.33		Sumner	158.00	96.00	65.00	80.50
	Stevens	196.00	121.00	97.00	138.00						
		Average:	177.00	109.38	87.08		124.49		Average:	179.09	109.09

Note: Estimates of rental rates are based on using KSU-Lease.xls available at <http://www.agmanager.info/farmmg/land/lease/default.asp>