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2017
Kansas County-Level Cash Rents for Non-Irrigated Cropland

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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 at what rental rate the market will ultimately adjust to 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 eastern 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.

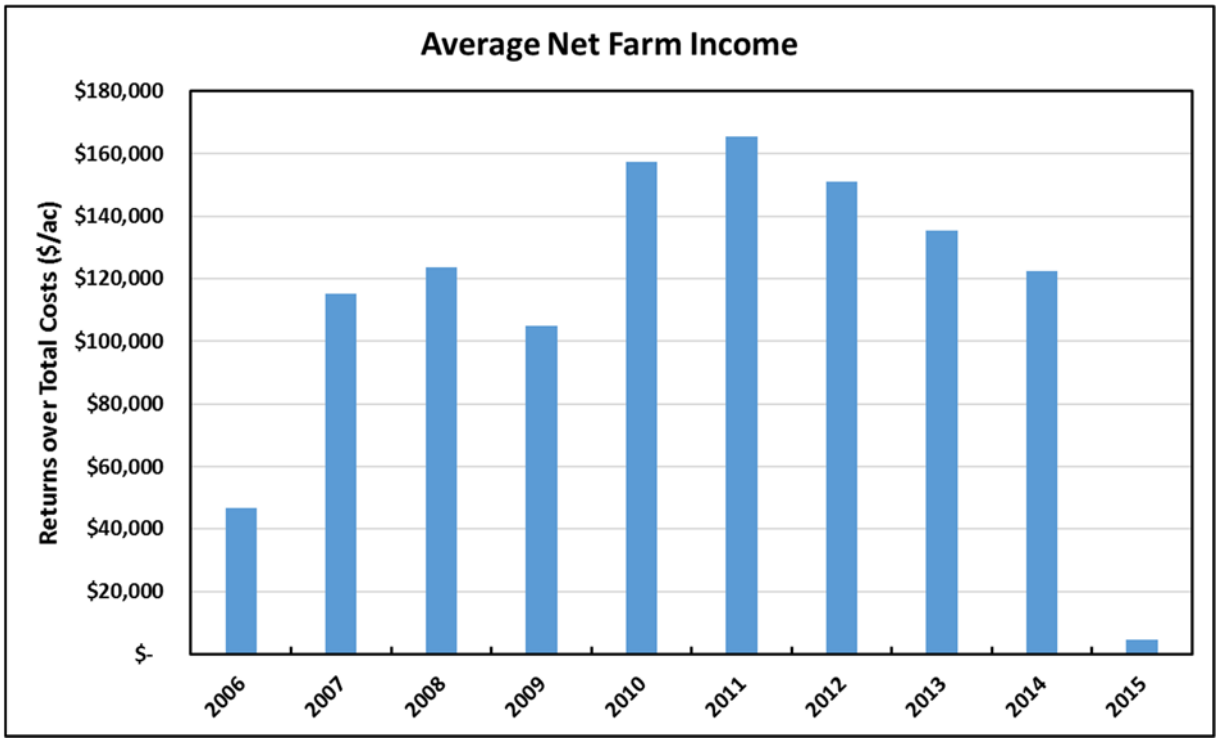

Figure 1. Average net farm income in Kansas, 2006-2015.

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 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 six regions, the next step is to identify who provides each of the contributions and calculate the resulting equitable crop share percentages for the landowner and the operator. The equitable shares are 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 tend to reflect what people have traditionally done in a region over a long period of time. For the rental rate estimates in this publication, a short term net crop share is calculated to reflect current profitability. Therefore, the calculated values reflect what is equitable based on current costs and do not necessarily reflect what people have historically done or the percentage they would be likely to share over multiple years.

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. The estimated crop share percentages used in the analysis range from 1% in the Southeast region of the state to 29.5% in the Northeast region.[3] The difference in crop share splits across the regions reflects the relative productivity, costs, and revenue potential of the farmland. A crop share percentage of 1% is not likely to occur in the rental market. However, the expected profitability for the Southwest region of the state is negative, make the calculation of profit-sharing impossible. Therefore, a 1% value was used as a placeholder to reflect the lack of profits above all economic costs of production (cash and overhead costs).

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 2017 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

[2] The completed versions of the six *KSU-Lease* files include numerous details that are not presented here to save space. However, the files are available from the author 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, Central, and East Central regions, the average crop share percentage for the corresponding northern and southern regions was used.

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 and 2007 Census of Agriculture.

Table 1. Prices and Acreages Used to Estimate Cash Rental Rates

Region	Price, $/bu	Crop Enterprise Mix, % of acres*	20-Year Adjusted Trend Yields*	Landowner's Crop Share
Northwest				7.2%
Wheat	3.89	35.3	48.0	
Corn	3.18	18.3	77.5	
Soybeans	7.80	3.2	28.5	
Grain Sorghum	2.69	8.0	71.5	
Southwest				1%**
Wheat	3.92	41.0	38.5	
Corn	3.25	1.7	63.5	
Soybeans	7.82	0.5	25.5	
Grain Sorghum	2.74	15.9	70.0	
North Central				16.6%
Wheat	3.95	44.2	51.5	
Corn	3.45	10.2	98.0	
Soybeans	7.92	31.5	33.0	
Grain Sorghum	2.78	14.1	85.0	
South Central				9.4%
Wheat	3.99	64.7	51.5	
Corn	3.02	7.5	86.5	
Soybeans	7.97	15.9	28.5	
Grain Sorghum	2.74	11.9	74.0	
Northeast				29.5%
Wheat	3.97	6.8	51.5	
Corn	3.08	41.6	125.5	
Soybeans	8.01	50.7	43.0	
Grain Sorghum	2.73	0.9	76.5	
Southeast				12.9%
Wheat	4.02	15.3	47.5	
Corn	3.22	31.8	107.0	
Soybeans	8.09	63.3	32.5	
Grain Sorghum	2.79	2.3	73.0	

* 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. Crop enterprise mix values do not necessarily add to 100% due to fallow or double cropping, depending on the region.

** Profitabilty in the Southwest CRD is expected to be negative, given expected prices, yields, and production costs. Therefore, a 1% cropshare is assumed as a replacement value for negative profit.

Table 2. Estimated Cash Rental Rates for Non-Irrigated Cropland ($/ac)[1]

Region	County	2014 KSU Rent ($/ac)	2015 KSU Rent ($/ac)	2016 KSU Rent ($/ac)	2017 KSU Rent ($/ac)	2016 NASS Rent ($/ac)
NW	Cheyenne	45.30	30.50	19.80	6.50	44.50
	Decatur	67.80	46.00	30.70	10.10	42.50
	Graham	54.10	34.90	24.60	7.90	36.50
	Norton	69.30	47.10	31.50	10.40	40.50
	Rawlins	57.60	39.10	25.80	8.40	59.50
	Sheridan	62.10	42.20	28.20	9.20	45.00
	Sherman	44.70	30.20	19.90	6.50	46.00
	Thomas	56.00	38.00	25.20	8.20	55.50
	Average:	**57.11**	**38.50**	**25.71**	**8.40**	**46.25**
WC	Gove	54.40	35.40	22.80	4.90	51.00
	Greeley	40.70	26.40	16.90	3.60	31.00
	Lane	41.30	26.80	17.00	3.60	36.50
	Logan	46.20	30.00	19.20	4.10	45.00
	Ness	39.30	25.50	16.10	3.40	30.50
	Scott	60.00	39.10	25.10	5.30	43.00
	Trego	46.30	30.20	19.30	4.10	31.50
	Wallace^	41.60	26.90	17.10	3.70	45.00
	Wichita^	48.00	31.30	20.00	4.30	45.00
	Average:	**46.42**	**30.18**	**19.28**	**4.15**	**40.00**
SW	Clark	38.50	23.60	14.00	0.90	31.00
	Finney	40.40	24.90	15.10	0.90	35.00
	Ford	44.00	27.00	16.30	1.00	32.00
	Grant	29.30	18.00	10.90	0.70	37.50
	Gray	46.10	28.40	17.20	1.10	41.00
	Hamilton	31.10	19.10	11.50	0.70	28.00
	Haskell^	37.90	23.30	14.10	0.90	29.50
	Hodgeman	35.70	21.90	13.10	0.80	35.50
	Kearny^	34.60	21.30	12.80	0.80	29.50
	Meade	30.90	19.00	11.40	0.70	33.50
	Morton	28.20	17.40	10.60	0.70	23.50
	Seward	34.60	21.30	12.90	0.80	27.50
	Stanton	36.90	22.70	13.70	0.90	29.50
	Stevens	33.20	20.50	12.50	0.80	29.00
	Average:	**35.81**	**22.03**	**13.29**	**0.81**	**31.27**

[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/farmmgt/land/lease/default.asp

[2] NASS rental rates available at www.nass.usda.gov (individual values were reported for 90 of 105 counties, remaining 15 are multi-county averages indicated with "^" following county name)

Table 2. Estimated Cash Rental Rates for Non-Irrigated Cropland ($/ac), cont.

Region	County	2014 KSU Rent ($/ac)	2015 KSU Rent ($/ac)	2016 KSU Rent ($/ac)	2017 KSU Rent ($/ac)	2016 NASS Rent ($/ac)
NC	Clay	115.80	79.90	56.30	37.60	70.50
	Cloud^	108.80	75.10	53.40	34.00	61.50
	Jewell	109.10	75.40	53.70	34.20	75.00
	Mitchell	105.40	72.80	51.70	32.30	66.50
	Osborne^	86.00	59.50	42.40	26.30	61.50
	Ottawa	92.50	63.70	45.10	28.60	61.50
	Phillips	84.00	57.90	41.40	26.00	44.50
	Republic	115.60	79.50	56.40	37.50	87.00
	Rooks	66.20	45.70	32.60	20.30	40.00
	Smith	98.60	68.10	48.60	30.50	64.50
	Washington	123.00	84.80	59.90	40.40	80.00
	Average:	**100.45**	**69.31**	**49.23**	**31.61**	**64.77**
C	Barton	72.20	48.20	34.10	17.40	47.50
	Dickinson	98.50	65.70	46.00	24.60	51.00
	Ellis^	55.00	36.70	25.90	13.10	40.00
	Ellsworth^	80.00	53.40	37.60	19.20	40.00
	Lincoln	86.90	58.00	40.90	21.10	53.00
	Marion	88.40	58.90	41.50	21.90	46.00
	McPherson	91.80	61.30	43.10	22.30	60.50
	Rice	90.20	60.10	42.50	22.00	49.50
	Rush	63.10	42.20	30.00	15.10	38.50
	Russell	69.40	46.40	32.90	16.60	40.00
	Saline	91.30	60.80	42.50	22.30	61.50
	Average:	**80.62**	**53.79**	**37.91**	**19.60**	**47.95**
SC	Barber	59.40	38.70	26.60	10.50	36.50
	Comanche	48.20	31.40	21.80	8.50	31.00
	Edwards	56.50	36.80	25.80	10.10	38.50
	Harper	57.90	37.70	26.00	10.20	40.50
	Harvey	90.50	59.00	41.40	16.80	55.00
	Kingman	62.30	40.60	27.90	11.00	39.50
	Kiowa	51.30	33.50	23.40	9.10	39.00
	Pawnee	63.70	41.50	29.20	11.40	40.50
	Pratt	69.30	45.20	31.40	12.40	37.00
	Reno	75.90	49.50	34.50	13.80	51.00
	Sedgwick	76.10	49.60	34.70	13.90	50.50
	Stafford	70.20	45.80	32.00	12.70	44.00
	Sumner	68.40	44.60	31.00	12.30	49.50
	Average:	**65.36**	**42.61**	**29.67**	**11.75**	**42.50**

Table 2. Estimated Cash Rental Rates for Non-Irrigated Cropland ($/ac), cont.

Region	County	2014 KSU Rent ($/ac)	2015 KSU Rent ($/ac)	2016 KSU Rent ($/ac)	2017 KSU Rent ($/ac)	2016 NASS Rent ($/ac)
NE	Atchison	180.50	125.80	109.30	99.80	97.50
	Brown	213.20	148.50	129.30	117.90	183.00
	Doniphan	239.60	166.70	145.90	132.20	164.00
	Jackson	157.30	109.80	94.90	86.70	62.50
	Jefferson	170.10	118.60	102.90	93.80	76.00
	Leavenworth^	157.20	109.80	94.50	87.50	73.00
	Marshall	152.20	106.60	91.80	81.90	103.00
	Nemaha	172.00	120.00	104.10	94.10	132.00
	Pottawatomie	155.70	108.80	94.00	85.20	74.50
	Riley	134.30	94.20	80.90	71.20	75.00
	Wyandotte^	151.30	105.70	90.70	84.90	73.00
	Average:	**171.22**	**119.50**	**103.48**	**94.11**	**101.23**
EC	Anderson	92.60	58.30	50.10	44.70	63.50
	Chase	91.50	57.80	49.20	44.20	46.50
	Coffey	91.30	57.60	49.10	44.40	51.00
	Douglas	122.00	76.60	66.10	59.20	69.50
	Franklin	102.80	64.80	55.30	50.30	76.50
	Geary	104.60	66.20	56.70	49.30	66.00
	Johnson^	109.30	68.80	58.90	53.50	65.00
	Linn	89.10	56.30	47.70	43.80	58.50
	Lyon	89.90	56.80	48.30	44.00	53.50
	Miami^	110.00	69.20	59.40	53.50	65.00
	Morris	83.70	53.00	45.40	39.60	49.50
	Osage	98.40	62.00	53.10	47.90	56.00
	Shawnee	125.80	79.00	68.20	61.10	53.00
	Wabaunsee	106.90	67.30	58.10	51.50	54.50
	Average:	**101.28**	**63.84**	**54.69**	**49.07**	**59.14**
SE	Allen	63.00	32.60	27.80	24.00	50.00
	Bourbon	61.90	32.10	27.20	23.80	46.50
	Butler	67.10	34.70	30.00	24.50	46.50
	Chautauqua	46.90	24.30	20.80	17.20	36.50
	Cherokee	67.20	34.80	29.60	25.30	55.50
	Cowley	53.60	27.90	23.80	19.00	46.00
	Crawford	68.80	35.60	30.50	26.00	62.00
	Elk^	60.40	31.30	26.70	22.90	46.50
	Greenwood	70.40	36.40	31.10	27.00	50.50
	Labette^	56.50	29.20	25.10	20.60	46.50
	Mongtomery^	57.90	29.90	25.70	21.30	46.50
	Neosho	57.50	29.70	25.40	21.40	49.00
	Wilson	61.60	31.90	27.40	22.90	69.00
	Woodson	63.10	32.60	28.00	23.80	50.00
	Average:	**61.14**	**31.64**	**27.08**	**22.84**	**50.07**