



2014/2015 Kansas County-Level Cash Rents for Non-Irrigated Cropland

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Mykel Taylor, K-State Ag Economics, (785) 532-3033, mtaylor@agecon.ksu.edu

Department of Agricultural Economics, Kansas State University

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In the wake of rapid changes in Kansas agricultural land values, many people are also wondering how rental rates for cropland have been affected. Historically, the ratio of cash rent to land value (i.e., rent-to-value ratio) for non-irrigated cropland in Kansas has been in the range of 5 to 6 percent. This ratio indicates the annual return (before real estate taxes) that landowners can expect on their capital investment from renting the land out, excluding capital gains. If that relationship still holds, then a state-level estimate for the value of non-irrigated cropland in 2013 of \$2,000/acre would imply a state average cash rental rate ranging from approximately \$100 to \$120/acre.¹ This range leaves a large amount of negotiating room for landowners and tenants. Furthermore, if part of the land value increase in recent years has been due to “non-ag” reasons, then the historical rent-to-value ratio may not be appropriate to use in the current environment, which prompts us to apply an alternative method of estimating rental rates.²

Rather than targeting a particular rate of return on non-irrigated cropland, which may or may not reflect the productivity of the land, production technology changes, or current crop prices, we estimate projected cash rents for the 2015 crop year using a method of calculating landowner revenue from an equitable crop share arrangement. Crop share arrangements have been the primary way of leasing land in Kansas for many years, so most landowners and producers are familiar with the concept.

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-*

¹ See publication MF-1100 (available at http://www.agmanager.info/farmmgmt/land/land_buy/default.asp) for historical Kansas land values.

² Rent-to-value ratios calculated from cash rent and land values reported by Kansas Agricultural Statistics in the past two years have been 3% to 4%, as the price of land has increased at a faster rate than cash rents.

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.³

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 six regions (NW, SW, NC, SC, NE, and SE) 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, where wheat was either summer-fallow or continuous. 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 2015-2017 harvest futures contracts (July for wheat, December for corn, and November for soybeans) and were the average daily prices during the month of November 2014. To get at expected cash prices for each of the regions, 3-year historical (2012-2014) harvest-time basis levels were 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) were based on current costs. Machinery costs were based on region-specific projected custom rates for 2014 multiplied by typical farming operations in the region. Custom rates were multiplied by 120% to account for producer-level costs typically being higher than custom rates. 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 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.

³ 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.

Given the completed crop budgets in *KSU-Lease* for each of the six regions, 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.⁴ 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 does not necessarily reflect 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. The estimated crop share percentages used in the analysis range from 16.4% in the Southeast region of the state to 35.7% in the Northeast region.⁵ The difference in crop share splits across the regions reflects the relative productivity, costs, and revenue potential of the farmland.

⁴ 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 authors upon request.

⁵ 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 operator receiving 100% of government payments.

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 | | | | 27.8% |
| Wheat | 5.70 | 35.3 | 44.0 | |
| Corn | 4.08 | 18.3 | 71.0 | |
| Soybeans | 9.18 | 3.2 | 29.0 | |
| Grain Sorghum | 3.90 | 8.0 | 65.0 | |
| Southwest | | | | 21.7% |
| Wheat | 5.73 | 41.0 | 35.0 | |
| Corn | 4.19 | 1.7 | 61.0 | |
| Soybeans | 9.17 | 0.5 | 24.0 | |
| Grain Sorghum | 3.94 | 15.9 | 64.0 | |
| North Central | | | | 30.9% |
| Wheat | 5.83 | 44.2 | 47.0 | |
| Corn | 4.36 | 10.2 | 89.0 | |
| Soybeans | 9.19 | 31.5 | 30.0 | |
| Grain Sorghum | 3.95 | 14.1 | 77.0 | |
| South Central | | | | 28.2% |
| Wheat | 5.80 | 64.7 | 43.0 | |
| Corn | 3.86 | 7.5 | 79.0 | |
| Soybeans | 9.38 | 15.9 | 26.0 | |
| Grain Sorghum | 3.92 | 11.9 | 67.0 | |
| Northeast | | | | 35.7% |
| Wheat | 5.82 | 6.8 | 47.0 | |
| Corn | 3.96 | 41.6 | 114.0 | |
| Soybeans | 9.41 | 50.7 | 39.0 | |
| Grain Sorghum | 3.95 | 0.9 | 63.0 | |
| Southeast | | | | 16.4% |
| Wheat | 5.88 | 15.3 | 43.0 | |
| Corn | 4.07 | 31.8 | 97.0 | |
| Soybeans | 9.47 | 63.3 | 29.0 | |
| Grain Sorghum | 3.95 | 2.3 | 66.0 | |

* 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.

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 2015 crop year for each county.⁶ To do this, the estimated crop share split was applied to 8-year historical county-level yields (2004-2011), as reported by the Kansas Agricultural Statistics Service (USDA-KASS), and the expected commodity price

⁶ 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.

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 and 2007 Census of Agriculture.

Table 2 reports the county-level 2014 non-irrigated cash rents as reported by Kansas Agricultural Statistics Service (KASS) and the KSU estimated values for 2015. The first column of rental rates contains the survey-based values reported by USDA-KASS for 2014 (KASS Rental Rate column). They are obtained via a survey of farmers, which asks for the average rent paid on the non-irrigated farmland they lease. A comparison of the rental rates from USDA-KASS and those estimated for the 2015 crop year using the equitable crop share approach (KSU Rental Rate column) reveals the USDA-KASS estimates are lower in some districts, similar in some, and higher in others.

Why would rental rates collected via survey be different than risk-adjusted crop share estimates? The cost of production and commodity price information used in the KSU crop share lease method reflects current available information about what returns to non-irrigated farming would be under prices projected for the next 3-5 years. Therefore, if a contract between a landowner and tenant were being negotiated today for the next 3-5 years, these rates should be very close to negotiated rates. A potential problem with the USDA-KASS survey values is that they do not reveal the year in which the rental rate being reported was negotiated. If a contract has been in place for several years, with no change in the rental rate, then the rate could be higher or lower than a current contract reflecting differences in crop prices.

The KSU estimates for the 2014 crop year were significantly higher than those estimated 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 2014 and November 2015. 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.

It is important to recognize that the two methods of estimating rental rates reflect two very different things. The USDA-KASS survey value reflects what people are paying (receiving) on average across all leases without considering when they were negotiated, landowner-operator relationships, etc. On the other hand, the KSU estimate value reflects what might be expected for a newly negotiated rent between two parties negotiating an equitable lease. Thus, the KSU-estimated values for 2015 should not be compared with the KASS-survey values for 2014 as to what we are expecting for year-to-year changes. As stated above, the two methods reflect two different things and thus they should not be viewed as 2014 versus 2015 rents (i.e., the KSU method for 2014 was significantly higher than the KASS surveyed values).

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

| | | 2014 KASS | | | 2015 KSU | | | Difference | | | | | 2014 KASS | | | 2015 KSU | | | Difference | | | | | | | | | | | | | | |
|---------------------|---------------------|---------------------------|---------------------------|--------------|---------------------|--------------------|---------------------------|---------------------------|------------------------|---------------------|--------------------------|---------------------------|---------------------------|-----------------|---------------------|----------|---------------------------|---------------------------|------------|--|--|------|--------------|--------------|--------------|--|--|--|--|--|--|--|--|
| Region ¹ | County | Rent (\$/ac) ² | Rent (\$/ac) ³ | (%) | Region ¹ | County | Rent (\$/ac) ² | Rent (\$/ac) ³ | (%) | Region ¹ | County | Rent (\$/ac) ² | Rent (\$/ac) ³ | (%) | Region ¹ | County | Rent (\$/ac) ² | Rent (\$/ac) ³ | (%) | | | | | | | | | | | | | | |
| NW | Cheyenne | 46.00 | 30.50 | -33.7 | NC | Clay [^] | 73.50 | 79.90 | 8.7 | NE | Atchison | 92.50 | 125.80 | 36.0 | | | | | | | | | | | | | | | | | | | |
| | Decatur | 42.50 | 46.00 | 8.2 | | Cloud [^] | 73.50 | 75.10 | 2.2 | | Brown | 187.00 | 148.50 | -20.6 | | | | | | | | | | | | | | | | | | | |
| | Graham | 36.00 | 36.90 | 2.5 | | Jewell | 67.50 | 75.40 | 11.7 | | Doniphan | 177.00 | 166.70 | -5.8 | | | | | | | | | | | | | | | | | | | |
| | Norton | 41.00 | 47.10 | 14.9 | | Mitchell | 66.50 | 72.80 | 9.5 | | Jackson | 60.50 | 109.80 | 81.5 | | | | | | | | | | | | | | | | | | | |
| | Rawlins | 65.50 | 39.10 | -40.3 | | Osborne | 49.00 | 59.50 | 21.4 | | Jefferson | 66.00 | 118.60 | 79.7 | | | | | | | | | | | | | | | | | | | |
| | Sheridan | 48.50 | 42.20 | -13.0 | | Ottawa | 66.00 | 63.70 | -3.5 | | Leavenworth [^] | 64.50 | 109.80 | 70.2 | | | | | | | | | | | | | | | | | | | |
| | Sherman | 48.00 | 30.20 | -37.1 | | Phillips | 38.00 | 57.90 | 52.4 | | Marshall | 91.50 | 106.60 | 16.5 | | | | | | | | | | | | | | | | | | | |
| | Thomas | 61.50 | 38.00 | -38.2 | | Republic | 79.00 | 79.50 | 0.6 | | Nemaha | 122.00 | 120.00 | -1.6 | | | | | | | | | | | | | | | | | | | |
| | | | | | | | Rooks | 39.00 | 45.70 | | 17.2 | Pottawatomie | 85.50 | 108.80 | | | | | | | | 27.3 | | | | | | | | | | | |
| | | | | | | | Smith | 57.00 | 68.10 | | 19.5 | Riley | 68.50 | 94.20 | | | | | | | | 37.5 | | | | | | | | | | | |
| | | | | | Washington | 74.50 | 84.80 | 13.8 | Wyandotte [^] | 64.50 | 105.70 | 63.9 | | | | | | | | | | | | | | | | | | | | | |
| | Average: | 48.63 | 38.75 | -20.3 | | Average: | 62.14 | 69.31 | 11.5 | | Average: | 98.14 | 119.50 | 21.8 | | | | | | | | | | | | | | | | | | | |
| WC | Gove | 45.50 | 35.40 | -22.2 | C | Barton | 46.50 | 48.20 | 3.7 | EC | Anderson | 57.00 | 58.30 | 2.3 | | | | | | | | | | | | | | | | | | | |
| | Greeley | 31.00 | 26.40 | -14.8 | | Dickinson | 53.00 | 65.70 | 24.0 | | Chase | 45.50 | 57.80 | 27.0 | | | | | | | | | | | | | | | | | | | |
| | Lane | 35.00 | 26.80 | -23.4 | | Ellis | 37.00 | 36.70 | -0.8 | | Coffey | 43.00 | 57.60 | 34.0 | | | | | | | | | | | | | | | | | | | |
| | Logan | 41.50 | 30.00 | -27.7 | | Ellsworth | 48.00 | 53.40 | 11.3 | | Douglas | 75.50 | 76.60 | 1.5 | | | | | | | | | | | | | | | | | | | |
| | Ness | 35.50 | 25.50 | -28.2 | | Lincoln | 48.00 | 58.00 | 20.8 | | Franklin | 74.00 | 64.80 | -12.4 | | | | | | | | | | | | | | | | | | | |
| | Scott | 42.00 | 39.10 | -6.9 | | Marion | 48.00 | 58.90 | 22.7 | | Geary | 84.50 | 66.20 | -21.7 | | | | | | | | | | | | | | | | | | | |
| | Trego | 33.50 | 30.20 | -9.9 | | McPherson | 58.00 | 61.30 | 5.7 | | Johnson | 64.00 | 68.80 | 7.5 | | | | | | | | | | | | | | | | | | | |
| | Wallace | 45.00 | 26.90 | -40.2 | | Rice | 42.00 | 60.10 | 43.1 | | Linn | 59.00 | 56.30 | -4.6 | | | | | | | | | | | | | | | | | | | |
| | Wichita | 44.50 | 31.30 | -29.7 | | Rush | 40.50 | 42.20 | 4.2 | | Lyon | 59.50 | 56.80 | -4.5 | | | | | | | | | | | | | | | | | | | |
| | | | | | | | Russell | 34.50 | 46.40 | | 34.5 | Miami | 60.00 | 69.20 | | | | | | | | | 15.3 | | | | | | | | | | |
| | | | | | Saline | 55.50 | 60.80 | 9.5 | Morris | 46.50 | 53.00 | 14.0 | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | Osage | 62.50 | 62.00 | -0.8 | | | | | | | | | | | | | | | | | | | | | |
| | Average: | 39.28 | 30.18 | -23.2 | | Average: | 46.45 | 53.79 | 15.8 | | Average: | 60.50 | 63.84 | 5.5 | | | | | | | | | | | | | | | | | | | |
| SW | Clark | 32.00 | 23.60 | -26.3 | SC | Barber | 39.00 | 38.70 | -0.8 | SE | Allen | 46.50 | 32.60 | -29.9 | | | | | | | | | | | | | | | | | | | |
| | Finney [^] | 32.50 | 24.90 | -23.4 | | Comanche | 26.00 | 31.40 | 20.8 | | Bourbon | 56.50 | 32.10 | -43.2 | | | | | | | | | | | | | | | | | | | |
| | Ford | 36.50 | 27.00 | -26.0 | | Edwards | 38.50 | 36.80 | -4.4 | | Butler | 40.50 | 34.70 | -14.3 | | | | | | | | | | | | | | | | | | | |
| | Grant | 44.50 | 18.00 | -59.6 | | Harper | 34.50 | 37.70 | 9.3 | | Chautauqua | 33.00 | 24.30 | -26.4 | | | | | | | | | | | | | | | | | | | |
| | Gray | 41.00 | 28.40 | -30.7 | | Harvey | 53.00 | 59.00 | 11.3 | | Cherokee | 63.00 | 34.80 | -44.8 | | | | | | | | | | | | | | | | | | | |
| | Hamilton | 29.50 | 19.10 | -35.3 | | Kingman | 39.50 | 40.60 | 2.8 | | Cowley | 39.50 | 27.90 | -29.4 | | | | | | | | | | | | | | | | | | | |
| | Haskell | 38.00 | 23.30 | -38.7 | | Kiowa | 37.00 | 33.50 | -9.5 | | Crawford | 55.00 | 35.60 | -35.3 | | | | | | | | | | | | | | | | | | | |
| | Hodgeman | 30.00 | 21.90 | -27.0 | | Pawnee | 49.50 | 41.50 | -16.2 | | Elk | 32.00 | 31.30 | -2.2 | | | | | | | | | | | | | | | | | | | |
| | Kearny [^] | 32.50 | 21.30 | -34.5 | | Pratt | 41.00 | 45.20 | 10.2 | | Greenwood | 44.50 | 36.40 | -18.2 | | | | | | | | | | | | | | | | | | | |
| | Meade | 27.50 | 19.00 | -30.9 | | Reno | 56.50 | 49.50 | -12.4 | | Labette | 45.50 | 29.20 | -35.8 | | | | | | | | | | | | | | | | | | | |
| | Morton | 24.00 | 17.40 | -27.5 | | Sedgwick | 49.50 | 49.60 | 0.2 | | Montgomery | 42.00 | 29.90 | -28.8 | | | | | | | | | | | | | | | | | | | |
| | Seward | 23.50 | 21.30 | -9.4 | | Stafford | 42.50 | 45.80 | 7.8 | | Neosho | 50.00 | 29.70 | -40.6 | | | | | | | | | | | | | | | | | | | |
| | Stanton | 31.00 | 22.70 | -26.8 | | Sumner | 45.50 | 44.60 | -2.0 | | Wilson | 63.00 | 31.90 | -49.4 | | | | | | | | | | | | | | | | | | | |
| | Stevens | 28.50 | 20.50 | -28.1 | | | | | | | Woodson | 39.00 | 32.60 | -16.4 | | | | | | | | | | | | | | | | | | | |
| | | Average: | 32.21 | 22.03 | | -31.6 | | Average: | 42.46 | | 42.61 | 0.3 | | Average: | | | | | | | | | 46.43 | 31.64 | -31.8 | | | | | | | | |

¹ Region refers to the Kansas Ag Statistics Service Crop Reporting Districts (CRD), where NW=Northwest, WC=West Central, SW=Southwest, NC=North Central, C=Central, SC= South Central, NE=Northeast, EC=East Central, SE=Southeast

² KASS rental rates available at http://www.nass.usda.gov/Statistics_by_State/Kansas/index.asp (individual values were reported for 99 of 105 counties, remaining 6 are multi-county averages indicated with '^' following county name)

³ 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>