2024 Kansas County-Level Cash Rental Rates for Non-Irrigated Cropland

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Purpose of these KSU Non-Irrigated Cash Rent Estimates[1]

Determining cash rental rates is an important decision for nearly every farmer in the state since over 90 percent of Kansas farmers rent at least some of their farmland. Cash leases are often determined by competitive local markets, which may or may not reflect the ability of the land to support "going" market rental rates. This publication provides non-irrigated cash lease breakeven estimates that incorporate land productivity to provide renters and landowners another perspective when negotiating lease rates.

A **tenant's residual method** is used to ***estimate*** **non-irrigated county breakeven cash rents for 2024** – incorporating county yield histories, recent grain prices, and KFMA farm expenses. These breakeven cash rent estimates can help farmland renters and owners determine equitable cash rentals rates for specific farms.

These Kansas State University estimates for 2024 county-level non-irrigated breakeven cash rental rates are found in Figures 5, 6, 7, 8, and 9 at the end of this publication. These estimates incorporate the September 2023 NASS county non-irrigated cash rental rate estimates into the model. *Based on the modeling approach used here, non-irrigated cash rents for newly rented ground are expected to: increase by 11% in Eastern Kansas, increase by 8% in Central Kansas, and increase by 2% in Western Kansas.*

Intended Use of Breakeven Cash Rental Rate Estimates

The rental rate estimates provided in this publication are intended for the ***2024 crop year***. These estimates include an expectation of 2023 and 2024 farm profitability. Because the estimate is based on average yields for the county, actual lease rates could be higher or lower depending on actual yield history. Estimates are also a function of USDA-NASS cash rental rate surveys from 2023 to help smooth out the estimate – anchoring the numbers to recent cash rental rate history.

These breakeven cash rent estimates are intended to cover all expenses and not only the cash or direct cost of crop production. As such, these non-irrigated cash rental rate estimates represent

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what farm operators can pay and cover *full economic cost* of production with no extra profits. If a crop producer's crop yields, production costs or selling prices vary from these crop budget assumptions, then the full economic cost breakeven cash rental rate that can be paid in 2024 will vary from these estimates.

Given the assumptions involved in calculating them, it holds true that these non-irrigated cash rental rate estimates are also NOT an endorsement for what a tenant should actually pay to a landlord. Instead, they are provided to give a starting point in lease negotiations, with care and attention given to the yield, production cost, and price estimates that these breakeven cash rental rate estimates have used.

Any lease that a tenant and landlord willingly agree to in which they have both utilized the best information they have available to them in making a decision, is considered here to be a "fair" and/or "equitable" lease.

Changes in the Model from Last Year's 2023 Estimates.

In September of 2021, Ibendahl and O'Brien published their first estimate of cash rental rates for non-irrigated cropland. Last year (September 2022), the model used to estimate cash rental rates was tweaked to put more emphasis on the NASS survey and to put more weight on the most recent years of net farm income. This year the model was adjusted to cap the maximum KSU rate at a 15 percent increase from the previous year.

Background – Estimating Farmland Cash Rental Rates

Farmers across the U.S. make extensive use of farmland leasing to provide a base of farmland for their operations. As shown in Figure 1, the median percentage of land rented is about 75% of the total cropland base on a farm (the red dashed line on the figure). There are very few crop and livestock producing farming operations in the United States that do not involved at least some rented cropland and/or pasture. Note that the green line in Figure 1 shows that less than 10% of farms have no rented land. The data for Figure 1 comes from an analysis of Kansas Farm Management Association (KFMA) farm records for the last 50 years. KFMA data is also used in the estimates of expenses that help determine the county level cash rents.

Part of the reason that so many farmers lease at least a portion of their farmland is the non-depreciable nature of farmland. Not only is land not depreciable but it typically appreciates in price. It is not unusual for half or more of a farm's real net returns to occur as land appreciation. These characteristics of farmland result in an asset that will very seldom ever cash flow (Oltmans, 1995). That is, when a farmer purchases farmland, the income provided from that land will not cover the principle and interest payments. Thus, in order for a farmer to cashflow any new farmland purchase, the income from other land is needed to cover the cashflow needs.

There are at least two main approaches of estimating cash lease rates. The first approach is based on either formal or informal surveys of what others are paying. Discussions with neighboring farmers would be a type of an informal approach. A more formal approach is a survey like the type USDA-NASS uses to estimate cash lease rates each year. The main issues with the survey approach are whether responses are accurately reported, the delay in time to collect a survey (resulting in

outdated lease rates), and whether the stated lease rate is actually something a tenant can pay and still cover all cash and non-cash expenses.

The second approach is to estimate breakeven cash lease rates based on soil productivity and market prices. These estimation methods have the advantage of looking forward rather than just using past experience. Also, a tenant can be more certain of covering all expenses if the calculations are developed correctly. The major disadvantage is that any forward projections are uncertain, and much more information is needed in order to develop an accurate cash lease estimate.

There are at least six methods of estimating a cash lease using the productivity approach. These are: 1) Average yields; 2) Corn suitability rating; 3) Share of gross crop value or revenue; 4) Return on investment; 5) Crop share equivalent; and 6) Tenant's residual. Iowa State University Extension has a publication detailing all of these methods and approaches (Plastina and Edwards, File C2-20).

NASS has been performing surveys of producers for cash rent expenses at the state level since 1994. They also have cash rent survey for individual counties but for a much shorter timeframe. Figure 2 plots this state rental data for both irrigated and non-irrigated cropland.

Cash rental rates are correlated with farm profitability to some extent as shown by the net farm income per crop acre for western, central, and eastern Kansas. These net farm income numbers per crop acre are shown in Figure 3. Net farm income increased from 2005 until about 2013 before starting to decline. Net farm income reached a low point in 2015 but has increased every year until last year (2022). Even though NFI decreased in 2022, it was still above historical norms for KFMA farms. A visual inspection of cash rents from NASS also show an increase in rates although there is some apparent delay and the rental rates are stickier, not increasing nor decreasing as quickly as net farm income changes.

Approach

In this paper, the tenant's residual approach is used to estimate how much income the tenant has available for rent payments after subtracting all the tenant's costs associated with producing the crop. These costs include variable costs of production along with fixed costs of depreciation and interest, a charge to operator labor, and a management fee. Also needed is the expected revenue for the farm. Once all the costs have been accounted for, the remaining amount that is available is assumed to be allocated for the payment of cash rent.

All of these calculations are taken down to the per acre basis for both irrigated and non-irrigated estimates. This paper estimates the breakeven non-irrigated cash rental amount using the tenant's residual approach method on a county basis for Kansas. A future companion paper will examine irrigated cropland breakeven cash rental rates on a county basis in Kansas.

Income

To calculate gross revenue an estimate is needed of crop yields and crop prices for the county as well as an estimate of the government payments per acre. Because estimates are developed for both irrigated and non-irrigated cropland, yields need to be specified for both irrigated and non-irrigated crops. NASS used to provide this information but for the last several years, they only provide a

single yield estimate per crop per county. Fortunately, the FSA does have this information by irrigated and non-irrigated crop per county. FSA also has the number of crops acres in a county.

Yields and prices and acres

Because yields are expected to generally follow a trendline over time, the last five years of FSA yields were used to estimate the average yield per crop per year. With only 5 years of data, a true trend could not be estimated but the trendline yield over time should not vary much from the simple average for the most recent 5-year period.

Acres and crop prices do not follow a discernible trend pattern over the last 5 years. Thus, while the last 5 years of data were used, a weighted average approach was incorporated so that more recent years had more weight. Once the gross crop revenue was calculated, the revenue per acre was calculated based on the number of crop acres. For this analysis of Kansas non-irrigated cropland, only corn, soybeans, wheat, and grain sorghum were used in the calculation.

Expenses

KFMA (Kansas Farm Management Association) crop enterprise data was used to estimate crop production expenses in this approach. Crop production expenses per crop were estimated at the Crop Reporting District (CRD) level. While KFMA has detailed whole farm numbers, the enterprise level data is limited. To get around this limitation, a similar approach to the estimate of net farm income was used (see https://www.agmanager.info/farm-management/farm-profitability/may-2021-estimate-2021-kansas-net-farm-income-and-projection-2022).

An entire farm's expense data from the KFMA database was used. However, these expenses were allocated to a specific crop by using the ratios of the KFMA state level enterprise summaries. This procedure not only gave an expense item per crop, but it also allows for the calculation of total non-irrigated crop expenses. Any "extra" crop acres that were not part of the four major crops were rolled into extra soybean acres when calculating a cost per acre per crop per farm.

The next step was to calculate a representative cost per crop per Kansas CRD. With 1,000 KFMA farms in the KFMA database, there are adequate numbers of crop farms by CRD for these calculations to be credible. At this point the median expense per crop is calculated from those farms within that CRD. Government payments were estimated in a similar manner. As discussed above in revision section, counties along a CRD border had their crop expenses and government payment per acre blended with the neighboring CRD by using a ratio of two-thirds weight from a county's home CRD and one-third weight from the neighboring county's CRD. This last change helped to smooth the crop expenses per acre when moving from one CRD to a neighboring CRD.

Revenue

At this point, with gross revenue per crop per acre, government payments per acre, and expenses per crop per acre, a net income per acre can be calculated for each year. Because all expenses need to be accounted for, 75% of unpaid operator labor is included as well as a 2% management charge based on gross revenue. Only 75% of unpaid operator labor is used to account for other

farm activities not related to crop production. The 2% management fee is for both management and the interest charge for any machinery equity on the farm.

As discussed above, yields are a 5-year average while the rest of the inputs to the model are a weighted average. 2022 has a weight of 0.25, while the years 2021 though 2019 have weights of 0.20, 0.15 and 0.10 respectively. Although numbers don't exist for 2023 yet, an earlier estimate of 2023 net farm income is predicting an increase in net farm income. However, the estimate for 2024 is predicting NFI to drop below 2022 levels. Thus, a 25% drop in net farm income was used for the years 2023 and beyond. This current year and future year's estimate is given a 0.30 weight. In theory, cash rents should be based on an expectation of future NFI. Here, we are making the assumption that the past 4 years (plus an estimate of this next year - and the expectations for the following years) are a guide to future NFI.

The tenant's residual per acre calculated is further adjusted by incorporating a relationship to the NASS 2023 reported county cash rent. If the calculated residual is above the 2023 estimate, then the final per acre number is 60% of the NASS 2023 estimate and 40% of the calculated value. If the calculated is residual is below the NASS number, then the NASS number is used. This residual calculation is further constrained to be no more than a 40 percent increase from the 2023 reported NASS number.

The final step in estimating a tenant's residual was to adjust for land use intensity. In western Kansas, there are fallow acres and in southeast Kansas there are double crop acres. To adjust for this, all KFMA farms within a CRD are used to calculate a land use percentage by dividing the number of harvested crop acres by the total number of physical crop acres. This fraction is multiplied by the previous tenant's residual to get the final value.

Range for tenant's residual

A range of values was estimated to account for various crop yield differences within a county. Using the same mix of farms by CRD, a net farm income per crop acre was calculated. The 25th and 75th percentiles were calculated in the crop reporting district, which were then compared to the estimated tenant's residual value. These differences were used to calculate a low and high range for each county.

The calculated difference really represents two sources of variation; variation within a county and variation between counties. It was assumed that the two sources of variation were equal and thus the calculated percent difference was divided in two.

Results

Figures 5, 6, 7, and 8 show the results of estimating a potential breakeven cash rent for 2024 using a Tenant's residual method. The 2023 NASS cash rental rate survey estimate is shown along with the predicted KSU value and the potential ranges for cash rents. For comparison, the 2022 NASS estimate is also shown along with the KSU prediction from last year.

Figure 5 shows the predicted KSU value on a color-coded state map of Kansas counties. The figure is capped at the ends so any county with a predicted cash rent above $150 per acre shows the darkest color and any county with a predicted rent below $40 per acre shows the lightest color.

Figure 4 shows the 2023 reported NASS survey estimates of cash rental rates for the state on a color-coded map similar to Figure 5. Given that KSU values incorporate the NASS survey numbers, producers should be interested in seeing these survey results.

Discussion

Net farm income has been rising for 5 of the last 6 years, so it should be expected that cash rents have been trending upward as well. While these estimates are calculated with full costs in mind, tenants and landlords sometimes likely also have other economic and some non-economic considerations in mind when negotiating leases.

For example, rented cropland located adjacent to a farmer might have more value to a particular farmer just because of location. Likewise, a landlord may have developed trust in a particular tenant and adjusts rent accordingly.

Communication and full information are needed in any discussion of cropland leases. This publication has been developed to help both tenants and landlords make as fully informed decisions as possible when negotiating cash rental rate agreements for the 2024 year.

References

Oltmans, A W. 1995. Why farmland cannot, will not and should not pay for itself. Journal of the American Society of Farm Managers and Rural Appraisers, 59(1): 57–67.

Plastina, A, and W. Edwards. 2021. "Computing a Cropland Cash Rental Rate." File C2-20. https://www.extension.iastate.edu/agdm/wholefarm/pdf/c2-20.pdf

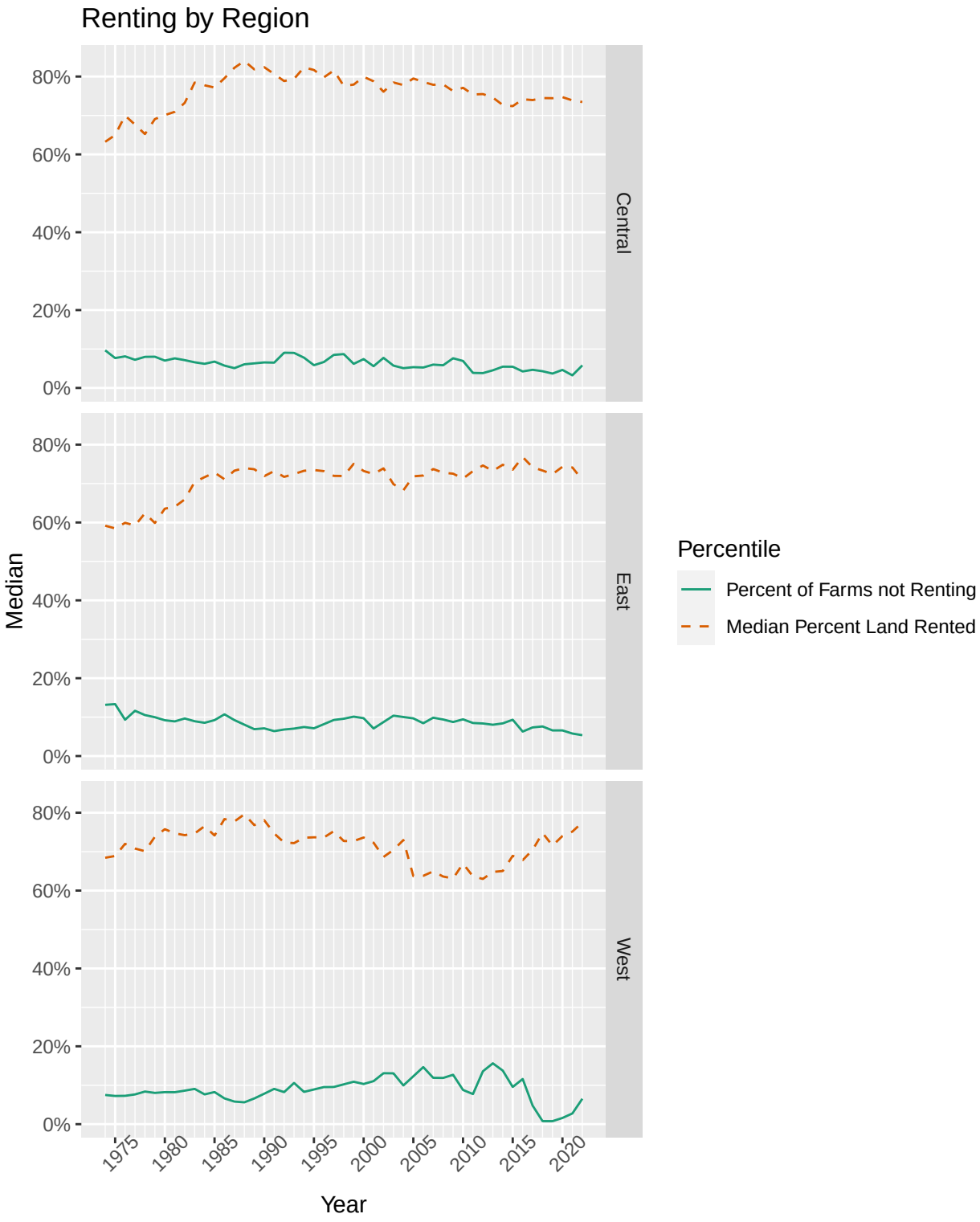

Figure 1: Percentage of Land Rented by Farm and the Percentage of Farms with no Rented Land

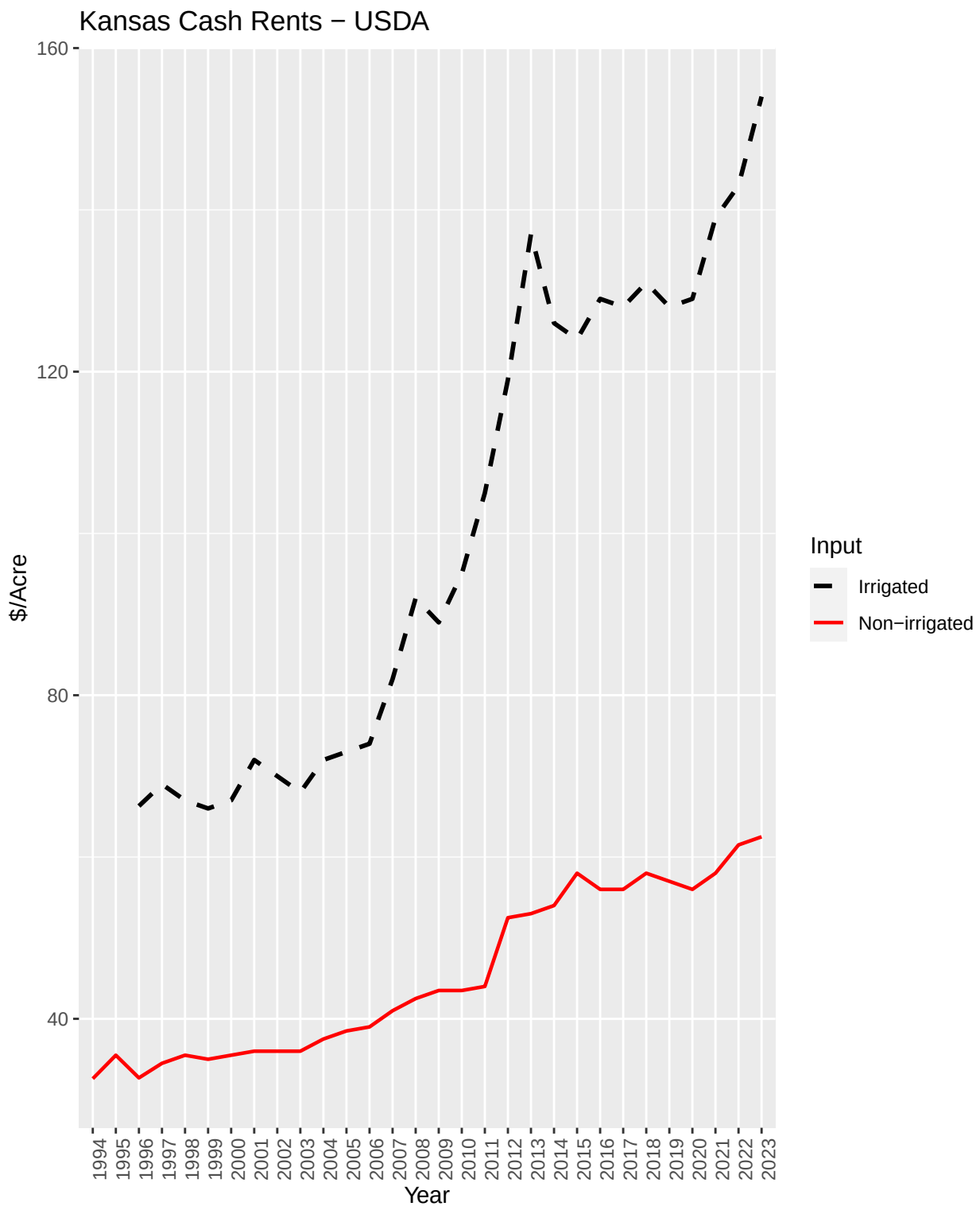

Figure 2: USDA-NASS Estimate of Kansas Irrigated and Non-Irrigated Cash Lease Rates

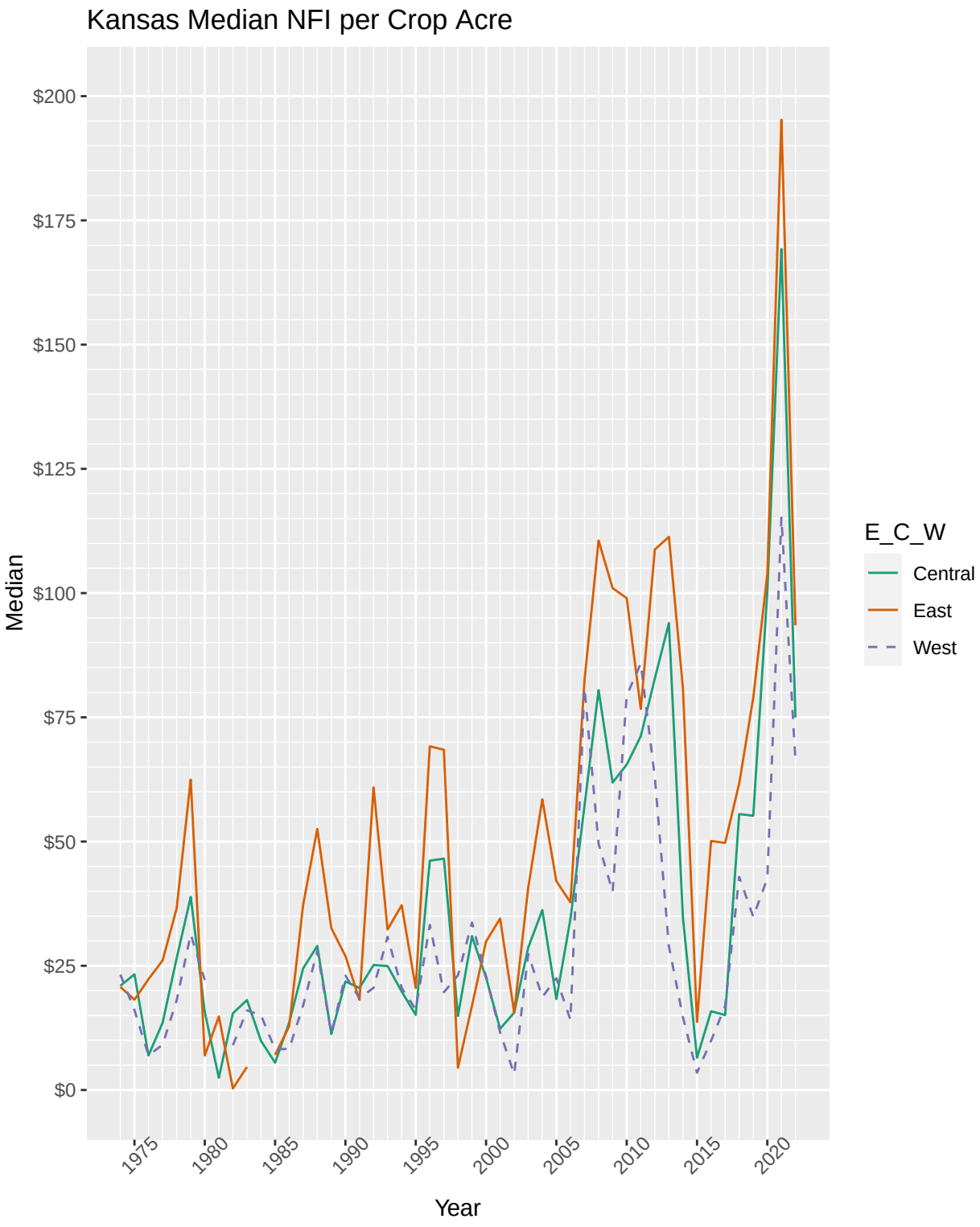

Figure 3: Median Kansas Net Farm Income per Crop Acre by Region

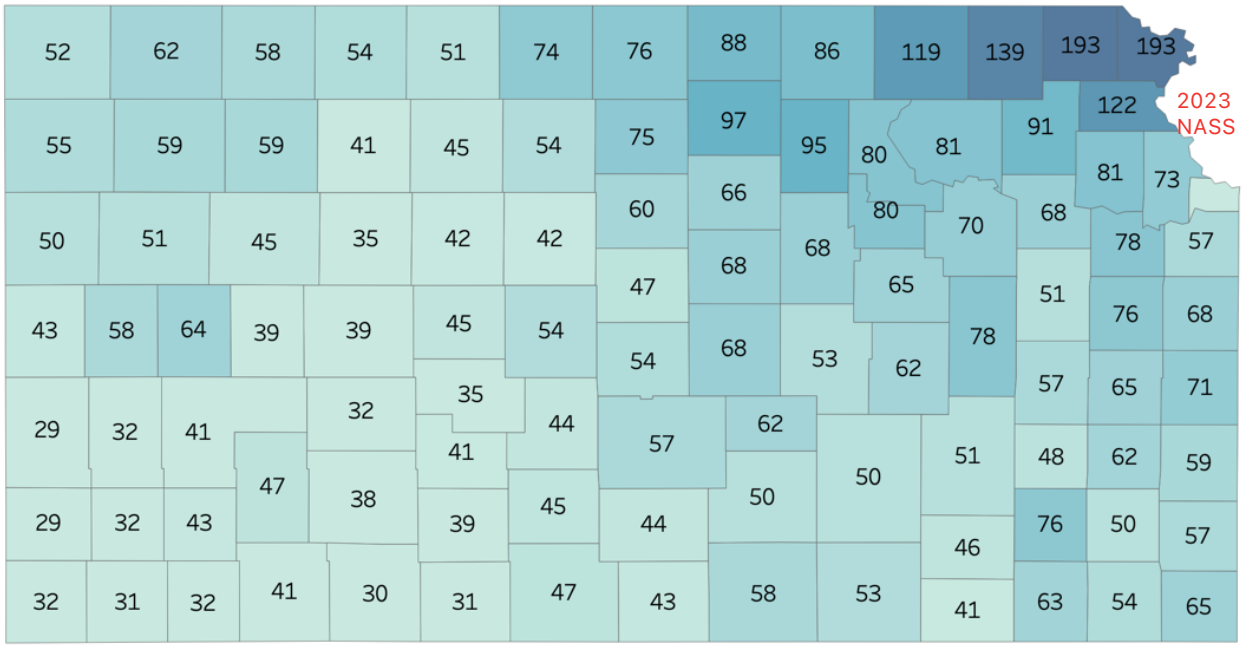

Figure 4: 2023 USDA-NASS Cash Lease Survey Results for Non-Irrigated Crop Land in Kansas. Color Code by ($/ac).

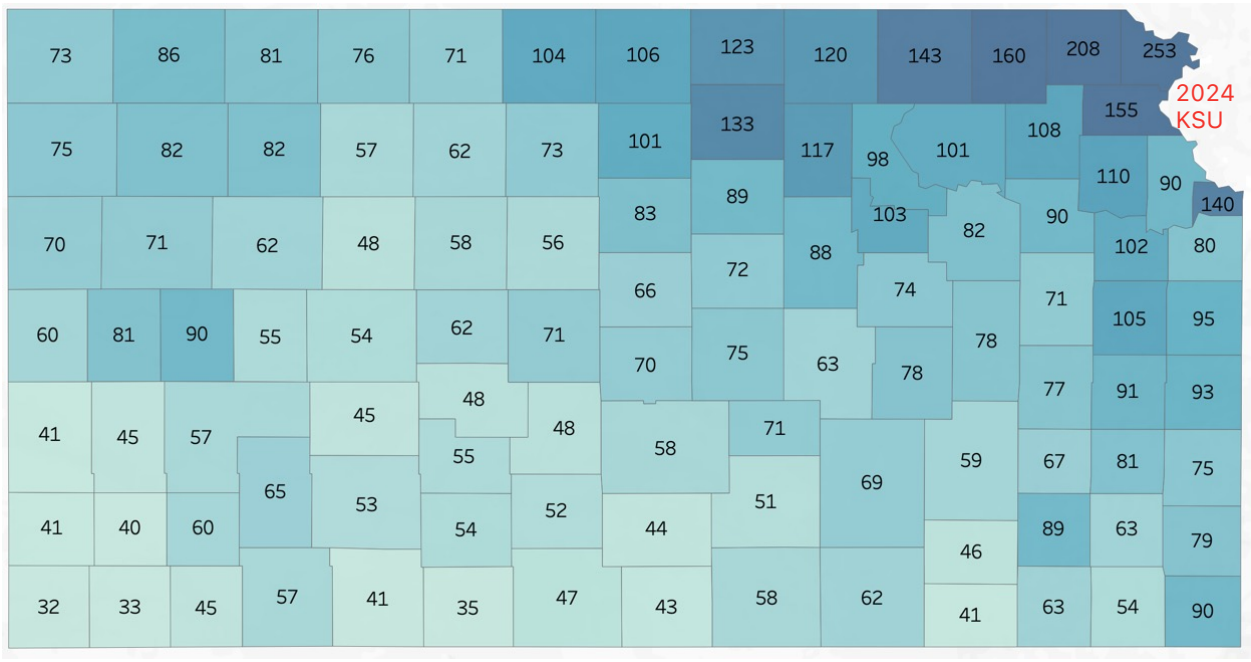

Figure 5: 2024 KSU Cash Lease Estimates for Non-Irrigated Crop Land in Kansas Using Tenant's Residual Approach. Color Coded by ($/ac).

Region	County	2022 NASS	2023 KSU	2023 NASS	2024 KSU	25th Percentile	75th Percentile
Northwest	Cheyenne	50	65	52	**73**	46	103
	Decatur	57	78	58	**81**	50	114
	Graham	42	58	41	**57**	36	82
	Norton	49	68	54	**76**	47	107
	Rawlins	60	77	62	**86**	54	122
	Sheridan	55	77	59	**82**	51	116
	Sherman	58	65	55	**75**	47	106
	Thomas	60	75	59	**82**	51	116
West Central	Gove	52	68	45	**62**	40	85
	Greeley	0	63	43	**60**	39	82
	Lane	39	55	39	**55**	35	74
	Logan	50	65	51	**71**	45	96
	Ness	46	57	39	**54**	35	73
	Scott	61	81	64	**90**	57	122
	Trego	40	55	35	**48**	31	66
	Wallace	0	70	50	**70**	45	95
	Wichita	57	74	58	**81**	52	109
Southwest	Clark	33	44	30	**41**	30	50
	Finney	45	61	41	**57**	41	70
	Ford	42	59	38	**53**	38	65
	Grant	28	35	32	**40**	29	49
	Gray	47	66	47	**65**	47	79
	Hamilton	34	40	29	**41**	29	49
	Haskell	43	60	43	**60**	43	72
	Hodgeman	37	51	32	**45**	32	55
	Kearny	31	43	32	**45**	32	55
	Meade	39	53	41	**57**	41	70
	Morton	31	31	32	**32**	23	38
	Seward	30	42	32	**45**	32	55
	Stanton	38	43	29	**41**	29	49
	Stevens	29	29	31	**33**	24	41

Figure 6: Estimated Cash Rental Rates for Non-Irrigated Cropland in Western Kansas

Region	County	2022 NASS	2023 KSU	2023 NASS	2024 KSU	25th Percentile	75th Percentile
North Central	Clay	86	102	95	**117**	98	135
	Cloud	93	116	97	**133**	112	154
	Jewell	76	106	76	**106**	89	123
	Mitchell	72	88	75	**101**	85	118
	Osborne	53	65	54	**73**	61	84
	Ottawa	64	78	66	**89**	75	103
	Phillips	57	80	51	**71**	59	82
	Republic	96	134	88	**123**	103	143
	Rooks	44	62	45	**62**	52	72
	Smith	77	108	74	**104**	87	120
	Washington	83	105	86	**120**	100	139
Central	Barton	51	61	54	**71**	57	87
	Dickinson	61	77	68	**88**	71	108
	Ellis	38	53	42	**58**	47	71
	Ellsworth	54	60	47	**66**	53	81
	Lincoln	62	72	60	**83**	66	102
	Marion	57	60	53	**63**	50	77
	McPherson	66	66	68	**75**	60	92
	Rice	54	61	54	**70**	56	86
	Rush	44	61	45	**62**	50	76
	Russell	39	48	42	**56**	45	68
	Saline	63	63	68	**72**	58	89
South Central	Barber	45	45	47	**47**	39	59
	Comanche	30	30	31	**35**	28	43
	Edwards	38	48	41	**55**	45	69
	Harper	44	44	43	**43**	35	54
	Harvey	62	62	62	**71**	59	89
	Kingman	43	43	44	**44**	36	55
	Kiowa	35	49	39	**54**	44	67
	Pawnee	41	57	35	**48**	40	60
	Pratt	46	46	45	**52**	43	65
	Reno	55	55	57	**58**	47	72
	Sedgwick	53	53	50	**51**	42	64
	Stafford	43	43	44	**48**	40	60
	Sumner	52	52	58	**58**	48	73

Figure 7: Estimated Cash Rental Rates for Non-Irrigated Cropland in Central Kansas

Region	County	2022 NASS	2023 KSU	2023 NASS	2024 KSU	25th Percentile	75th Percentile
Northeast	Atchison	118	135	122	**155**	120	199
	Brown	181	181	193	**208**	161	267
	Doniphan	189	220	193	**253**	196	325
	Jackson	87	94	91	**108**	83	138
	Jefferson	72	95	81	**110**	85	141
	Leavenworth	68	78	73	**90**	70	116
	Marshall	127	127	119	**143**	110	183
	Nemaha	139	139	139	**160**	124	205
	Pottawatomie	76	88	81	**101**	78	129
	Riley	82	85	80	**98**	76	126
	Wyandotte	0	121	0	**140**	108	179
East Central	Anderson	59	79	65	**91**	72	108
	Chase	55	68	62	**78**	62	93
	Coffey	62	68	57	**77**	61	92
	Douglas	77	89	78	**102**	81	122
	Franklin	74	91	76	**105**	84	125
	Geary	76	89	80	**103**	82	122
	Johnson	56	76	57	**80**	63	95
	Linn	70	81	71	**93**	74	110
	Lyon	68	68	78	**78**	62	93
	Miami	91	105	68	**95**	75	113
	Morris	57	65	65	**74**	59	89
	Osage	65	79	51	**71**	57	85
	Shawnee	66	78	68	**90**	71	107
	Wabaunsee	62	72	70	**82**	65	98
Southeast	Allen	56	70	62	**81**	59	107
	Bourbon	52	65	59	**75**	54	99
	Butler	45	63	50	**69**	51	92
	Chautauqua	37	37	41	**41**	30	54
	Cherokee	64	78	65	**90**	65	119
	Cowley	63	63	53	**62**	45	82
	Crawford	66	69	57	**79**	58	105
	Elk	53	53	46	**46**	34	61
	Greenwood	52	52	51	**59**	43	79
	Labette	48	48	54	**54**	39	72
	Montgomery	57	57	63	**63**	46	84
	Neosho	47	54	50	**63**	46	83
	Wilson	78	79	76	**89**	65	118
	Woodson	54	74	48	**67**	49	88

Figure 8: Estimated Cash Rental Rates for Non-Irrigated Cropland in Eastern Kansas

		KSU	NASS
EAST	Northeast	143	117
	East Central	87	67
	Southeast	67	55
CENTRAL	North Central	100	73
	Central	69	54
	South Central	51	46
WEST	Northwest	76	55
	West Central	66	47
	Southwest	47	35

Figure 9: Comparison of KSU and NASS Estimates for Non-Irrigated Cropland by CRD