

A Preliminary Estimate of 2022 Kansas Net Farm Income and a Projection for 2023

Gregg Ibendahl and Dan O'Brien

Abstract

Kansas Farm Management Association (KFMA) farms are used to estimate 2022 and 2023 net farm income for grain farms in Kansas. While 2022 Net Farm Income (NFI) will be within historical ranges, it will still be well below the record NFI from 2021. The drought in many parts of Kansas in 2022 will result in a much wider variation in NFI across the state. While some farmers will report a very good year, others will be in much worse shape. Crop insurance levels will be a big factor for 2022 farm level NFI. 2023 is looking like it could experience a further decrease in NFI as farmers will likely see the full effects of the rapid raise in input prices that have occurred over the last two years. There is much uncertainty entering this year so these projections are likely to change during the year.

Introduction

This particular article discusses both the expected net farm income for Kansas grain farms for 2022 and then projects net farm income for 2023 based on current grain future prices and normal yields. Even though KFMA has not released 2022 results yet, predicting net farm income for 2022 is a much simpler process as state yields and prices are known. Also the government payouts for 2022 are known. Net farm income predictions for 2023 are much less certain as the only guide to prices is crop futures and both yields and prices are influenced by weather variability.

One of the big unknowns for this forecast is the effect of the drought. While the state crop yields are known at this time, county yields won't be released until the end of February. Thus, the next 2022 NFI income update will likely show a wider range of NFI even if the overall average doesn't change very much. The crop insurance section of the model assumes a certain level of coverage and those farms within the drought areas will see a large difference in NFI depending upon their level of crop insurance coverage.

The drought also complicates government payment predictions for 2023. Using the state average yield as the basis for ARC-CO payments would result in few government payments in 2023. However, some counties will likely have low enough yields in 2022 that 2023 government payments then become likely. RMA yields won't be available until

Gregg Ibendahl
Dan O'Brien

email: ibendahl@ksu.edu
email: dobrien@ksu.edu

twitter: [@ibendahl](https://twitter.com/ibendahl)
twitter: [@KSUGrains](https://twitter.com/KSUGrains)

this summer but the NASS yields released at the end of February should help with this estimate.

A compounding factor for these estimates is the large increases in input costs that occurred during 2021 and during 2022. Fertilizer prices peaked during the spring of 2022 and have since retreated to some extent. When these inputs were purchased will greatly affect how much of the price increase will show up in the 2022 estimate vs the 2023 estimate. Some farmers likely avoided the entire price rise in fertilizer for their 2022 expenses. Because of this input timing consideration, 2023 fertilizer expenses are higher than 2022 even though fertilizer prices have leveled off and decreased since last spring. The same holds true for diesel fuel. Herbicide prices have actually increased the most in the last 12 months with herbicide prices 50% higher than last year.

This allocation of input cost increases to either 2022 or 2023 is also complicated by farmer's ability to use cash accounting. Cash accounting allows for an input cost to be counted as a cost when purchased. Thus, net farm income for 2022 could well be lower if farmers purchased much of their 2022 fertilizer needs after January 1, 2022, instead of purchasing in the fall of 2021. With the softening of fertilizer prices, farmers who delayed purchasing their 2023 fertilizer inputs will likely see a lower fertilizer price than farmers who purchased their fertilizer in the fall.

Methods

In this particular article a general overview of the net farm income projection procedure is provided. Like the analyses from previous years, KFMA farms are used as a baseline. In order to ensure a farm's production history is incorporated into the analysis, only grain farms with a minimum of three years of history are included in the analysis. This requirement reduced the number of farms that were analyzed but there were still 550 grain farms that provided data.

There were seven major areas that were addressed in the forecast model: yields, prices, crop acres, expenses, crop insurance, government payments from the farm bill, and ad hoc government payments. Each of these areas was projected down to the farm level to estimate net farm income for each of the 550 KFMA grain farms for 2022 and 2023.

Yields - State yields are projected down to the farm level based on the historical relationships between state yields, crop reporting district yields, county yields, and farm yields. For 2022, only the state yield is known as of the date of this article. However, county level yields should be known soon and will be incorporated into future estimates. For 2023, average yields are assumed but these will adjusted as forecasts become available.

Kansas State University – Department of Agricultural Economics

Prices - Monthly state grain prices are used if available, otherwise the futures prices are used. Like the yields, relationships between national, state, and farm prices are used to estimate the farm level price. For 2022, monthly grain prices are available for Kansas for all months. For 2023, future prices are used to estimate farm prices.

Crop acres - State crop acres for 2023 are available from NASS. 2022 saw a 4% increase in soybean acres, a 4% decrease in corn acres, steady wheat acres, and a 8% decrease in sorghum acres. Acreage allocation for 2023 is based on the assumption there will only be minor changes in crop acres. Thus, soybean acres are projected to be 2% lower while corn and wheat acres are projected to be 2% and 3% higher respectively.

Expenses - KFMA provides detailed expenses but only at the farm level. Because expenses vary by crop grown, a change in the acreage mix means that farm expenses need to be allocated at the enterprise level in order to better estimate the overall expense change. KFMA does provide detailed enterprise reports for the state and these were used to allocate the total expense item back to the farm enterprise level. The last five years of KFMA state crop enterprise reports were averaged by crop to determine the item expense ratio relative to that expense item of soybeans. For example, based on the KFMA enterprise reports, the corn fertilizer expense is five times the soybean fertilizer expense. These ratios were then used to calculate a farm's expense item at the farm enterprise expense level. Because a farm's own expenses were used, the total farm expense didn't change but some farms had higher specific costs than other farms. The ratio of the specific expense among crops was consistent among farms though.

Crop insurance - Crop insurance was estimated under the assumption of farmers choosing Crop Revenue Coverage (CRC) with the Harvest Price Option. Not all farmers chose this option and the level of coverage varies by farm so this calculation was adjusted based on the three years of known data. For example, first the potential crop insurance payout was calculated using a 70 percent coverage level and then the payout was adjusted downward by a discounting factor to reflect what farms actually received. The discounting factor that best fit the three years of known data was then applied to the estimates of 2022 and 2023.

Prevented planting payouts were also incorporated into the analysis of crop insurance. The FSA provides this information at the county level and it is updated multiple times during the year. Many counties in 2019 had a large number of prevent plant acres. Prevented plantings have not been a large factor the last couple of years.

Farm bill government payments - Government payments are separated by regular government payments that are part of the 2018 farm bill and special ad hoc government payments like MFP and CFAP payments. The current estimate of government payments for 2022 and 2023 is based on actual FSA data for ARC and PLC. Given the year delay of

data used in the calculation and the payout to farmers, this reported number should be very close to the actual farm bill government payment for 2022. The 2023 government payment estimation is more complicated as county yields are not known yet. Given the drought in 2022 and the wide range of county yields, the 2023 estimate for government payment could change greatly by the next NFI estimate.

PLC payments are estimated based on county base acres, county yield history, and estimated payments per bushel that the Department of Agricultural Economics provides. Since the FSA provides crop base acres at the county level, an average PLC payment can be estimated for the county for an average acre of land in the county. Thus the model used in this analysis assumes that a farm within a particular county has similar characteristics of the county average. That is, the base acreage mix of the individual farm matches the county average of base acres and farm yields are the same as county yields.

Specific expense adjustments - These were based on the price indexes provided by NASS. Fertilizer saw most of its price increase during the second half of 2021 through spring planting of 2022. Since then, fertilizer prices have declined slightly and continue to drift lower. The 2022 estimate of fertilizer prices assumed that farmers were able to purchase ahead and avoid some of the fertilizer price increase that occurred. However, even though prices are lower than last spring, the 2023 estimate for fertilizers allows for farmers purchasing ahead the previous year. This means farmers are likely facing higher fertilizer costs even though fertilizer costs may have peaked in the spring of 2022. Because oil follows a similar pattern to fertilizer, the diesel price increase mirrors the fertilizer price increase. Herbicide prices have increased 50% since last year and this is reflected in the higher herbicide costs for 2023.

Results

Table 1 shows the average actual revenues and expenses for 550 KFMA grain farms for 2020 and 2021. The table also shows the estimated 2022 revenues and expenses and the predicted 2023 revenues and expenses. Net farm income is expected to decrease by 56% in 2022, from \$355,000 to \$156,000. Net farm income then is forecast to fall by 74% in 2023 to \$41,000. However, that last estimate is still very uncertain as the estimate includes normal rainfall and the government payment number is very uncertain until county yields are reported.

Figure 1 shows the average and median as well as the 25th and 75th percentile of net farm income for 2019 through the estimated 2023 values. The average is higher than the median as some of the larger farms help to raise the overall average. As forecast, 2023 projections still show an average farm earning positive NFI although it is much

lower than recent years. As this figure shows, 40% of the farms in 2023 are expected to have a negative net farm income.

Figure 2 shows a cumulative distribution for the 2021, 2022, and 2023 estimated net farm incomes. At any given NFI amount, the graph shows the percentage of farms that have that particular level of NFI or lower. The 50-percentile point is the median level of NFI. Normally a cumulative distribution shows a line from 0 to 100 percent to represent the entire distribution of farms. However, because there is such a wide variation in NFI, the tails have been trimmed to highlight the main area of the graph.

Conclusions

Most grain farmers in Kansas should have a very profitable year in 2022 but not at the level of 2021. However, the rapidly increasing input costs will catch up to farmers in 2022 and especially in 2023. Higher expenses and the potential end of ad hoc government payments means that net farm income will drop substantially. The major worry going into 2023 is that 40% of Kansas grain farms could have negative net farm income. In addition, the average NFI will be much lower. This could result in farms increasing their debt levels at a time when interest rates could be rising

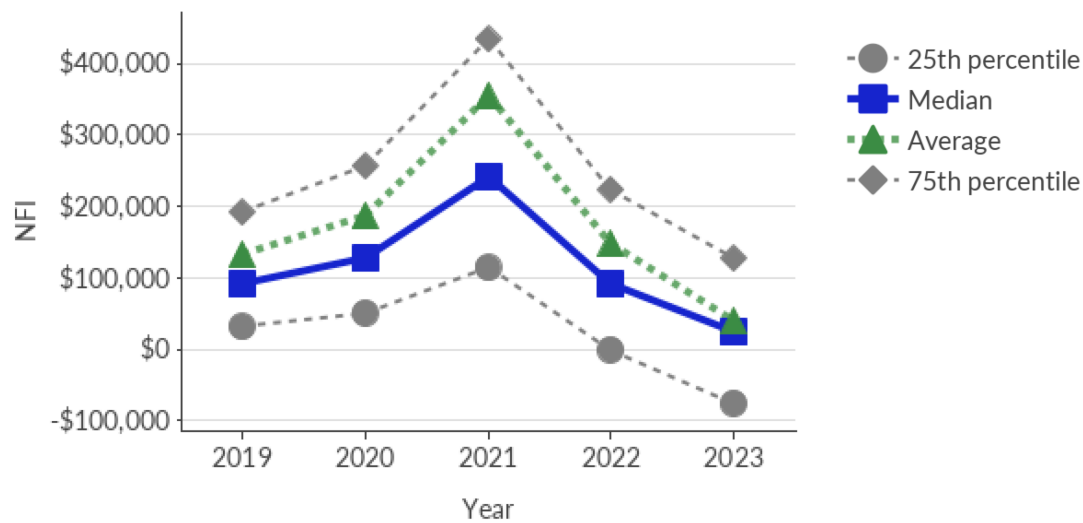


Figure 1. The 25th Percentile, the Median, the Average, and the 75th Percentile of Net Farm Income From 588 KFMA Grain Farms

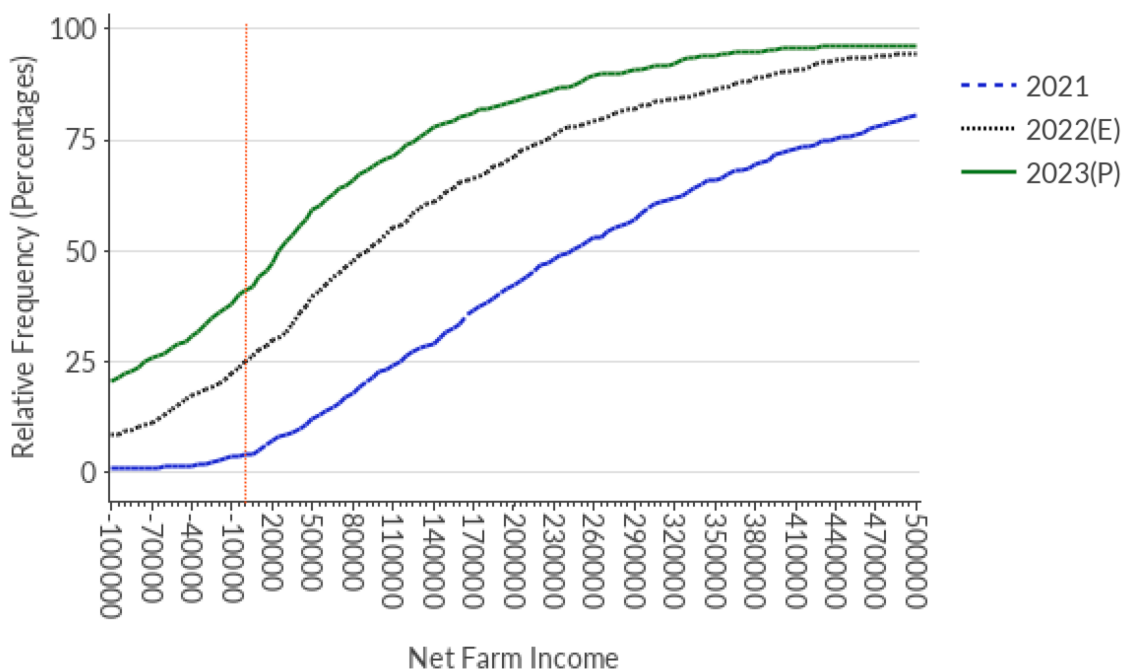


Figure 2. Comparison of 2020 NFI and Predicted 2021 and 2021 NFI for KFMA Grain Farms

Table 1. 2020, 2021, Predicted 2022, and Estimated 2023 KFMA Net Farm Income

		2020	2021	2022(p)	Est 2023
Income					
Beef		\$ 57,021	\$ 72,372	\$ 83,228	\$ 91,551
Dairy-livestock		152	45	48	50
Dairy-milk		-	-	-	-
Sheep		164	198	198	198
Swine		2,139	2,851	3,421	3,421
Poultry and eggs		227	241	241	241
Other livestock		864	518	523	523
Custom feeding		8,640	11,481	12,284	12,284
Ad hoc pmt - Livestock		12,874	3,443	-	-
minus Feed purchased		26,397	30,338	37,923	41,715
Livestock VFP		\$ 55,684	\$ 60,811	\$ 62,020	\$ 66,553
Corn		233,332	359,103	329,127	362,740
Grain sorghum		50,125	70,058	73,562	66,518
Soybeans		221,696	259,624	295,909	310,832
Sunflowers		2,419	979	-	-
Wheat		76,169	149,149	169,419	165,952
Hay and forage		12,540	18,578	20,435	22,479
Other crop		-	-	-	-
Govt payment (farm bill only)		32,420	19,384	833	10,481
Ad hoc pmt - Crops		49,292	43,826	-	-
Crop ins proceeds		23,038	16,279	77,148	30,499
Machine work		16,963	16,923	17,092	17,946
Other income and hedging		37,527	31,302	32,867	33,525
Crop VFP		\$ 755,522	\$ 985,205	\$ 1,016,393	\$ 1,020,971
TOTAL VFP		\$ 811,205	\$ 1,046,016	\$ 1,078,414	\$ 1,087,524
Expenses					
Hired Labor		26,278	28,251	31,143	34,335
Machinery Repairs		56,046	63,311	73,127	79,010
Irrigation Repairs		2,271	2,312	2,543	2,925
Building Repairs		3,609	4,038	4,240	4,664
Seed/Other Crop Expenses		80,923	83,100	109,549	123,659
Crop Insurance		20,350	28,775	33,989	37,562
Fertilizer-Lime		90,825	107,127	202,204	223,807
Machine Hire		25,854	29,243	37,904	41,850
Organization Fees, Publications		5,598	6,039	6,372	7,002
Vet-Med-Drugs		4,133	4,086	4,413	4,855
Misc Crop Expense		4,423	6,359	6,948	7,681
Misc Livestock Expense		2,251	2,325	2,558	2,686
Dairy Expense		-	-	-	-
Gas-Fuel-Oil		22,761	29,863	60,000	61,219
Irrigation Energy		4,892	5,607	6,728	8,747
Real Estate Taxes		12,194	12,402	12,650	13,282
Personal Property Taxes		2,513	2,548	2,691	2,824
General Farm Insurance		14,211	15,178	16,045	17,635
Utilities		6,555	7,535	8,340	9,158
Cash Farm Rent		51,467	55,856	58,649	64,514
Herbicide-Insecticide		77,048	88,068	119,082	166,383
Conservation		2,191	2,617	2,925	3,035
Auto Expense		796	860	1,540	1,703
Other expenses		(79)	33	33	33
Total Operating Expenses		\$ 517,111	\$ 585,537	\$ 803,675	\$ 918,568
Interest paid		29,356	24,376	26,326	28,432
Depreciation - machinery		65,612	72,283	83,126	91,438
Depreciation - buildings		8,160	8,353	8,520	8,520
Total Farm Expenses		\$ 620,239	\$ 690,549	\$ 921,646	\$ 1,046,958
Net Farm Income		\$ 190,966	\$ 355,467	\$ 156,767	\$ 40,566