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Weekly Farm Economics: Stress Test of 2022 Crop Returns

Gary Schnitkey, Krista Swanson, and Nick Paulson

Department of Agricultural and Consumer Economics
University of Illinois

Carl Zulauf

Department of Agricultural, Environmental and Development Economics
Ohio State University

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Illinois Crop Budgets for 2022 corn and soybeans were released in July (see *farmdoc Daily*, July 27, 2021). Positive returns are projected for both crops given a $4.25 corn price and $12.00 soybean price, both of which are significantly above prices received from 2014 to 2019. We provide stress tests of corn and soybean returns under lower prices which could result for a variety of reasons including acreage responses. A return to 2014-2019 prices would result in meager incomes, and possible pressures for another round of ad hoc Federal payments. In two scenarios of lower prices, corn returns are much lower than soybean returns, suggesting there is more risk to growing corn than soybeans in 2022. Commodity title payments from Agriculture Risk Protection (ARC) and Price Loss Coverage (PLC) programs do not protect against the possibility of negative farm returns.

2022 Average Returns

We modified the crop budgets released in July to account for new information about yields, prices, and cash rents. Table 1 shows revised budgets with three modifications from the same table in the July 27, 2021 *farmdoc daily*:

1. Yields for 2021 were increased due to USDA estimates of state yields released on August 12, 2021. USDA estimated Illinois yields at 214 bushels per acre for corn and 64 bushels per acre for soybeans. Both those projected yields are at record levels. As a result, the 2021 corn yield in the budget was increased from 222 bushels per acre to 235 bushels per acre. Likewise, soybean yield was increased from 69 bushels per acre to 73 bushels per acre.

2. Soybean prices were lowered given declines in futures prices and forward delivery prices. For 2021, soybean price was lowered from $13.60 per bushel to $13.00 per bushel. For 2022, the projected soybean price was lowered from $12.35 per bushel to $12.00 per bushel.

3. Cash rents were increased based on state rents released by USDA (here). From 2020 to 2021, state rents increased by $5 per acre. As a result, cash rent for high-productivity farmland in Central Illinois was increased by $5 per acre to $284 per acre. The 2022 projected cash rent was increased to $293 per acre, the same as the highest cash rent set in 2014.

Table 1. Corn and Soybean Returns, Central Illinois, High-Productivity Farmland

	Corn			Soybeans		
	2020	2021P	2022P	2020	2021P	2022P
Yield per acre	214	235	220	72	73	69
Price per bu	$4.33	$5.25	$4.50	$11.22	$13.00	$12.00
Crop revenue	$927	$1,234	$990	$808	$949	$828
ARC/PLC	0	0	0	0	0	0
Ad hoc Federal payments	68	0	0	45	0	0
Crop insurance proceeds	9	0	0	4	0	0
Gross revenue	**$1,004**	**$1,234**	**$990**	**$857**	**$949**	**$828**
Fertilizers	143	153	193	42	45	63
Pesticides	78	61	66	47	50	54
Seed	112	115	124	71	74	80
Drying	22	22	24	0	0	2
Storage	15	15	15	5	5	5
Crop insurance	21	24	24	14	16	16
Total direct costs	**$391**	**$390**	**$446**	**$179**	**$190**	**$220**
Machine hire/lease	16	17	19	14	14	16
Utilities	5	5	6	5	5	6
Machine repair	28	30	33	24	21	23
Fuel and oil	15	18	20	13	12	13
Light vehicle	2	2	2	1	1	1
Mach. depreciation	65	68	71	56	55	58
Total power costs	**$131**	**$140**	**$151**	**$113**	**$108**	**$117**
Hired labor	20	21	22	20	22	23
Building repair and rent	6	7	8	5	6	7
Building depreciation	13	14	15	11	12	13
Insurance	11	11	12	11	11	12
Misc	10	10	11	10	10	11
Interest (non-land)	17	14	12	15	12	10
Total overhead costs	**$77**	**$77**	**$80**	**$72**	**$73**	**$76**
Total non-land costs	**$599**	**$607**	**$677**	**$364**	**$371**	**$413**
Operator and land return	**$405**	**$627**	**$313**	**$493**	**$578**	**$415**
Cash rent	279	284	293	279	284	293
Farmer return	**$126**	**$343**	**$20**	**$214**	**$294**	**$122**

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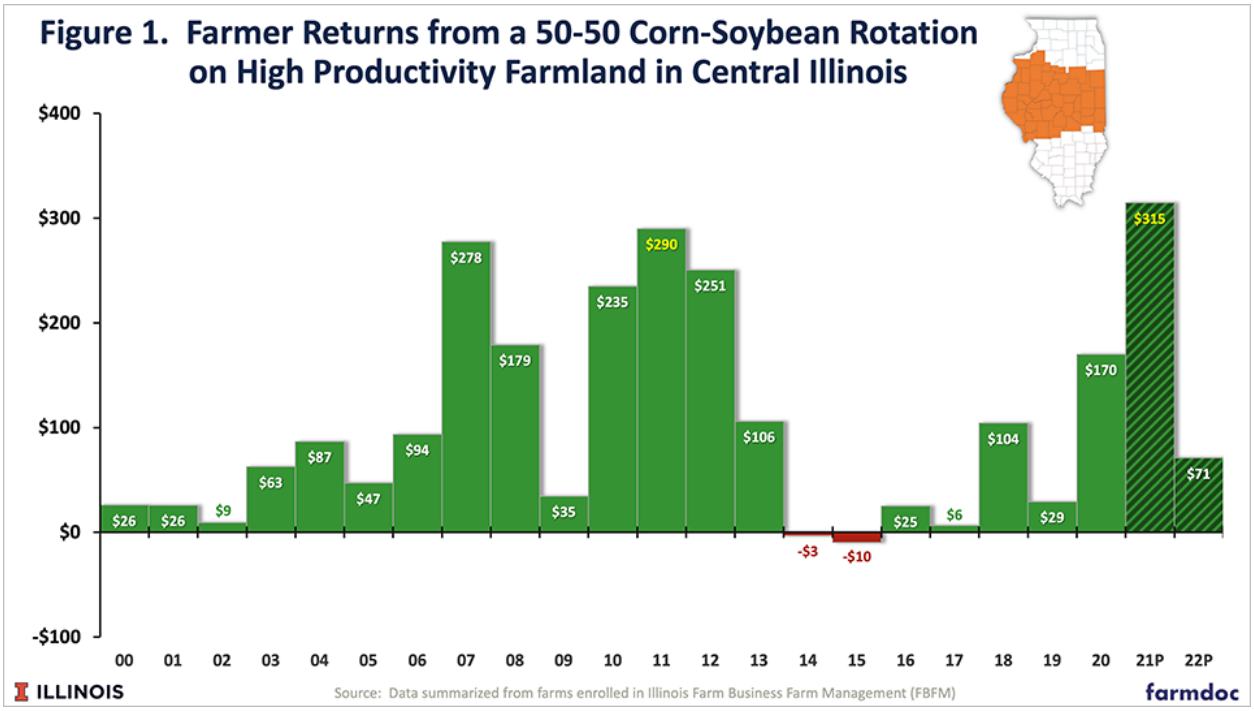
Farmer returns are shown in Table 1 for cash rented farmland, with the cash rent set at average levels. Cash rents can vary significantly from parcel to parcel, so returns will vary across parcels. In 2021, farmer return is projected at $343 per acre for corn and $294 per acre for soybeans. For 2022, farmer return for corn is projected at $20 per acre for corn and $122 per acre for soybeans.

2022 Returns in Perspective

Perspective on these returns can be seen in Figure 1, which shows farmer returns for high-productivity farmland in Central Illinois given a 50% corn and 50% soybean rotation (hereafter called a 50-50 rotation). Rotation will have large impacts on yield, with a 50-50 rotation being the most common in this area. Given current projections, putting more soybeans in the rotation will increase returns.



Projected farmer return for the 50-50 rotation is $315 per acre for 2021, a record level exceeding the previous high of $290 per acre set in 2011. Incomes in 2021 likely will be considerably higher than average if harvested yields are near record levels and commodity prices remain high.

For 2022, farmer return is projected at $71 per acre. The 2022 projected farmer return would be below the average for the entire 2000-2020 period of $97 per acre. Farmer returns are cyclical, with the last low return period occurring from 2014 to 2019 when returns averaged $25 per acre. The $71 projection is above the 2014-2019 average.

Stress Tests

Returns are projected at $71 per acre in 2022 at budgeted prices of $4.50 per bushel for corn and $12.00 per bushels for soybeans. Returns were estimated at lower prices to identify potential stress points for the coming year. Only prices were lowered as acreage responses could lead to lower prices. Yields and costs were maintained at the same levels as shown in Table 1. In the lower price scenarios, ARC/PLC payments were included when prices indicated the likelihood of payment. The three scenarios are:

1. 2022 break-even prices,
2. 2014-2019 average prices, and
3. Lowest price from 2014 to 2017.

Returns decreased from scenario 1 to scenario 2 to scenario 3.

Stress-Test One: 2022 Break-Even Prices

While returns are projected positive for 2022, relatively small declines in prices could cause returns to be negative. The 2022 break-even prices below which returns would be negative on cash rented land are:

- $4.41 per bushel for corn, and

- $10.23 per bushel for soybeans.

ARC/PLC payments were not included at those break-even levels as commodity title payments are not likely (ARC could make payments if yields are also low). These break-even prices are considerably higher than average prices in recent years. From 2014 to 2019, farmers received an average of $3.64 per bushel for corn and $9.91 per bushel for soybeans. The 2022 break-even price for corn of $4.41 is $.78 higher than the 2014-2019 average. The soybean break-even price of $10.25 is $.34 per bushel higher than the 2014-2019 average.

The 2022 break-even prices are high relative to the 2014-2019 prices because:

1. Non-land costs are projected higher in 2022 than the average from 2014-2019. For corn, average non-land costs from 2014-2019 were $549 per acre, while the 2022 projected costs are $677 per acre. Non-land costs for corn are projected almost $100 higher in 2022 than the 2014-20-19 average. For soybeans, non-land costs averaged $363 per acre from 2014 to 2019, while 2022 projected costs are $413 per acre, an increase from the 2014-2019 average of $50 per acre.

2. ARC/PLC payments are projected at $0 per acre in 2022, while the payments averaged $12 per acre from 2014 to 2019.

3. Ad hoc Federal payments are not included in 2022. Market Facilitation Program (MFP) and Coronavirus Food Assistance Program (CFAP) payments were important sources of revenue in 2018, 2019, and 2020. For corn, ad hoc payments averaged $1 per acre in 2018, $110 per acre in 2019, and $68 per acre in 2020. For soybeans, ad hoc payments were $122 per acre in 2018, $94 per acre in 2019, and $45 per acre in 2020.

Stress-Test Two: 2014 to 2019 Average Prices

Returns were estimated at 2014-2019 average prices of $3.64 per bushel and $9.91 per bushel. Base acres in corn most likely would generate a commodity title payment at those prices if those acres were placed in PLC. ARC/PLC payments were set at an average of $5 per acre for both corn and soybeans. These payments were averaged across crops because payments are made on base acres and not planted acres.

At those prices, the average return for corn is -$164 per acre and -$17 per acre for soybeans. The 50-50 rotation return is -$86 per acre, well below all returns since 2000 (see Figure 1). An -$86 return would be $76 below the lowest return of -$10 per acre occurring in 2015.

Incomes for grain farms in Illinois would be at very low levels if those 2014-2019 average prices occurred, without any additional ad hoc Federal payments. Ad hoc payments of $86 per acre would result in break-even returns, with $86 per acre being higher than average payments in 2018 through 2020 ($62 per acre in 2019, $54 per acre in 2019, and $27 per acre in 2020). Whether ad hoc payments would occur is an open question.

Stress-Test Three: Lowest Price from 2014 to 2017

This scenario represents low prices that are unlikely but could happen. The lowest prices from 2014 to 2017 was used in for this scenario:

- $3.49 for corn, which occurred in 2016, and

- $9.39 per bushel for soybeans, which occurred in 2018.

The years 2018 and 2019 are not included because trade difficulties influenced those prices. We judged the likelihood of trade difficulties in 2022 as being low. Had those years been included, the soybean price used for stress test three would have been lowered to $9.12. A $3.49 corn price would generate a PLC

payment for corn, but a $9.39 soybean price would not generate a PLC payment. ARC/PLC payments set at an average of $20 per acre were applied to both corn and soybeans.

At those price levels, corn's projected return is -$182 per acre, while soybean returns are projected at -$38 per acre. The average return for the 50-50 rotation is -$110 per acre. Under this scenario, most farmers' financial situation would deteriorate significantly.

Summary

Incomes on Illinois grain farms likely will be above average in 2021 and could be above 2014-2019 levels in 2022. Both 2021 and 2022 prices and costs are well above averages during the late-2010s, leading to concerns of lower returns if prices decline. A return to 2014-2019 could lead to very low returns because of higher non-land costs.

Even though reference prices are at the same level, current commodity title programs provide less protection against low incomes in 2022 than in the 2014-2019 period. Higher non-land costs contribute to less protection along with declining benchmark prices for ARC.

Lower prices could lead to pressures for another round of ad hoc Federal payments. Whether those payments would occur under lower prices is an open question.

References

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