

# Estimates of Soybean Production and Yields Based on 9/15/24 Crop Conditions

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## Abstract<sup>1</sup>

This reports estimates soybean yields for the 18 leading soybean states and then calculates total soybean production and average national soybean yield using the recently released NASS crop acre estimates. Based on the 9/15/24 crop condition report, total soybean production is estimated to be 4.5 billion bushels with a range from 4.4 billion to 4.7 billion bushels. The national soybean yield is estimated to be 52.8 bu/ac with a range from 51.6 to 54.0 bu/ac. This week's estimate of yield is 0.2 bu/ac lower than last week. Given that harvest is commencing across the U.S., this will be the last yield prediction report based on crop conditions.

## Introduction

This estimate is based on the USDA estimate of crop conditions for 9/15/24 (week #37). For a full description of this procedure and model, readers are encouraged to read "Estimates of Soybean Production and Yields Based on 6/30/24 Crop Conditions".

Since Ibendahl's 9/10/24 estimate, USDA/NASS has released the September Crop Production Report. USDA kept both acres and national yield identical to the August report. For comparison, USDA/NASS is currently estimating a 53.2 bu/ac national soybean yield.

## Results

Figure 1 is a Likert graph of the soybean crop conditions for the last 20 years in the U.S. The Likert graph is centered on the fair category to make comparisons among years easier. The number along the left-hand-side of the figure is the total of the very poor and poor categories while the number along the right-hand-side is the total of the good and excellent categories.

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Figures 2, 3, and 4 show the estimated yield per harvested acre, the estimated harvested acres, and the total production for each of the 18 leading soybean states. The harvested acre estimate comes directly from the USDA-NASS estimate from the September 12, 2024 Acreage Report.

Figure 5 projects a national yield per acre for each week with a crop condition report. Because the yield per acre from the individual states can't be summed together, the shown yield per acre is calculated from the total production divided by the total harvested acres. Total U.S. soybean production is calculated by adjusting the production from the 18 leading soybean states upward based on the historic relationship between U.S. production and the production from the 18 leading soybean states. As calculated, total U.S. soybean production is estimated to be 4.549 billion bushels with a range from 4.445 billion to 4.652 billion bushels. The national soybean yield is estimated to be 52.8 bu/ac with a range from 51.6 to 54.0 bu/ac.

While this is the last estimate for 2024 based on the current model, Ibendahl will report on alternative models for estimating national soybean yields using variations to the crop conditions model factors and also alternatives to a trendline yield.

## References

Ibendahl, G. "Estimates of Soybean Production and Yields Based on 6/30/2024 Crop Conditions." *farmdoc daily* (14):125, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, July 8, 2024.

<https://farmdocdaily.illinois.edu/2024/07/estimates-of-soybean-production-and-yields-based-on-6-30-2024-crop-conditions.html>

### Condition of US Soybeans as of 9/15/24

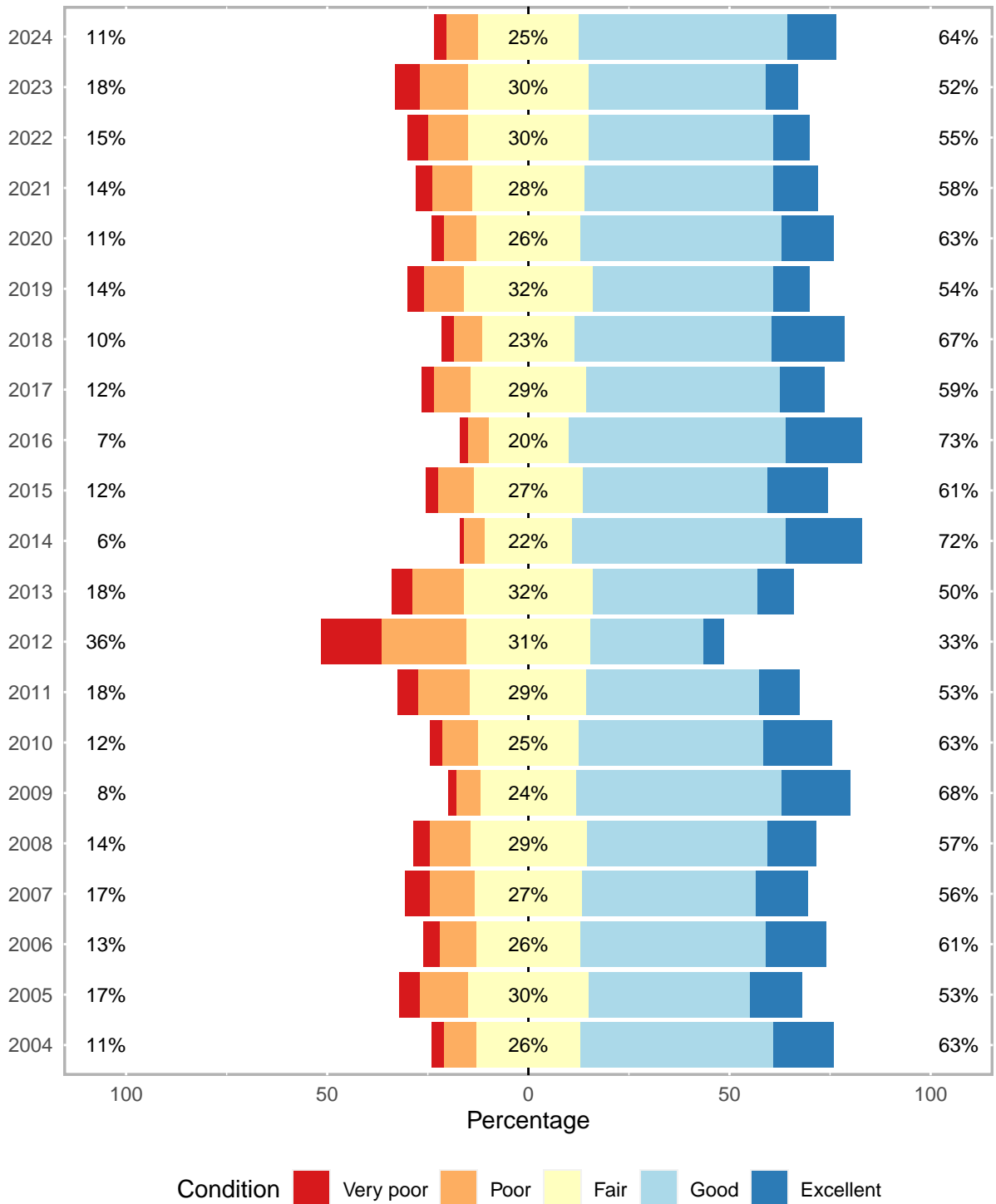


Figure 1: Likert Graph of Soybean Crop Condition

Soybean Yields per Acre by State - 9/15/24					
Bushels per harvested acre					
State	Last year	2024 prediction			R squared
		Lower CI	Predicted	Upper CI	
Arkansas	54.0	55.0	56.1	57.1	0.49
Illinois	63.0	63.3	64.8	66.4	0.41
Indiana	61.0	59.8	60.8	61.8	0.60
Iowa	58.0	60.7	61.9	63.0	0.70
Kansas	26.0	37.4	38.6	39.7	0.81
Kentucky	55.0	52.1	53.2	54.2	0.76
Louisiana	40.0	55.2	56.9	58.6	0.54
Michigan	46.0	47.8	49.0	50.2	0.37
Minnesota	48.0	48.6	49.6	50.6	0.51
Mississippi	56.0	56.1	57.1	58.2	0.57
Missouri	48.0	51.6	52.9	54.2	0.73
Nebraska	51.5	60.2	61.3	62.3	0.69
North_Carolina	38.5	35.3	36.2	37.2	0.69
North_Dakota	35.5	33.4	34.9	36.3	0.26
Ohio	58.0	51.2	52.5	53.8	0.69
South_Dakota	44.0	43.8	44.9	46.0	0.49
Tennessee	51.0	45.4	46.5	47.7	0.81
Wisconsin	51.0	48.6	50.0	51.3	0.61

Figure 2: Estimated Yields per Acre for 18 Leading Soybean States

Soybean Harvested Acres by State - 9/15/24				
1,000 acres				
State	Last year	Planted acres	2024 harvest estimate	
			NASS est	
Arkansas	2,950	3,050	3,020	
Illinois	10,300	10,800	10,750	
Indiana	5,480	5,800	5,780	
Iowa	9,880	10,050	9,970	
Kansas	4,030	4,530	4,480	
Kentucky	1,820	2,050	2,040	
Louisiana	980	1,100	1,060	
Michigan	2,030	2,190	2,180	
Minnesota	7,280	7,400	7,330	
Mississippi	2,130	2,300	2,270	
Missouri	5,520	5,900	5,830	
Nebraska	5,180	5,300	5,250	
North_Carolina	1,630	1,630	1,620	
North_Dakota	6,160	6,650	6,600	
Ohio	4,730	5,050	5,030	
South_Dakota	5,070	5,450	5,400	
Tennessee	1,570	1,830	1,800	
Wisconsin	2,060	2,150	2,120	
sum	—	78,800	83,230	82,530

Figure 3: Estimated NASS Harvested Acres for 18 Leading Soybean States

Total Soybean Production by State - 9/15/24					
1,000,000 bushels					
State	Last year	2024 prediction			
		Lower CI	Predicted	Upper CI	
Arkansas	159	166	169	172	
Illinois	649	680	697	714	
Indiana	334	345	351	357	
Iowa	573	605	617	629	
Kansas	105	168	173	178	
Kentucky	100	106	108	111	
Louisiana	39	59	60	62	
Michigan	93	104	107	109	
Minnesota	349	356	364	371	
Mississippi	119	127	130	132	
Missouri	265	301	308	316	
Nebraska	267	316	322	327	
North_Carolina	63	57	59	60	
North_Dakota	219	221	230	239	
Ohio	274	258	264	270	
South_Dakota	223	236	242	248	
Tennessee	80	82	84	86	
Wisconsin	105	103	106	109	
sum	—	4,017	4,291	4,391	4,491

Figure 4: Estimated soybean Production for 18 Leading Soybean States

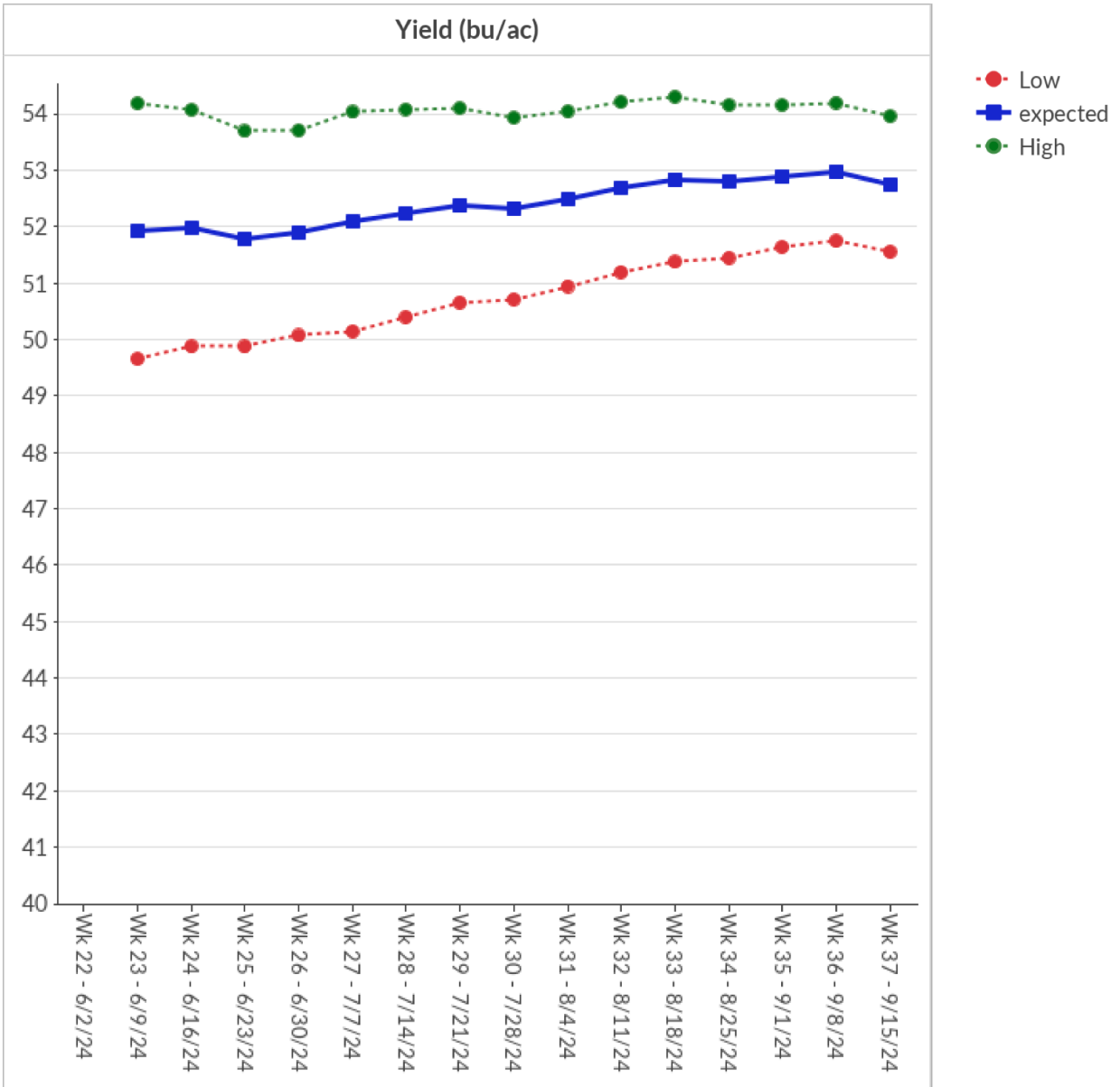


Figure 5: Estimated National Soybean Yield per Acre