

Quality of the United States Soybean Crop: 2024

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naeve002@umn.edu

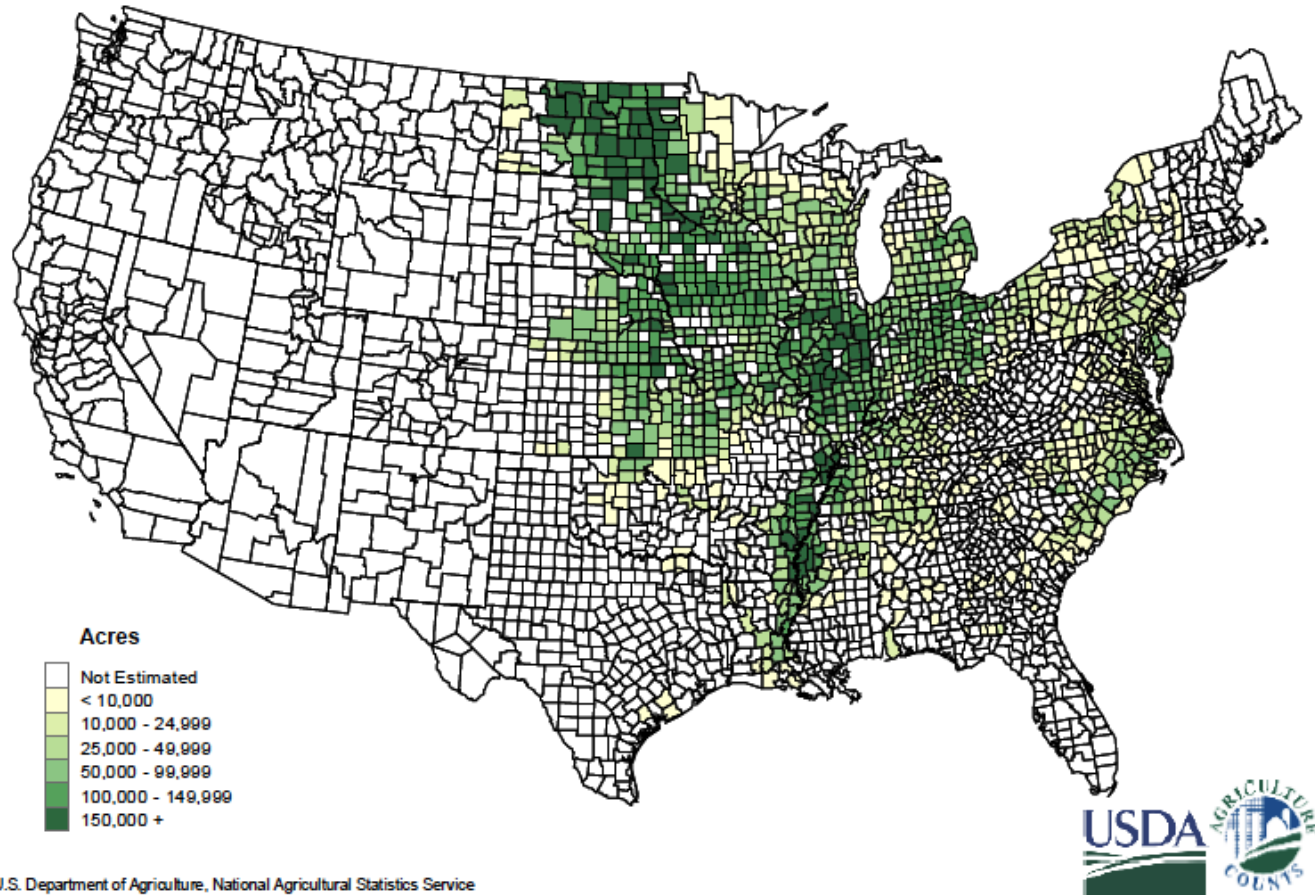
January 2024



UNIVERSITY OF MINNESOTA

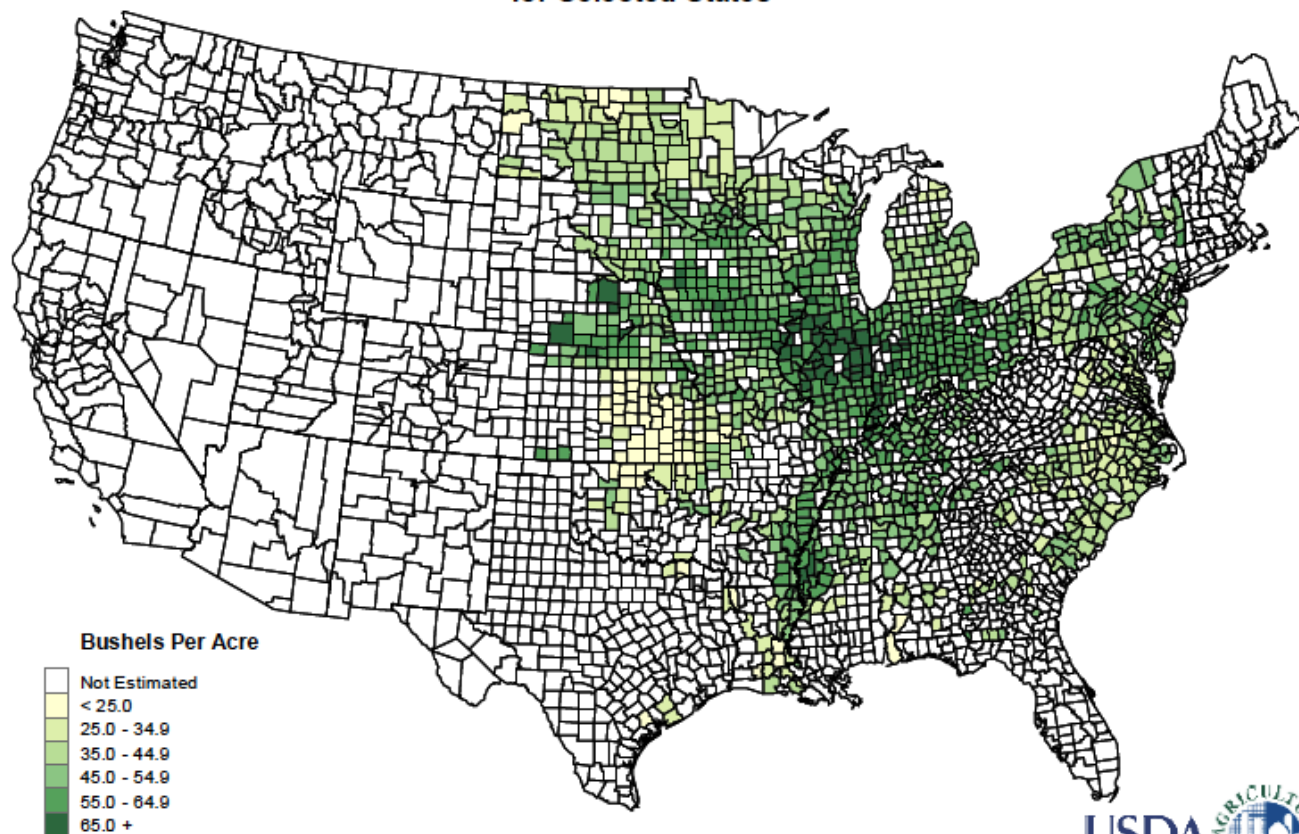
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Soybeans 2023
Harvested Acres by County
for Selected States



U.S. Department of Agriculture, National Agricultural Statistics Service

Soybeans 2023
Yield Per Harvested Acre by County
for Selected States



U.S. Department of Agriculture, National Agricultural Statistics Service



CRITICAL WEATHER EVENTS

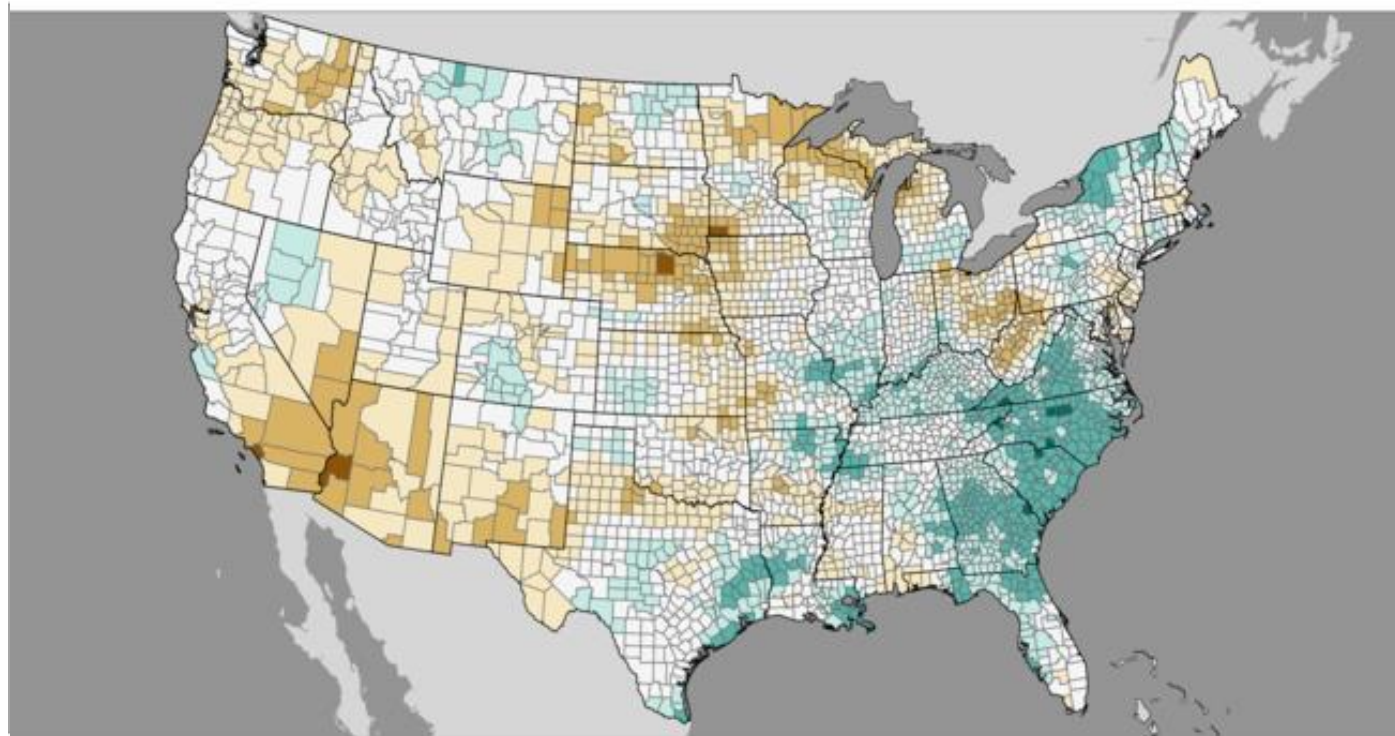


County Precipitation Ranks

July-September 2024

Ranking Period: 1895-2024

NOAA's National Centers for Environmental Information

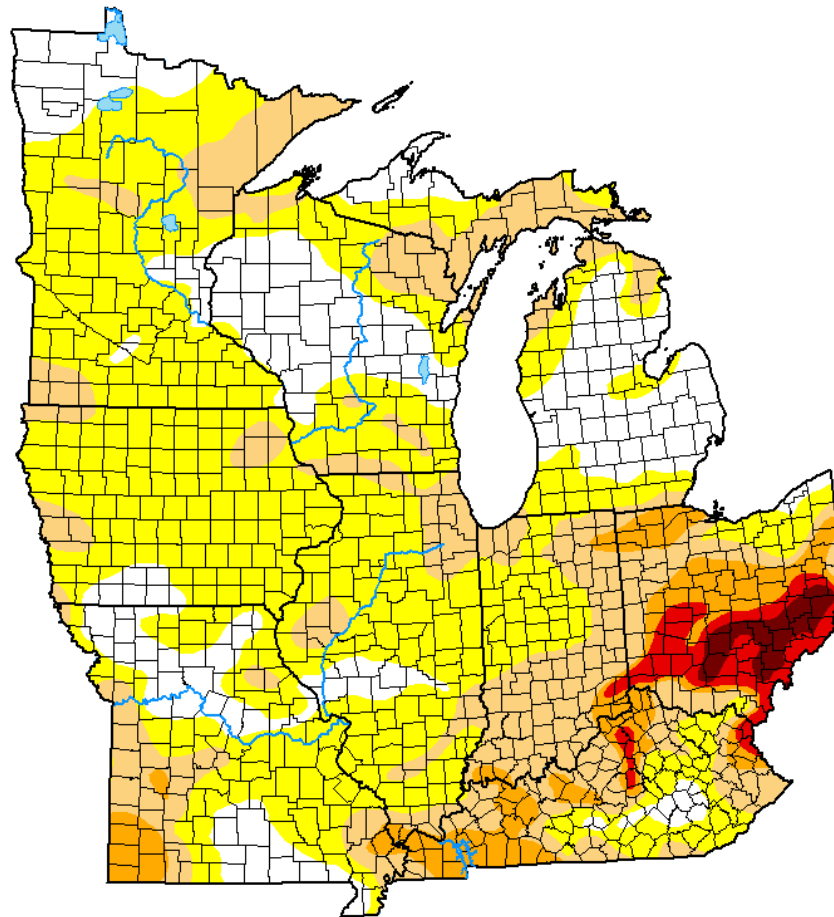


Created: Mon Oct 21 2024

Source: nClimGrid-Monthly




9 September 2024



droughtmonitor.unl.edu

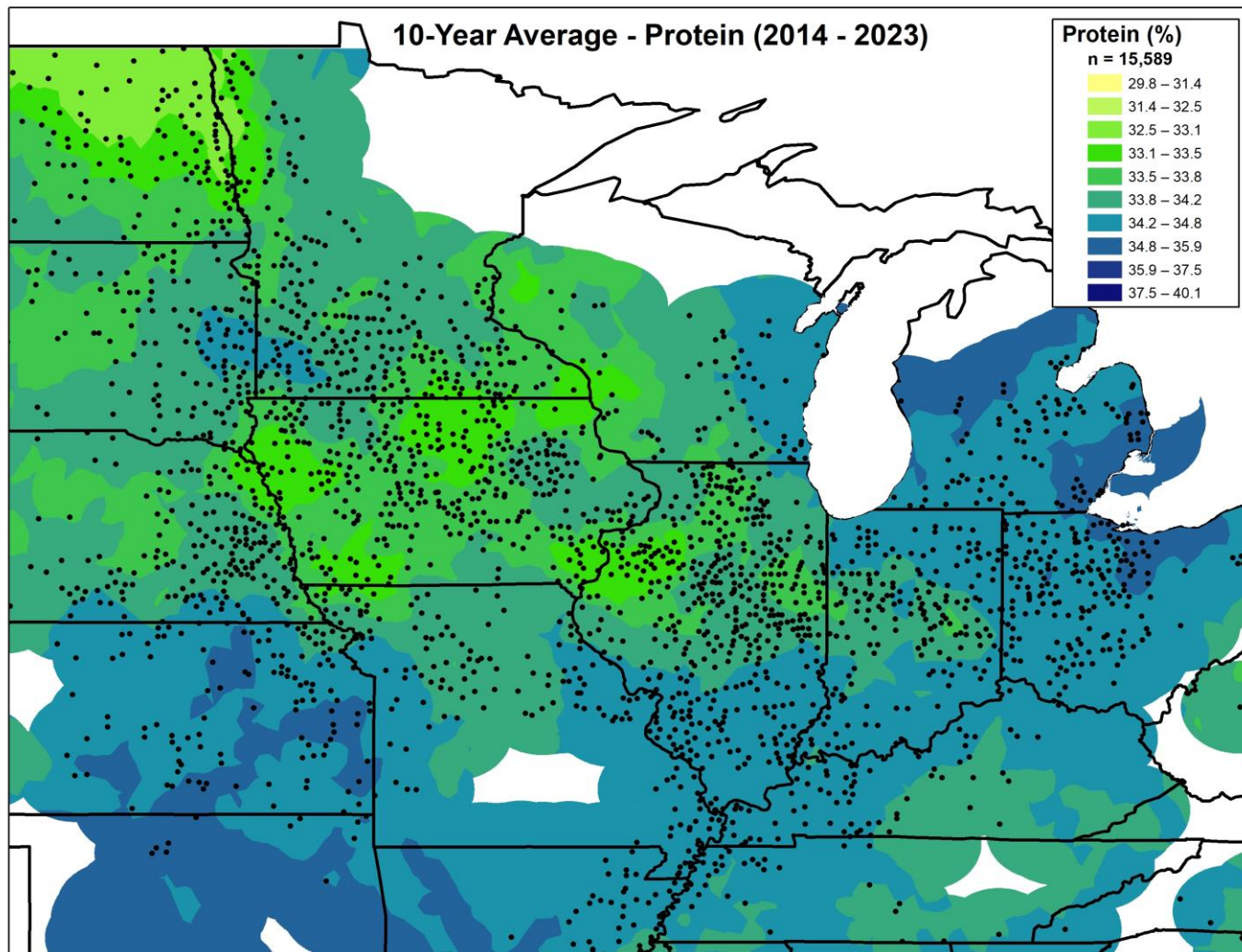


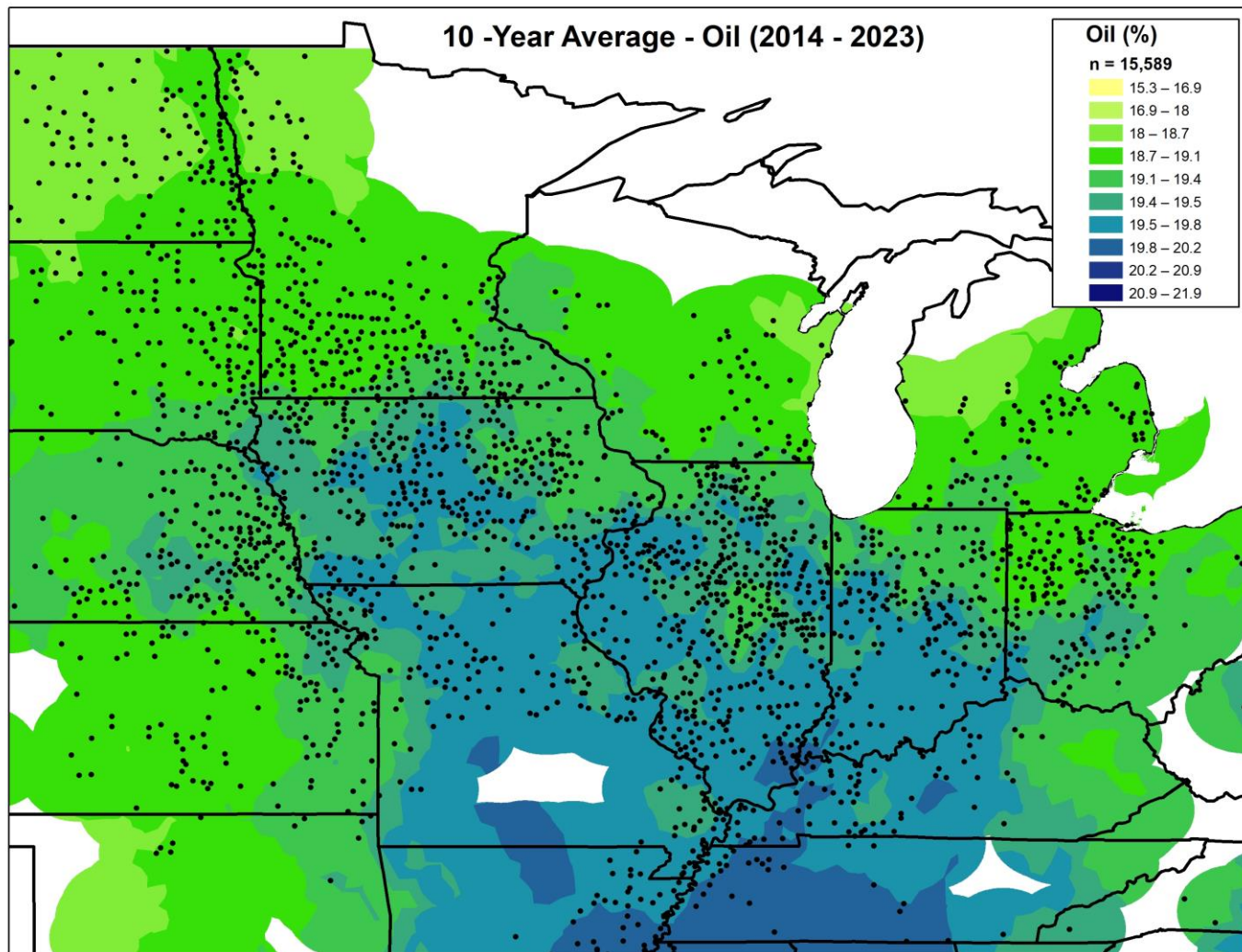


QUALITY OF THE UNITED STATES SOYBEAN CROP: 2024

A close-up photograph of several soybean pods hanging from a stem. The pods are brown and covered in fine, light-colored hairs. The background is a soft, out-of-focus brown. A dark rectangular box is overlaid in the center, containing the title text in white.

HISTORICAL PROTEIN AND OIL VARIATION

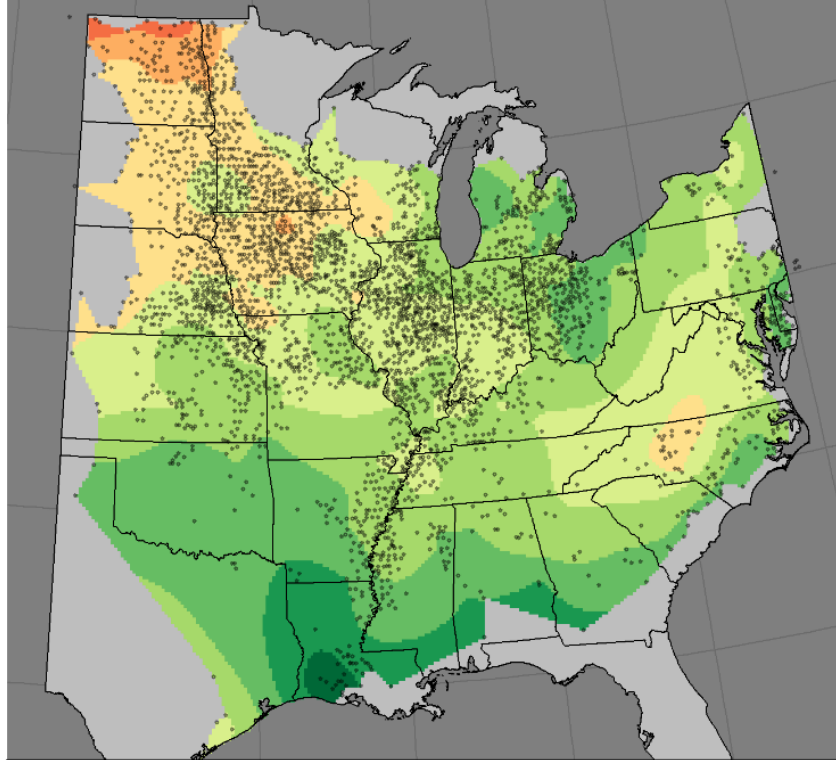




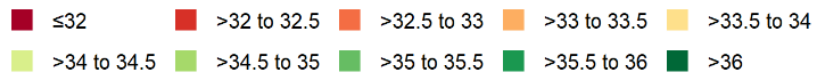


CHANGE OVER TIME

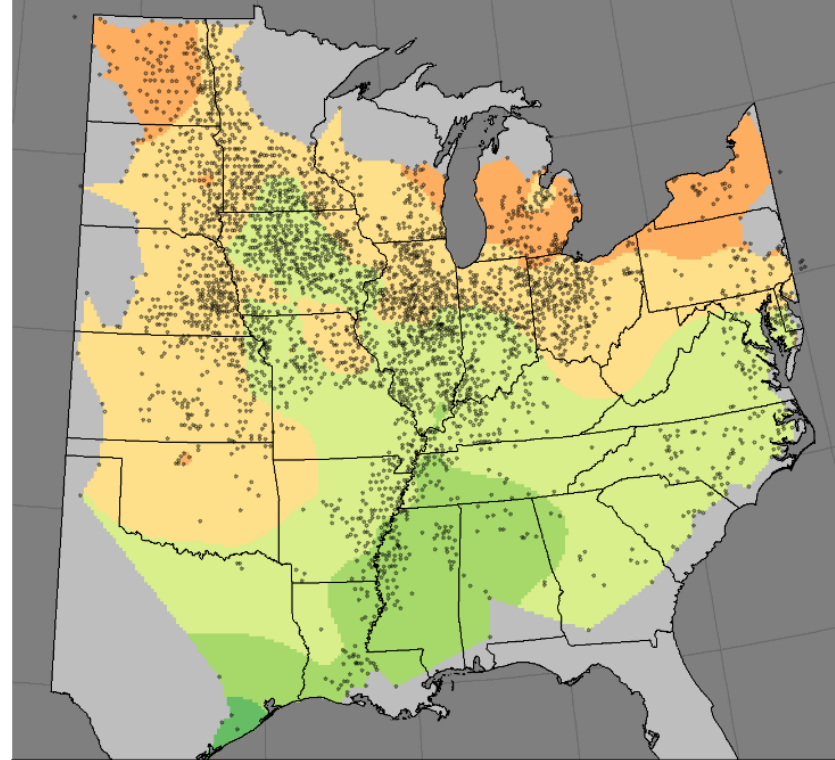
(a) Seed protein - average 2006 to 2023



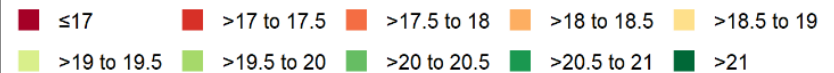
Seed protein (%)



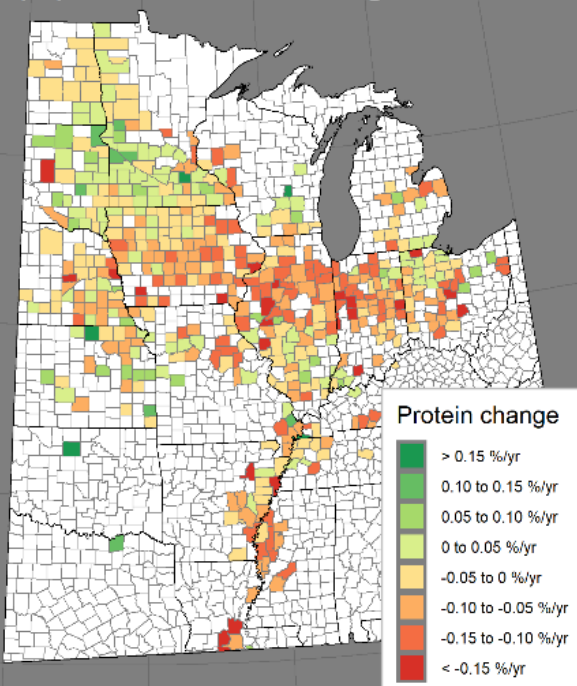
(b) Seed oil - Average 2006 to 2023



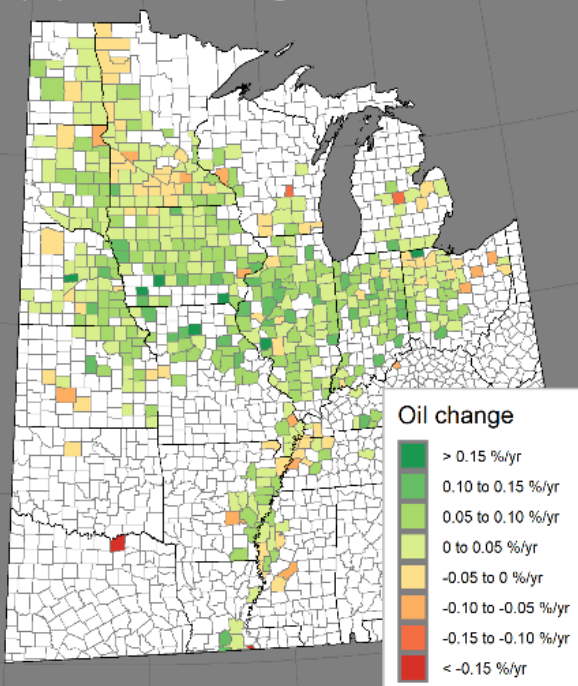
Seed oil (%)



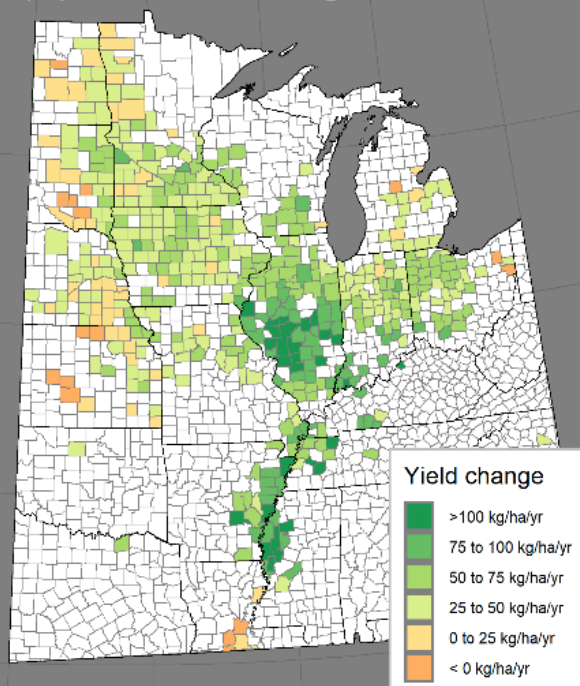
(a) Protein change



(b) Oil change



(c) Yield change

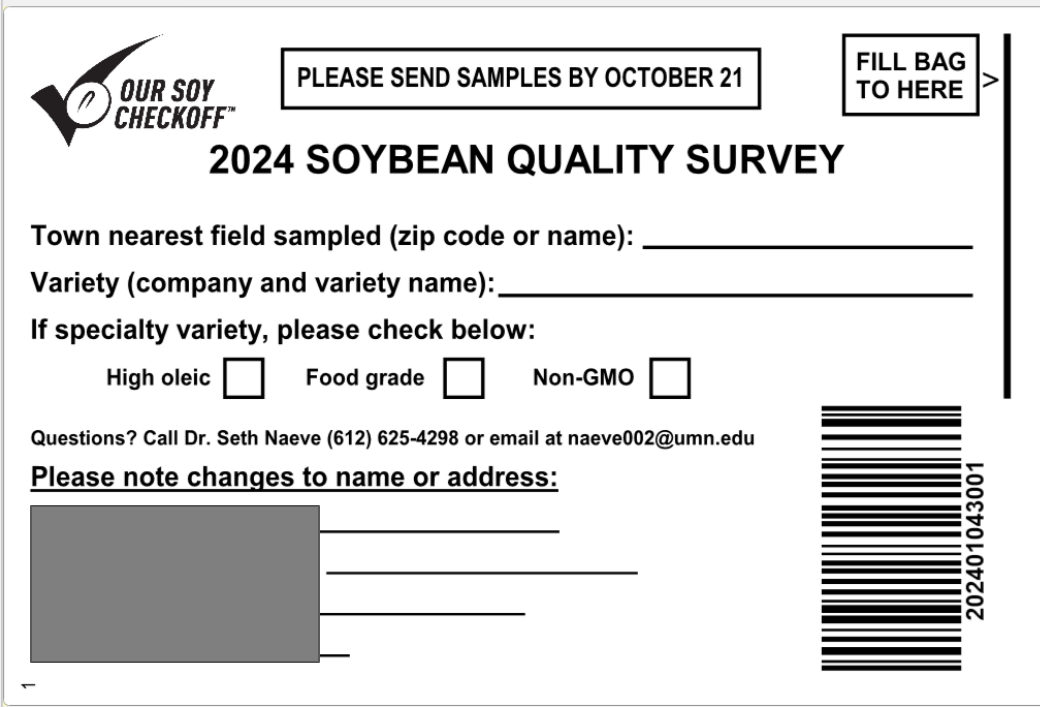


2024 SURVEY RESULTS



2024 Survey Methods

- In August, sample kits were mailed to 3,889 soybean producers based on soybean production by state
- By 30 October 2024, 1,132 samples were received for analyses



The image shows a survey form titled "2024 SOYBEAN QUALITY SURVEY". At the top left is the "OUR SOY CHECKOFF" logo. To its right is a box that says "PLEASE SEND SAMPLES BY OCTOBER 21". Further right is a box that says "FILL BAG TO HERE" with an arrow pointing right. Below the title, there are three lines for text entry: "Town nearest field sampled (zip code or name):", "Variety (company and variety name):", and "If specialty variety, please check below:". Under the last line are three checkboxes: "High oleic", "Food grade", and "Non-GMO". Below these is a line of text: "Questions? Call Dr. Seth Naeve (612) 625-4298 or email at naeve002@umn.edu". Below that is a line that says "Please note changes to name or address:" followed by a large grey rectangular box and three horizontal lines for text entry. On the right side of the form is a vertical barcode with the number "202401043001" printed vertically next to it.

OUR SOY CHECKOFF™

PLEASE SEND SAMPLES BY OCTOBER 21

FILL BAG TO HERE >

2024 SOYBEAN QUALITY SURVEY

Town nearest field sampled (zip code or name): _____

Variety (company and variety name): _____

If specialty variety, please check below:

High oleic ☐ Food grade ☐ Non-GMO ☐

Questions? Call Dr. Seth Naeve (612) 625-4298 or email at naeve002@umn.edu

Please note changes to name or address:

202401043001

A short video from our laboratory



PROTEIN AND OIL



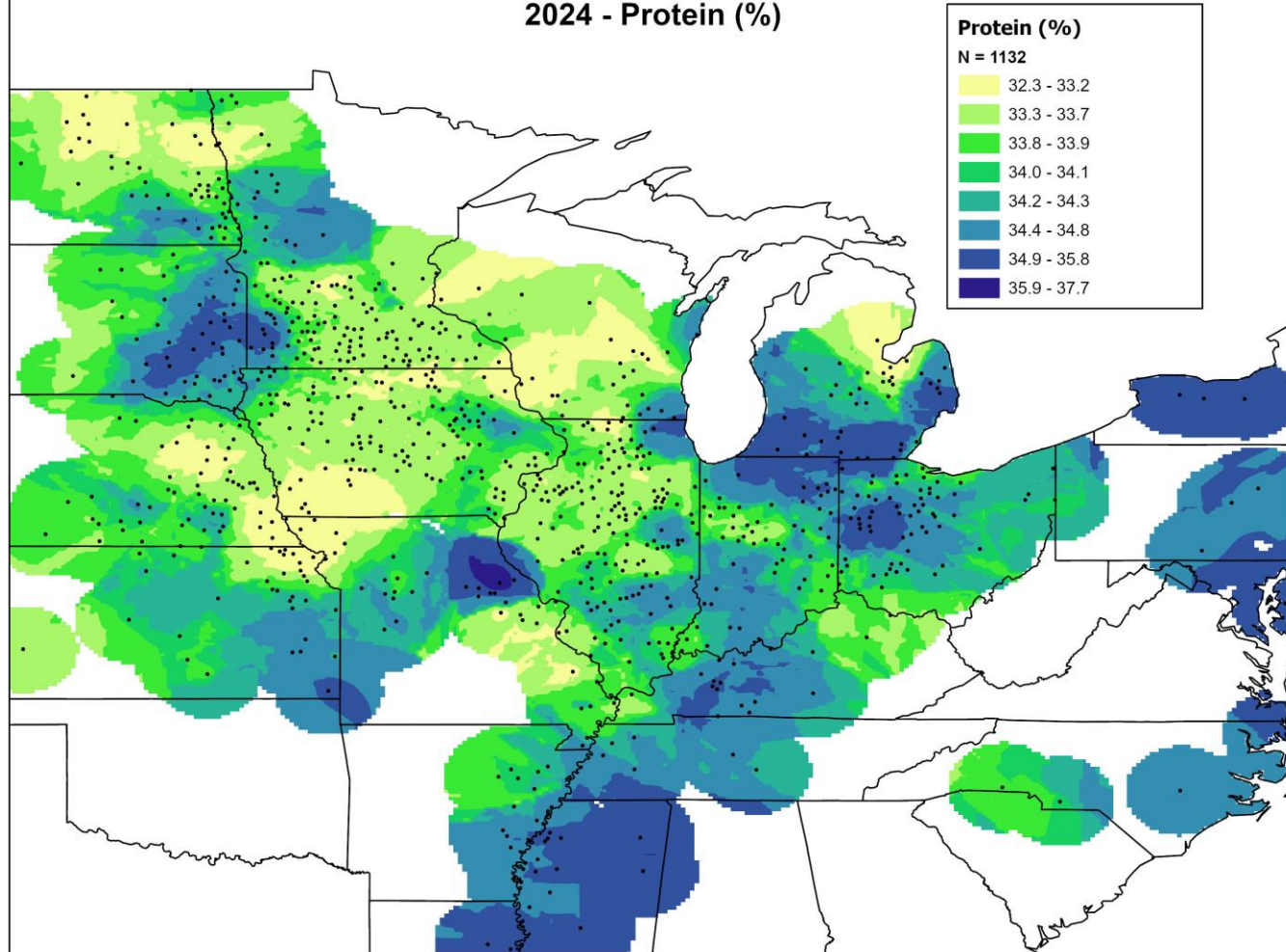
2024 U.S. average values

Region	Number of Samples	Protein (13%)	Change from 2023	Oil (13%)	Change from 2023	Seed Weight (g/100 seeds)
US Average	1130	33.9		19.8		16.0
Average of 2024 Crop[†]		34.0	0.3	19.9	0.3	15.9
US 2014-2023 avg.		34.1		19.3		

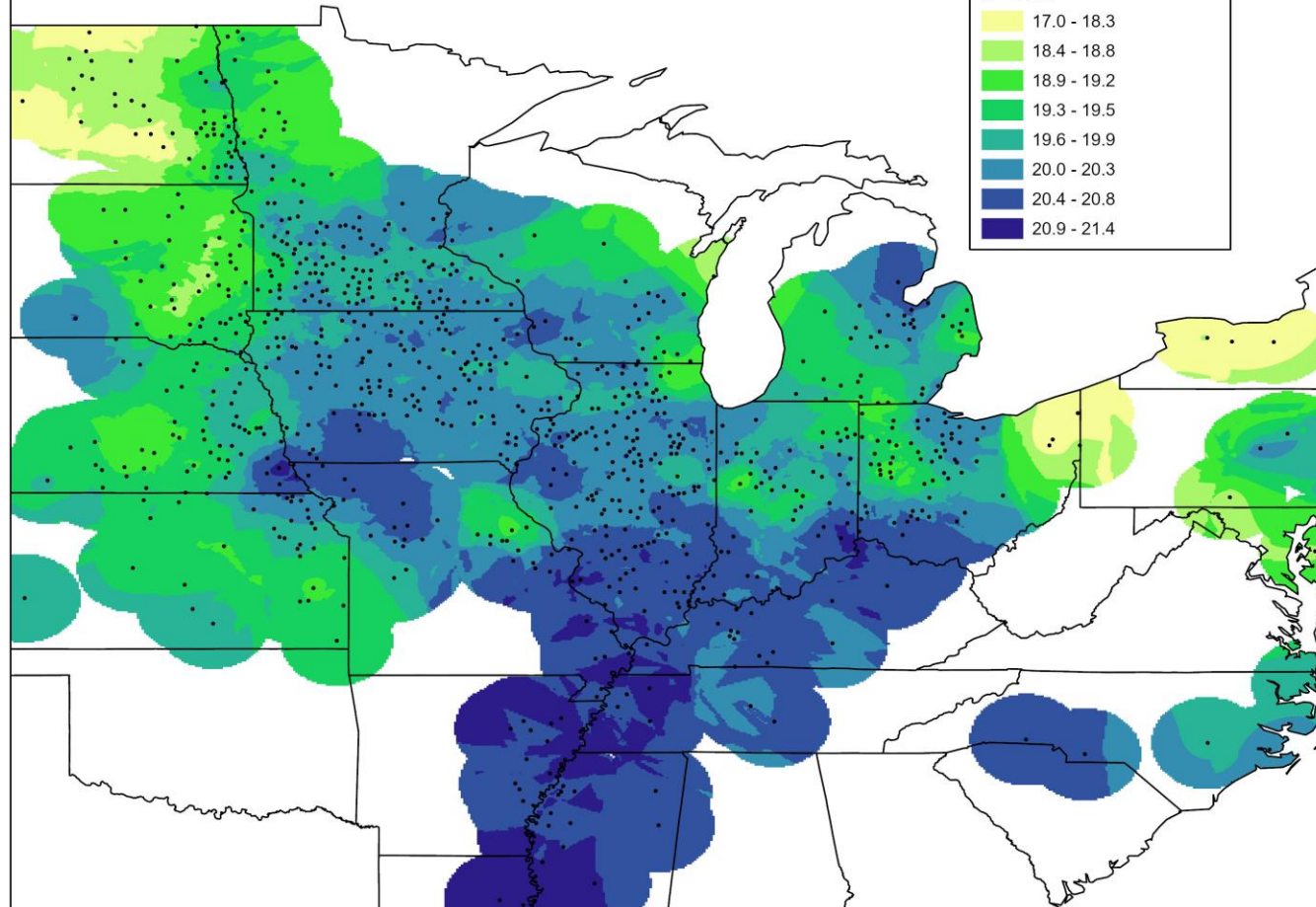
[†]US average values weighted based on estimated production by state as estimated by USDA, NASS Crop Production Report (October 2024)



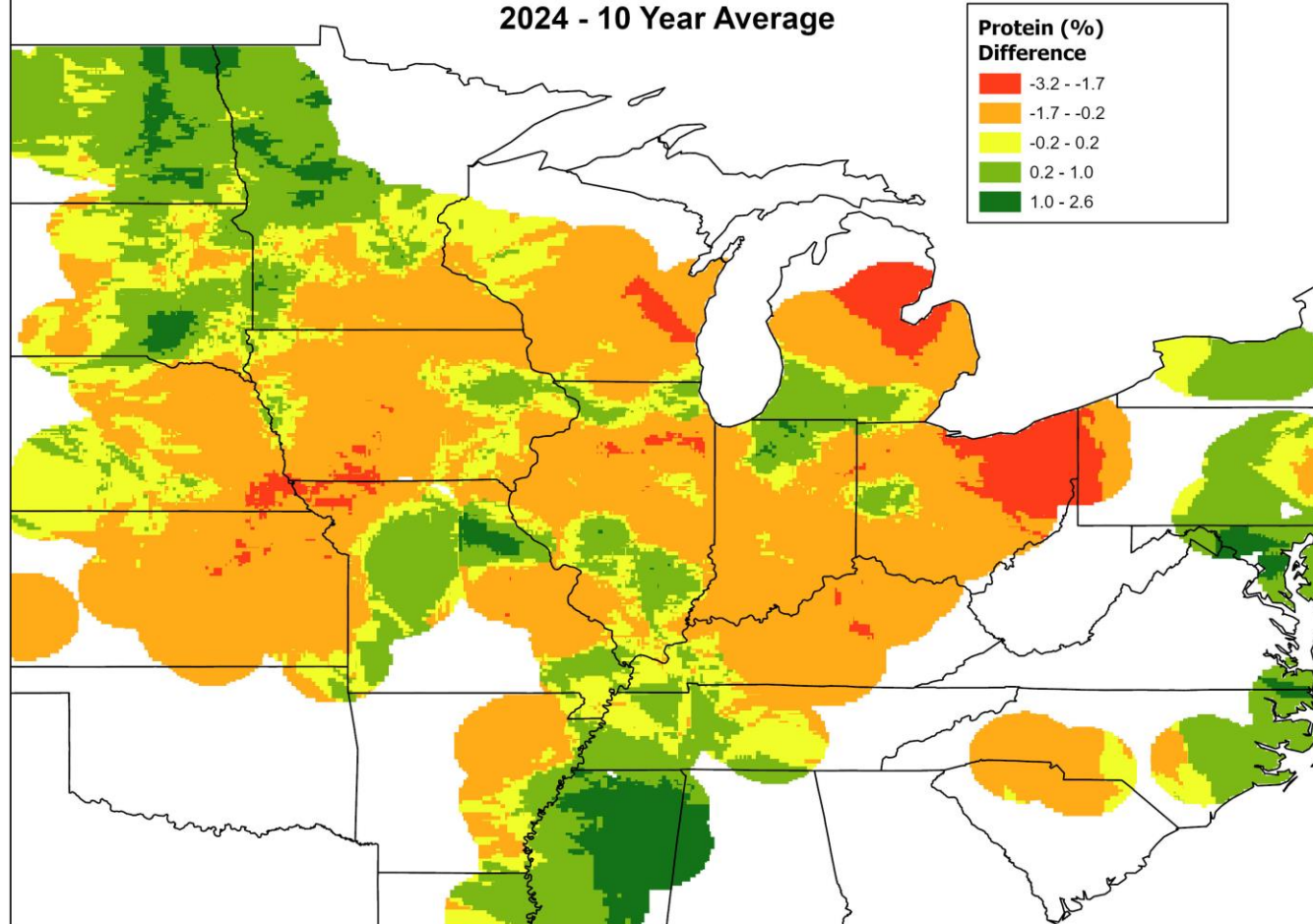
2024 - Protein (%)



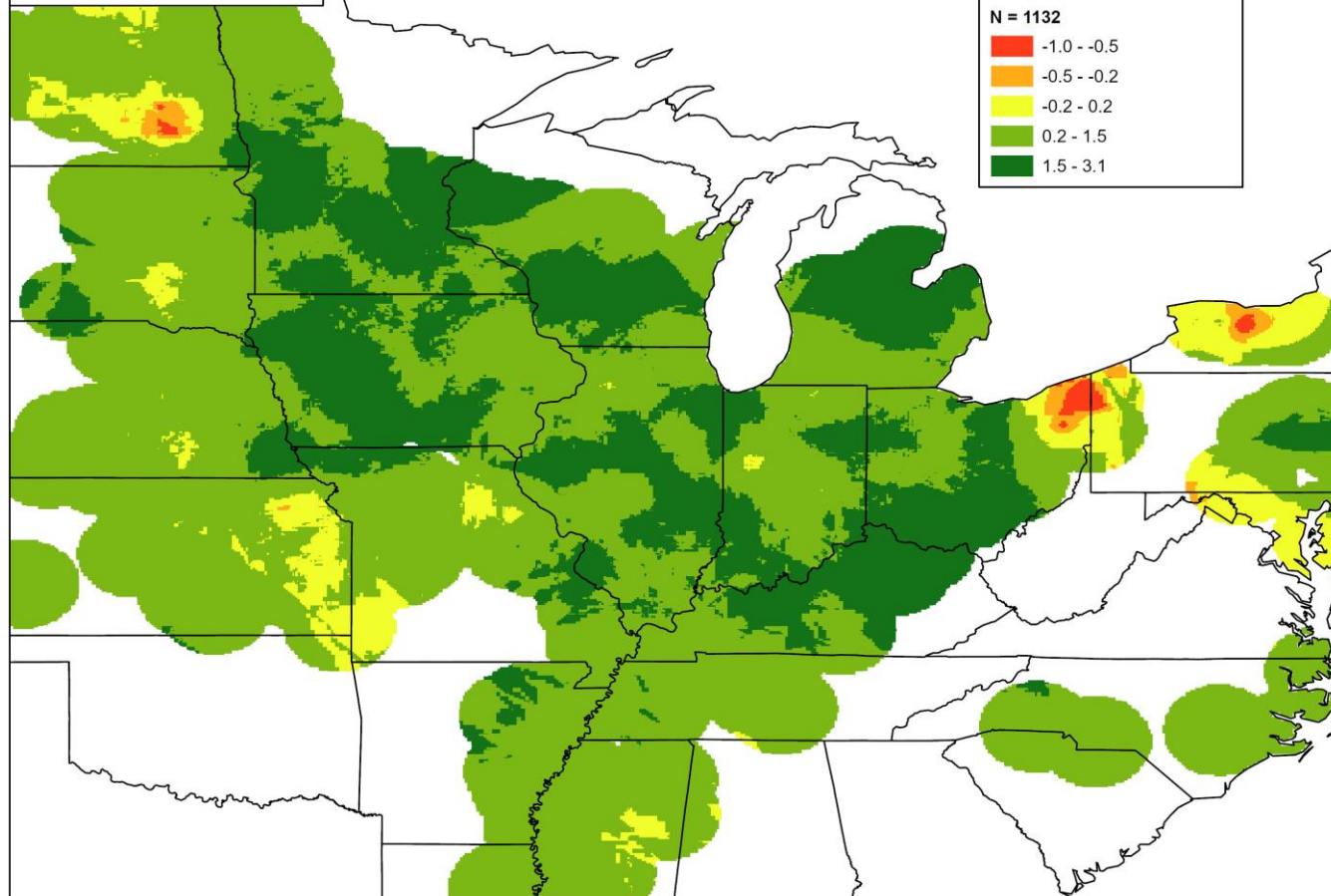
2024 - Oil (%)



Protein (%) Difference 2024 - 10 Year Average



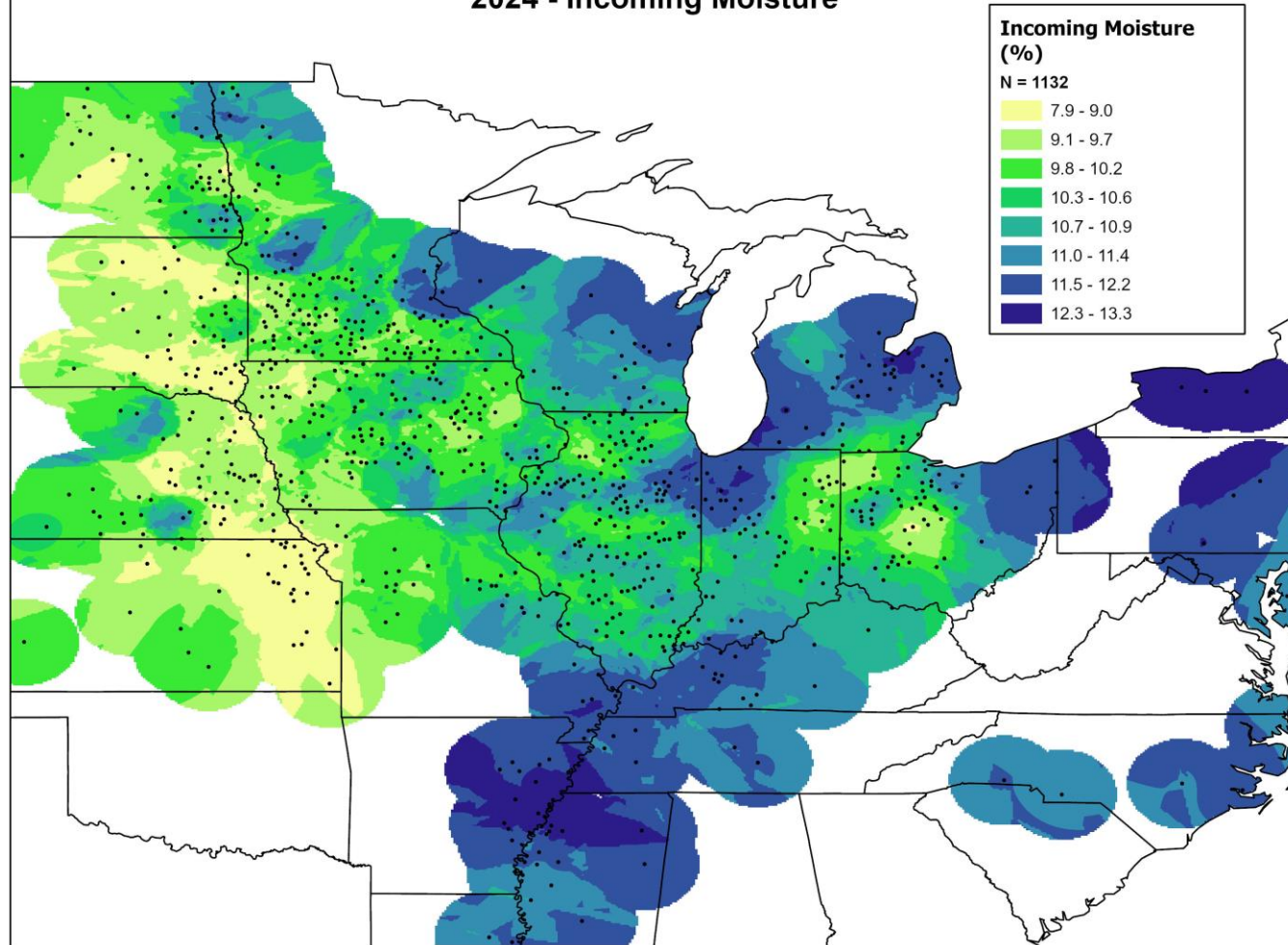
Oil (%) Difference 2024 - 10 Year Average



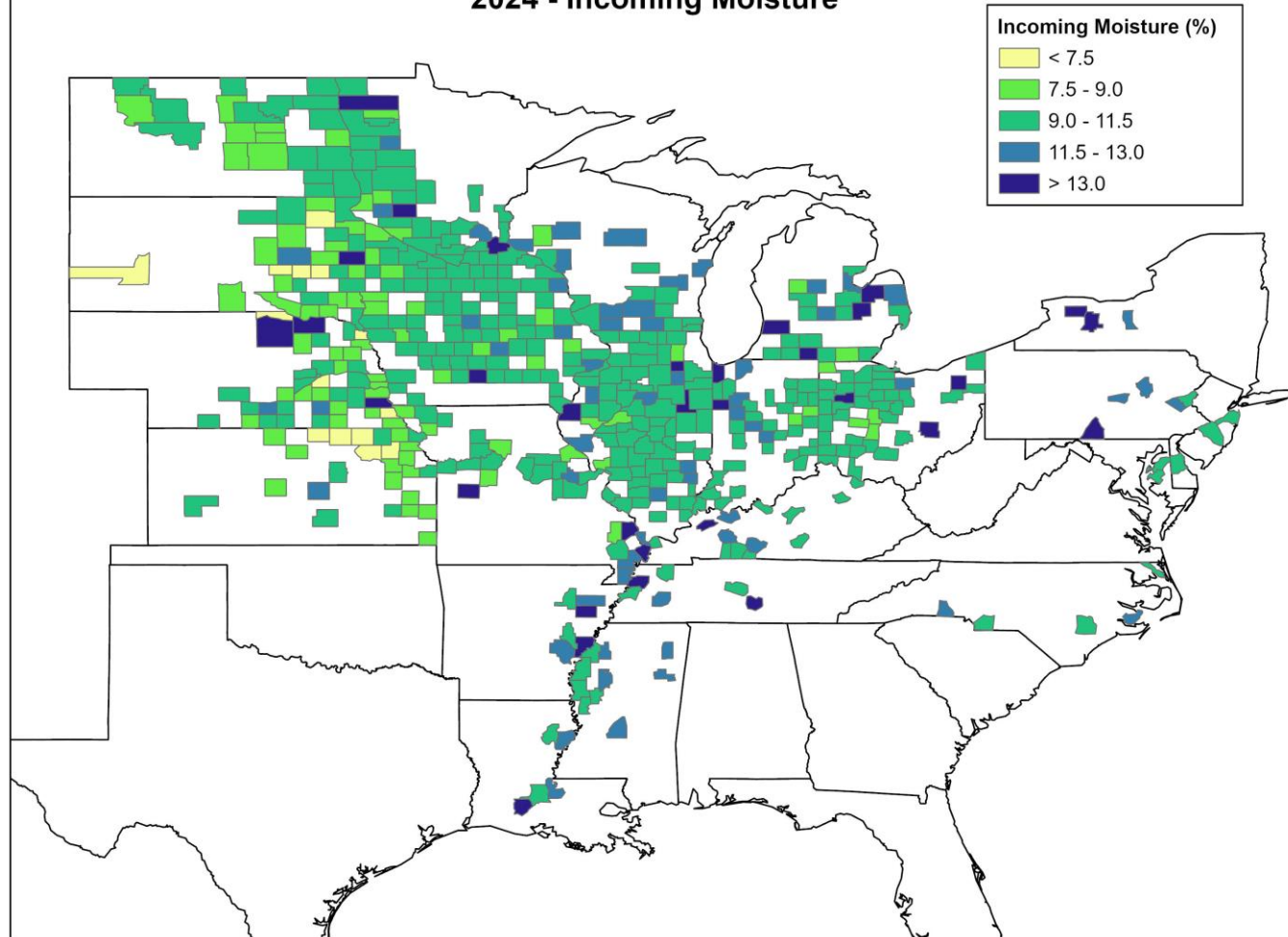


PHYSICAL CHARACTERISTICS

2024 - Incoming Moisture



2024 - Incoming Moisture



2024 Crop on an "as-is" basis

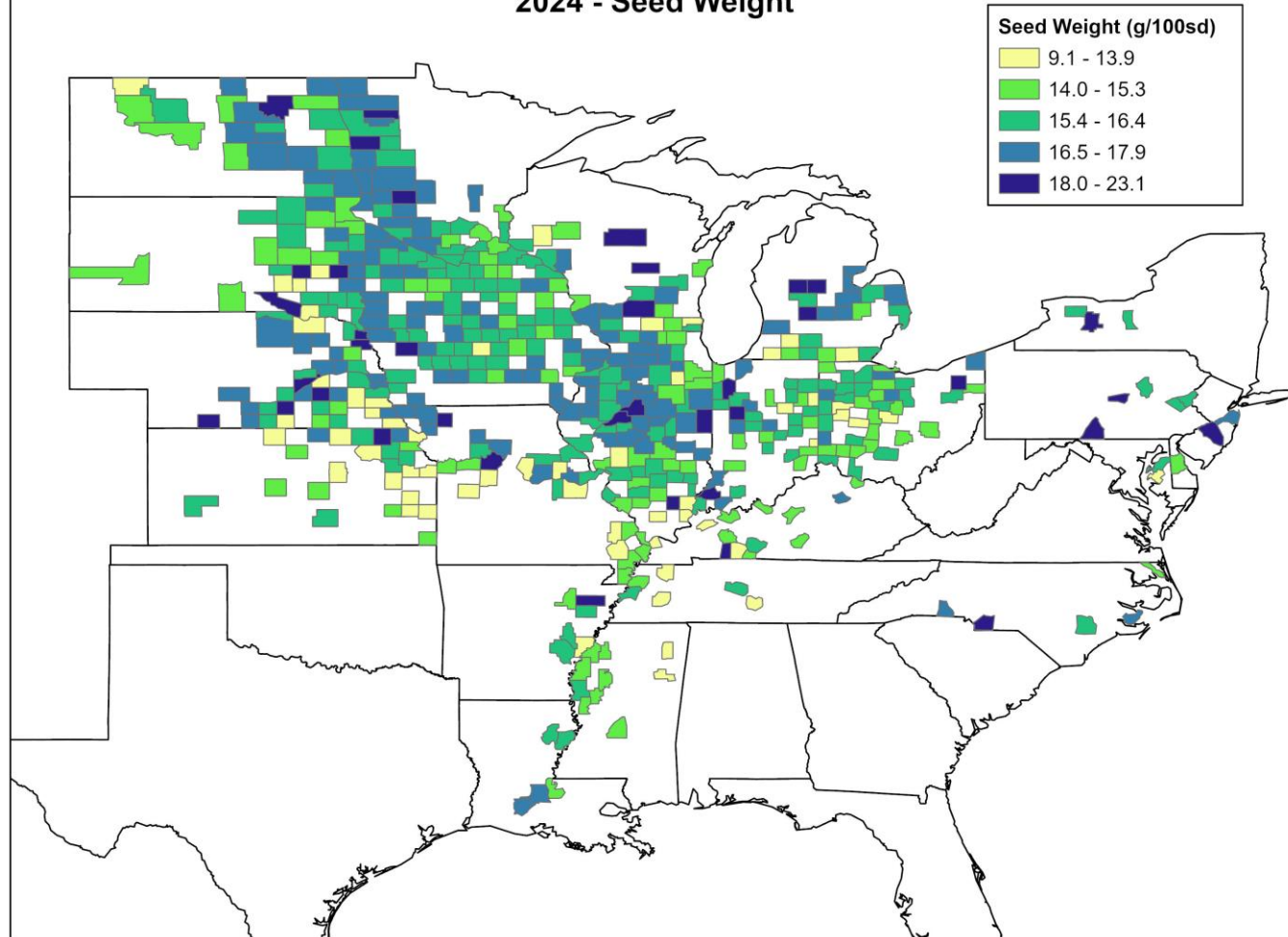
Region	Number of Samples		Protein	Change from 2023	Oil	Change from 2023
US Average	1130	(As-Is)	35		20.5	
Average of 2024 Crop†		(As-Is)	35.0	0.8	20.5	0.6
Average of 2024 Crop*		(13%)	34.0	0.3	19.9	0.3

† Regional and US average values weighted based on estimated production by state as estimated by USDA, NASS Crop Production Report (October 2024)

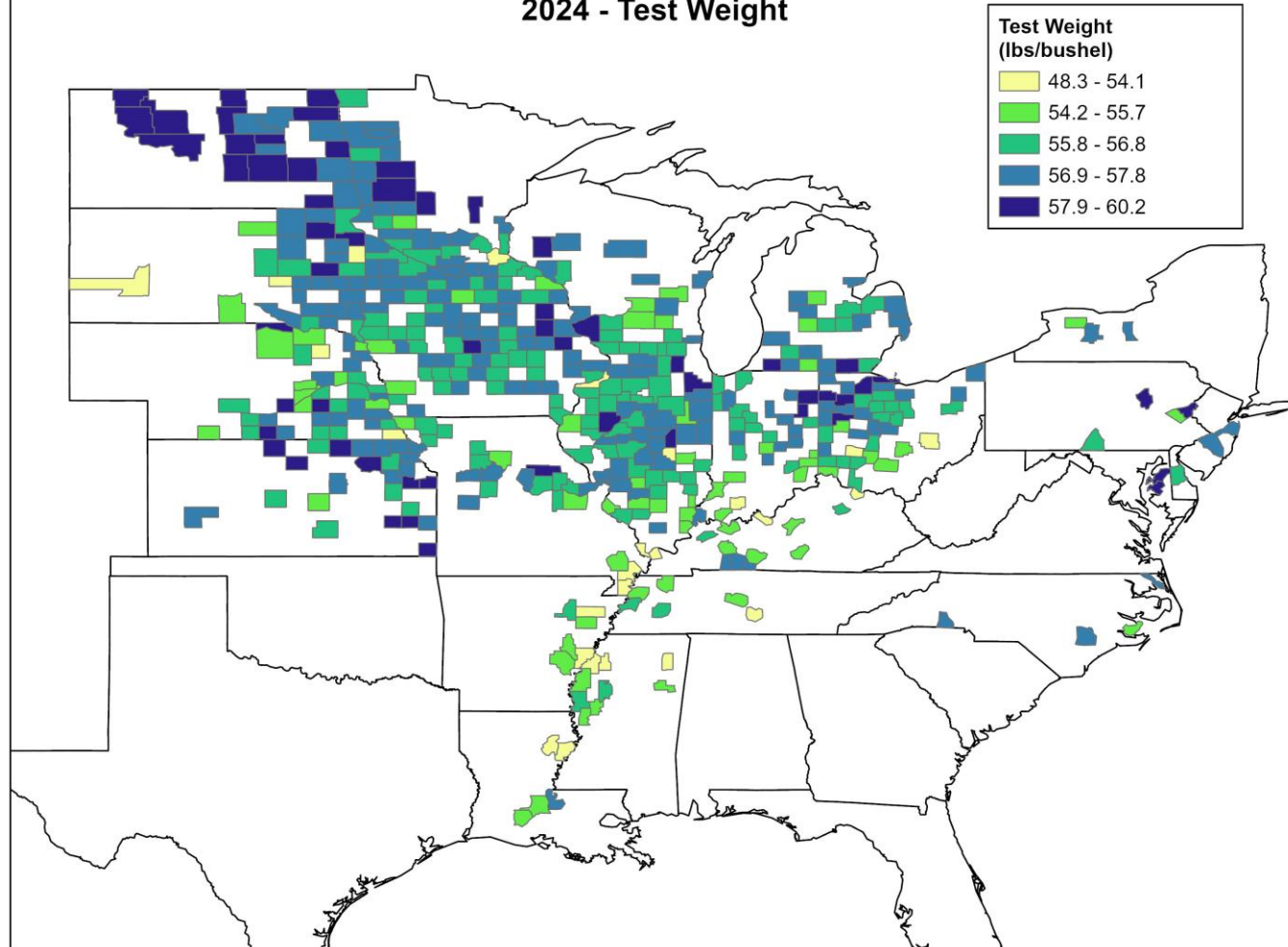
* 13% moisture basis - US average values weighted based on estimated production by state



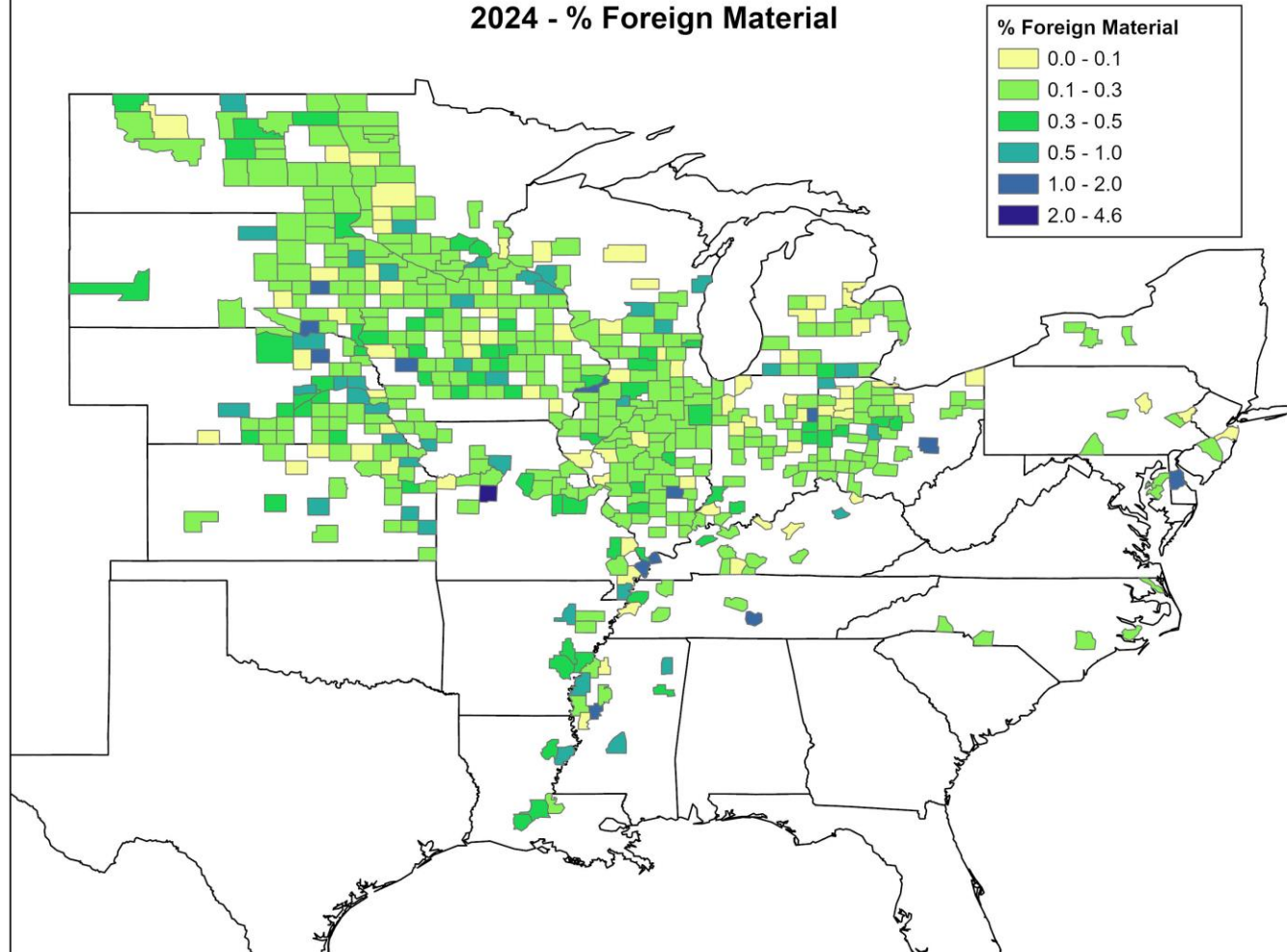
2024 - Seed Weight



2024 - Test Weight



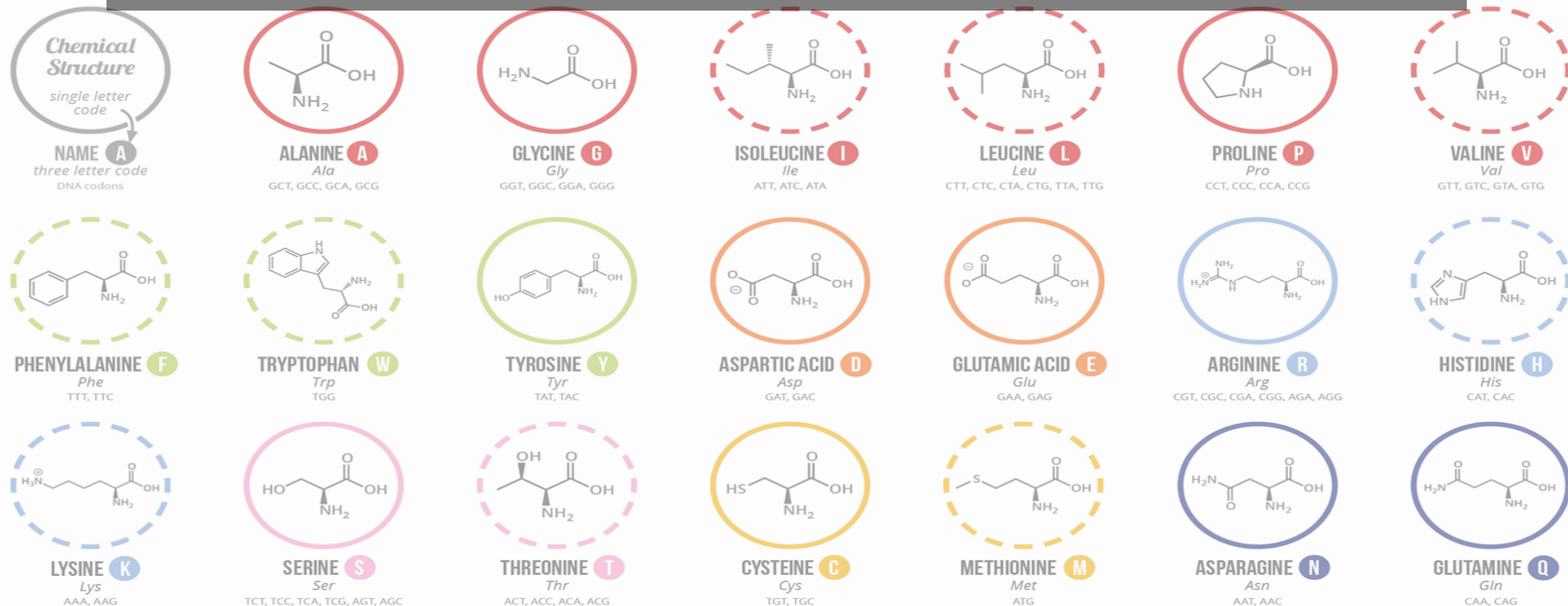
2024 - % Foreign Material



BETTER MEASURES OF QUALITY:

AMINO ACIDS ARE THE BUILDING BLOCKS OF PROTEINS IN LIVING ORGANISMS. THERE ARE OVER 500 AMINO ACIDS FOUND IN NATURE - HOWEVER, THE HUMAN GENETIC CODE ONLY DIRECTLY ENCODES 20. 'ESSENTIAL' AMINO ACIDS MUST BE OBTAINED FROM THE DIET. THE 10 'NON-ESSENTIAL' AMINO ACIDS CAN BE SYNTHESISED IN THE BODY.

Chart Key: ● ALIPHATIC ● AROMATIC ● ACIDIC ● BASIC ● SULFONIC ● SULFHYDRYL ● AMIDIC ○ NON-ESSENTIAL ○ ESSENTIAL



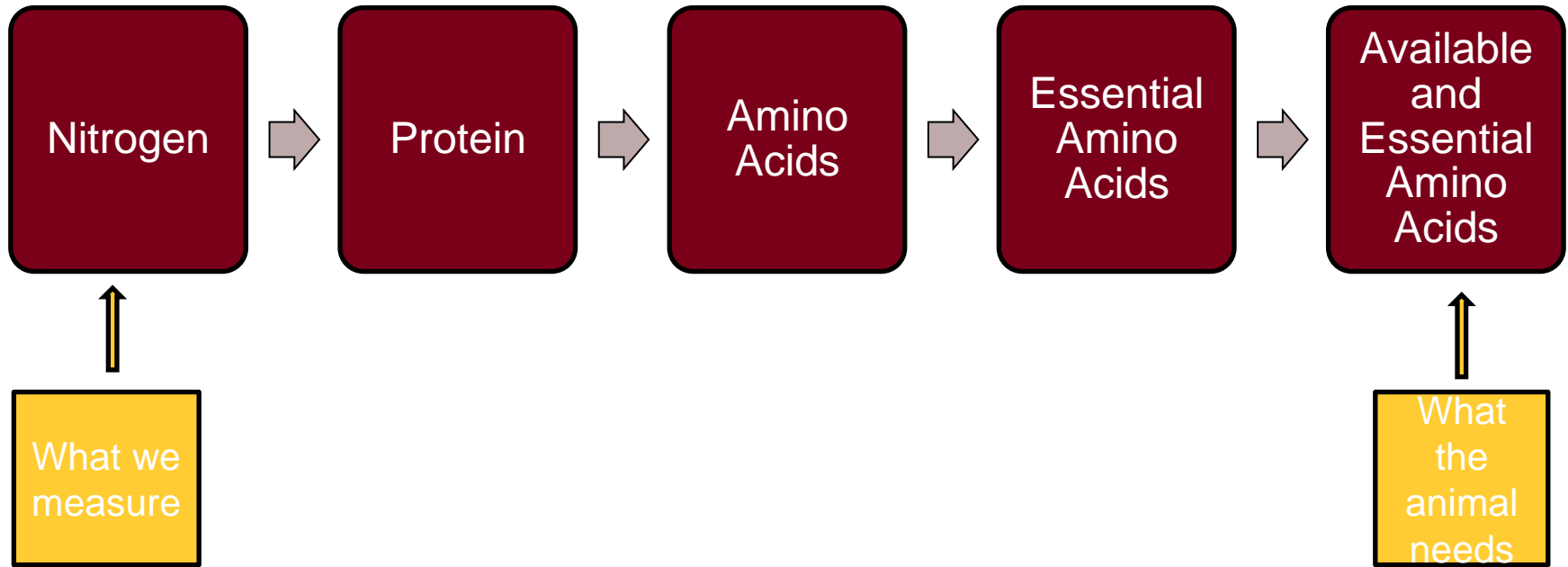
Note: This chart only shows those amino acids for which the human genetic code directly codes for. Selenocysteine is often referred to as the 21st amino acid, but is encoded in a special manner. In some cases, distinguishing between asparagine/aspartic acid and glutamine/glutamic acid is difficult. In these cases, the codes asx (B) and glx (Z) are respectively used.

Better measures of the value of soybeans

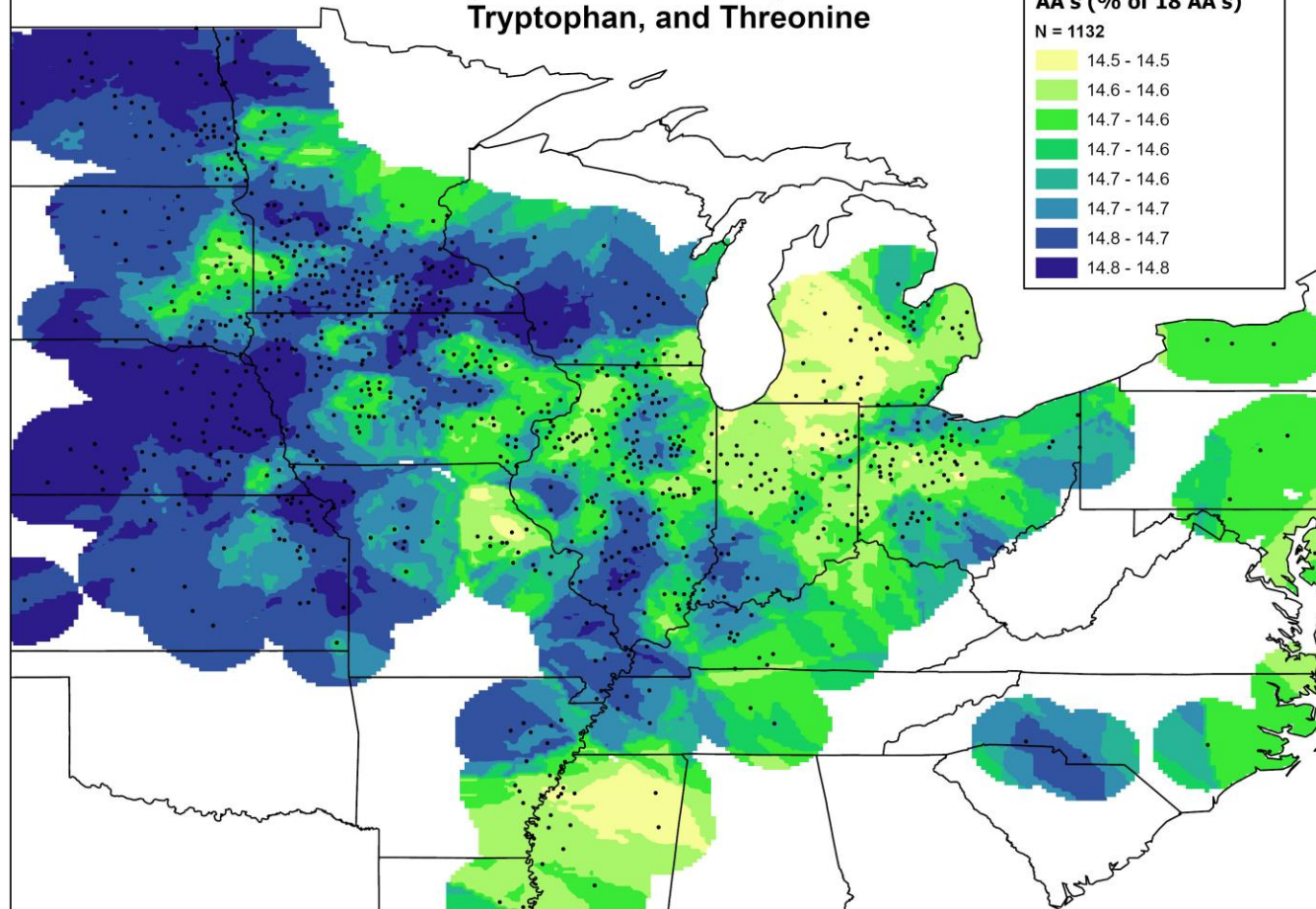
- Soybean is a complex and variable product/commodity.
- Traditional grading systems do not correlate well with actual value.
- Soybeans & soybean meal have been valued primarily on an indirect measure of protein – ‘crude protein’
- Crude protein is probably not the best measure of a soybean (or a soybean meal’s) value
- The first purchasers who can find hidden value will capture additional profit.



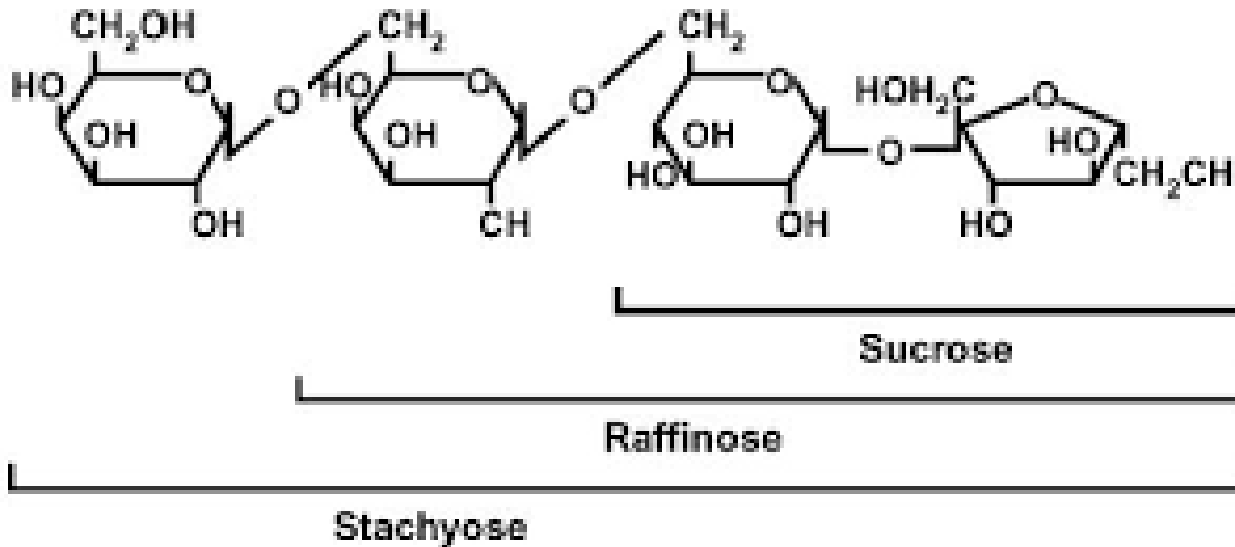
CP (N) is an indirect measure of quality



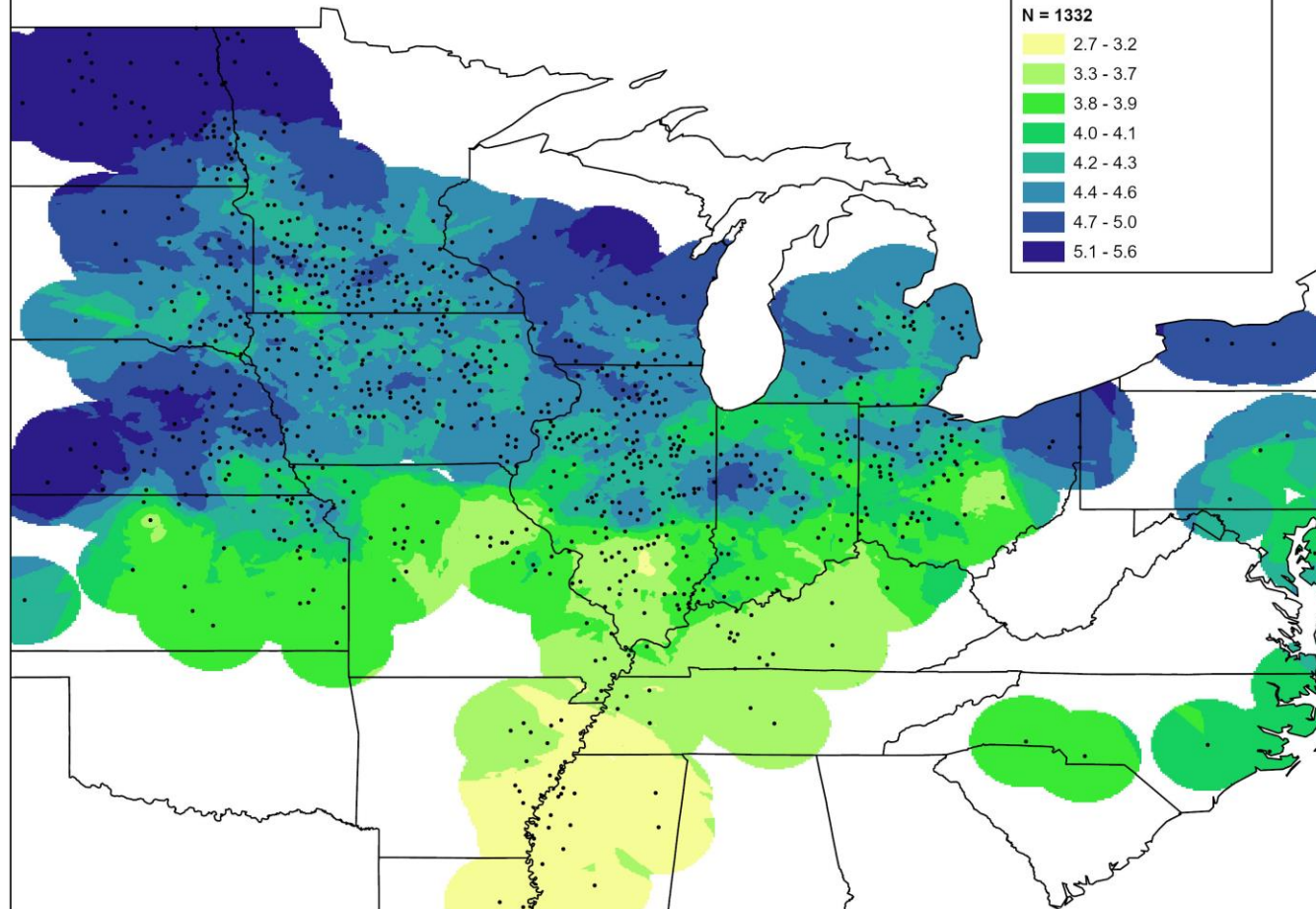
2024 - Sum of Five Essential AA's Lysine, Methionine, Cysteine, Tryptophan, and Threonine



BETTER MEASURES OF QUALITY: SOLUBLE SUGARS



2024 - Sucrose



Summary

- Excess rainfall early in the growing season with drought later affected soybean yield and quality
- The 2024 crop was strong for both protein and oil content, but it is really an 'Oil Crop'
- Dry fall conditions led to very dry soybean harvest across the U.S.
 - As-is protein and oil levels are extremely high in 2024.
 - Processors will see high meal and oil yields from this crop.





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