Quality of the United States Soybean Crop: 2025

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UNIVERSITY OF MINNESOTA

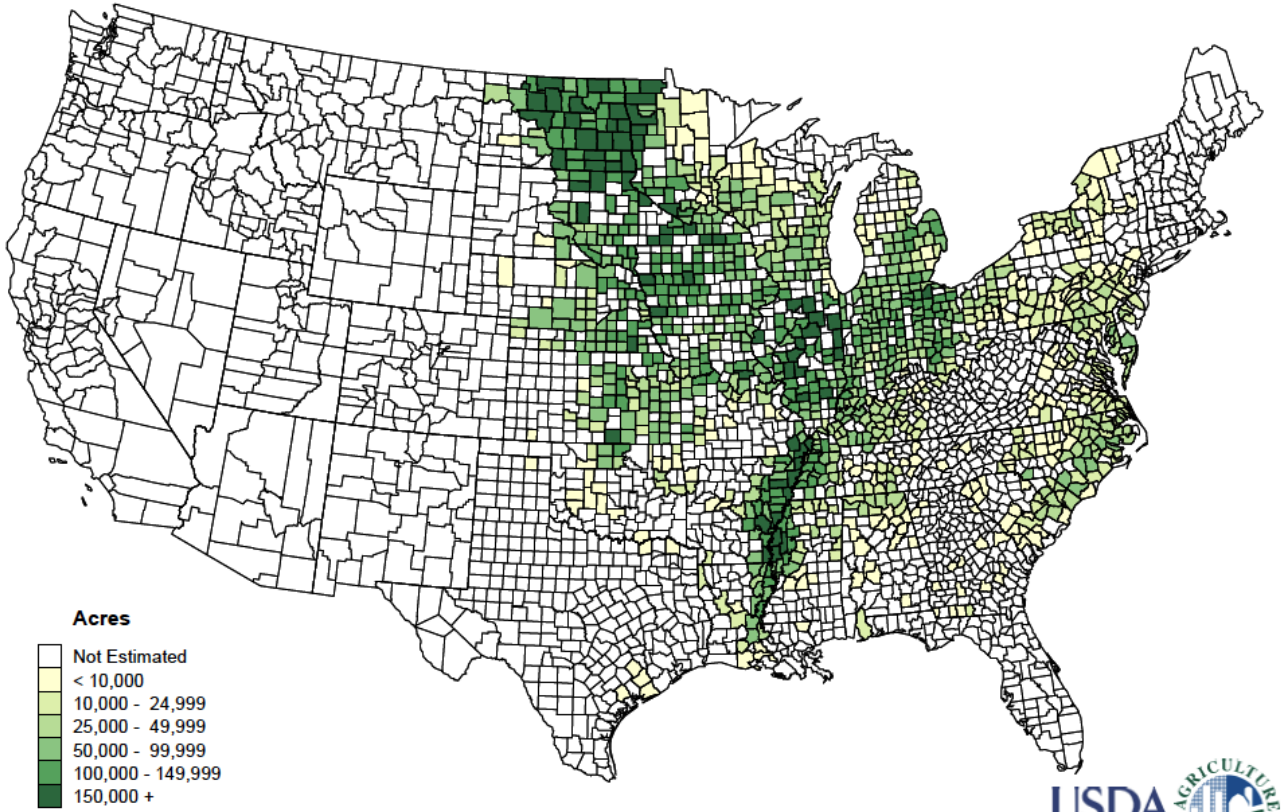
- Dr. Charles Hurburgh
- 1986-2005

- Dr. Seth Naeve
- 2006-2025

The Legacy

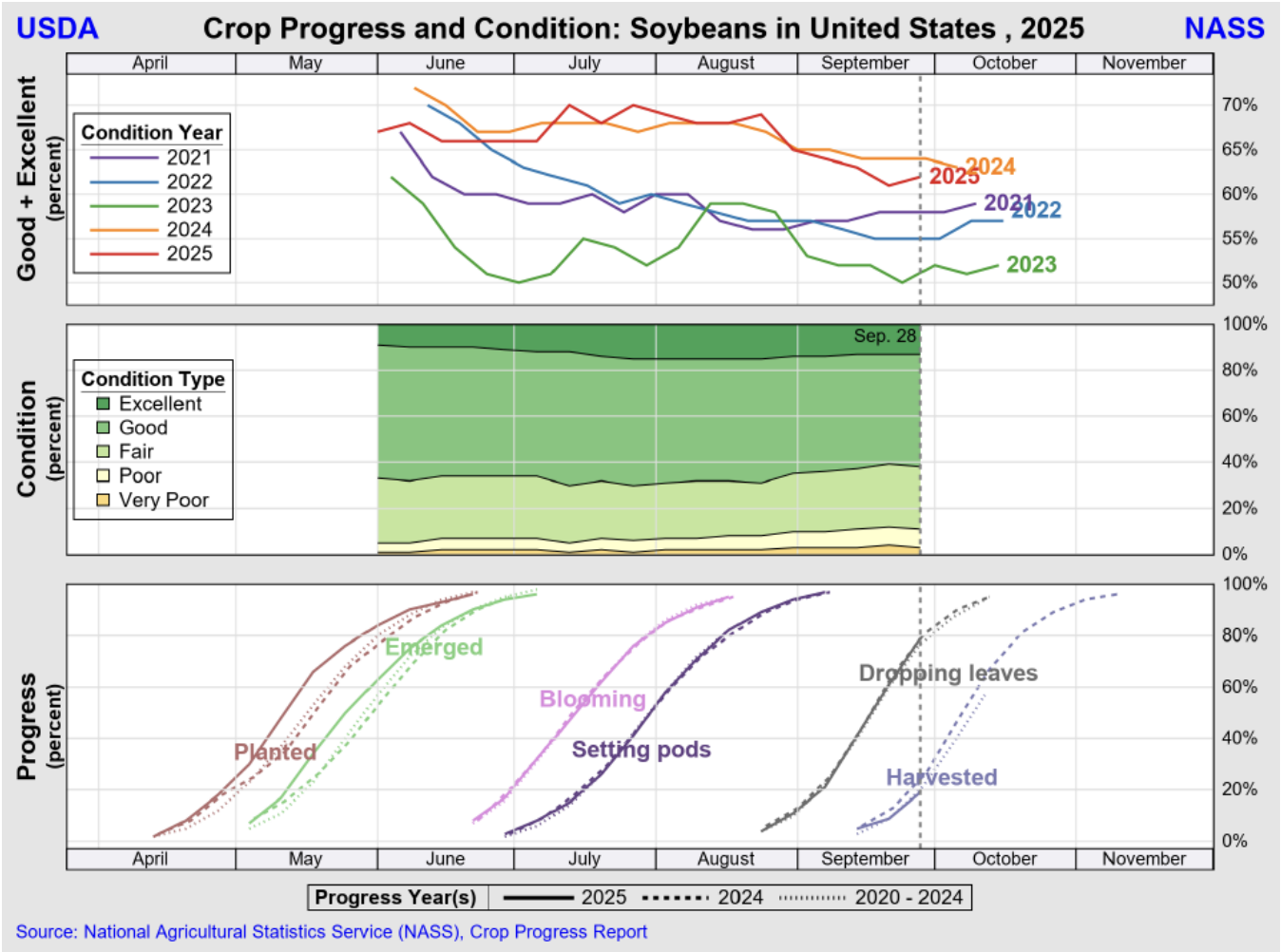
- **Core Mission:** Provide transparent, science-based data to sustain U.S. soybean export leadership and support our partners in their purchasing decisions by benchmarking U.S. Quality.
- **Enduring Impact:** 40 years of compositional data based on environment, production, and breeding – underpinning marketing, feed formulation, human health, and international trust in U.S. soy.

Soybeans 2024
Planted Acres by County
for Selected States



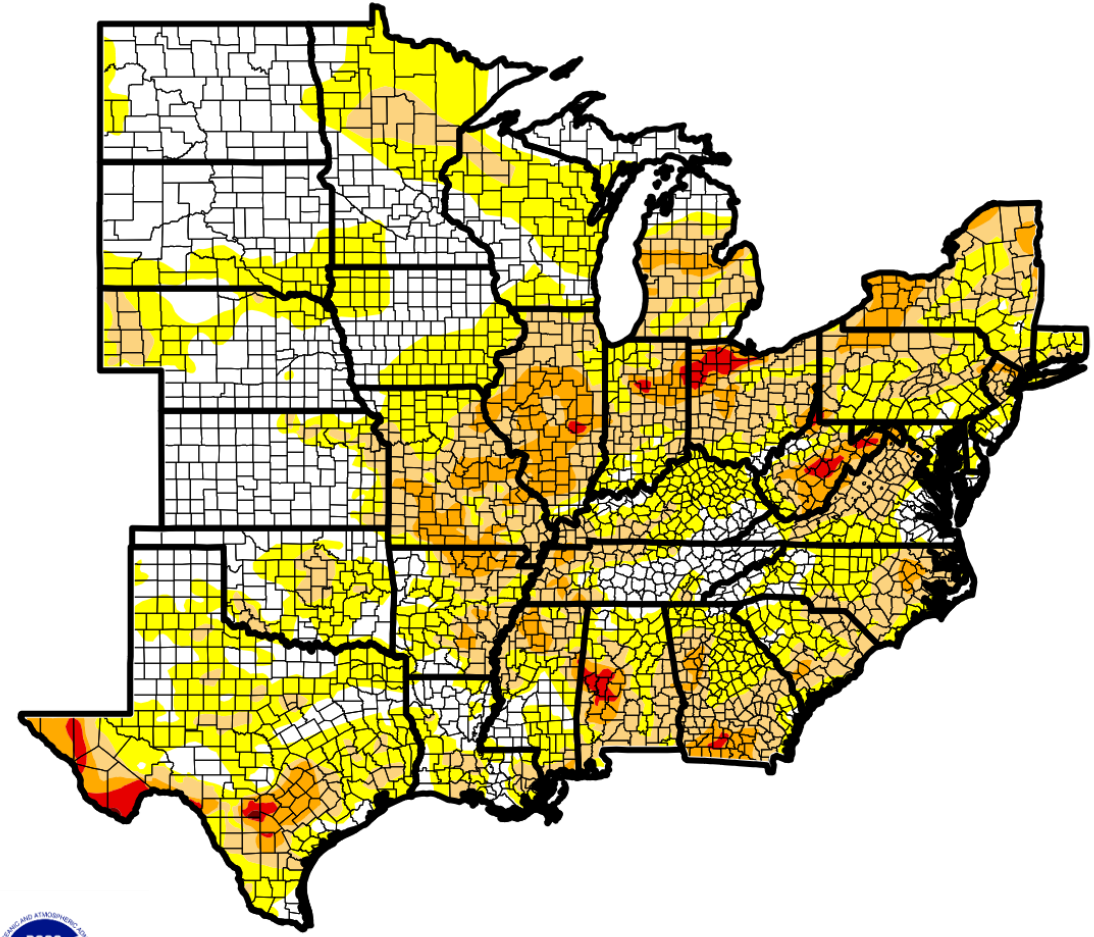
U.S. Department of Agriculture, National Agricultural Statistics Service

USDA AGRICULTURE COUNTS



https://www.nass.usda.gov/Charts_and_Maps/Crop_Progress_&_Condition/2025/US_2025.pdf

CRITICAL WEATHER EVENTS

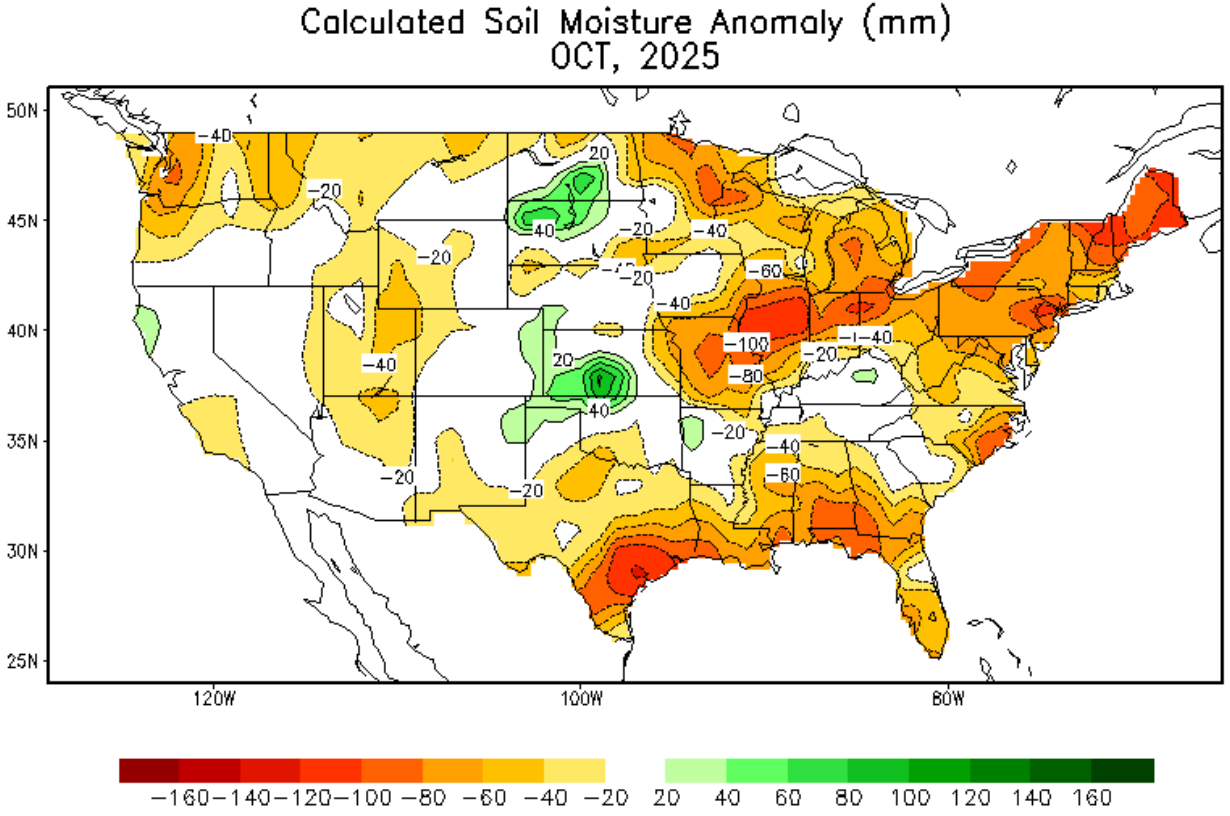


U.S. Drought Monitor

October 7, 2025

(Released Thursday, Oct. 9, 2025)

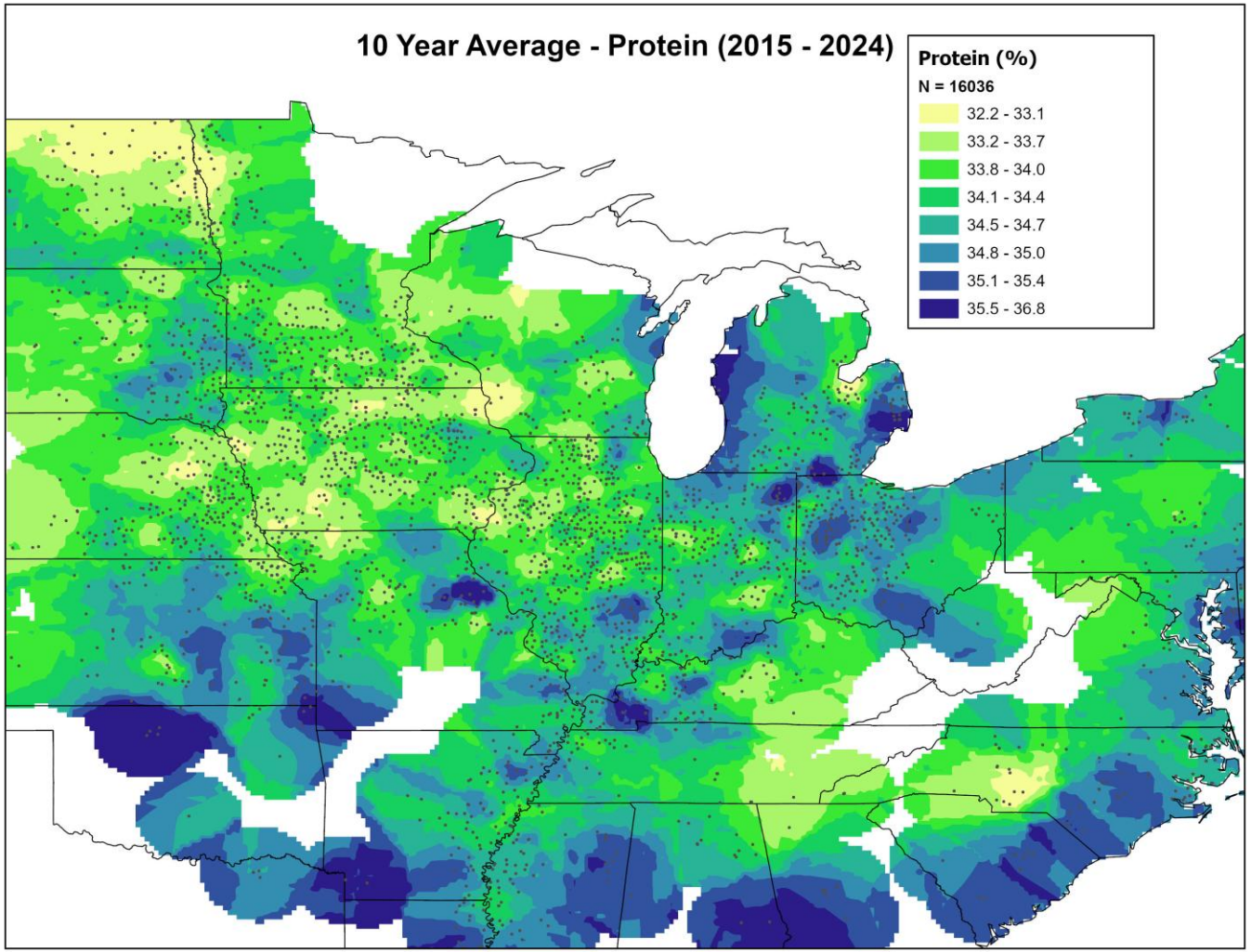
Valid 8 a.m. EDT

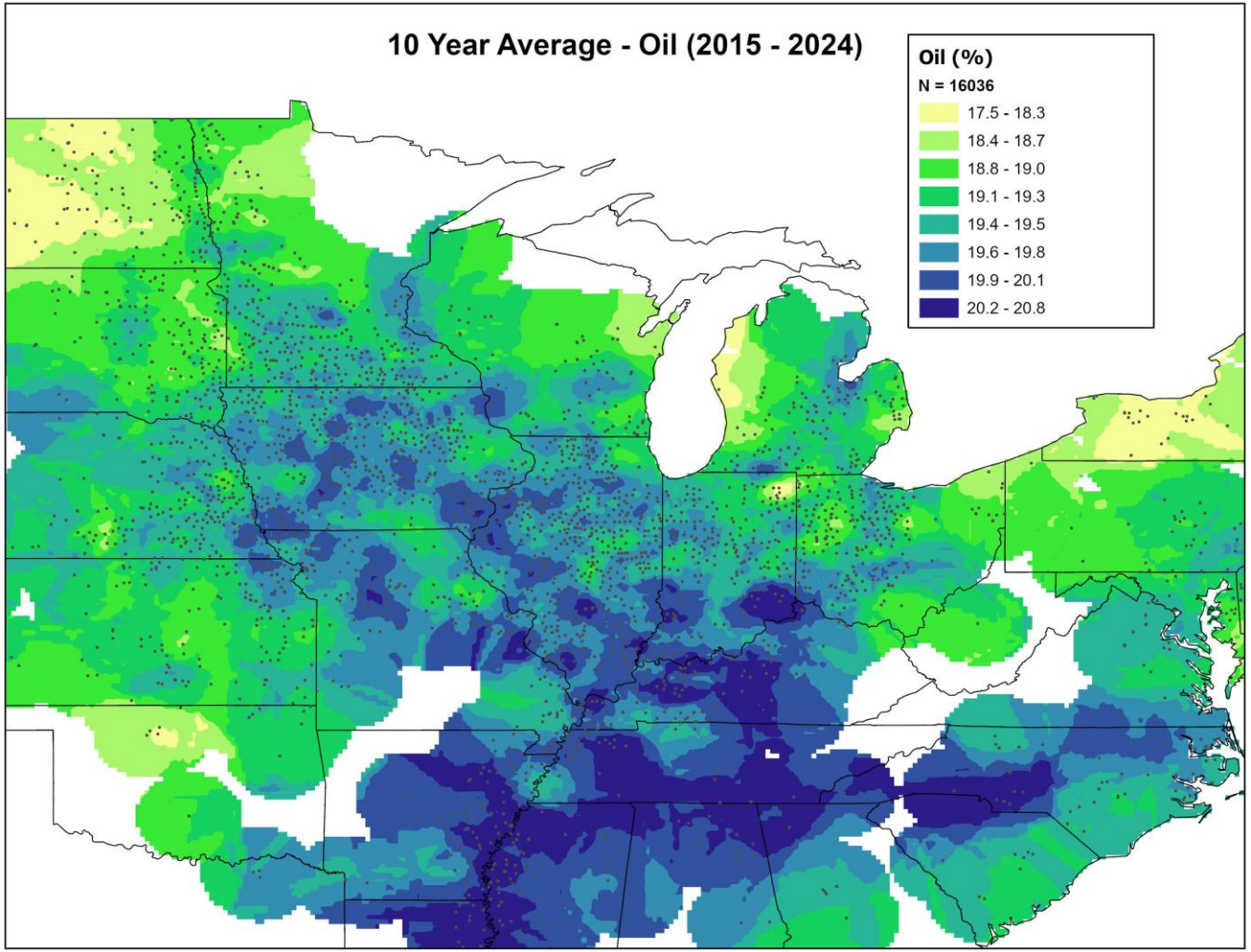

Calculated Soil Moisture Anomaly (mm)
OCT, 2025
50N
45N
40N
35N
30N
25N
120W
100W
80W
−160 −140 −120 −100 −80 −60 −40 −20 20 40 60 80 100 120 140 160

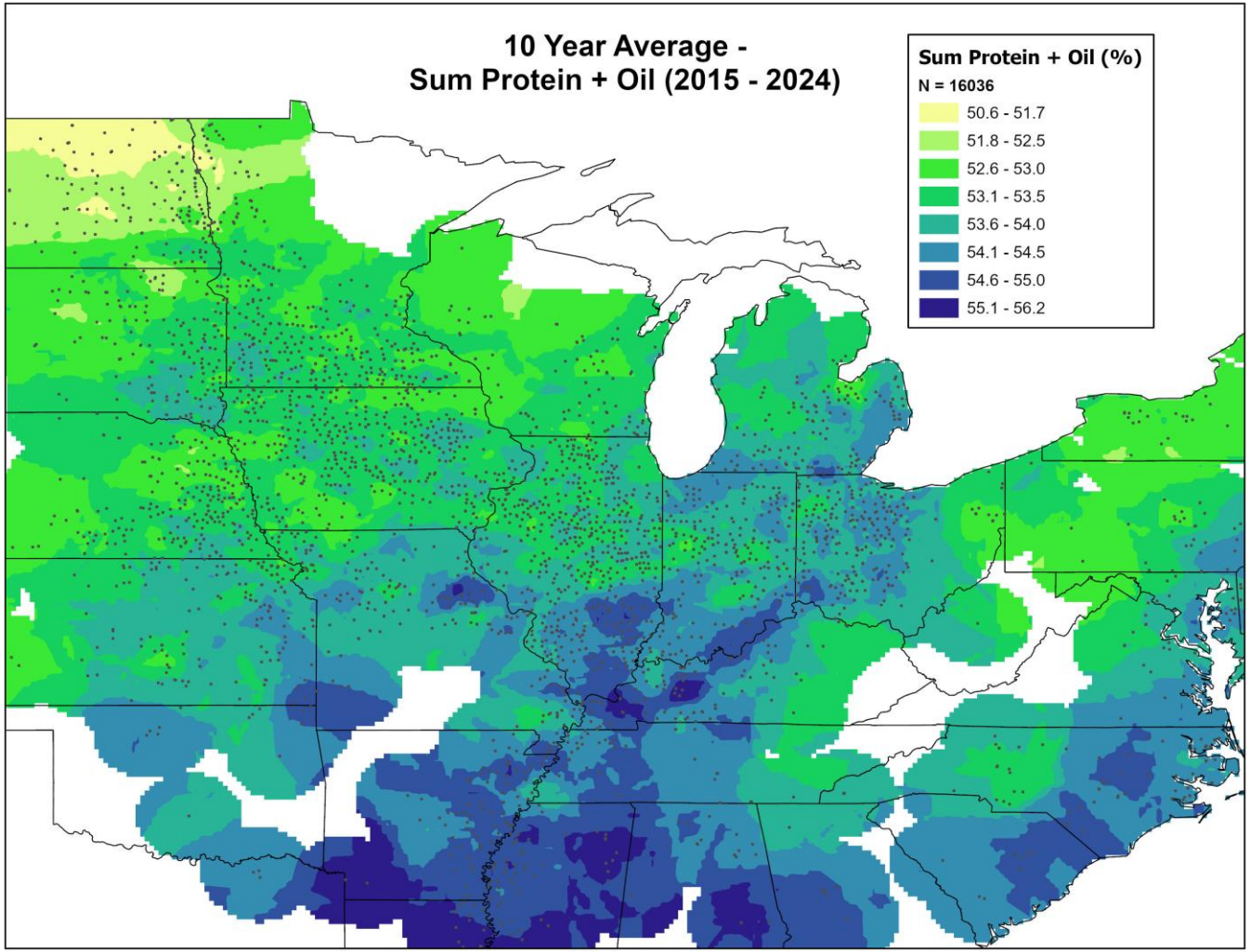
QUALITY OF THE UNITED STATES SOYBEAN CROP: 2025

University of Minnesota

HISTORICAL PROTEIN AND OIL VARIATION


10 Year Average - Protein (2015 - 2024)
Protein (%)
N = 16036
32.2 - 33.1
33.2 - 33.7
33.8 - 34.0
34.1 - 34.4
34.5 - 34.7
34.8 - 35.0
35.1 - 35.4
35.5 - 36.8


10 Year Average - Oil (2015 - 2024)
Oil (%)
N = 16036
17.5 - 18.3
18.4 - 18.7
18.8 - 19.0
19.1 - 19.3
19.4 - 19.5
19.6 - 19.8
19.9 - 20.1
20.2 - 20.8

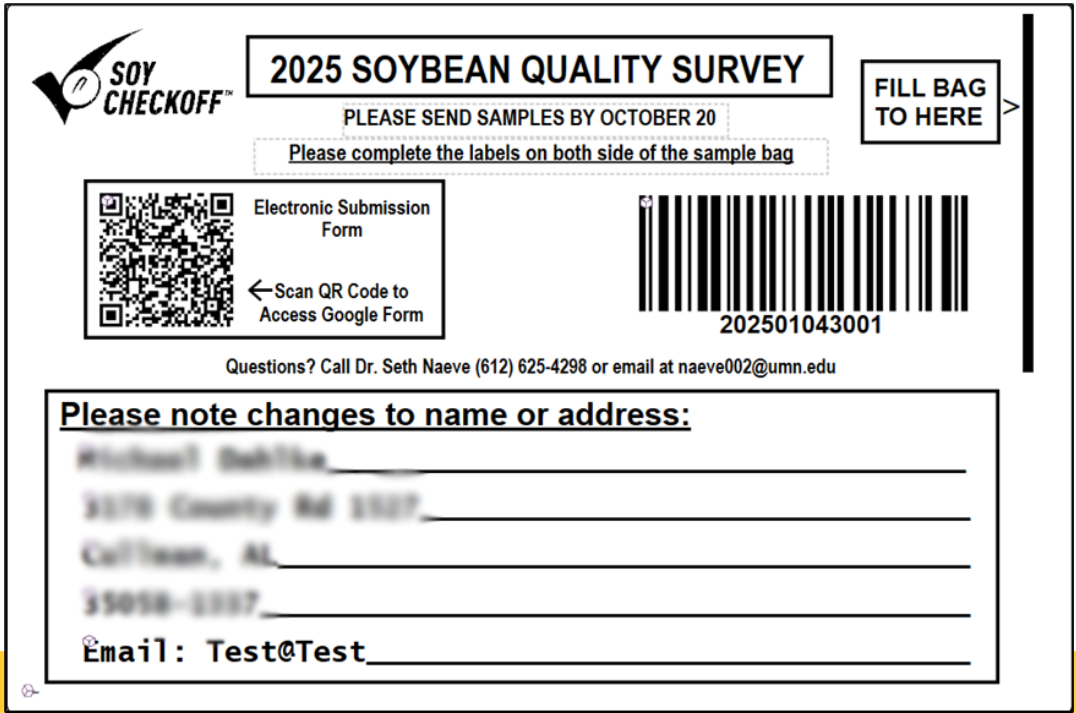

10 Year Average -
Sum Protein + Oil (2015 - 2024)
Sum Protein + Oil (%)
N = 16036
50.6 - 51.7
51.8 - 52.5
52.6 - 53.0
53.1 - 53.5
53.6 - 54.0
54.1 - 54.5
54.6 - 55.0
55.1 - 56.2


2025 SURVEY RESULTS
Voyager Pro
WEIGHING
UNITS
2nd UNITS
CALIBRATE
11/30/64 20:43:40
1.29835 lb
588.92 g
4100g
On/Off
Menu
Print
Mode
Enter
OHAUS
USSEC
2008 Food Soybean
Quality Survey
Variety (name/number and company):
Intended use:
Tofu
Natto
Miso
Other
Additional characteristics:
Special oil
Non-GMO
Organic
Field location (zip code or town, state):
Producer name or specific field identifier:
Contracting company:
Questions? Call Dr. Seth Naeve at (612) 625-4298

2025 Survey Methods

- In August, sample kits were mailed to 3,941 soybean producers based on soybean production by state

- By 27 October 2025, 1,024 samples were received for analyses

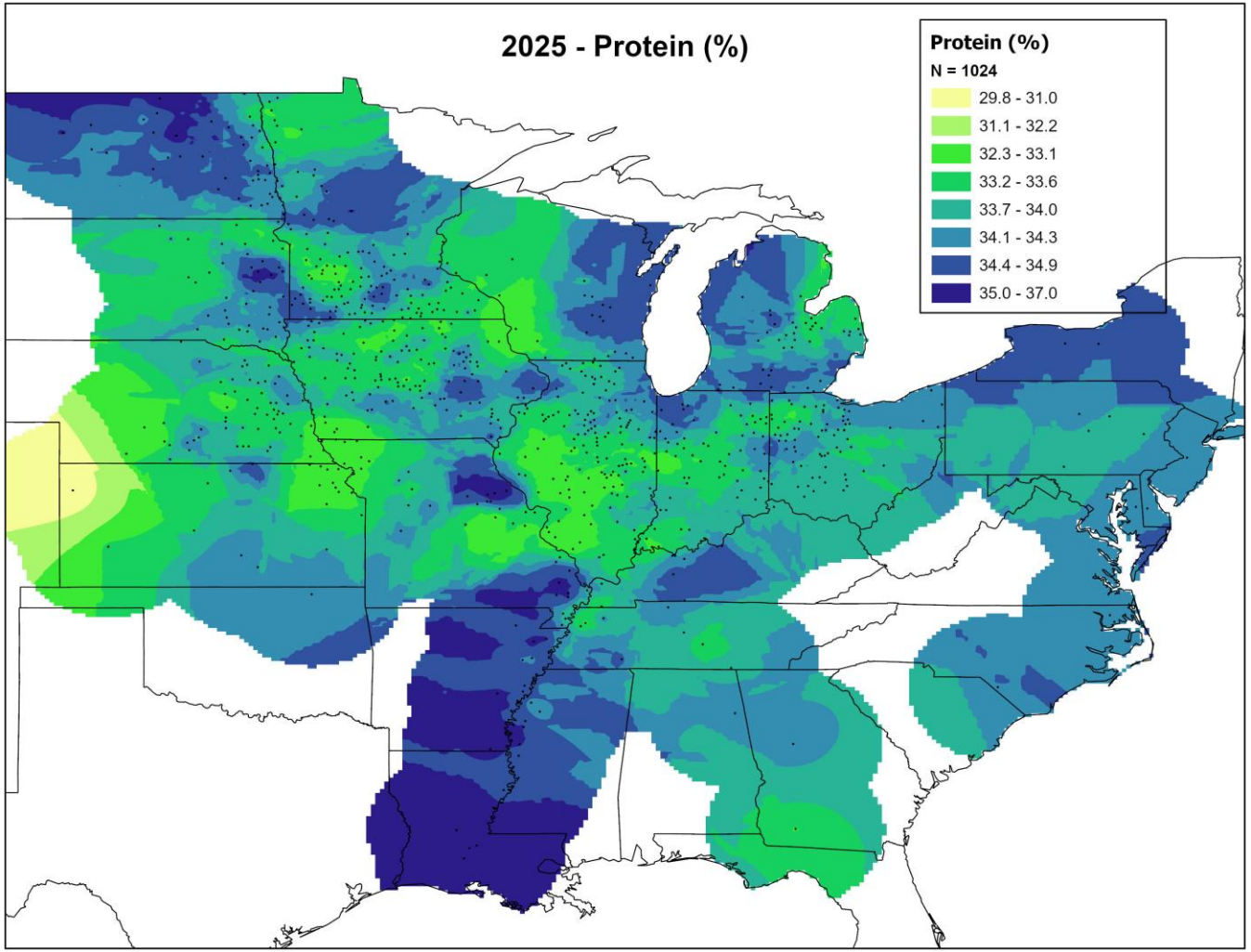


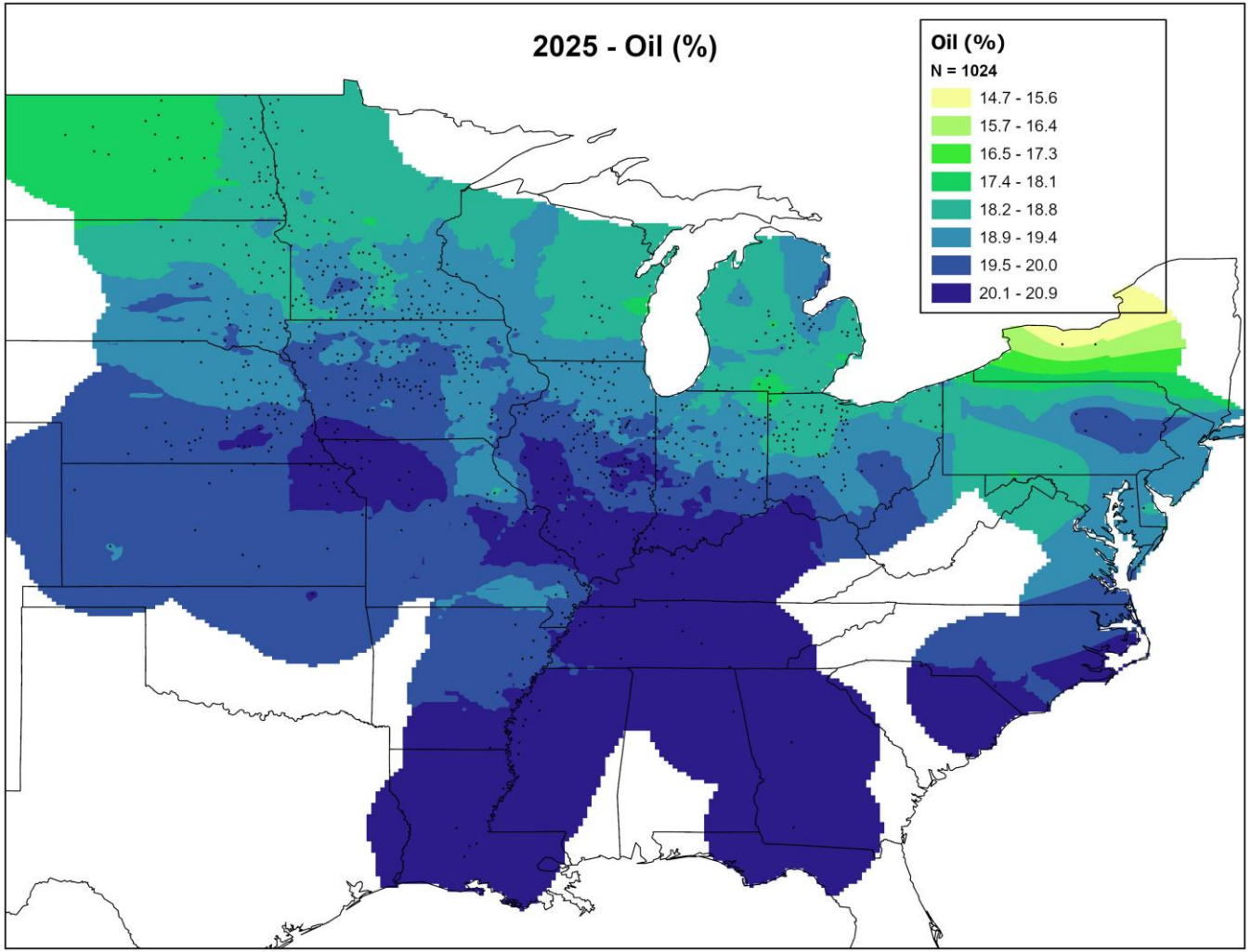
PROTEIN AND OIL

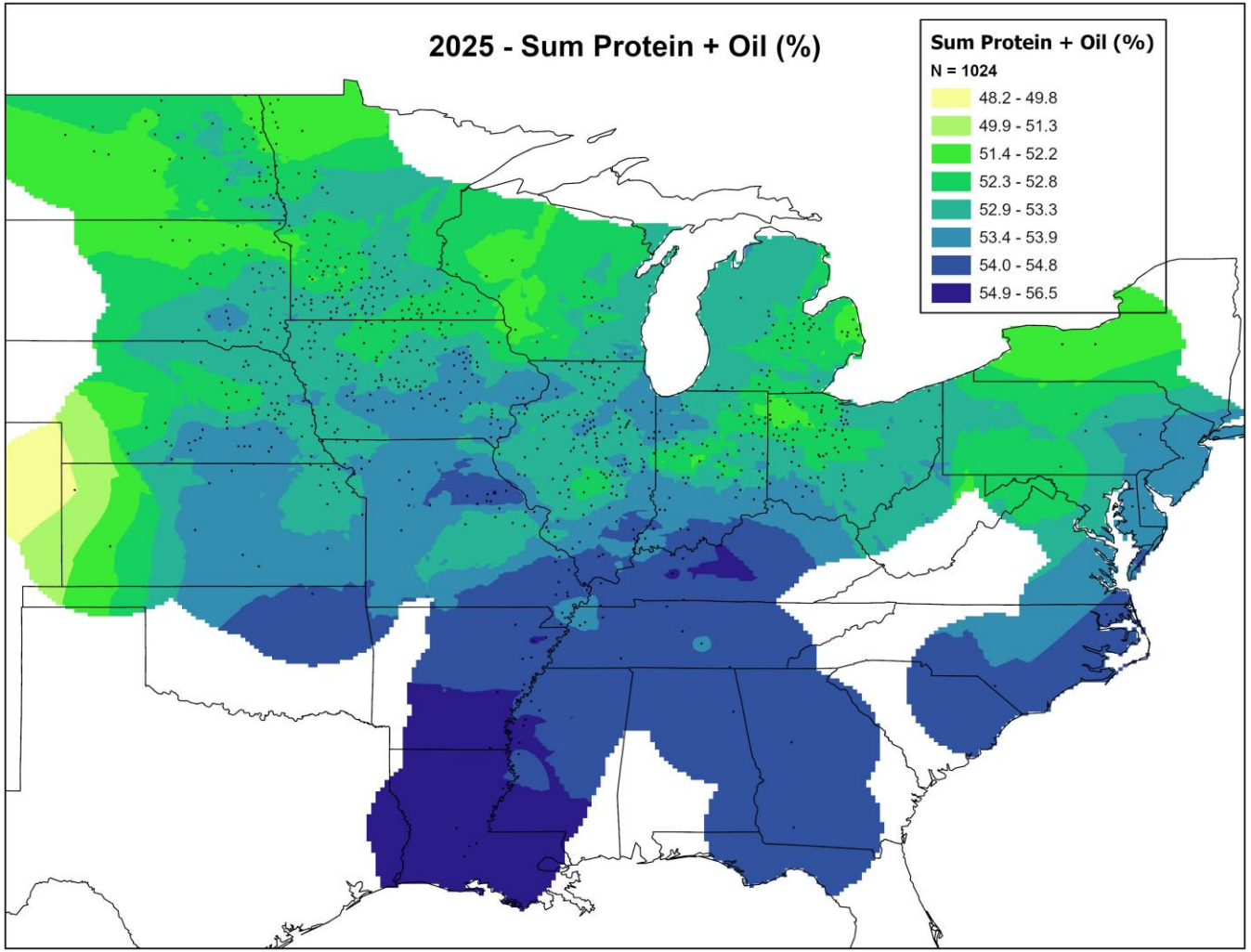
2025 U.S. average values

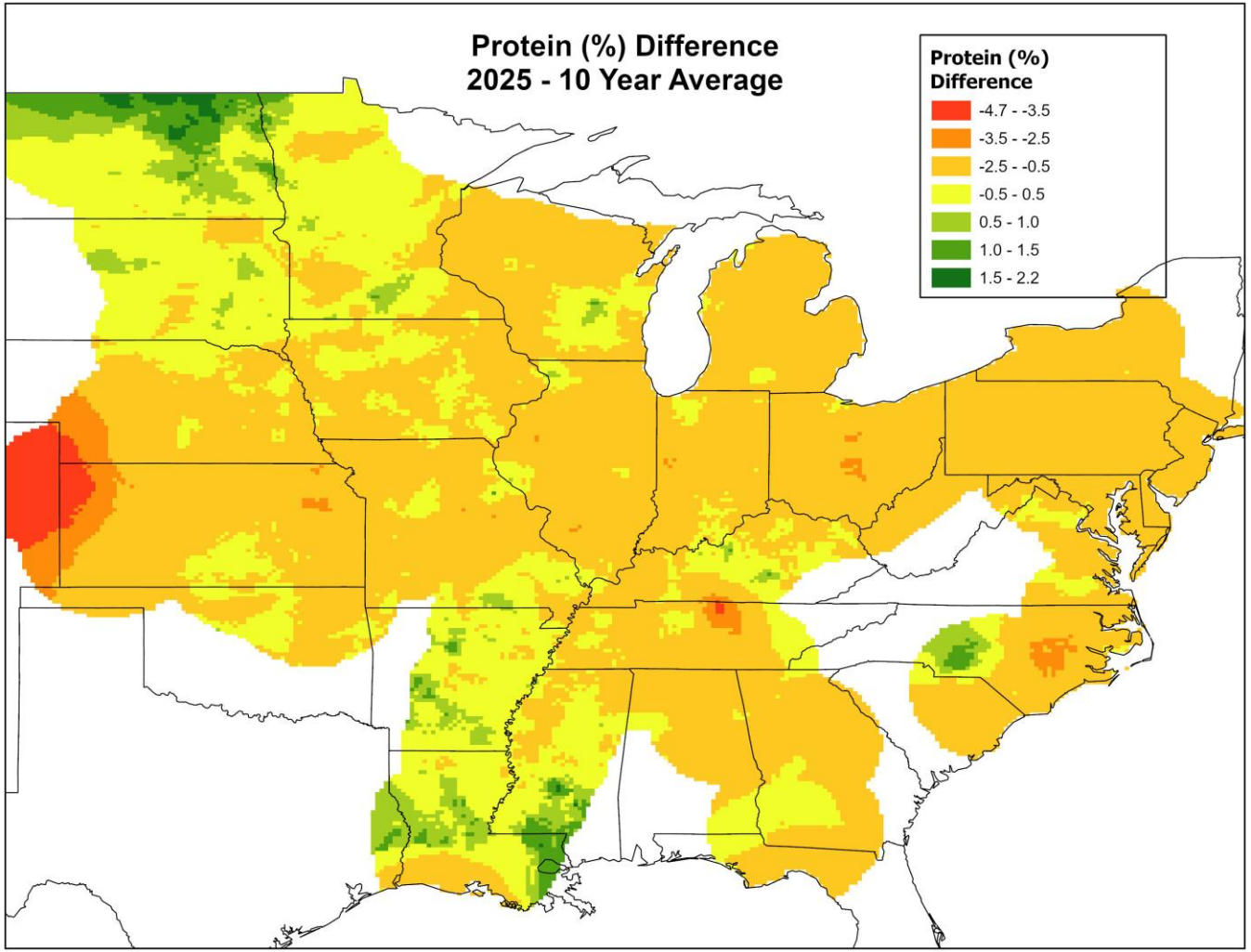
Region	Number of Samples	Protein (13%)	Change from 2024	Oil (13%)	Change from 2024	Seed Weight (g/100 seeds)
US Average	1024	33.8		19.3		15.4
Average of 2025 Crop†		**33.8**	**-0.2**	**19.4**	**-0.5**	**15.2**
US 2015-2024 avg.		34.0		19.5		

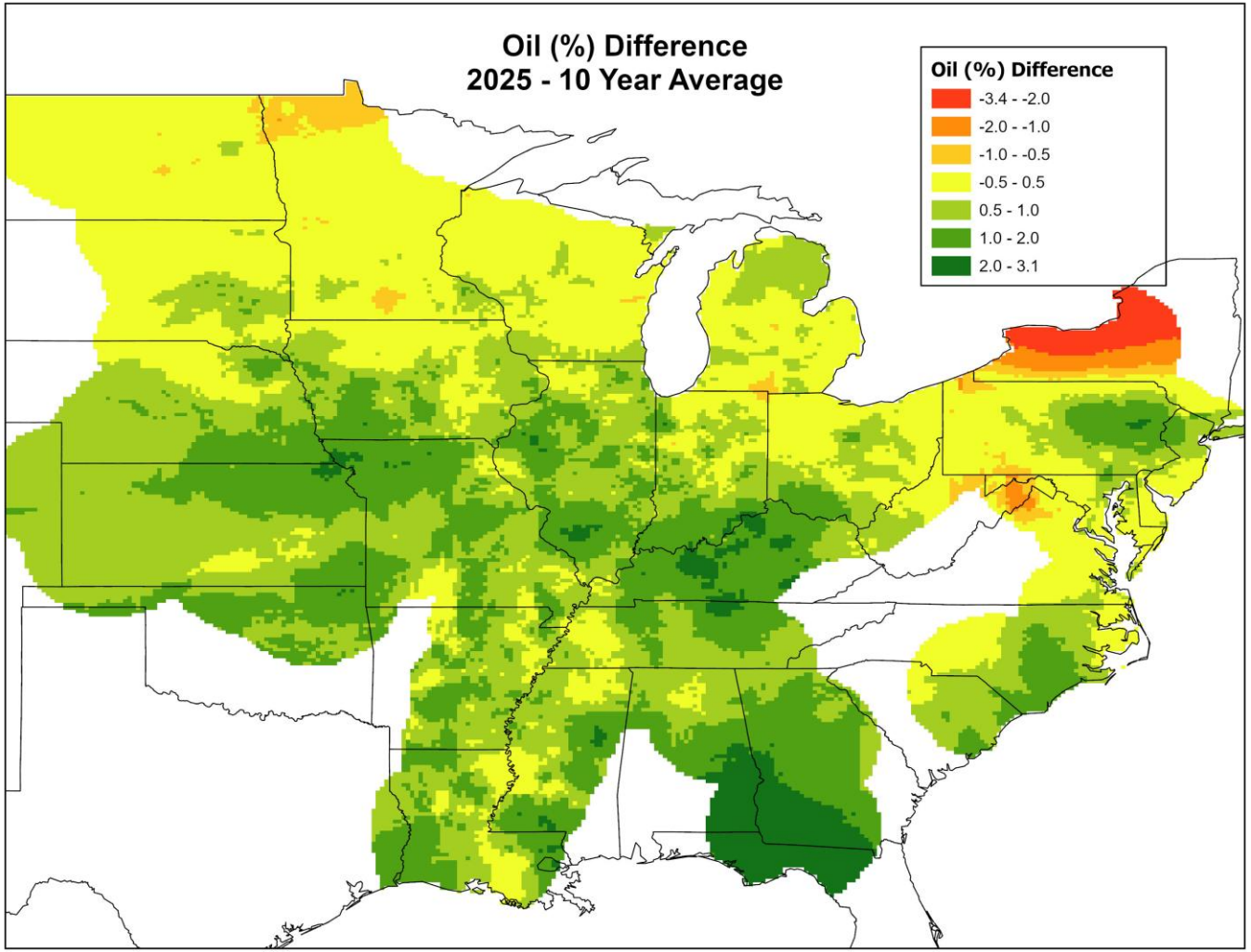
†US average values weighted based on estimated production by state as estimated by USDA, NASS Crop Production Report (September 2025)

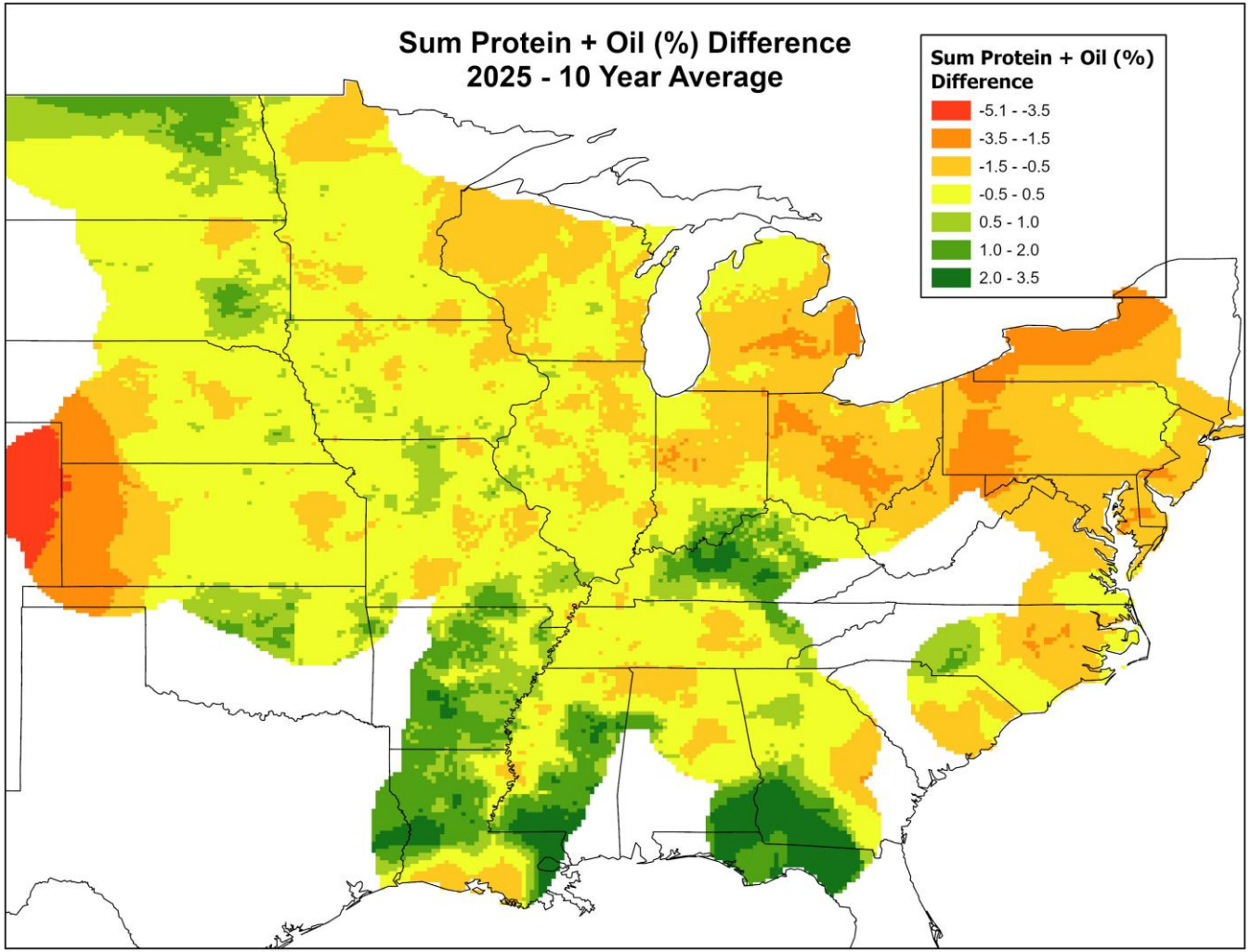

2025 - Protein (%)
Protein (%)
N = 1024
29.8 - 31.0
31.1 - 32.2
32.3 - 33.1
33.2 - 33.6
33.7 - 34.0
34.1 - 34.3
34.4 - 34.9
35.0 - 37.0

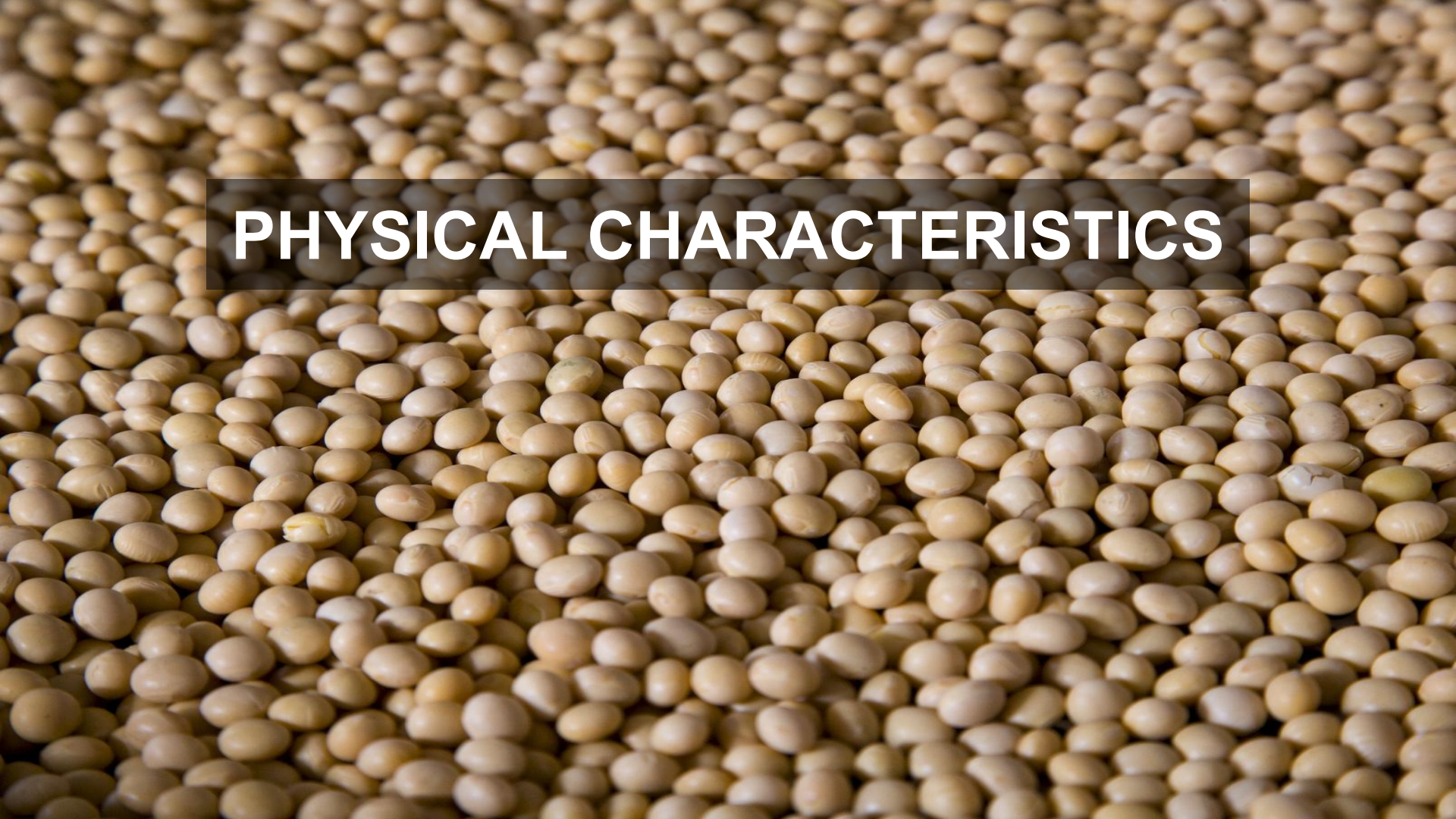

2025 - Oil (%)
Oil (%)
N = 1024
14.7 - 15.6
15.7 - 16.4
16.5 - 17.3
17.4 - 18.1
18.2 - 18.8
18.9 - 19.4
19.5 - 20.0
20.1 - 20.9

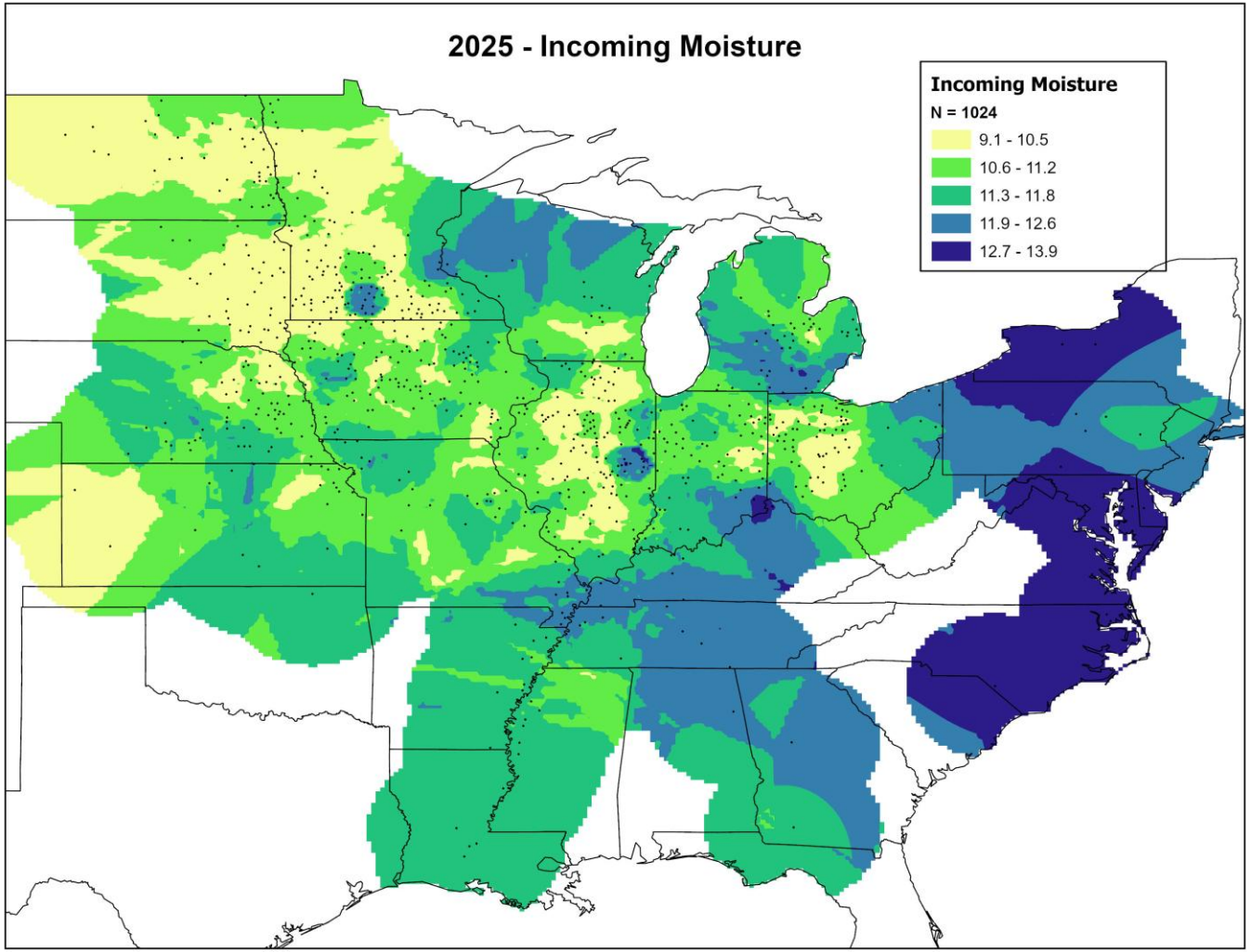

2025 - Sum Protein + Oil (%)
Sum Protein + Oil (%)
N = 1024
48.2 - 49.8
49.9 - 51.3
51.4 - 52.2
52.3 - 52.8
52.9 - 53.3
53.4 - 53.9
54.0 - 54.8
54.9 - 56.5

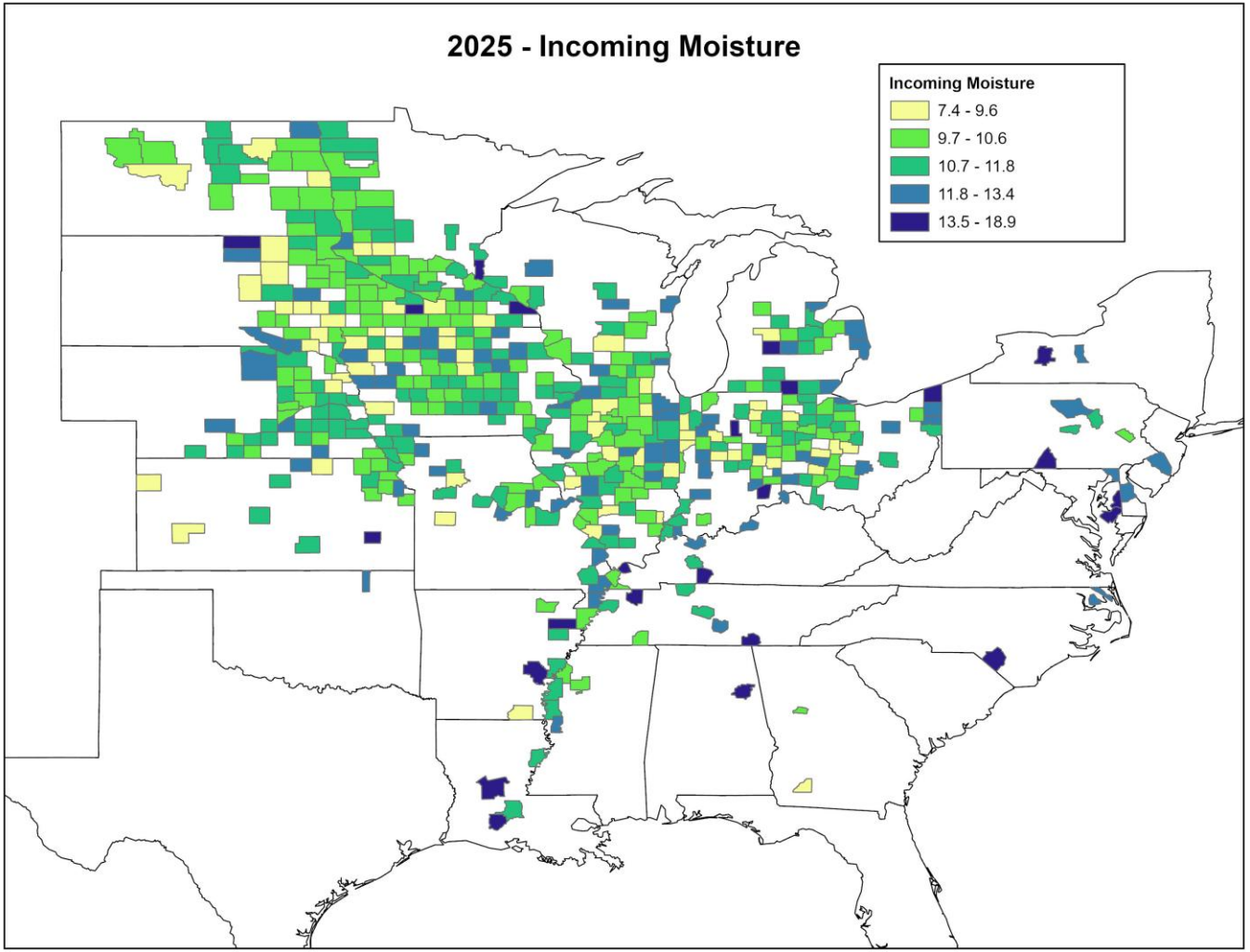

Protein (%) Difference
2025 - 10 Year Average
Protein (%) Difference
-4.7 - -3.5
-3.5 - -2.5
-2.5 - -0.5
-0.5 - 0.5
0.5 - 1.0
1.0 - 1.5
1.5 - 2.2


Oil (%) Difference
2025 - 10 Year Average
Oil (%) Difference
-3.4 - -2.0
-2.0 - -1.0
-1.0 - -0.5
-0.5 - 0.5
0.5 - 1.0
1.0 - 2.0
2.0 - 3.1


Sum Protein + Oil (%) Difference
2025 - 10 Year Average
Sum Protein + Oil (%) Difference
-5.1 - -3.5
-3.5 - -1.5
-1.5 - -0.5
-0.5 - 0.5
0.5 - 1.0
1.0 - 2.0
2.0 - 3.5


PHYSICAL CHARACTERISTICS


2025 - Incoming Moisture
Incoming Moisture
N = 1024
9.1 - 10.5
10.6 - 11.2
11.3 - 11.8
11.9 - 12.6
12.7 - 13.9

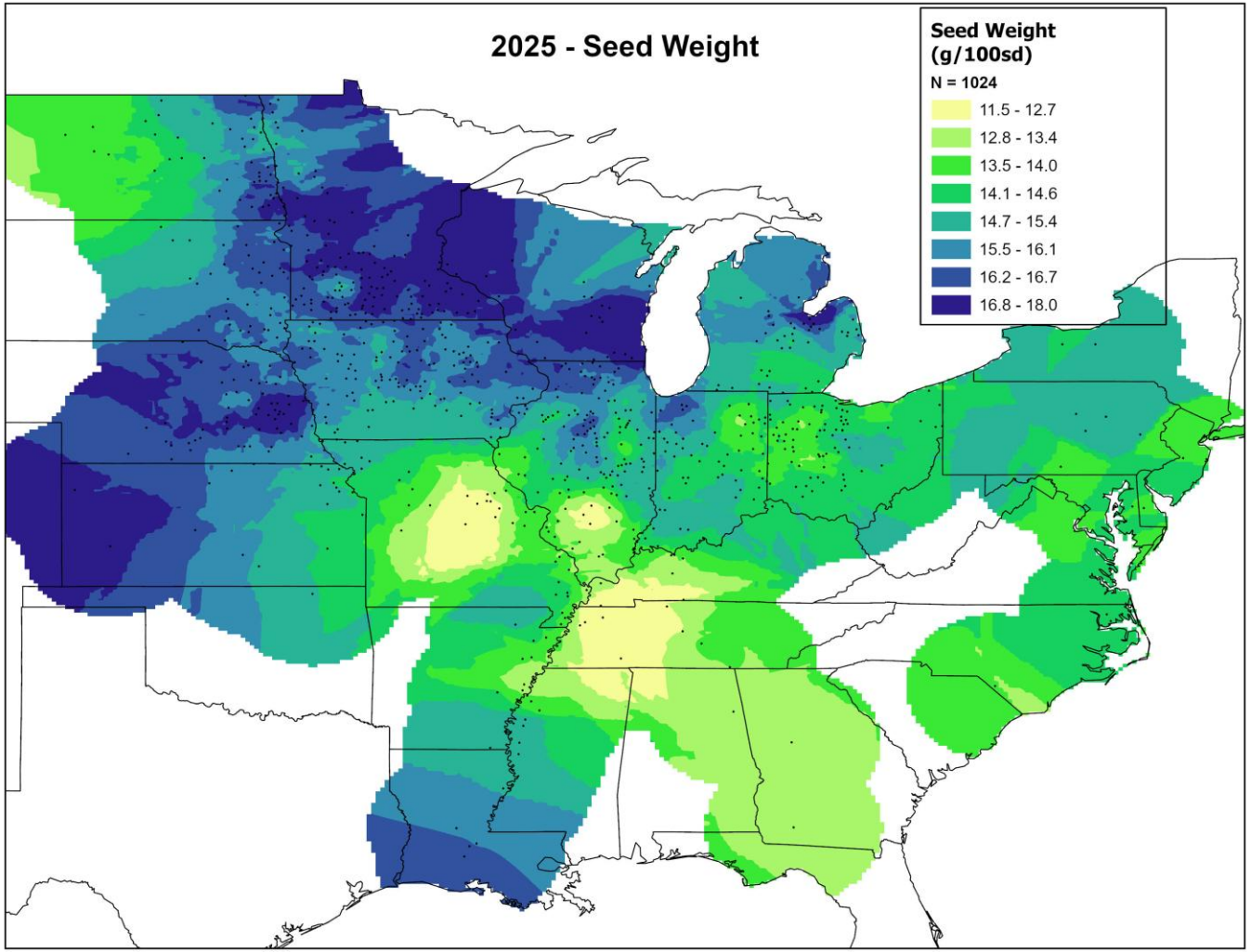

2025 - Incoming Moisture
Incoming Moisture
7.4 - 9.6
9.7 - 10.6
10.7 - 11.8
11.8 - 13.4
13.5 - 18.9

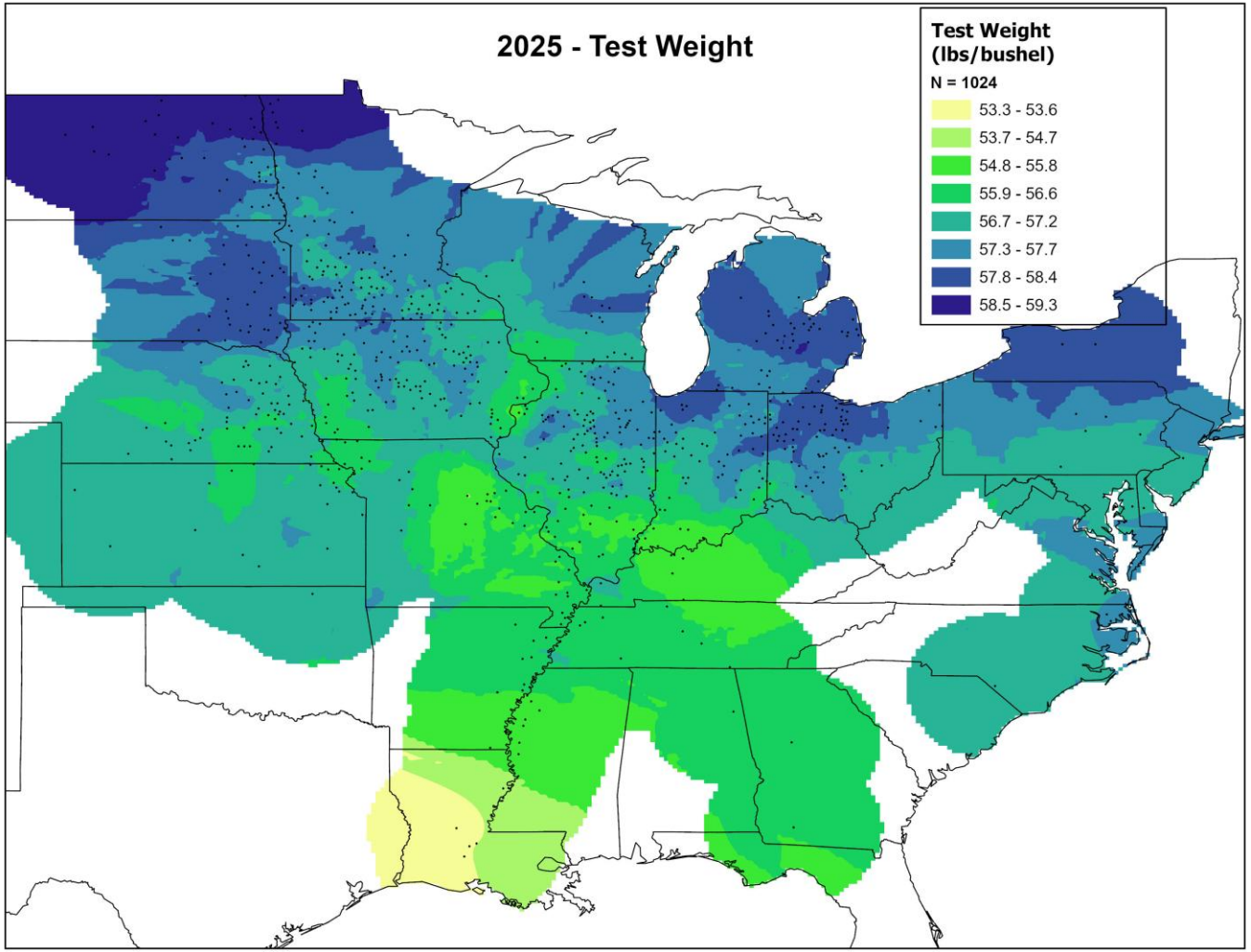
2025 Crop on an ”as-is” basis

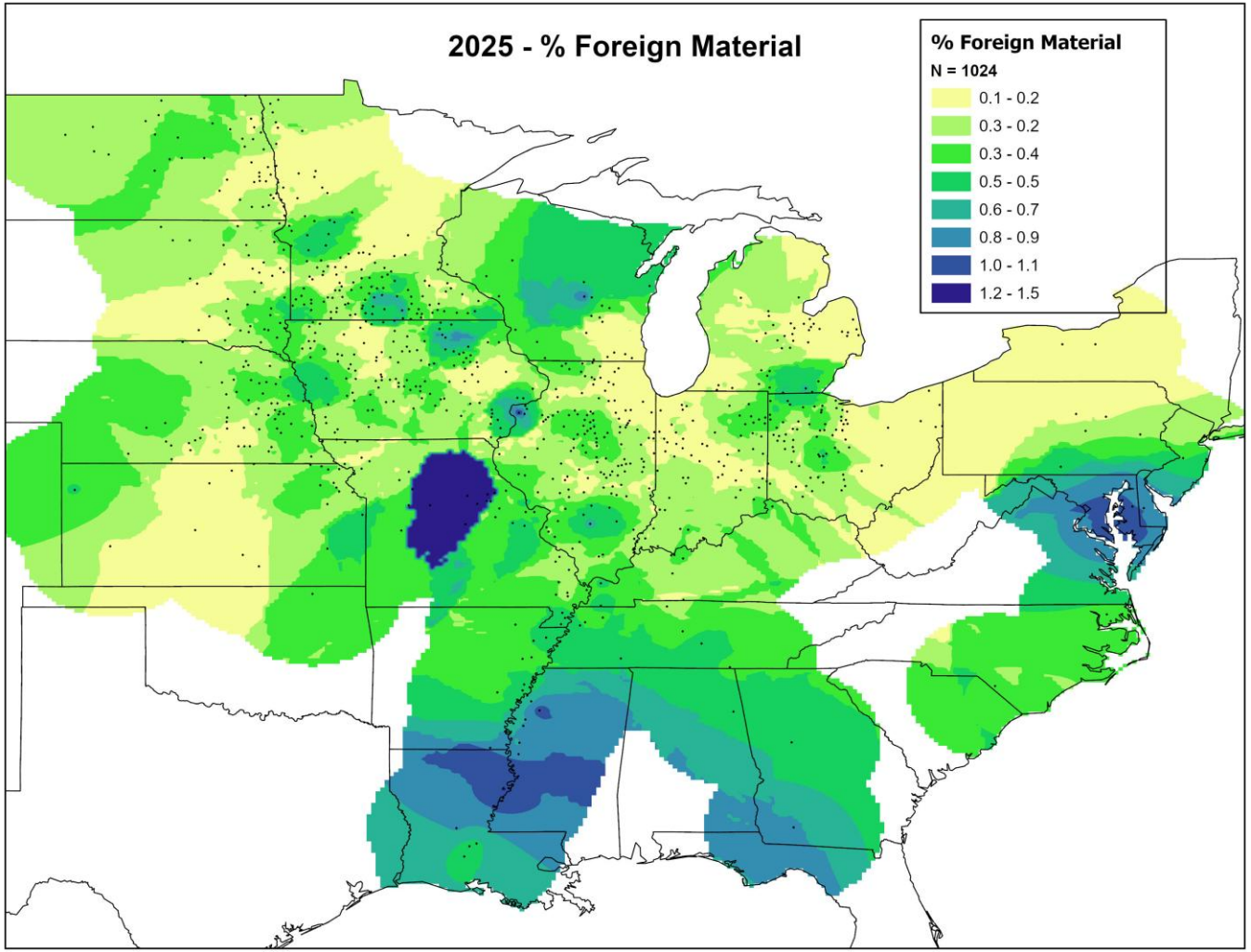
Region	Number of Samples		Protein	Change from 2024	Oil	Change from 2024
US Average	1024	(As-Is)	34.6		19.7	
Average of 2025 Crop†		**(As-Is). 10.9%**	**34.6**	**-0.4**	**19.8**	**-0.7**
Average of 2025 Crop*		(13%)	33.8		19.4	

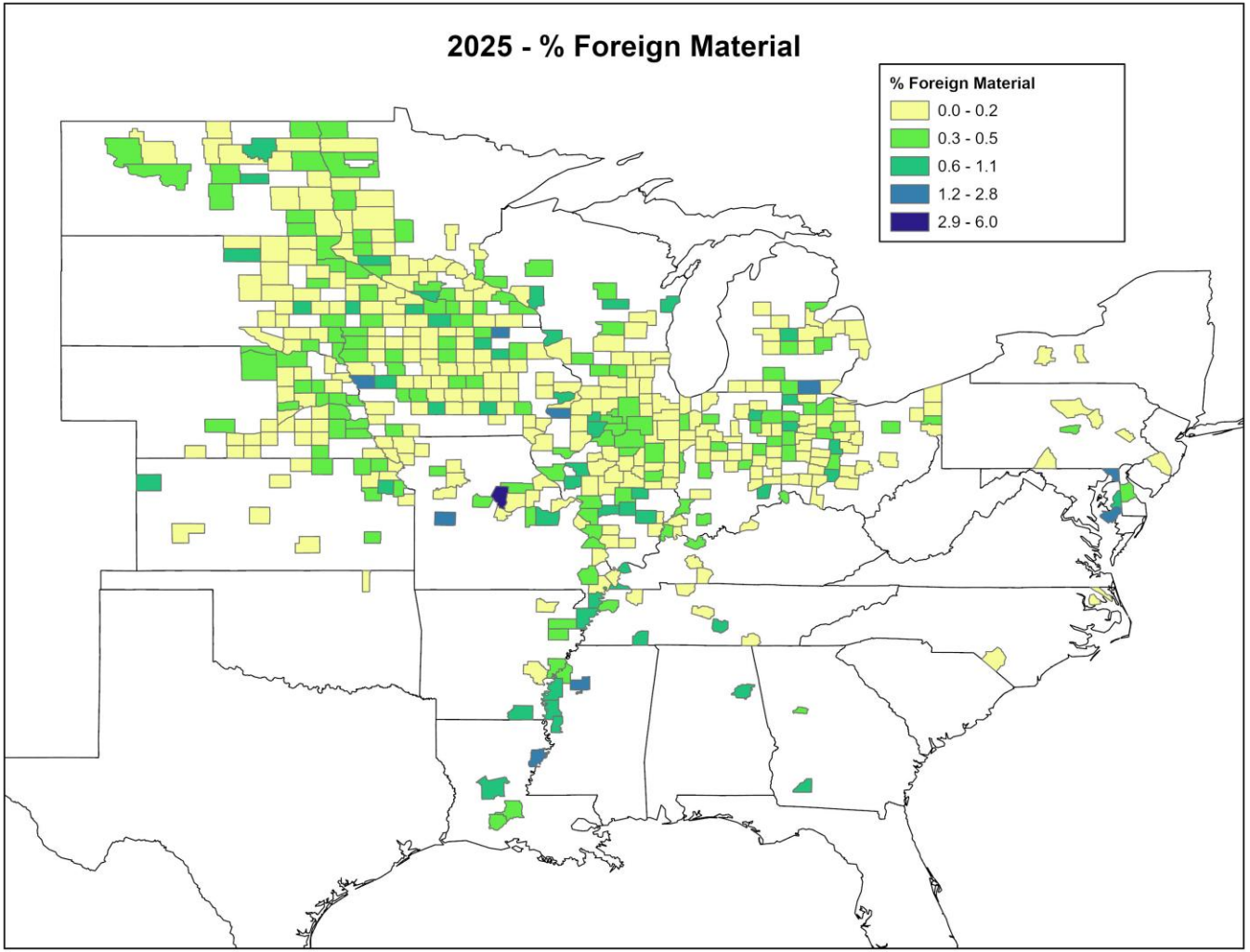
† Regional and US average values weighted based on estimated production by state as estimated by USDA, NASS Crop Production Report (October 2024)

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


2025 - Seed Weight
Seed Weight
(g/100sd)
N = 1024
11.5 - 12.7
12.8 - 13.4
13.5 - 14.0
14.1 - 14.6
14.7 - 15.4
15.5 - 16.1
16.2 - 16.7
16.8 - 18.0


2025 - Test Weight
Test Weight
(lbs/bushel)
N = 1024
53.3 - 53.6
53.7 - 54.7
54.8 - 55.8
55.9 - 56.6
56.7 - 57.2
57.3 - 57.7
57.8 - 58.4
58.5 - 59.3


2025 - % Foreign Material
% Foreign Material
N = 1024
0.1 - 0.2
0.3 - 0.2
0.3 - 0.4
0.5 - 0.5
0.6 - 0.7
0.8 - 0.9
1.0 - 1.1
1.2 - 1.5


2025 - % Foreign Material
% Foreign Material
0.0 - 0.2
0.3 - 0.5
0.6 - 1.1
1.2 - 2.8
2.9 - 6.0

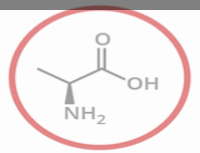
BETTER MEASURES OF QUALITY: AMINO ACIDS

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 EATEN FROM THE DIET. NON-ESSENTIAL AMINO ACIDS CAN BE SYNTHESISED IN THE BODY.

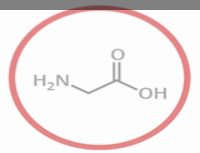
Chart Key: ALIPHATIC · AROMATIC · ACIDIC · BASIC · HYDROXYLIC · SULFUR CONTAINING · AMIDIC · NON-ESSENTIAL · ESSENTIAL

Chemical Structure — *single letter code*

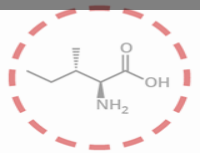
NAME (A) — *three letter code* — DNA codons



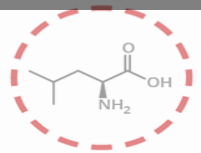
ALANINE (A)
Ala
GCT, GCC, GCA, GCG



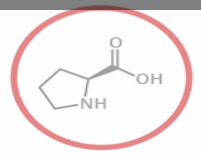
GLYCINE (G)
Gly
GGT, GGC, GGA, GGG



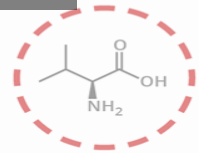
ISOLEUCINE (I)
Ile
ATT, ATC, ATA



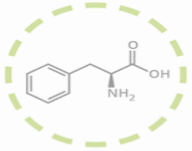
LEUCINE (L)
Leu
CTT, CTC, CTA, CTG, TTA, TTG



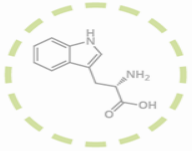
PROLINE (P)
Pro
CCT, CCC, CCA, CCG



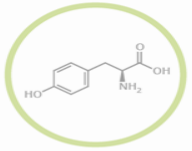
VALINE (V)
Val
GTT, GTC, GTA, GTG



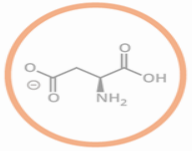
PHENYLALANINE (F)
Phe
TTT, TTC



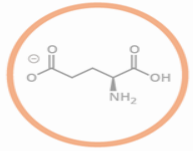
TRYPTOPHAN (W)
Trp
TGG



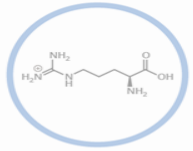
TYROSINE (Y)
Tyr
TAT, TAC



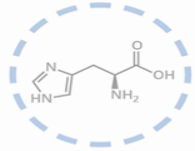
ASPARTIC ACID (D)
Asp
GAT, GAC



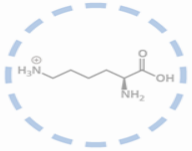
GLUTAMIC ACID (E)
Glu
GAA, GAG



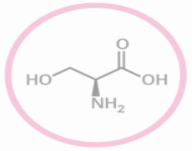
ARGININE (R)
Arg
CGT, CGC, CGA, CGG, AGA, AGG



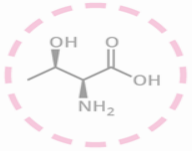
HISTIDINE (H)
His
CAT, CAC



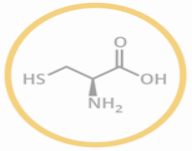
LYSINE (K)
Lys
AAA, AAG



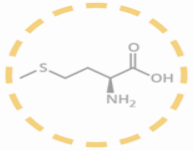
SERINE (S)
Ser
TCT, TCC, TCA, TCG, AGT, AGC



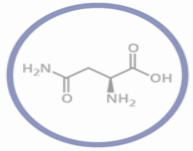
THREONINE (T)
Thr
ACT, ACC, ACA, ACG



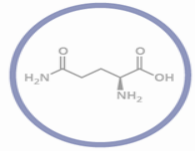
CYSTEINE (C)
Cys
TGT, TGC



METHIONINE (M)
Met
ATG



ASPARAGINE (N)
Asn
AAT, AAC



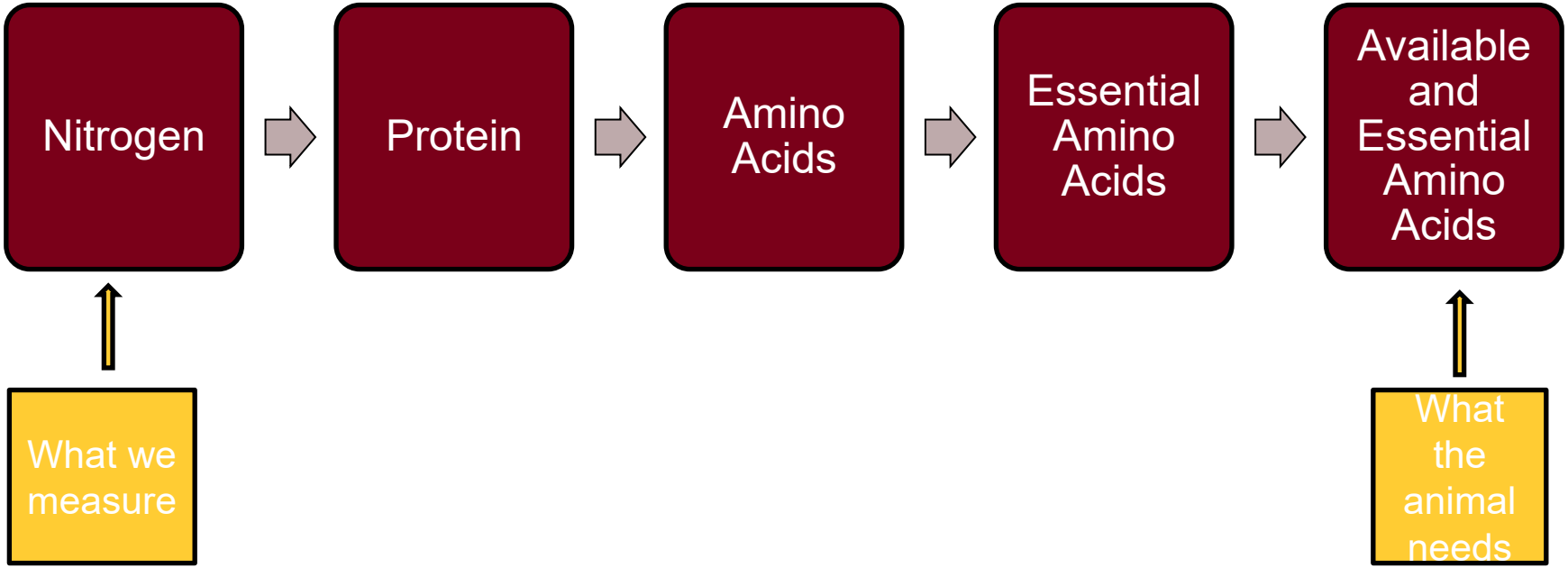
GLUTAMINE (Q)
Gln
CAA, CAG

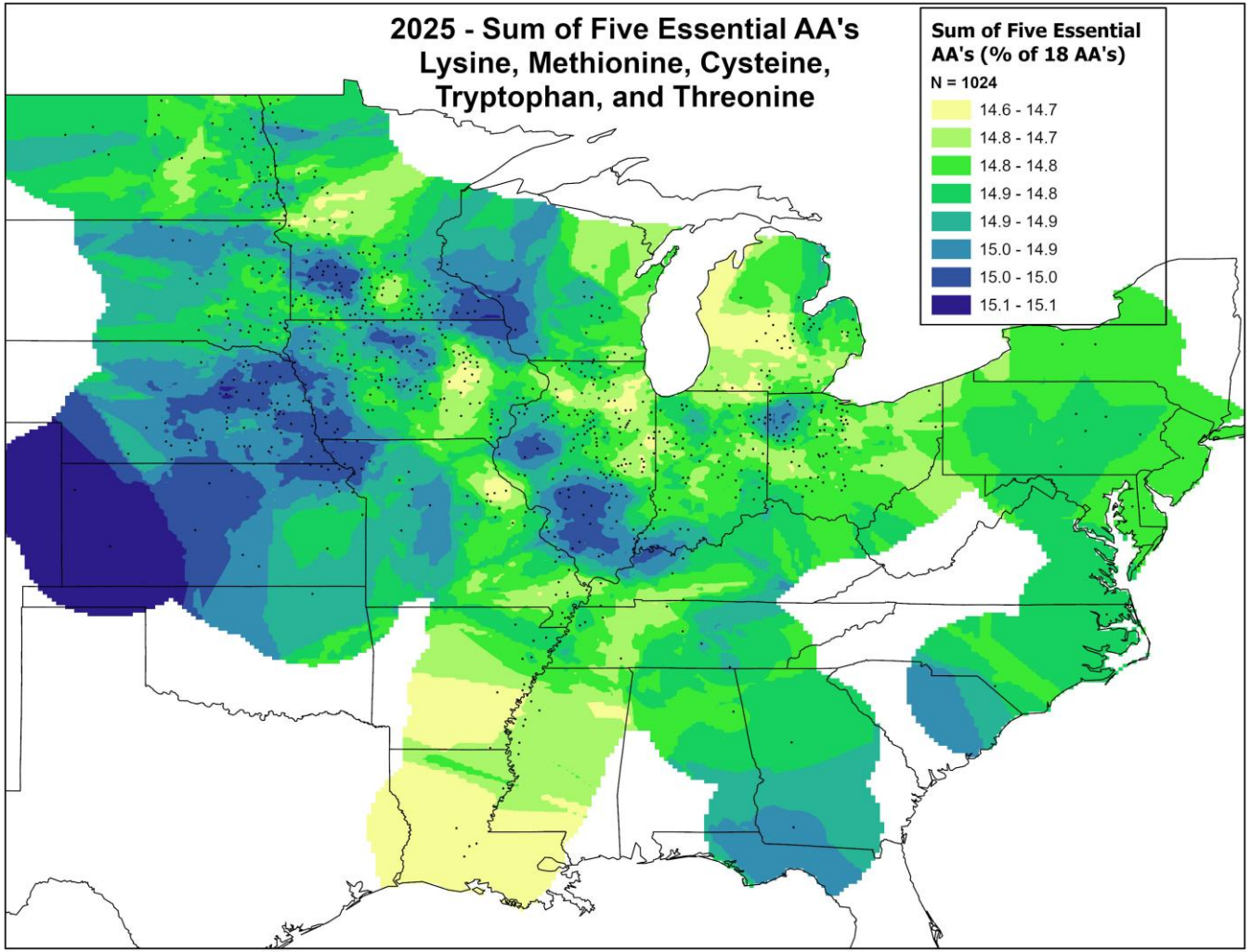
Note: This chart only shows those amino acids for which the human genetic code directly codes for. Selenocysteine is often referred to as the 21st amino acid, but is encoded in a special manner. In some cases, distinguishing between asparagine/aspartic acid and glutamine/glutamic acid is difficult. In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

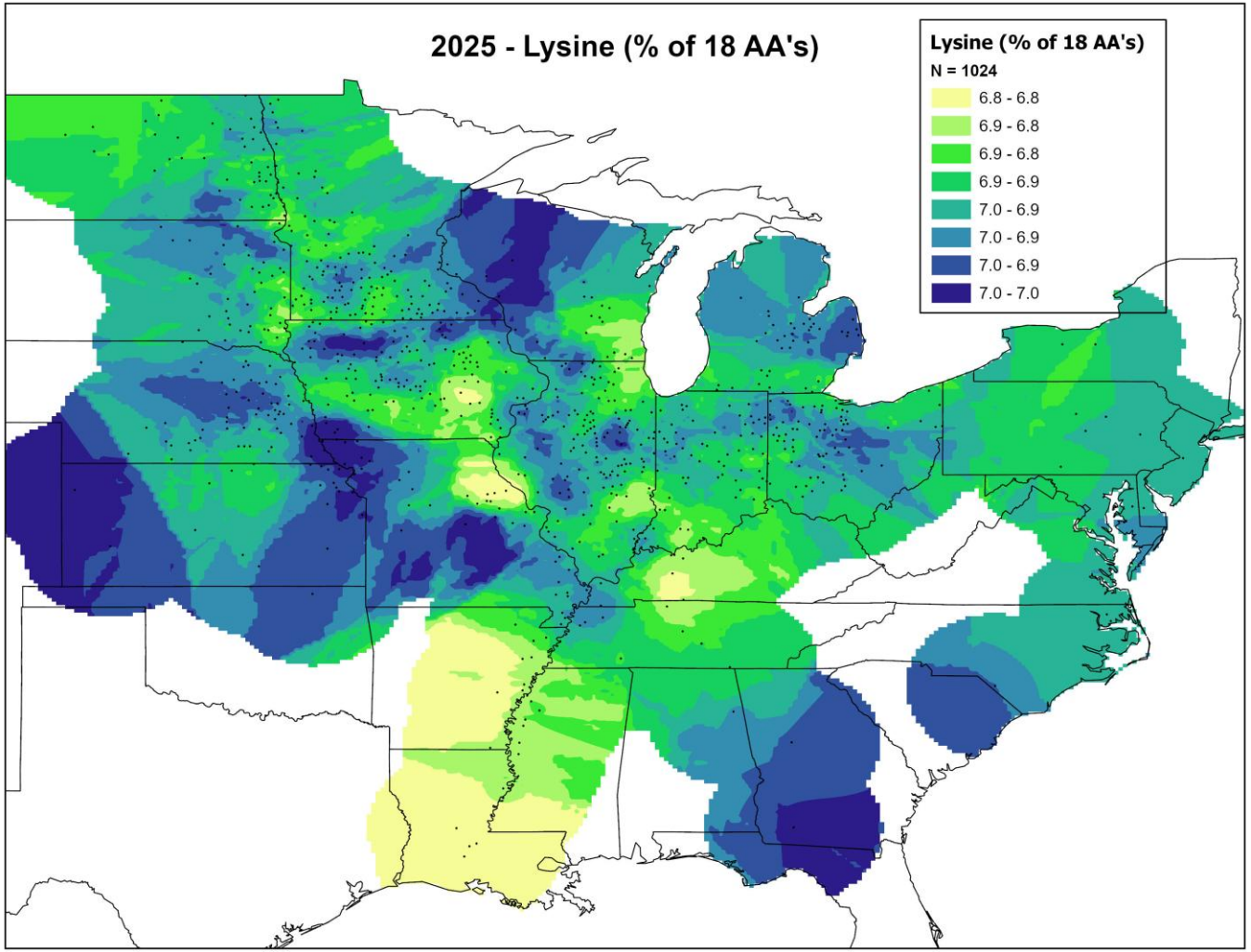
Better measures of the value of soybeans

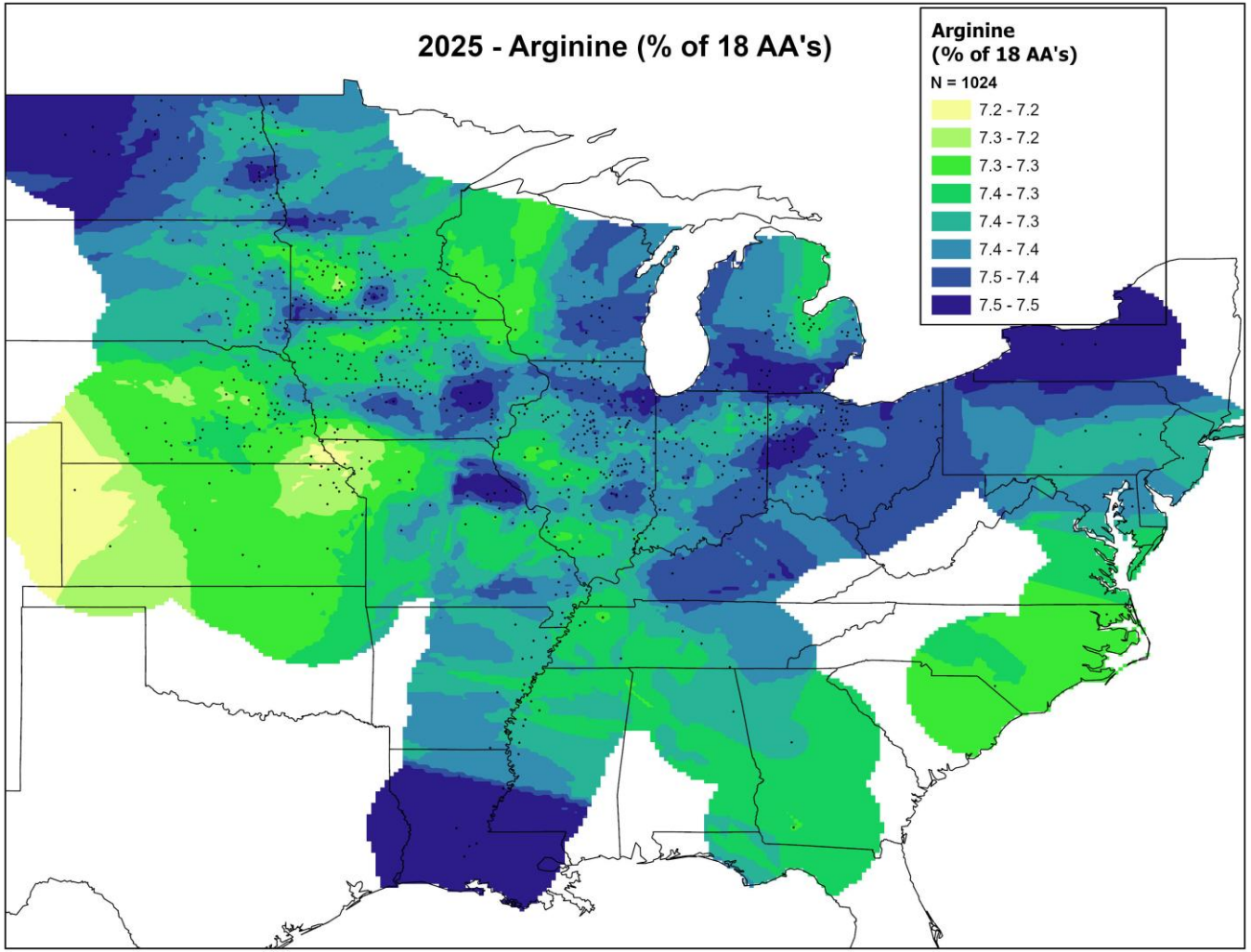
- Soybean is a complex and variable product/commodity.
- Traditional grading systems do not correlate well with actual value.
- Soybeans & soybean meal have been valued primarily on an indirect measure of protein – ‘crude protein’
- Crude protein is probably not the best measure of a soybean (or a soybean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

CP (N) is an indirect measure of quality

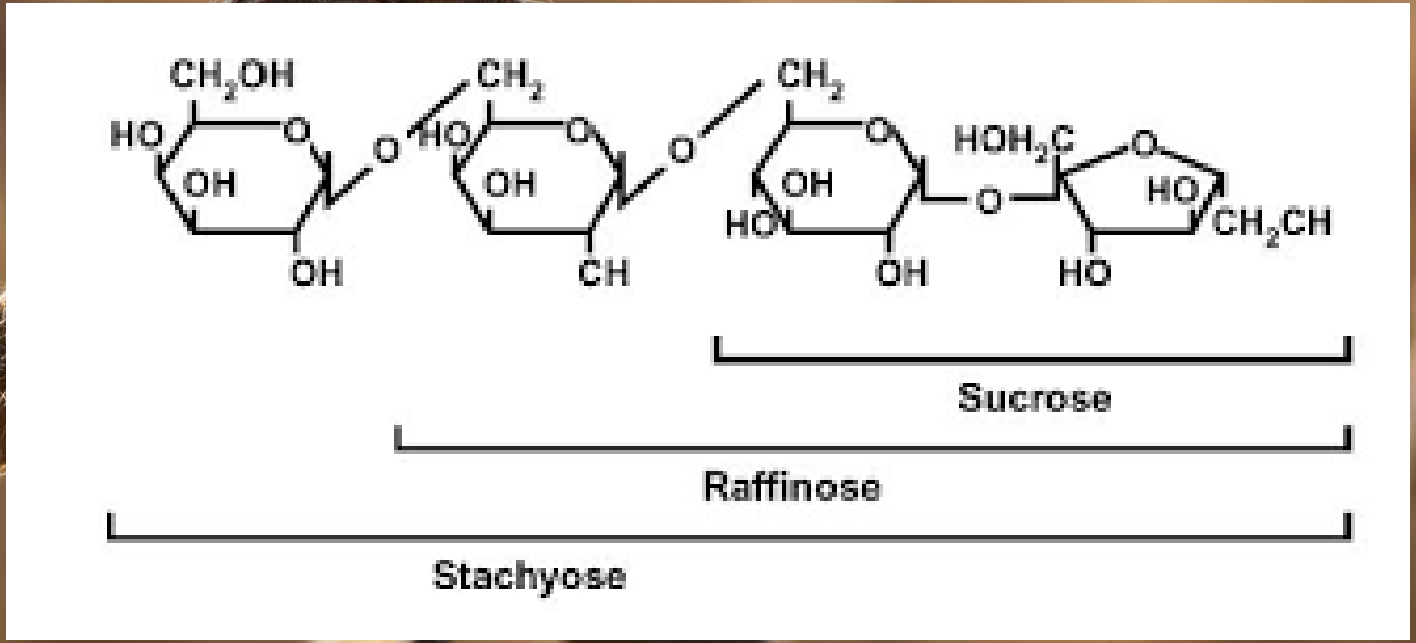


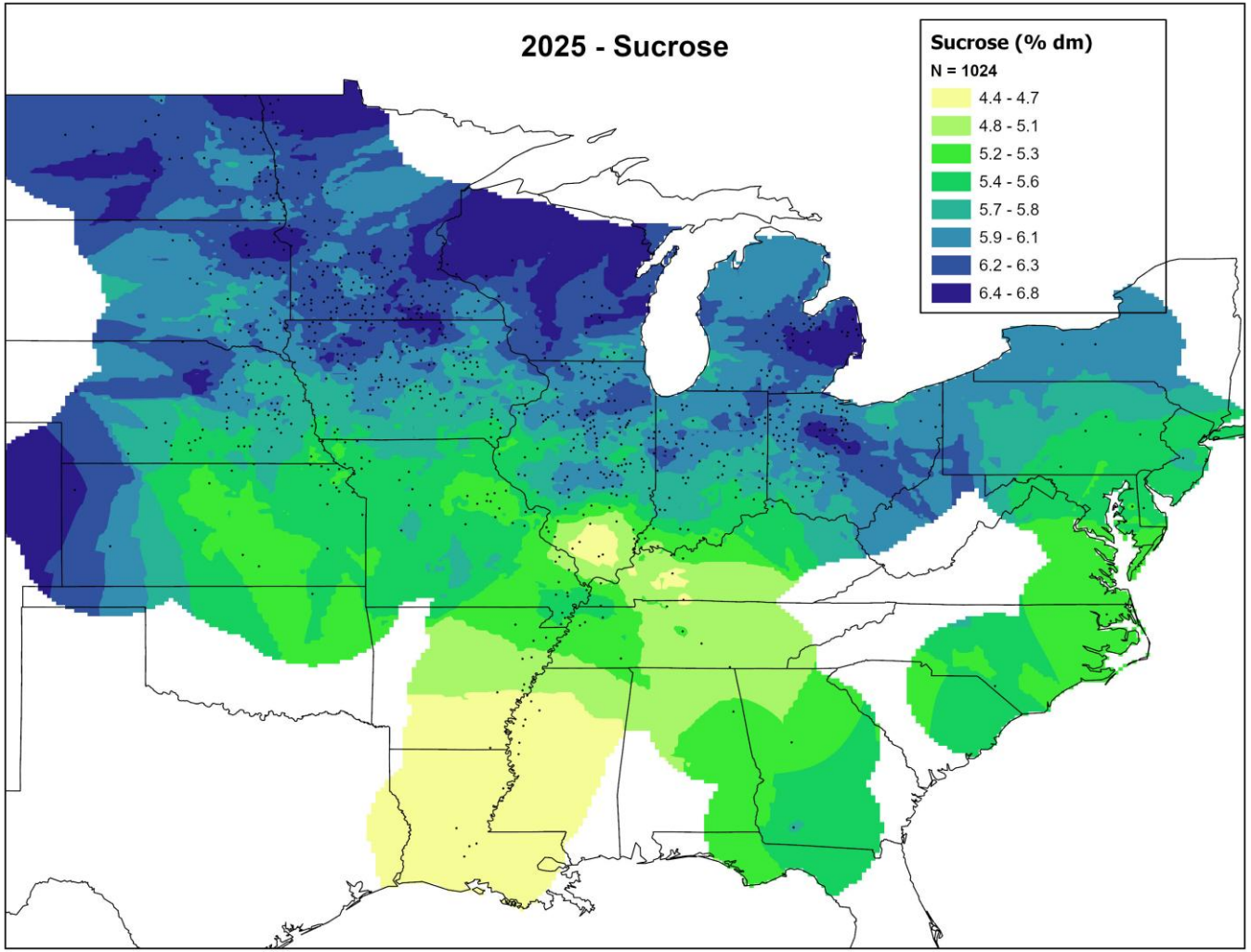

2025 - Sum of Five Essential AA's
Lysine, Methionine, Cysteine,
Tryptophan, and Threonine
Sum of Five Essential
AA's (% of 18 AA's)
N = 1024
14.6 - 14.7
14.8 - 14.7
14.8 - 14.8
14.9 - 14.8
14.9 - 14.9
15.0 - 14.9
15.0 - 15.0
15.1 - 15.1


2025 - Lysine (% of 18 AA's)
Lysine (% of 18 AA's)
N = 1024
6.8 - 6.8
6.9 - 6.8
6.9 - 6.8
6.9 - 6.9
7.0 - 6.9
7.0 - 6.9
7.0 - 6.9
7.0 - 7.0


2025 - Arginine (% of 18 AA's)
Arginine
(% of 18 AA's)
N = 1024
7.2 - 7.2
7.3 - 7.2
7.3 - 7.3
7.4 - 7.3
7.4 - 7.3
7.4 - 7.4
7.5 - 7.4
7.5 - 7.5

BETTER MEASURES OF QUALITY: SOLUBLE SUGARS




2025 - Sucrose
Sucrose (% dm)
N = 1024
4.4 - 4.7
4.8 - 5.1
5.2 - 5.3
5.4 - 5.6
5.7 - 5.8
5.9 - 6.1
6.2 - 6.3
6.4 - 6.8

Summary

- 2025 brought **record soybean yields** and **strong compositional uniformity**, with **slightly lower protein and oil**, and **record sucrose levels**.

- Despite area losses, the U.S. crop remains globally competitive with **improved amino acid and energy** potential for feed and **consistent quality** across years and regions

Funding provided by the USB

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