Issue #22 – September 19, 2025

In This Issue:

From South to North: Indiana's Corn Progress Update

(Jeferson Pimentel, Bruno Scheffer, Dan Quinn & Betsy Bower)

Corn Condition

Indiana's crop ratings softened slightly this week, with 49% rated good and 9% excellent (down from 52% good and 11% excellent last week). Fair ratings increased to 29%, while poor-to-very-poor combined held at 13%. Iowa remains one of the strongest profiles at 59% good and 20% excellent, while the 18-state average stands at 50% good and 17% excellent, nearly unchanged from last week. See more in **interactive maps 1.**

Corn Dented

Indiana reached **85% dented**, up sharply from 71% last week and now ahead of its 5-year average of 84%. Neighboring Illinois (93%) and Iowa (90%) are also advancing well, while the 18-state average is 85%, nearly identical to the long-term pace of 86%. See more in **interactive maps 2**

Corn Maturity

Indiana's crop is now **40% mature**, a jump from 19% last week and notably ahead of its 5-year average of 33%. Illinois (50%) and Iowa (48%) also posted strong gains, while the 18-state average sits at 41%, in line with the historical norm. See more in **interactive maps 3.**

Corn Harvest

Harvest has begun in Indiana, with **6% of the crop harvested**, ahead of both last year (4%) and the 5-year average (2%). Kentucky (30%), Texas (71%), and North Carolina (59%) are the most advanced, while the 18-state average stands at 7%, matching the long-term pace. See more in **interactive maps 4.**

Indiana is on track for a record corn yield this year, with the USDA projecting one of the highest averages ever. Even though crop ratings slipped a little in September, most of the state's corn held strong through the key growing stages with nearly 60% still rated good to excellent. Early-season health and timely rains set the foundation, keeping yield potential high despite late-season stress.

➡ Let us know if we can help.

Interactive Maps 1. U.S. Corn **Condition** (USDA-NASS)
Click on the categories below to see the corn condition at each U.S. state on Sep 14th.

Very Poor	Poor	Fair	Good	Excellent

Interactive Maps 2. U.S. Corn **Dented** Progress (USDA-NASS)
Click on the dates below to see the corn dented progress over time and the average:

Sep 14, 2024	Sep 7, 2025	Sep 14, 2025	Average (2020-2024)

Interactive Maps 3. U.S. Corn **Maturity** Progress (USDA-NASS)
Click on the dates below to see the corn maturity progress over time and the average:

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Interactive Maps 4. U.S. Corn **Harvest** Progress (USDA-NASS)
Click on the dates below to see the corn harvest progress over time and the average:

Sep 14, 2024	Sep 7, 2025	Sep 14, 2025	Average (2020-2024)

🌽📈 Indiana & USA: Corn Dashboard

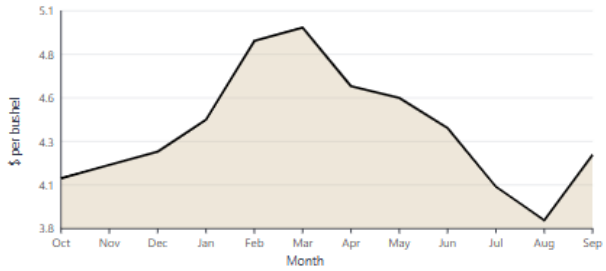
(Bruno Scheffer & Daniel Quinn)

Indiana and U.S. corn prices climbed through winter, then eased into summer. September's latest U.S. futures price is $4.24 nationally, up $0.25 from the previous week. The seasonal softening isn't surprising with bins emptying and new-crop confidence improving.

Production expectations also nudged higher. Indiana's 2025 forecast moved from 1.056 to 1.076 billion bushels (about +20.5 million, +1.9%) from August to September. The U.S. forecast rose by roughly 72.7 million bushels (+0.4%). Bigger crops generally lean on price, but local outcomes will still hinge on late-season weather, standability, and harvest pace. If the forecast holds, elevators will be busy; plan drying and logistics, so you aren't forced to sell wet at a discount.

Indiana's September predicted average yield is 205 bu/ac, up 7 bu from 2024 and remained unchanged from the August report. The U.S. currently sits at 186.7 bu/ac, up 7.4 bu from 2024, but lower than the August 2025 report. That puts Indiana state predicted yield average ~18 bu above the predicted national average.

US Corn Price (Business Insider)



Source: Business Insider Markets (1Y), accessed via markets.businessinsider.com/commodities/corn-price.

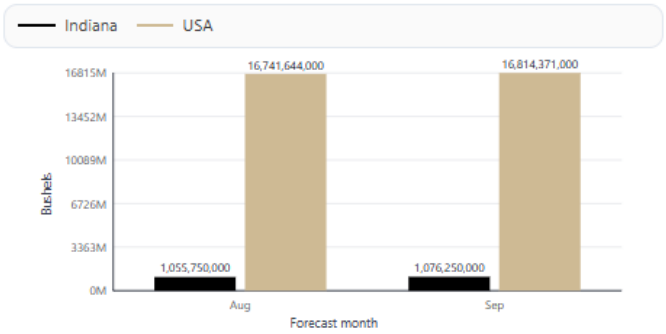
Price Snapshot (US, Business Insider)

Latest month: Sep

USA (BI)	$4.24 ▲ +0.25

Change vs prior close. Source: Business Insider Markets.

2025 Production Forecast (bushels)

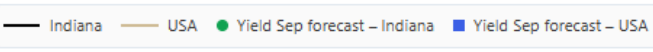


Source: USDA-NASS, 2025.

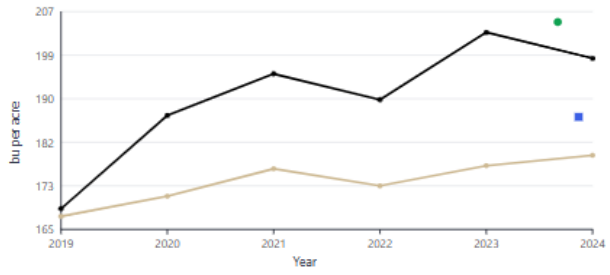
Production Snapshot (Indiana)

1,076,250,000

bushels • latest: Sep forecast



Yield (bu/ac)



Source: USDA-NASS, 2025.

Yield Snapshot (Sep forecast vs 2024)

Indiana	205.0 bu/ac ▲ +7.0
USA	186.7 bu/ac ▲ +7.4

Arrows compare Sep forecast to 2024 actual.

Reference: USDA-NASS, 2025.

Purdue Corn Team Research Update

(Betsy Bower, Narciso Zapata & Daniel Quinn)

Can Foliar Applied Nutrients Impact Corn Yield?

Corn growers have used foliar nutrition products for several years, but in the last 15-20 years new formulations have entered the market, some even with surfactants to improve plant uptake. Therefore, our question is do these products work? And if so, when is the best time to apply them? In addition, can they get a free ride with another application like a post herbicide pass or the fungicide pass to limit application costs?

In 2023 the Kernel Lab started working with **BRANDT Consolidated Inc**. on research trials with **BRANDT Smart K B**, a foliar nutritional product with label suggested application timings of growth stages V10-R2 (about 14 days before silking through 15-18 days after silk emergence). Smart K B has a nutritional analysis of 2-0-16 (N-P-K), and also contains 2.5% boron and 0.2% molybdenum.

What do K, B and Mo do in the corn plant? Why are they important?

1. **Potassium (K):** Improves nitrogen and water use efficiency, its involved in sugars and nutrients movement, and strengthens stalks for better standability and disease.
2. **Boron (B):** Critical for reproduction (impacts tassel and silk development, pollen germination, pollen tube growth, and kernel set). Also plays a significant role in moving sugars from the leaves to developing kernels, which is essential for kernel development and yield.
3. **Molybdenum (Mo):** Crucial to convert nitrate (the form of nitrogen corn primarily absorbs) into ammonium for protein formation, improves nitrogen uptake, and supports photosynthesis under stress.

Trial Results So Far

2023: The research trial compared either a foliar fungicide Delaro Complete (Prothioconazole + Trifloxystrobin + Fluopyram, Bayer Crop Science) and Delaro Complete plus 2 qt/ac of Smart K B to an nontreated check at 3 locations the Agronomy Center for Research and Education (ACRE), Northeast Purdue Ag Center (NEPAC) in NE IN, and Southeast Purdue Ag Center (SEPAC). See the tables below containing yield results from these trials.

ACRE: Corn yield (bu/ac) and grain moisture (%) response to R1-R2 foliar applied fungicide and nutritional products. West Lafayette, IN 2023.

Treatment Description	Grain Moisture	Grain Yield
	---- % ----	--- bu/ac ---
Nontreated Check	19.2 a*	276.2 b
R1-R2 Foliar Fungicide	19.7 a	286.6 ab
R1- R2 Fungicide + Smart K B	19.6 a	290.9 a

* Mean values which contain dissimilar letters and are in the same column are determined significantly different from each other ($P<0.1$).

NEPAC. Corn yield (bu/ac) and grain moisture (%) response to R1-R2 foliar applied fungicide and nutritional products. Columbia City, IN 2023.

Treatment Description	Grain Moisture	Grain Yield
	---- % ----	--- bu/ac ---
Nontreated Check	24.3 b*	227.4 b
R1-R2 Foliar Fungicide	25.6 a	253.3 a
R1-R2 Fungicide + Smart K B	25.8 a	258.4 a

* Mean values which contain dissimilar letters and are in the same column are determined significantly different from each other ($P<0.1$).

SEPAC. Corn yield (bu/ac) and grain moisture (%) response to R1-R2 foliar applied fungicide and nutritional products. Butlerville, IN 2023.

Treatment Description	Grain Moisture	Grain Yield
	---- % ----	--- bu/ac ---
Nontreated Check	21.2 b*	250.8 c
R1-R2 Foliar Fungicide	21.7 a	257.9 b
R1-R2 Fungicide + Smart K B	21.7 a	263.4 a

* Mean values which contain dissimilar letters and are in the same column are determined significantly different from each other (*P*<0.1).

2024: In 2024, the trial was adjusted to look more closely at the individual impact of Smart K B alone, Delaro Complete alone, and the combination of both products**.** To better understand how these treatments affect grain development, we also tracked kernel growth from blister stage to black layer at the ACRE location. From each plot, four ears were collected, split, and fifteen kernels were sampled each week. These kernels were weighed fresh and then dried each week to monitor grain fill progress differences between treatments. The following tables highlight yield and kernel weight results from ACRE in 2024.

ACRE. Corn grain moisture (%) and yield (bu/ac) in response to R1 foliar applied fungicide and fertilizer products. West Lafayette, IN 2024.

Foliar Treatment	Grain Moisture	Grain Yield
	--- % ---	-- bu/ac --
Nontreated	18.3 b*	257.3 b
Delaro Complete (10 oz/ac @ R1)	19.1 a	265.1 ab
Smart K B (2 qt/ac @ R1)	18.9 ab	264.4 ab
Delaro Complete + Smart K B	18.9 ab	271.7 a
***P*>F**	***0.024***	***0.031***

* Mean values which do not contain the same letter are determined statistically different from each other (*P*<0.1)

ACRE. Corn grain fill duration and maximum kernel weight (mg/kernel) in response to R1 foliar-applied fungicide and fertilizer products. West Lafayette, IN 2024.

Foliar Treatment	Days after Silking	Dry Kernel Weight	R^2
	-- days --	-mg/kernel-	
Nontreated	59.1	453	0.93
Delaro Complete (10 oz/ac @ R1)	60.4	454	0.95
Smart K B (2 qt/ac @ R1)	59.0	460	0.91
Delaro Complete + Smart K B	63.2	473	0.94

* Mean values were acquired using quadratic plateau regression analysis performed using the 'easynls' package in R. The regression was statistically significant for all treatments (*P*<0.1).

2025: This season, the protocol was updated to test whether an earlier application at V10 (Delaro Complete alone and Delaro Complete plus Smart K B), followed by the traditional R1 timing, could enhance results. The six treatments being compared are:

1. Untreated control
2. Delaro Complete @ R1
3. Smart K B @ R1
4. Delaro Complete + Smart K B @ R1
5. Delaro Complete @ V10 followed by Delaro Complete @ R1
6. Delaro Complete + Smart K B @ V10 followed by Delaro Complete + Smart K B @ R1

Figure 1. Ear samples pulled from two different treatments of the BRANDT Smart K B research trial at ACRE 2025. Note differences in ear size and grain fill.

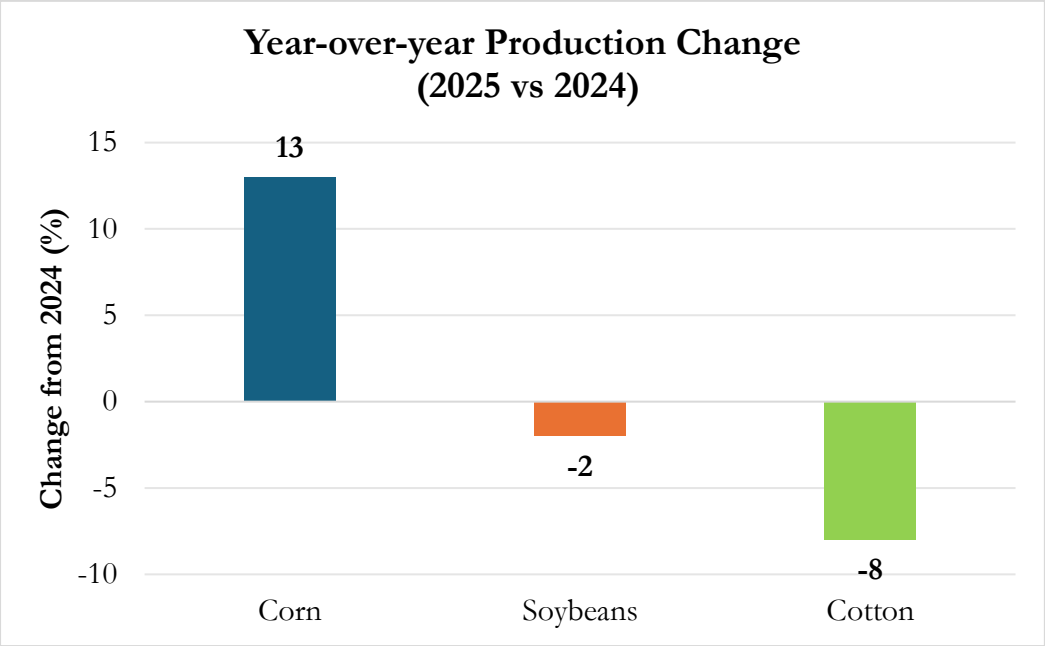
Take-home message

While results can vary by location and season, early findings suggest that combining foliar nutrients like Smart K B with fungicide may improve yield and kernel development. With 2025 trials underway, stay tuned for updates as we continue to explore how foliar-applied nutrients fit into corn production systems, predominately when combined with in-season foliar fungicide applications.

USDA Crop Production Report

(Jeferson Pimentel & Daniel Quinn)

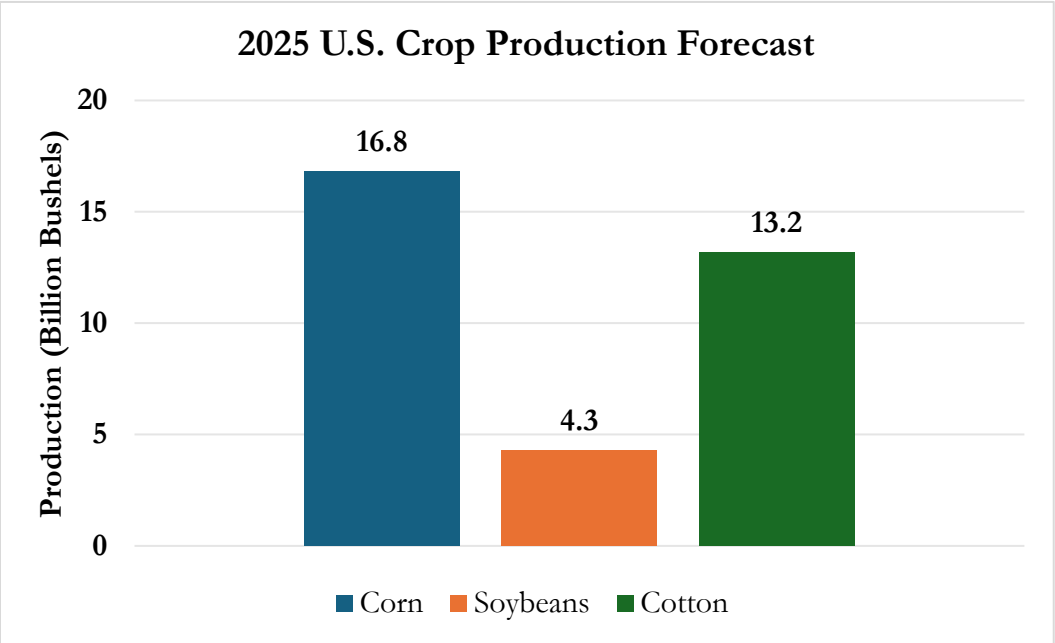
The latest USDA Crop Production report shows a strong rebound in U.S. corn, while soybeans and cotton edge lower compared to 2024. **For corn, the outlook is especially noteworthy for Indiana and the broader Corn Belt.**



Corn production is projected at **16.8 billion bushels**, a **13 percent increase** from last year. The national yield forecast is **186.7 bushels per acre**, up 7.4 bushels year over year despite a slight month-to-month decline. **Record-high corn yields are anticipated in several key states, including Indiana, Illinois, and Iowa, reflecting a combination of favorable 2025 growing conditions and strong agronomic management across the Corn Belt.**

Planted corn area climbed to **98.7 million acres**, with **90 million acres expected to be harvested**, both about 9 percent higher than in 2024. **For Indiana farmers and others across the Corn Belt, this larger national crop means ample supply and potential downward pressure on prices. Strategic marketing, such as forward contracting or on-farm storage, will help capture a stronger basis later in the season. Even with record yields, late-season scouting for stalk quality and lodging is crucial to harvesting efficiently at the right time.**

Soybean output is forecast at **4.3 billion bushels**, 2 percent below 2024, though yields are expected to reach a robust 53.5 bushels per acre, 2.8 bushels higher than last year. Harvested acreage is estimated at 80.3 million acres, down 7 percent from 2024 despite a slight monthly increase.



Cotton production is projected at **13.2 million 480-pound bales**, an 8 percent drop from last season. Harvested area is pegged at 7.37 million acres, down 6 percent from last year, with yields averaging 861 pounds per acre, 25 pounds lower than 2024.

Improving Diagnosis and Tactical N Management in Corn

(Leonardo Bosche, Federico Gomez, Ignacio Ciampitti)

Nitrogen (N) management in corn remains one of the biggest challenges for Midwest farmers, as the amount of N the crop requires depends on many interacting factors, including soil type, weather conditions, and the growth stage of the corn plant (Briat et al., 2020). Getting the correct N rate to apply at the right time is critical for maximizing yield, reducing costs, and protecting the environment.

Early in the season, corn takes up little N. After the sixth-leaf stage (V6), uptake increases quickly and peaks around flowering, when the crop requires the most N to build leaves and biomass. Later in the season, uptake slows down as the plant moves N from leaves and stems into the kernels. The challenge is ensuring the crop receives enough N when it requires it most, while avoiding overapplication.

Application of more N than needed could be common due to potential fear of losing yield (Houser, 2022). However, new tools may help to improve N decision-making process. Sensing technologies can now detect if the crop is short on N, giving farmers real-time information to guide in-season applications. Our project at the Agronomy Center for Research and Education (ACRE) in West Lafayette, IN, during the 2025 season is exploring one of these tools to see how they can support better N decisions in corn cropping systems.

Our field trial this year includes **six different N rates** and **two corn hybrids**. One is a short-stature hybrid (*PR111-20SSC*), and the other is a tall hybrid (*DKC62-70*). The applied N rates range from **0 (control)** up to **240 pounds of N per acre**. This setup allows us to create different scenarios of N supply, from severe N stress to full N availability. By including the short-stature hybrid, we are also testing a new technology, which may show different characteristics compared to traditional tall corn.

Figure 1. Corn experimental field located at the ACRE research site in West Lafayette, IN.

Throughout the growing season, a field-portable, high-resolution spectroradiometer (SVC 1024i model, made by Spectra Vista Corporation) was used to obtain hyperspectral data at the main physiological crop growth stages. Data were collected from the most developed leaf at the V9 growth stage, and from the ear leaf 15 days before flowering and at flowering. The sensor works by capturing how corn leaves reflect sunlight across hundreds of narrow wavelengths, creating a detailed "spectral fingerprint" of the plant. These fingerprints allow us to detect subtle changes in leaf color and structure linked to crop N status. Our goal in using this technology is to identify when and where N is limited. This information can help us use fertilizer more efficiently, improve yields, and reduce N losses to the environment.

Figure 2. Using the HR1024i sensor to collect hyperspectral data from the most developed leaf of corn at the V9 growth stage at the ACRE research site in West Lafayette, IN.

While we are currently focused on N, this type of technology has much broader applications. Spectral sensors can also help to detect other nutrient stresses, as well as crop issues, such as drought (Burnett et al., 2021), disease (Lowe et al., 2017), or insect damage (Garcia Furuya et al., 2021), often before they become visible to the eye. In addition, the data collected on the ground can be used as a benchmark for data derived from drones and satellites, thereby improving the accuracy of aerial scouting tools that many farmers already use.

Our main goal in conducting this research is to explore the practical applications of hyperspectral sensing for developing more effective diagnostic tools for agronomists and farmers. By analyzing the detailed light signals reflected by corn leaves, we aim to more precisely identify crop N status at earlier crop growth stages. Earlier and more accurate diagnostics allow farmers to make better decisions about when and how much N to apply, supporting higher efficiency, stronger yields, and improved long-term productivity.

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Acknowledgments

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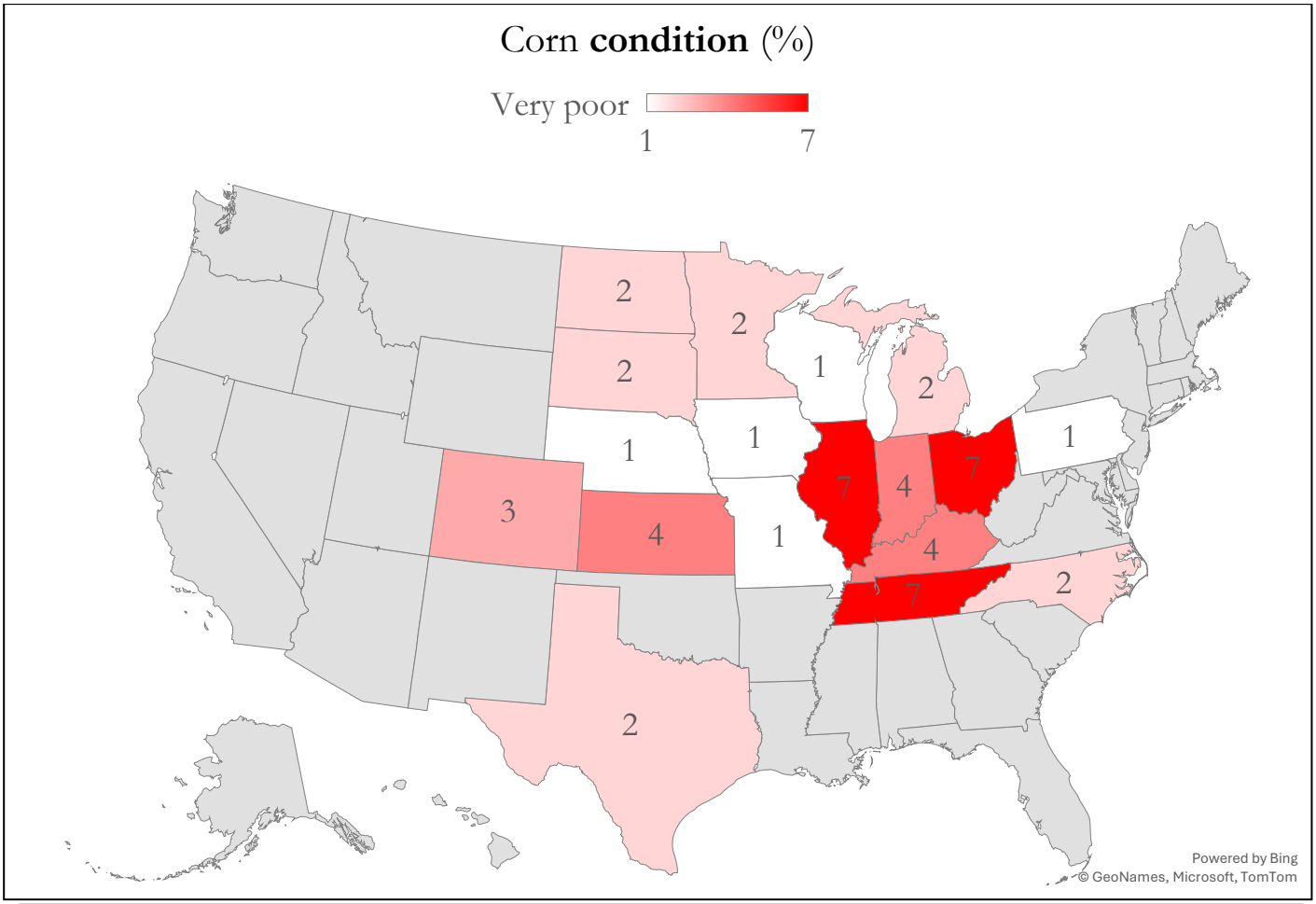

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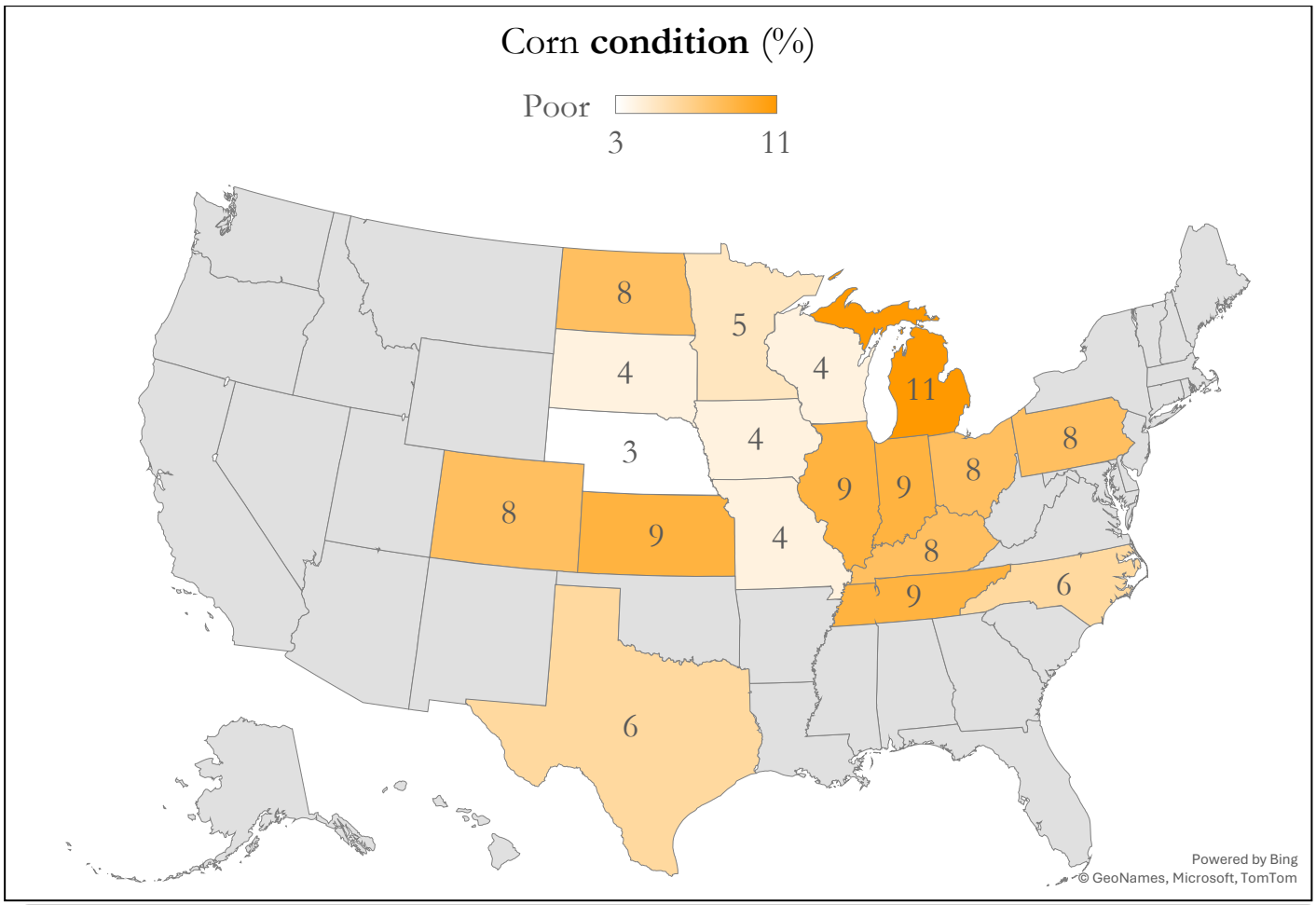

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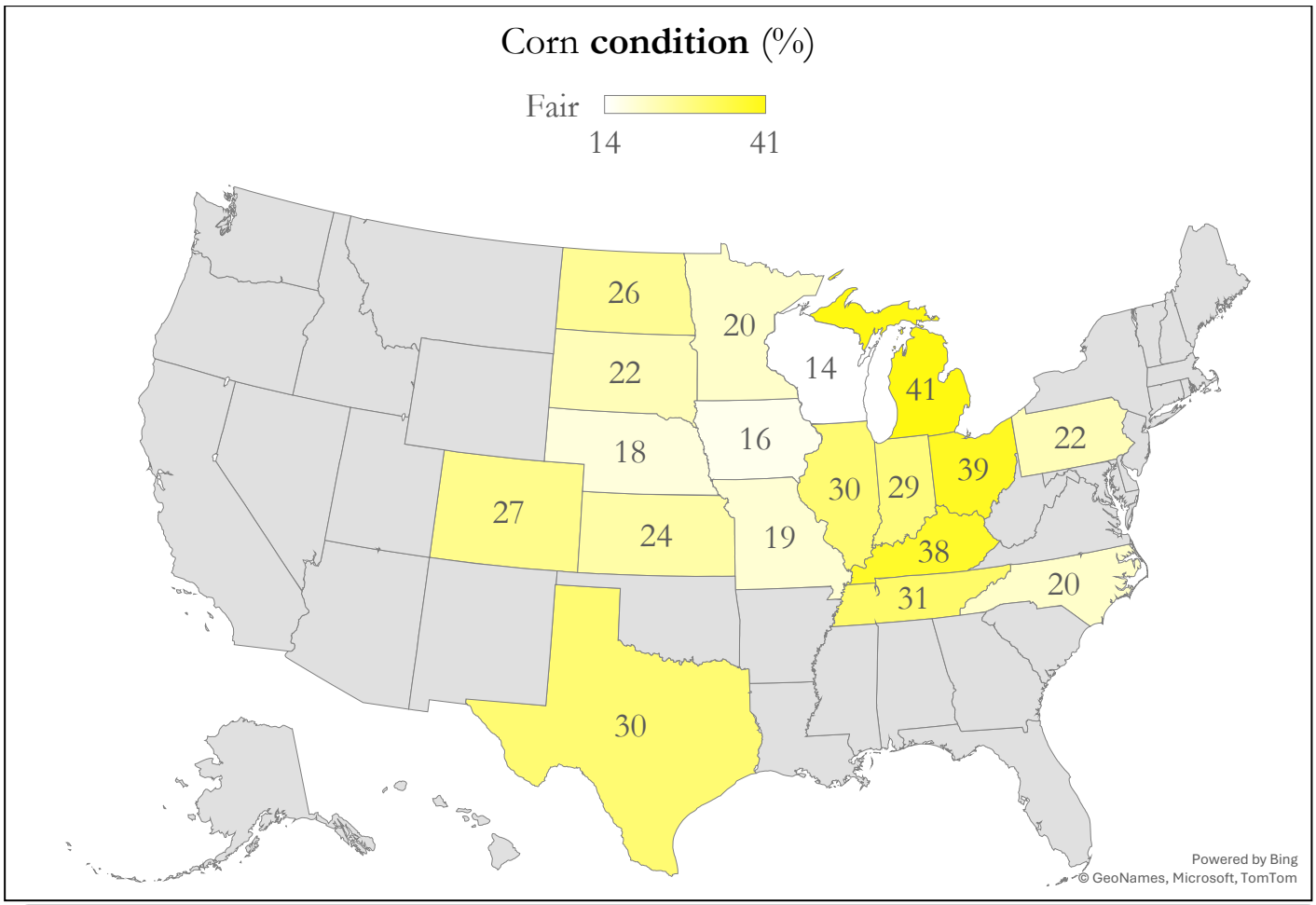

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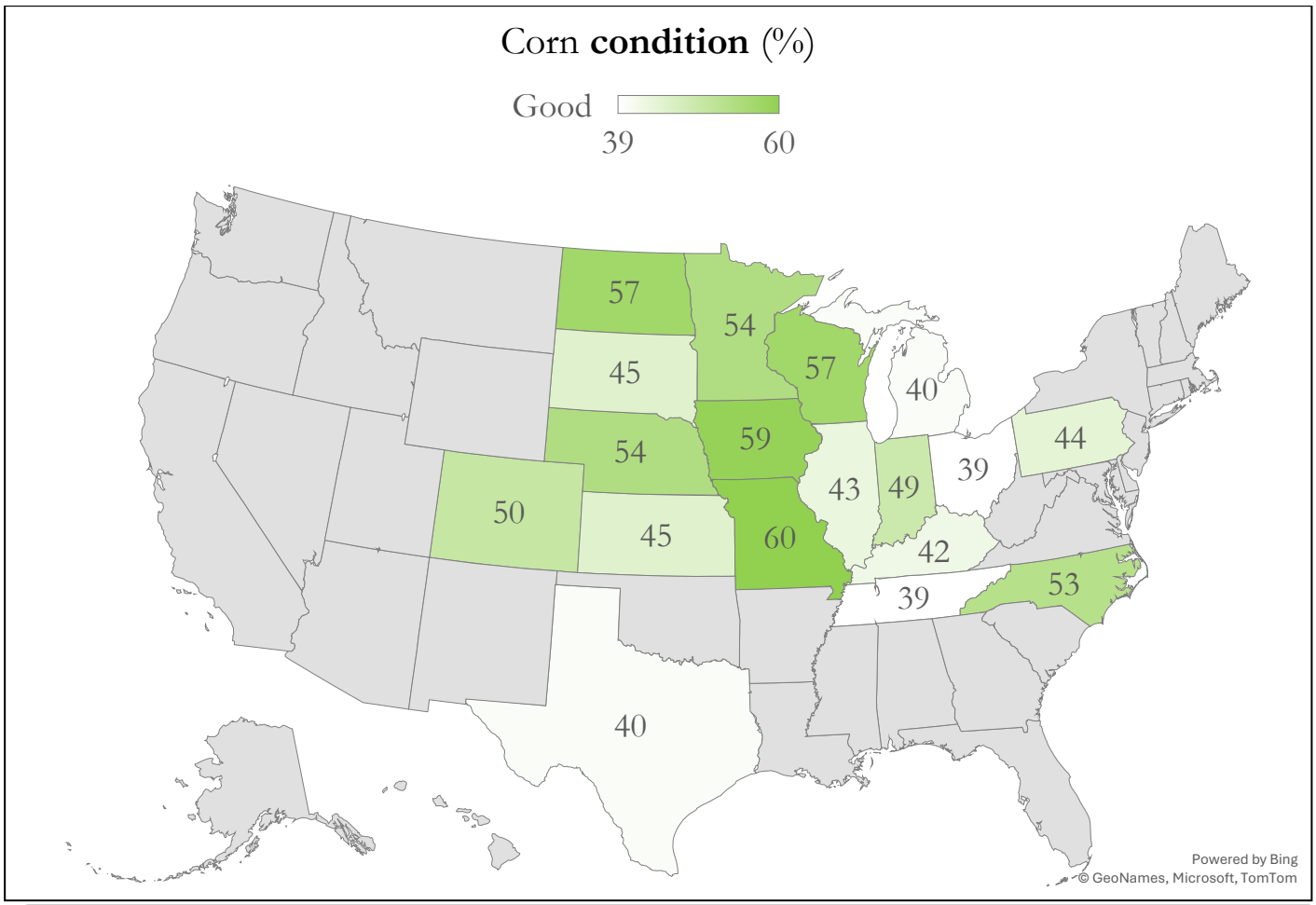

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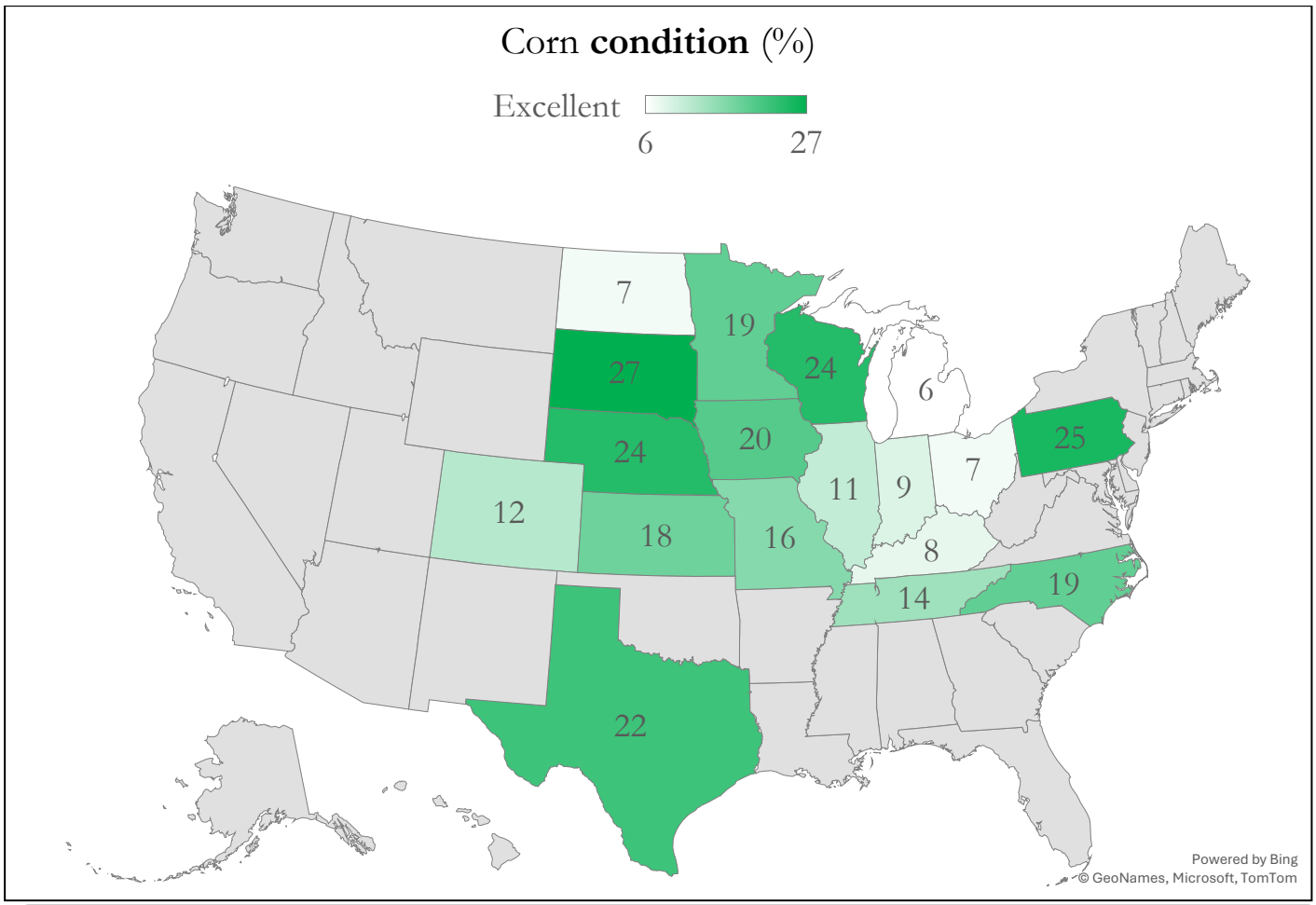

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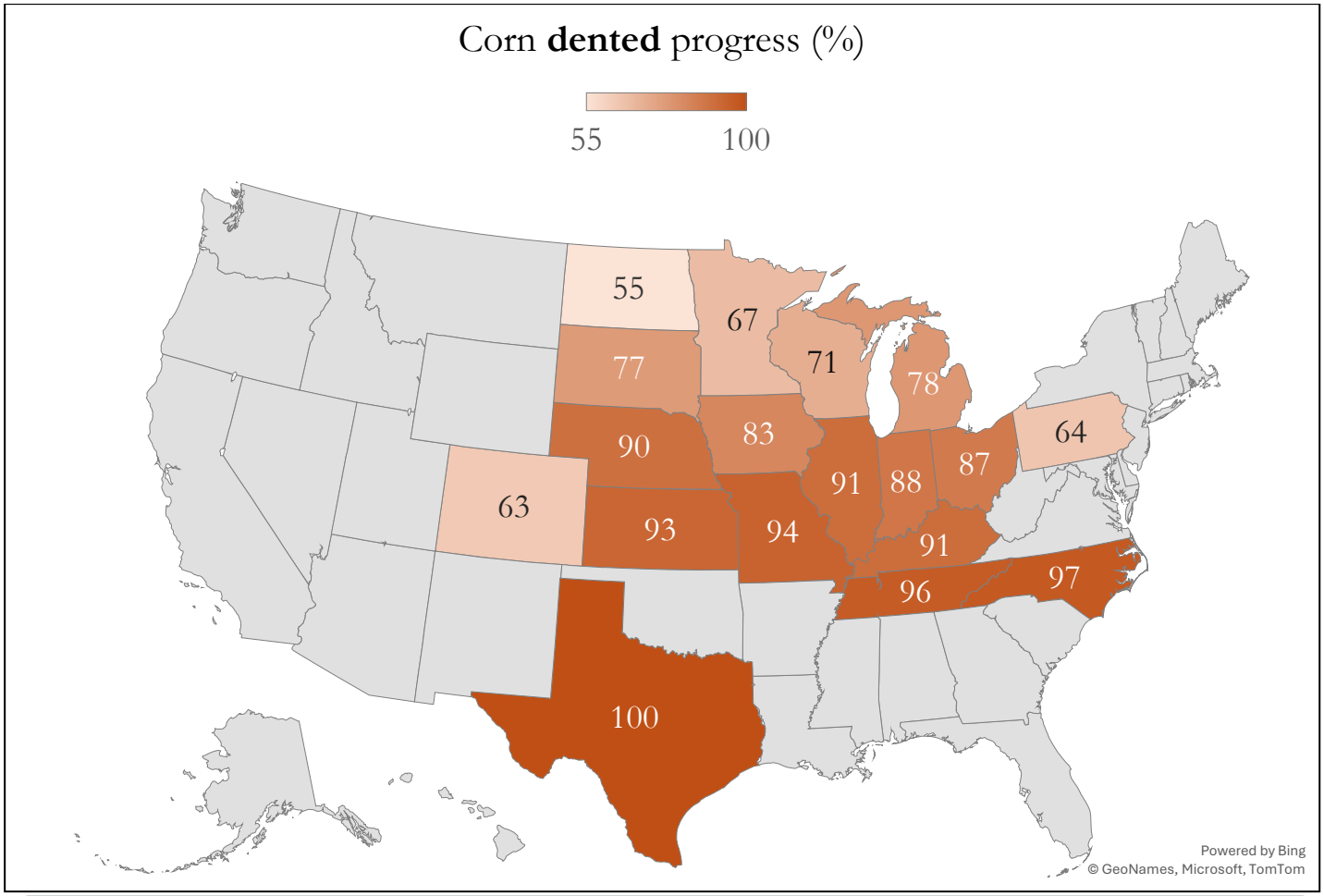

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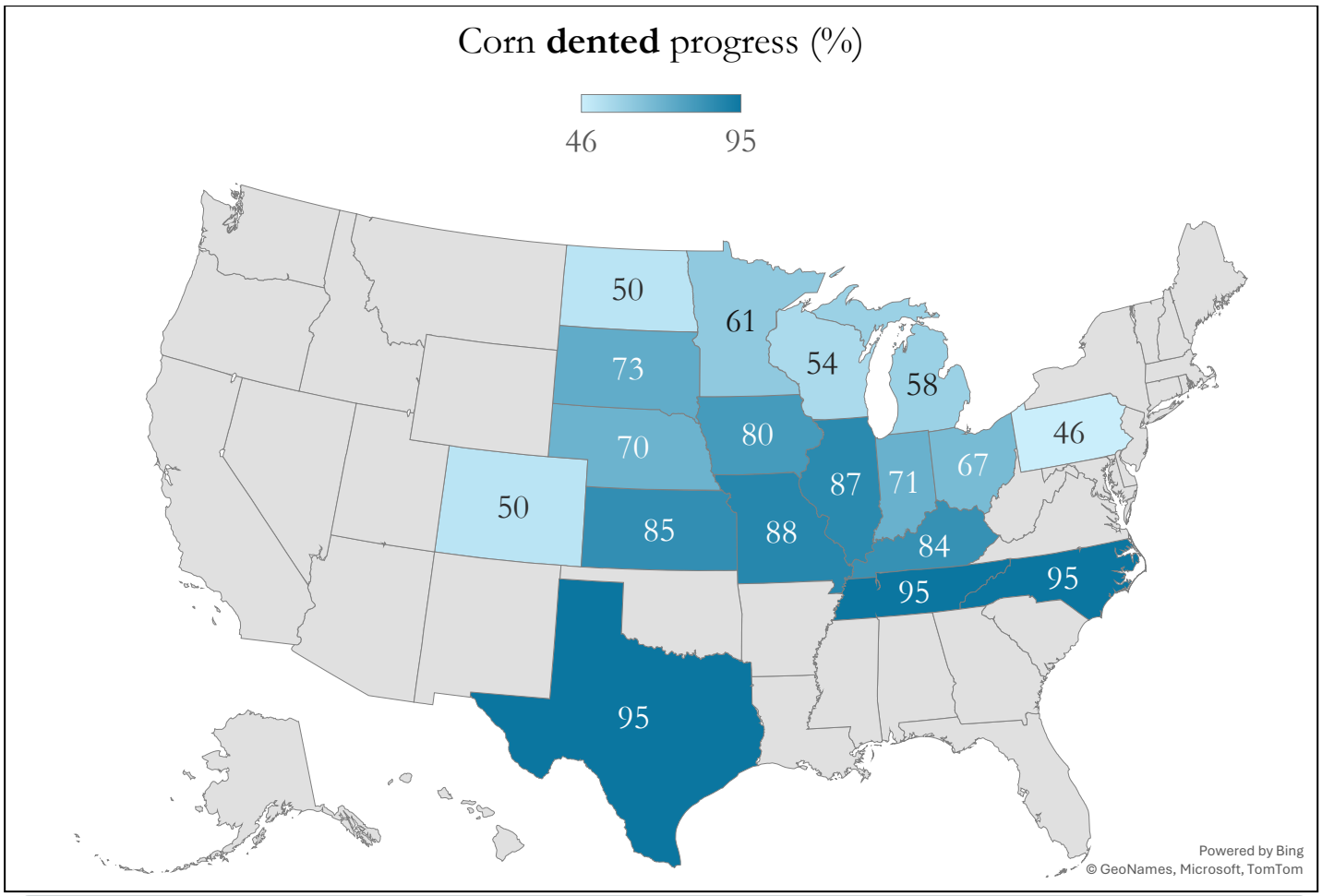

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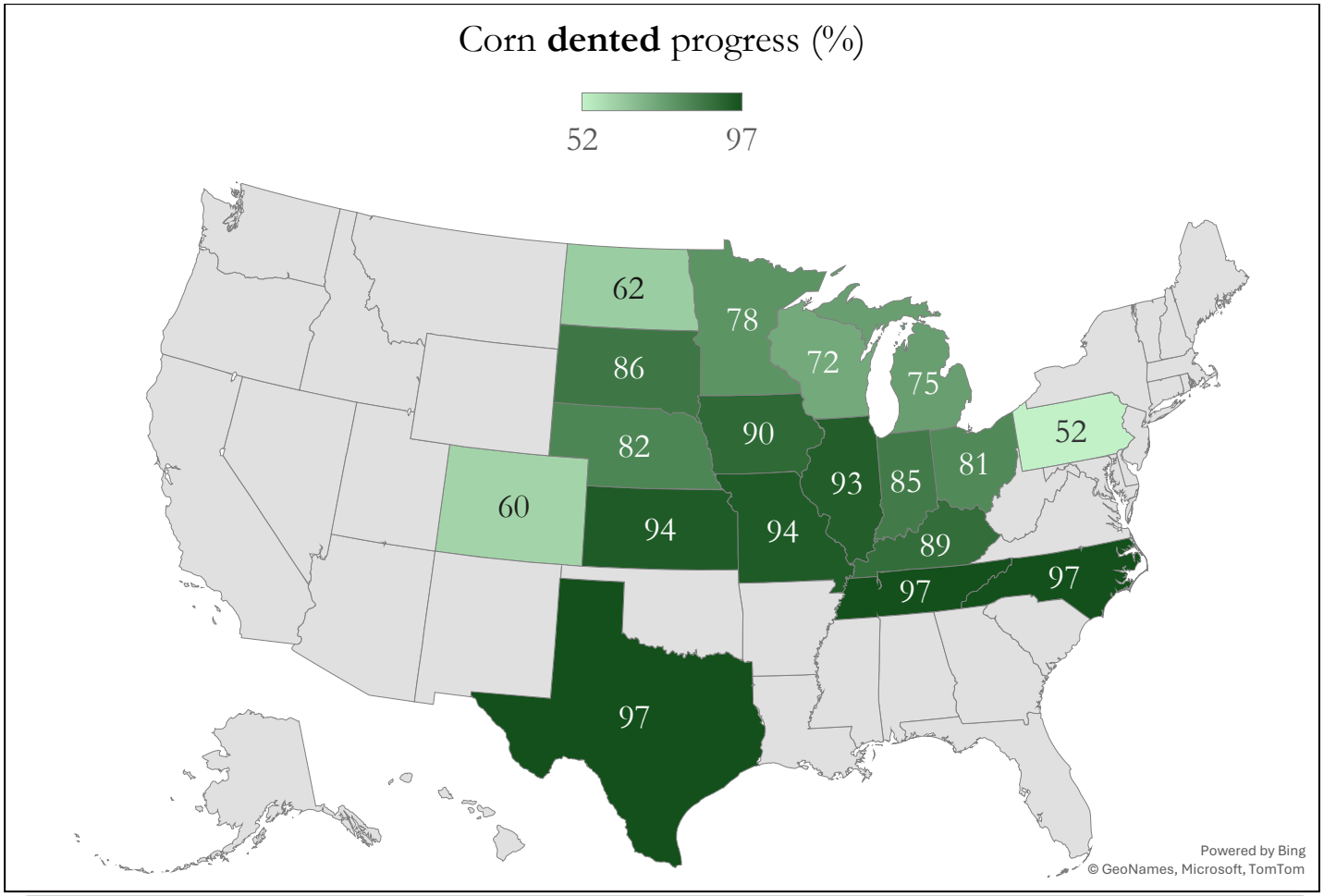

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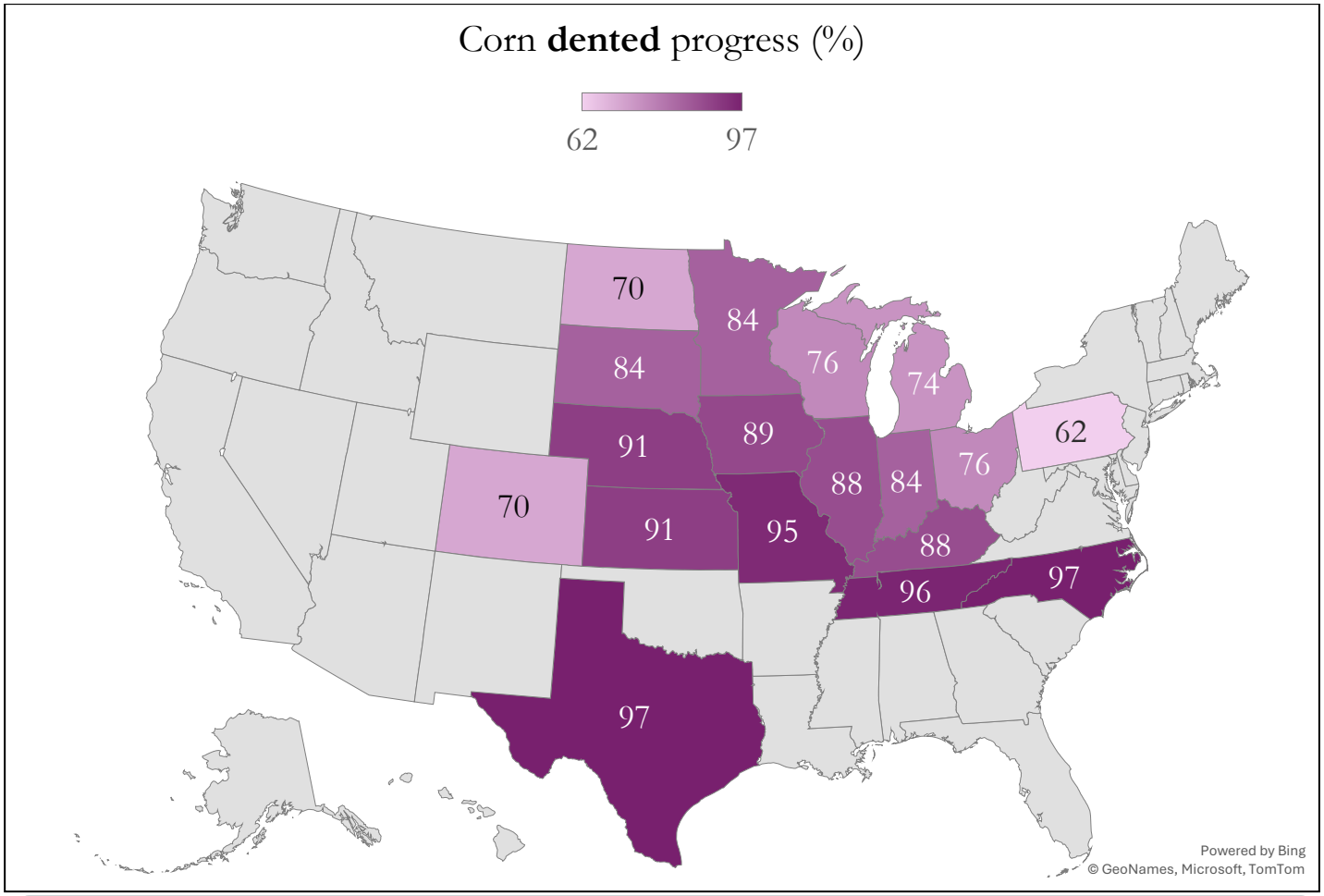

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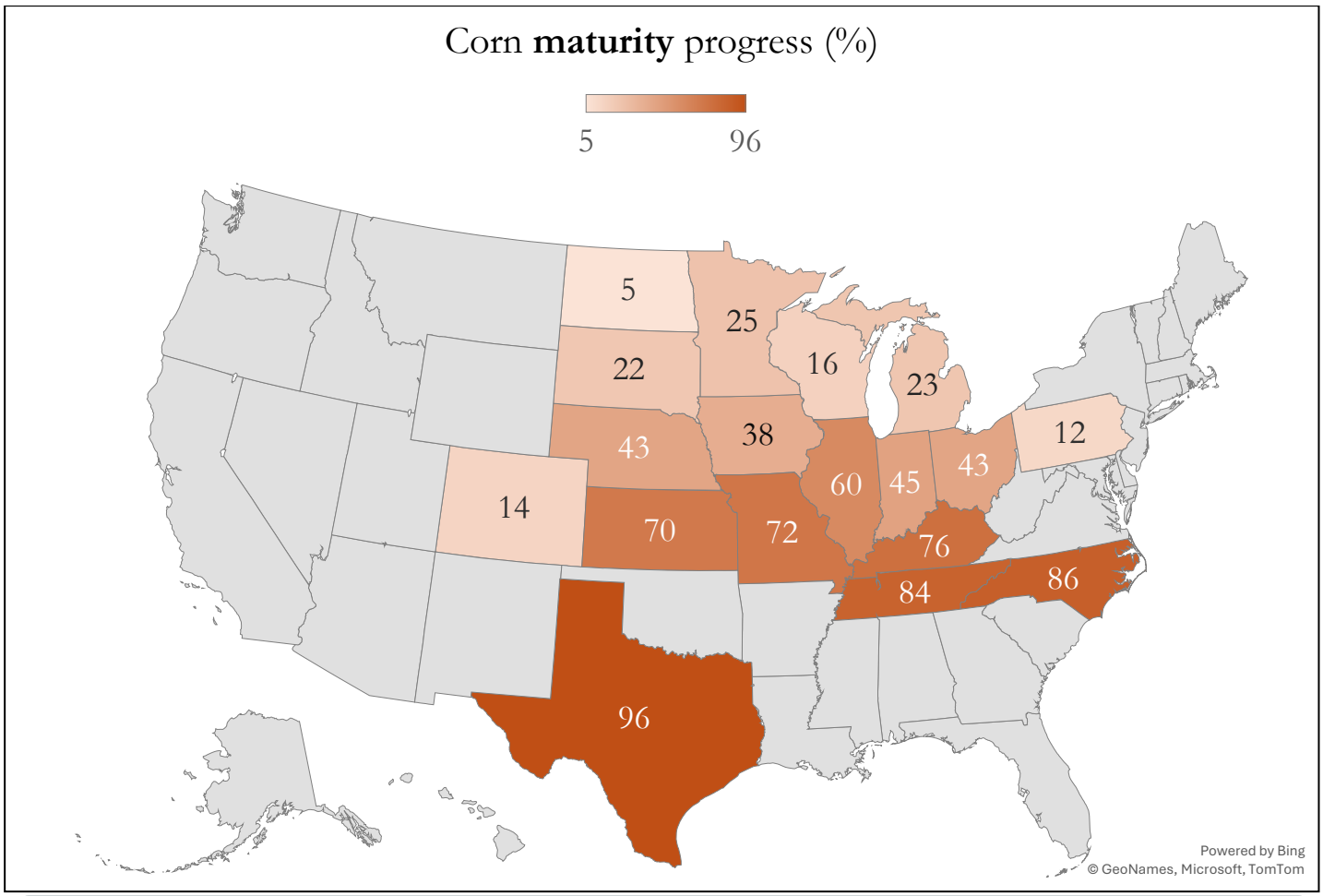

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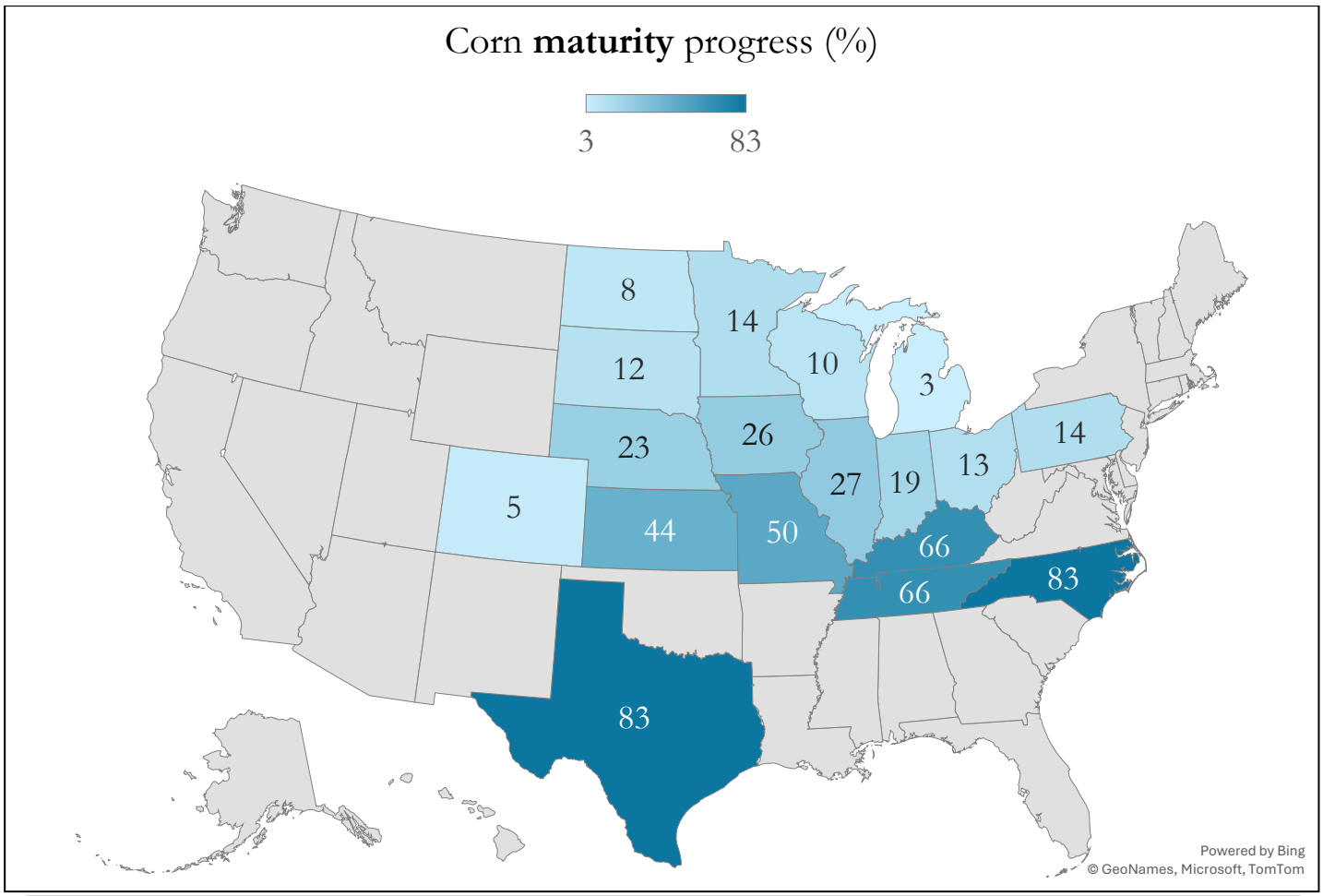

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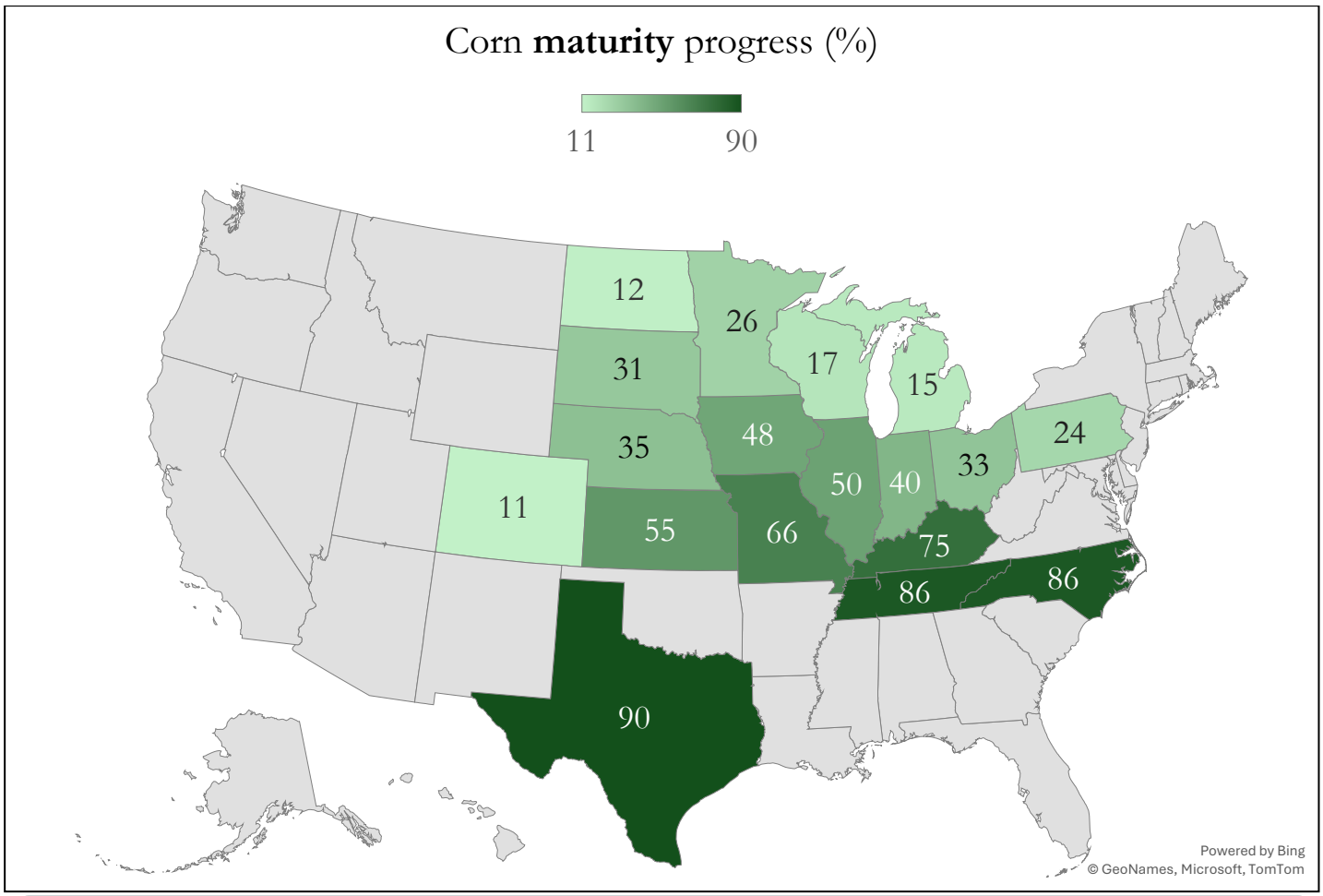
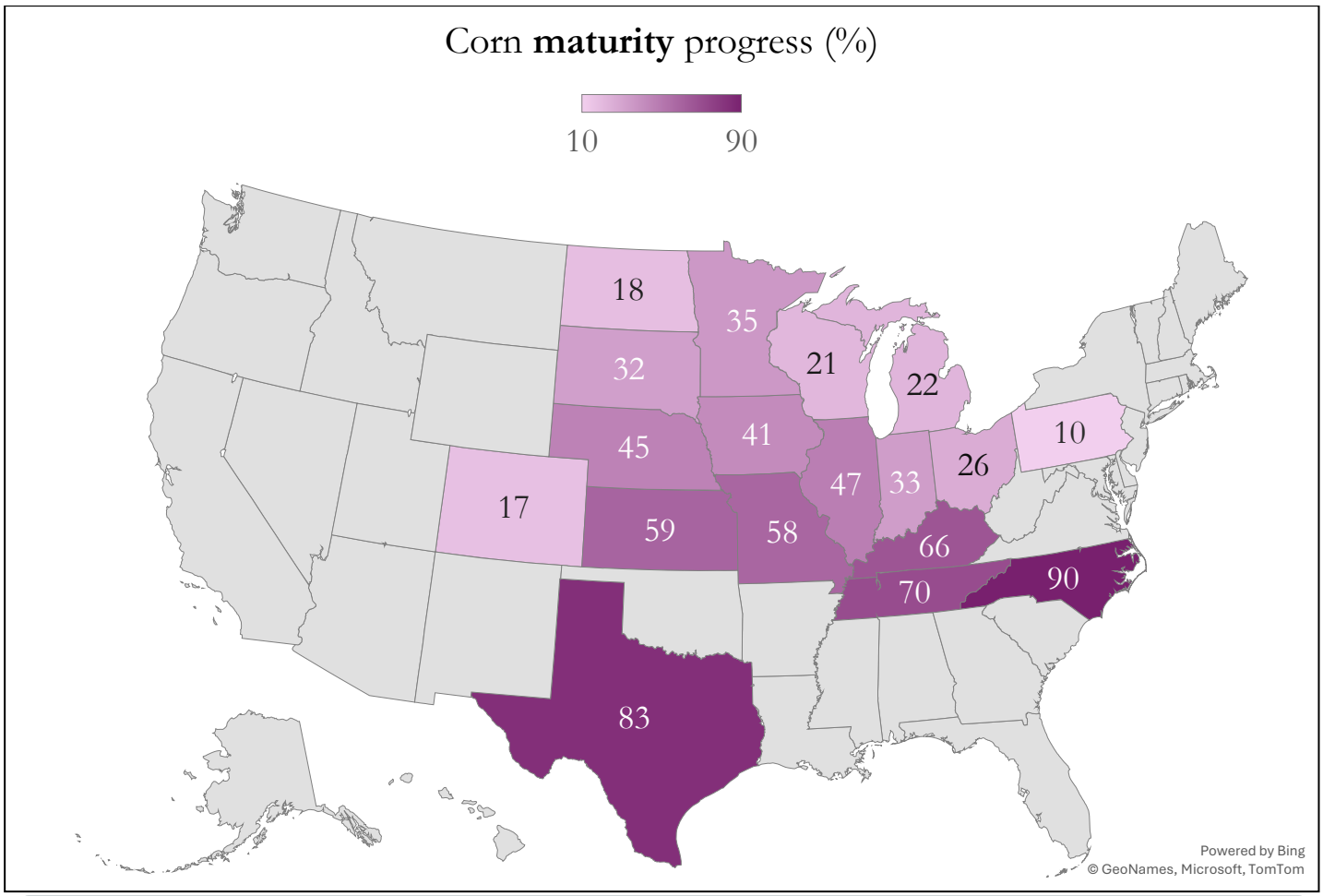


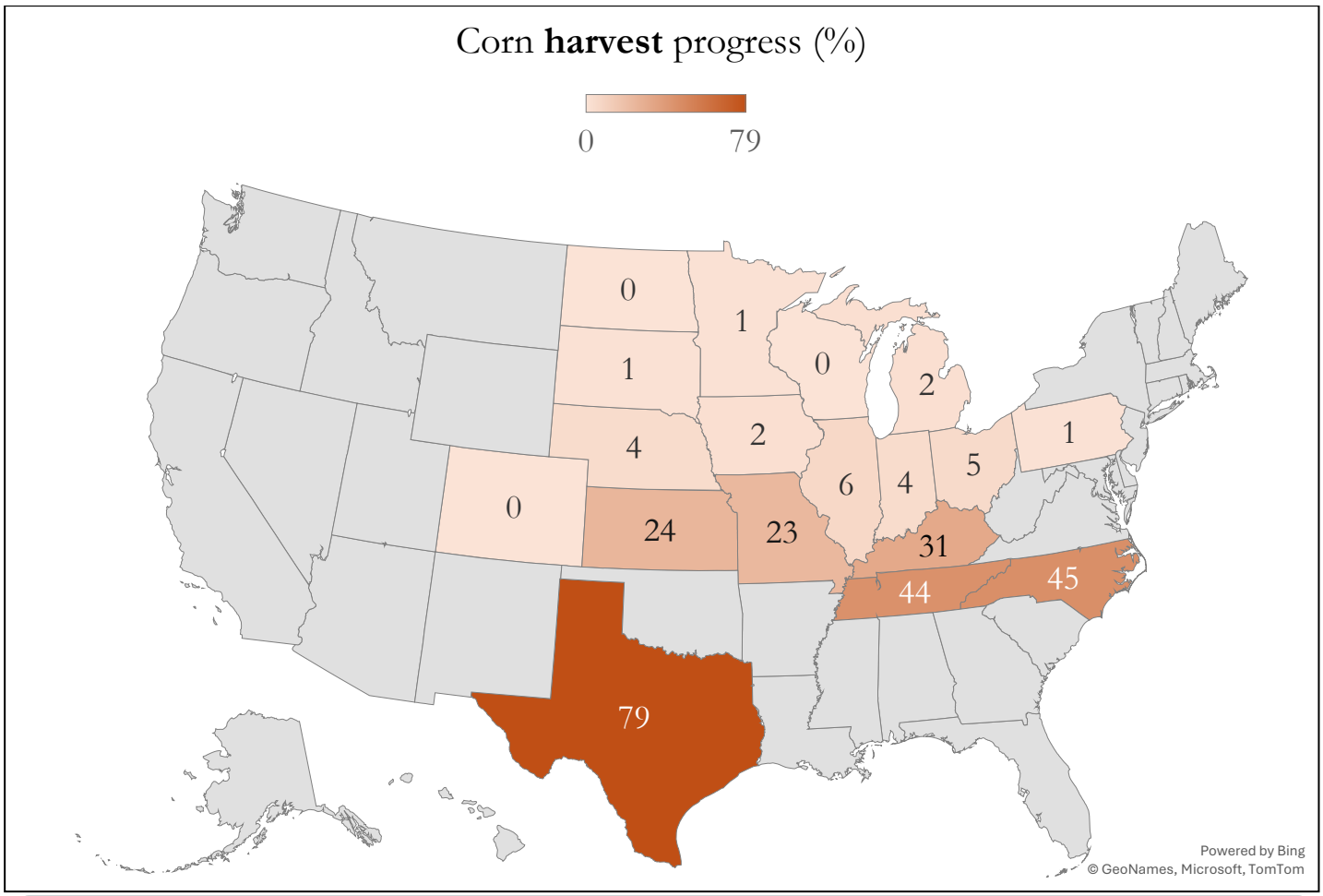
Interactive Maps 3. U.S. Corn **Maturity** Progress (USDA-NASS)
Click on the dates below to see the corn maturity progress over time and the average:

Sep 14, 2024	Sep 7, 2025	**Sep 14, 2025**	Average (2020-2024)	Back to page 2



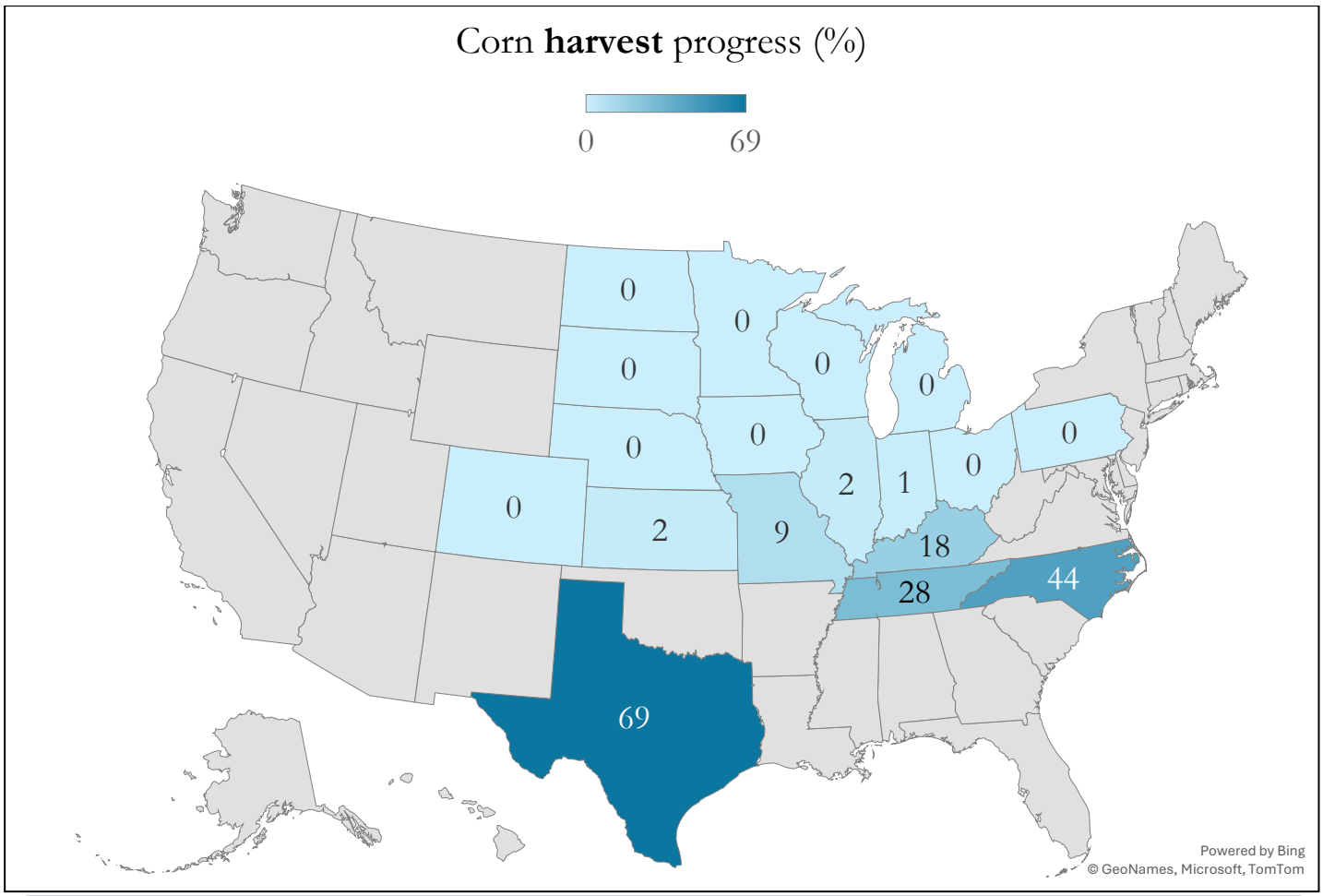
Interactive Maps 3. U.S. Corn **Maturity** Progress (USDA-NASS)
Click on the dates below to see the corn maturity progress over time and the average:

Sep 14, 2024	Sep 7, 2025	Sep 14, 2025	**Average (2020-2024)**	Back to page 2



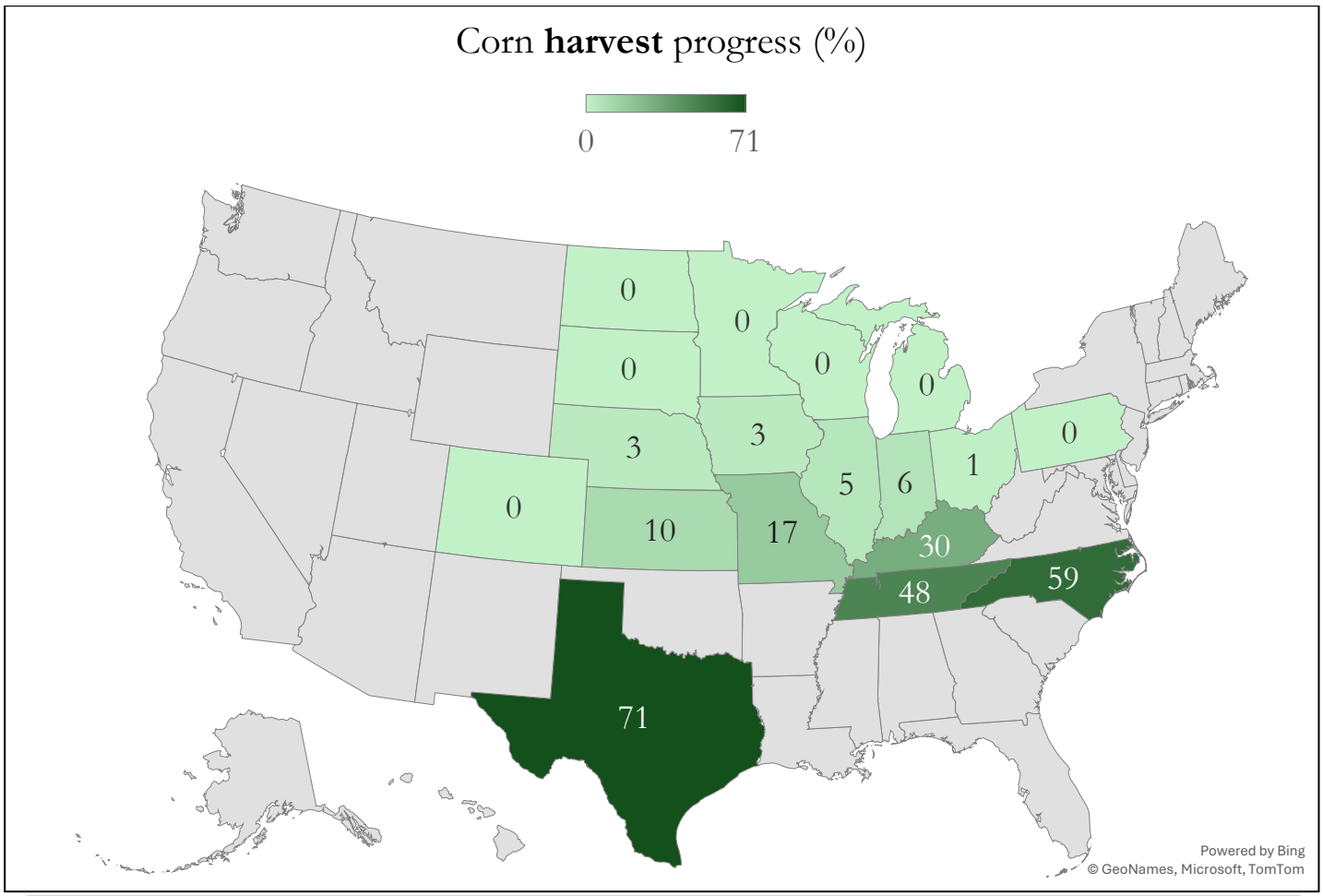
Interactive Maps 4. U.S. Corn **Harvest** Progress (USDA-NASS)
Click on the dates below to see the corn harvest progress over time and the average:

Sep 14, 2024	Sep 7, 2025	Sep 14, 2025	Average (2020-2024)	Back to page 2



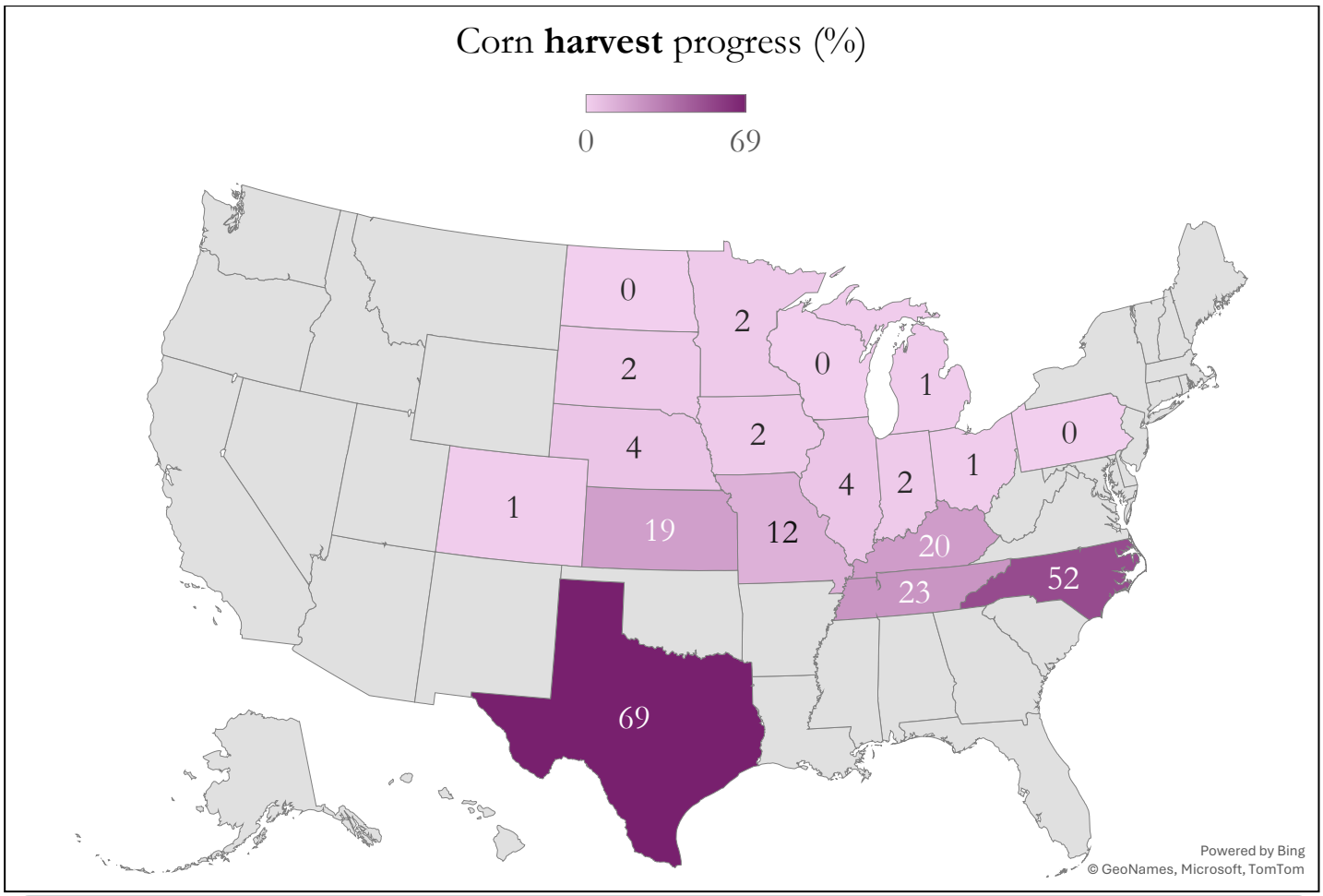
Interactive Maps 4. U.S. Corn **Harvest** Progress (USDA-NASS)
Click on the dates below to see the corn harvest progress over time and the average:

Sep 14, 2024	**Sep 7, 2025**	Sep 14, 2025	Average (2020-2024)	Back to page 2



Interactive Maps 4. U.S. Corn **Harvest** Progress (USDA-NASS)
Click on the dates below to see the corn harvest progress over time and the average:

Sep 14, 2024	Sep 7, 2025	**Sep 14, 2025**	Average (2020-2024)	Back to page 2



Interactive Maps 4. U.S. Corn **Harvest** Progress (USDA-NASS)
Click on the dates below to see the corn harvest progress over time and the average:

Sep 14, 2024	Sep 7, 2025	Sep 14, 2025	**Average (2020-2024)**	Back to page 2