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From South to North: Indiana's Corn Progress Update

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

Corn Condition

Indiana's crop condition ratings held steady this week with 48% good and 9% excellent, totaling 56% good to excellent. Fair ratings stand at 29%, while poor-to-very-poor account for 14%. The 18-state average shows 49% good and 17% excellent, nearly unchanged from last week. See more in interactive maps 1.

Corn Dented

Indiana reached **95% dented**, moving closer to the 5-year average of 97%. Progress is nearly on par with

neighbors Illinois (98%) and Iowa (97%), and aligned with the 18-state average of 95%. See more in interactive maps 2.

Corn Maturity

The state is now **68% mature**, right in line with the 5-year average (68%). This marks strong advancement from 54% last week. Illinois (85%) and Iowa (80%) are running slightly ahead, while the 18-state average stands at 71%. See more in **interactive maps 3.**

Corn Harvest

Indiana has **16% of corn harvested**, above last year (10%) and slightly ahead of the 5-year average (14%). Kentucky (53%) and Missouri (40%) are moving faster, while the 18-state average is 18%. See more in **interactive maps 4.**

Indiana's corn crop is on track with the 5-year average, with 95% dented, 68% mature, and 16% harvested, slightly ahead of the normal harvest pace. Crop condition ratings remained steady, with 56% rated as good to excellent, indicating that yield potential remains strong despite some late-season stress. Overall, Indiana is positioned to finish the season well, with timely rains earlier in the year setting up fields for one of the state's best yield outcomes.

Let us know if we can help.

Interactive Maps 1. U.S. Corn Condition (USDA-NASS) <u>Click on the categories</u> below to see the corn condition at each U.S. state on Sep 28th. Very Poor Fair Good Excellent Poor Interactive Maps 2. U.S. Corn Dented Progress (USDA-NASS) <u>Click on the dates</u> below to see the corn dented progress over time and the average: Sep 21, Sep 28, Sep 28, Average (2020-2024)2024 2025 2025 Interactive Maps 3. U.S. Corn Maturity Progress (USDA-NASS) <u>Click on the dates</u> below to see the corn maturity progress over time and the average: Sep 28, Sep 21, Sep 28, Average (2020-2024)2024 2025 2025 Interactive Maps 4. U.S. Corn Harvest Progress (USDA-NASS) <u>Click on the dates</u> below to see the corn harvest progress over time and the average: Sep 28, Sep 21, Sep 28, Average (2020-2024)2024 2025 2025

(Bruno Scheffer & Daniel Quinn)

As corn enters grain fill and approaches maturity, leaves naturally senesce as chlorophyll declines and nutrients are remobilized to the ear.

Senescence usually begins before pollination is complete and accelerates during grain fill. Prior work has linked both a longer grain-fill period and sustained leaf greenness during grain fill with higher yields (Daynard & Kannenberg, 1976). Stress that speeds up grain fill and maturity typically reduces yield.

One stress symptom during grain fill is the earlier-than-expected senescence of the upper canopy, commonly referred to as **top**



Figure 1. Top senescence at early R5, West Lafayette, IN (Aug 2023).

dieback (Figure 1). We often expect a bottom-up, uniform pattern, but a hybrid environment can flip that script. When the top 4–5 leaves fade during R3–R5,

especially across hybrids and whole fields during heat or dry spells, grain fill and yield may be at risk. To separate normal bottom-up maturity from stress-related top dieback, see **Table 1** for side-by-side cues, then

split stalks above the ear to confirm the cause.

These symptoms were widespread in Indiana after the late-August 2023 **heat and dryness** (averaged 91 °F highs) in West Lafayette. Fields showed stress (for example, N deficiency) changed fastest and likely lost the most grain fill.

References

Daynard & Kannenberg. 1976. Relationships between length of the actual and effective grain filling periods and the grain yield of corn. Canadian Journal of Plant Science. Quinn, D. J. 2023. Top "Dieback" and Senescence Patterns in Corn. The Kernel. Purdue Univ. Agronomy News.

Nielsen, R.L. 2011. Top Leaf Death or "Dieback" in Corn. Corny News Network. Purdue Univ. Extension.

Table 1. Field cues to distinguish normal senescence from top dieback in corn (R3–R5).

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Feature	Normal senescence	Top dieback	
Timing	Late grain fill, usually late R5 approaching black layer	Mid to late grain fill (R3–R5) following stress	
Pattern	Begins on lower leaves, progresses upward in an even pattern	Begins on upper canopy (ear leaf and above), progresses downward; uneven within plants/fields	
Leaf color	Gradual yellowing to tan; leaves dry from tip and margins; midribs last	Rapid gray-green to scorched appearance, then necrosis; upper leaves may collapse suddenly	
Ear progression	Kernel fill proceeds normally; black layer forms on schedule	Risk of shortened filling period; lighter test weight and earlier black layer if stress is severe	
Common drivers	Natural aging, N remobilization as plant approaches maturity	Abiotic: heat, drought, late nutrient shortage; Biotic: anthracnose, stalk rots; compaction or hail	
Yield impact	Minimal or none if harvested on time	Can be moderate to severe depending on timing and cause	

Furdue Corn Team Research Update

(Betsy Bower, Evan Cohagan, Narciso Zapata & Daniel Quinn)

Finding any ear rots scouting fields for harvest?

Being in research trials multiple times is very different than being in a production field. In trials, we are out there taking numerous measurements across a set of treatments all season long. So, you get very close and personal with a field trial.

One of the measurements we take are ear samples after black layer. Ten ears are husked on two rows next to the harvest rows. In those ears you can see the differences between treatments (without knowing which is which), between hybrids, and how the growing season and environment shaped the crop.

This year at ACRE was definitely a disease year, especially leaf diseases. But we are also finding several different ear diseases not just in dent corn, but in popcorn too. On top of that, we are seeing a fair amount of earworm damage.

So, is it enough that we need to think about special harvest and drying plans? Not at this point. But seeing this much ear disease does get you thinking about why it is showing up, what role the environment played, and how management decisions might make a difference.

Why do we see ear rots?

For ear rots to develop, three factors must come together:

- **1. The pathogen:** the disease organism must be present.
- 2. The host: corn is a susceptible host crop.
- **3. The environment:** conditions must favor infection (often during silking, though specifics vary by disease).
- **4. Additional entry points:** insect feeding or hail damage can create openings that make infection more likely.

Why do they matter?

The first problem ear diseases cause is yield loss. But the bigger issue is what can follow: **mycotoxins**. These can develop if the disease hangs around on the ear and the weather lines up just right (with or without much visible ear rot). Grain testing positive for mycotoxins is off-limits for human food, and only low levels are allowed in livestock feed (with strict limits depending on the species).

What do we do about ear rots?

Harvest and storage decisions are very important. If you have fields with significant ear rot issues, plan to harvest those early. When you set the combine, adjust it to cut down on kernel damage and try to blow out the lighter, diseased kernels. After harvest, dry the grain quickly to below 15% moisture and,

Ear Rot	Mycotoxin Produced	Conditions Favoring	Signs and Symptoms
Aspergillus	Aflatoxin	Hot and dry	Olive-green spores
Fusarium	Fumonisins	Moderate to warm temperatures during silking, wet periods before harvest	White to pink-purple mold scattered across ear; starburst pattern in kernels
Gibberella	Deoxynivalenol (DON or vomitoxin) and zearalenone	Cool and wet	Pink to white mycelial growth
Penicillium	Ochratoxin (some species)	Wet and humid after grain-fill	Blue-gray fungal spores
Trichoderma	Trichothecenes (only some species)	Damaged corn	Blue-green spores growing in and on kernels; may cause sprouting
Diplodia	None currently known in U.S. and Canada	Moderate temperatures, wet during silking	White mycelial growth on ear and husk; black pycnidia in cob
Nigrospora	None	Damaged corn	Black spores, gray mycelia, shredding cob
Cladosporium	None	Wet weather near harvest	Dark-green to black kernels

Figure 1. A general guide to corn ear rots (Crop Protection Network, 2024)

when conditions allow, **cool it down to about 60°F**. Keep checking grain every couple of weeks, catching problems early can save you a lot of trouble later.

It is important to properly identify ear molds. The Purdue Plant and Pest Diagnostic Lab can do this for a very reasonable fee. The best option is to send in physical ear samples, but if that is not possible, you can also upload clear, close-up photos of the mold. Reach out to your trusted agronomic advisor to help decide when it is worth sending samples in.

Figure 2. Fusarium ear rot with germinating kernels.



Figure 5. Fusarium ear rot in dent corn.

Purdue Research

To dig deeper into this issue, Master's student Evan Cohagan, Extension Corn Specialist Dan Quinn, Extension Pathologist Darcy Telenko, and the Kernel Lab have launched a two-year study on ear rots and mycotoxin development. This study is trying to highlight the relationship between a R1 fungicide application, husk characteristics, and harvest timing to the resulting mycotoxin contamination and ear rot severity. This is to see what the most impactful and important practices are to consider when moving into the next growing season. Please, stay tuned for updates on the results and conclusions from the first year of research this winter.



Figure 3. Trichoderma or penicillin in dent corn.



Figure 6. Diplodia Ear rot in popcorn.



Figure 4. Various ear diseases in popcorn.



Figure 7. Ear worm feeding with a subsequent secondary disease infection.

References

Crop Protection Network (2024). *An Overview of Ear Rots.* doi.org/10.31274/cpn-20190620-001

Grain Samples Needed!

(Darcy Telenko)

In Indiana, five ear rots can lead to mycotoxin production in corn. They include Aspergillus ear rot, Gibberella ear rot, Fusarium ear rot, and Penicillium ear rot. They can cause the production of five different mycotoxins in association with the different ear rot: Aflatoxin (*Aspergillus*), Deoxynivalenol or as also called DON/vomitoxin and Zearalenone (*Gibberella*); Fumonisins (*Fusarium*), and Ochratoxin (*Penicillium* and sometimes *Aspergillus*).

Due to increased reports of mycotoxin contamination in corn in the last few years we will again be conducting a survey of Indiana grain for mycotoxin testing and collecting data for forecasting model validation in 2025. If you have fields of concern and want to participate, please reach out to Darcy Telenko at dtelenko@purdue.edu to get more information and sample protocol.

This project is supported by the Indiana Corn Marketing Council (ICMC).

Ear rots and mycotoxin risk

Scouting for ear rots is very important. The Crop Protection Network has a number of great resources to help scout and identify ear rots

- Corn mycotoxin
 FAQs https://cropprotectionnetwork.org/p
 ublications/mycotoxin-faqs
- An Overview of Ear Rots (PDF)
- Grain and Silage Sampling and Mycotoxin Testing

If a field has ear rot problems, it will be important to test the harvested grain lots for mycotoxins. The Grain and Silage Sampling and Mycotoxin Testing Resources publication provides a good reference on how to take a sample or sub-samples and a list of professional laboratories available to grain testing. In addition, harvest management for ear rots includes identifying and harvesting fields early, drying grain quickly to below 15% moisture, and storing in dry and cool conditions to limit fungal growth and mycotoxin accumulation.



Mid-season Insect Pests In 2025: Survey Results

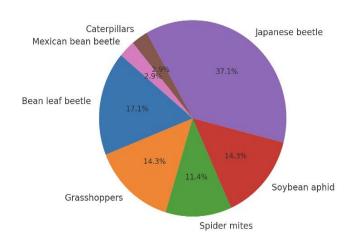
(Christian Krupke)

About a month ago, we published an article asking readers for input on what pests they were seeing and what levels of economic damage may be out there in corn and soybean fields. The results are presented below:

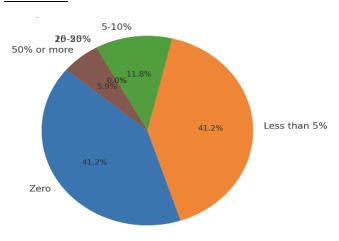
Do you scout for mid-season insect pests?

26=Yes 4=No

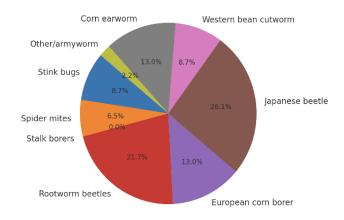
Q1: Which pests are commonly found causing crop damage during mid-season scouting of soybeans (check all that apply)?



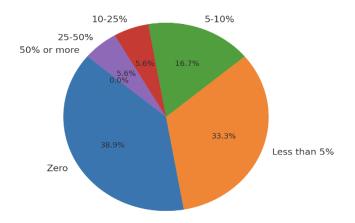
Q2: What percentage of <u>soybean</u> fields that you scout exhibit mid-season insect <u>damage over</u> threshold?



Q3: Which pests are commonly found causing crop damage during mid-season scouting of <u>corn</u> (check all that apply)?



Q4: What percentage of <u>corn</u> fields that you scout exhibit mid-season insect damage over threshold?



Looking over these results, a couple of key points occurred to me:

- First, Japanese beetles are clearly the big player in both crops (#1 in both). Although these generalist feeders are common in virtually any environment (including homes, parks, gardens, etc.) during July and into August, they are usually restricted to cropping field borders because they frequently pop back and forth between multiple potential hosts they are not restricted to corn or bean fields.
- The second key point are the very low overall damage levels in both corn and soybeans. Roughly 40% of both are estimated to have no treatable (above threshold) levels of damage. When we include the "below 5%" category as well, we have roughly 70-80% of corn and soybean fields included with a low likelihood of damage at this time of year. This is encouraging from a crop health point of view, and matches up with anecdotal reports and what we see in our research trials - even when we are trying to encourage and promote pest infestations, it's difficult to get those numbers up over economic thresholds. A very different story than 15-20 years ago! Pest numbers are down, and although all of the reasons behind the trend are not clear, these trends offer an opportunity to save time and money when it comes to insect pest management.

Future of Corn Production and US Agriculture

(Priscila B. Cano and Ignacio A. Ciampitti- Ciampitti Lab, Department of Agronomy and IDAAS)

The adoption of new digital technologies is bringing about an unprecedented transformation in corn farming in the United States. These technologies are adopted to increase long-term productivity and reduce environmental impact.

Technological innovations are key drivers of operational efficiency and competitiveness in corn production. These innovations span multiple domains, including data acquisition and communication systems

that facilitate information collection; computing infrastructure that enables efficient processing; and artificial intelligence that identifies critical patterns for decisionmaking. Integrating

automation,

robotics,

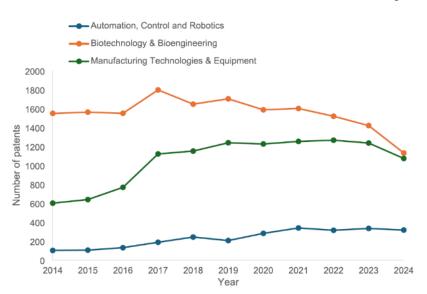


Figure 1. Evolution of agricultural patents (for three major categories) in the United States. The remaining categories were identified at a relatively low frequency (Figure 2).

biotechnology, and resource management technologies creates a comprehensive ecosystem that supports sustainable, efficient corn farming.

From biotechnology to artificial intelligence (AI), innovations are changing the way we grow corn. But where exactly is this innovation happening? To answer this question, our team analyzed over 32,000 U.S. agricultural patents issued between 2014 and 2024. We mapped the landscape of applicable corn technology and

identified emerging trends that will shape the future of corn cultivation.

Eight Categories of Agricultural Technology

We classified patents into eight key categories that reflect the diversity of digital agricultural technologies (Figure 1).

Biotechnology & Bioengineering (53%)

The dominant category encompasses plant breeding, genetic improvements, and biological innovations. These patents focus on developing crop varieties with specific traits that improve productivity and resilience. For instance, they involve the development of drought-tolerant hybrids and nitrogen-efficient corn varieties that reduce fertilizer requirements.

Manufacturing & Equipment (36%)

Advanced agricultural machinery, actuators, materials, and equipment. This category has seen steady growth, reflecting the mechanization and modernization of farming operations. For example, planter technology achieving planting speeds up to 10 mph.

Automation, Control & Robotics (8%)

Technologies for monitoring, controlling, and automating farm operations. This category shows a major growth and represents the future of automation in farming. For example, a system that uses computer vision to distinguish corn plants from weeds, applying herbicides only where needed and autonomous grain cart systems that coordinate with combines during harvest, reducing labor needs during peak season.

Data Acquisition & communication (1.3%)

Covers processes related to data collection, processing, storage, and transmission, including image acquisition, remote sensing, sensor technologies, and data transmission. For example, high-resolution aerial imaging that detects individual corn plant health issues, pest damage, and nutrient deficiencies at early growth stages and soil sensor that provides field-specific data on moisture and temperature.

Data Science & Artificial Intelligence (1.3%)

It involves tools for deep data analysis means that fusing scientific methods and AI algorithms. These tools include AI-powered corn yield forecasting models and machine learning algorithms that recommend the best corn hybrid selection based on field characteristics and historical performance.

Computing & Cloud Technology (0.06%)

It includes tools and applications for storing and processing data on remote servers, including networks, databases, and software. One example is a cloud-based farm management platform that integrates corn scouting data, input applications, and financial records.

Information Systems (0.3%)

This category includes organized systems of interrelated components—including hardware, software, networks, and people—that collect, process, store, and distribute information to support decision-making and management. One example is software that plans variable-rate seeding prescriptions based on soil types and yield history in corn fields.

Resource-related Technologies (0.05%)

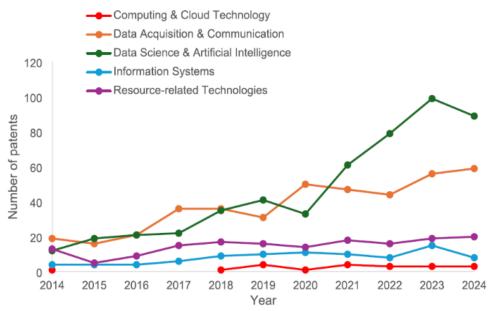


Figure 2. Evolution of agricultural patents (categories with reduced numbers) in the United States. Our network analysis revealed that agricultural technologies are highly interconnected. This interconnection means that future innovations will likely emerge from combining technologies rather than advancing them in isolation.

This category includes innovations that focus on managing and optimizing natural resources. These innovations cover smart agricultural buildings, carbon capture, renewable energy, soil and environmental conservation, and efficient water and waste management.

Conclusion

The pace of agricultural innovation is accelerating, albeit unevenly. The digital divide presents a significant opportunity.

The interconnected nature of these technologies means that the most successful innovations will likely come from integrated approaches that combine multiple technological domains.

As digital technologies continue to advance, how farmers and innovators embrace these integrated solutions will define the next era of corn production in the United States.

Full article: Precision Agriculture (2025) 26:59 https://doi.org/10.1007/s11119-025-10257-

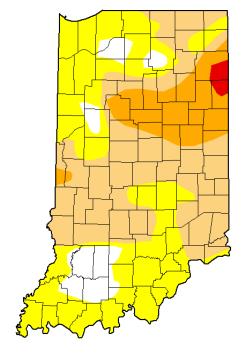
Drought Conditions Improve in Southern Indiana, Worsen in Northern Areas

(Austin Perason)

Fall and drought have been nearly synonymous in recent years; 2025 is no different. The September 30 US Drought Monitor, released on October 2, indicated that over 92 percent of the state was categorized as either abnormally dry (D0) or moderate drought (D1), with additional areas classified as severe drought (D2) or extreme drought (D3) (Figure 1). The driest part of

the state extends from Fort Wayne to just east of Lafayette, with totals more than 4 inches below normal from August 2 – September 30 in spots. D3 conditions now exist in parts of Allen and Adams Counties, along with D2 conditions stretching westward to cover a large portion of northcentral Indiana counties. A year ago, D3 reappeared in the state for the first time since

U.S. Drought Monitor Indiana



with portions of the region now classified as D0, or 'DNada'- a term for no drought.

The rapid onset of drought began in August. Using the Southern Regional Climate Center's <u>Climate</u>

<u>Perspectives Tool</u>, available for the Midwestern Region, I aimed to compare the total precipitation for August to September with historical data (Figure 2). Several stations in northern Indiana experienced their top 5 driest August to September on record. Marion, Indiana,

recorded

2.19

two

5.26

inches

inches

over the

months,

which was

below the

1991-2020

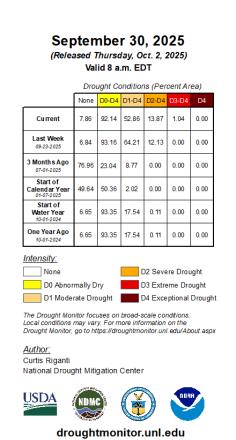


Figure 1: September 30, 2025, US Drought Monitor Map

August 2012, affecting parts of Franklin, Dearborn, and Ripley Counties for one week. This was temporary as remnants of Helene brought rain that alleviated drought conditions in southern Indiana. The addition of D3 in the state this week marks the second time this has occurred since the 2012 drought. Portions of Vermillion and Parke Counties have also had D2 lingering for several weeks. Heavy rains in southern Indiana have improved drought conditions slightly,

climatological normal. This was the driest August to September period Marion ever experienced, with records spanning more than 131 years of data. The Fort Wayne Airport had its fourth driest August to September on record, spanning 121 years of data. Drought impacts range from dormant lawns (a welcome break from mowing, though) to the lowest water levels some have seen in ponds, reduced streamflows, rapidly drying crops, premature tree leaf drop, and various other effects.

So where do we go from here?

Fortunately, we have some precipitation forecast between October 2 and October 9, 2025. The heaviest totals appear to be in central and eastern Indiana, with over an inch

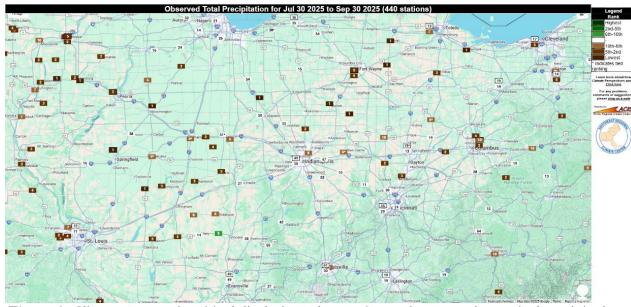


Figure 2: Climate Perspectives Tool displaying July 30 – September 30 station ranked precipitation totals.

in most spots, and up to 2 inches in others (Figure

3). Fingers crossed, let's hope we get this

precipitation. The Climate Prediction Center has elevated confidence in above-normal precipitation statewide through mid-October. This is a complete shift from the pattern that has been locked in for what seems like weeks.

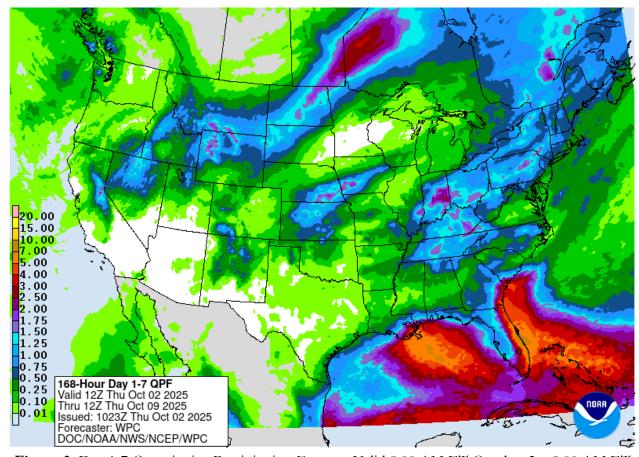


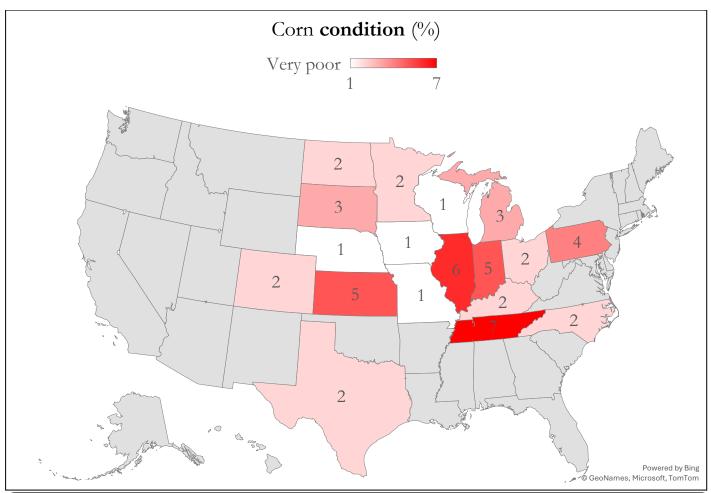
Figure 3: Day 1-7 Quantitative Precipitation Forecast Valid 8:00 AM ET October 2 – 8:00 AM ET October 9.

Acknowledgments

The authors greatly appreciate the feedback and contributions of all growers, county agents, consultants, and corn industry stakeholders.

Proudly supported by:





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 28th.

Very
Poor

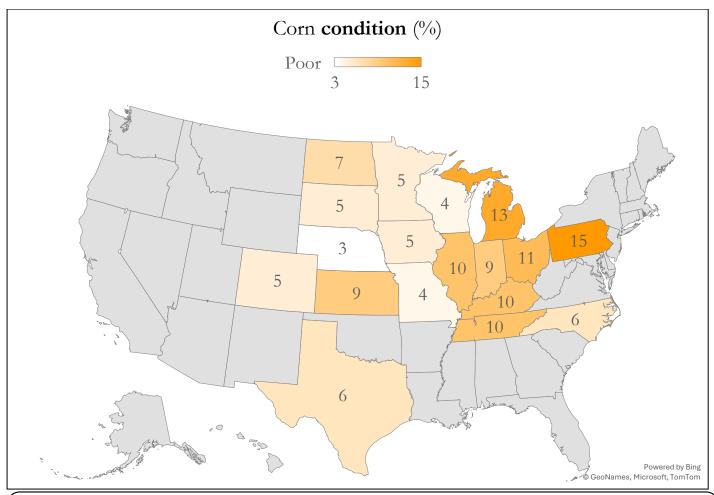
Poor

Fair

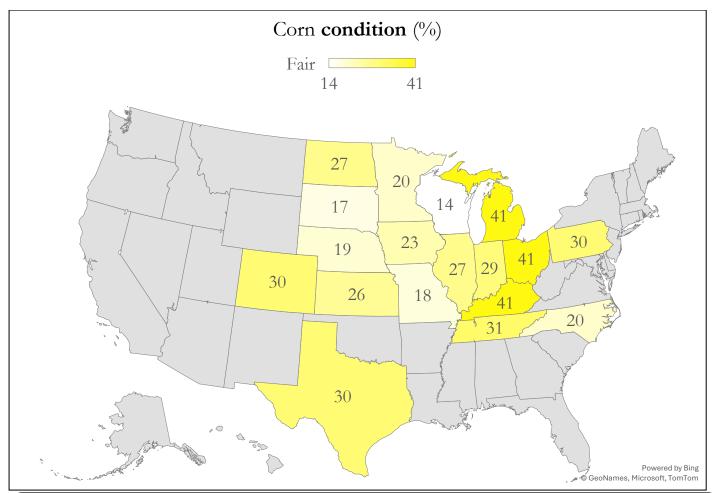
Good

Excellent

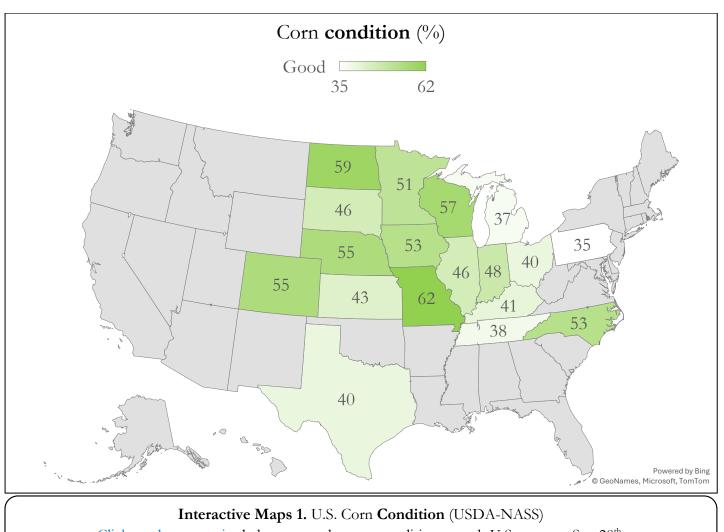
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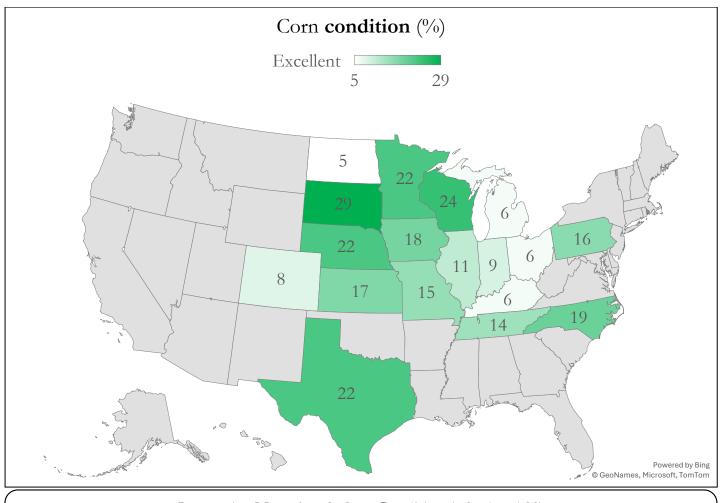
Interactive Maps 1. U.S. Corn Condition (USDA-NASS) Click on the categories below to see the corn condition at each U.S. state on Sep 28th. Very Poor Fair Good Excellent Back to page 2



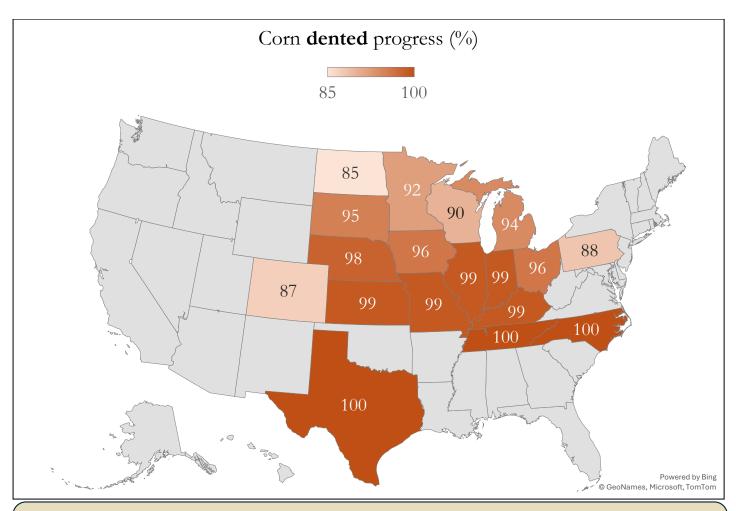
Very Poor Fair Good Excellent Back to page 2



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 28th. Very Poor Fair Good Excellent page 2



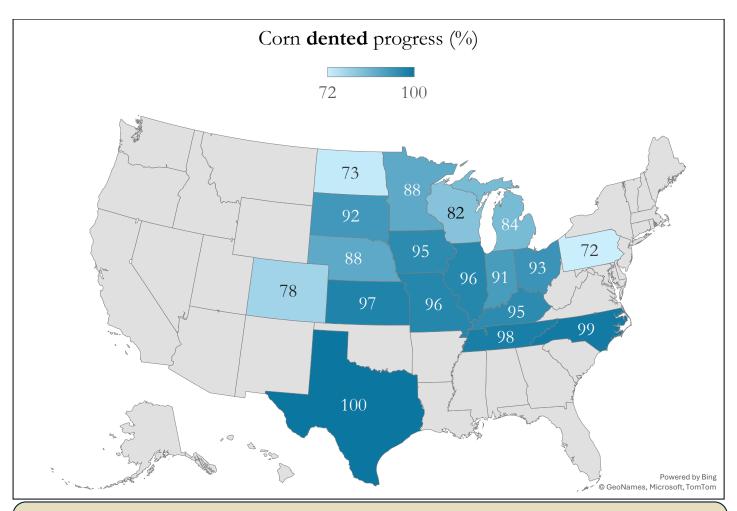
Interactive Maps 1. U.S. Corn Condition (USDA-NASS) Click on the categories below to see the corn condition at each U.S. state on Sep 28th. Very Poor Poor Fair Good Excellent Page 2



Sep 28, 2024 Sep 21, 2025

Sep 28, 2025

Average (2020-2024)

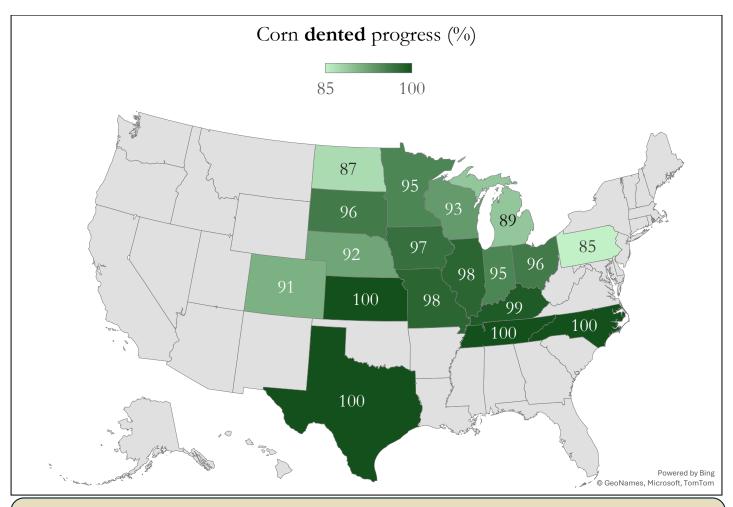


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Sep 28, 2025

Average (2020-2024)

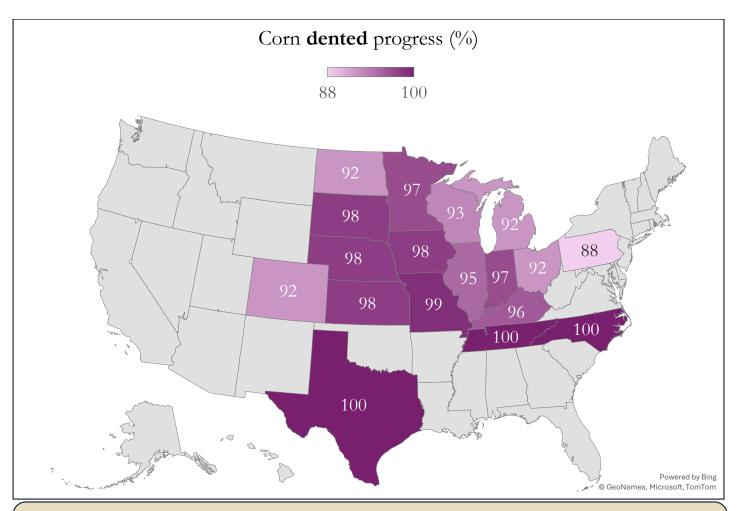


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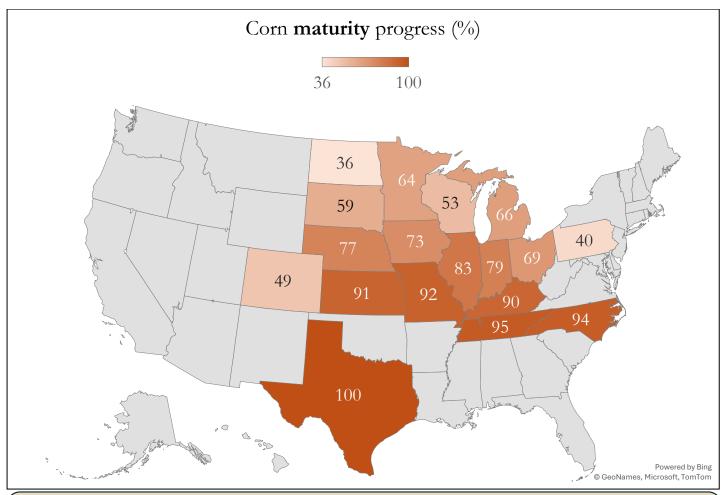


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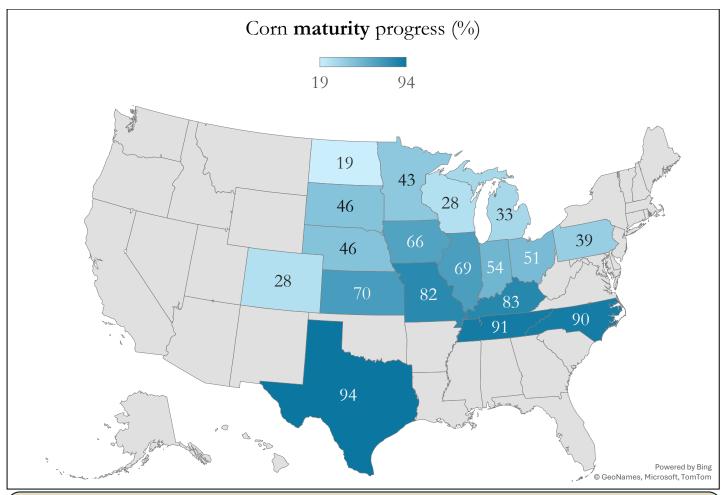
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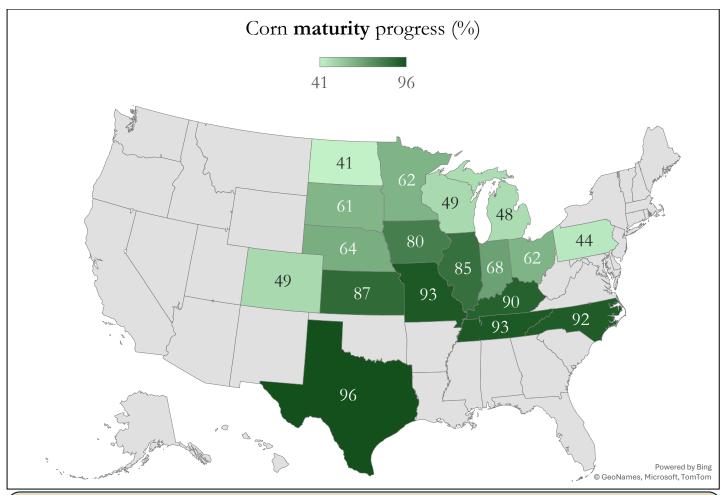
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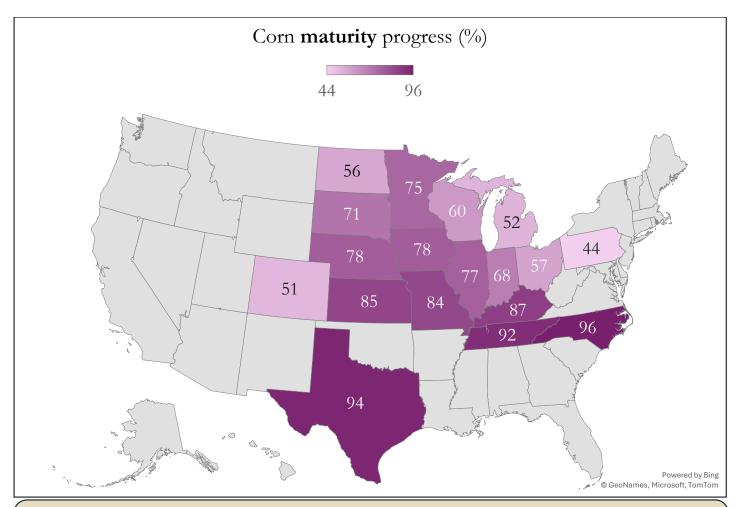
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Sep 21, 2025 Sep 28, 2025

Average (2020-2024)



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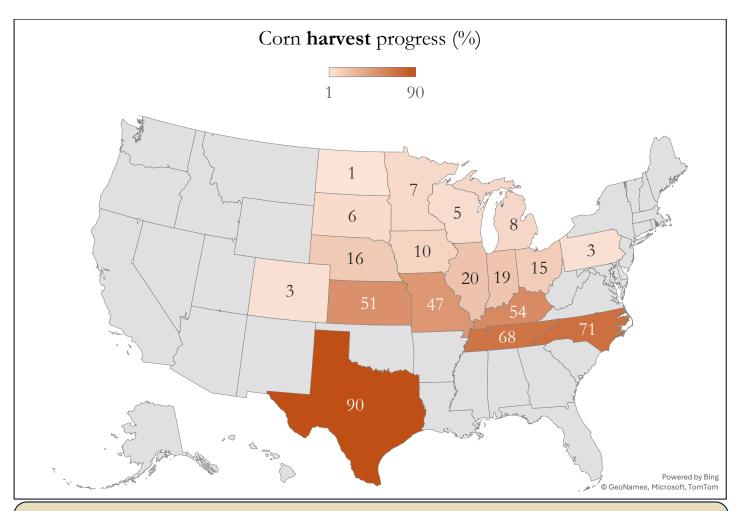


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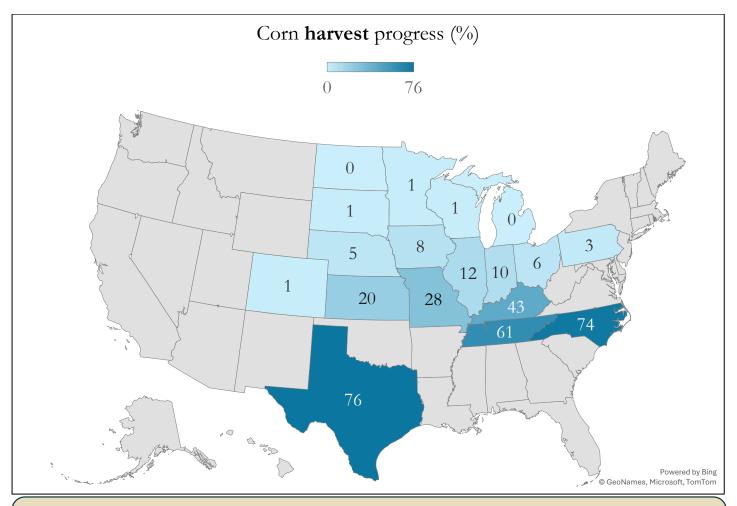
Average (2020-2024)



Sep 28, 2024 Sep 21, 2025

Sep 28, 2025

Average (2020-2024)

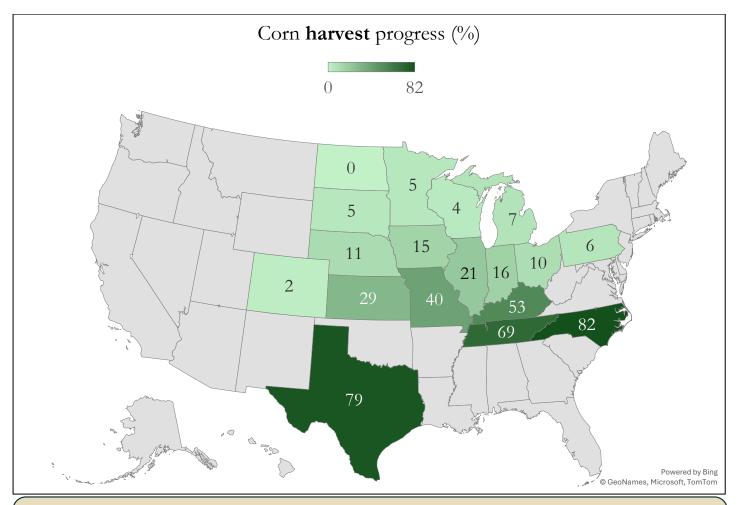


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Average (2020-2024)

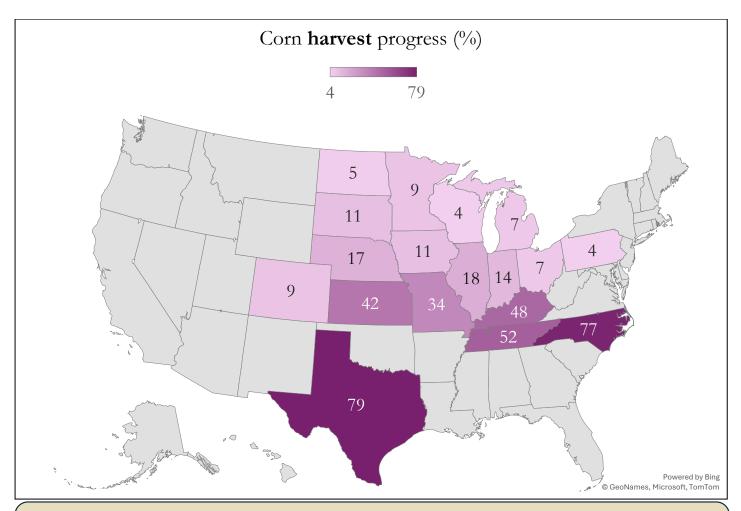


Sep 28, 2024

Sep 21, 2025

Sep 28, 2025

Average (2020-2024)



Sep 28, 2024

Sep 21, 2025

Sep 28, 2025

Average (2020-2024)