

# A Quick Look in the Rear-view Mirror



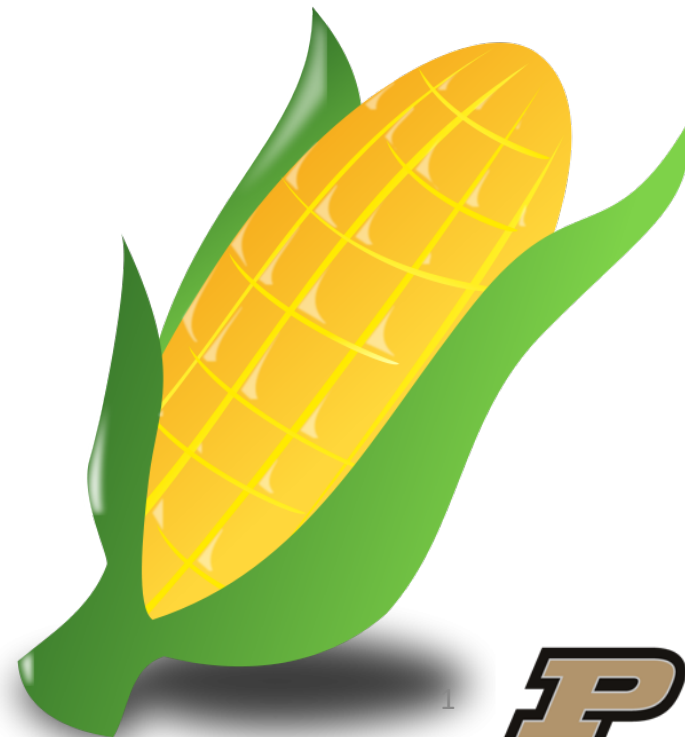
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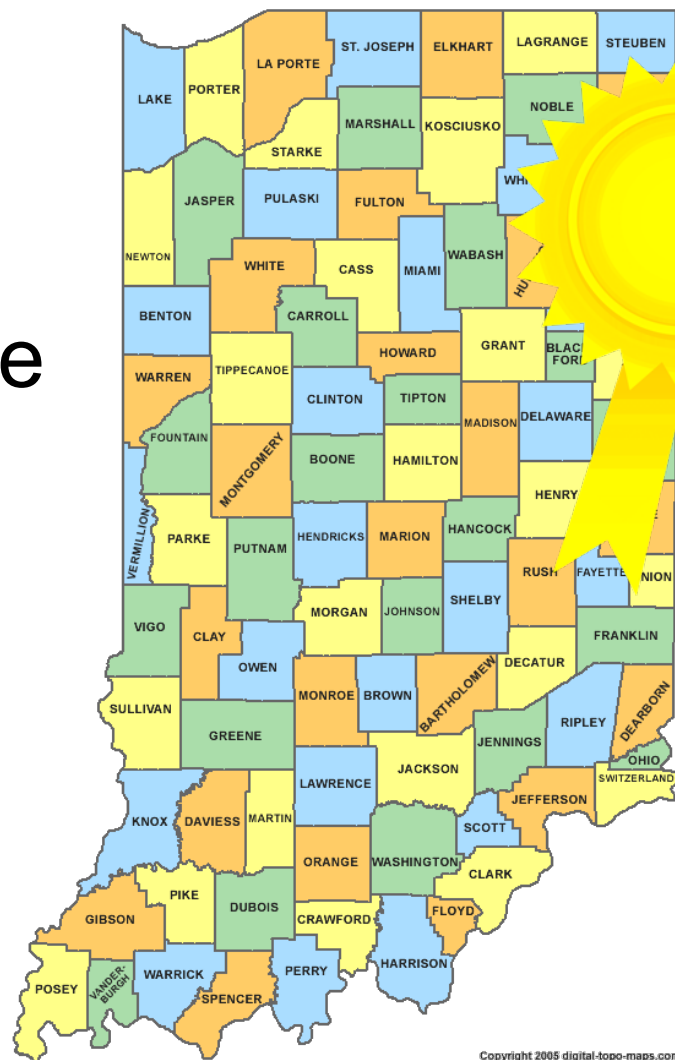


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# 2019 brought many corny achievements

- Corn planting progress statewide was among the 3 most delayed of the past 40 years
  - Nearly 710,000 acres eventually not planted, according to FSA data, which set a new record!

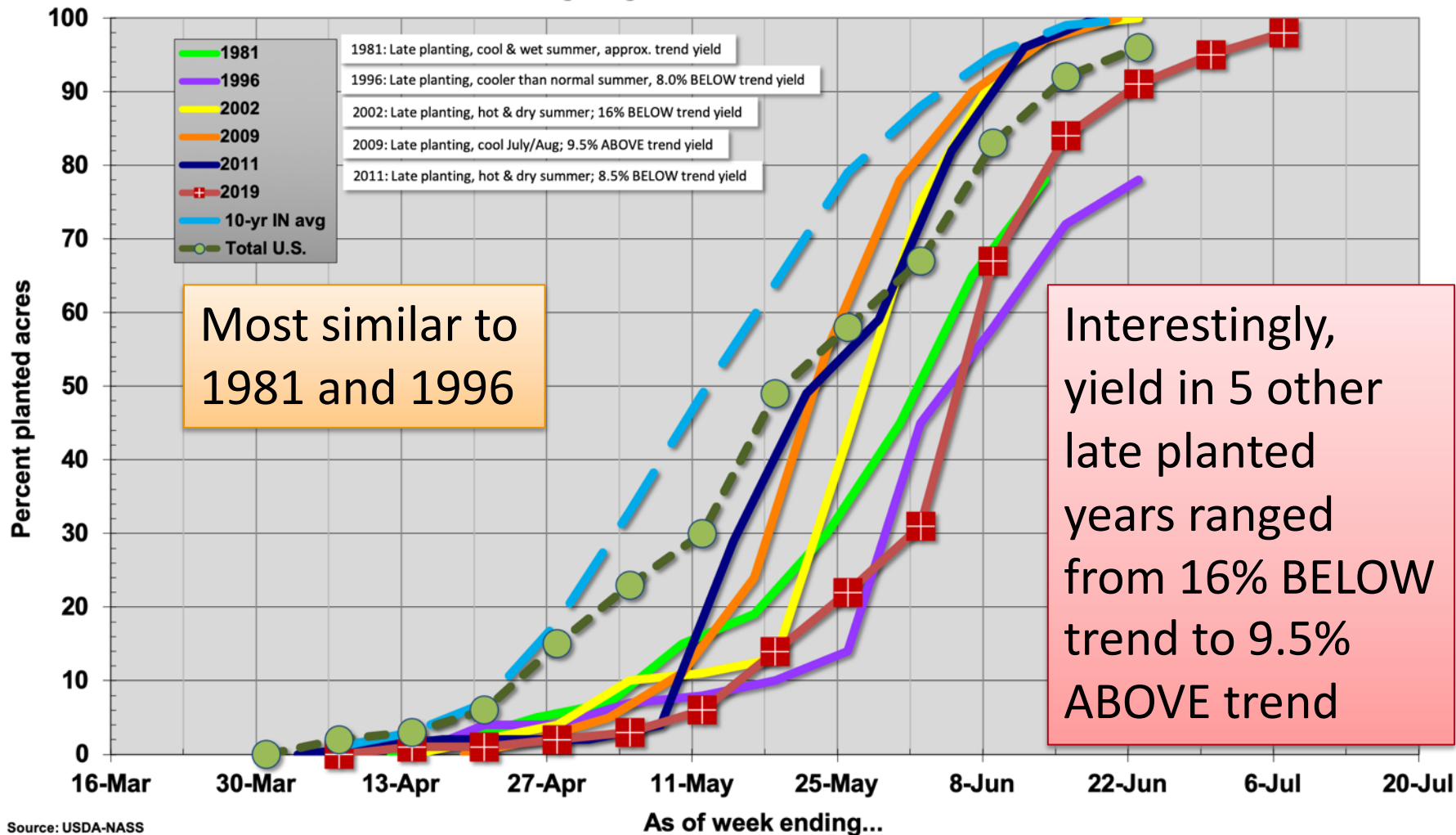


Copyright 2005 digital-topo-maps.com

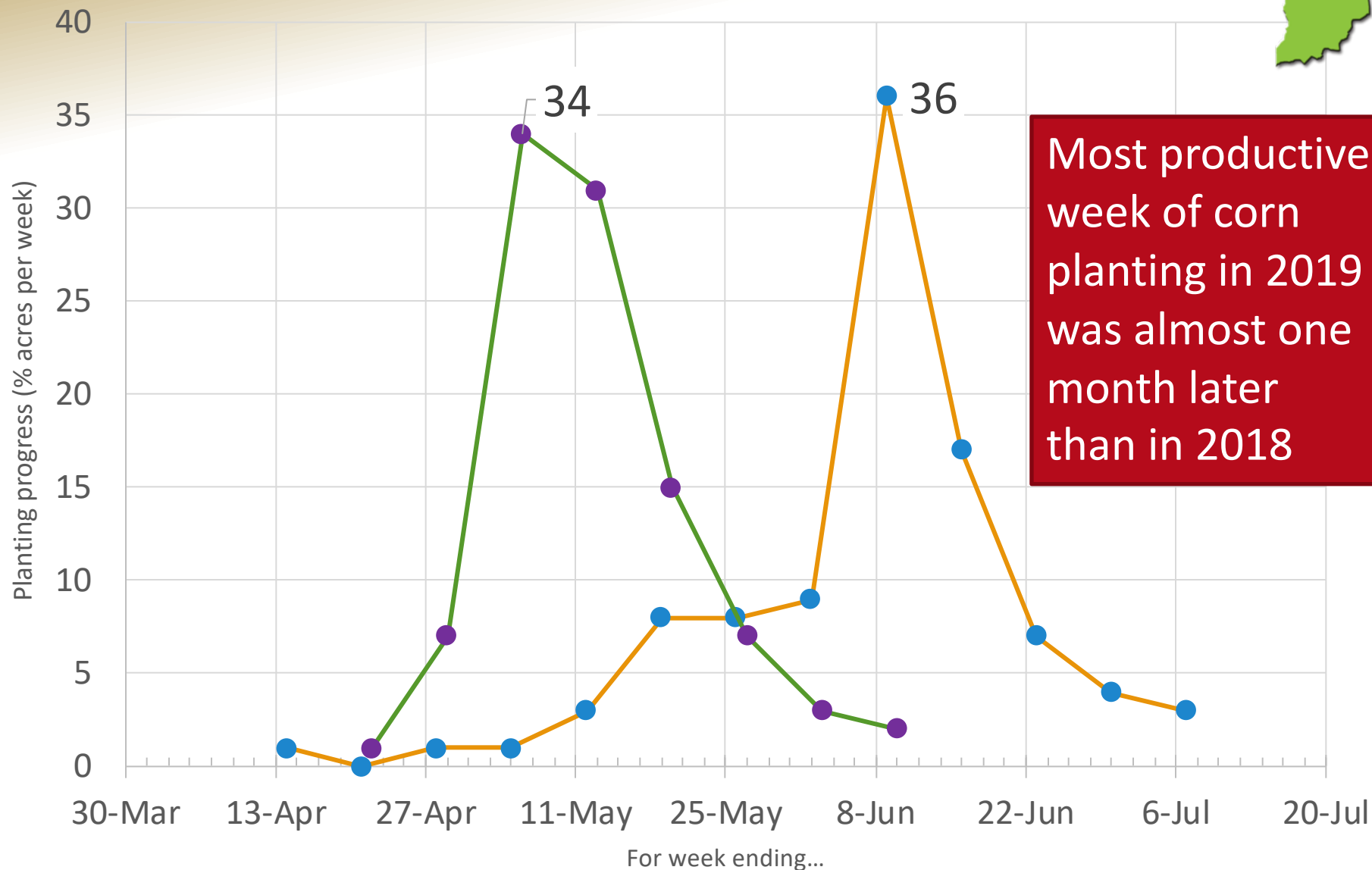
# Corn planting progress in 2019 was dismal at best



Corn Planting Progress in Indiana for Select Years



## Corn Planting Progress per Week – 2018 vs 2019 Indiana



Data derived from USDA-NASS Crop Progress Reports

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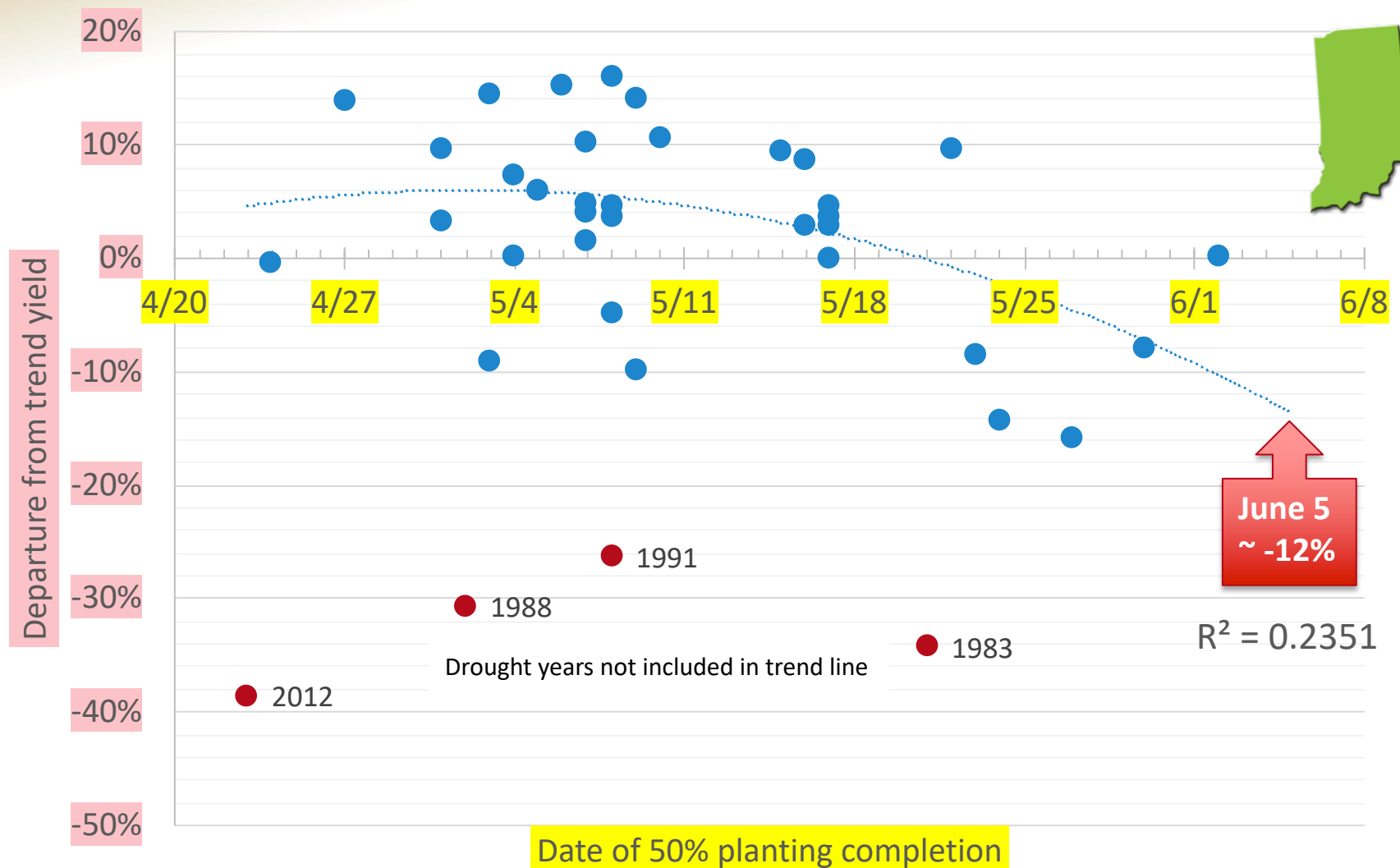


# Late corn planting & prospects for yield?



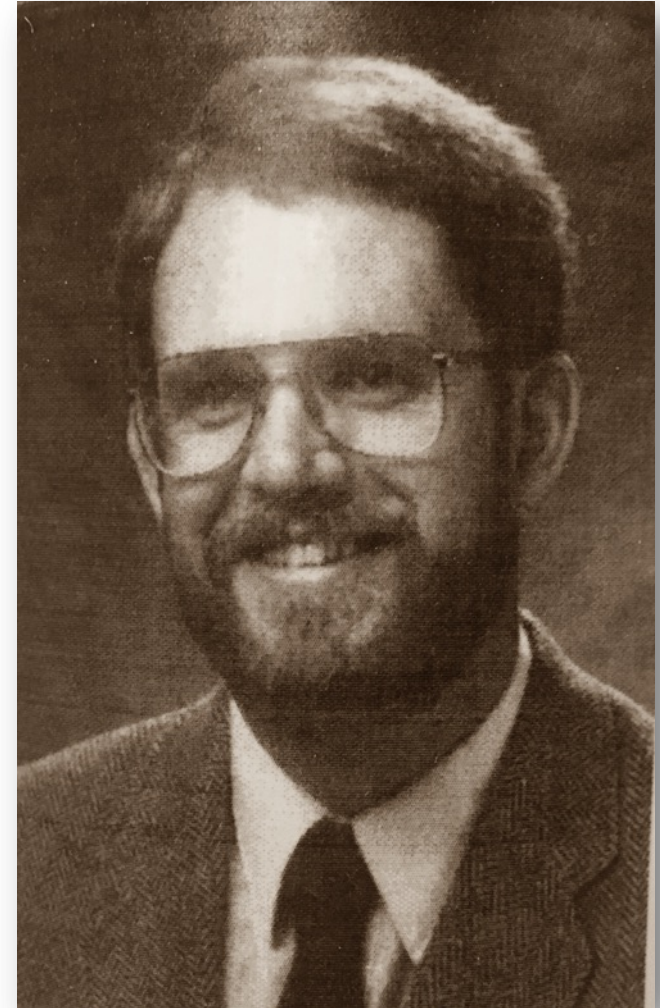
Educational license from CartoonStock.com

# Yield vs. Planting date (Indiana, 1981-2018)



# But, not to worry...

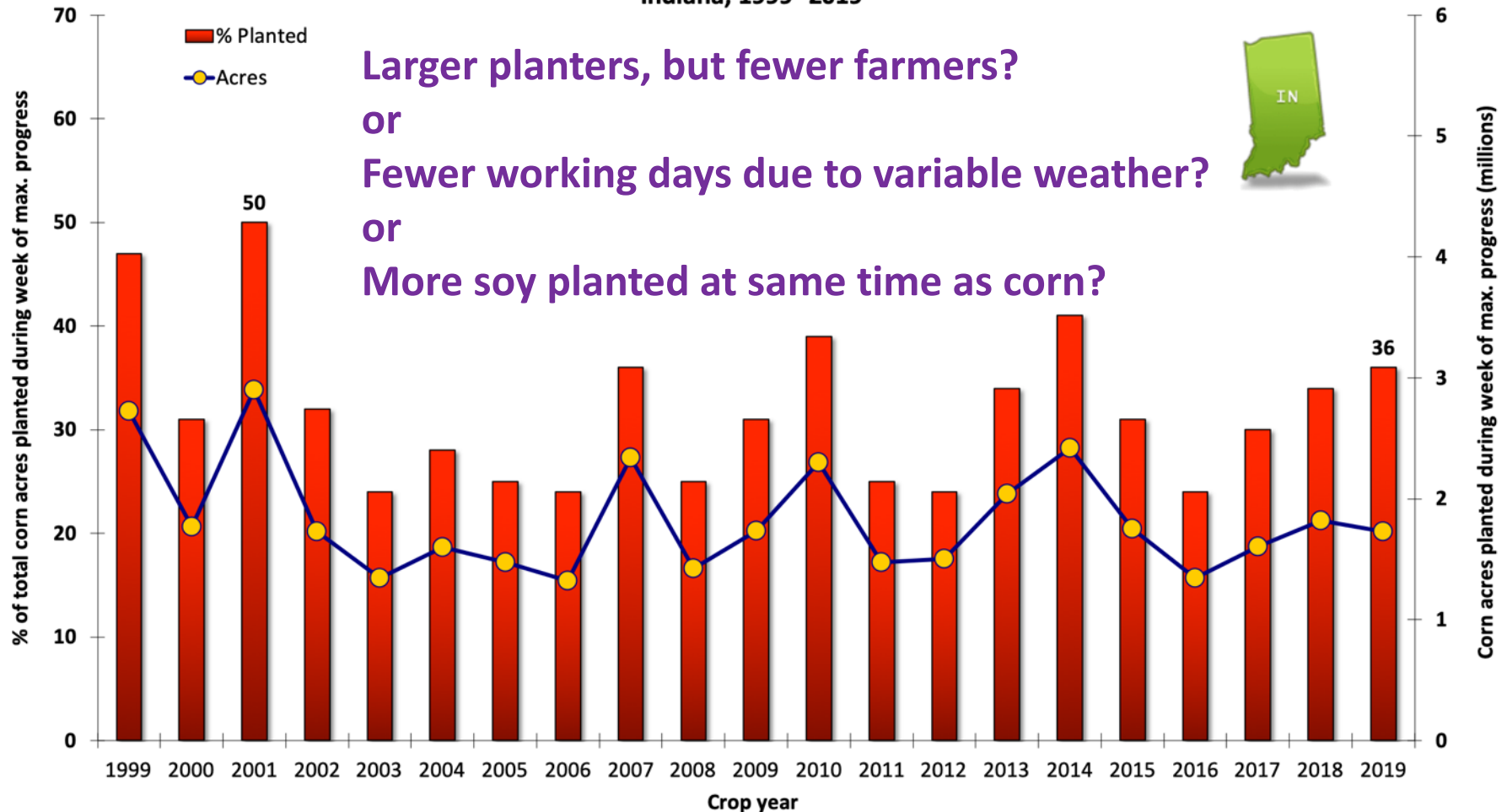
- Trustworthy corn  
Extension specialists  
assured us that...
  - ...planting date was only  
one of a bozillion factors  
that influence yield
  - ...yields could be good if  
the remainder of the  
season was favorable



CornGuy image ca. 1980's

# Side note: The max. weekly planting progress has not increased over time

Corn Acres Planted During Week of Maximum Progress  
Indiana, 1999- 2019

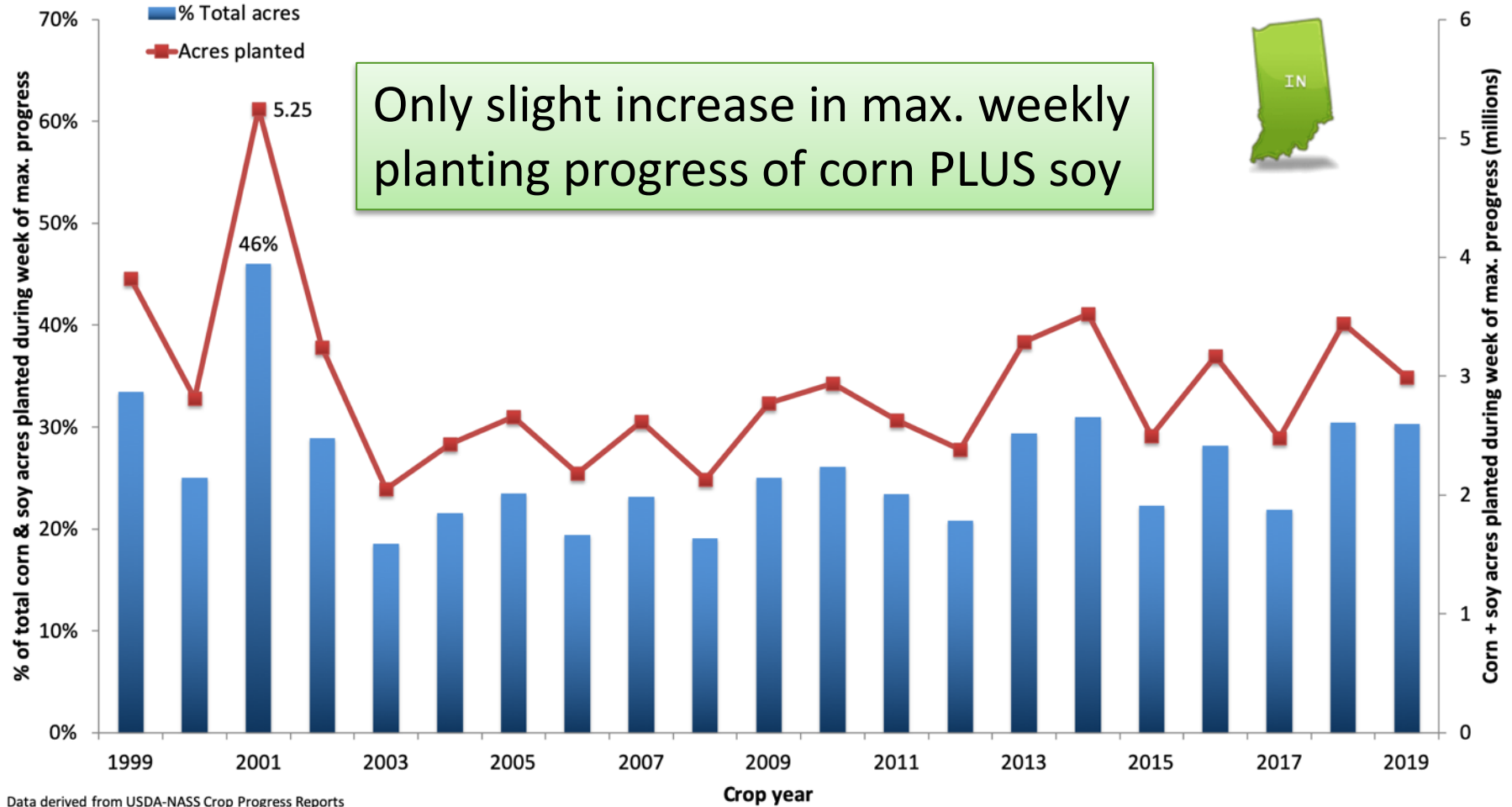


Larger planters, but fewer farmers?  
or  
Fewer working days due to variable weather?  
or  
More soy planted at same time as corn?



Data derived from USDA-NASS Crop Progress Reports

## Combined Acreage of Corn & Soybean Planted During Week of Maximum Progress Indiana, 1999 - 2019



## 2019: More near-record achievements

- Planting progress statewide was among the 3 latest in past 40 years
  - Nearly 710,000 acres not planted
- Silking progress was also among the most delayed of the past 40 years...

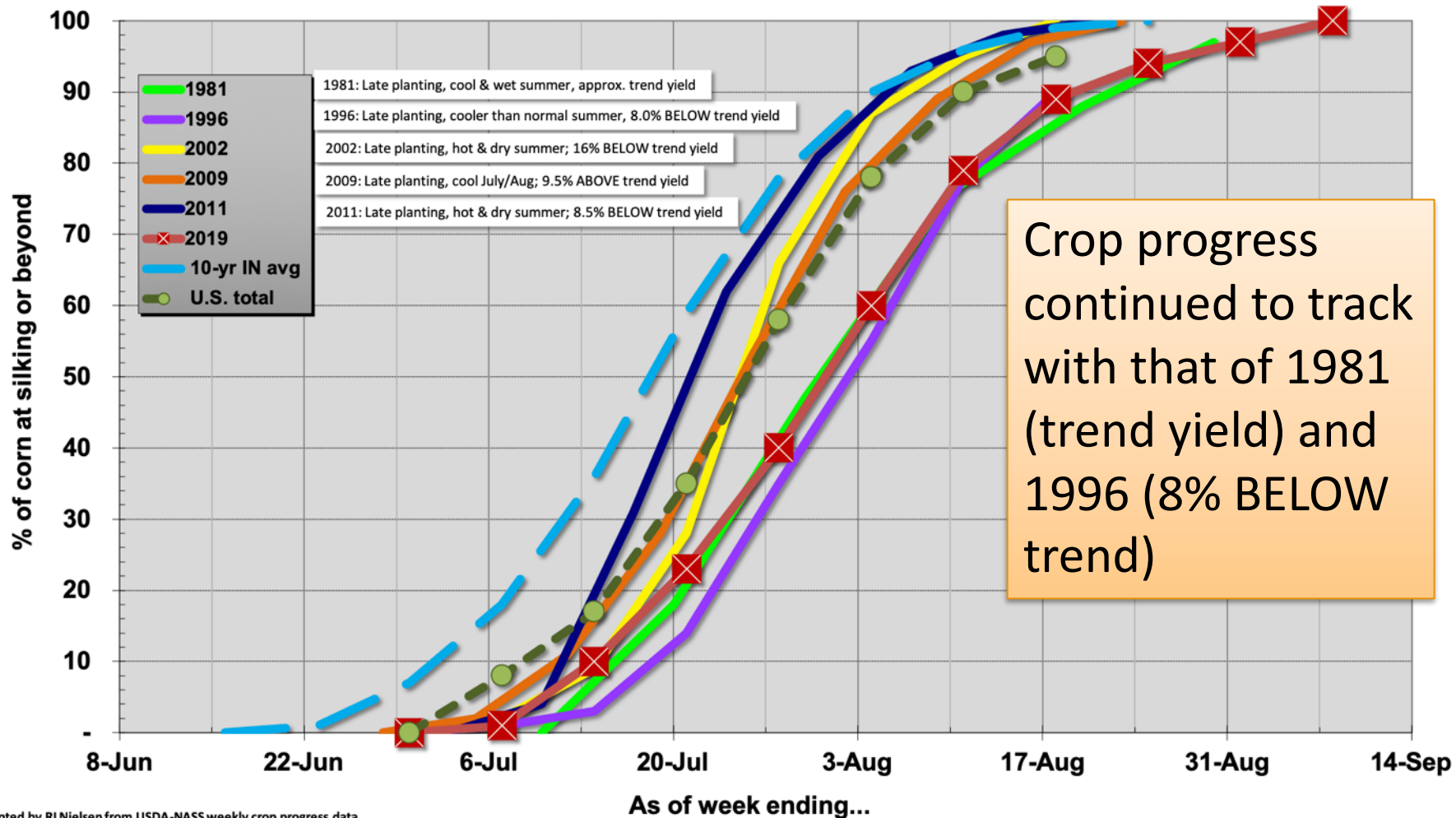




# Half the state's crop silked in August (or beyond)



Percent of Indiana Corn Crop in Silking Stage or Beyond: Select Years

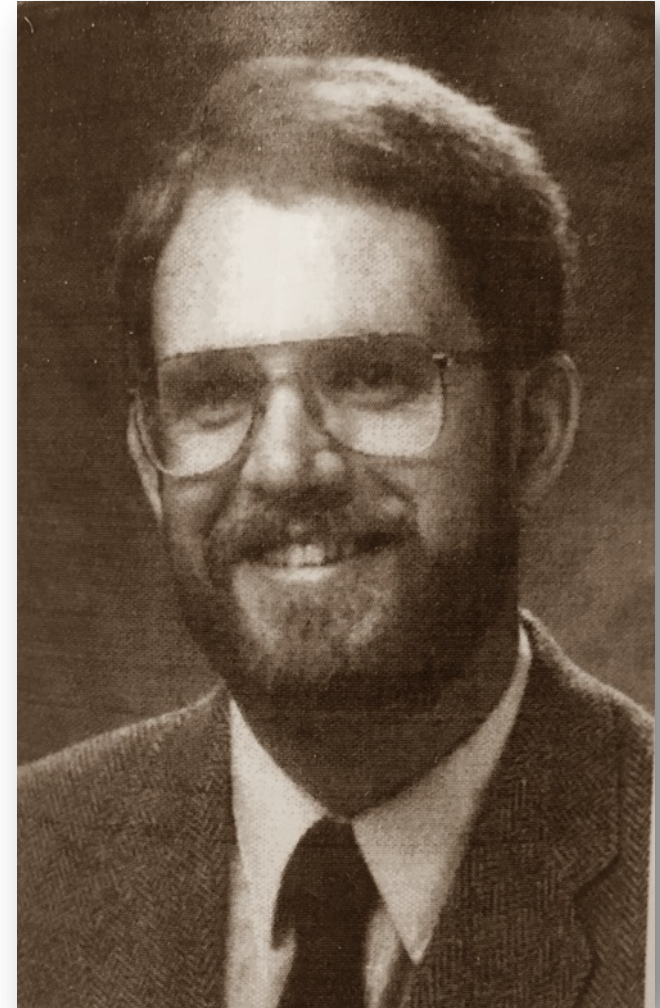


Adapted by RLNielsen from USDA-NASS weekly crop progress data



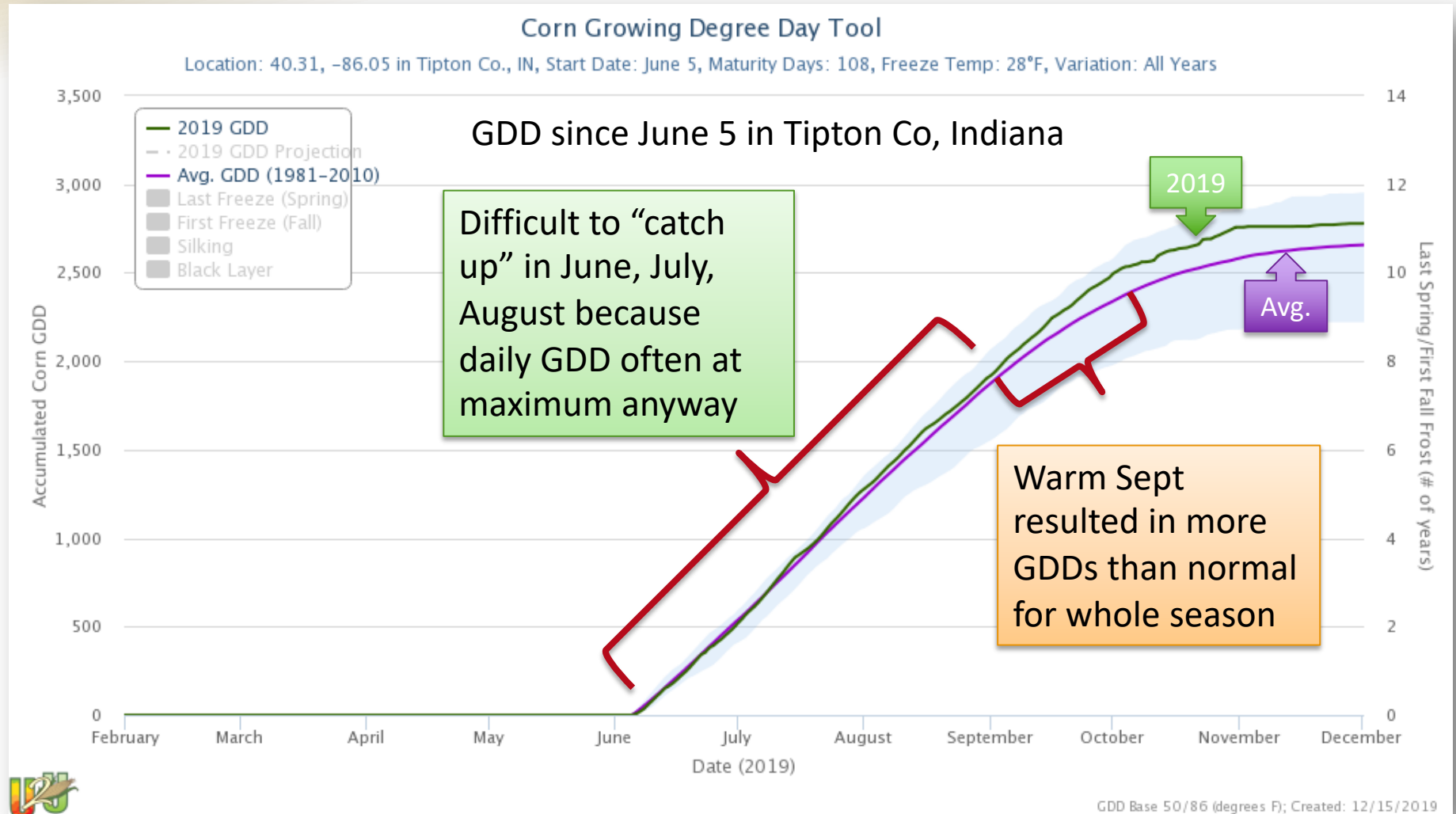
# But, not to worry...

- Trustworthy corn Extension specialists reminded us...
  - ...that late silking was not a “kiss of death” for yield
  - ...kernel set and grain fill could still be good if weather was favorable for remainder of the season



CornGuy image ca. 1980's

# Crop progress never “caught up” ...



Graph: U2U Corn GDD Decision Support Tool, <https://hprcc.unl.edu/gdd.php>

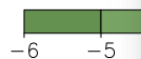
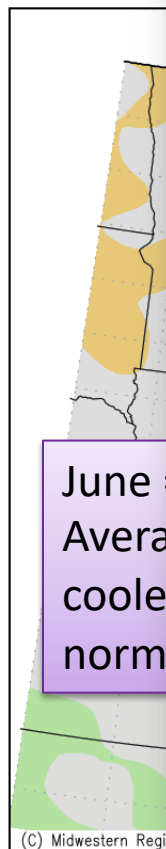
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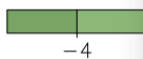
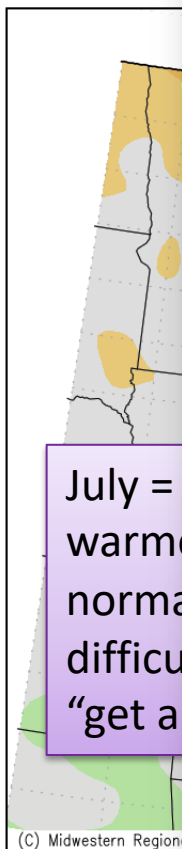


Average



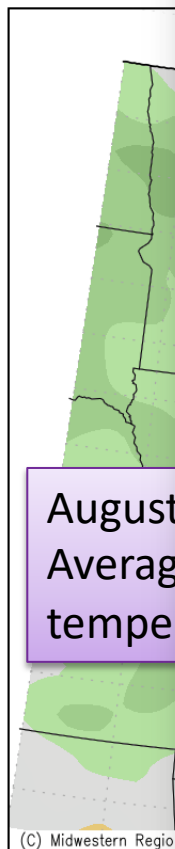
Illinois

Average



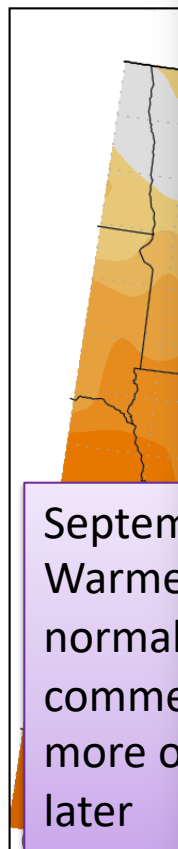
Illinois

Average  
August



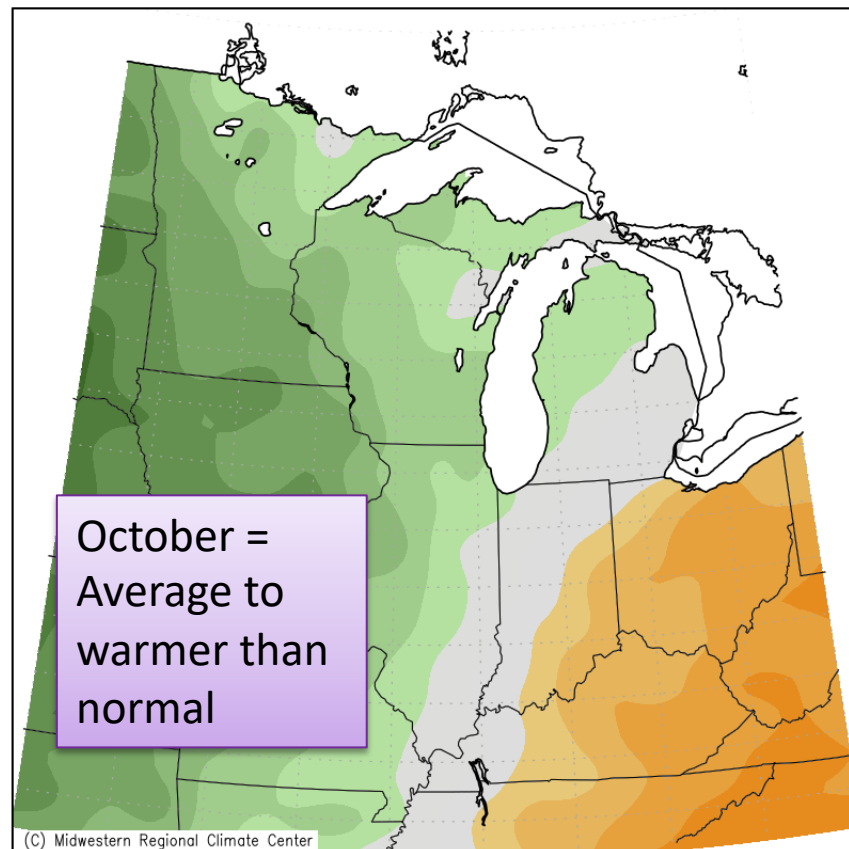
Illinois

Average  
September

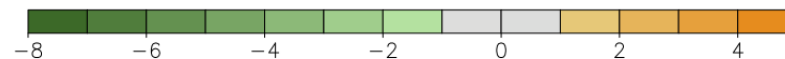


Illinois

Average Temperature (°F): Departure from Mean  
October 1, 2019 to October 31, 2019



Mean period is 1981–2010.



Midwestern Regional Climate Center  
Illinois State Water Survey, Prairie Research Institute  
University of Illinois at Urbana–Champaign

# 2019: More near-record achievements

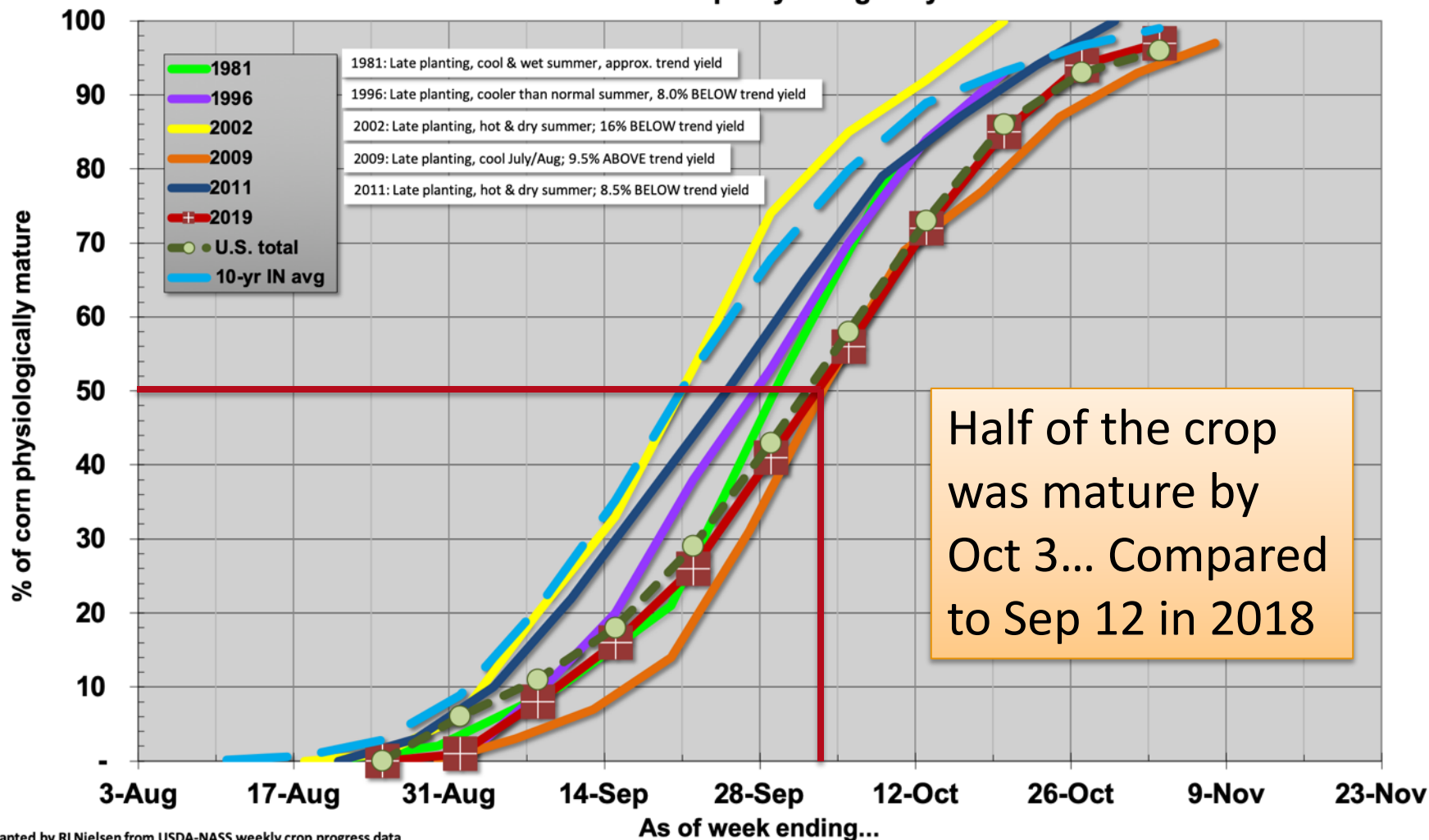
- Planting progress statewide was among the 3 latest in past 40 years
  - Nearly 710,000 acres not planted
- Silking among 3 latest in 40 years
- Grain maturity (black layer) occurred about as late as it ever has in the past 40 years



# Half of the crop matured in October or beyond

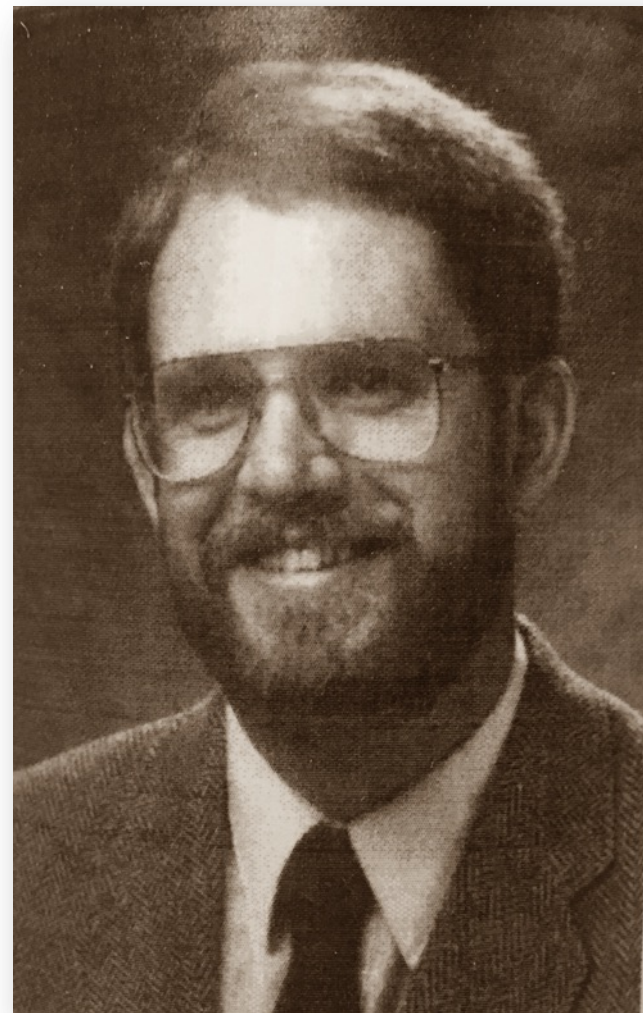


Percent of Indiana Corn Crop Physiologically Mature: Select Years



# Well, that was worrisome...

- Because trustworthy corn Extension specialists had reassured us that most late-planted fields would mature well ahead of a killing freeze and all would be well.
  - Based on previous research on hybrid GDD response to late planting



CornGuy image ca. 1980's



# Delayed Planting Effects on Flowering and Grain Maturation of Dent Corn

Robert L. Nielsen,\* Peter R. Thomison, Gregory A. Brown, Anthony L. Halter, Jason Wells,  
and Kirby L. Wuethrich

## ABSTRACT

Delayed planting shortens the effective growing season for corn (*Zea mays* L.), increasing the risk of late-season stresses. Farmers often must decide whether to plant early or late to minimize this risk. The objective of this study was to determine whether delayed planting influenced grain yield, silking, and kernel weight. The effects of delayed planting on corn hybrid maturities were investigated at four locations. The time from planting to silk emergence was longer for late-planted corn. GDDs for June vs. early May planting decreased an additional 110 GDD. The decrease in GDDs from planting in early June compared to early May was greater for late-planted corn. The three hybrids with greater GDD decreases with delayed planting had greater rates of GDD decrease with

season requirements of corn hybrids. Unfortunately, the *days-to-maturity* hybrid maturity descriptor most commonly

called *relative maturity* or time (Nielsen et al., 1994). Whether a given hybrid is a late-planting

often used by farmers to make planting decisions. The relationship between GDDs and relative maturity (BL) for corn hybrids typically require a late-planting

GDDs are potentially important decisions

Our previous research suggested that hybrid GDD to black layer decrease ~ 6.8 GDD per day of delayed planting after May 1... Thus, a hybrid normally rated as 2440 GDD might mature in mid-Sept with only 2168 GDD when planted June 10 (40 days after May 1)

Nielsen et al., 2002, Delayed Planting Effects on Flowering and Grain Maturation of Dent Corn. Agron. J. 94:549-558





## Corny News Network

12 Oct 2019

URL: [http://www.kingcorn.org/news/articles\\_19/LatePlantedCornMaturity\\_1012.html](http://www.kingcorn.org/news/articles_19/LatePlantedCornMaturity_1012.html)

## Late Planted Corn Not Maturing as Expected

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Keen observers were reporting that late-planted fields were maturing at GDD greater than expected

In recent weeks, I have received reports that late-planted corn fields are not maturing as expected. The number of GDD (GDD) from planting to kernel black layer is greater than anticipated relative to the GDD ratings for the hybrids AND the unusually late planting season of 2019. This is interesting because earlier this season, when we were all struggling to find the planting "windows of opportunity", I offered some guidelines for making hybrid maturity decisions for delayed planting predicated on the fact that hybrid GDD to maturity decrease with delayed planting (Nielsen, 2019).

Results from earlier research conducted throughout Indiana and Ohio (Nielsen et al., 2002) indicated that the number of GDD from planting to kernel black layer decrease approximately 6.8 GDD per day of delayed planting after May 1. For example, a hybrid normally rated as 2700 GDD to black layer, but planted on May 31 (30 days after May 1), might reach maturity (kernel black layer) in only 2496 GDD after planting ( $2700 - (30 \text{ days} \times 6.8)$ ) instead of its usual 2700 GDD. The results from that earlier research suggested that farmers could plant their usual relative hybrid maturities later than otherwise expected with minimal risk of late season damage from frost or freezing temperatures.

[Click image for larger view](#)

Indeed, some of our late-planted trials reached black layer at GDD expected for late April plantings, not June

## Predicted vs Actual Black Layer Dates for Several Trials

1-May

Location	Planted	est. GDD to kernel black layer				Actual black layer	
		Normal	est. Date	Late plt	est. Date	Est. date	Est. GDD
Eastcentral	6-Jun	2575	3-Oct	2330	19-Sep	3-Oct	2567
Eastcentral	7-Jun	2600	5-Oct	2348	22-Sep	13-Oct	2661
Northeast	4-Jun	2600	1-Oct	2369	27-Sep	18-Oct	2546
Northeast	3-Jun	2440	3-Oct	2216	18-Sep	8-Oct	2493
Westcentral	10-Jun	2440	1-Oct	2168	15-Sep	4-Oct	2453
Westcentral	4-Jun	2640	7-Oct	2409	23-Sep	16-Oct	2695
Westcentral	3-Jun	2730	15-Oct	2506	28-Sep	14-Oct	2703

# What was different in 2019?

- Kernel black layer develops in response to reduced photosynthate (sucrose) availability late in the season due to...
  - Normal leaf canopy deterioration
  - Sub-optimum temperatures typical in mid to late September / early October
- In 2019, late-planted corn was still “healthy” in mid to late September & could take advantage of warmer than normal September temperatures...



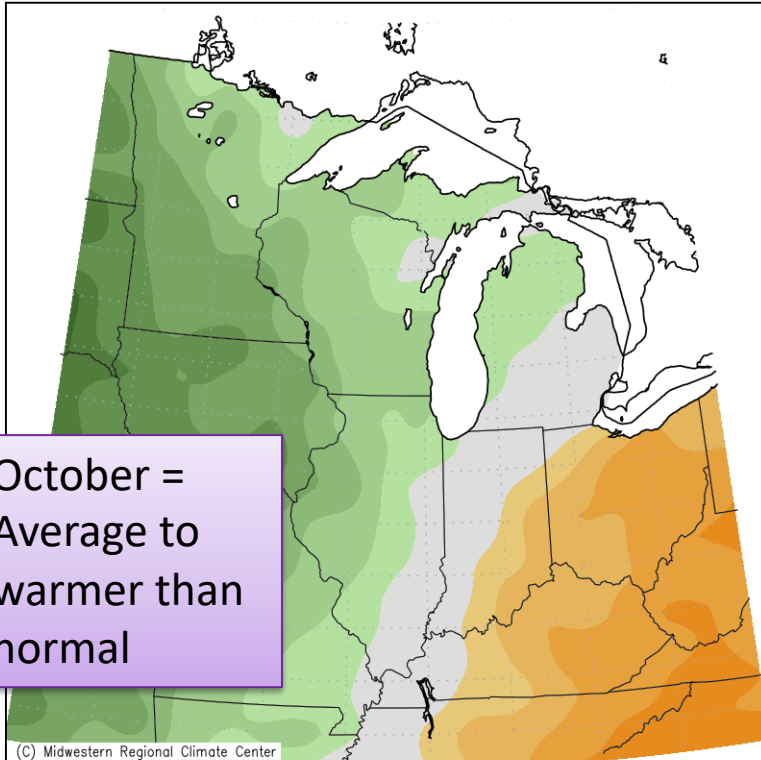
101 “day” hybrid (2440 GDD rating) planted June 10.  
I estimated BL would occur ~ 2168 GDD in mid-Sept.  
On Sept 14, crop was only  $\frac{1}{4}$  to  $\frac{1}{2}$  milkline.  
Physiol. maturity occurred ~ Oct 4 (2453 GDDs)



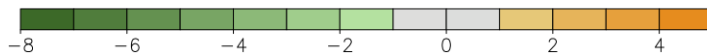


# Late maturation + Average to cooler than average temperatures = Not conducive to grain drydown

Average Temperature (°F): Departure from Mean  
October 1, 2019 to October 31, 2019

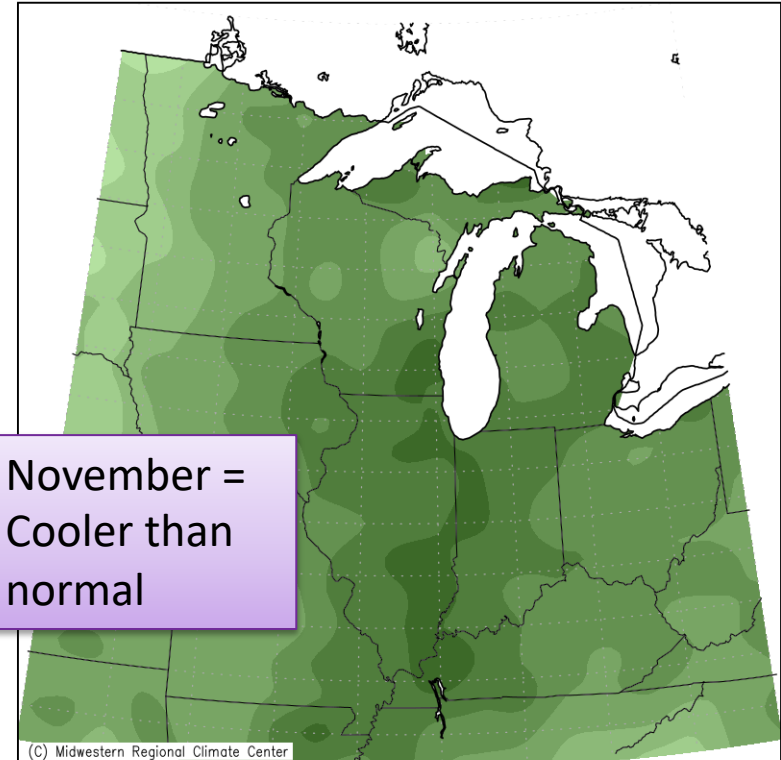


Mean period is 1981–2010.



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Average Temperature (°F): Departure from Mean  
November 1, 2019 to November 30, 2019



Mean period is 1981–2010.



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Illinois State Water Survey, Prairie Research Institute  
University of Illinois at Urbana–Champaign

# 2019: Many near-record achievements

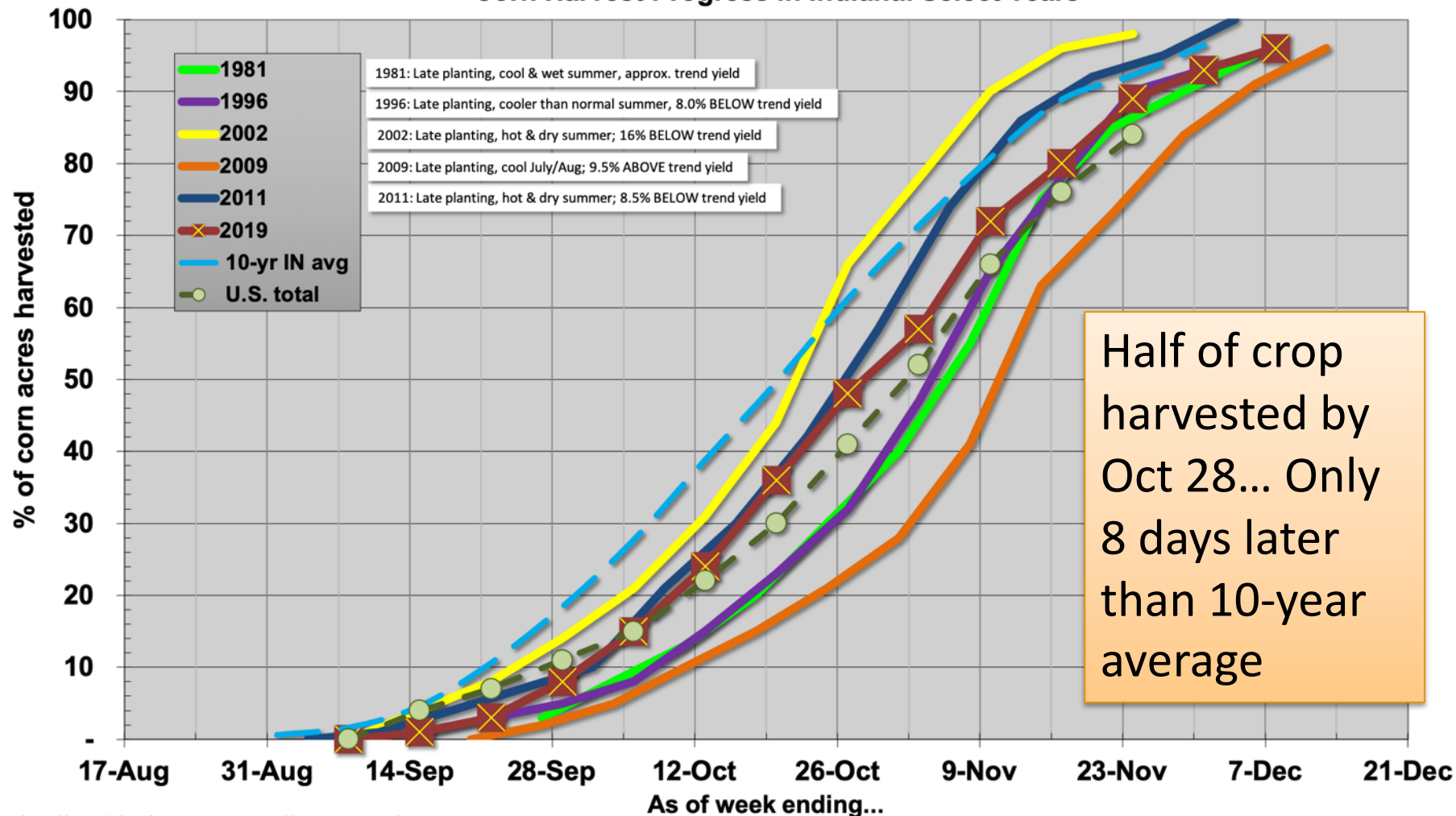
- Planting progress statewide was among the 3 latest in past 40 years
  - Nearly 710,000 acres not planted
- Silking among 3 latest in 40 years
- Grain maturity among 3 latest in 40 years
- Grain harvest 5<sup>th</sup> latest in 40 years



# 1<sup>st</sup> half of harvest went amazingly well, then...



Corn Harvest Progress in Indiana: Select Years



Adapted by RLNielsen from USDA-NASS weekly crop progress data



# 2019: Many near-record achievements

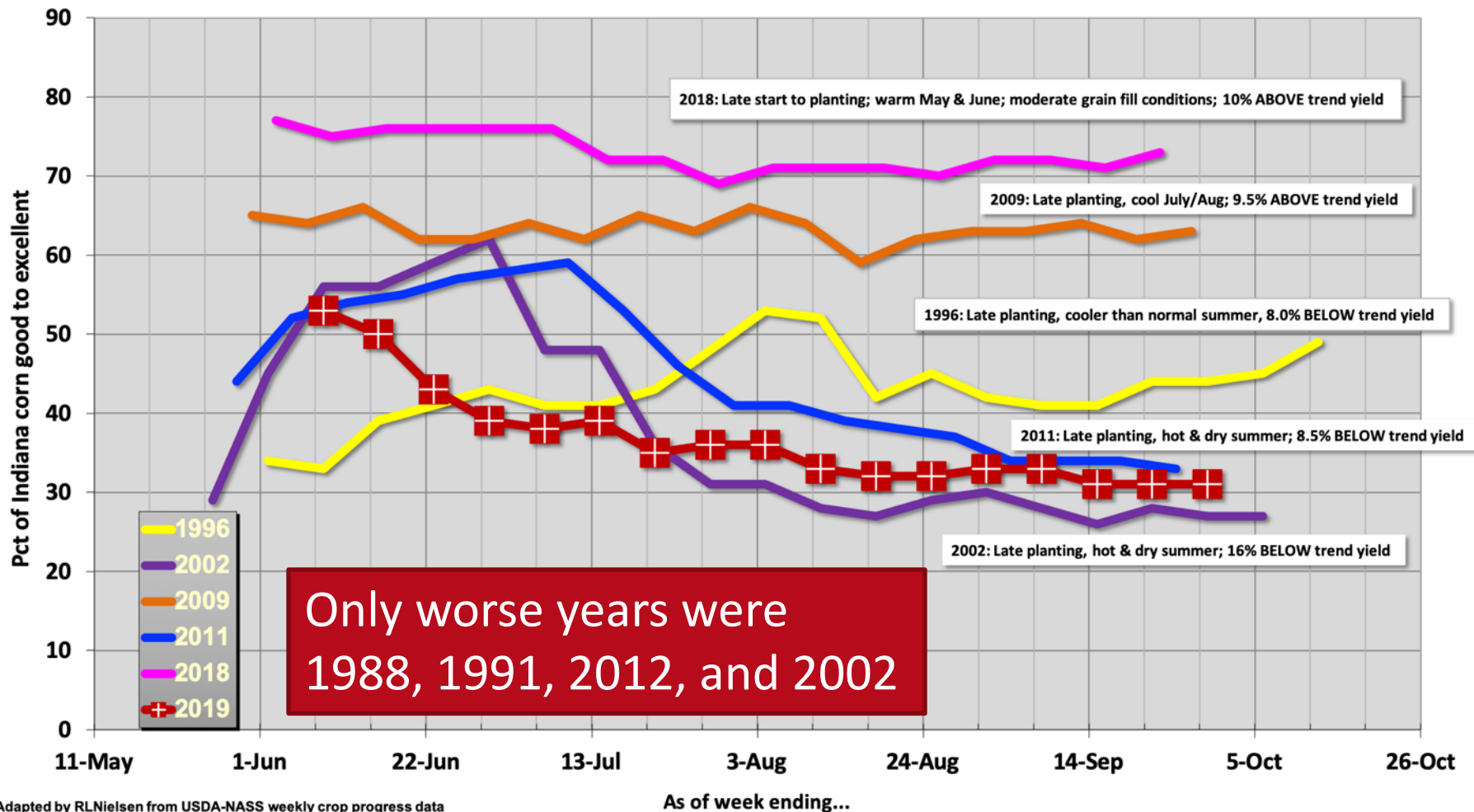
- Planting progress statewide was among the 3 latest in past 40 years
  - Nearly 710,000 acres not planted
- Silking among 3 latest in 40 years
- Grain maturity among 3 latest in 40 years
- Grain harvest 5<sup>th</sup> latest in 40 years
- Season-long crop condition ratings were 5<sup>th</sup> worst in 34 years



# Less than 40% “Good” to “Excellent” for most of the season

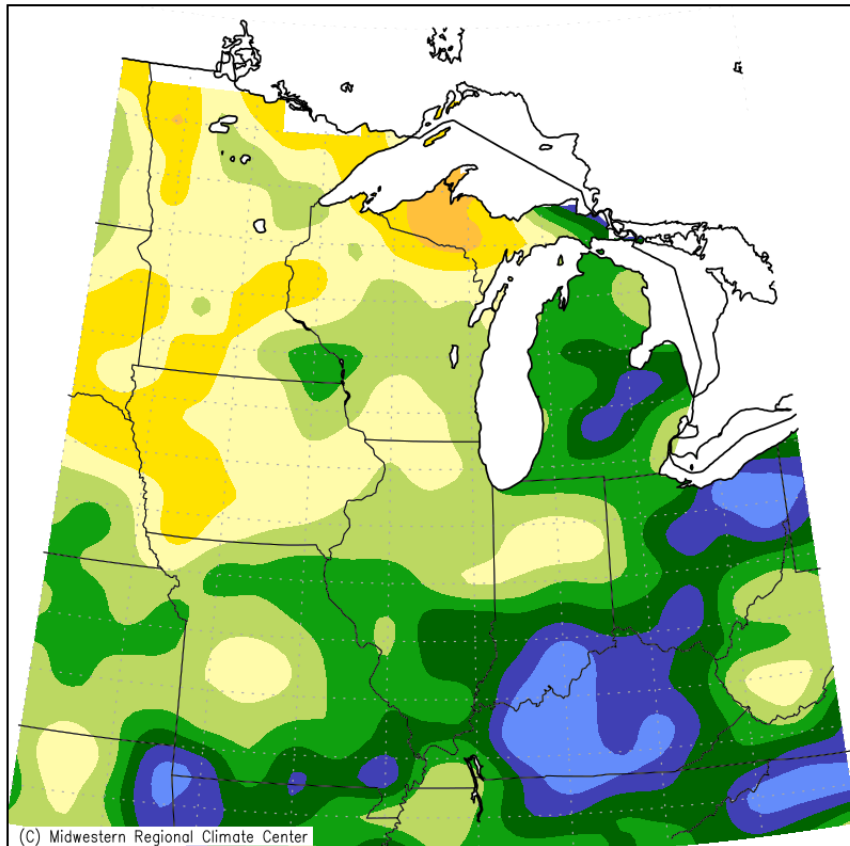


Seasonal Indiana Corn Crop Condition Ratings for Select Years  
Percent of Acres “Good” and “Excellent”

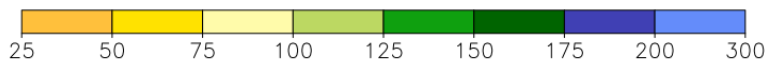


Adapted by RLNielsen from USDA-NASS weekly crop progress data

# Accumulated Precipitation: Percent of Mean June 1, 2019 to June 30, 2019



Mean period is 1981–2010.

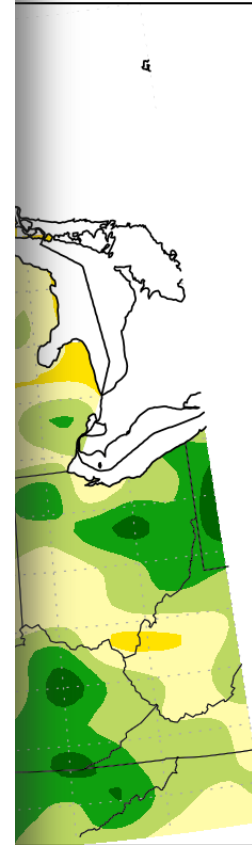


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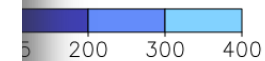
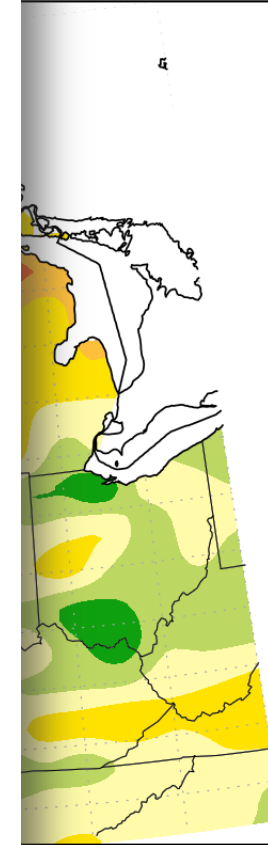
University of Illinois at Urbana–Champaign

nt of Mean  
2019



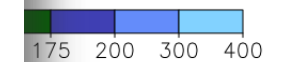
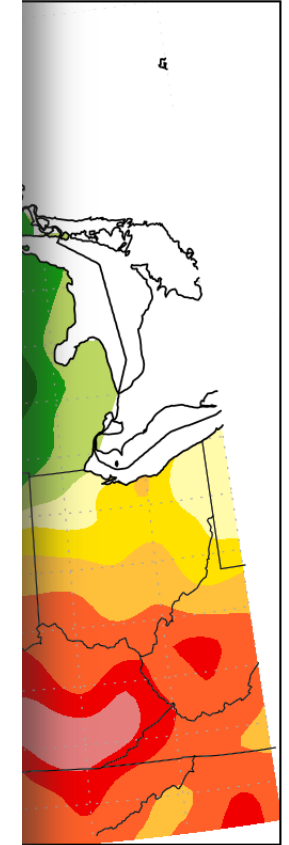
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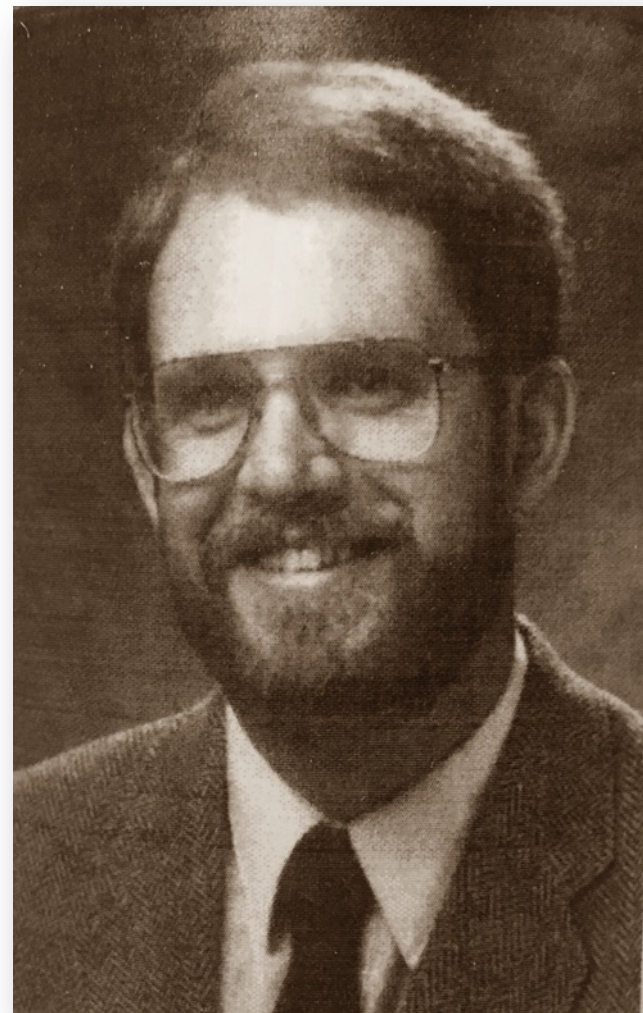
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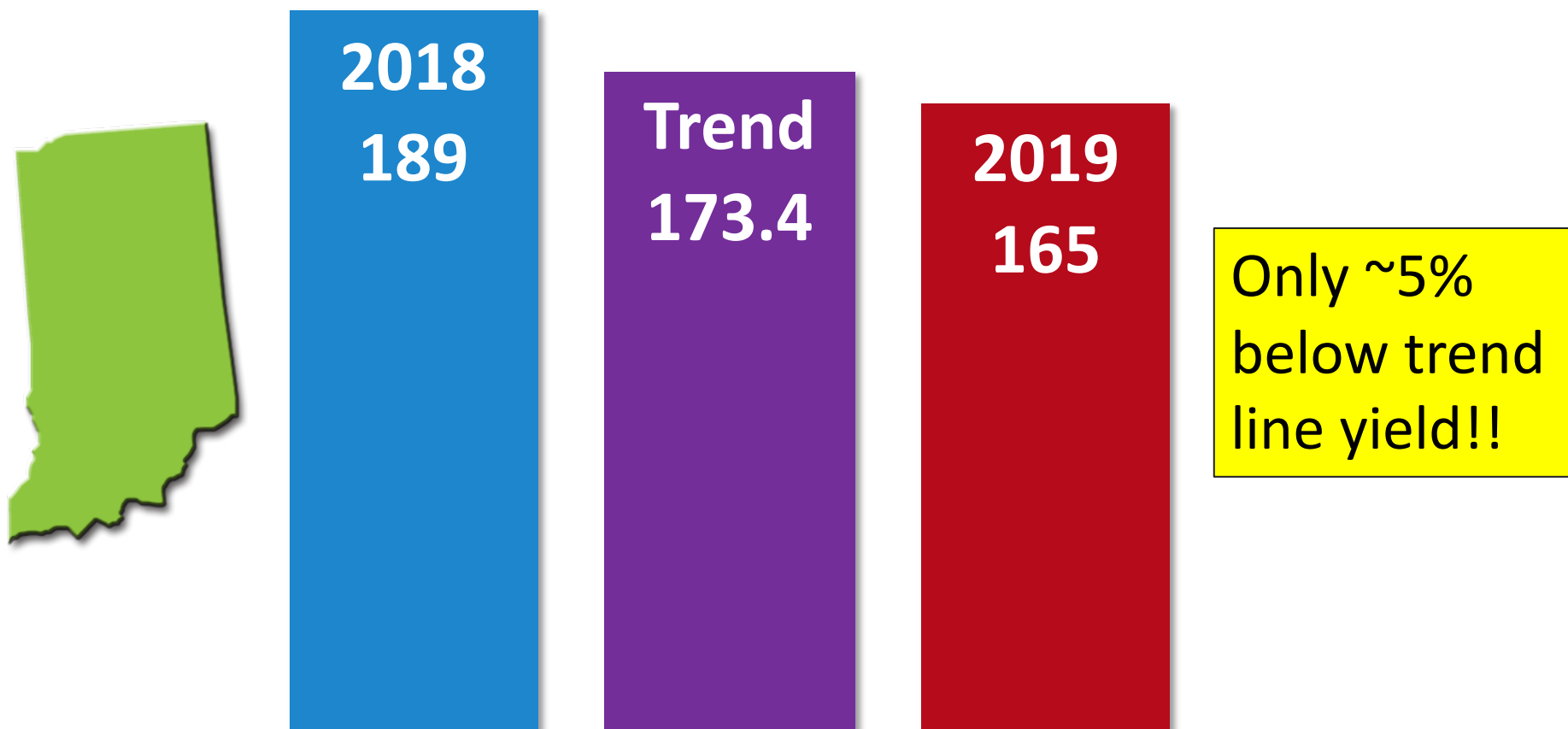
# Well, maybe we should worry...

- Trustworthy corn  
Extension specialists told us that such poor crop condition ratings did not bode well for yield
- Estimated statewide corn yield could be as bad as 15% below trend!



CornGuy image ca. 1980's

# And yet, statewide 2019 grain yield estimate is amazingly high!

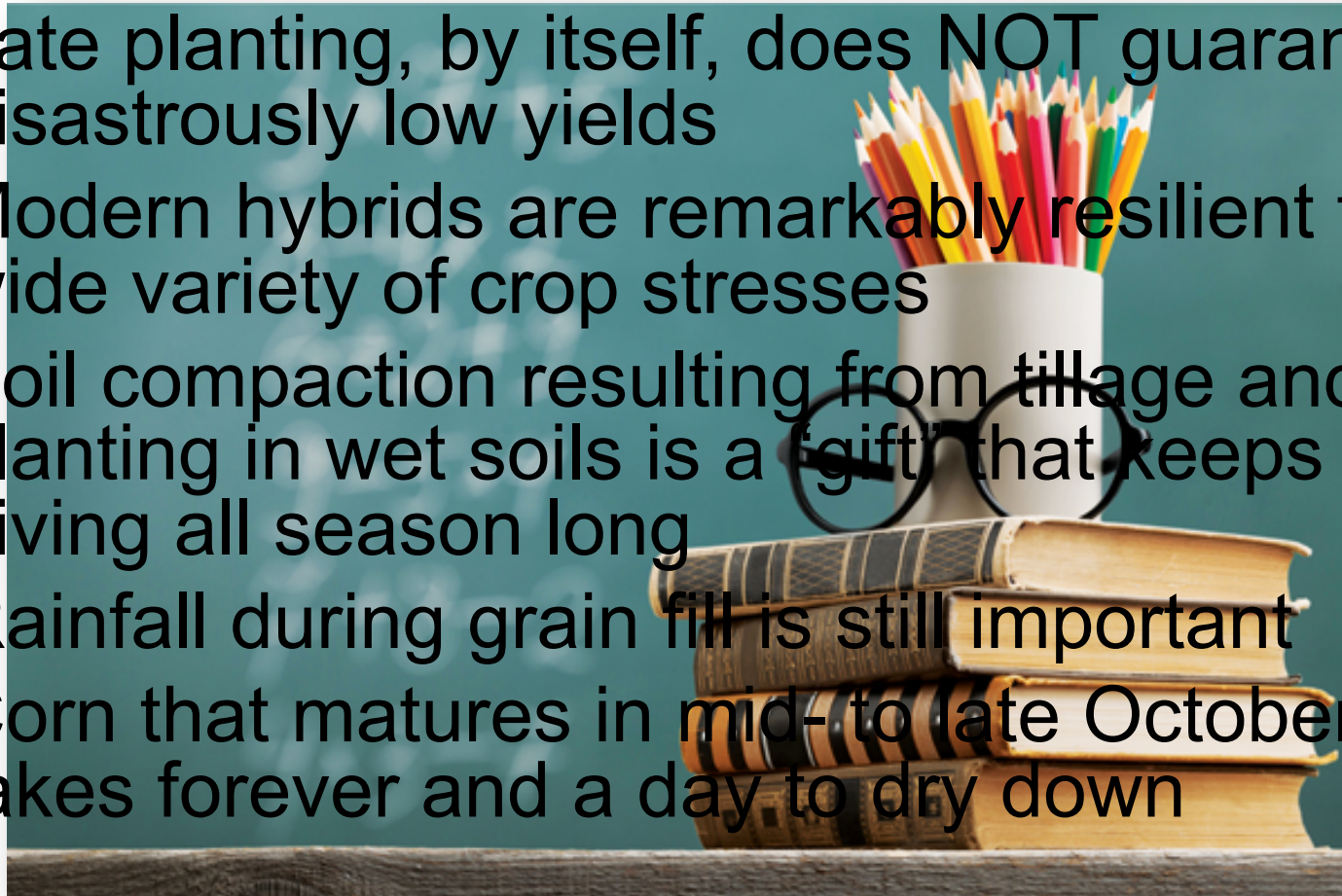


Data derived from USDA-NASS, 2019 est. current as of Nov 2019



# Lessons learned (or re-learned) in 2019...

- Late planting, by itself, does NOT guarantee disastrously low yields
- Modern hybrids are remarkably resilient to a wide variety of crop stresses
- Soil compaction resulting from tillage and planting in wet soils is a 'gift' that keeps on giving all season long
- Rainfall during grain fill is still important
- Corn that matures in mid- to late October takes forever and a day to dry down



# Looking ahead...

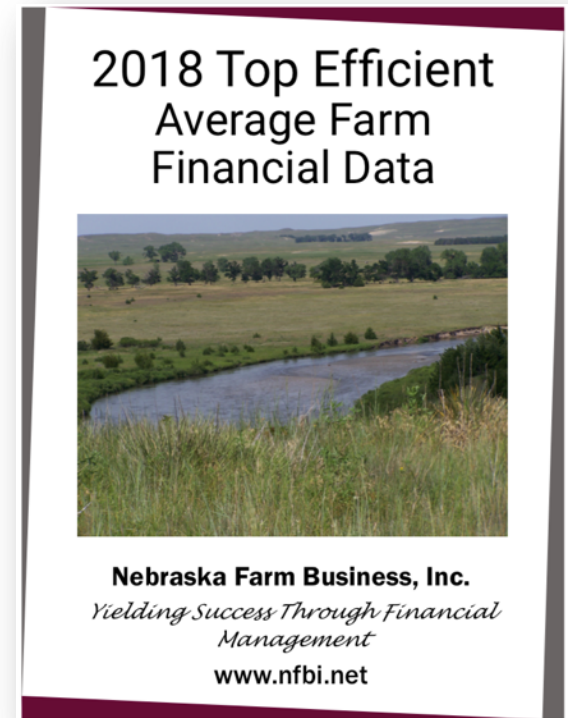
- Next year's extreme weather?
- Next year's grain prices?
- Fertilizer cost is less than 2019, but other variable costs about the same
- Profit margins will continue to be tight
- Seek to improve profit by 1) trimming costs without sacrificing yield or 2) cost-effectively increasing yields





# Characteristics of Efficient Farms?

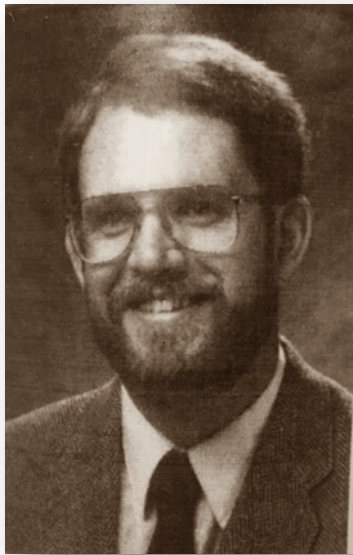
- It's not about marketing
- Higher yields, but not remarkably so
- *"It's saving a little bit in every [cost] category."*
  - In total, average \$40 to \$60 less cost per acre for efficient farms
- *"...the takeaway is to make sure the decisions being made produce the highest net return."*



# Focus on the fundamentals

- We all need to sharpen our focus on the agronomic fundamentals of growing corn.
- There are no “silver bullets” or “one size fits all” solutions to improving corn yields.
- Use today’s technologies to supplement your agronomic decision-making, not replace it.





# Timely agronomic information

Purdue Extension Agriculture Agronomy the Chat 'n Chew Cafe

## The Chat 'n Chew Cafe

Timely Agronomic News & Information  
for the U.S. Corn Belt



**[www.kingcorn.org/cafe](http://www.kingcorn.org/cafe)**

# More “corny” information...

Purdue Extension Agriculture Agronomy Chat 'n Chew Cafe Corny News Compendium

## Topic Areas

General information

Hybrid selection

Planting date, replanting

Plant populations,  
seeding depth

Stand uniformity, planter  
maintenance

Soil fertility & plant  
nutrition

Growth staging

Early season problems

Mid season

## Corny News Compendium

One of the great characteristics of the Web is its ability to serve as a repository of historical information that is accessible at the click of a mouse. These Corny News Network (CNN) Archives serve as a repository for the agronomic articles published by yours truly at the Chat 'n Chew Café since 1995, with some additional others written by some of my colleagues here at Purdue. There is value to preserving these articles because the problems and issues they speak to repeat themselves in corn fields somewhere every year. Even though you may not have seen a particular problem before, chances are that I have during my nearly 40 years of walking corn fields.

The articles are grouped by topic areas in the sidebar list to the left on large screen devices or by clicking the menu icon in the upper

the topic of  
browse.

*"Some problems are so complex that you have to be highly intelligent and well informed just to be undecided about them."*

— Laurence J. Peter



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Available at...

[www.kingcorn.org/cafe](http://www.kingcorn.org/cafe)



**“Always do right.....  
This will gratify some people  
and astonish the rest.”**  
— *Mark Twain*

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