Flood-Drought-Flood Challenges for Agriculture

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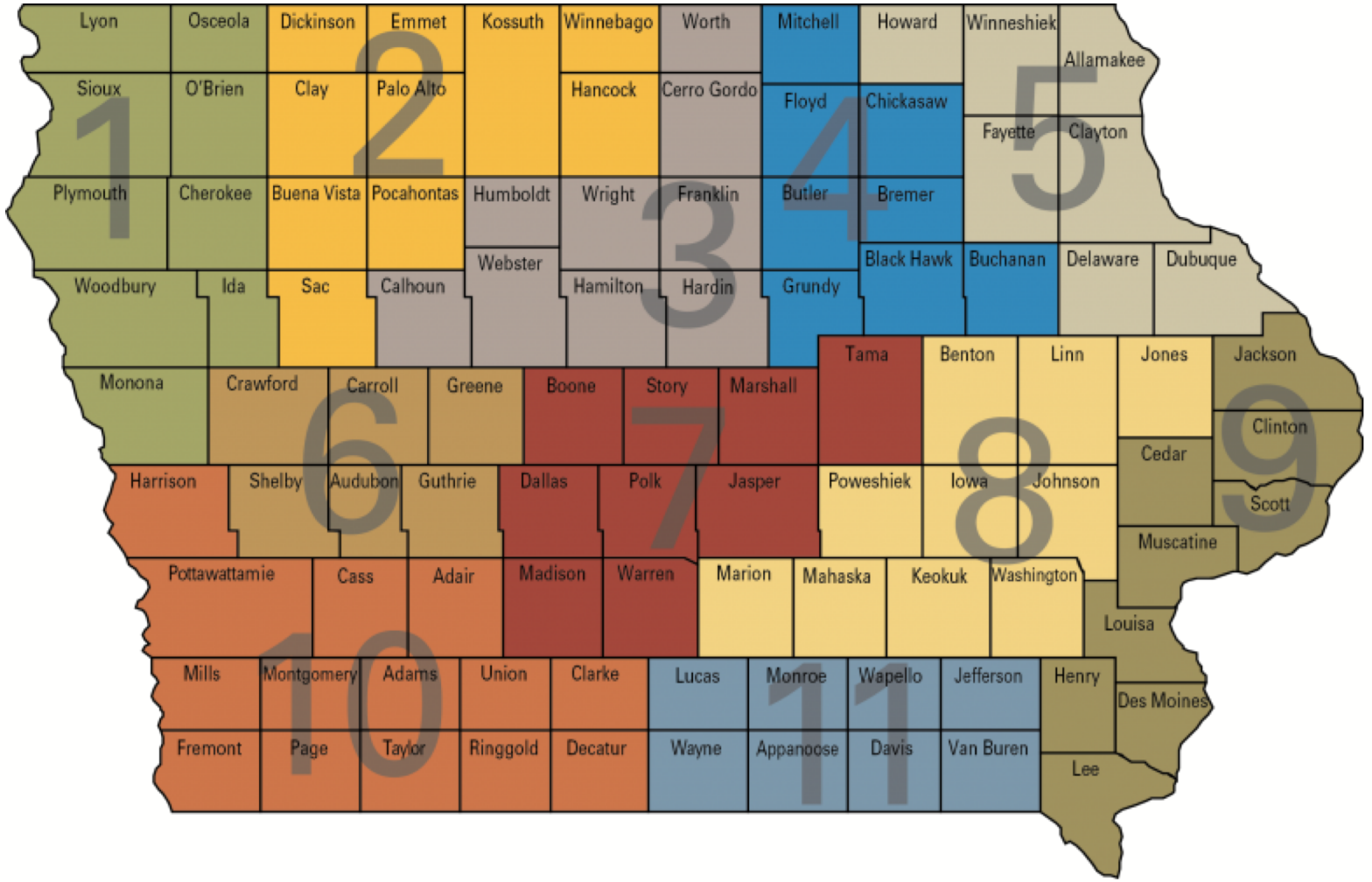
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Floyd
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Buena Vista
Pocahontas
Humboldt
Wright
Franklin
Butler
Bremer
Webster
Black Hawk
Buchanan
Delaware
Dubuque
Woodbury
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Hamilton
Hardin
Grundy
Tama
Benton
Linn
Jones
Jackson
Monona
Crawford
Carroll
Greene
Boone
Story
Marshall
Clinton
Cedar
Harrison
Shelby
Audubon
Guthrie
Dallas
Polk
Jasper
Poweshiek
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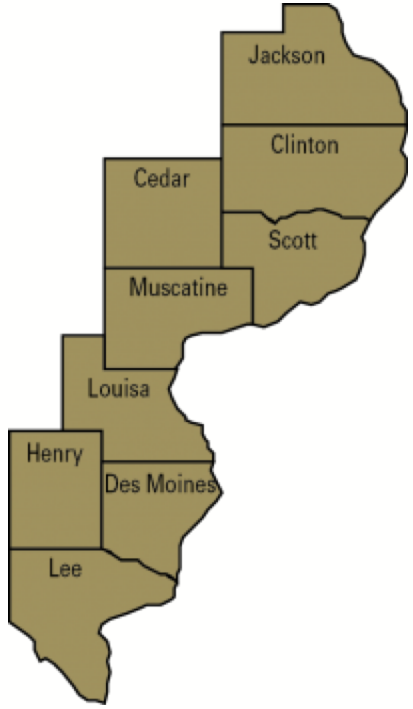
Agenda

- 2019 In a Nutshell
- Impacts on Crop Production
- Management Challenges
- Early Warning Assistance Implications



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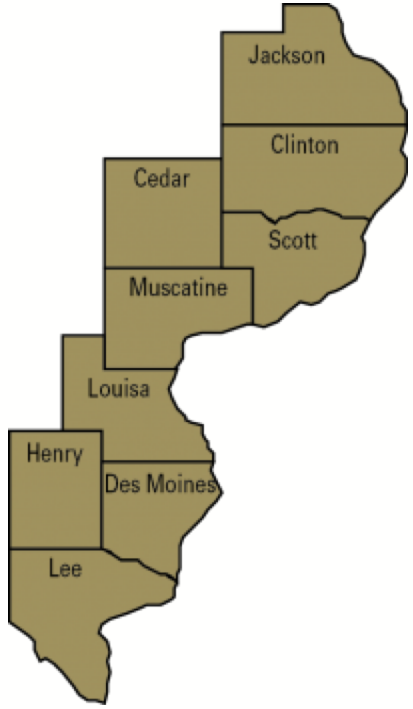
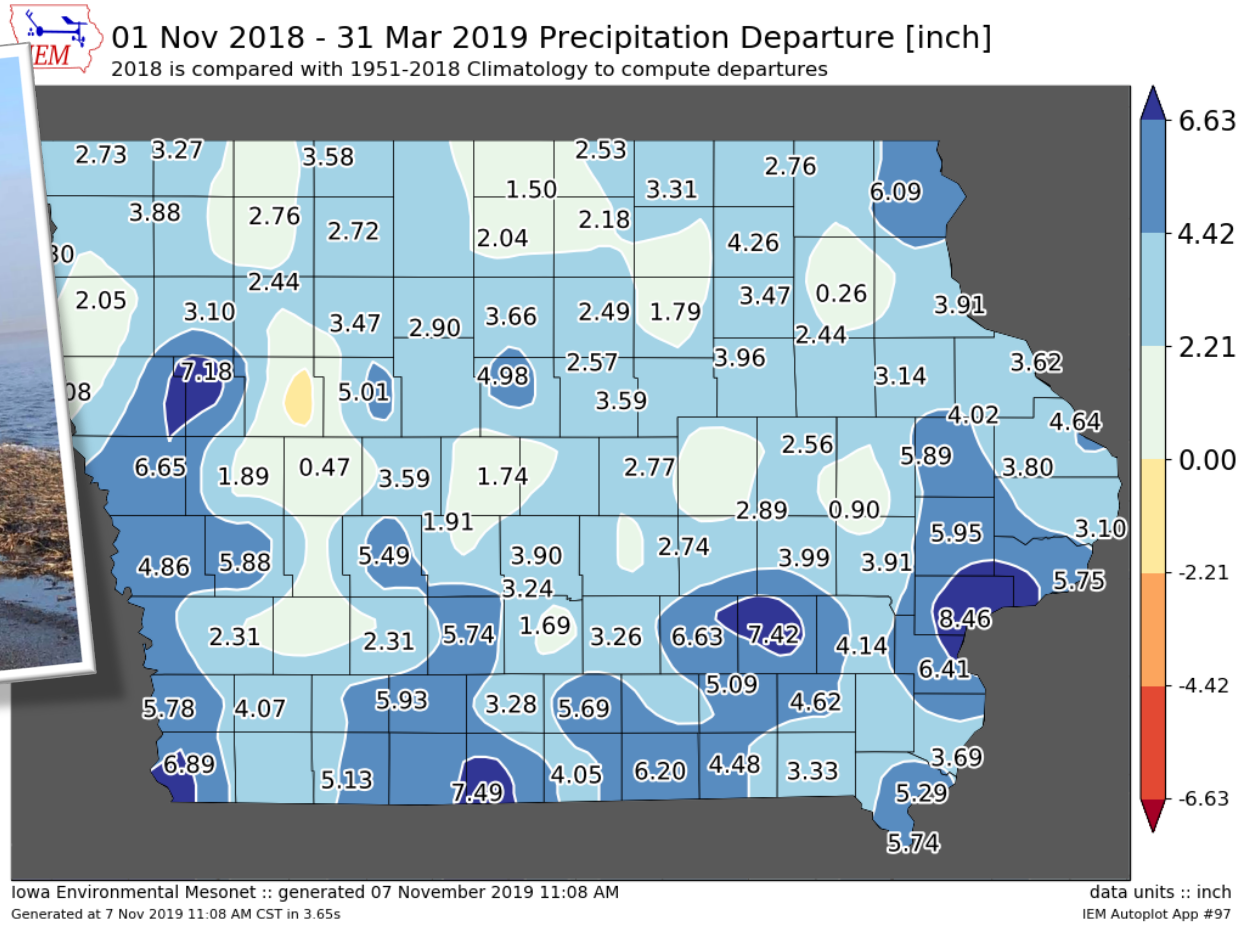


2019

- Six floods on the Mississippi River
  - One > 90 days
- Drought in mid-Summer
  - ~10 weeks

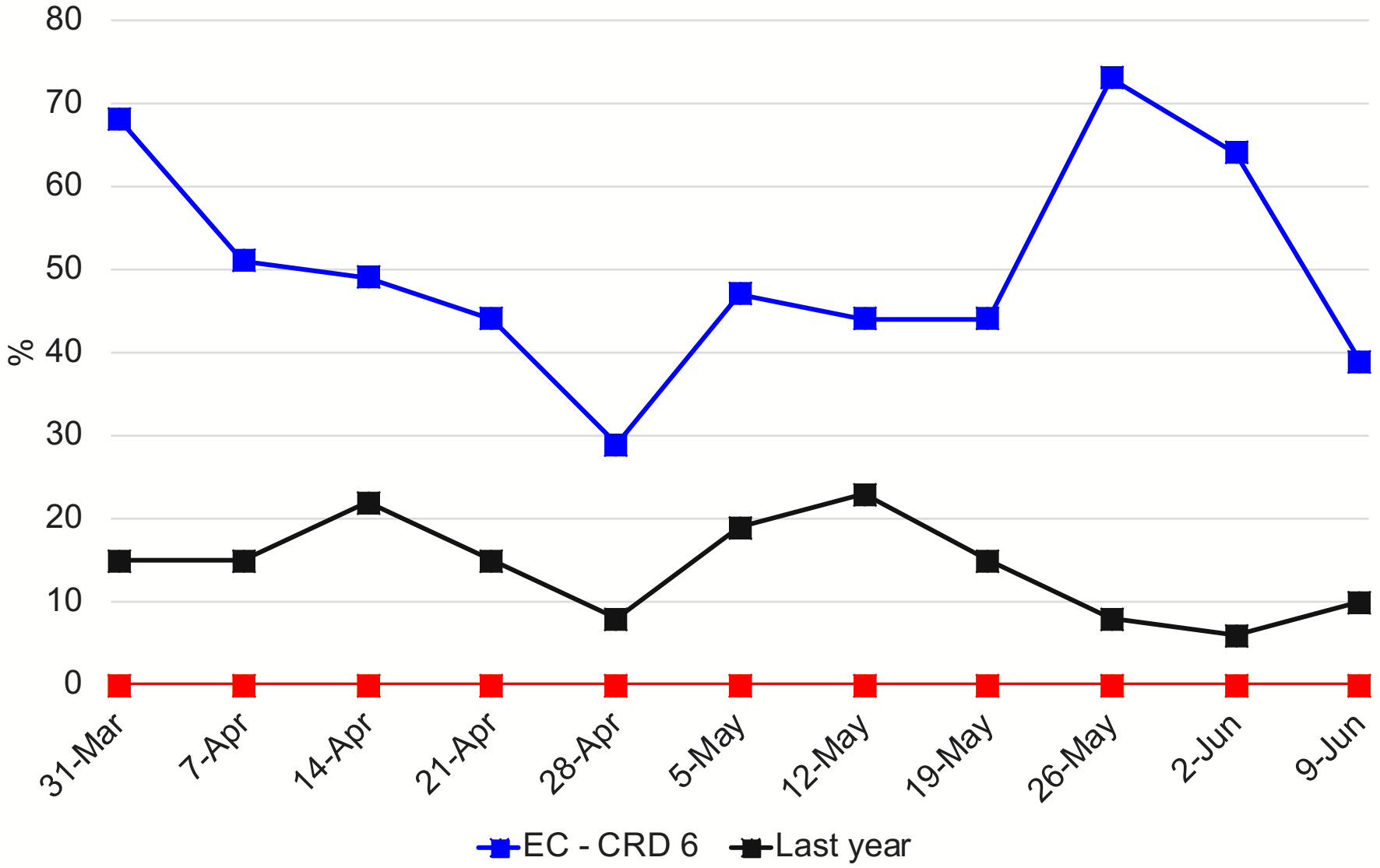
Fall 2018/Winter 2019

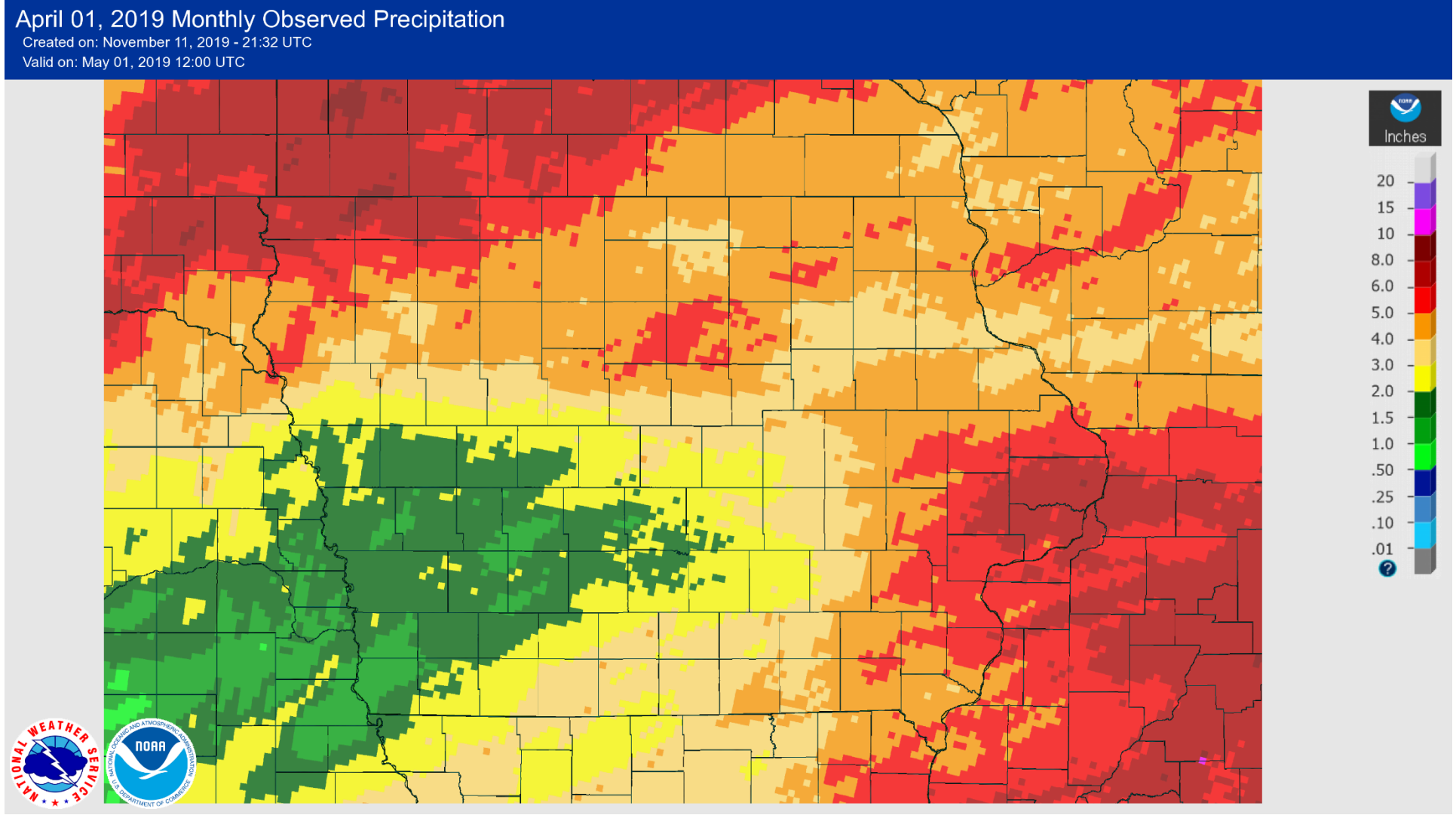
3rd Wettest on Record



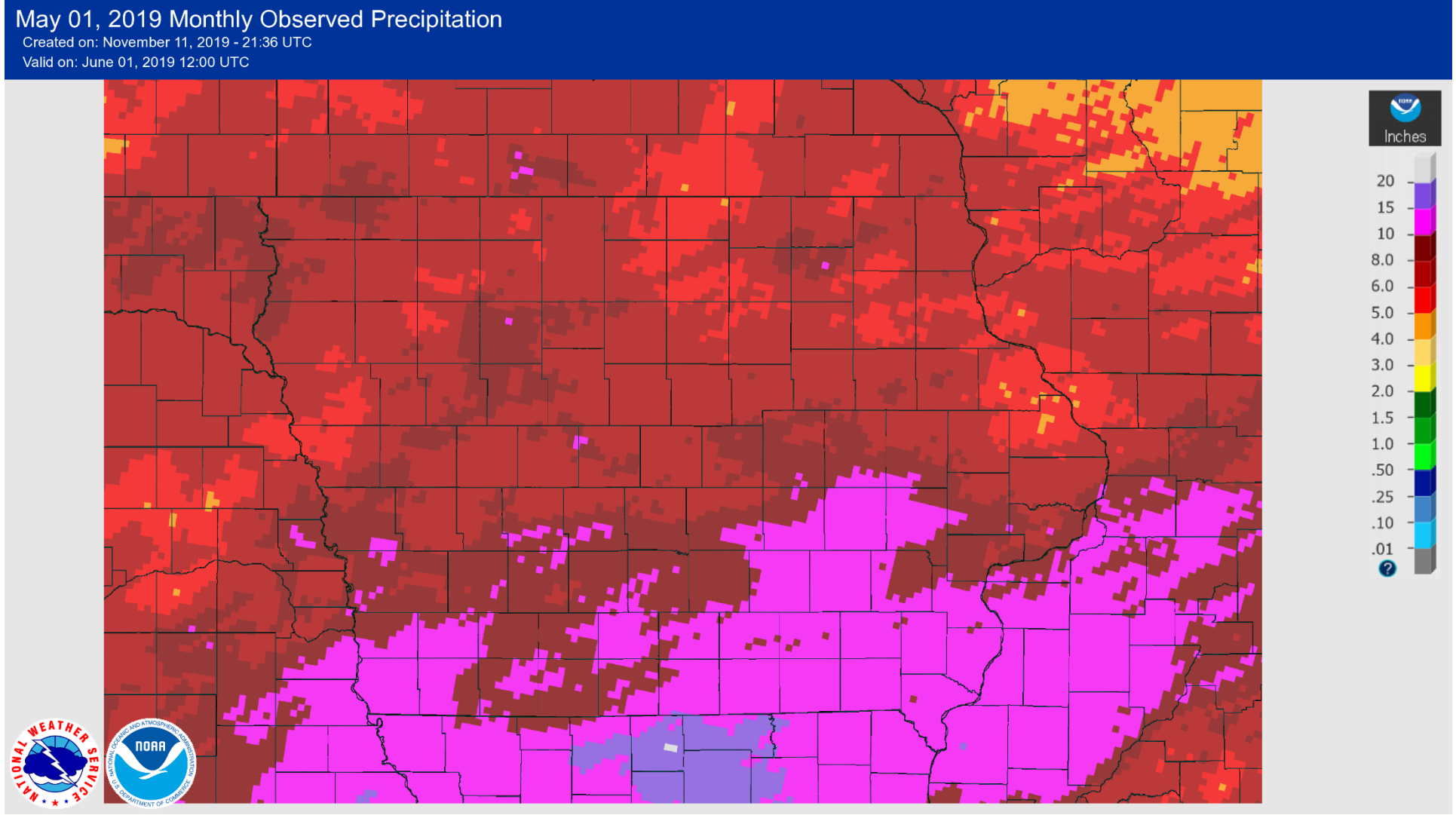
% of Topsoil with Surplus Moisture

March 31 – June 9

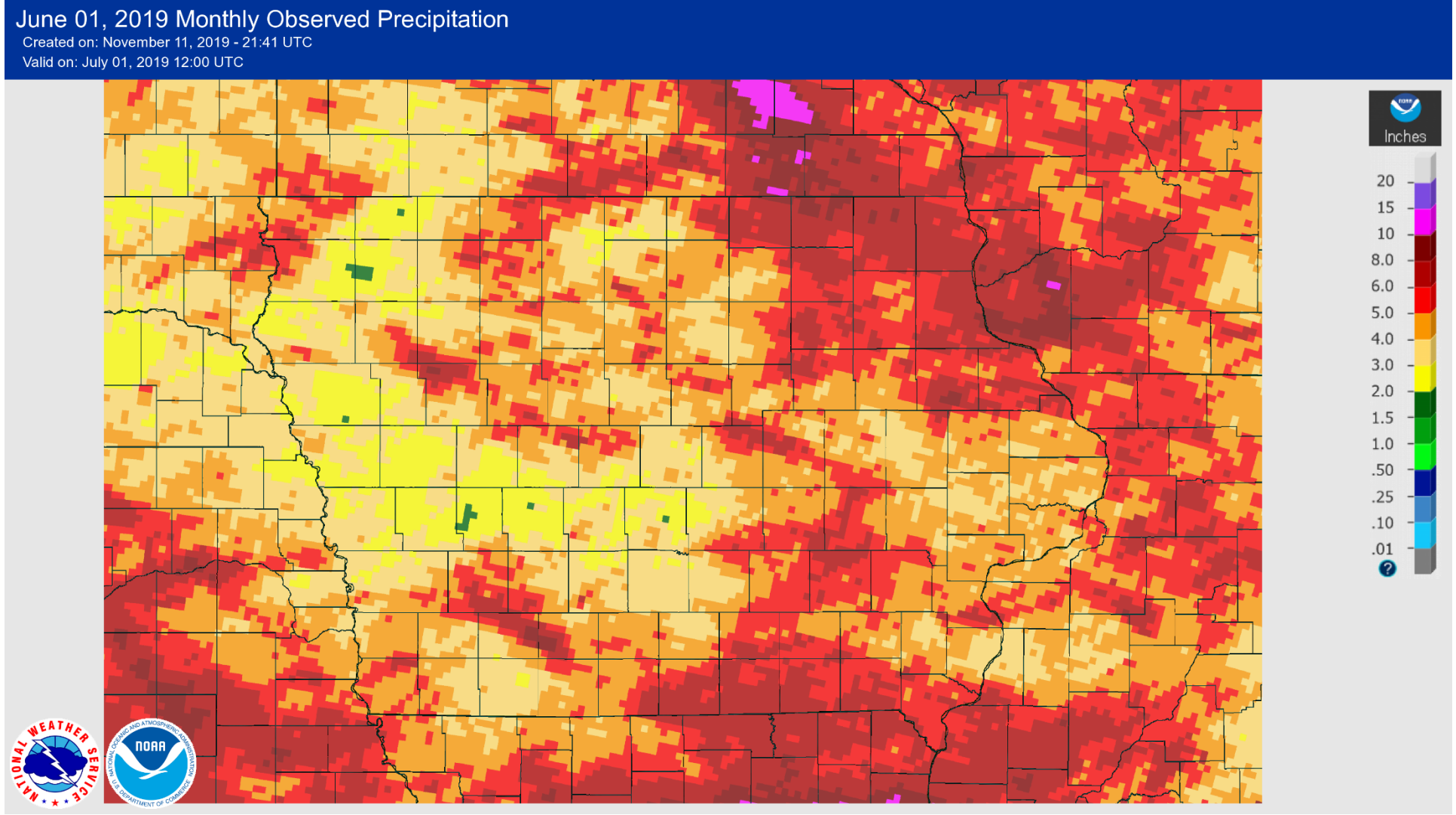




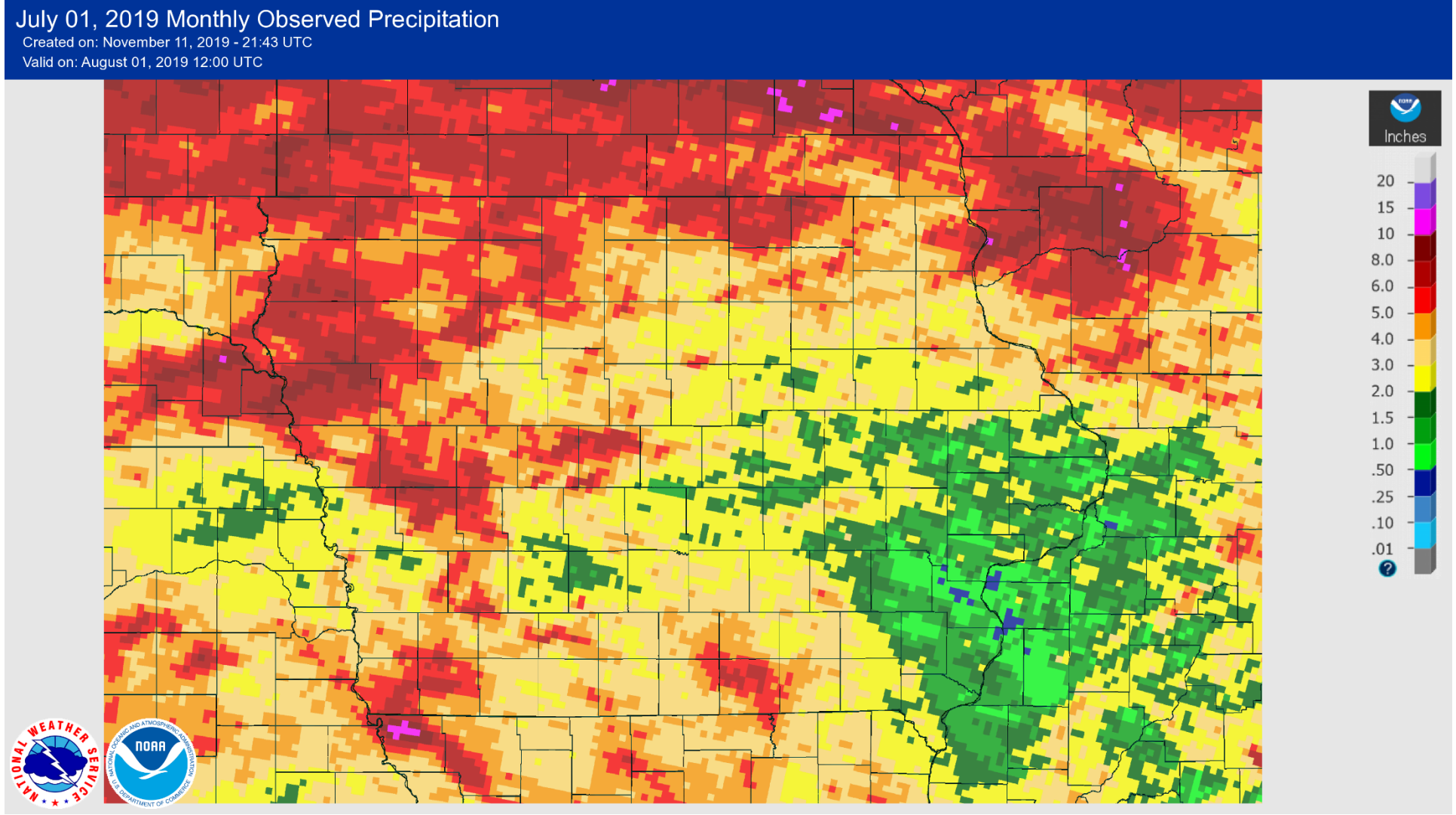
- Corn planting generally begins in mid-to-late April
  - Some in late April



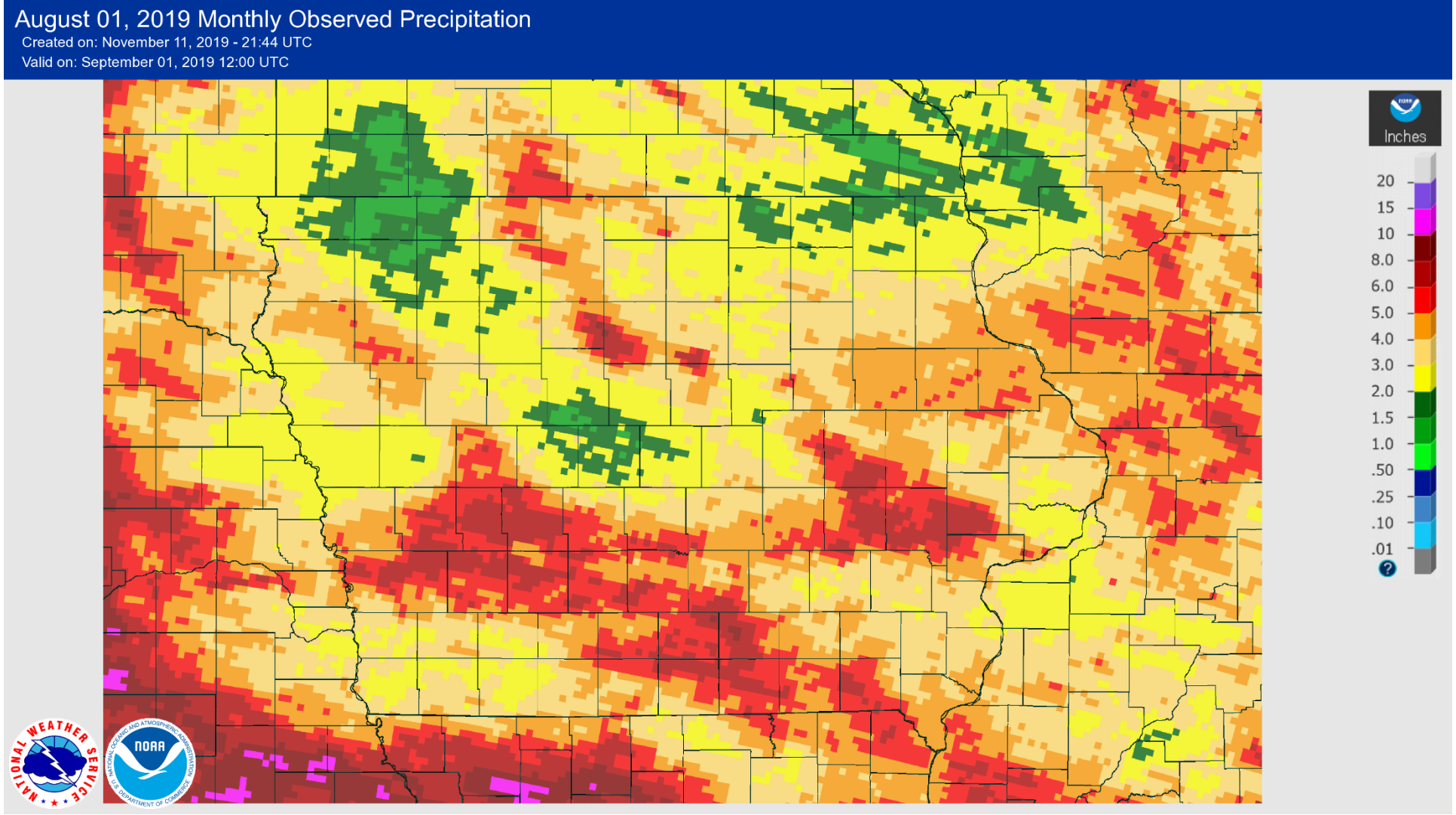
- A few people were able to work in the field May 15 - 16



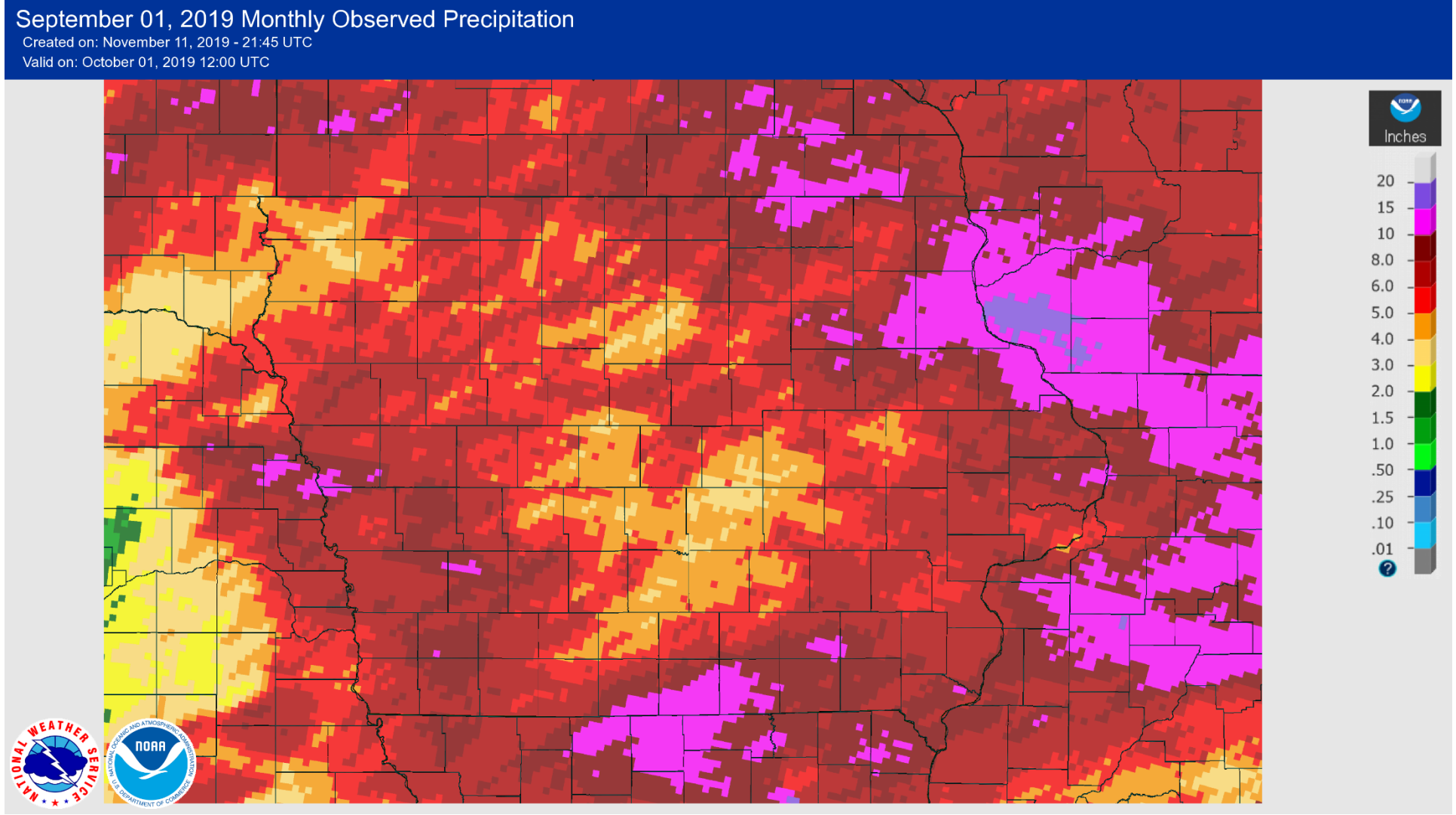
- Much corn planted the first week of June.
- Most soybeans planted the second week of June.
- April plan and May planted corn show drought stress for a week
- June planted corn showed drought stress beginning in late June.



- Flash drought begins.
  - June planted corn continues to struggle with drought
  - Crops on coarse textured soils struggle.
  - Forage growth is slow.
  - Some pastures begin to turn brown.



- Crops on coarse textured soils continue to struggle
  - Some corn is taken as silage
- Forage growth is slow.
- Pastures with small-bladed grass start to brown.



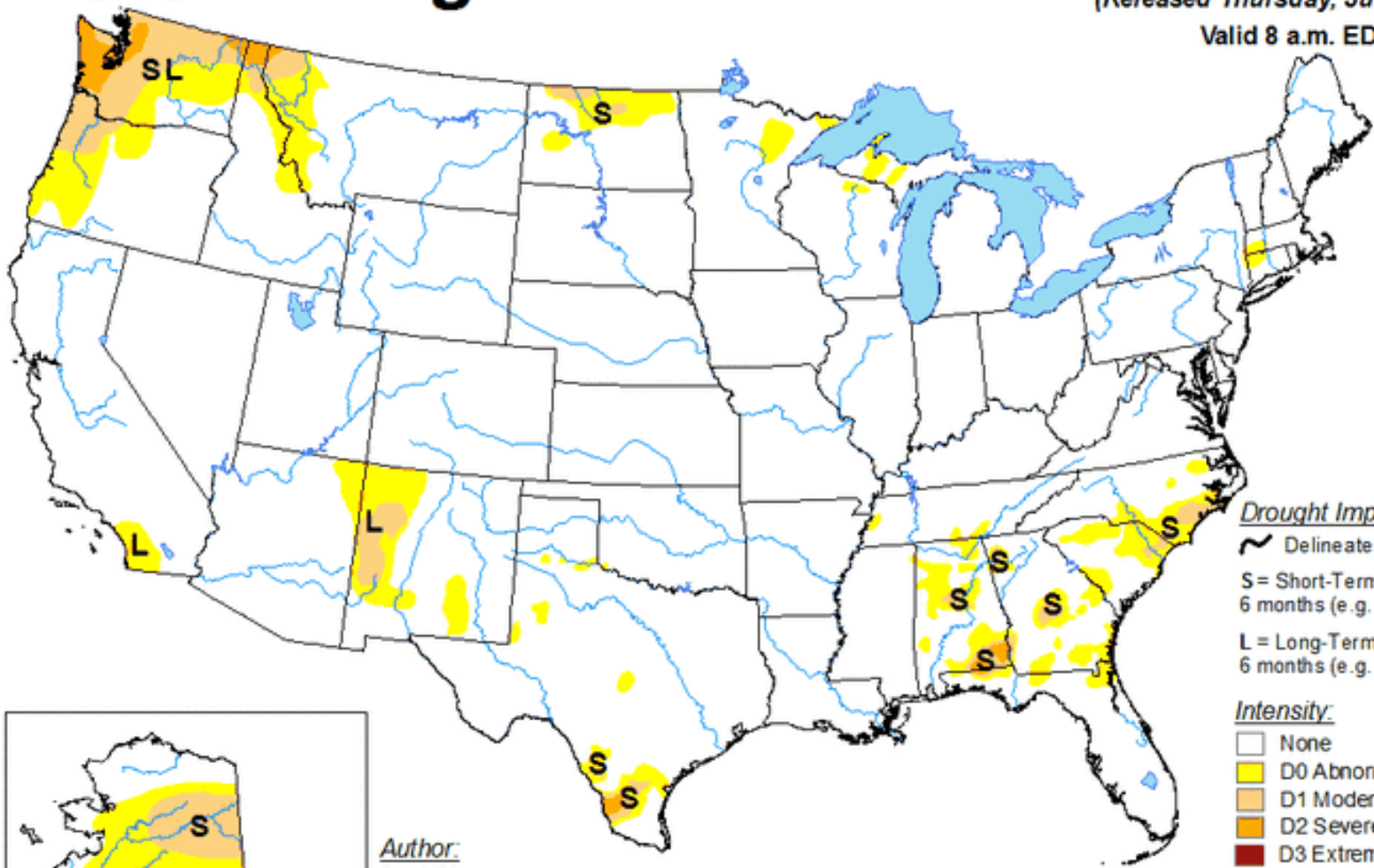
- Harvest normally begins in mid-to-late September
- Prohibited by
  - Late maturing of grain crops.
  - Unfit field conditions.

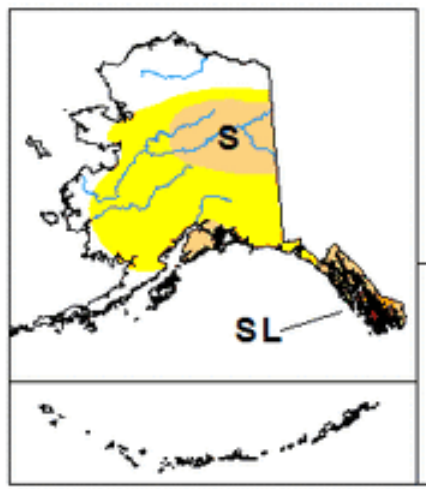
U.S. Drought Monitor

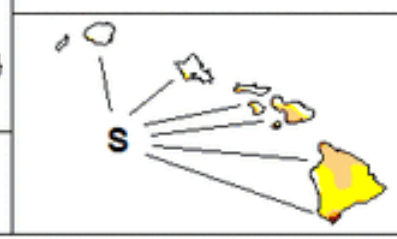
July 16, 2019

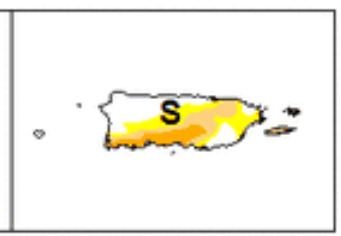
(Released Thursday, Jul. 18, 2019)

Valid 8 a.m. EDT









Author:
Brad Rippey
U.S. Department of Agriculture

Drought Impact Types:

~ Delineates dominant impacts

S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)

L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

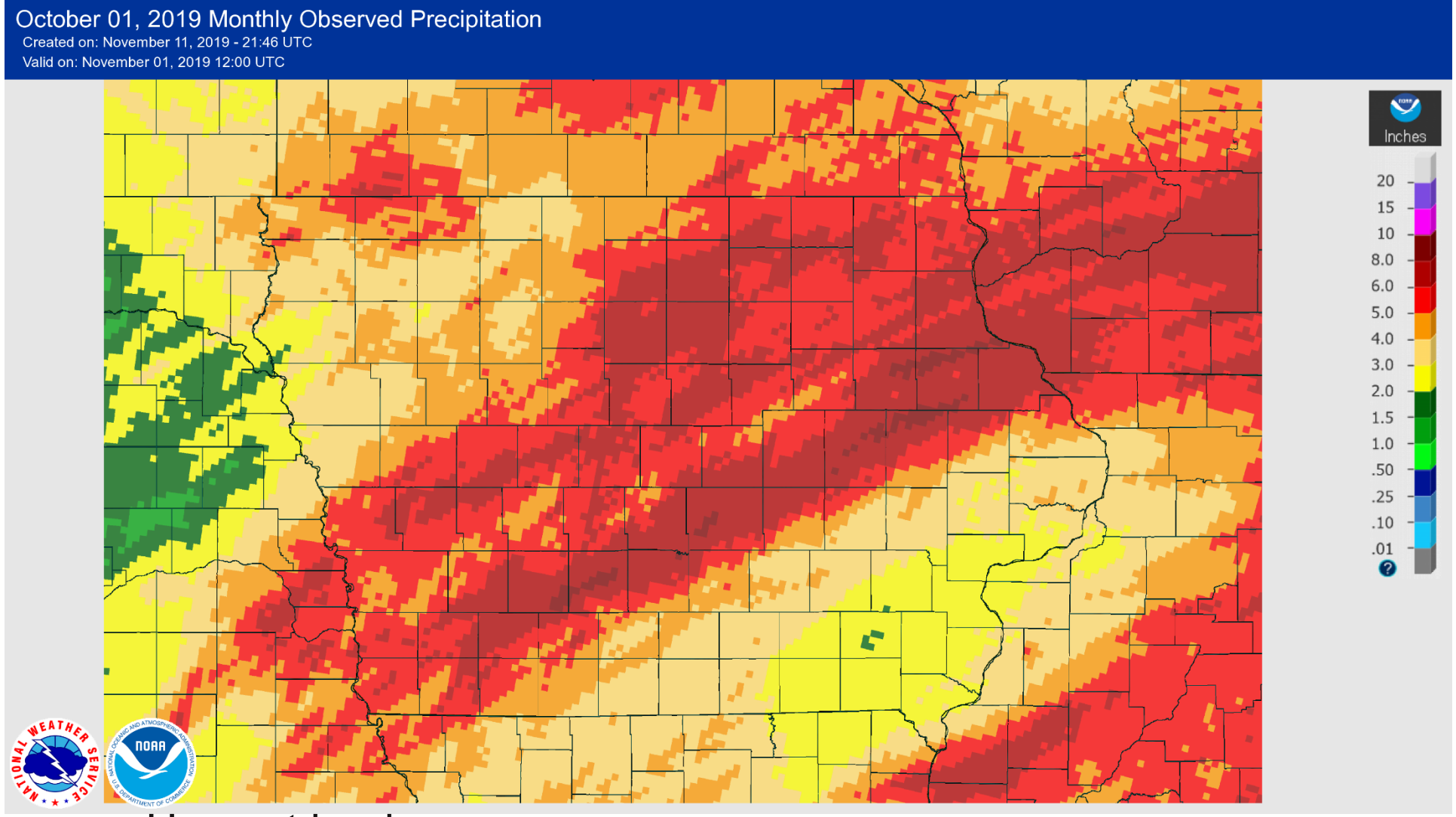
Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

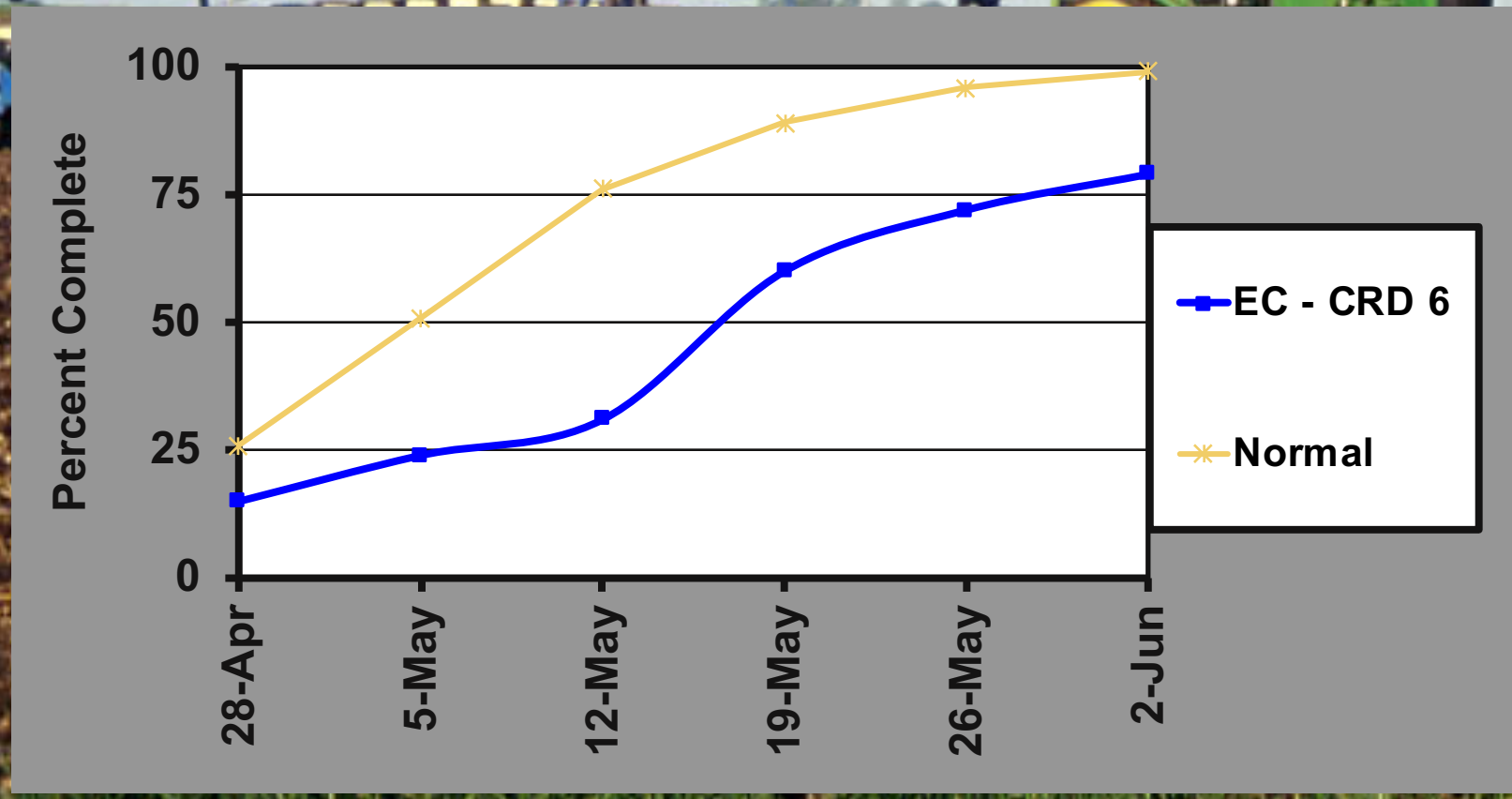
USDA NDMC

droughtmonitor.unl.edu



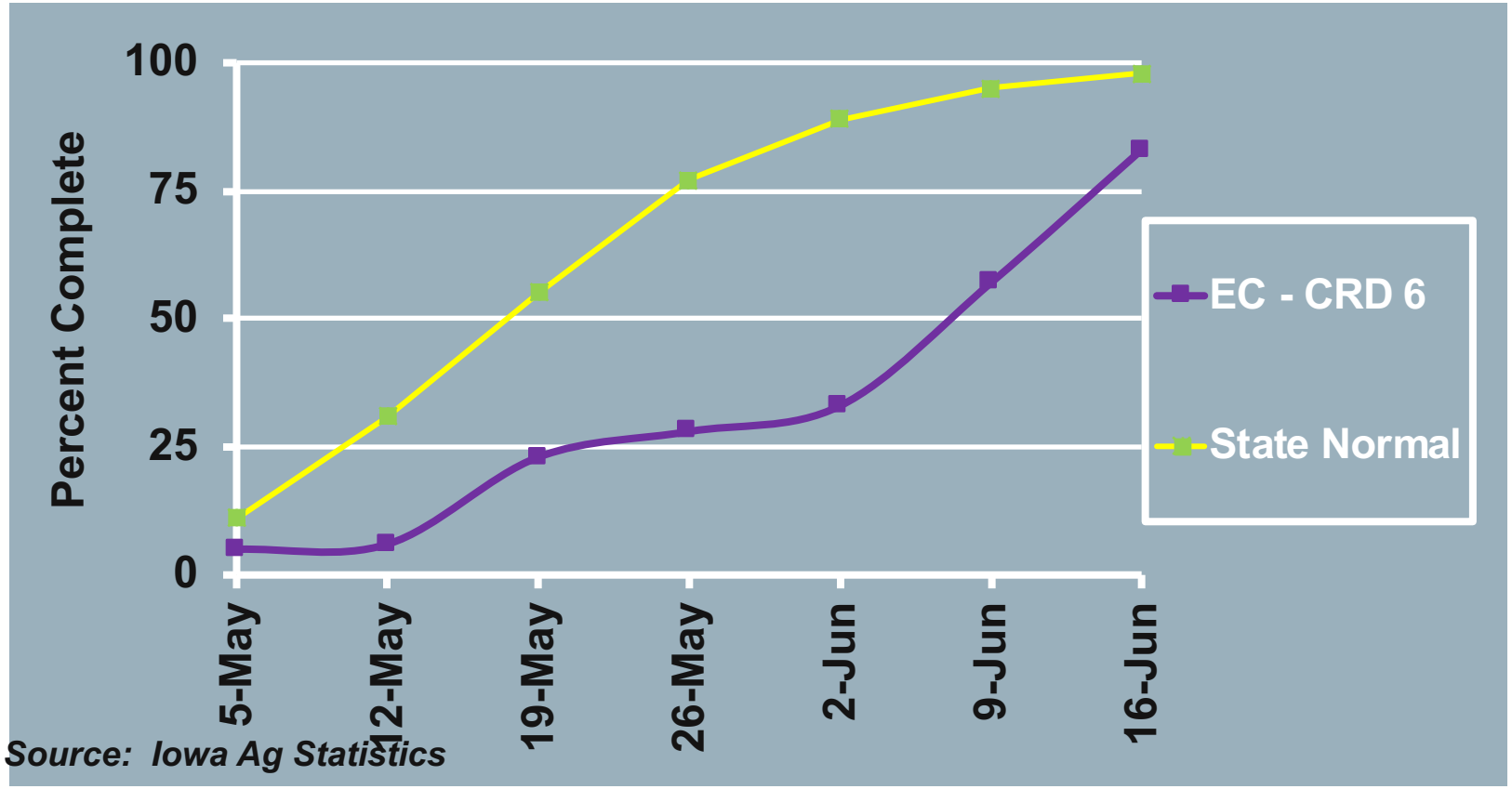
- Harvest begins
  - Soybean moisture is high
  - Corn moisture is high
  - Propane for drying becomes short
  - Deep tracks left by harvest equipment in many fields

Eastern Iowa Corn Planting Pace



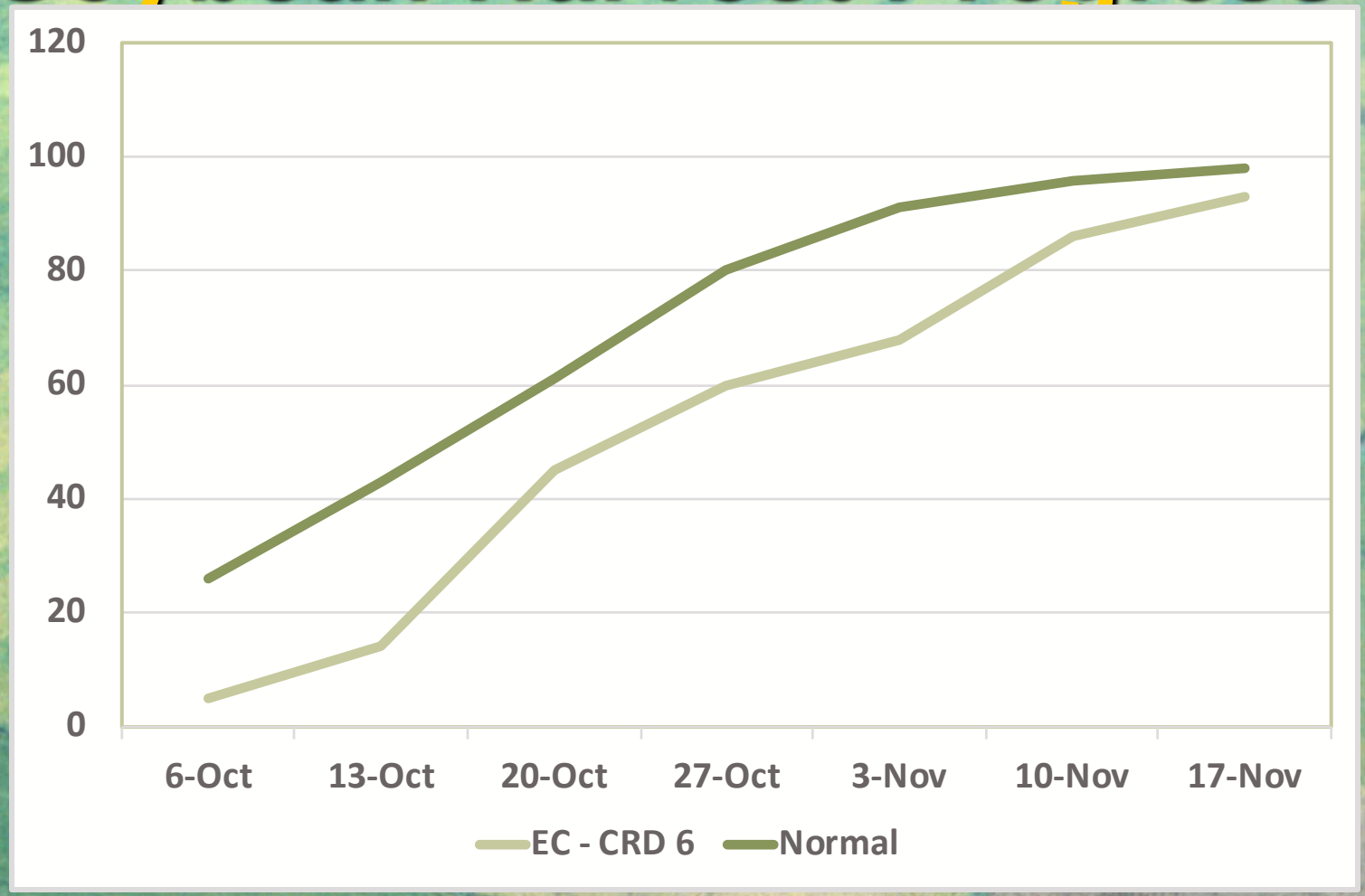
Source: Iowa Ag Statistics

Eastern Iowa Soybean Planting Pace



Source: Iowa Ag Statistics

Soybean Harvest Progress



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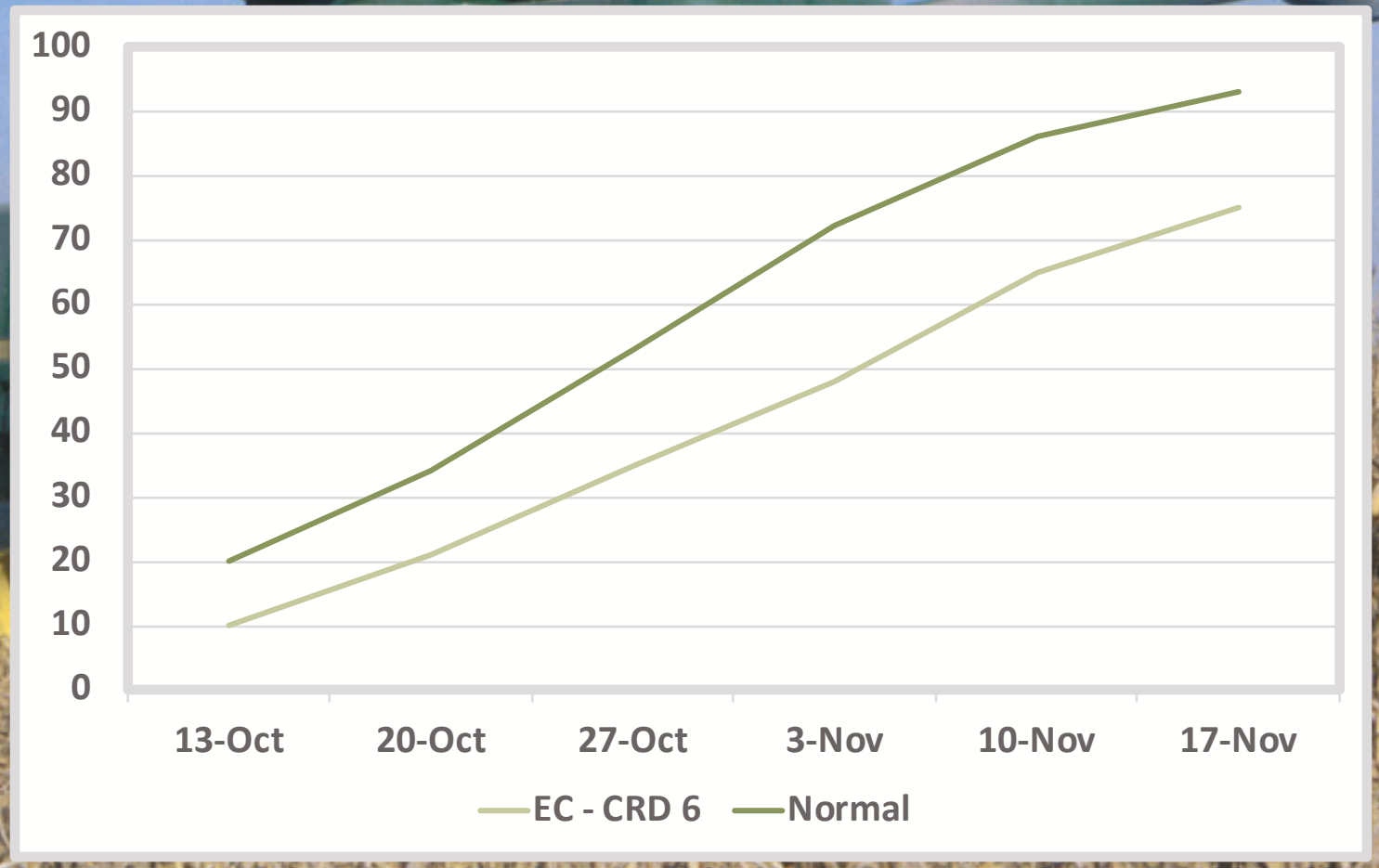
Corn Harvest Progress



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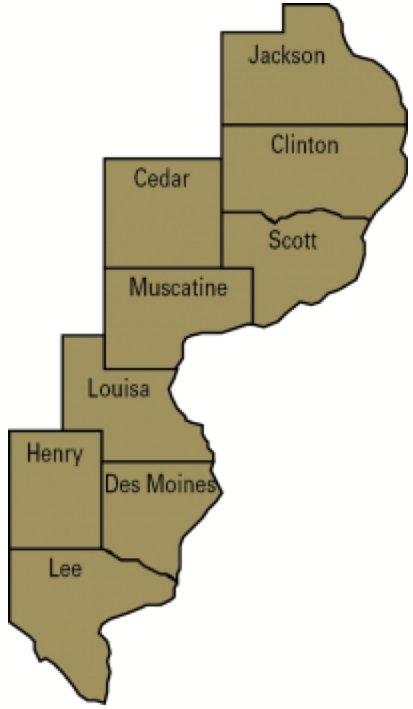
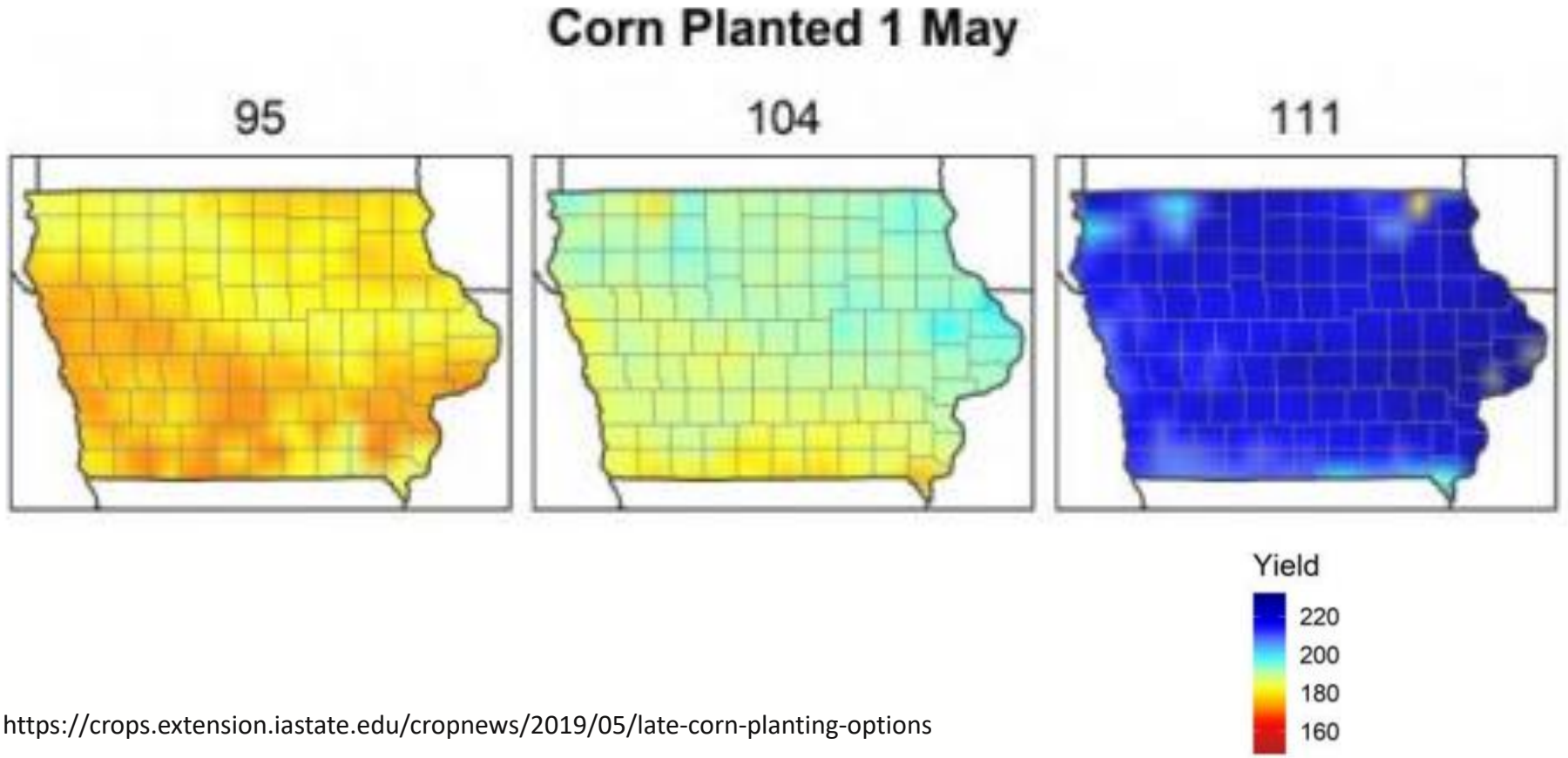


Implications and challenges

- Late planting reduces yield potential.

Expected Yields with Delayed Planting



https://crops.extension.iastate.edu/cropnews/2019/05/late-corn-planting-options

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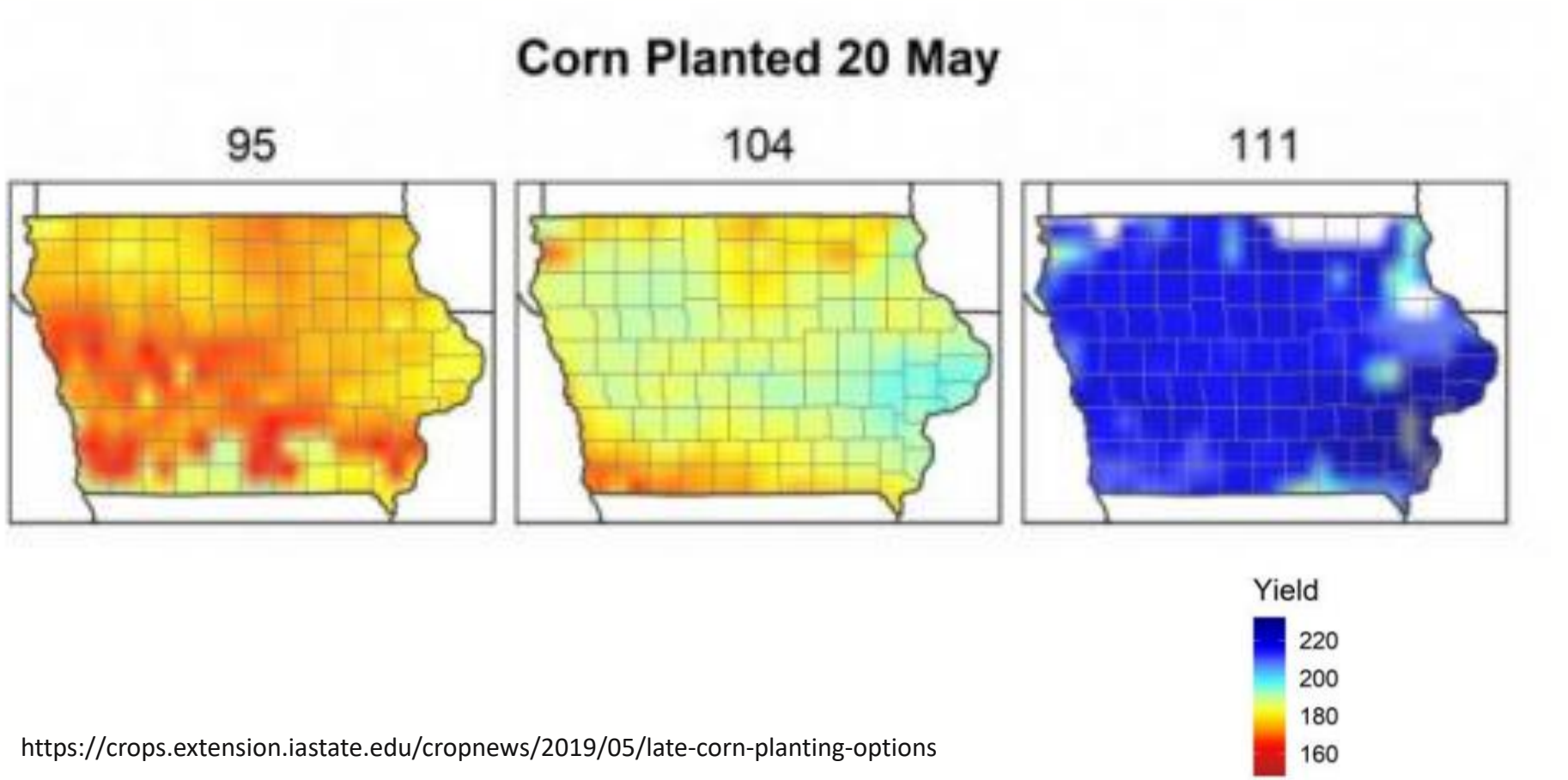

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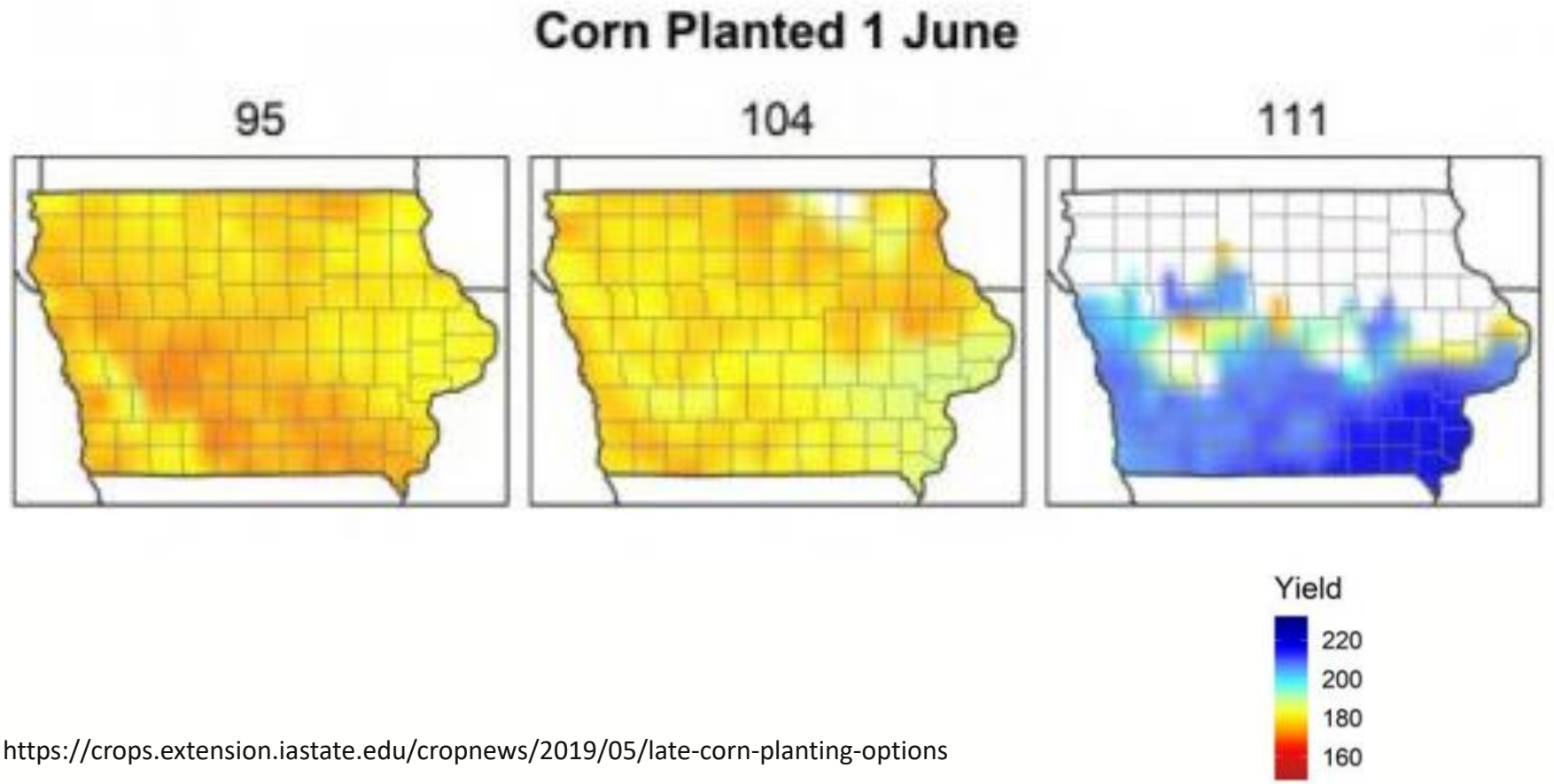

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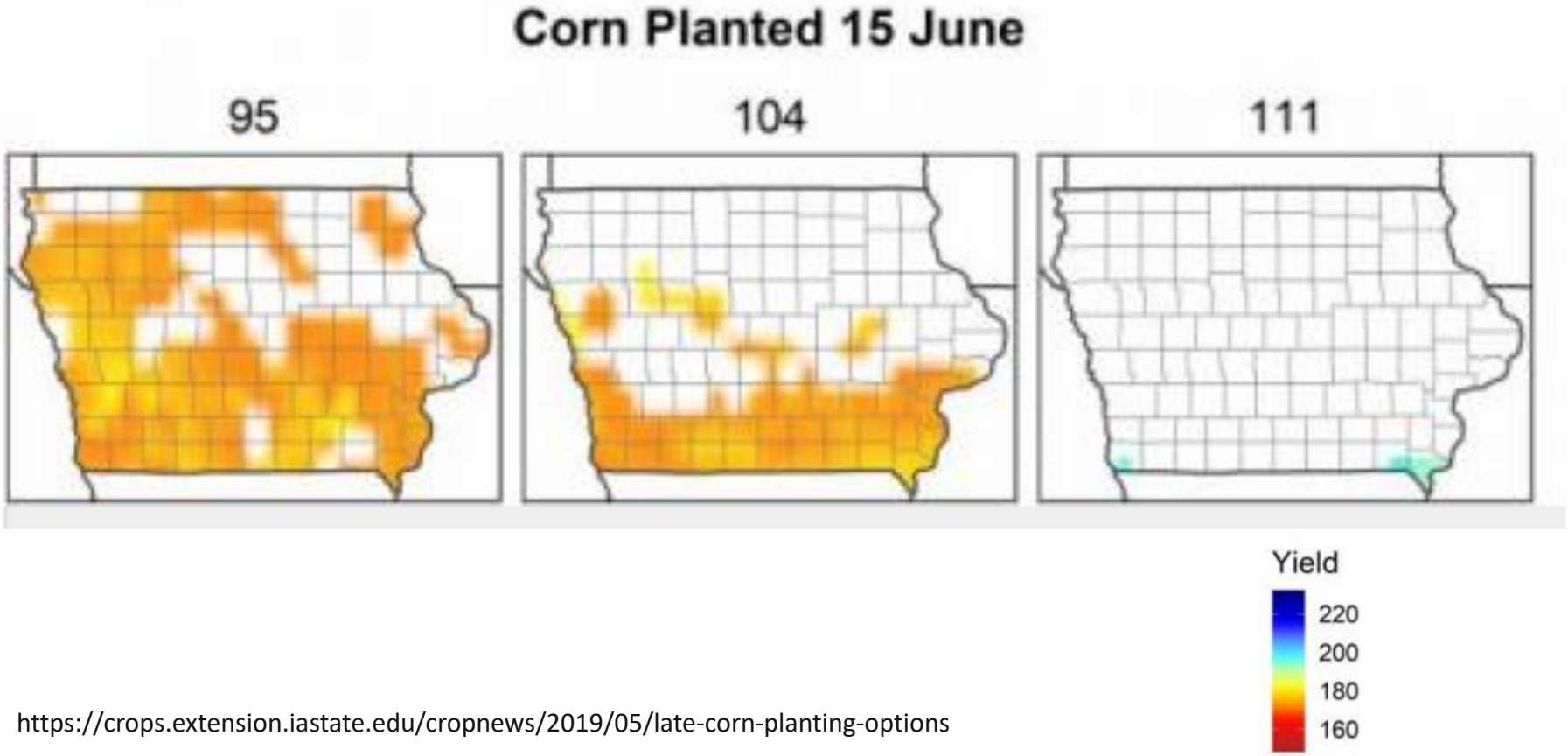

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Soybean yields and planting date

Planting date	Northern Iowa	Central Iowa	Southern Iowa
Relative Yield (percent of potential yield)			
Late April	100	96*	98*
Early May	96*	100	100
Mid-May	99*	96*	98*
Early June	81	93	89
Mid-June	61	59	82
Early July	33	45	47

*Not statistically different from 100%

Source: ISU Publication PM-1851 “Soybean Replant Decisions”

Implications and challenges

- Late planting reduces yield potential.
- Late planting causes farmers to switch crop genetics
- Planting into wet soils may result in compaction issues.
  - Limits root growth and function.
- Wet soils limit root growth, making plants vulnerable to flash droughts.
  - Roots need water and oxygen to grow.
  - Poor roots cannot mobilize water deeper in the soil profile.

Implications and challenges

- Corn and soybean breeders do not develop genetics designed to flourish under late-planting conditions.
- Late planted crops do not mature early enough to take advantage of normal Fall dry down in the field.
  - Drying costs or moisture discounts.
- Late harvest increases losses.
  - Weather
  - Critters

Implications and challenges

- River navigation is critical
  - Bring in inputs
  - Carry away produce
- Some fields were not planted.
  - Take crop insurance instead (55% of otherwise guaranteed amount)
  - Need to plant a cover crop

Implications and challenges

- (Lack of) Moisture stress reduces corn yields
  - Corn leaf rolling
    - During the week of silking, 4 hours = 1% yield reduction
    - At other times, 12 hours = 1% yield reduction
- Marketing is always a challenge, but is much more difficult in these scenarios
  - How much will you have to sell?

Overall Implications

- Wet-Dry-Wet pattern opposite of what is needed for crop production
  - Wet Spring prevents timely planting
  - Dry Summer limits water availability during the highest water demand portion of growth and development
  - Wet Fall prevents normal in-field dry down and is problematic for harvest
- Farmers need to do more thinking and make decisions “on the fly”
  - Change genetics
  - Change pest management plans
  - Change harvesting and marketing plans

Farmer two-word summary of 2019

Not fun…

Mental Health is an issue.

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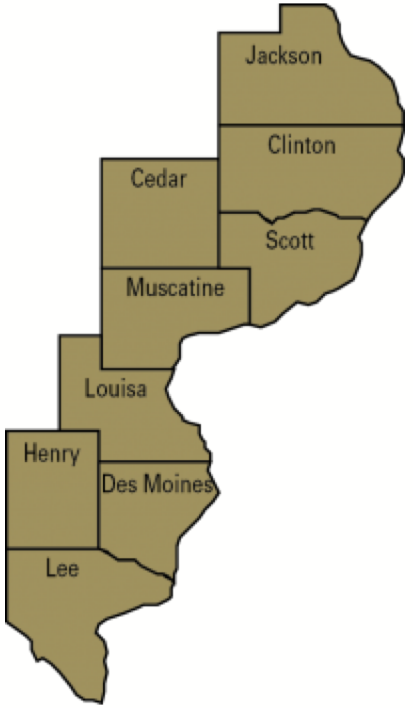

An early warning system would help farmers…

- Select appropriate genetics
  - Drought tolerance
  - “Wet feet”
  - Maturity
- Improve soil and crop management
  - Tillage, equipment, etc.
- Improve pest (disease, insect, weed) management

An early warning system would help farmers…

- Plan for livestock
  - Water for livestock (on pasture)
  - Feed if crops are small
  - Enterprise(s) resizing
- Improve marketing
- Have better mental health – “I have a plan in place.”
- “Feed the World”

We have addressed…

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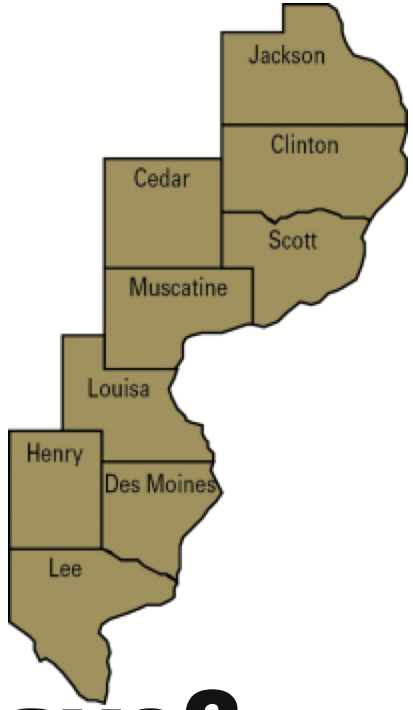

What questions do you have?