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Salvageability of Waterlogged Fields of Corn: That's the $64 Question– (Bob Nielsen) -

The repeated occurrences of excessive rainfall throughout areas of Indiana early this growing

season have certainly taken a toll on the health and outright survival of Indiana's major crops of corn and soybean. The most recent estimate of statewide corn crop condition by USDA-NASS pegs 21% of the state's corn crop as poor to very poor condition (USDA-NASS, 6 July 2015) and much of that poor rating is a reflection of the waterlogged soil conditions prevalent around the northern half of the state.

Farmers, crop consultants, bankers, and landlords all are asking whether waterlogged fields of corn, if not already dead, will recover to the extent that they can be considered salvageable. The answer to that $64 question helps to answer whether or not the damaged fields deserve either supplemental nitrogen (N) fertilizer or, perhaps, the originally intended but delayed initial sidedress application of N fertilizer.

Corny Trivia: The phrase "That's the $64 question" traces back to a CBS Radio quiz show Take It or Leave It that was on the air from 1940 to 1947. Contestants were asked a series of questions, each one more challenging than the last, in an attempt to win prize money. The first question was worth $1, with the value doubling with each successive question until the seventh and final question that was worth $64.

Assessing the likely survival and salvageability of corn fields that have sustained such lengthy periods of saturated soils, if not outright ponding, is not easy. With age and experience comes some benefits relative to assessing the salvageability of damaged corn crops. However, even us "gray beards" have not seen the likes of what Mother Nature has thrown in our way this season in terms of the sheer number of days of soggy soils and resulting crop damage.

Remember that the main effect on crop growth and development of saturated soils is the deterioration or death of roots due to oxygen deprivation. As soils begin to dry, new root growth (regeneration if you will) begins near the soil surface and "follows" the downward drying of the soil with time. It is the rate and extent of that fresh root development that largely determines whether a waterlogged field will recover "strongly" or not.

Bright sunshine and warm temperatures help "drive" photosynthesis by the above-ground crop canopy, which provides the necessary photosynthates to support renewed root development below ground. Cloudy, cool days during the recovery period simply slow the recovery process. Repeated re-wetting of the soil profile delays further drying of the saturated soil. Unfortunately, most of Indiana has not yet had a significant string of days with favorable growing conditions and

so corn field recovery has been exceedingly slow and frustrating for growers.

However, it is worth remembering that the corn plant can be surprisingly resilient to early season damage and still recover to yield surprisingly well at the end. A few photos may provide some help in helping assess crop recovery in the coming days and weeks. Like it or now, the key word is still "patience" as this waterlogged crop shows us whether it will recover well enough to produce an acceptable grain yield at the end of the season or not. Much depends on what weather we receive from this point forward.

Fig. 1. Truly waterlogged soil. Plants severely stunted.

Fig. 2. Roots damaged by saturated soils. Acceptable plant recovery not likely.

Fig. 3. Waterlogged field of corn. Plants stunted, lower leaves "fired", upper canopy yellow-green.

Fig. 4. Acceptable root recovery of Fig. 3 plants.

Fig. 5. Healthy stalk tissue of Fig. 3. plants.

Fig. 6. Waterlogged field of corn.

Fig. 7. Acceptable root recovery of Fig. 6. plants.

Fig. 8. Aceptable above-ground recovery.

Fig. 9. Acceptable root recovery of Fig. 8. plants.

Fig. 10. Plants likely not salvagleable.

Fig. 11. Severe root damage of Fig. 10. plants.

Fig. 12. Dead lower stalk tissue of Fig. 10 plants.

Fig. 13. Dead and dying plants.

Fig. 14. Death by drowning.

Related reading

Camberato, Jim. 2014. Late-season nitrogen application for corn. Soil Fertility Update, Purdue Univ. Agronomy. http://www.agry.purdue.edu/ext/soilfertility/news/Late-seasonnitrogen.pdf. [URL accessed June 2015].

Camberato, Jim and RL (Bob) Nielsen. 2015. Assessing Available Nitrogen from Fall- and Spring-Applied Nitrogen Applications. Corny News Network, Purdue Extension. http://www.kingcorn.org/news/timeless/AssessAvailableN.html [URL accessed July 2015].

Nielsen, RL (Bob). 2015. Effects of Flooding or Ponding on Corn Prior to Tasseling. Corny News Network, Purdue Extension. http://www.kingcorn.org/news/timeless/PondingYoungCorn.html [URL accessed July 2015].

Nielsen, RL (Bob). 2015. Yellow, Stunted Corn... More Than One Possible Cause. Corny News Network, Purdue Extension. http://www.kingcorn.org/news/articles_15/YellowStuntedCorn_0615.html [URL accessed July

2015].

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VIDEO: Soybean Assessment After Wet Conditions

– (Shaun N. Casteel and John Obermeyer) -

In this video, three different areas of a soybean field that have been subjected to extended periods of saturated soils to flooding are assessed for damage. Primarily, once soils allow foot traffic, one should evaluate the health of the root system and nodules. Root and nodule recovery is possible once soils drain and aerate (oxygen supply for respiration and growth). White roots are indicative of being healthy, whereas dark roots are compromised. Nitrogen-fixing nodules will either be white (new and developing), red (pink and producing N), or dead (hollow and mushy). Although there will be yield differences in these areas of the field, it is too soon to determine how much.

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VIDEO: Soybean Nitrogen Stress After Wet Conditions – (Shaun N. Casteel and John Obermeyer) -

This video discusses the damage of roots and nitrogen-fixing nodules to varying degrees of water stressed soybean plants. Saturated soils for extended periods will cause soybean yellowing in portions of or whole fields. Applying supplemental nitrogen in late vegetative stages (V4 onward) as soybeans transition to early reproductive stages (flowering) to these yellowish fields may help with nutrient needs while nodules are recovering from water-logged (oxygen-deprived) soils.

Under normal growing conditions, soybeans accumulate ~10 lb N/acre by V4 then accumulate another ~3 lb N/acre daily until R2 (full bloom). Thus, soybeans normally accumulate another 60 lb N/acre by R2 (full bloom). Nitrogen stress during this period will impact yield.

Forty to sixty pounds of N per acre has been beneficial in these situations (6+ bushels/ac and double digit yield benefits under severe situations). Urea treated with a urease inhibitor is the preferred N source since straight UAN will damage foliage at these rates. You may also consider a blend of polymer-coated urea to provide a slow release of N until the nodules become active. Soybeans will take up the N forms of urea and ammonium without compromising N fixation. High levels of nitrate in the soil can temporarily inhibit or pause nodule activity, but 100 lb of urea (46 lb of N) per acre should not be a problem. Other N sources to consider would be ammonium sulfate (100 lb of product spread dry to supply 21 lb N/acre). Many foliar fertilizers will not supply enough N to be warranted, but diluting UAN in a foliar application may be beneficial since more N could be supplied. One option would be ~3 gallons of UAN/ac to supply 10 lb N/ac with water making up the difference in broadcast rates of 10 to 15 GPA.


Soybean Nitrogen Stress
After Wet Conditions
0:02 / 3:49

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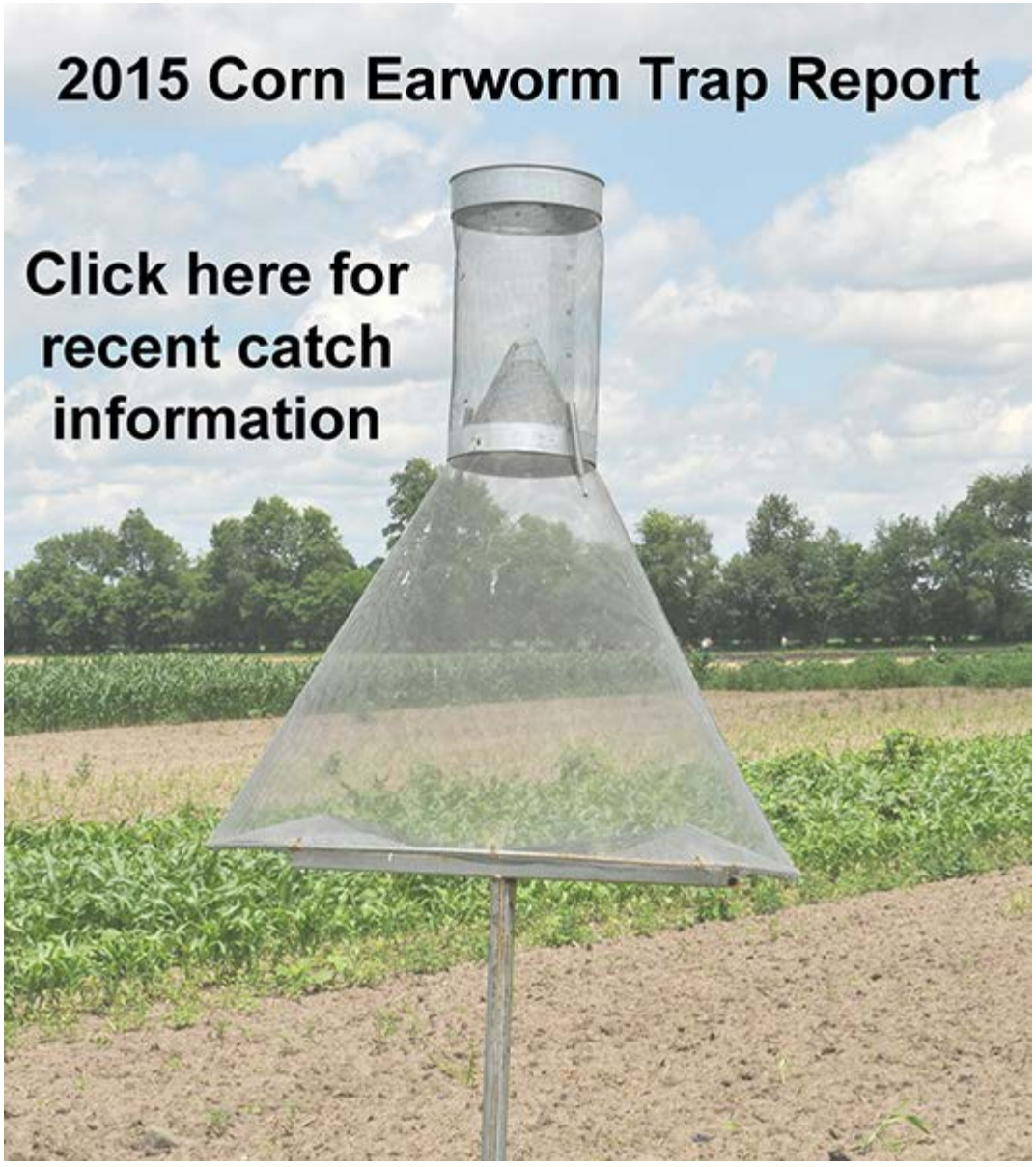
INSECTS, MITES & NEMATODES



Corn Earworm Trap Report.

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Western Bean Cutworm Pheromone Trap Report

County:	**Adams**
Cooperator:	**Kaminsky/New Era Ag**
Wk 1	**0**

Wk 2	**0**
County:	**Adams**
Cooperator:	**Roe/Mercer Landmark**
Wk 1	**0**
Wk 2	
County:	**Allen**
Cooperator:	**Anderson/Syngenta Seed**
Wk 1	**0**
Wk 2	**0**
County:	**Allen**
Cooperator:	**Gynn/Southwind Farms**
Wk 1	**0**
Wk 2	**0**
County:	**Allen**
Cooperator:	**Kneubuhler/G&K Concepts**
Wk 1	**0**
Wk 2	**0**
County:	**Bartholomew**
Cooperator:	**Bush/Pioneer Hybrids**
Wk 1	**0**
Wk 2	**0**
County:	**Boone**
Cooperator:	**Campbell/Beck's Hybrids**
Wk 1	**0**
Wk 2	**0**
County:	**Clay**
Cooperator:	**Bower/Ceres Solutions/Brazil**

Wk 1	**0**
Wk 2	**0**
County:	**Clay**
Cooperator:	**Bower/Ceres Solutions/Bowling Green**
Wk 1	**0**
Wk 2	**0**
County:	**Clinton**
Cooperator:	**Emanuel/Boone Co. CES**
Wk 1	**0**
Wk 2	**0**
County:	**Clinton**
Cooperator:	**Foster/Purdue Entomology**
Wk 1	**0**
Wk 2	**0**
County:	**DeKalb**
Cooperator:	**Hoffman/ATA Solutions**
Wk 1	
Wk 2	
County:	**Dubois**
Cooperator:	**Eck/Purdue CES**
Wk 1	**0**
Wk 2	**0**
County:	**Elkhart**
Cooperator:	**Kauffman/Crop Tech Inc.**
Wk 1	**1**
Wk 2	**0**
County:	**Fayette**

Cooperator:	**Schelle/Falmouth Farm Supply Inc.**
Wk 1	**0**
Wk 2	
County:	**Fountain**
Cooperator:	**Mroczkiewicz/Syngenta**
Wk 1	**0**
Wk 2	**14**
County:	**Fulton**
Cooperator:	**Jenkins/N. Central Coop-Rochester**
Wk 1	**1**
Wk 2	**263**
County:	**Fulton**
Cooperator:	**Jenkins/N. Central Coop-Kewana**
Wk 1	**2**
Wk 2	**121**
County:	**Gibson**
Cooperator:	**Schmitz/Gibson Co. CES**
Wk 1	**0**
Wk 2	**0**
County:	**Hamilton**
Cooperator:	**Campbell/Beck's Hybrids**
Wk 1	**0**
Wk 2	**0**
County:	**Hamilton**
Cooperator:	**Truster/Reynolds Farm Equipment**
Wk 1	**0**
Wk 2	

County:	**Hendricks**
Cooperator:	**Nicholson/Nicholson Consulting**
Wk 1	**0**
Wk 2	**0**
County:	**Henry**
Cooperator:	**Schelle/Falmouth Farm Supply Inc., Millville**
Wk 1	**0**
Wk 2	
County:	**Jasper**
Cooperator:	**Overstreet/Purdue CES**
Wk 1	**0**
Wk 2	**2**
County:	**Jasper**
Cooperator:	**Ritter/Brodbeck Seeds**
Wk 1	**0**
Wk 2	
County:	**Jay**
Cooperator:	**Boyer/Davis PAC**
Wk 1	**0**
Wk 2	**0**
County:	**Jay**
Cooperator:	**Shrack/Ran Del Agri Services**
Wk 1	**0**
Wk 2	**0**
County:	**Jay**
Cooperator:	**Temple/Jay County CES**
Wk 1	**2**

Wk 2	0
County:	Jennings
Cooperator:	Bauerle/SEPAC
Wk 1	1
Wk 2	0
County:	Knox
Cooperator:	Bower/Ceres Solutions/Freelandville
Wk 1	0
Wk 2	0
County:	Knox
Cooperator:	Bower/Ceres Solutions/Vincennes
Wk 1	0
Wk 2	0
County:	Knox
Cooperator:	Bower/Ceres Solutions/Frichton
Wk 1	0
Wk 2	0
County:	Lake
Cooperator:	Kleine/Kleine Farms
Wk 1	0
Wk 2	2
County:	Lake
Cooperator:	Moyer/Dekalb Hybrids, Shelby
Wk 1	2
Wk 2	7
County:	Lake
Cooperator:	Moyer/Dekalb Hybrids, Schneider

Wk 1	0
Wk 2	4
County:	LaPorte
Cooperator:	Rocke/Agri-Mgmt Solutions, Wanatah
Wk 1	5
Wk 2	74
County:	LaPorte
Cooperator:	Rocke/Agri-Mgmt Solutions, LaCrosse
Wk 1	2
Wk 2	135
County:	Miami
Cooperator:	Early/Pioneer Hybrids
Wk 1	0
Wk 2	6
County:	Miami
Cooperator:	Myers/Myers Ag Service
Wk 1	2
Wk 2	0
County:	Montgomery
Cooperator:	Stine/Nicholson Sonsulting
Wk 1	0
Wk 2	0
County:	Newton
Cooperator:	Moyer/Dekalb Hybrids, Lake Village
Wk 1	1
Wk 2	3
County:	Porter

Cooperator:	**Leuck/PPAC**
Wk 1	**1**
Wk 2	**10**
County:	**Putnam**
Cooperator:	**Nicholson/Nicholson Consulting**
Wk 1	**0**
Wk 2	**0**
County:	**Randolph**
Cooperator:	**Boyer/DPAC**
Wk 1	**0**
Wk 2	**0**
County:	**Rush**
Cooperator:	**Schelle/Falmouth Farm Supply Inc.**
Wk 1	**0**
Wk 2	
County:	**Shelby**
Cooperator:	**Simpson/Simpson Farms**
Wk 1	**0**
Wk 2	**2**
County:	**Sullivan**
Cooperator:	**Bower/Ceres Solutions/Sullivan**
Wk 1	**0**
Wk 2	**0**
County:	**Tippecanoe**
Cooperator:	**Bower/Ceres Solutions**
Wk 1	**2**
Wk 2	**15**

County:	Tippecanoe
Cooperator:	Nagel/Ceres Solutions
Wk 1	0
Wk 2	0
County:	Tippecanoe
Cooperator:	Obermeyer/Purdue Entomology
Wk 1	0
Wk 2	0
County:	Tippecanoe
Cooperator:	Westerfeld/Monsanto
Wk 1	0
Wk 2	0
County:	Whitley
Cooperator:	Walker/NEPAC
Wk 1	0
Wk 2	2

* = Intensive Capture...this occurs when 9 or more moths are caught over a 2-night period

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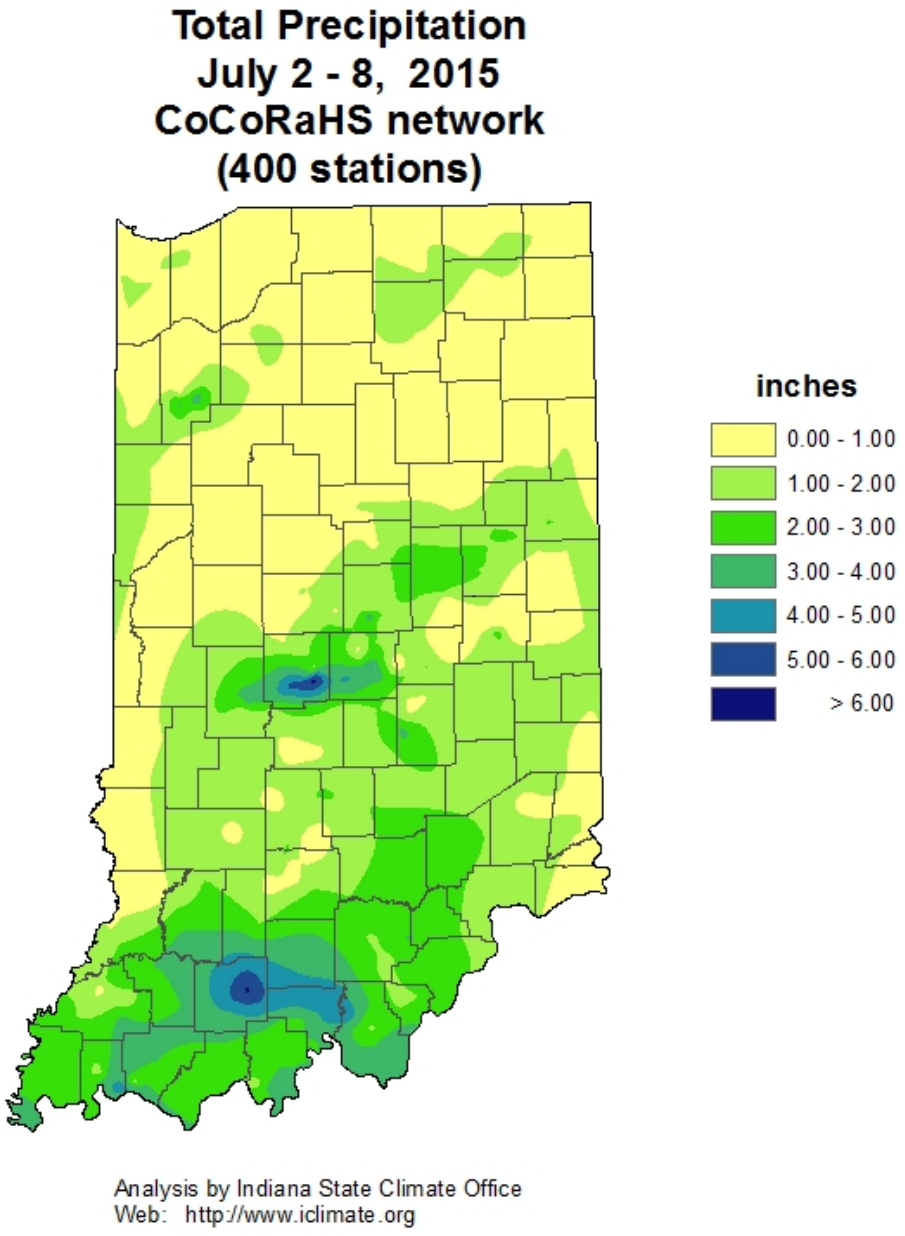
Precipitation


Total Precipitation
July 2 - 8, 2015
CoCoRaHS network
(400 stations)
inches
0.00 - 1.00
1.00 - 2.00
2.00 - 3.00
3.00 - 4.00
4.00 - 5.00
5.00 - 6.00
> 6.00
Analysis by Indiana State Climate Office
Web: http://www.iclimate.org

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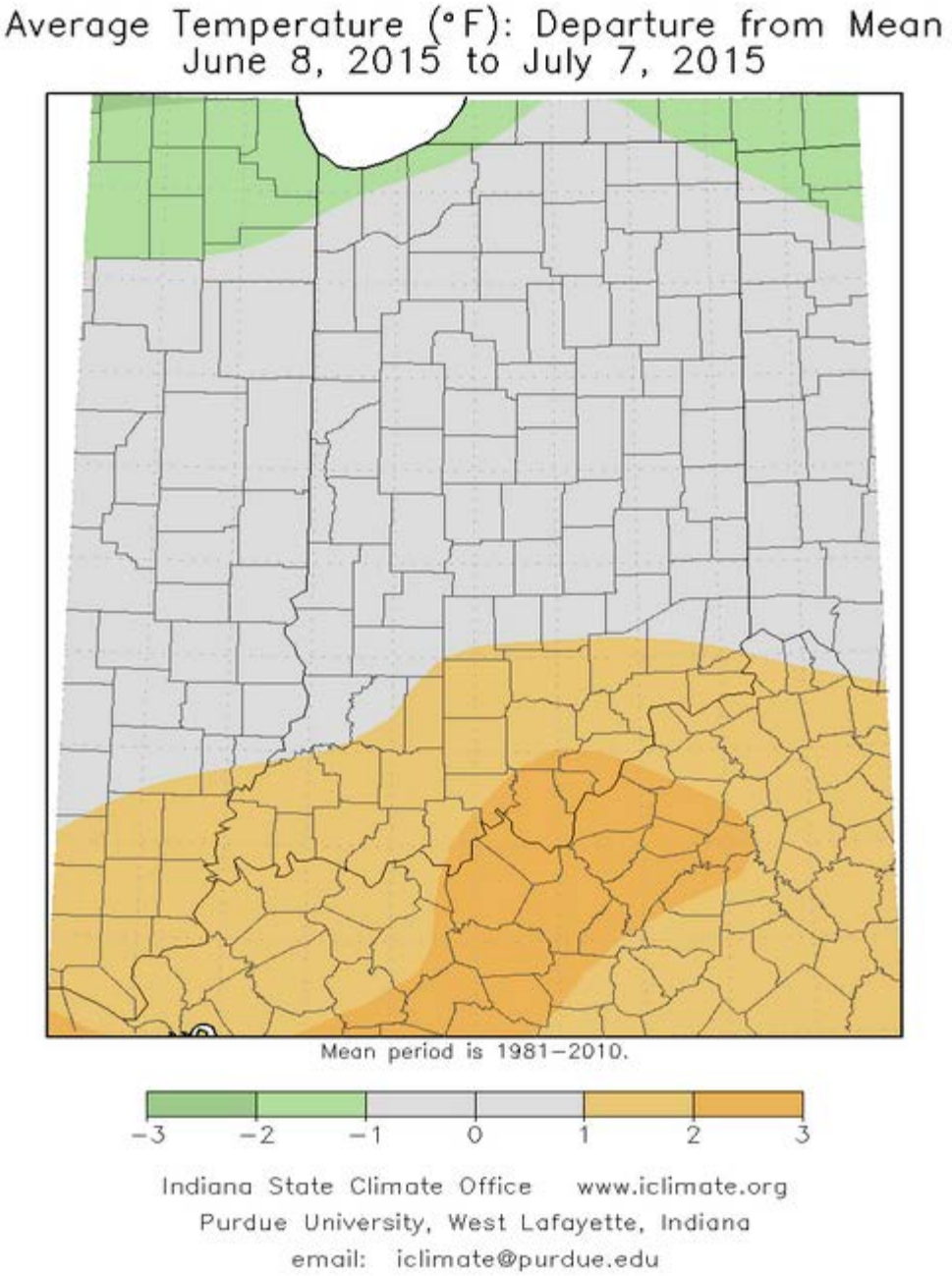
Temperature



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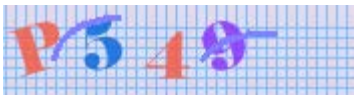

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