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European Corn Borer First Generation Moths Flying

– (John Obermeyer) -

- **Renewed and new interest in European corn borer (ECB).**
- **Non-Bt-traited corn, anywhere in the Midwest, is vulnerable to this pest.**
- **Moth trapping questions abound, it is not a perfect science.**
- **Ground truthing, aka, field scouting, is vital to successfully manage ECB.**

For the last several years, we have heard from pest managers about European corn borer (ECB) infestations and damage catching the producer, or themselves, off guard when growing non-Bt-traited corn (e.g., popcorn, white corn, etc). This seems to occur more often when large acreage of unprotected corn is grown in close proximity. Though this pest had been in decline since the early 2000's, when Bt-traited corn was becoming predominantly grown in the state, it is very obvious that their many other hosts, including weeds and vegetables, has kept them present…though low-key. Even more fascinating to us is younger field personnel are unfamiliar with this pest of old when encountered.

Good thing European corn borer moths can't read!

Now we receive questions about how and when to monitor for this pest. For seasoned pest managers, they recall it was a complex and fickle pest, even in its "heyday" before Bt-corn, varying greatly in damage from year to year. It should be no surprise that for the past couple of decades, there has been virtually no advancement in monitoring and predicting this pest, as the necessity of this work and university research dollars to do it dried up. For years, we maintained and reported captures from a black light trapping network (placed at eight regional Purdue Ag Centers), ECB being one of many Lepidoptera species. As expected, as Bt corn acreage increased/expanded, ECB moth captures declined; many times they were nearly absent throughout the year. There are no plans to resurrect the black light trapping program.

One important attribute of ECB biology, concerning monitoring, is that male and female moths mate at the appropriately-named "action sites" during the evening and night. Action sites are grassy areas outside of the field, examples being waterways and roadsides. In order to know early

and peak flights of the moths, one must monitor during these times. ECB typically has two generations, historically mean flights are from May 26-June 10 for the first flight and July 26-August 14 for the second. The range accounts for the developmental (heat) differences from southern to northern Indiana. To "ground-truth" these calendar dates, one can use black light and/or pheromone traps. The other less technical approach, but perfect for night-owls, is to drive farm lanes of the non-traited corn with your vehicle's bright lights. Yes, you will see them flying around and eliminate a few on the windshield. A slight caution with this method, there are other insect species that can have massive night flights but are not a concern to crops, e.g., mayflies.

Black light and pheromone traps (we have the Iowa strain in Indiana) both have their advantages and disadvantages. Traps need to be placed close to the crop of concern and checked daily, and the general rule is that more traps are better. Trapping for ECB is an art, not a science, and the important point is that trap catches are NOT PREDICTIVE of infestations and/or damage. The reality with any of the methods, even the night drive, is that you are gathering relative flight information to better time your scouting visits to the cornfields, ideally peak mating and egg-laying. Also, there are degree-day models available online to help track ECB development once you know moths are flying. Nonetheless, there are no shortcuts for scouting trips to determine egg laying and/or damage. ECB female moths are quite discerning about which field, and where in the field, they deposit their eggs. Meaning they will likely be clustered, rather than uniform, in a given field. If you have not had the pleasure, scouting for first-generation ECB is a walk-in-the-park compared to the second.

With prior research and the tools developed, this new/old pest can be managed quite successfully. Depending on acreage involved, it may require personnel dedicated to understanding and monitoring for this pest. Some might consider hiring a crop consultant that provides such services. If you are contemplating the thought of treating without the monitoring, there are plenty of experienced field personnel that will tell you that it won't work. The treatment window from egg hatch to larval boring is short, once in the stalk, control is not possible and they are safe. Happy scouting!

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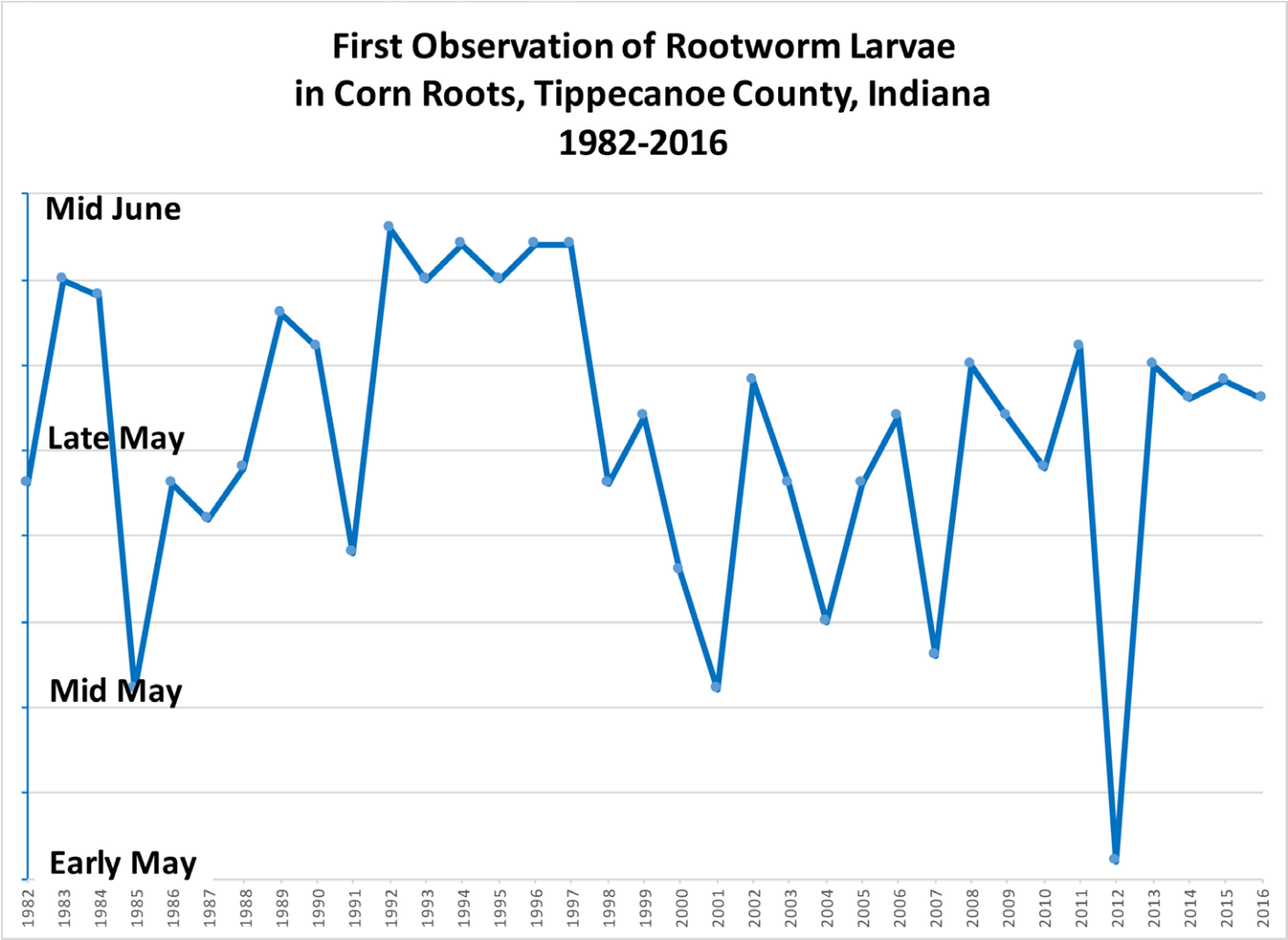
Corn Rootworm Hatch is Underway – (John Obermeyer and Larry Bledsoe) -

- **Hatch of rootworm in west central Indiana occurred on June 1**
- **Sampling for larvae in high-risk fields will be possible in mid June**

Roots from 2-leaf corn collected on June 1 near Lafayette in Tippecanoe County revealed a rootworm larva. Hatch in southern Indiana counties has occurred several days earlier, while hatch in northern counties will soon be occurring. Hatch will continue for several weeks.

Unlike the previous years, soils are not saturated throughout the state. Newly hatched larvae are prone to drowning, and reduced orientation, when soil pores are water filled. The good news is that overwintering (eggs) rootworm populations should be low, the bad news is that those hatching larvae have ideal soil conditions for finding corn roots.

It is too early to sample corn roots for the presence of larvae, as the minute worms are inside the roots. In a couple weeks, it will be possible to dig up and inspect for larvae and feeding scars on the roots. More on this in a future issue of Pest&Crop.



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Armyworm Pheromone Trap Report

County/Cooperator:	Dubois/SIPAC Ag Center
Wk 1	0
Wk 2	0
Wk 3	348
Wk 4	258

Wk 5	11
Wk 6	6
Wk 7	22
Wk 8	44
Wk 9	35
Wk 10	
Wk 11	
Wk 12	
Wk 13	
County/Cooperator:	Jennings/SEPAC Ag Center
Wk 1	0
Wk 2	0
Wk 3	15
Wk 4	18
Wk 5	9
Wk 6	1
Wk 7	9
Wk 8	0
Wk 9	1
Wk 10	
Wk 11	
Wk 12	
Wk 13	
County/Cooperator:	Knox/SWPAC Ag Center
Wk 1	0
Wk 2	6
Wk 3	197
Wk 4	63

Wk 5	17
Wk 6	39
Wk 7	22
Wk 8	22
Wk 9	19
Wk 10	
Wk 11	
Wk 12	
Wk 13	
County/Cooperator:	LaPorte/Pinney Ag Center
Wk 1	0
Wk 2	25
Wk 3	317
Wk 4	296
Wk 5	63
Wk 6	149
Wk 7	121
Wk 8	29
Wk 9	10
Wk 10	
Wk 11	
Wk 12	
Wk 13	
County/Cooperator:	Lawrence/Feldun Ag Center
Wk 1	4
Wk 2	97
Wk 3	155
Wk 4	76

Wk 5	42
Wk 6	21
Wk 7	14
Wk 8	14
Wk 9	15
Wk 10	
Wk 11	
Wk 12	
Wk 13	
County/Cooperator:	Randolph/Davis Ag Center
Wk 1	0
Wk 2	0
Wk 3	0
Wk 4	24
Wk 5	122
Wk 6	162
Wk 7	101
Wk 8	14
Wk 9	11
Wk 10	
Wk 11	
Wk 12	
Wk 13	
County/Cooperator:	Tippecanoe/Meigs
Wk 1	0
Wk 2	4
Wk 3	141
Wk 4	101

Wk 5	45
Wk 6	50
Wk 7	55
Wk 8	114
Wk 9	32
Wk 10	
Wk 11	
Wk 12	
Wk 13	

County/Cooperator:	Whitley/NEPAC Ag Center
Wk 1	7
Wk 2	21
Wk 3	619
Wk 4	1,091
Wk 5	376
Wk 6	682
Wk 7	612
Wk 8	173
Wk 9	78
Wk 10	
Wk 11	
Wk 12	
Wk 13	

Wk 1 = 3/31/16 - 4/6/16; Wk 2 = 4/7/16 - 4/13/16; Wk 3 = 4/14/16 - 4/20/16; Wk 4 = 4/21/16 - 4/27/16; Wk 5 = 4/28/16 - 5/4/16; Wk 6 = 5/5/16 - 5/11/16; Wk 7 = 5/12/16 - 5/18/16; Wk 8 = 5/19/2016 - 5/25/2016; Wk 9 = 5/26/2016 - 6/1/2016

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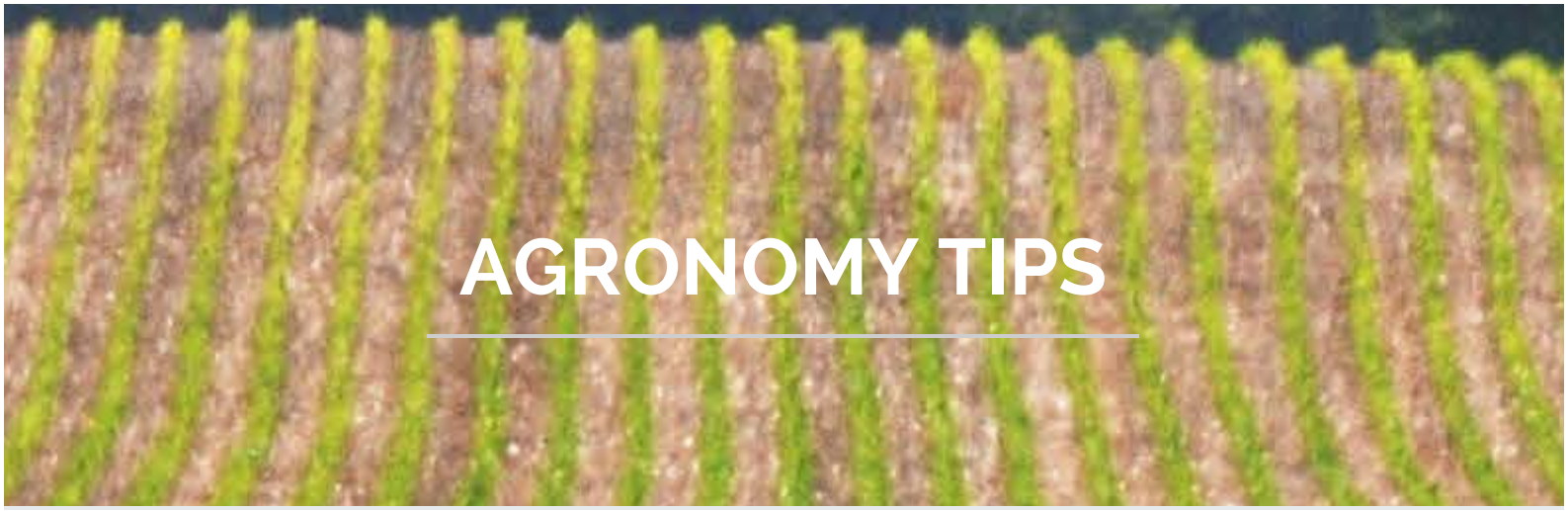

Striped Corn – Potential Nutritional Deficiencies – (Jim Camberato) -

Interveinal chlorosis of corn leaf tissue (striped corn) occurs to some extent every growing season. Several nutrient deficiencies result in similar striped corn symptoms that can be very difficult to distinguish.

Plant sampling and tissue analysis should be conducted to diagnose if leaf striping is due to a particular nutrient deficiency or multiple nutrient deficiencies or another factor unrelated to plant nutrition. Plant samples should be obtained from both good and bad areas of the field. Whole plants can be sampled when plant height is less than 12 inches tall. The most recently collared leaf is suggested when plants exceed this height. The earleaf is sampled at tasseling and silk emergence.

Soil sampling at the same time as plant sampling can help determine whether or not impaired nutrient levels in the plant tissue are a result of inadequacies or imbalances in soil nutrient and pH levels or inefficiency of the crop root system.

Not all cases of striped corn are due to nutrient deficiency. Nematode predation and/or herbicide injury have been implicated as causal factors in some instances of striped corn that cannot be attributed to nutrient deficiencies.

Consider submitting whole plants and roots with rootzone soil to the Purdue Plant & Pest Diagnostic Laboratory for nematode analysis and herbicide injury diagnosis.

Sulfur (S) deficiency may cause striping or overall yellowing of corn leaves. Release of S from soil organic matter (O.M.) is the primary source of S for plants when no fertilizer S is applied. Cold, wet, low O.M., and sandy soils, high residue, and no-till, are conditions that promote S deficiency. Tissue S <0.15 – 0.18% and/or a N:S ratio >15:1 - 20:1 are indicative of S deficiency.

Zinc (Zn) deficiency may cause striping that begins at the base of the leaf and progresses to the tip. Stripes often coalesce to form a white band along the edge of the leaf or the midrib. High pH, low O.M., sandy soils are most prone to Zn deficiency especially in cool, cloudy springs. Tissue Zn <15-25ppm is considered deficient.

Magnesium (Mg) deficiency may cause striping and/or reddening of corn leaves. Yellow areas between the veins may be 'beaded' rather than striped. Low Mg is often associated with low pH, but Mg deficiency can occur at high pH if imbalances with calcium occur. High soil potassium (K) and high applications of K and anhydrous ammonia can aggravate Mg deficiency. Tissue Mg< 0.15-0.20% is considered deficient.

Manganese (Mn) deficiency causes striping that is often described as olive green or mustard yellow in color with veins remaining green. High pH, high O.M., and dry soil conditions reduce Mn availability in certain soils resulting in Mn deficiency. Tissue Mn< 20ppm is considered deficient.

Other useful information:

Zinc deficiency in corn. http://www.agry.purdue.edu/ext/soilfertility/ZincDeficiencyCorn.pdf

Sulfur deficiency in corn.
http://www.agry.purdue.edu/ext/corn/news/timeless/SulfurDeficiency.pdf

Manganese deficiencies in Indiana soils. http://www.agry.purdue.edu/ext/pubs/AY-276-W.pdf

Role of micronutrients in efficient crop production.
http://www.extension.purdue.edu/extmedia/AY/AY-239.html

Tri-state fertilizer recommendations for corn, soybean, wheat & alfalfa.
http://www.extension.purdue.edu/extmedia/AY/AY-9-32.pdf

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Improve Control of Giant Ragweed with New 'Focus on Soybean' Webcast – (Bill Johnson) -

Giant ragweed, if left unchecked, will compete with slower growing soybean plants for critical resources and can significantly reduce yield, with losses reaching as high as 30-90 percent in soybean field trials.

The Plant Management Network (PMN) has released a new presentation entitled "Herbicide Resistance in Giant Ragweed" for growers, crop consultants, and extension agents discussing the biological characteristics that make giant ragweed problematic in soybean production and how its increased resistance to herbicide impacts potential control strategies.

The webcast, developed by Bill Johnson, Professor of Weed Science at Purdue University, chronicles giant ragweed's increasing resistance to herbicide varieties and describes how stem-boring insects can aid its chances of surviving a herbicide treatment. It also discusses the:

- **Effectiveness of various herbicide application strategies**
- **Herbicide varieties that best combat different resistance profiles**
- **Essential techniques for optimizing ragweed control**

The 20-minute presentation will remain open access through July 31 in the Focus on Soybean webcast resource.

The Plant Management Network is a nonprofit publisher of applied, science-based resources that help enhance the health, management, and production of agricultural and horticultural crops. Partnering with over 80 universities, nonprofits, and agribusinesses, PMN provides materials covering a wide range of crops and contemporary issues through the online PMN Education Center.

EMBEDDED LINKS

Herbicide Resistance in Giant Ragweed
http://www.plantmanagementnetwork.org/edcenter/seminars/soybean/GiantRagweed/

Focus on Soybean webcast resource http://www.plantmanagementnetwork.org/fos

PMN Education Center http://www.plantmanagementnetwork.org/edcenter/

PMN Update http://www.plantmanagementnetwork.org/update/current

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Dry Field Condition Create Need For Early Season Irrigation – (Lyndon Kelley, Michigan State and Purdue Universities) -

Late planted seed corn and replant commercial corn and soybeans can benefit from irrigation if dry soil conditions exist. Achieving the maximum uniform germination and emergence can be assured through proper early season water management. Irrigating fields prior to or just after planting can keep the planter moving and still meet the "plant into moisture" requirement if rainfall is lacking in your area.

Late spring tillage and the delays in killing cover crop are two additional reasons we see drier than normal planting condition in some areas. "Wet mid-spring conditions has delayed field work and recent dry spells in some area have led to crop emerging into dry condition says Lyndon Kelley, MSU / Purdue Extension Irrigation Educator. Late planting may result in a greater need for early June irrigation for developing crops as we enter into the typical drier weather of summer.

Irrigation water applied at ½ to ¾ inch will wet dry soil down to 6 inches to replace water loss to tillage. An inch of irrigation will often be needed in a field that has not received rainfall since the

cover crop was destroyed. Monitoring newly emerged crops that were "irrigated up" is essential. It is important to water enough to keep roots growing down into the moisture. Most years' rainfall is plentiful enough to replenish water lost to tillage or cover crop, but a dry layer 6 inches to 8 inches down can greatly hinder crops development, and needs to be replenished by rain or irrigation.

Early season irrigation can be both the cause and solution to soil crusting and emergence problems. Depending on soil type, crop residue, and irrigation application equipment early season irrigation can create some soil crusting accelerated by rapid surface drying. Small applications of water 0.2 to 0.3 inch may help to allow emergence of seed through the crust.

Planting after harvest forage like wheat hay or cereal rye silage has a double advantage but rain fan or irrigation is required to replace the depleated soil moisture. Newly emerged corn and soybeans use less than ½" water per week but many annuals like wheat and rye will dry the soil to depth of 2-3 ft. leave the crop depended on timely rain or irrigation. If unless the forecast promises big chance of rain 1" to 1 ½ "of irrigation is need to create the moist soil crop need to develope into.

Many herbicide options can be assisted by a timely rain or irrigation. Applications of 0.3 to 0.5 inch of water will move activated soil applied herbicides if rainfall does not occur within two days after herbicide application. Irrigating in herbicides can also create the problem of different levels of weed control between the dry corners and the irrigated portion of the field. Timely and directed scouting for weeds in dry corners will be needed later in the season.

Early season irrigation can be more accurately scheduled from monitoring soil moisture in the root zone rather than checkbook irrigation scheduling system for newly emerged crops. Later in the season checkbook irrigation scheduling will show its advantages over scheduling by soil moisture in the root zone alone. To learn more about checkbook irrigation scheduling click on the following link;
http://msue.anr.msu.edu/uploads/235/67987/resources/SoilWaterBalanceSheet.03.05.15.pdf or http://msue.anr.msu.edu/uploads/235/67987/FactSheets/3_IrrigationSchedulingTools5.14.pdf.

Delayed planting and slow root growth may increase the need for monitoring soil moisture and June irrigation. Soil probing below the developing root is a good indication of the need for early season irrigation. Soil below the roots should still be able to form and hold ball when squeezed, if adequate moisture is present. USDA offers an easy to use guide on hand feel method of soil moisture motoring. http://msue.anr.msu.edu/uploads/235/67987/lyndon/FeelSoil.pdf.

For more information on irrigating contact Lyndon Kelley, Extension Educator Purdue/MSU, Irrigation at 269/467-5511.

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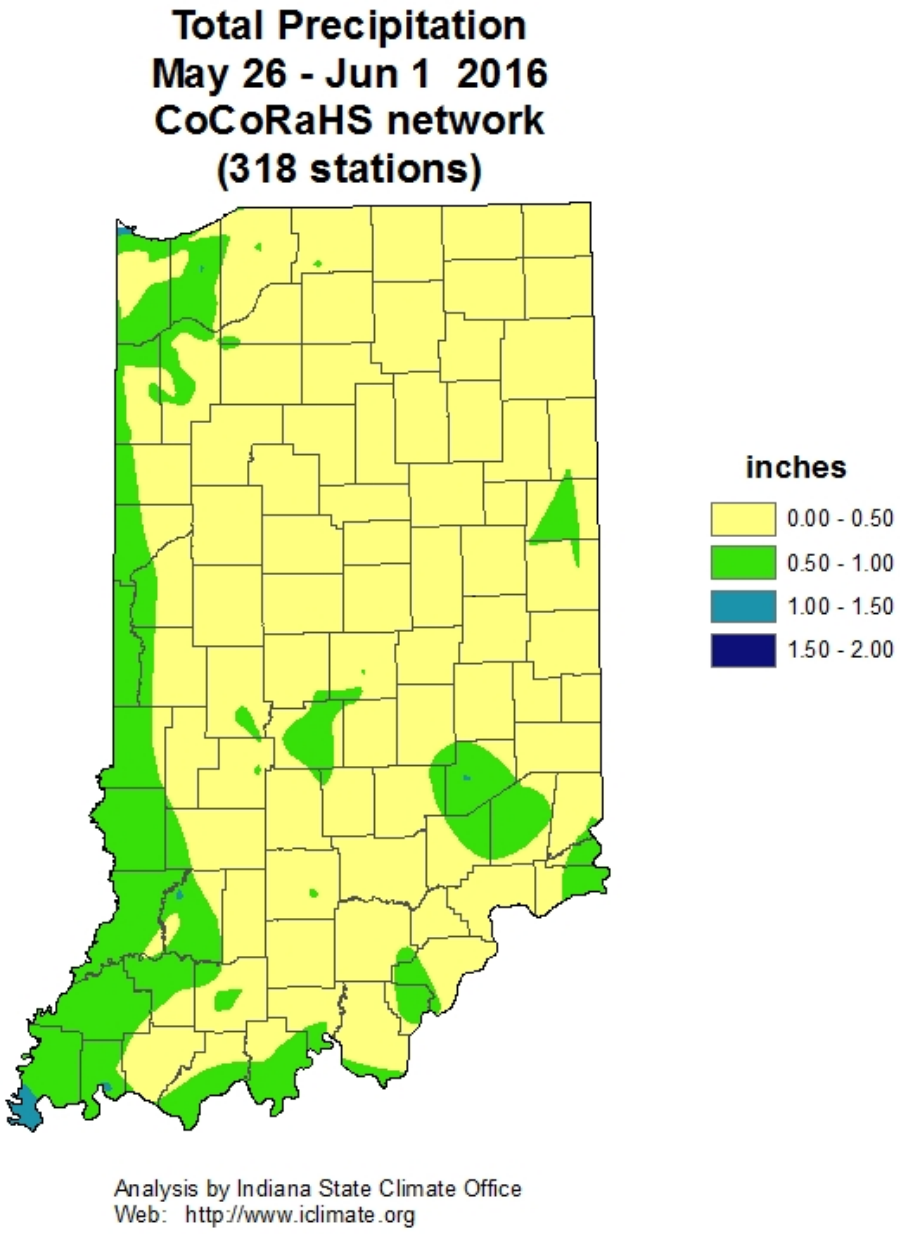
WEATHER UPDATE

Precipitation


Total Precipitation
May 26 - Jun 1 2016
CoCoRaHS network
(318 stations)
inches
0.00 - 0.50
0.50 - 1.00
1.00 - 1.50
1.50 - 2.00
Analysis by Indiana State Climate Office
Web: http://www.iclimate.org

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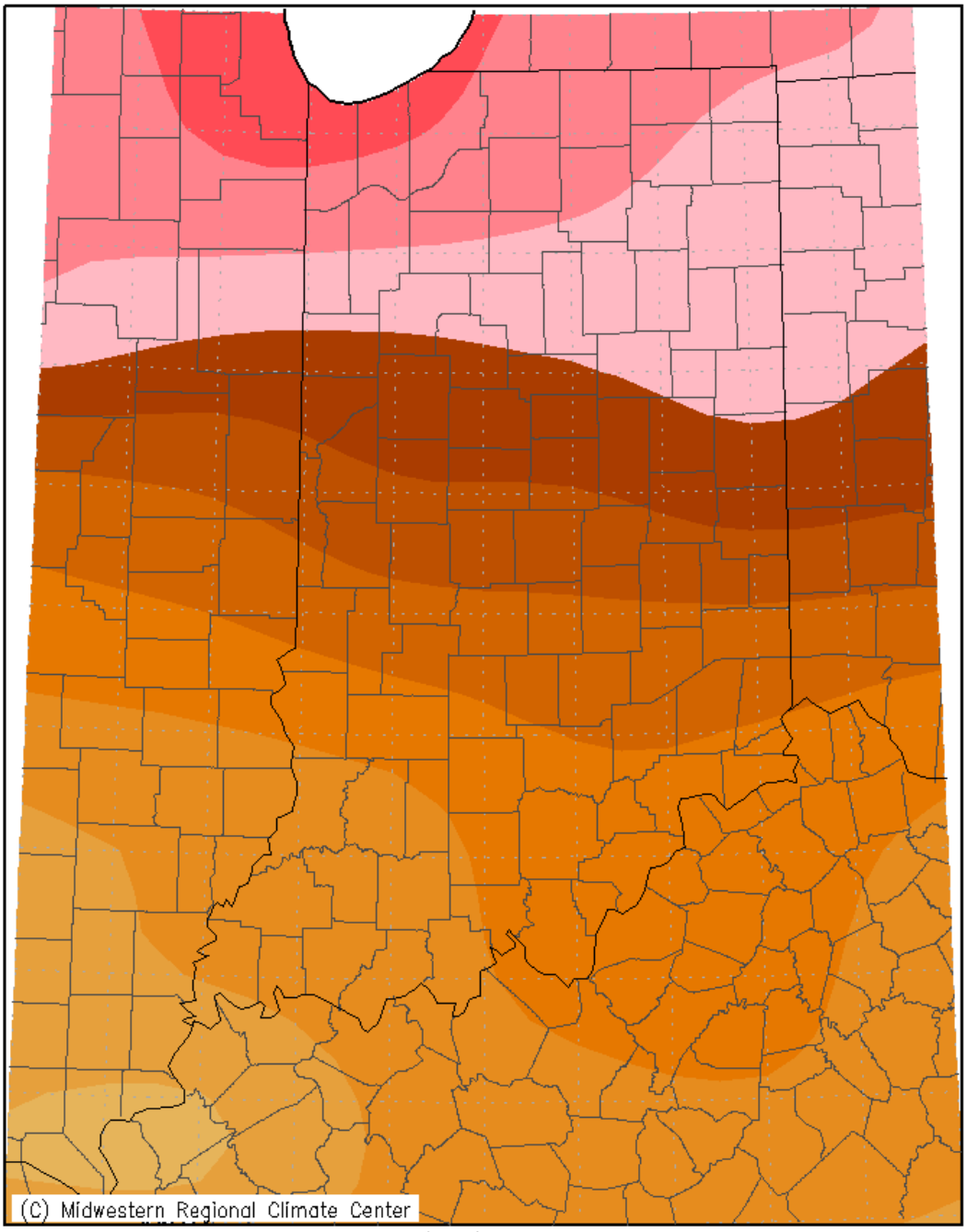
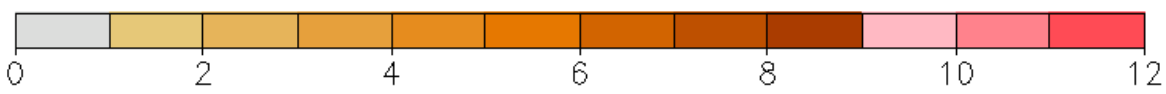
Temperature

Average Temperature (°F): Departure from Mean
May 24, 2016 to May 30, 2016



Mean period is 1981–2010.



Indiana State Climate Office www.iclimate.org
Purdue University, West Lafayette, Indiana
email: iclimate@purdue.edu

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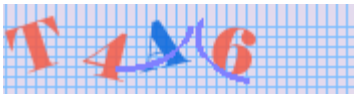

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