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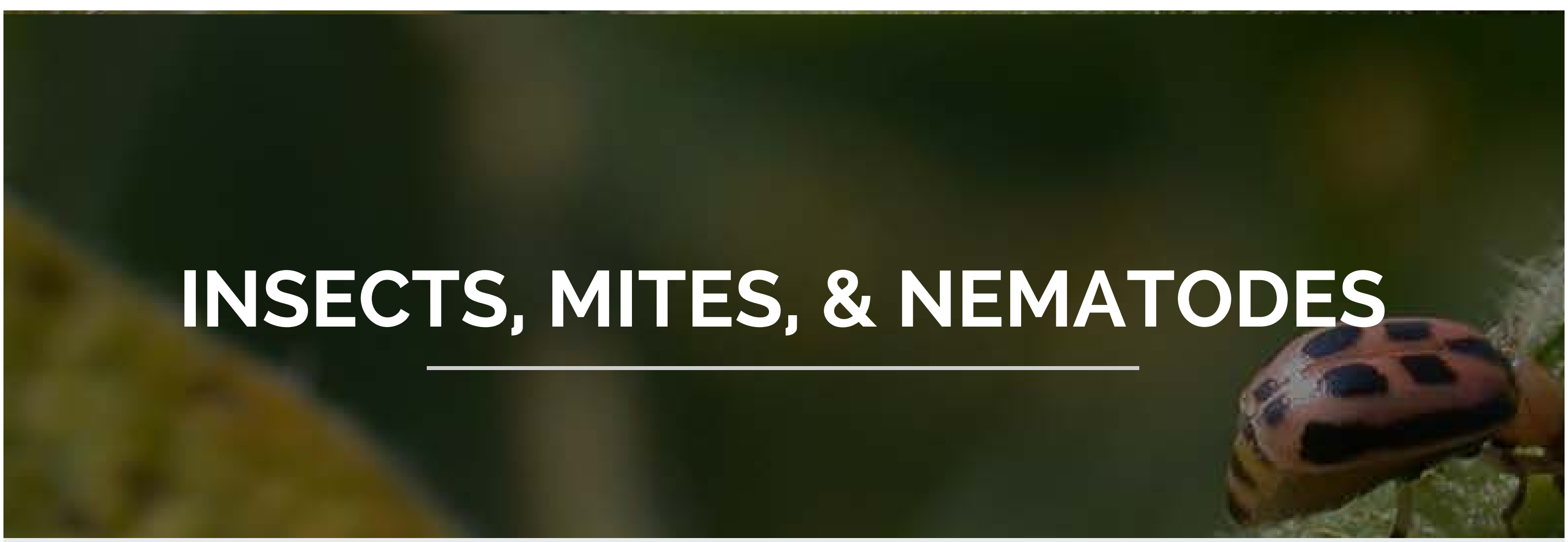
Insects, Mites, and Nematodes



Slugs Sliming Corn – (Christian Krupke and John Obermeyer) -

- **Reports of slug damage received from NC Indiana, due to cool/wet spring.**
- **Crop damage and stand losses are most severe when slugs enter open seed slots.**
- **Control options are limited and difficult to implement. Slugs are bad news!**

Slugs are soft-bodied, legless, slimy, and grayish or mottled gastropods – relatives of snails, clams, and other aquatic animals. Their length, depending on species, can reach up to 4 inches, but is usually 1/2 to 1-1/2 inches long. Build-up of slug populations is greatest in no-till systems and weedy fields, because the optimum conditions for slug survival (wet soils, lots of residue) are most likely to occur under these conditions. Juvenile slugs, which are present now, will continue to increase in size, as will their appetite. Fortunately, their feeding on crops is due to slow down soon, as sun shines and temperatures increase, along with quicker growth of the crop out of the danger period.

Classic slug damage to 4-leaf corn.

Both corn and soybeans can be significantly damaged by this nocturnal pest. Their mouthparts cause a scraping type of damage, where the top layer of leaf tissue is removed. On corn, slugs feed on the surface tissue of leaves resulting in narrow, irregular, linear tracks or scars of various lengths. Severe feeding can result in split or tattered leaves that resembles hail damage. Soybean

damage is not as predominant on the foliage, but rather on the hypocotyl and cotyledons. Given good growing conditions, plants usually outgrow slug damage once the crop is up. Most damage and stand losses by slugs occur when fields are too wet to plant and seed slots are not properly closed. In this situation, slugs can be found feeding on the seedlings within the slot, day or night. That is really a worst case scenario, and pretty uncommon. But once the growing point of corn or soybeans is injured, plant recovery is unlikely.

Control of slugs is difficult, if not impossible. Disruption of their environment, i.e., tillage, is typically not an option, especially on long-term no-till or highly erodible land. A metaldehyde-pelleted bait is labeled and available for use. However, spreading the pellets evenly over the field or damaged areas is another matter; a commercial mechanical dispenser is one possibility. Field trials at Ohio State have shown good results when the pellets are evenly distributed. With the significant cost and difficulty of application, consider these baits only as a last resort to protect crop stands in high slug populated areas. Remember that time is on your side – as the season advances, the risks of slug damage decrease with increasing temps and crop growth.

Where replanting is necessary from slug damage, one should strongly consider lightly tilling the area first, or at least a zone tillage for the seed row. This should help dry the area and break-up and bury crop residue. This will discourage further slug activity. Granular, liquid, and seed-applied insecticides are ineffective against slugs, as they are able to “over-slime” them, not a technical term. Bt corn has no effect on slugs. Home remedies, such as spraying plants at night with liquid fertilizer (high salt concentration), have proved futile and are obviously impractical for most large-scale plantings.

Slug damage to soybean hypocotyls.

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VIDEO: Corn Field Damage by Slugs – (Christian Krupke and John Obermeyer) -

Christian Krupke shows slug damage in a 4-leaf corn field and how to find them during the day

Short discussion on the limited control options. View this video:

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Notes on Recent Pollinator Health Initiatives – (Greg J. Hunt) -

Indiana is working on a state pollinator protection plan, which is being spearheaded by the Office of the Indiana State Chemist with input from various stakeholders, including growers, farm chemical company representatives and beekeepers. A large part of the plan will involve protecting bees from pesticides. This plan is part of a national movement initiated by the president last year. A "national strategy to promote the health of honey bees and other pollinators" was released on May 19 by the newly established Pollinator Health Task Force.

The national plan offers an assessment of the decline of honey bees, wild bees and monarch butterfles. The decline in honey bees coincided with the introduction of parasitic mites but other factors including pesticides play a role. Last year the nation lost 40% of its hives. Beekeepers had to scramble to make new hives to pollinate the nation's crops. The annual loss has been about 30% for

the past ten to twenty years. There are over 4,000 species of native bees in addition to honey bees in North America. Honey bees were introduced by the colonists. It is assumed that policies that improve the health of honey bees will also benefit native species but there are some initiatives aimed at native bees. The plan recognizes that the monarch butterfly is only a minor pollinator but that it is a major indicator of ecosystem health. For example, the area covered by overwintering monarchs in Mexico has decreased by about 90% in the last twenty years.

There are three main objectives: (1) returning honey bee colony health to acceptable levels (approximately 15% overwintering loss, a level from which beekeepers are capable of successfully dividing surviving healthy colonies to remain economically viable); (2) increasing monarch butterfly populations to historic averages to ensure successful continuation of annual migrations; and (3) increasing and maintaining cumulative pollinator habitat acreage in critical regions of the country.

Solitary bee on dandelion.

Most new funding will be funneled to research on causes and cures for pollinator declines, which will be about $29 million in 2016. This will be a great boon to those who are studying factors

influencing bee losses, or those interesting in surveying existing bee and butterfly populations in various habitats, or looking at the value of habitats and other practices as benefits to pollinator populations. The stated goal for objective 3 is to restore or establish 7 million acres of land for pollinators over the next 5 years. There will be some funds for habitat restoration but most of this should be accomplished through changes in policies for federal and state lands, and reallocation of existing funds. There will be opportunities to enhance pollinator habitat in private lands in the conservation reserve program, or CRP. The plan proposes better coordination involving many federal agencies and state agencies to help make this happen. For example, the federal wildlife service will partner with the Association of Fish and Wildlife Agencies to include monarch butterfly and pollinators in their State Wildlife Action Plans. This will allow states to use a portion of their state wildlife grant funds for pollinator conservation.

Another major area discussed in the plan is pollinator public education and outreach. Federal agencies will be encouraged to develop educational websites and the public will be engaged through initiatives such as National Pollinator Week, which is the third week in June. The National Park Service, the DOE and USDA will play important roles in designing educational materials and events. All in all, this plan looks like great news for pollinators, for our food supply and for the health of our environment.

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Armyworm Pheromone Trap Report

County/Cooperator	Wk 1	Wk 2	Wk 3	Wk 4	Wk 5	Wk 6	Wk 7	Wk 8	Wk 9	Wk 10	Wk 11	Wk 12
Dubois/SIPAC Ag Center	0	0	1	0	2	1	0	4	0			
Jay/Davis Ag Center	0	0	2	0	4	1	0	0	0			
Jennings/SEPAC Ag Center	0	0	0	0	1	0	0	2	4			
Knox/SWPAC Ag Center		0	0	0	1	0	0	2	3			

LaPorte/Pinney Ag Center	0	0	3	0	17	35	29	5	0			
Lawrence/Feldun Ag Center	0	2	0	1	0	11	3	5	7			
Randolph/Davis Ag Center	0	0	0	0	0	0	0	0	0			
Tippecanoe/Meigs	0	0	1	0	0	0	0	0	0			
Tippecanoe/Meigs (Hartstack)				7	548	406	58	13	7			
Whitley/NEPAC Ag Center	0	1	5	2	17	25	4	0	5			
Whitley/NEPAC Ag Center (Hartstack)						792	404	137	103			

Wk 1 = 4/2/15 - 4/8/15; Wk 2 = 4/9/15 - 4/15/15; Wk 3 = 4/16/15 - 4/22/15; Wk 4 = 4/23/15-4/29/15;

Wk 5 = 4/30/15-5/6/15; Wk 6 = 5/7/15-5/13/15; Wk 7 = 5/14/15-5/20/15; Wk 8 = 5/21/15-5/27/15;

Week 9 = 5/28/15-6/3/15

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Giant Ragweed Should be a Driver Weed for many Indiana Farmers – (Travis Legleiter and Bill Johnson) –

As planting season is wrapping up many Indiana farmers are likely to start turning their attention towards postemergence herbicide applications. Many of the corn acres in the state likely have already received a postemergence application and many soybean fields will begin to be sprayed in the next couple of weeks. In previous seasons it has been common to drive around and see farmers making postemergence herbicide applications to fields containing giant ragweed that was well over the recommended 4-6" height. This is a trend that is concerning to Purdue Weed Science.

Giant ragweed is a troublesome weed that emerges early in the season and grows quite rapidly, outcompeting crops and other weeds for cherished sunlight. The plant grows until it reaches about 1 ft. of height over other plants to maximize its light harvesting ability. This often leads to giant ragweed reaching the 4-6" height that is recommended for postemergence herbicide applications well before other weeds species.

A 6 inch tall giant ragweed in a corn field with multiple grass species ranging from 1-2 inches in height.

A lack of a residual herbicide at planting and farmers hesitation to spray when only the giant ragweed is at the appropriate height often leads to situations where postemergence applications, regardless of the herbicide of choice, are being made to giant ragweed plants that are much larger than the labeled height or would be recommended by Purdue Weed Science. These post applications on large giant ragweed place great selection pressure for herbicide resistance that has led to past cases of glyphosate and ALS-inhibitor resistance and can certainly lead to future cases of herbicide resistance. The number of postemergence herbicides for control of giant ragweed is

already limited, but continued applications to large plants will only decrease the number available options in the future.

Those producers who know that fields have a history of giant ragweed, especially those who did not apply a residual herbicide, should key in on this weed species as a driver weed. The term "driver weed" refers to the weed species that dictates or drives herbicide management decisions for a particular field. The rapid growth of giant ragweed should always position it as a species that determines the appropriate timing for a postemergence herbicides. All too often we see where producers were reluctant to make a postemergence application to 4-6" giant ragweed because of a lack of other weeds at that size and the potential need for a second postemergence application because of the extensive time till soybean canopy. Waiting for the other weeds to emerge or for the soybean canopy to further develop will only allow the giant ragweed to continue to grow well past a manageable height and likely effect yields. Farmers need to focus on giant ragweed as their driver weed as in many of these situations it is the species to has the largest potential to reduce yields if not managed. It should also be realized that fields with heavy infestations of giant ragweed are likely to need multiple postemergence applications and that single postemergence herbicide programs are not a reality of effective weed management programs.

As farmers and consultants continue or begin to scout fields keep in mind that if giant ragweed is present amongst other smaller weeds, that it should drive the decision for making a postemergence herbicide application. Fields with a history of giant ragweed pressure should be especially noted and be prioritized to be sprayed before giant ragweed reaches 6 inches in height.

More information on Giant Ragweed Control can be accessed at the following links:

Take Action: Management of Herbicide-Resistant Giant Ragweed
https://ag.purdue.edu/btny/weedscience/Documents/50737_12_TA_FactSheet_GiantRagweed_V3_LR.pdf

2015 Ohio, Indiana, and Illinois Weed Control Guide: Control of Problem Weeds, pgs 175-176
https://mdc.itap.purdue.edu/item.asp?Item_Number=WS-16-W#.VJLVQCdVtMy.

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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 http://www.ppdl.purdue.edu/PPDL/

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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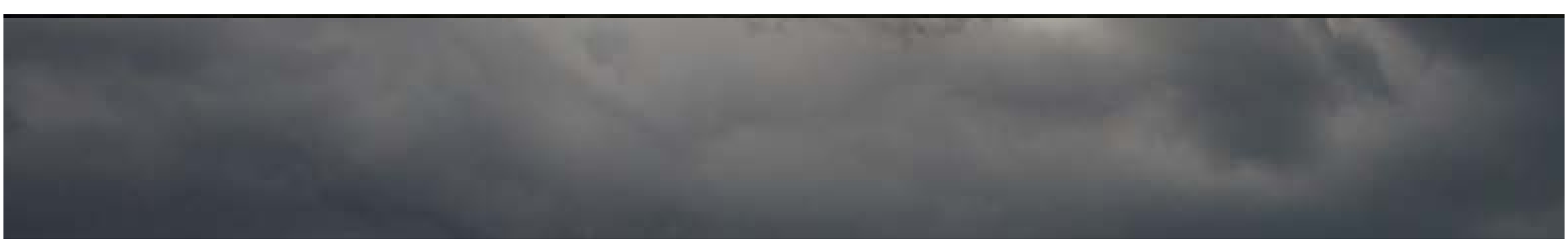
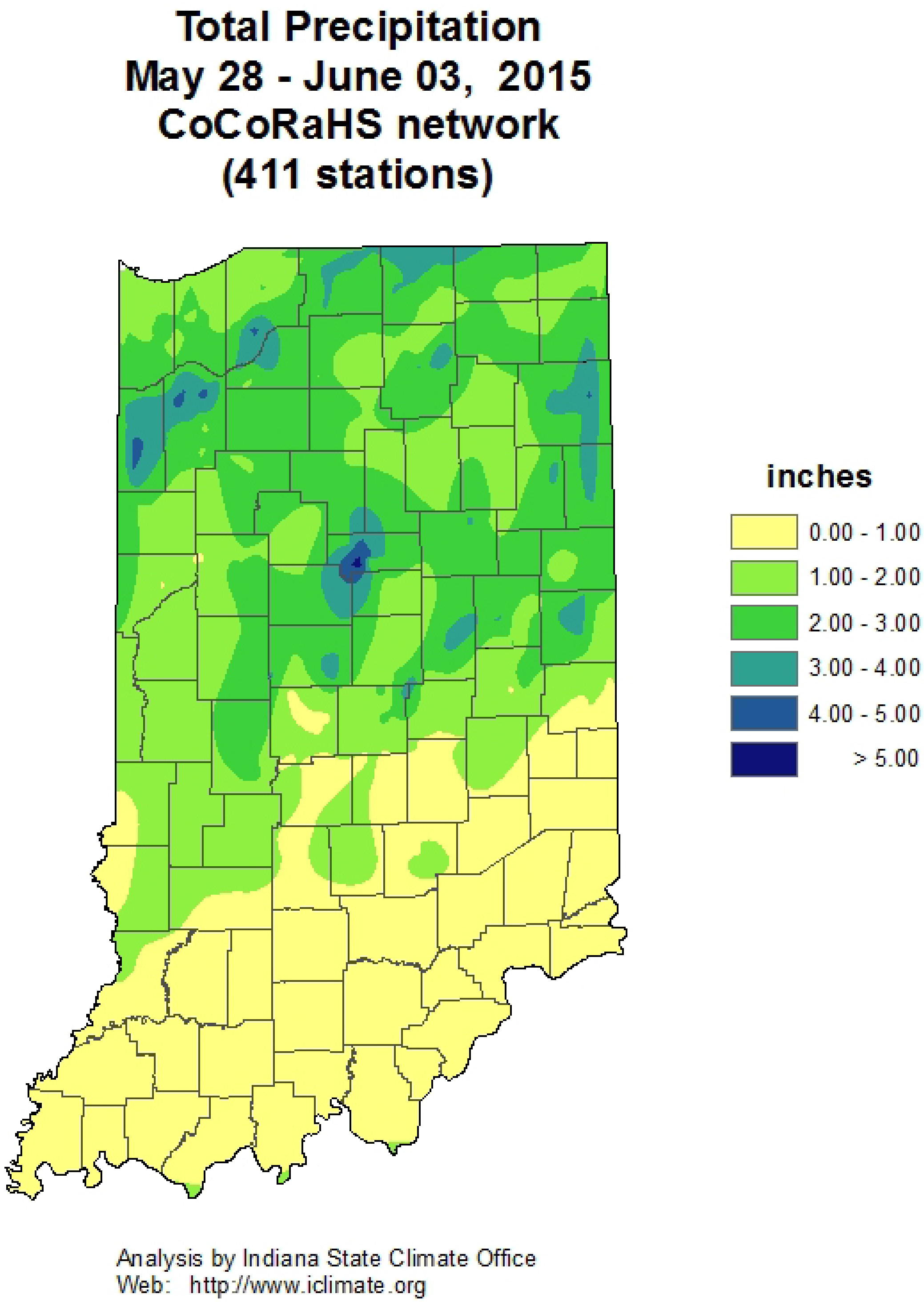


WEATHER UPDATE

Precipitation



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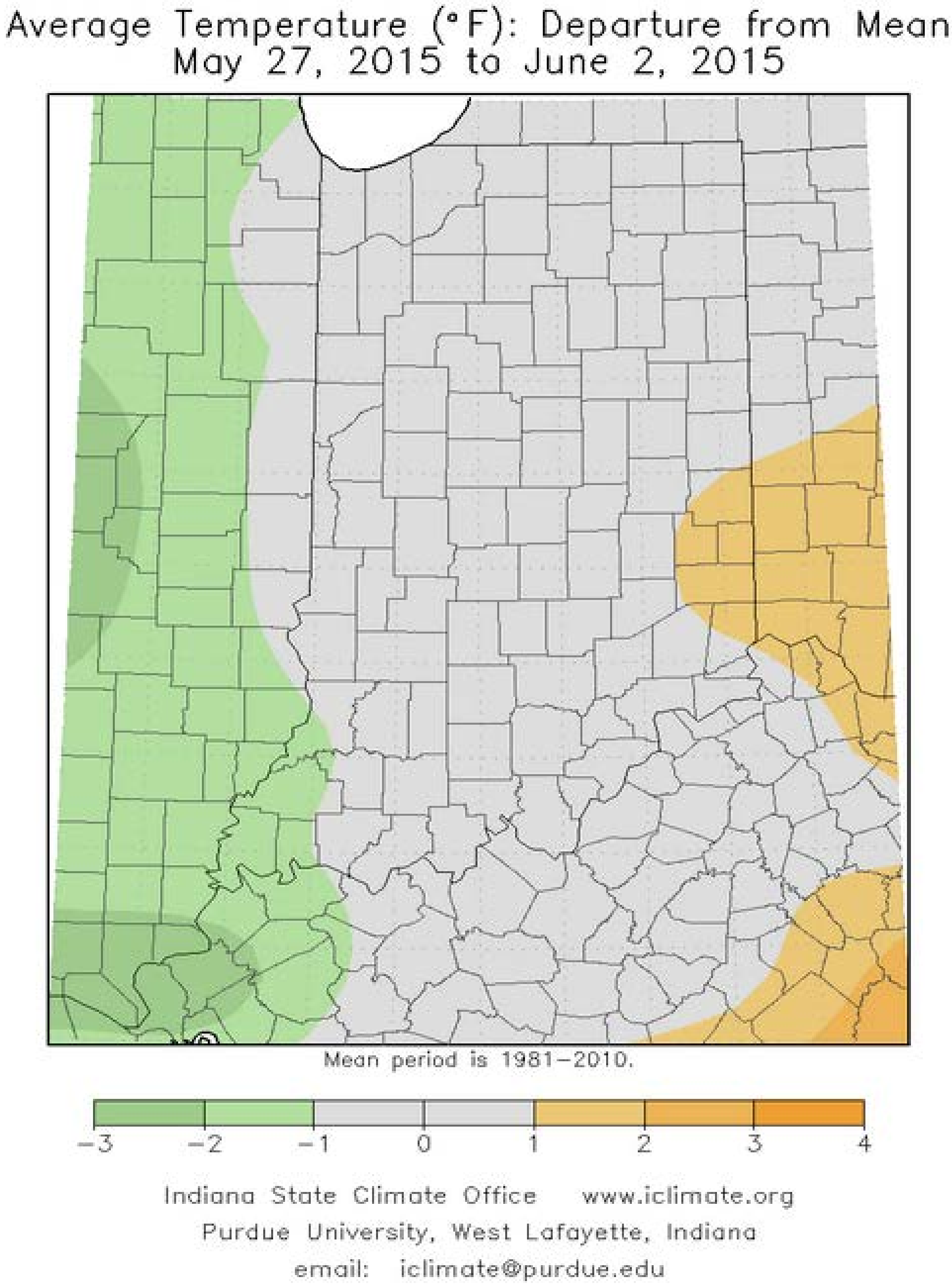
Temperature


Average Temperature (°F): Departure from Mean
May 27, 2015 to June 2, 2015
Mean period is 1981–2010.
−3
−2
−1
0
1
2
3
4
Indiana State Climate Office www.iclimate.org
Purdue University, West Lafayette, Indiana
email: iclimate@purdue.edu

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THANKS FOR READING

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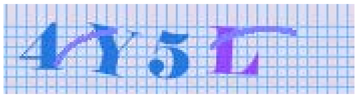

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