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Pest & Crop Newsletter

Purdue Cooperative Extension Service

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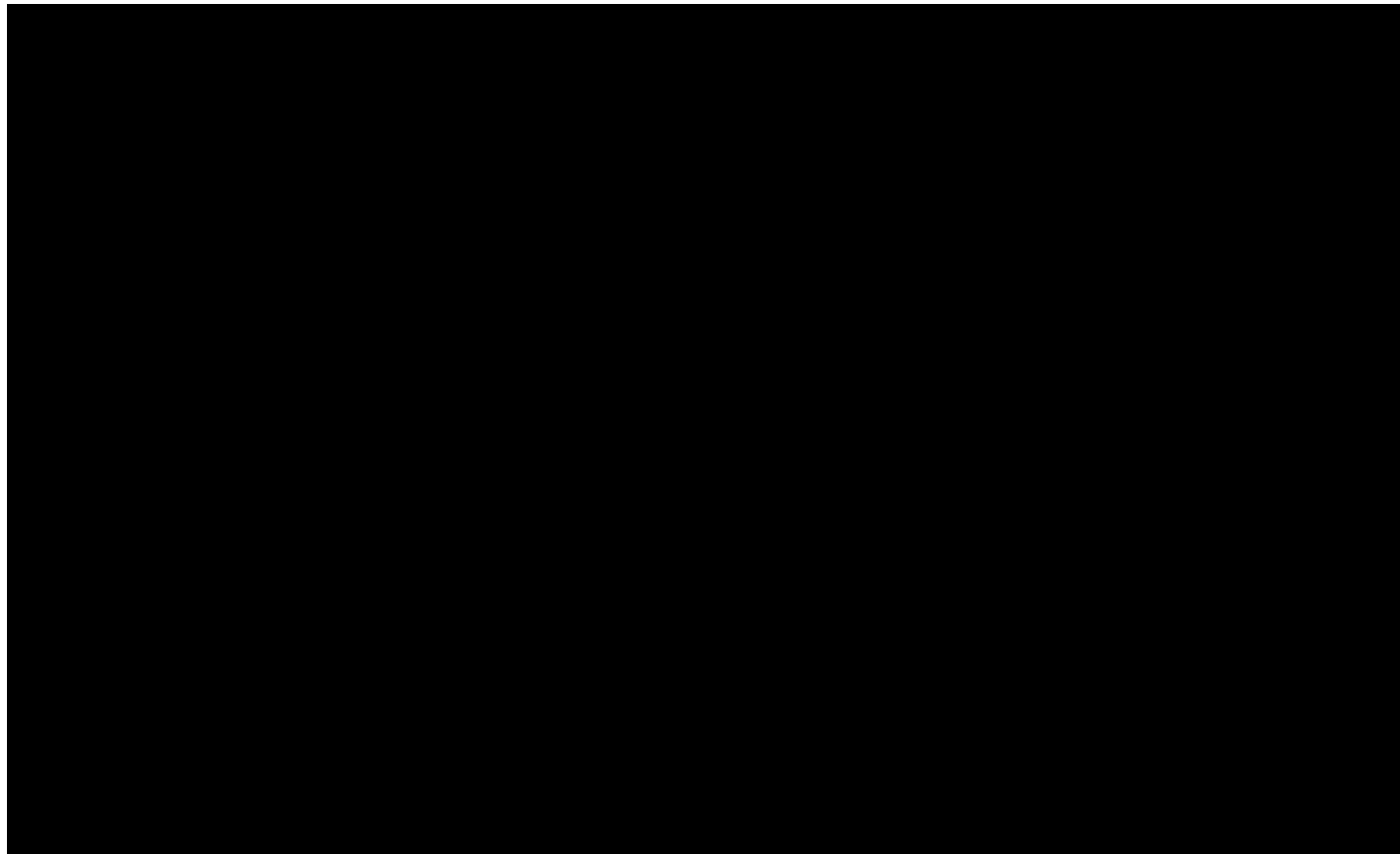
INSECTS, MITES, & NEMATODES

Insect Musings for a Wet, Cool Early April – (*Christian Krupke and John Obermeyer*) -

Take a look at some of the impressive *black cutworm* captures this past week, “Black Cutworm Adult Pheromone Trap Report,” with many intensive captures (9 or more moths captured over two consecutive nights). It is not unusual at this time of year to have very high catches mixed in with zeroes, one of the reasons we want many cooperators all over the state. Typically, we receive freezing temperatures following these early flushes. Since the black cutworm isn’t cold hardy, e.g., spending the winter in Southwestern States and Mexico, many likely perish during these cold spells. But since they will keep filtering in over the coming weeks, there are certain to be sufficient moths to lay eggs in the many winter annual weeds and cover crops. We use these trap counts only as a timing mechanism or presence/absence gauge, to help determine when to start looking for them. A record number of moths DOES NOT equate to a disaster in the making and vice versa for small numbers of moths. In the near future, we will publish color-coded maps with their anticipated development to help you to time your scouting trips. As a reminder, the cutworm threat will be greatest when they get large feeding on winter annual weeds and cover crops, and then get the opportunity to feed on seedling corn as it emerges. The best time for control, as with most insects, is when the cutworms are small.

Alfalfa weevil damage should be scouted for in southern Indiana counties. We are way ahead of what is “typical” in terms of heat unit development for this pest. A mild winter, including a warm finish in the months of February and March, was likely favorable for populations statewide. This is especially true for alfalfa stands of two or more years old. Look for the tiny holes in leaves of the upper canopy. Carefully unfold some leaves of the damaged tips and look for the greenish larvae with black heads.

A video to help identify and understand sampling for alfalfa weevil can be watched here:





Some bucket traps have been busy catching black cutworm moths.

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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	0									
Jennings/SEPAC Ag Center	0	1	1									
Knox/SWPAC Ag Center	0	13	26									
LaPorte/Pinney Ag Center	0	0	3									
Lawrence/Feldun Ag Center	4	108	216									
Randolph/Davis Ag Center	0	29	41									
Tippecanoe/Meigs	0	2	15									
Whitley/NEPAC Ag Center	0	34	90									

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Black Cutworm Adult Pheromone Trap Report

County	Cooperator	BCW Trapped			
		Week 1 3/23/17-3/29/17	Week 2 3/30/17-4/5/17		
Adams	Kaminsky/New Era Ag				
Adams	Roe/Mercer Landmark	11	17*		
Allen	Anderson/Syngenta Seed		0		
Allen	Gynn/Southwind Farms	2	1		
Allen	Kneubuhler/G&K Concepts - Trap 1		0		
Allen	Kneubuhler/G&K Concepts - Trap 2		9		
Bartholomew	Bush/Pioneer Hybrids	1	13*		
Clay	Bower/Ceres Solutions - Clay City	0	0		
Clay	Bower/Ceres Solutions - Bowling Green	0	0		
Clay	Bower/Ceres Solutions - Brazil	0	0		
Clinton	Emanuel/Boone Co. CES	8	9		
DeKalb	Hoffman/ATA Solutions	0	0		
Dubois	Eck/Purdue CES	14	28*		
Elkhart	Barry/Helena				
Elkhart	Kauffman/Crop Tech Inc.	0	0		
Fayette	Schelle/Falmouth Farm Supply Inc.	5	33*		
Fountain	Mroczkiewicz/Syngenta	7	18*		
Fulton	Jenkins/N. Central Coop - Talma	0	5		
Fulton	Ranstead/NCC Coop - Rochester	0	0		
Gibson	Schmitz/Gibson Co. CES				
Hamilton	Campbell/Beck's Hybrids	14	13		
Hamilton	Truster/Reynolds Farm Equipment		0		
Hendricks	Nicholson/Nicholson Consulting	0	3		
Jasper	Overstreet/Jasper Purdue CES	2			

Jasper	Ritter/Brodbeck Seeds	1	3		
Jay	Boyer/Davis PAC		3		
Jay	Shrack/Ran-Del Agri Services	1	3		
Jay	Temple/Jay County CES				
Jennings	Bauerle/SEPAC	0	0		
Knox	Bower/Ceres Solutions - Freelandville	0	0		
Knox	Bower/Ceres Solutions - Vincennes	0	0		
Kosciusko	Klotz/Etna Green	0	0		
Lake	Kleine/Kleine Farms	4	16*		
Lake	Moyer/Dekalb Hybrids - Shelby	5	5		
Lake	Moyer/Dekalb Hybrids - Schneider	2	5		
LaPorte	Rocke/Agri-Mgmt Solutions				
Madison	Truster/Reynolds Farm Equipment		0		
Marshall	Harrell/Harrell Ag Services		0		
Marshall	Klotz/SR 10 & SR 331	0	0		
Marshall	Miller/North Central Coop	0	0		
Miami	Early/Pioneer Hybrids	0	0		
Newton	Moyer/Dekalb Hybrids - Lake Village	2	6		
Porter	Leuck/PPAC	5	3		
Pulaski	Capouch/M&R Ag Services	0	0		
Pulaski	Leman/North Central Coop		0		
Putnam	Nicholson/Nicholson Consulting		2		
Randolph	Boyer/DPAC		1		
Rush	Schelle/Falmouth Farm Supply Inc.		6		
Shelby	Fisher/Shelby County Co-op	2	3		
Shelby	Simpson/Simpson Farms	7	49		
Starke	Capouch/M&R Ag Services	0	0		
Starke	Wickert/Wickert Consulting - California Twnshp	1			
Starke	Wickert/Wickert Consulting - Railroad Twnshp	0			
Sullivan	Bower/Ceres Solutions - Farmersburg	0	1		
Sullivan	Bower/Ceres Solutions - Sullivan	6	21*		
Tippecanoe	Bower/Ceres Solutions	0	0		
Tippecanoe	Kremer/Monsanto Research Farm	0	0		
Tippecanoe	Nagel/Ceres Solutions	30	47*		
Tippecanoe	Obermeyer/Purdue Entomology	2	5		
Tipton	Campbell/Beck's Hybrids	10	17		

Vermillion	Bower/Ceres Solutions		0		
Wabash	Enyeart/North Central Coop				
Whitley	Walker, Richards/NEPAC1 - Main	10	28*		
Whitley	Walker, Richards/NEPAC2 - Kyler	3	8		

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

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AGRONOMY TIPS

Yield Response of Corn to Plant Population – *(Bob Nielsen, Jason Lee, John Hettinga, and Jim Camberato) -*

Economic Optimum Plant Populations for Indiana

Results from 81 field scale trials around Indiana since 2008 suggest that maximum yield response to plant populations for 30-inch row corn grown under minimal to moderate stress conditions occurs at about 31,600 PLANTS per acre (ppa), equal to seeding rates of about 33,250 SEEDS per acre (spa). Corn grown under extremely challenging conditions (e.g., severe drought stress) may perform best at PLANT populations no higher than 22,800 ppa and perhaps as low as 21,000 ppa under truly severe growing conditions (e.g., actual drought, non-irrigated center pivot corners, non-irrigated sandy fields with minimal rainfall). *Economic optimum populations are several thousand lower than the agronomic optimum.*

For the full update, see the online summary at <http://www.kingcorn.org/news/timeless/CornPopulations.pdf>

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Residual Herbicides and Fall Cover Crop Establishment – *(Joe Ikley, Travis Legleiter, and Bill Johnson)* -

Recently there has been increased interest in utilizing cover crops in our corn and soybean production systems. Concurrently, there has also been increased utilization of soil residual herbicides in our corn and soybean production systems to help manage herbicide resistant weeds such as marehail, pigweeds, and ragweeds. Soil residual herbicides can remain active in the soil for anywhere from weeks to months after application. The length of time a residual herbicide remains biologically active in the soil is influenced by soil type, soil pH, organic matter, rainfall, and temperature. Since these factors will vary from field to field, definitive time intervals of residual herbicide activity can be difficult to predict.

A significant challenge has arisen because use of residual herbicides in our corn and soybean production systems may interfere with establishment of fall seeded cover crops. An unfortunate coincidence is that many of the crops being used for cover crops were not evaluated for herbicide carryover when field research was being conducted for support of the EPA label of the respective herbicide. As a result, data are lacking regarding rotational intervals for establishment of many cover crop species.

Over the last couple of growing seasons we have established experiments designed to evaluate the impact of commonly used residual herbicides on the establishment of many cover crop species. In addition, our colleagues in adjacent states have conducted similar research and we feel like we have a better handle on this topic now than we did two or three years ago. As was mentioned above, predicting herbicide persistence is complicated because so many different factors can influence herbicide dissipation in the soil.

As a general rule, residual herbicides that have activity on grass weeds can interfere with the establishment of some grass cover crop species, especially the smaller seeded ryegrass species. Residual herbicides from group 2 (ALS), group 5 (triazine), group 14 (PPO), or group 27 (bleacher) can interfere with the establishment of some of the broad leaf cover crop species.

More specifically we have learned the following:

- Corn herbicides
 - Pyroxasulfone (Zidua) and metolachlor (Dual, etc) can hinder ryegrass establishment.
 - Atrazine or simazine at > 1 lb/A will be problematic for legumes and mustards unless lots of rain.
 - < 0.75 lb/A may allow for most legume cover crops, mustards, and annual ryegrass.

- Atrazine < 1 lb/A can allow cereal grain establishment.
- Mesotrione (Callisto, Lumax, Lexar etc.), flumetsulam (Python) and clopyralid (Stinger, Hornet, SureStart) can be problematic for legumes and mustards like canola and forage radish.
- Soybean herbicides
 - Chlorimuron (Classic, Canopy, Cloak, etc.), imazethapyr (Pursuit), and fomesafen (Reflex, etc.) could be a problem for fall seeded legume or mustard covers including radish. However, establishment of cereal grains should be OK.

It is important to remember that herbicide application timing greatly influences the risk of carryover interfering with cover crop establishment. In general, herbicides applied at planting have a lower risk of interfering with cover crop establishment than herbicides applied postemergence later in the year. An example would be fomesafen, which can be applied both preemergence and postemergence in soybean. Fomesafen applied postemergence in late June is more likely to interfere with cover crop establishment than fomesafen applied at planting in April or May. We can use the knowledge we have about herbicide interactions with specific cover crops to assess risk of certain herbicide programs interfering with cover crop establishment. However, it is important to prioritize controlling weeds in your cash crop rather than dropping certain herbicides from your program to ensure successful cover crop establishment.

This summarizes our current knowledge on establishment of cover crops following the use of residual herbicides. The final two things to mention is that if you have questions about specific situations, one way to address the residual herbicide left in a field is to do a bioassay. Simply collect soil from the area you would like to seed the cover crop into and an area with a similar soil type, but no herbicide residue, and plant seed from the cover crop you would like to use. Observe growth for 3 weeks and if the plants look the same in the untreated and treated soil, you should be safe to plant to desired crop. Waiting 3 weeks to observe growth may push the planting of cover crops beyond the desired planting window, so careful planning is required to conduct a bioassay. One method is to collect soil at least 4 weeks ahead of your planned day of planting fall cover crops to allow enough time to observe the plants in your bioassay. Another consideration if you do not have time to do a bioassay is to plant a cover crop mixture. Cover crop establishment may be more reliable when mixtures of grass and broadleaf species are purchased and planted. Residual herbicides may interfere with establishment of some species in the mix, but have no effect on other species. The use of mixtures may allow one more protection from complete failure due to excessive residues in the soil. It would be important however to be sure that at least one or two of the species in the mixture is tolerant to the herbicides used in a specific field.

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The Dicamba Labels for Xtend Soybeans – (Mark Loux, OSU, Joe Ikley, Travis Legleiter, and Bill Johnson) -

This article was originally published in November 2016. The information presented in this update is accurate as of March 31st 2017. Here are the key dicamba label changes since November:

- *Engenia and FeXapan have received labels.*
- *Limited tank mixes and additional nozzles have gained approval.*
- *We have received clarification from USEPA and Office of Indiana State Chemist one what constitutes a “sensitive area”.*

As everyone has probably heard by now, there are federal labels for the use of 3 dicamba products, on dicamba-resistant (Xtend) soybeans. These products are Xtendimax (Monsanto), FeXapan (DuPont), and Engenia (BASF). Xtendimax and FeXapan are essentially the same product being sold by two different companies, and the labeling and eventually also the list of approved mixtures and nozzles should be the identical between these products. Engenia is a new formulation of dicamba. We cover some of the

highlights from the Xtendimax label here. Table 1 lists the label differences between Xtendimax/FeXapan and Engenia.

- XtendiMax is based on dicamba DGA (Clarity), and the formulation contains “VaporGrip”, which reduces the volatility of the dicamba spray mix. It’s a 2.9 lb/gallon liquid, so 22 oz provides 0.5 lb of dicamba, which is equivalent to 16 oz of Clarity and other 4 lb/gallon dicamba products. Engenia is a new formulation of dicamba. It is a BAPMA salt, which has reduced volatility compared to older formulations. It’s a 5 lb/gallon liquid, so 12.8 oz provides 0.5 lb of dicamba.
- Xtendimax minimum application rate for any use is 22 oz/A. The maximum rate per application prior to soybean emergence is 44 oz/A, which is also the total maximum allowed for all applications prior to soybean emergence. The maximum rate per application after soybean emergence is 22 oz/A, and the total of all POST applications cannot exceed 44 oz/A. The total applied per year for all applications cannot exceed 88 oz. Engenia minimum AND maximum application rate is 12.8 oz/A. This rate can be applied twice for all applications prior to soybean emergence, for a maximum of 25.6 oz/A. The 12.8 oz/A rate can be applied twice after soybean emergence, for a total of 25.6 oz/A applied POST. Total Engenia applied per year for all applications cannot exceed 51.2 oz.
- POST applications can be made from emergence up to and including the R1 stage of soybean growth. Weeds should be less than 4 inches tall at time of POST application. Label states that Monsanto will not warrant product performance when applied to weeds greater than 4 inches tall (how this will work for giant ragweed we have no idea, since it comes out of the ground more than 4 inches tall, and a height of 6 to 10 inches at first POST makes more sense).
- Products cannot be tank-mixed with any adjuvants, drift reducing agents, or other herbicides unless they are listed on the websites in Table 1.
- Use of ammonium sulfate, UAN, etc is not allowed due to their potential to increase the volatility of dicamba. There are approved AMS replacement products listed on the website if you need to mitigate hard water issues.
- Application parameters: Only approved nozzles can be used. The list of approved nozzles for each product are accessed at the respective websites listed in Table 1; minimum spray volume of 10 gpa; maximum ground speed of 15 mph; spray boom should be no more than 24 inches above target; and no aerial application.
- Do not apply if rain is forecast within the next 24 hours following application. Do not apply during temperature inversions.
- Xtendimax/FeXapan wind speed and application: <3 mph – do not apply; 3 to 10 mph – optimum application conditions provided all other application requirements on label are met; >10 to 15 mph – do not apply when wind is blowing toward non-target sensitive crops; >15 mph – do not apply. Engenia allows applications below 3 MPH, but states the applicator is responsible to confirm no temperature inversion is present.
- When “sensitive areas” are downwind from the site of application, a buffer between the last treated soybean row and the sensitive area must be maintained. The following areas can be considered part of the buffer: road, paved, or gravel surfaces; agricultural fields that have been planted to corn, Xtend soybeans, sorghum, proso millet, small grains or sugarcane (if you figure out how to successfully grow that last one here in the Midwest let us know); fields that have been prepared for planting but not yet planted; areas covered by footprint of building or other man made structure with walls and/or a roof.
- “Sensitive areas” are not clearly defined on the label. In discussion with the USEPA and our state chemist office, our understanding is that **roadside ditches, grass field borders, treelines or shrubs/bushes in field borders, etc. ARE sensitive areas**. These sensitive areas are designated as potential habitats of endangered species.
- With regard to “non-target susceptible crops: do not apply where off-target movement can occur to food, forage etc plantings and cause damage or render the crops unfit for sale, use or consumption; applicators are required to ensure that they are aware of proximity to non-target susceptible crops, including consulting registries that list commercial specialty or certified organic crops that may be near the application site.
- Do not apply when wind is blowing toward “adjacent commercially grown dicamba sensitive crops”, including but not limited to, commercially grown tomatoes and other fruiting vegetables, cucurbits, and grapes. It is not clear on the label what other crops are on this list, but our interpretation is that non-Xtend soybeans also fall under this category.
- There is a whole section on herbicide resistance, which emphasizes the need for “diversified weed control strategies to minimize selection for weed populations resistant toherbicides...”. Some desirable resistance management practices are listed along with the need to scout for non-performance after application and report any such instances to the company.

If you plan on using dicamba in your Xtend soybean fields, it is important to monitor the associated websites for approved tank mixes and nozzles. At the time of this writing, 20 nozzles are approved for use with Xtendimax. There are a handful of adjuvants and herbicides, including glyphosate, that are approved for tank-mixtures with Xtendimax. However, it is clearly marked on the website that several of these adjuvants and herbicides, including all approved glyphosate formulations, also require a specific drift reduction agent (DRA) in the tank as well. It is our understanding that any combination on this list can be mixed and matched according to the most restrictive label. Engenia currently has 6 nozzles approved for use, and also several adjuvants and herbicides. What is different from the Xtendimax label is that when applying an approved glyphosate product with Engenia, you do not need to add an approved DRA in the tank. Currently, there is only 1 approved nozzle, and no approved tank-mixes for FeXapan. These websites seem to be updated weekly, if not daily, so the situation is constantly evolving.

It is going to be imperative that everyone involved completely understands without confusion the application guidelines with regard to not injuring nearby sensitive crops, ornamentals, etc. The label places responsibility for this directly onto the person making the application, so applicators will need to figure out what type of system and alternative plans to have in place to keep up with their typically hectic application schedule and still meet label guidelines based on current weather and proximity to sensitive crops.

Table 1. Key differences between approved dicamba formulations.

Factor	Xtendimax/FeXapan	Engenia
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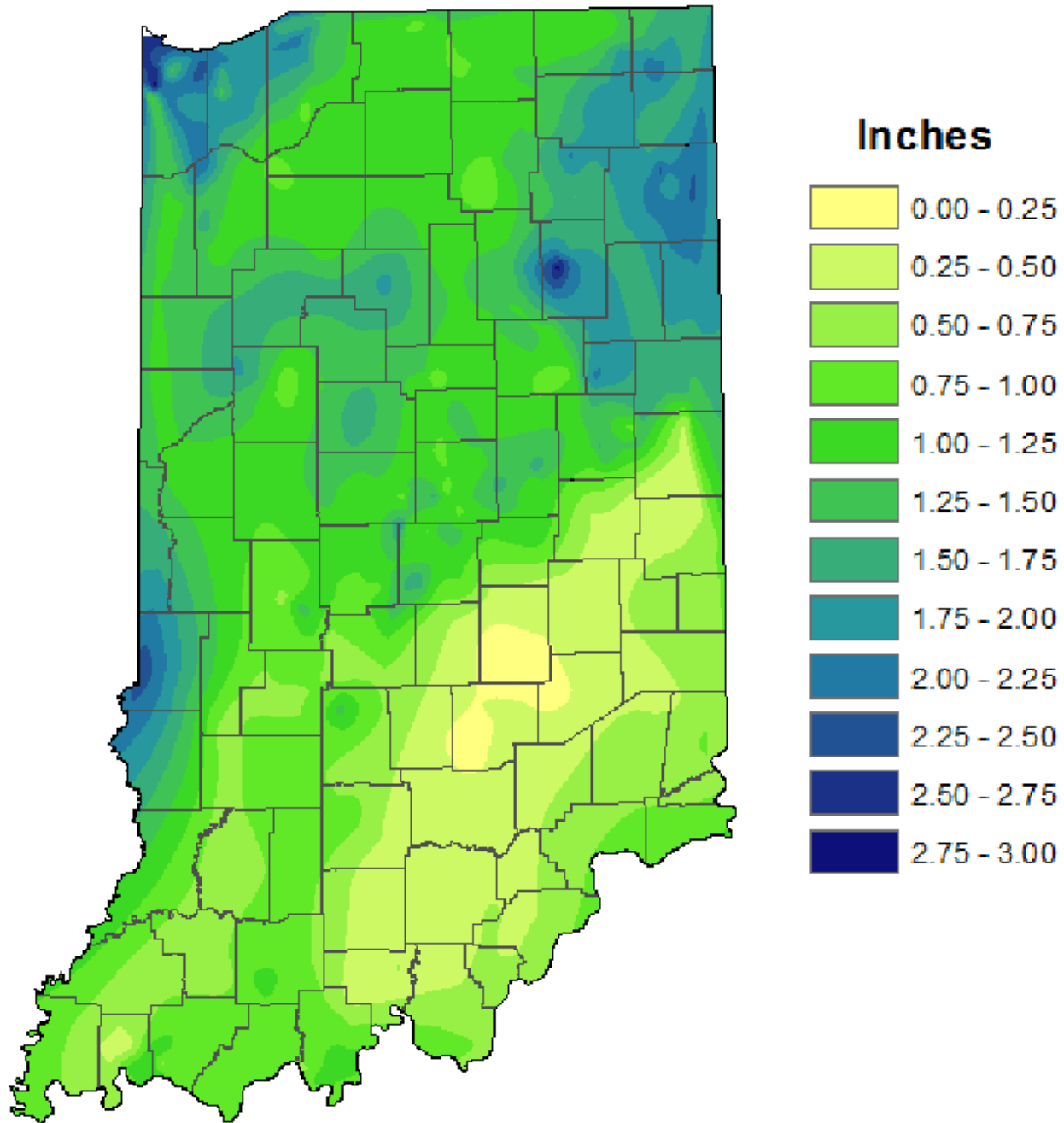
Formulation	DGA salt + VaporGrip 2.9 lb./gal.	BAPMA salt 5 lb./gal.
Tank mixtures and nozzles	http://www.xtendimaxapplicationrequirements.com & http://www.fexapanapplicationrequirements.dupont.com	http://www.engeniatankmix.com
Wind speed	3-15 mph	0*-15 mph
Rain - do not apply if rain is expected within	24 Hours	4 Hours
Buffer	110 ft. for 22 oz., 220 ft. for 44 oz.	110 ft. for 12.8 oz.
*Only apply when wind is 0-3 mph after confirming no temperature inversion is present.		

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WEATHER UPDATE

Precipitation

Total Precipitation Mar 30 - Apr 5, 2017 CoCoRaHS Network (323 Stations)

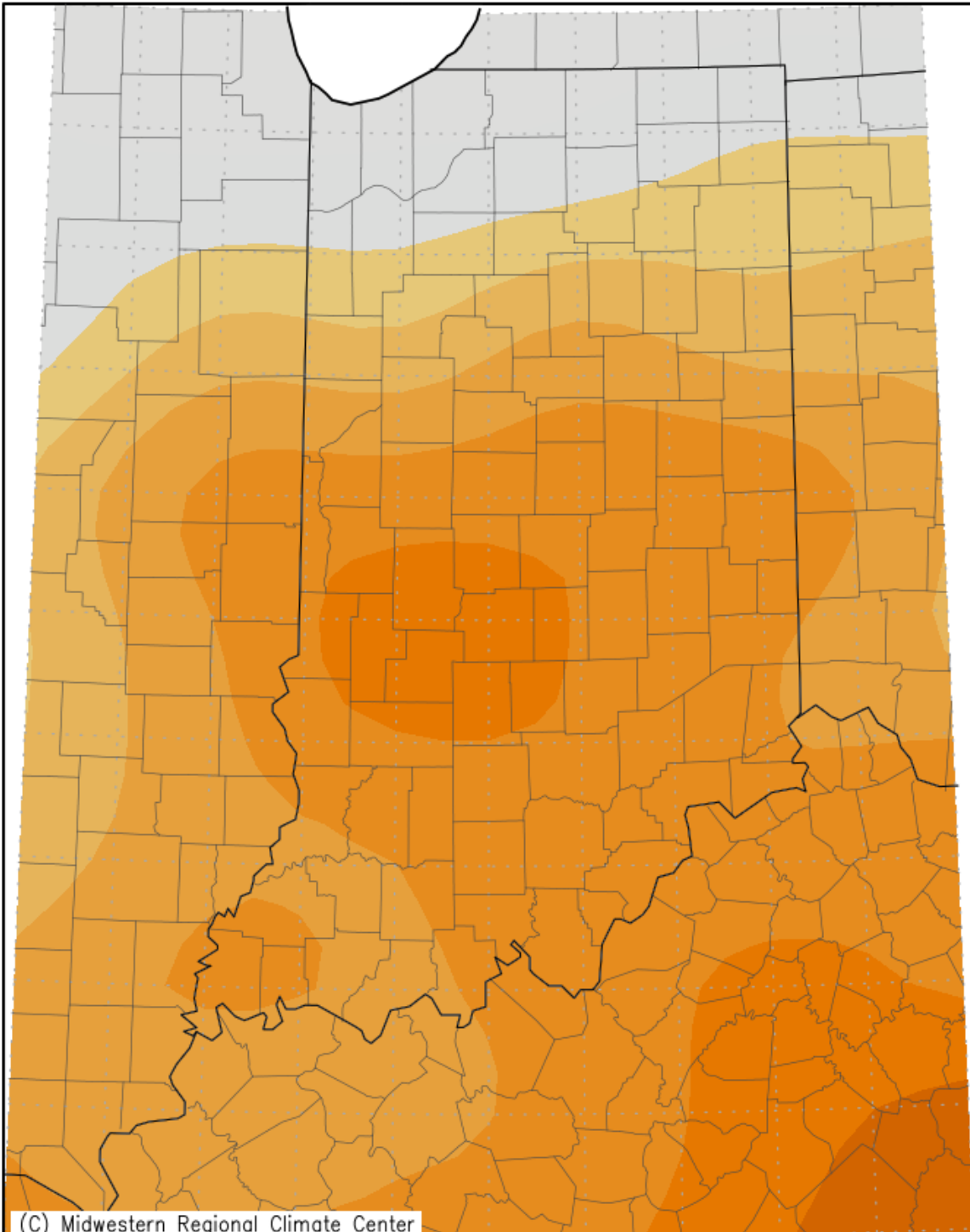


Analysis by Indiana State Climate Office
Web: <http://www.iclimate.org>

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Temperature

Average Temperature (°F): Departure from Mean
March 28, 2017 to April 3, 2017



Mean period is 1981–2010.



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

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THANKS FOR READING

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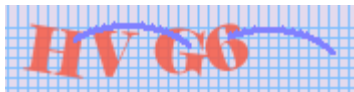
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