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Publication Recaps Academic Research on Neonicotinoids – (Darrin Pack, Ag Communications) –

Neonicotinoid insecticides applied as a coating to soybean seeds provide a maximum of three weeks of protection after planting and are ineffective against later-emerging threats such as soybean aphids, according to a new publication by researchers from Purdue and 12 other Midwest universities.

The Purdue Extension publication, The Effectiveness of Neonicotinoid Seed Treatments in Soybean, summarizes current research on both the crop protection benefits of neonicotinoids and some of the unintended consequences that have been documented since their widespread introduction as corn and soybean seed treatments about 12 years ago.

Christian Krupke, professor of entomology at Purdue and one of the authors, said the publication is intended as an information resource for farmers.

"We wanted to develop a quick reference guide with research results addressing the utility, efficacy and fit of neonicotinoid seed treatments in soybean pest management," he said. "Our goal is to help producers assess if and when these products fit for them and make the best possible decisions for their particular field conditions."

Neonicotinoids became widely available in the mid-1990s and first gained popularity in

horticulture crops partly because pests had become immune to other insecticides. In addition, the "neonics," as they are commonly called, are less toxic to mammals than many older insecticide classes.

Beginning in the early 2000s, neonicotinoids were increasingly used as seed treatments for field crops. More than 80 percent of corn and 40 percent of soybean acres nationally are planted with neonicotinoid-treated seed.

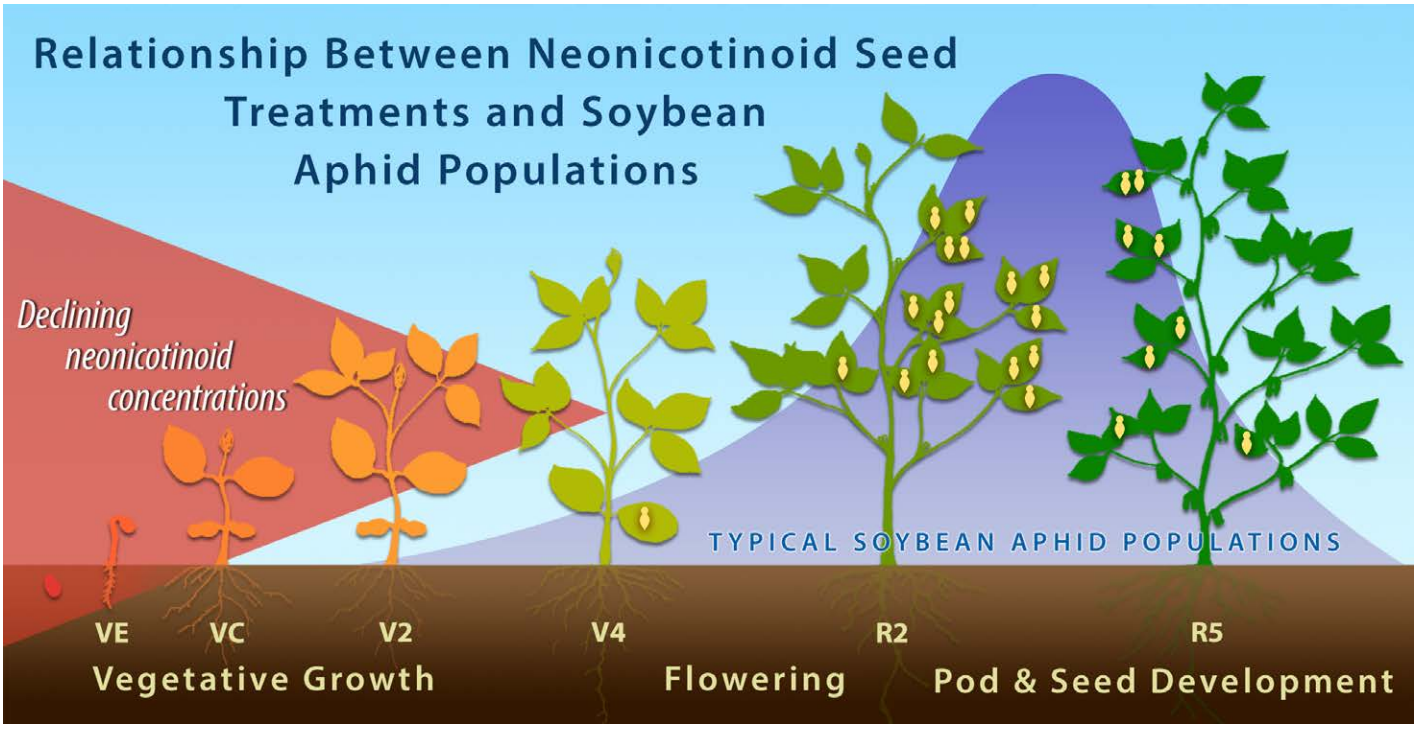
Published research has shown that while neonicotinoids can be effective in controlling sporadic and inconsistent early-season threats such as wireworms or white grubs, they lose effectiveness well before midsummer, which is usually when the most potentially destructive soybean pest, the soybean aphid, begins to colonize soybean fields across the Midwest. Other publications have also shown that neonicotinoids spread readily through the environment and could pose a threat to beneficial species.

"Planter dust, which is generated during and shortly after planting neonicotinoid-treated seeds, contains high concentrations of neonicotinoid insecticides," the publication says. "Dust can move beyond field margins and land on flowers and other vegetation and potentially expose non-target insects (including honeybees and other pollinators)."

In addition, "Neonicotinoids are highly soluble in water, which facilitates movement beyond field borders via tile drainage and runoff," the publication says.

Most soybean pests, including soybean aphid, can be managed using an integrated pest management approach, which includes a combination of scouting and insecticide use when needed. The authors recommend that farmers consult with their local university Extension services for recommendations on specific pest management strategies in their state.

The publication was a joint effort of Purdue, Iowa State University, Kansas State University, the University of Nebraska-Lincoln, North Dakota State University, Michigan State University, the University of Minnesota, the University of Missouri, Ohio State University, Penn State University, South Dakota State University, Texas A&M University and the University of Wisconsin. The full publication is available at: https://extension.entm.purdue.edu/publications/E-268-W.pdf



In this illustration, the red-shaded area represents the relative concentration of a neonicotinoid pesticide and the blue-shaded area represents the relative concentration of the soybean aphid population in a typical year. According to a new publication summarizing academic research, so-called "neonics" provide protection for a maximum of three weeks after planting and are ineffective against later-emerging threats such as soybean aphids. (Purdue Agricultural Communication graphic/Dan Annarino)

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Response of Corn to Starter Fertilizer - 2015 Research Update – (Jim Camberato, Cody Hornaday, and Bob Nielsen) -

Starter fertilizer is the placement of fetilizer near or with seed at planting. Tradional starter fertilizer placement has been two inches below and two inches to the side of the seed and is termed 2X2 placement. When in this position, the seedling roots encounter the fertilizer shortly after emergence. Different starter fertilizer placements, positioned both vertically and horizontally from the seed, are possible. In-furrow fertilizer, often referred to as pop-up, is an alternative to 2X2 placement that involves less hardware, cost, and lower amounts of fertilizer. Placement with the seed may result in earlier nutrient utilization by the plant than 2X2 placement.

In previous research, starter fertilizer often accelerated the early growth of corn, resulting in taller corn and more dry matter. Sometimes early gowth responses resulted in increased grain yield, but sometimes they did not. Grain moisture was sometimes lower with starter fertilizer than without, even when grain yield was unaffected.

The full publication is available at:
https://www.agry.purdue.edu/ext/corn/research/StarterFertilizer.pdf

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Successful Annual Ryegrass Termination with Herbicides – (Travis Legleiter, Bill Johnson, and Bryan Young) -

Annual ryegrass has become a popular cover crop choice for growers in Indiana and many other states. Annual ryegrass has many attributes that make it a favorable cover crop including quick establishment across a wide range of environments, the ability to survive Midwest winters, a vigorous and aggressive vegetative growth habit, and a high biomass potential both above and below the soil line. Annual ryegrass is also valued for its ability to sequester and release nitrogen for corn production.

Unfortunately, its adaptability, quick establishment, and aggressive growth are also considered to be characteristics of a weed. The annual ryegrass we know as a cover crop is the same species (*Lolium multiflorum***) as Italian ryegrass, which has become a major pest in both the southern Mississippi Delta and Pacific Northwest. Italian ryegrass is not only tough to control, it also has been confirmed resistant to four herbicide sites of action in the United States: ACCase inhibitors (Group 1), ALS inhibitors (Group 2), glyphosate (Group 9), and glufosinate (Group 10). This species' aggressive growth aspects and its ability to adapt to herbicides has made many weed scientists cautious about recommending it as a cover crop. While annual ryegrass has shown to be an excellent cover crop it is also the most difficult grass cover crop to terminate, so should only be grown by experienced cover crop users.**

To read the rest of this publication see: https://www.extension.purdue.edu/extmedia/WS/WS-52-W.pdf

Successfully terminated cereal rye cover crop.

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Current Status of Dicamba Use in Dicamba-Resistance Soybeans – (Bill Johnson and Travis Legleiter) -

Dicamba-resistant soybeans are commercially available for the 2016 growing season. However, the current labels of all the dicamba herbicide products do not allow dicamba to be used in these new soybean varieties. This new herbicide resistant soybean technology can be a useful tool for weed management in soybean, but it is unlikely that soybean farmers can realize its full utility during the 2016 growing season. Currently, there are no labels for any dicamba-containing product that allow

applications at soybean planting (preemergence) or after the soybean crop has emerged (postemergence). Based on current timelines for comment periods, then approval of federal and state labels, it is very unlikely that we will be able to use dicamba-containing products on these varieties during the 2016 growing season. Without approved labels, applying a dicamba-containing product to these soybean varieties would constitute a violation of both state and federal laws. Additionally, some elevators have indicated they will not accept grain produced from dicamba-resistant soybean until the stacked trait obtains approval by the European Union.

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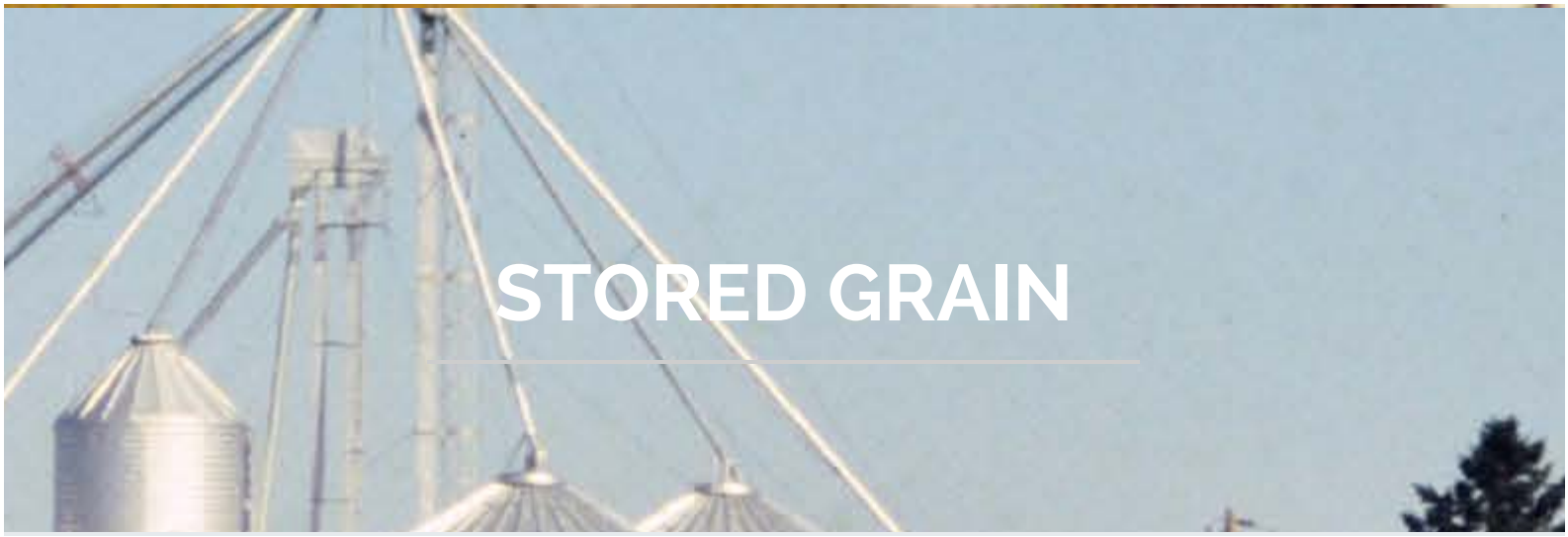

Spring Management of Stored Grain – (Klein E. Ileleji, Extension Engineer, Agricultural & Biological Engineering) -

The spring weather is a time to enjoy the warmth of the sun, bringing a welcoming break from winter chills and hibernation indoors. However, as the weather warms up in the spring, it should remind farmers and elevator managers who have stored grain in silos that the time for increased vigilance in monitoring the condition of grain has arrived. We typically recommend that grain should be adequately dried before binning in the fall, after which it is gradually cooled down by ambient aeration to as low as below 32ºF in the winter by December. For corn and soybean, we

recommend drying to a final moisture content of 15% and 13%, respectively, should you plan to sell by spring, and subsequently to one percentage point lower should storage of up to one year is planned. If grain is to be held for over one year, then drying down to two percentage points lower, that is, to 13% and 11%, respectively, is recommended. Because last year was quite favorable to field drying in Indiana, farmers were able to dry their grain to the recommended moisture levels. For those who binned corn above 15%, it is recommended that spring aeration be employed to get the grain to 15% or below. However, it is most likely that this will not be the case for the majority of farmers in Indiana this year.

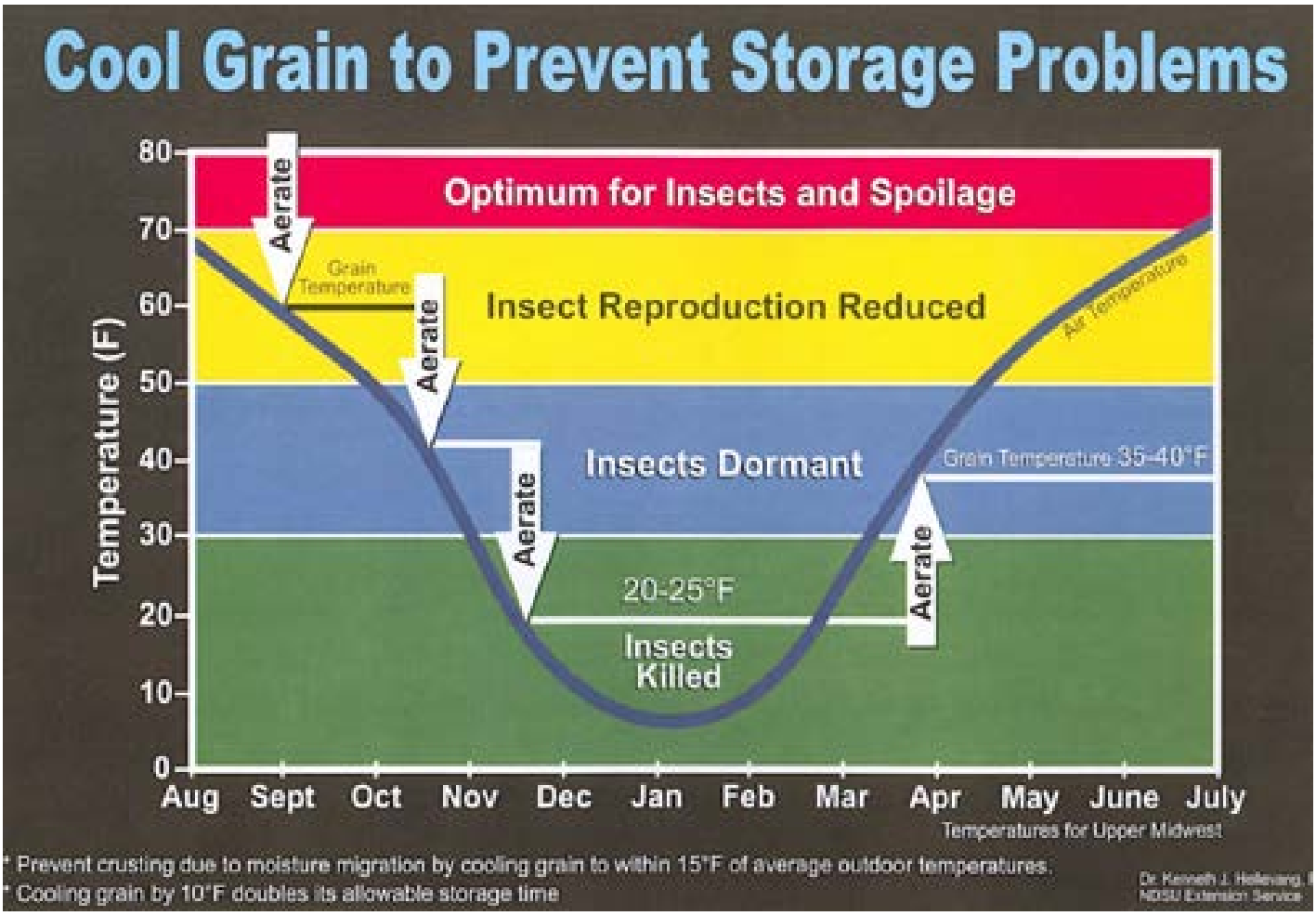

Figure 1. In-bin aeration cooling strategies for stored grain from binning in the fall to the following summer. (Source: Dr. Kenneth Hellevang, NDSU)

Figure 1 shows in-bin aeration strategies to cool grain upon binning through the following summer. Cooling grain serves to retard or stop the proliferation of any biological activities, namely from

mold spoilage and insect pests. After binning, ambient aeration should be employed to gradually cool the grain to below 32°F in the peak of the winter season. At this temperature level, neither mold nor insect will thrive. Luckily, the weather condition in the Midwest permits employing natural ambient aeration using fans to cool binned grain without the use of any ambient conditioning equipment. Because grain is a good insulator, it is able to still maintain cool temperatures way into the beginning of summer. Note that while prior Extension publications have recommended warming the grain to within 10oF of the ambient in the spring, new studies at Purdue on temperature management strategies for stored corn showed that it was best not to aerate the bins early in the spring (Ileleji et. al., 2007). Aerating the grain early in the spring will warm it up to temperatures conducive to mold and stored insect pests growth, and thus the security provided by cold winter aeration is rapidly lost. It is also advisable to cover the fan air intake when not in use, in order to prevent passive warm air from aerating and warming up the stored grain (Fig. 2). Again, do not aerate your grain in the spring to warm up to within 10°F of ambient temperatures. Hold off aeration till May or even June depending on how fast the core of the stored grain warms up.

Figure 2. Air intake on the fan sealed to prevent passive aeration of the bin.

The third aspect that should be taken into consideration is implementing a good monitoring plan. Remember, the warmer it gets, the more the need for increase frequency of monitoring. Anecdotal evidence suggests that less than 30% of on-farm stored grain in Indiana is monitored using temperature and relative humidity sensors with or without automatic data logging. Most producers depend on their nose as the sensor (smell). While this practice has been used for years,

and most producers are comfortable with it, perceiving spoiled grain means that there is rather active biological activity (spoilage or insect pests) in the stored grain. It is better to prevent biological activity proliferating in the stored grain mass early, before it becomes a major problem. Temperature cables, if used appropriately, would enable you to see temperature trends within the bulk over time and provide a pre-emptive diagnostic tool to detect hot spots in stored grain. Another tool that can be used is a CO_2 sensor that is used to detect CO_2 produced when mold consumes starch in grain and/or active seed respiration by high moisture grain (Ileleji et. al., 2006). The current challenge with this technology is the lack of good diagnostics to translate the CO_2 numbers to the corresponding degree or extent of the biological activity/spoilage. In the absence of having no sensors, turning the aeration fans for a few minutes will enhance detection by smelling. Checking your bins frequently (at least weekly), and increasing frequency as the weather warms up is a good practice.

With low grain prices at the moment, most producers may hold grain this year for longer periods than they are used to. Remember you need to be proactive with managing your stored investment. Record your data as part of the management protocol, which would allow you to observe trends over time. With the transition from cold to warm, any ice formed in the stored grain bin and within the grain mass will melt and can cause localized moisture increase and hot spot development. Also, look out for cracks and openings on the roof that could allow water leakage. Seal these appropriately as needed. Lastly, be safe when working around grain silos. Remember, a silo is a confined space and pose a hazard to personnel working inside silos. Follow recommended guidelines for safely working in grain silos. So while you enjoy the outdoors, enjoy it with the peace of mind that your grain is safely stored.

References:

1. Ileleji, K.E., D.E. Maier, C. Bhat and C.P. Woloshuk. 2006. Detection of a developing hot spot in stored corn with a CO_2 sensor. Applied Engineering in Agriculture. 22(2): 275-289.

2. Ileleji, K.E., D.E. Maier, and C.P. Woloshuk. 2007. Evaluation of different temperature management strategies for suppression of Sitophilus zeamais (Motschulsky) in stored maize. Journal of Stored Products Research. Journal of Stored Products Research 43 (2007) 480-488.

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2016 Popcorn Agri-Chemical Handbook – (Genny Bertalmio, The Popcorn Board) -

The 2016 Popcorn Agri-Chemical Handbook is now available to ensure everyone in the popcorn industry is informed about products registered for use on popcorn or in popcorn storage facilities. The handbook lists agri-chemicals registered and the regulatory status or special use restrictions, if any.

The handbook continues to provide appendix information on residue tolerances, as may be found in the Global MRL Database, which includes popcorn (corn, pop) and denotes established levels by the US, Codex, and 106 markets.

The handbook notes the Mode or Mechanism of Action (MOA) numerical classification of each listed chemical when used on a product label. The classification schemes are published by the Insecticide Resistance Action Committee, the Herbicide Resistance Action Committee and the Fungicide Resistance Action Committee. The handbook also highlights the Signal Word "Danger" when used on a product label as required by the EPA's Label Review Manual.

The Popcorn Board urges you to provide the above links to growers or download, print and distribute the updated version of this critical information to them. Contact Genny Bertalmio,

+1.312.821.0217 or gbertalmio@smithbucklin.com, for further information.

The Popcorn Board accepts voluntary contributions to ensure continued funding of its efforts to provide this important information to the popcorn industry. Checks should be mailed to The Popcorn Board, 8333 Solutions Center, Chicago, IL 60677-8003.

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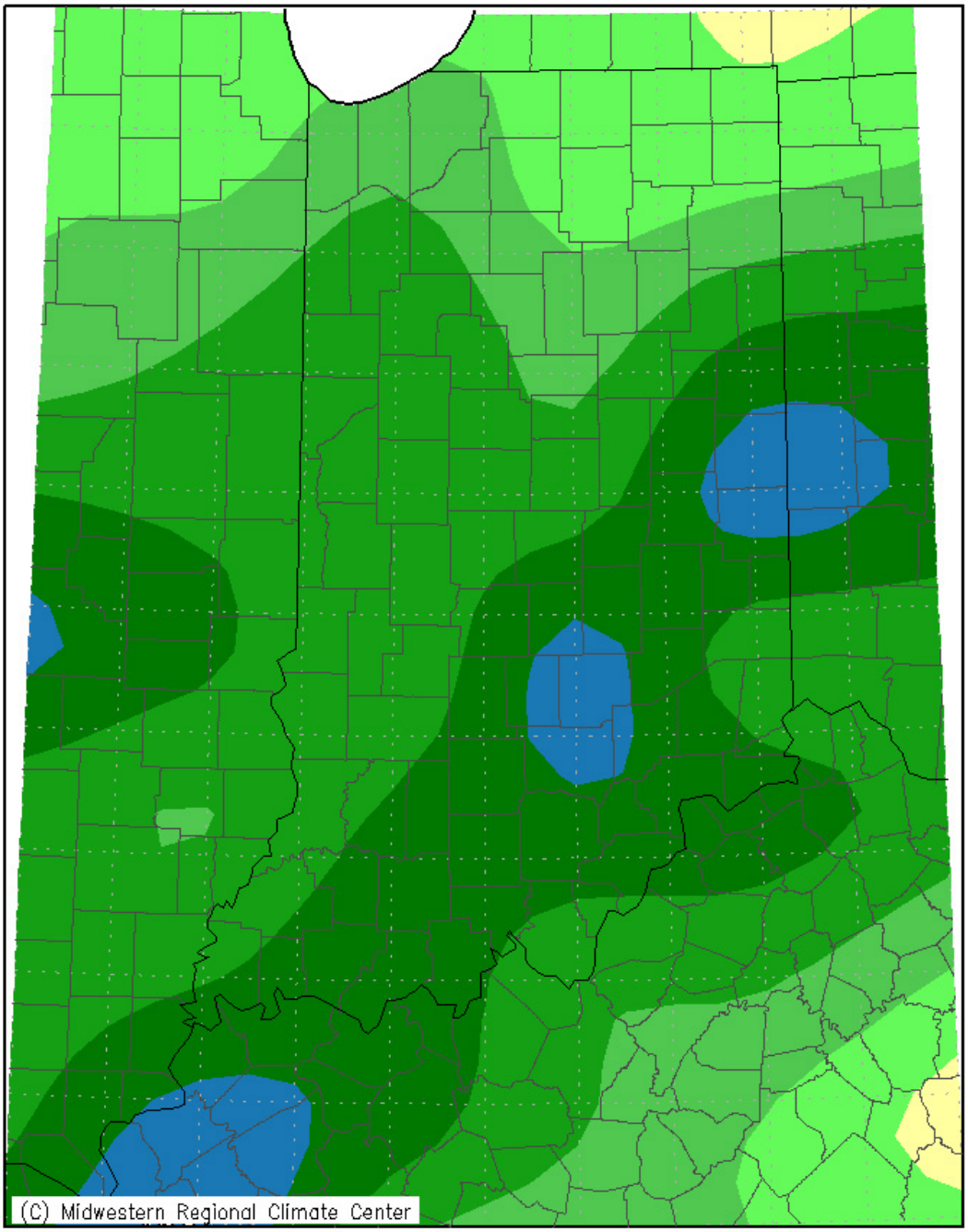
WEATHER UPDATE

Precipitation

Accumulated Precipitation (in): Departure from Mean
December 24, 2015 to March 22, 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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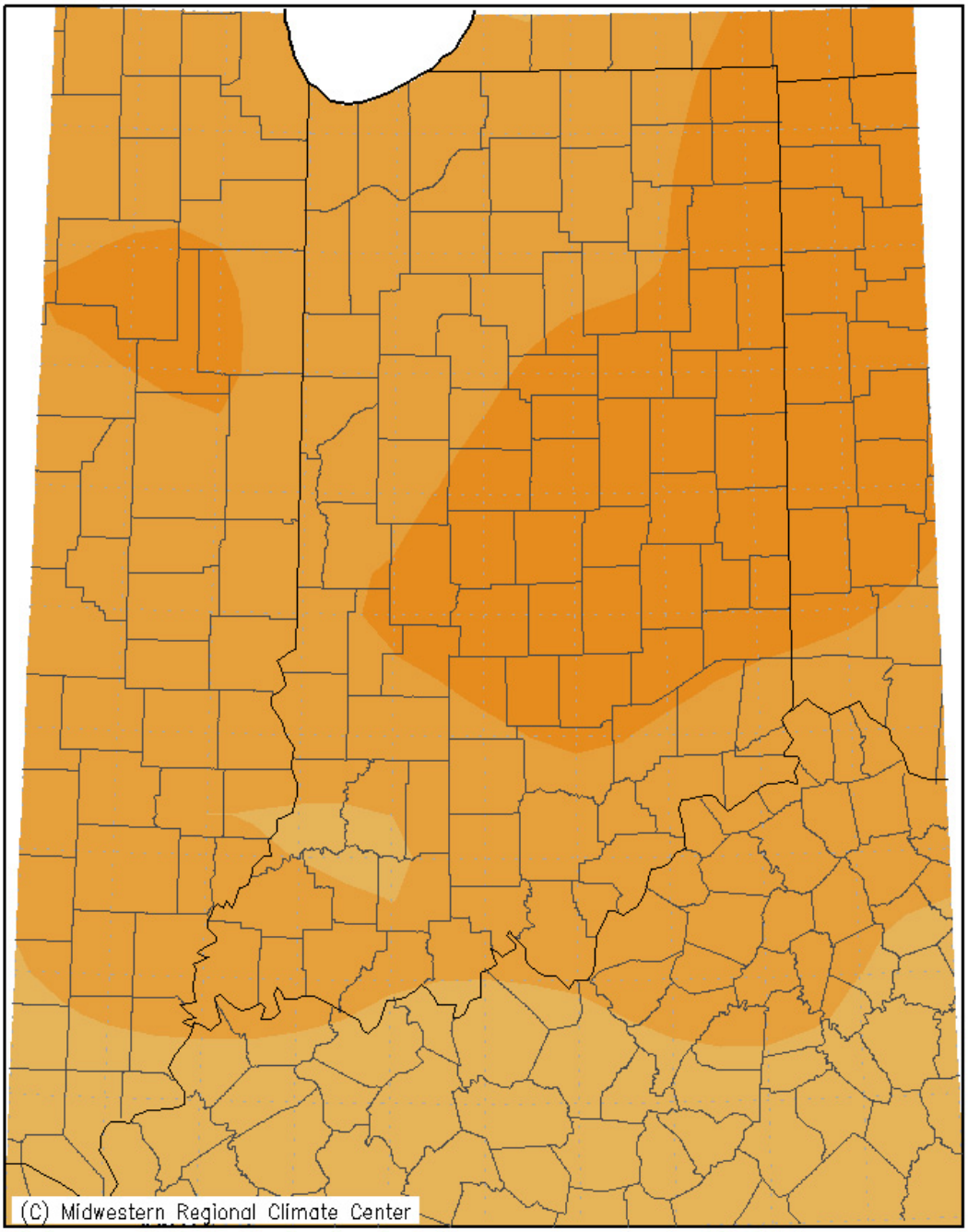
Temperature

Average Temperature (°F): Departure from Mean
December 24, 2015 to March 22, 2016



Mean period is 1981–2010.

Indiana State Climate Office www.iclimate.org
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