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Pest&Crop newsletter

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In This Issue

Fall Armyworm Still Active, But Their End Is Near!

(John Obermeyer) & *(Christian Krupke)*

Astute observers have recently reported mysterious egg masses on the outside of their homes, including siding, gutters, soffits, facia, and porch ceiling fan blades! Not just in the rural areas, but city homes as well. We have been able to experience this first-hand, making it easy to document and identify. No surprise, these are fall armyworm – part of the last remnants of the great outbreak of 2021.

Fresh (enlarged inset) fall armyworm egg masses on my home, multiple remnants of hatched egg masses can also be seen, photo taken on September 30. (*Photo Credit: John Obermeyer*)

Fall armyworm is a tropical/sub-tropical species, and moths arrive in Indiana from Southeast/Gulf States anytime weather systems from that area move our way. We certainly have had such weather events from hurricanes/tropical storms this season. Currently, Indiana is under a huge low/high pressure system tussle, this "spin" is not only sending a continuous week of spotty showers, but likely a new flush of moths as well. In other words, there aren't distinct generations of fall armyworm in the Midwest. Moths, egg masses, and larvae active now may be the progeny of previous arrivals that caused damage to our crops, or some may be new arrivals. The good news…this species is not cold-hardy, and will die during our first stretch of cold nights, even prior to a hard freeze.

One week later, the egg mass on the gutter was alive with hatching larvae. Below are still flowering roses…they will be watched! (*Photo Credit: John Obermeyer*)

This male fall armyworm moth was nectar feeding on mums at night in my yard, photo taken on September 29. Also feeding on the mums were adults of the yellow-striped armyworm and corn earworm (not shown). (*Photo Credit: John Obermeyer*)

This late fall armyworm "excitement" is reminiscent of mid-October 2007. That year, after harvest of corn and soybean, the fields became green with volunteer seedlings. There were many jokes about double-crop corn, as some fields in southern Indiana reached knee-high before frost. The point is, fall armyworm found this "crop" to their liking. We know the end of that story, eventually it did freeze, and the fall armyworm with the "double-crop" died.

Volunteer corn, October 15, 2007, near Purdue campus, being riddled by early-instar fall armyworm larvae. (*Photo Credit: John Obermeyer*)

Currently (October 7), meteorologists indicate there is no immediate freeze in sight…but we know it is eventually coming. Even before freezing temps hit, cool temperatures (50's and 60's) at night are not favorable for fall armyworm growth and development. They won't die, but they will not thrive, feed and grow rapidly. With that said, it certainly would be worth a look, before that time, in crops that are still green, e.g., alfalfa, cover, etc. While it is possible, it is more likely that this late fall armyworm activity and delayed season will not create a "perfect storm" for still growing crops, but will wind up being an entomological curiosity much like 2007.

Happy scouting!

"New" Weeds Added To The Problem Weed Section Of The Weed Control Guide

(Bill Johnson), *(Mark Loux)*, *(Aaron Hager)* & *(Marcelo Zimmer)*

Each fall we revise and update our Weed Control Guide for Ohio, Indiana, and Illinois (WS-16) publication. This year, in addition to incorporating a few new herbicide names and subtle label change information, we are adding information to the problem weed section on control of Cressleaf Groundsel, Poison Hemlock, and Annual Bluegrass. Since some of the best control strategies for all three of these weeds involve using herbicides applied in the fall, I decided to use this information in newsletter article.

Figure 1. Cressleaf groundsel/butterweed.

Cressleaf groundsel is a winter annual weed that has become more prevalent in pastures and agronomic crop ground over the past decade. The small seeds produced by this weed allow it to thrive in reduced and no-till systems as well as poorly established pastures. Cressleaf groundsel emerges as a rosette in the fall then bolts, flowers, and produces seed in the spring. Basal rosette leaves are deep pinnate serrations with roundly lobed leaf margins.

The presence of this weed in pastures and hay fields is of greatest concern due to its toxicity to livestock when ingested. Leaves, flowers, and seeds of cressleaf groundsel contain alkaloids that will cause chronic liver damage in livestock (seneciosis). Symptoms of seneciosis are loss of appetite, sluggish depressed behavioral patterns, and in extreme cases aimless walking without regard to fences or structures. Although cressleaf groundsel is not as toxic as many of its relatives in the *Packera* genus, livestock producers encountering this weed in pastures or hay should take steps to avoid feeding and ingestion by animals.

Fall prior to corn or soybeans. Apply from early October to mid-November. Effective treatments include the following:

– combinations of 2,4-D plus either glyphosate, metribuzin, dicamba, paraquat, simazine (corn only), metribuzin, Canopy/Cloak DF/EX (soybeans only), or a product containing tribenuron and/or rimsulfuron (Basis, Express, Audit, Nimble, etc). Maximum rate of rimsulfuron products is reduced prior to soybeans.

– combinations of paraquat with metribuzin or simazine (corn only)

Spring burndown – corn and soybeans. For corn, combinations of 2,4-D plus glyphosate, paraquat or Acuron/Lexar/Stalwart 3W are effective. Paraquat treatments are most effective when applied with atrazine. For soybeans, combinations of 2,4-D plus glyphosate, paraquat, and/or Canopy/Cloak DF/EX are effective. Paraquat

treatments are most effective when applied with metribuzin. Control of cressleaf groundsel in spring can be challenging when herbicides are applied to large plants under cool weather conditions. These conditions may result in substantial injury and necrosis of leaves, followed by regrowth from live buds on the plant. A follow up herbicide application may be required in these situations.

Wheat. Spring application of 2,4-D after full tiller is effective.

Pastures/grass hay. Small plants in rosette stage can be controlled with mixtures or premixes containing 2,4-D, or a combination of 2,4-D and dicamba, applied to rosettes in the fall or early spring prior to bolting. The goal should be to control cressleaf groundsel when plants are small, so that they do not get to a size that grazing or harvest in hay becomes a problem. Plants that are larger, or bolting, are more difficult to control. Producers should be aware that applications of these herbicides will also kill favorable broadleaves (legumes) that are present in pastures.

Legume hay. Apply herbicides in fall or early spring when plants are in the small rosette stage. Herbicide options are limited to Pursuit or Raptor, and the combination of one of these with 2,4-DB (Butyrac).

Figure 2. Poison hemlock.

Poison hemlock is commonly found in pastures, fencelines, and field edges, from which it can move into no-till crop fields. It is a biennial weed that exists as a low growing herb in the first year of growth and bolts to three to eight feet tall in the second year, when it produces flowers and seed. It is often not noticed or identified as a problem until the bolting and reproductive stages of the second year. The alternate compound leaves are pinnate (finely divided several times) and are usually triangular in outline. Flowers are white and occur in an umbel inflorescence. Poison hemlock is often confused with wild carrot but can be distinguished by its lack of hairs and the presence of purple blotches on the stems.

Poison hemlock contains five alkaloids that are toxic to humans and livestock, primarily when ingested. The plant's alkaloids may also be absorbed through the skin, and cause skin problems on sensitive individuals. Precautions to take when removing plants by hand are use of gloves and long sleeves. All parts of the plants contain the toxic alkaloids with levels being variable throughout the year. Cases of poisoning due to poison hemlock ingestion are rare as the plants emit a musty odor that makes it undesirable and unpalatable to livestock and humans. Consumption and toxicity in animals usually occurs in poorly managed or overgrazed pastures where animals are forced to graze poison hemlock because of lack of desirable forage.

This plant can be noticed very early in the spring, as it is typically one of the first weeds to green up, usually in late February to early March if temperatures are favorable. Control of poison hemlock with herbicides is most effective when applied to plants in the first year of growth or prior to bolting and flowering in the second year. The closer to reproductive stages, the less effective the herbicide.

Fall prior to corn or soybeans. Combinations of glyphosate plus 2,4-D or dicamba are effective, along with dicamba plus 2,4-D.

Corn. Preplant application of mesotrione (Callisto etc) and mesotrione premixes (Acuron, Lexar, Lumax, Stalwart EW) plus 2,4-D or dicamba have been effective in reducing infestations along field edges.

Soybean. Preplant application of saflufenacil (Sharpen and Sharpen containing premixes) plus glyphosate, glyphosate plus 2,4-D, and 2,4-D plus dicamba will be most effective. Be aware of preplant application restrictions (days between application and planting) when these herbicides are used in the spring. Preplant intervals with saflufenacil will vary based on rate and soil type. Preplant intervals with 2,4-D and dicamba will vary based on the soybean herbicide-resistance trait to be planted, and whether 2,4-D and dicamba were applied together.

Wheat. Mixtures of 2,4-D plus dicamba or clopyralid applied in the spring after full tillering will be most effective.

Non Crop and Pastures. Herbicides containing triclopyr (Remedy Ultra, Garlon, numerous others) or triclopyr plus 2,4-D (Crossbow) are most effective in controlling poison hemlock. Other herbicides that have substantial activity when applied at the proper timing are dicamba (Clarity, numerous others), metsulfuron-methyl (Escort XP), metsulfuron-methyl plus dicamba plus 2,4-D (Cimarron Max) and clopyralid plus 2,4-D (Curtail).

Figure 3. Annual bluegrass.

Annual bluegrass, a winter annual grass, is an upright, clump-forming weed that expands through the development of aggressive tillers. It can be particularly abundant in highly compacted, excessively wet soils. Seeds germinate in late summer, early autumn, and spring. It is generally identifiable by its light green leaf blades that are smooth on both surfaces, have two distinct, clear lines on each side of the midrib, and a boat-shaped leaf tip. Annual bluegrass also has a slightly pointed, membranous ligule. A single annual bluegrass plant can produce over 300 seeds that have the ability to lie dormant in the soil for many years. Annual bluegrass is most easily controlled with fall-applied herbicides. It can be difficult to control in cool, wet springs, due to reduced herbicide activity.

Fall prior to corn or soybeans. Application of mixtures containing glyphosate, rimsulfuron (Basis etc), or Canopy/Cloak can control bluegrass. Paraquat can be effective, but activity is affected by weather.

Corn. Preplant application of paraquat, glyphosate or rimsulfuron are effective. Control of annual bluegrass in the crop is accomplished with glyphosate or glufosinate in the appropriately traited corn. Control annual bluegrass in non-GMO corn with rimsulfuron-based products.

Soybean. Preplant application of paraquat, glyphosate or chlorimuron are effective. Control of annual bluegrass postemergence is accomplished with glyphosate, glufosinate, or one of the postemergence grass herbicides such as clethodim or quizalofop.

Wheat. Annual bluegrass in wheat can be suppressed or controlled with Anthem Flex, Finesse, and Osprey.

Alfalfa. Postemergence grass herbicides that contain clethodim (SelectMax, others) and sethoxydim (Poast Plus, others) are effective on annual bluegrass in alfalfa. To get the most favorable activity from these herbicides, apply when temperatures are above 60 °F and plants are not drought stressed.

Pastures. There are no herbicides for controlling annual bluegrass in grass pastures that won't harm the desirable grass forage species. The best option for pastures is to reseed thin areas and fertilize to promote growth of desirable forage species.

Herbicide Shortage – How To Plan For The 2022 Growing Season

(Bill Johnson), *(Marcelo Zimmer)* & *(Bryan Young)*

There is a lot of speculation about a herbicide shortage for the 2022 growing season, which will impact weed management decisions starting with fall applications. The two main active ingredients that we're hearing about right now are glyphosate (Roundup, others) and glufosinate (Liberty, others), both associated with an increase in cost. There will likely be limited supplies of other pesticide active ingredients as well, but in the short term, a shortage of these two active ingredients poses some major challenges for corn and soybean production. The purpose of this article is to discuss ways to minimize the impact of herbicide shortage on corn and soybean production in the Midwest. As you search for alternatives to these two herbicides you may have already determined that weed control guides produced by University Extension and Industry will become your most important tool for planning your herbicide purchases for many years to come. To access the Weed Control Guide for Ohio, Indiana, and Illinois, follow this link – https://extensionpubs.osu.edu/2021-weed-control-guide-for-ohio-indiana-and-illinois/.

First, what is causing the shortage? There are several different factors which are impacting this issue. In no particular order, the reasons for the herbicide shortage include a decline in number of laborers to unload tanker ships at gulf ports, lack of truck transportation from the ports to get the ingredients to U.S. formulation plants or formulated products to the retailers, reduced supplies of some of the inert ingredients of the formulation, shortages of materials to make containers and packaging, and Hurricane Ida that damaged a glyphosate production plant in Luling, LA (https://www.agweb.com/news/business/technology/hurricane-ida-idles-largest-glyphosate-production-plant-us).

Regardless of the cause, it is also important to consider herbicide costs. We are hearing that glyphosate prices will be in excess of $80/gallon. So, even if there is not a shortage, you should plan your weed control strategies for the next growing season to accommodate a limited availability because of supply or price of these two active ingredients.

It is important to point out that the demand for glyphosate will be considerably less in a conventional till system then in a no-till system. Glyphosate is arguably the most important herbicide that facilitates no-till crop production. It's even more important in systems where cover crops are used and need to be terminated before corn or soybean planting. Therefore, one simple way to reduce reliance on glyphosate is to simply go back to using tillage for fall and early spring weed control. This practice will be very effective for controlling the weeds emerged at the time of tillage, but some farm operations may not be set up for the extra equipment, labor, and fuel needed to do this on a widespread basis. In addition, replacing burndown herbicides with tillage threatens soil conservation practices. Glufosinate demand, on the other hand, will not be impacted as much by choice of tillage system since we don't use glufosinate in our fall or spring burndown application, and not much is used in corn. There is some glufosinate used in delayed burndown situations. However, we mostly use glufosinate postemergence in soybeans after the crop and summer annual weeds have emerged.

If you're not interested in returning to widespread use of tillage, keep in mind that you are looking for ways to control winter annual weeds before planting and control grass weeds with other herbicides to decrease reliance on glyphosate for postemergence grass weed control. Secondly, regardless of tillage system, you want to build a solid residual program as the backbone of your weed control strategy to

reduce reliance on using glyphosate postemergence in the crops. In the next section of this article, we will outline some weed control considerations based on the type of tillage system you are in and the weeds to be controlled at different times of the year.

Figure 1. Sprayer (*Photo Credit: Fred Whitford*)

Fall Applied Herbicides for Winter Annuals on No-Till Ground

If you are a cover crop user, plant high biomass producing covers that include cereal rye for horseweed suppression. Suppression of winter annuals other than horseweed can be somewhat variable, but we usually have better results if biomass production is high in the fall. If legumes are not planted with the cereal rye, we can also use 2,4-D or dicamba in the fall to control winter annual broadleaf weeds that emerge before winter freeze up. Weed control benefits from high biomass cover crops can also be realized for the 2022 growing season as well. We occasionally see some suppression of waterhemp and annual grasses as well with high biomass cover crops.

If you are not a cover crop user and you use fall applied herbicides for winter annuals, consider taking out glyphosate and just using 2,4-D + dicamba mixtures this fall ***IF*** you only have broadleaf weeds [chickweed, henbit/deadnettle, shepherd's purse, field pennycress, mustard species, cressleaf groundsel, dandelion (which is a perennial), poison hemlock (a biennial), etc.] in your fields. If you have grass weeds (annual bluegrass, Carolina foxtail, false timothy, others), and they are small and actively growing, you can use reduced rates of glyphosate to control the grasses and rely on 2,4-D + dicamba mixtures to control the broadleaf weeds. Keep in mind that if you mix reduced rates of glyphosate with 2,4-D, dicamba or both, grass control can be compromised (herbicide antagonism). So, make those applications on a warm day and be sure to add AMS to the mix to minimize the risk of herbicide antagonism. In addition, we have observed that the addition of saflufenacil (Sharpen, others), can help speed the activity of glyphosate on some annual grass species. Again, if you are reducing the rate of glyphosate to conserve your supply, adding a saflufenacil product might improve the activity of glyphosate. Remember to use MSO and a nitrogen source with saflufenacil for optimum foliar activity.

There are other active ingredients that provide some control or suppression of winter annual grass weeds and can be used in the fall, such as paraquat, clethodim (Select, others) and rimsulfuron (Resolve, Basis, Crusher, others). These herbicides will be a bit more limited in the spectrum of weeds controlled compared to glyphosate. Therefore, make sure to properly identify the weeds present in the field and check if the weed species found are listed on labels of these products.

Paraquat is commonly used with metribuzin (Sencor, TriCor, others) and 2,4-D or dicamba for fields going to soybean. For fields going to corn paraquat + simazine (Princep, others) + 2,4-D or dicamba would be an effective broadspectrum treatment. If you are using a clethodim or rimsulfuron product instead of paraquat, add 2,4-D or dicamba to help with broadleaf weeds.

Spring Applied Herbicides for Winter Annuals and Early Emerging Summer Annuals on No-Till Ground

For no-till corn acres, we have to design a program to 1) control the winter annual and early spring summer annual weeds that have emerged, 2) fit the crop being grown that summer, and 3) factor in the fairly long list of residual premixes that might have some combination of atrazine, isoxaflutole, mesotrione, rimsulfuron or thiencarbazone, metribuzin, or saflufenacil in them. All these herbicides have some foliar activity on early spring weeds and fit into a no-till burndown scenario. Isoxaflutole, rimsulfuron, and thiencarbazone have foliar and residual activity on grasses and will control a few selected broadleaf weeds. Metribuzin, saflufenacil, and mesotrione have foliar and residual activity on a key no-till weed, horseweed (aka marestail), and can also help with waterhemp and Palmer amaranth control. A group 15 herbicide (metolachlor, dimethenamid, pyroxasulfone, acetochlor) is also needed to form the backbone of the soil residual grass and small seeded broadleaf weed control program for the season.

As we get closer to the 2022 growing season and start planning for control of summer annual weeds it will be important to assess your supply of these active ingredients and build the backbone of your weed control program around full rates of residual herbicides so you can minimize reliance on postemergence herbicides. As mentioned in the introduction, there are many good references available to help you determine which residual herbicides best fit the weed species you are battling. Consult the weed response table such as these to choose the best product for each specific field. If you can build a weed control program that only requires one postemergence treatment of glyphosate or glufosinate, and possibly at a rate less than the maximum labeled rate, that will allow you to stretch glyphosate and glufosinate supplies over more acres. However, don't fall into the trap of thinking you only get one application of these herbicides so you should wait for the last weed flush before you spray. With limited supply and increased costs, the best route is to use a reasonable rate on small weeds with the best adjuvant system and application method possible. Use residual herbicides to manage other weed flushes.

Here are a few scenarios to consider based on the problematic weeds in a specific field. Keep in mind we do not endorse any specific product or company. We are simply pointing out which products, based on the active ingredients they contain, would be a good fit with the weed pressure we have mentioned. All the University Extension weed control guides and most of the guides written by the crop protection industry have weed efficacy tables in them to help the user determine which products provide acceptable control of the most common weeds in the specific geographical area covered by the guide. Of course, these guides assume all herbicide label recommendations are followed for the application and herbicide resistance in the weed population has been considered.

Example 1. A no-till corn field with lots of annual bluegrass or Carolina foxtail, and summer annual grass pressure. If the grasses are 3 inches or less in height, and you have a limited supply of glyphosate, consider using this combination for your burndown treatment – Corvus or Revulin Q at a full labeled rate. The thiencarbazone + isoxaflutole in Corvus or the rimsulfuron + mesotrione in Revulin Q will control small annual

grasses. Add atrazine (1 to 1.5 lb ai/A) and possibly a group 15 herbicide to boost residual broadleaf and grass weed control. If you have some emerged broadleaf weeds present when the burndown treatment is made, add saflufenacil, 2,4-D or dicamba to the mixture. For weeds that break through the residual treatment, use a postemergence treatment of glufosinate + dicamba or glyphosate + dicamba and add a 1/3 to ½ label rate of the atrazine premix products that contains a group 15 herbicide to lengthen the window of residual weed control in the crop. We know many growers won't use glufosinate in corn since it isn't always clear what hybrids are Liberty Link and they want to save the glufosinate for soybeans. You can also use Revulin Q, Realm Q, Armezon, Armezon PRO, Impact or Laudis for postemergence grass control if glyphosate or glufosinate is not available.

Example 2. What if the field in example 1 will be planted to soybean, rather than corn and is also infested with horseweed and waterhemp? The good news here is that there are several premixes available that have metribuzin in them. We have always observed better activity out of paraquat by adding a triazine herbicide to it and by simply adding paraquat and 2,4-D to a premix that has metribuzin in it, you have a ready-made, broadspectrum burndown and residual herbicide. The soybean premixed products that would fit this scenario include Authority MTZ, Canopy, Dimetric Charged, Intimidator, Matador, Boundary/Moccasin MTZ. The second choice would be to use clethodim for grasses + other herbicides to control broadleaf weeds. Clethodim can be used for emerged grasses, but activity will be slower in cool weather conditions and can also be antagonized by other components of the mixture (2,4-D, dicamba, acetochlor). Rimsulfuron can be used 30 days or more before planting soybean and may help with winter annual grasses, providing some residual control of summer annual grasses as well. Use of rimsulfuron would be best suited to STS or Bolt soybeans since they will be more tolerant to rimsulfuron. The postemergence weed control program will be based on the soybean trait planted and the weeds that break through the residual herbicide. Adding a group #15 residual herbicide (metolachlor, dimethenamid, pyroxasulfone, acetochlor) to the postemergence application will be the backbone of your small seeded broadleaf and grass control program, and reduce the need for a second postemergence application later in the growing season.

Example 3. A no-till corn field with no winter annual grasses, but lots of horseweed (marestail), giant ragweed, and lambsquarters have started to emerge. The field has a history of having some foxtail, fall panicum and waterhemp, but the summer annual grasses and waterhemp don't emerge as early as the ragweed and lambsquarters. Use Acuron, Lumax/Lexar, Resicore, or Verdict. Add saflufenacil (not needed with Verdict since it contains saflufenacil), 2,4-D or dicamba to each of them for additional foliar activity on broadleaf weeds. Add atrazine to Resicore or Verdict for additional residual control of broadleaf weeds. If summer annual grass weeds have emerged, add paraquat or a pint/A of glyphosate to the mixture. If saflufenacil is added to one of the premixes that doesn't contain saflufenacil, add 20-30 gallons of UAN (if corn has not emerged) and MSO for burndown of small grasses and broadleaves. For weeds that break through the residual treatment, use glufosinate + dicamba or glyphosate + dicamba and add a 1/3 to ½ label rate of the atrazine premix product that contains a group 15 herbicide to lengthen the window of residual weed control in the crop. You can also use Revulin Q, Realm Q, Armezon, Armezon PRO, Impact or Laudis for postemergence grass control if glyphosate or glufosinate is not available.

Example 4. What if the field in Example 3 will be planted to soybean, rather than corn? In this field, broadleaf weeds (winter and summer annuals) and horseweed are the target with the burndown treatment. So, start of by determining which soybean trait will be planted. If it is non-GMO or straight Roundup Ready or Liberty Link, remember that there will be a preplant interval for 2,4-D or dicamba. The interval for 2,4-D will be shorter for these soybean traits. So, a mixture of 2,4-D + saflufenacil or metribuzin for broadleaf weeds will be the backbone of the burndown program and all that is likely needed for burndown if no grass weeds are present. As mentioned above, we will want to build the weed control program around a broadspectrum residual herbicide, so simply adding 2,4-D to premixes that contain saflufenacil (Verdict, Zidua Pro) or metribuzin (Authority MTZ, Canopy Blend, Intimidator, Kyber, Matador, Boundary/Moccasin MTZ, Trivence, or Panther Pro) makes the most sense and would require a 7 to 30 day preplant interval depending on the 2,4-D formulation and rate used. If you planted Enlist beans, you would use the same strategy, but no preplant interval is required if you use the 2,4-D choline (Enlist One) product from Corteva. If you plant Xtend soybeans, simply replace 2,4-D with an approved dicamba product (Engenia, Xtendimax, or Tavium) and no preplant interval is required for that trait. The postemergence weed control program will be based on the soybean trait planted and the weeds that break through the residual herbicide. Adding a group #15 residual herbicide to the postemergence application will be the backbone of your small seeded broadleaf and grass control program and reduce the need for a second postemergence application later in the growing season.

Next week, we will cover recommendations for Examples 5 and 6 outlined below.

Example 5. A field is planted to multi specie mixture of cover crops that contains cereal rye, (and to a lesser extent annual rye) and other species which include legumes and brassicas. The cover crops that will need to be terminated prior to corn.

Example 6. A field is planted to multi specie mixture of cover crops such as cereal rye, (and to a lesser extent annual rye) and other species which include legumes and brassicas. The cover crops that will need to be terminated prior to soybeans.

These are just a few examples of some different scenarios to consider when building a weed control program. Keep in mind that the concern isn't just the limited supply of glyphosate and glufosinate, but the increase in cost, especially glyphosate which may be 4X the cost just a few years ago, which makes other herbicide options much more feasible that you didn't consider previously. We will add other examples to this discussion as we write our future newsletter articles through the winter months. We will also be covering this topic in our winter county meetings as well.

Other Tips:

- Target using "regular" rates of glyphosate to stretch supply. Instead of using 32 or 44 oz/acre of a Roundup brand product, consider using the standard rate on the label such as 22 oz/acre for Roundup PowerMax (Note – Roundup PowerMax3 will be launched in 2022 and the standard rate is 20 oz/acre; equivalent to 22 oz/acre of the old R. PowerMax formulation).
- Identify glyphosate or glufosinate premixes that may be in greater supply or at lower relative costs compared to solo glyphosate and glufosinate products.
- Failure is not an option for herbicide applications. Make sure you optimize your herbicide applications using the best methods (GPA, spray nozzles, etc.), adjuvants, and minimal weed size for foliar applications.
- Substitute alternative corn post herbicides that control grasses and broadleaves, if they don't include a residual group 15

herbicide, add one to the postemergence mixture.
- Cultivate if needed and/or possible.
- Hand weed escapes prior to the weeds setting seed.

A New Tool For Your War Against Weeds

(Sarah Lancaster, Kansas State Extension Weed Science Specialist) & (Bill Johnson)

Are you interested in keeping up with the latest weed management information? If so, you'll want to add the "War Against Weeds" podcast to your weed management toolbox. The podcast is hosted by Sarah Lancaster, Kansas State Extension Weed Science Specialist, Mandy Bish, Extension Weed Scientist at the University of Missouri, and Joe Ikley, Extension Weed Scientist at North Dakota State.

All podcast episodes will be posted at https://waragainstweeds.libsyn.com/ and available on Spotify, iTunes, and Google Podcasts. Episodes feature guests with expertise in a variety of aspects of weed science and discusses integrated weed management, herbicide resistance, and other timely topics.

Prussic Acid Potential In Frosted Sorghum

(Shelby Gruss)

Nights are beginning to get cooler, the first frost is approaching, and you may be questioning whether your livestock should be removed from your forage sorghum pastures.

Here are some commonly asked questions about what to do if your field gets frosted.

Photo shows frost damage on sorghum x sudangrass. Brown leaf tissue was killed by frost. Green tissue could have increased prussic acid potential. (Photo Credit: Shelby Gruss)

Should my livestock be removed from the field? And why?

Yes, your livestock should be removed from your sorghum fields if a frost is predicted for that night.

Prussic acid (hydrogen cyanide) potential can increase due to frost damage. Sorghum species (forage sorghum, sorghum x sudangrass, sudangrass, and Johnsongrass in a pasture) all produce prussic acid, but generally are considered safe when they reach 18 to 24 inches tall. Frost, however, can increase prussic acid production.

Preferably, it is best to utilize sorghum before the first frost occurs or to let the plant totally die from several killing freezes and to graze it then.

How long should the livestock be removed?

There is not a straightforward answer, but generally speaking animals should be removed for seven days. If another frost occurs during that timeframe, the seven days starts again.

Is there a way to utilize sorghum to reduce prussic acid?

Yes, sorghum utilized as a silage will help reduce prussic acid potential as compared to grazing, but care still needs to be taken to make sure it has been reduced to safe levels. Sorghum that could be high in prussic acid should not be used directly for grazing or harvested as a hay.

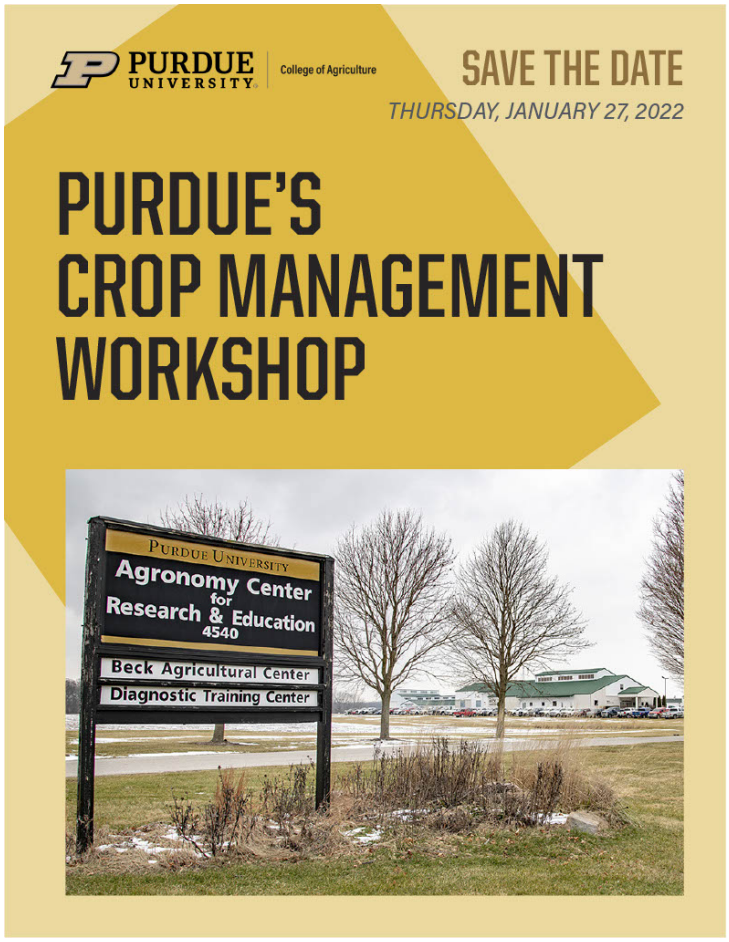
Remember, for most safety utilize the sorghum before the frost happens.

For more information refer to this video:

Be careful when utilizing sorghum as hay after a frost. New data shows that hay does not help decrease prussic acid potential.

Purdue's Crop Management Workshop – Save The Date!

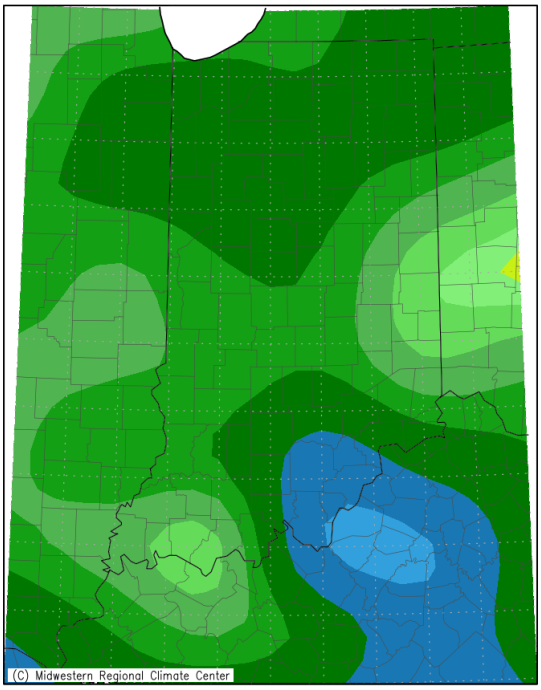
(John Obermeyer)

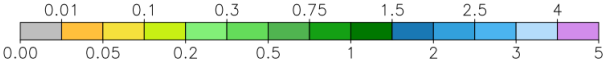


Weather Update

(Beth Hall)

Accumulated Precipitation (in)
September 30, 2021 to October 6, 2021





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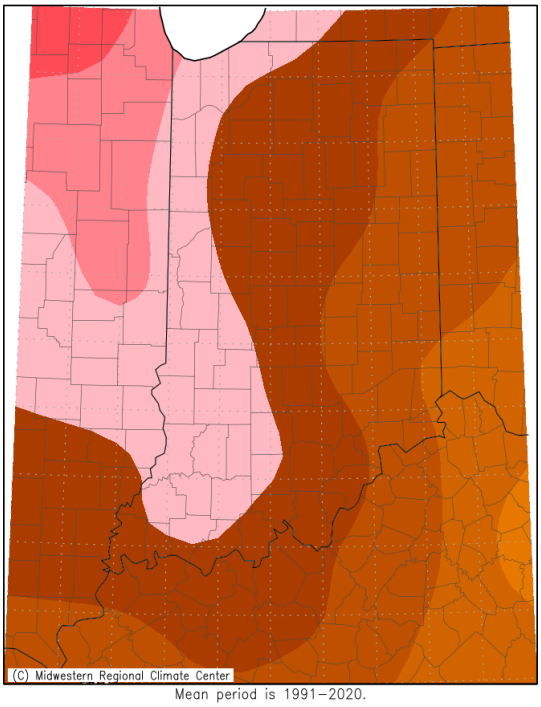
Average Temperature (°F): Departure from Mean
September 30, 2021 to October 6, 2021



Mean period is 1991–2020.

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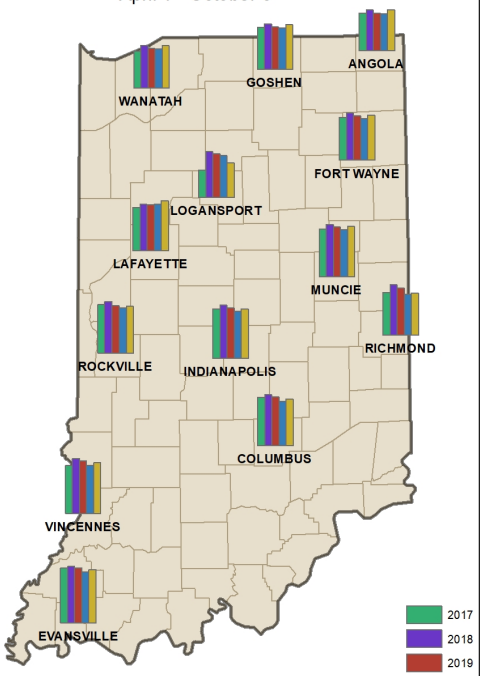
Accumulated Growing Degree Days (86/50)
April 1 - October 6



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