

Pest & Crop newsletter

Purdue Cooperative Extension Service and USDA-NIFA Extension IPM Grant

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Woolly Bear Wanderlust And Winter Weather

(John Obermeyer)

While traveling a local county road this week, I was amazed at the number of woolly bear caterpillars I came across. At one particular location, they were crossing en masse from one weedy, unharvested soybean field to a grass pasture. Though I had experienced this phenomenon before, I did stop to enjoy and take some pictures! First, you've got to appreciate their determination, relative speed, and direct path in moving across the road. Sadly, many met their fate by car tire, never to experience the other side...paradise!? Why is the woolly bear caterpillar crossing the road...other than "to get to the other side!" The purpose, observers for many generations tell us, is to find the perfect over-wintering site, under leaf litter, fallen tree branches, rock crevices, etc. Within the last couple hundred years, they have also used our structures such as barns, outhouses, etc. Amazingly, because they are able to chemically alter their bodily fluids to much like anti-freeze, the shelter is probably more to protect them from predators, e.g., raccoons and birds, during this winter stasis.



Banded woolly bear caterpillars, *Pyrrharctia isabella*, are easily recognized for their brown and black coloration and gentle, fuzzy touch. (Photo Credit: John Obermeyer)



This woolly bear is determined to make it across the road, unlike his ill-fated buddy. (Photo Credit: John Obermeyer)

Folklore tells us that the woolly bear is able to predict how cold/mild the winter will be. As I write this, October 22, we are still waiting for our first frost, much less killing freeze ($\leq 28^{\circ}\text{F}$) with none forecasted in the near future. Spoiler alert, because these caterpillars are seeking over-wintering harborage, they are predicting it will freeze this winter! See...they can prognosticate future temperatures!

How about the whole winter season's temperatures? This is done by measuring the width of the brown band, the more the brown, the milder the winter, and vice versa for the black coloration. If you don't believe me, just "Google" it, amazing what you will find! If you are going to do your own local observations and measurements for a precise forecast, you must use the correct species of woolly bear, *Pyrrharctia isabella*, more commonly known as the banded woolly bear, or woolly worm. Using another species of caterpillar will throw the "science" off! Below, via pictures, I will share my results, I'll let you come to your own conclusion about this coming winter's weather, at least for Purdue University!



What does this random sampling of banded woolly worms tell us about the coming winter? (Photo Credit: John Obermeyer)



If you use this larger, black woolly bear caterpillar (giant leopard moth) in your "data," the winter would look ominous! (Photo Credit: John Obermeyer)



Measuring the brown-band width of these squirmly caterpillars is quite challenging! (Photo Credit: John Obermeyer)

Winter Weed Control In Corn And Soybean Stubble

(Bill Johnson) & (Marcelo Zimmer)

As our crops come out of the field, now is the time to think about weed

control for winter annual weeds, including marestail. Scouting fields should begin soon after a field is harvested, with special attention paid to fields with heavy infestations of marestail this year. With fall applied herbicide season about to begin, we wanted to provide a few application tips to those who are in the process of making fall herbicide applications.

1. Scout fields and determine whether you need an application. Not all fields need an application, however, if you pull back the residue, especially in corn fields, you are likely to find infestations of winter weeds. Winter weeds could be particularly prevalent in both soybean and corn stubble this year because we had excessive amounts of rain over the past month.
2. We have known cases of glyphosate-resistant and ALS-resistant marestail in most counties in Indiana and we have noticed a substantial number of fields with marestail in them late this summer that either were not controlled by postemergence herbicides or emerged after postemergence herbicides were applied. It would be wise to treat fields with marestail with a combination of dicamba and 2,4-D as part of the herbicide program. Fields that are harvested early would benefit with the addition of 4 to 6 ounces of metribuzin to provide residual control of marestail this fall until the ground freezes. This residual will not last into the spring, but will help with late-fall emerging plants. Fields harvested later in October or November may not need metribuzin unless it stays warm late into the fall.
3. The best time to apply herbicides in the fall is on days when the morning low is above freezing. The best foliar herbicide activity will occur when you have a few days of warm daytime air temperatures (50's or higher) and applications are made in the middle of this period. If fall applied herbicides are needed, one should not leave the sprayer in the shed if daytime temperatures do not get into the 50's. Just remember that the foliar activity of systemic herbicides like glyphosate and 2,4-D is less in cool conditions. In these conditions, it would be advisable to use residual products tankmixed with the foliar products to provide residual activity for periods when weather conditions might allow additional weed emergence.
4. Dandelions can still be controlled with fall applications of 2,4-D or a glyphosate product. Use a minimum of 1 qt/A of 4 lb/gallon 2,4-D products and 1 qt/A (0.75lb ae/A) of a glyphosate product. Either 2,4-D or a glyphosate product works very effectively in the fall. Once we have had a couple of hard frosts,

the dandelions may be a little tougher to control, so don't rely on reduced rates.

5. In fields with heavy corn residue, increase spray volume or decrease speed to increase carrier volume. Many weeds will be shielded by residue, so spray coverage can be compromised. In addition, use of residual products in these situations will increase the consistency of winter weed control because these products can be washed off of the corn residue with precipitation and into the soil where they can be effective.



Is there marestail out in those harvested fields? (Photo Credit: John Obermeyer)

Using Phosphorus and Potassium Fertilizers Wisely

(Jim Camberato)

Phosphorus (P) and potassium (K) fertilizer prices have increased dramatically in recent months. If you cannot afford all the fertilizer P and K you think you need or there is not enough fertilizer to be had, you might want to prioritize their use on your farm. The key to prioritizing P and K use is to have recent soil test information for your fields.



Now is a great time to find out what P&K is out there! (Photo Credit: John Obermeyer)

Top Priority: If soil test levels are below the critical level (Figure 1, Table 1) then crop yield response to added P and/or K might occur. These low testing fields or areas in a field should be given the highest priority for fertilization. The further the soil test is below the critical

level the more likely yield will increase with application of that nutrient and that yield increase will likely be larger. The fertilizer application rates recommended for soil tests below the critical level are designed to maximize crop response, replace crop removal, and add extra P_2O_5 and K_2O to increase soil test levels to the critical level over a four-year period (Table 2). Recent research with K fertilization of corn and soybean¹ suggests the current rates recommended are about right for maximizing crop response at very low soil test K levels, so be careful if you decide to apply less than recommended rates on soils testing low in K.

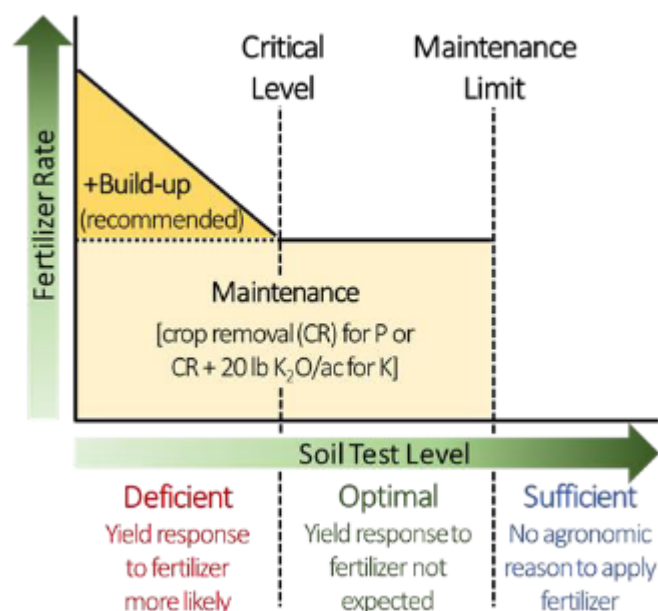


Figure 1. Fertilizer recommendations for P and K based on soil test levels and likelihood of response to applied fertilizer.

Unfortunately, we don't have any recent research on optimizing P rates on soils testing very low in P. However, older research found applying some of the P in a starter band and the remainder broadcast was better than all broadcast or all banded. If you need to compare the price of P in MAP, DAP, and 10-34-0 use this on-line tool:

<https://ag.purdue.edu/digital-ag-resources/phosphorus-cost-comparison-tool/>.

Secondary Priority: Our traditional recommendation has been to maintain soil test levels of P and K between their respective critical levels and the maintenance limits (Table 1). Within this maintenance range, we normally recommend replacing crop P_2O_5 and crop K_2O removal (Table 3) plus 20 pounds of K_2O per acre to maintain soil test at about the same level.

However, understand that within this maintenance range of soil test levels, a yield response to this year's fertilizer is not expected. Consequently, this provides the flexibility to not apply fertilizer without risk of incurring yield losses when fertilizer prices are high, fertilizer is scarce, commodity prices are low, and/or if weather prevents application.

Table 1.
Soil test critical level and maintenance limit for phosphorus and potassium fertilization of corn and soybean for different soil test methods and cation exchange capacity (CEC).

	Critical level	Maintenance limit
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Table 1.
Soil test critical level and maintenance limit for phosphorus and potassium fertilization of corn and soybean for different soil test methods and cation exchange capacity (CEC).

Soil test method (CEC)	Nutrient	Critical level	Maintenance limit
Bray-P1	Phosphorus (P)	15 (30)	30 (60)
Ammonium acetate (5 meq/100g)	Potassium (K)	88 (176)	118 (235)
Ammonium acetate (15 meq/100g)	Potassium (K)	115 (230)	145 (290)
Mehlich-3	Phosphorus (P)	20 (40)	40 (80)
Mehlich-3 (<5 meq/100g)	Potassium (K)	100 (200)	130 (260)
Mehlich-3 (>5 meq/100g)	Potassium (K)	120 (240)	170 (340)

Table 2. Phosphorus and potassium recommendations for corn and soybean by different soil test methods and cation exchange capacity at selected soil test levels below the critical level and specific grain yields. Bray and ammonium acetate recommendations shown below are based on original Tri-State Fertilizer Recommendations², but updated to utilize current estimates of crop removal (Table 3). Mehlich-3 recommendations are from the 2020 updated Tri-State Fertilizer Recommendations³.

Soil test method (cation exchange cap.)	Soil test level (ppm (lbs/ac))	Nutrient	Corn, 200 bu/ac	Soybean, 50 bu/ac
Bray-P1	10 (20)	P ₂ O ₅	95	65
Ammonium acetate K (5 meq/100g)	65 (130)	K ₂ O	90	105
Ammonium acetate K (15 meq/100g)	90 (180)	K ₂ O	80	95
Mehlich-3 P	15 (30)	P ₂ O ₅	95	65
Mehlich-3 K (5 meq/100g)	75 (150)	K ₂ O	90	110
Mehlich-3 K (5 meq/100g)	100 (200)	K ₂ O	95	115

Table 3. Corn and soybean removal of P₂O₅ and K₂O in grain

Crop	Grain nutrient removal	
	lb P ₂ O ₅ /bushel	lb K ₂ O/bushel ¹
Corn	0.35	0.20
Soybean	0.80	1.15

¹Maintenance recommendations for K add 20 lb K₂O/acre to the estimate of K₂O removed in the grain.

Lowest Priority: If soil test P and K are above the maintenance limits (Table 1) there is no agronomic need to apply P and K and no need to replace crop nutrient removal in the short term. Soil test levels change very slowly over time. We estimate soil test P and K will only decrease about 1 part per million (2 pounds per acre) for every 10 to 20 pounds

of K₂O or P₂O₅ removed from the soil. Nutrient removal levels in Table 2 can be used to estimate the decrease in soil test levels that will occur in the absence of fertilizer application. It will take several years before soil test levels fall below the critical level if initial soil test levels begin above the maintenance limit. Regular soil sampling will also help monitor the changes in soil tests.

References:

- ¹Helms, Alex, "Effect of Potassium Fertilizer in a No-Till Corn and Soybean Rotation with very low Soil Test Potassium" (2021). Creative Components. 854. <https://lib.dr.iastate.edu/creativecomponents/854>
- ²See pages 49, 51 in: Culman, S., A. Fulford, J. Camberato, and K. Steinke. Tri-State Fertilizer Recommendations for Corn, Soybean, Wheat, and Alfalfa. (2020) Bulletin 974. <https://ag.purdue.edu/agry/soilfertility/Documents/Tri-State%20Fertilizer%20Recommendations.pdf>
- ³See pages 36, 38 in above publication.

"Forage Forum Fridays" Begin In December – Register Now

(Keith Johnson) & (Elysia Rodgers, Dekalb County ANR Educator)

Purdue University, in collaboration with the Indiana Forage Council, will be hosting educational webinars about forage production and utilization on Friday noon Eastern Time beginning December 3. The "Forage Forum Fridays" series is scheduled through late February. The forum will be an opportunity to hear from and interact with experts about relevant forage topics.


One of the learning opportunities, December 8, is a Wednesday evening in-person Private Applicators Recertification Program. Locations where the recertification program will be held will be made available in the near future.

You are encouraged to register even if you cannot be present for the live Friday noon presentations. Programs will be recorded for later viewing if you register for the forum.

Below are the topics for December. Please share the opportunity with other forage-livestock producers, agribusiness personnel, and others that interact with producers. Please register at: tinyurl.com/ExtFFF

FORAGE FORUM FRIDAYS ROUND 2

Join Purdue and Industry
Forage Specialists as we
dive even deeper into the
world of forages!



PLEASE REGISTER AT:
tinyurl.com/ExtFFF

If you registered for the first round back in March 2021, you do not need to register again.

DECEMBER 3, 2021@12:00 PM EST
FORAGE SEED PRODUCTION AND INVENTORY UPDATE

DECEMBER 8, 2021*
*THIS WILL BE IN-PERSON SESSIONS AROUND INDIANA
FORAGE PARP
6:30-8:30 PM EST
FEATURING
MARCELO ZIMMER-PURDUE WEED SPECIALIST
DR. CHRISTIAN KRUPKE-PURDUE ENTOMOLOGY SPECIALIST
\$10 FOR PARP CREDITS

DECEMBER 10, 2021@12:00 PM EST
WHAT HAPPENS TO MY HAY WHEN I SEND IT IN FOR A HAY TEST?

STAY TUNED FOR MORE SESSIONS IN JANUARY AND FEBRUARY 2022

THE PURDUE UNIVERSITY COOPERATIVE EXTENSION SERVICE IS AN AFFIRMATIVE ACTION EQUAL OPPORTUNITY INSTITUTION.

Graphic contributed by Elysia Rodgers, Purdue University Extension Educator – DeKalb County

New Indiana Climate Newsletter

(Beth Hall)

The Indiana State Climate Office (IN-SCO) hosted a climate services summit in early June 2021. During that 2-day summit, multiple state and regional climate services partners showcased free online climate tools and resources for the public that can improve decision making, planning, and awareness of climate and its impacts. As you can imagine, there was a lot of information presented! Therefore, a request was made to find a way to deliver this type of content in smaller doses, across a longer period of time, and to an increasingly growing audience. Therefore, the IN-SCO has launched the quarterly climate newsletter,

Climate Informer, to highlight key climate services partners, share relevant climate tools, provide climate outlooks for the next few months, pass along interesting climate facts and explanations, and promote upcoming climate-relevant events. There is a link within the newsletter to subscribe, if you would like to join the mailing list.



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Editor: Tammy Luck | Department of Entomology, Purdue University, 901 W. State St., West Lafayette, IN 47907