

Auglaize County OSU Extension Weekly Agriculture Newsletter – July 8, 2020

Scouting and Latest Information



Corn



Soybean

Hello!! Good afternoon! I pray you are well.

Every Tuesday from 8:30 to 9:30 AM we will be hosting a virtual meeting via Zoom that can also act as a simple conference call for those of you not able to get online to view live. The meeting will be set up to discuss key, timely information for your operation and to open the floor for questions and sharing of information. You may propose topics for the next meeting at anytime during the week by e-mailing or calling me. **Next week is our monthly Ag Breakfast meeting. We will have Aaron Wilson speak about Climate Change and its Impact Upon Agriculture.** Please join use every Tuesday for Auglaize County Farm Talk.

If you are a buyer or seller of hay or straw, let me know and I can keep a list to share with others.

List of individuals searching for hay or straw: None

List of individuals selling hay or straw:

1. About 200 3' X 3', 2019 wheat straw bales for sale.
2. At least 500 small square wheat straw bales from 2019 for sale.

Call the OSU Extension office at 419-739-6580 or my cell phone at 701-541-0043 or e-mail me at stachler.1@osu.edu to get the contact information.

I hear some straw prices have come down to about \$75/ton out of the field and \$115 to \$120/ton baled and delivered.

Joke: Why did the cabbage win the race??

Agricultural Fun Fact: A pound of soybean consists of about 2,800 seeds on average!

Rain fell 3 days this past week. Most of the county is getting quite dry, but some are getting lucky! Rainfall on Saturday, July 4th ranged from 0" at 13 locations, mostly in the central part of the county to 0.5" near Sommers and Minster-Ft. Recovery roads (2.8" near St Rt. 364 and Amsterdam roads. Rainfall Monday ranged from 0" at 13 locations, mostly in central part of county to 1.46" near Fiekert and St. Rt. 385. Rainfall on Tuesday ranged from 0" at 17 locations in the county to 0.25" near Valley and Idle roads. Rainfall for the week ranged from 0" at 12 locations to 1.74" near Fiekert and St.Rt. 385 roads. Rainfall for the week averaged 0.19" 0.16" less than last week. Rainfall for the month of June ranged from 1.64" near Feikert and St. Rt. 385 roads to 3.4" near Mercer Line and St. Rt. 197 roads. The average rainfall for the month of June was 2.44", 1.39" less than the normal of 3.83 for the month. Year to date rainfall is 22.11", 3.33" above the normal of 18.78". There is at least a 40% chance of rain through Sunday, with Friday the greatest chance at 60%.

The average high temperature now is 84 degrees F. We have now reached our maximum temperature for the summer. Temperatures were above normal for **7** days of the week and below normal for **0** days of the week. The range in high temperature for the week was 88 to 91 degrees F. The average high temperature for the week was 89.6 degrees F, which is 9.6 degrees F warmer than last week and 5.6 degrees F **warmer than** the current normal high temperature. Temperatures for the next 7 days will be mostly above normal.

Wheat



Field of wheat

As of Sunday 70% of the wheat was harvested in the county, mostly south of US Rt. 33. Wheat yields were from 60 to 95 bushels per acre with most in the 80's bushel per acre. Moisture was from 12 to 22% with most less than 15%. Test weight was from 50 to 61 pounds per bushel with most at the 59 pound per

Alfalfa



Severe leafhopper burn



Alfalfa

A good amount of second cutting alfalfa was harvested last week. Quality is pretty good, but yields are reduced by 25 to 50%. Leafhopper levels are through the roof yet.

Corn



Current stage of corn (V9)



Moisture stressed corn

Corn grew by leaps and bounds this past week! Crop quality improved this past week despite the dry weather. Corn was certainly rolling on Sunday as shown above, but more of it was due to hot temperatures rather than moisture stress. I'm still not impressed with the crop. I rated the corn crop at 3% excellent, 40% good, 56% fair, 1% poor, and 0% very poor. Last week, I rated the corn crop as 7% excellent, 30% good, 61% fair, 1% poor, and 1% very poor. The range in corn is from V3 (third collar visible) to V14 (fourteenth collar) stage. Most corn is at the V12 (twelfth collar) to V13 (thirteenth collar) stage. We will have corn tasseling! No leaf diseases or insects are present at this time. I saw more corn with potassium deficiency in fields.

Soybean



Most developed soybean (R2)



Field of soybean



Manganese deficiency

All soybeans are planted now, although most double crop soybeans will not emerge unless a significant rainfall occurs. The soybean crop improved again this week! The current condition of soybean in the county is 23% excellent, 48% good, 28% fair, 1% poor, and 0% very poor. Last week's crop condition was 17% excellent, 41% good, 39% fair, 2% poor, and 1% very poor. The range in soybean stage is from emergence to R2 (full bloom) stage, but most are at R1 (begin bloom) to R2. I found no leaf diseases. I did find some more

red-headed flea beetles along with some white flies and potato leaf hoppers. I found more fields where the soybeans are deficient in potassium, but it was just the field margins. I also found some fields with significant patches of manganese deficiency as shown above.

Weeds



Still giant ragweed in corn!



Large giant ragweed in soybean!

Most herbicides can no longer be used on corn due to the stage and/or height of the corn! The maximum corn stage for most herbicides is from V8 to V10. Weeds are still in soybean in some fields. Legally glufosinate and fomesafen should no longer be applied when the stage is at R1 which is most soybeans.

Insects/Other



Red-headed flea beetle

There were no western bean cutworm moths in any of the four traps this week.

With the cancellation of dicamba products applied to dicamba soybean, I did not update the label information below. Not sure of label changes for Tavium (<http://www.syngenta-us.com/herbicides/tavium-tank-mixes>) this week. With the end of Engenia, FeXapan, and XtendiMAX, I deleted the tank-mix information, but since Tavium is still legal, I kept that. There are 47 herbicides, 101 DRA's, 316 adjuvants, 96 nutritionals, 16, insecticides, 7 fungicides, 8 other products, and 41 nozzles approved for use with Tavium.

Enlist One and Enlist Duo for Enlist soybeans and corn also have approved tank-mix partners and nozzles like the dicamba products. **There were no changes to the labels this week!** The list of approved tank-mixtures for both of these products has been updated. Please follow these labels online at <https://www.enlist.com/en/herbicides.html> . There are 48 nozzles, 153 herbicides (10 new ones), 20 glyphosate formulations (1 new one), 10 glufosinate formulations (1 new one), 11 Dry AMS products, 85 insecticides, 30 fungicides, 21 plant growth regulators, 645 other products, and 315 fertilizers / nutrients labeled with Enlist One. There are 23 nozzles, 89 herbicides (15 new ones), 51 insecticides (3 new ones), 17 fungicides, 22 plant growth regulators, 8 Dry AMS products, 512 Other products, and 168 fertilizers / nutrients labeled with Enlist Duo.

Other information about the Enlist products include the following:

1. Enlist Duo rate is 4.75 pts/A which only has 1.0 lbs ae/A of glyphosate which is really not enough. You would think you could just add more glyphosate, but you CAN NOT add more glyphosate with Enlist Duo.
2. Enlist One can be mixed with ANY rate of glyphosate, glufosinate and 192 other herbicides.
3. Never use Enlist One alone on Enlist crops and always apply Enlist One at 2 pts/A
4. You CAN NOT add glufosinate with Enlist Duo!
5. When adding a postemergence grass soybean herbicide like quizalofop, clethodim, sethoxydim, or fluazifop to Enlist One add 33% higher rate of these products to reduce the antagonism with grasses OR apply the postemergence grass herbicides 7 days after the Enlist One.

Upcoming Meetings

1. **Ag Breakfast / Auglaize County Farm Talk.** This Tuesday from 8:30 to 9:30 AM we will have a virtual Ag Breakfast meeting. The topic is Climate Change and It's Impact On Agriculture. The link to get onto the meeting is as follows: <https://osu.zoom.us/j/2119847503> If you just want to call in the phone number and meeting code are as follows: 646-876-9923 2119847503#
2. **The OSU Farm Office is Open.** The OSU Extension Farm Office Team will open our offices online and offer biweekly live office hours on Thursdays from **9:00-10:30 am EST**. This Thursday there will be a meeting!! Each office session is limited to 500 people and if you miss our office hours, we'll post recordings on farmoffice.osu.edu the following day. **Register at <https://go.osu.edu/farmofficelive>.**
3. **All OSU Extension face to face meetings have been cancelled or postponed through July 10th. Meetings after this date will go on as planned at least until further notice.**

Answer to joke: Because it was ahead!!

Is Grey Leaf Spot Present in Corn?



Currently I have seen no grey leaf spot in corn fields. This is of no surprise since it is currently too hot and dry for the disease to develop. Corn plants are free of all leaf diseases at this time.

Grey leaf spot is initially identified by small pinpoint lesions with yellow halos. Grey leaf spot is most commonly recognized by its rectangular brown to grey lesions between the veins on a corn leaf. Lesions grow over time reaching up to 1.5 to 2 inches in length. Lesions can coalesce to form large irregular areas of dead tissue on the leaves. When severe enough the entire leaf can become brown. In partially resistant hybrids the lesions do not grow so lesions stay small and have a round or jagged shape to them.

Grey leaf spot is caused by the pathogen called *Cercospora zea-maydis*. It has been at economic levels since about the mid-1990's.

The presence of the disease is strongly correlated to corn hybrid susceptibility and weather conditions that affects the pathogen.

The fungus survives the winter on infected corn residue at the soil surface. As it warms in the spring *Cercospora zea-maydis* produces spores that splash onto the young corn leaves. This is why the disease starts on the lower leaves of the plant. The fungal spores may also be transported by wind from one field to another.

Infection occurs during prolonged warm (75° F to 85° F) and humid (more than 90% relative humidity) periods. Heavy dew and overcast days cause symptoms to become present. Fields in river bottoms and next to wooded areas are most likely to get the disease.

During low humidity conditions spores stop development, but resume when humidity rises. The spores produced by the lesions are splashed or blown to upper leaves. These spores can survive for long periods until conditions are right for growth. This movement upward in the canopy is how it spreads.

The length of infection period can be up to two weeks. So you must look at the previous weather to know when infection occurred. Hot dry weather will reduce disease development and spread.

Corn planted late will experience initial infection at earlier growth stages. This can result in higher levels of infection and increased yield loss, which we are not seeing much at this time.

Substantial yield loss is possible with favorable conditions. The impact of the lesions is that there becomes less area for photosynthesis which reduces production of carbohydrates necessary to fill the grain. Yield loss of 0-2% is possible when 5% or less of the ear leaf has lesions on it. At this time I have no lesions on corn leaves. When 6 to 25% of the ear leaf is covered with lesions then you can expect a 2 to 10% yield loss. If 75 to 100% (leaf death) of the leaf is covered with lesions then you can expect a 15 to 50% yield loss.

The only ways to manage grey leaf spot is to plant resistant hybrids, manage corn residue, and use fungicides effectively. It is extremely important to plant resistant hybrids where corn is planted after corn, corn is planted no-till, and in areas of high humidity. A one-year rotation away from corn followed by tillage is recommended to prevent disease development.

Consider a fungicide application if the corn hybrid is susceptible or moderately susceptible and 50% of plants in a field have disease lesions present on the third leaf below the ear leaf or higher prior to tasseling. We currently have no lesions present to the best of my knowledge. Apply a strobilurin or strobilurin plus triazole premix fungicide to corn that is tasseling (VT) to early silking (R1) when the disease is at the appropriate level. If the hybrid is moderately resistant then apply fungicide when 50% of plants in a field have disease lesions on the third leaf below the ear leaf or higher and if corn residue is present and favorable weather conditions exist.

So at this time there is no need to spray fungicides in corn, but we must scout again at tasseling to see if any comes in over the next week.

C.O.R.N. Newsletter

<https://agcrops.osu.edu/newsletter/corn-newsletter>

Drought Projections Do Not Go Well With Fungicide Applications



Several calls this past week for fungicide applications on corn and soybean at all different growth stages. So let's review what might be at stake here.

Soybeans. Frogeye leaf spot and white mold on susceptible varieties when the environment is favorable for disease easily pay the cost of application plus save yield losses. Let's dig a bit deeper. Both of these diseases are caused by fungi but frogeye leaf spot is a polycyclic disease, meaning that multiple infections occur on new leaves through the season while white mold is monocyclic and the plant is really only susceptible during the flowering stage. Both of these diseases are also limited geographically in the state. White mold is favored in North East Ohio and down through the central region where fields are smaller and air flow can be an issue. Frogeye has been found on highly susceptible varieties south of 70, but it is moving a bit north so it is one that I am watching.

White mold is also favored by closed canopy, cool nights and high relative humidity. So farmers in these areas should double check their variety ratings first. If it is moderate to low score for resistance (read the fine print) then this year a spray may be warranted. We have gotten consistent control of white mold with Endura at R1. Herbicides that are labeled for white mold suppression have also knocked back this disease,

but if a drought occurs or no disease develops, losses of 10% or greater can occur due to the spray alone. For these purposes R1 is a flower on the bottom of 1/3 of the plants in the field.

Frogeye leaf spot –There also must be some inoculum or low level of disease present in the field for this disease to cause substantial and measurable yield losses. This disease will only move in the canopy when there is regular rainfall. And again only on susceptible varieties. With dry weather, this will sit and hold. Time to scout for this will be at the end of flowering if it can be found in the field. With drought conditions, the disease will not impact the crop.

The story is very similar from a corn pathology standpoint. Most of our major diseases (gray leaf spot, northern corn leaf blight, eye spot) are driven by wet, humid conditions, consequently, the dry weather we have experienced over the last several days will keep most diseases in check. Fungicides are not warranted under these conditions; it just does not pay. Although some product labels may mention yield responses under drought-like condition, our data do not support such a benefit. We see the highest yield responses when fungicides are applied to susceptible hybrids at VT-R1 under disease-favorable conditions. These conditions would include extended periods of dew and high relative humidity, especially during the early-to mid-morning hours.

For a disease like southern rust that usually blows up from the south, and tar spot, an emerging disease of increasing concern in the state, fields should be scouted before making an application. Both diseases develop well under warm conditions, but they also need moisture and high relative humidity to spread. In the case of tar spot, based on what we have seen in 2018 and 2019, it usually develops well into grain fill (R4-R5), and as such, may have little effect on grain yield. Data from some states in the western half of the corn belt show that when tar spot develops early, yield loss may be substantial. The same is true for early southern rust development. So, scout fields to see what is out there and at what level before investing in fungicide application.

Author(s):

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Foliar Fertilizer Applications to Soybean



When soybean prices are low, inputs need to be carefully considered. Will I get a return on my investment?

In 2019, Ohio State participated in a national protocol to evaluate foliar fertilizer in soybean. Trials were conducted in 13 states and totaled 20 different growing environments (Figure 1). In 2019, only 1 environment (Fond du Lac, Wisconsin) showed a yield benefit associated with foliar fertilizer application. Ohio-specific results are shown in Figure 2. In Ohio, none of the evaluated foliar fertilizer products resulted in a different yield compared with the non-treated control (no foliar fertilizer application). Our results are consistent with previously conducted trials in Ohio. Historically, yield response to micronutrient foliar fertilizer application is rare. For detailed information, see Corn, Soybean, and Alfalfa Yield Responses to Micronutrient Fertilization in Ohio FactSheet (<https://ohioline.osu.edu/factsheet/agf-519>).

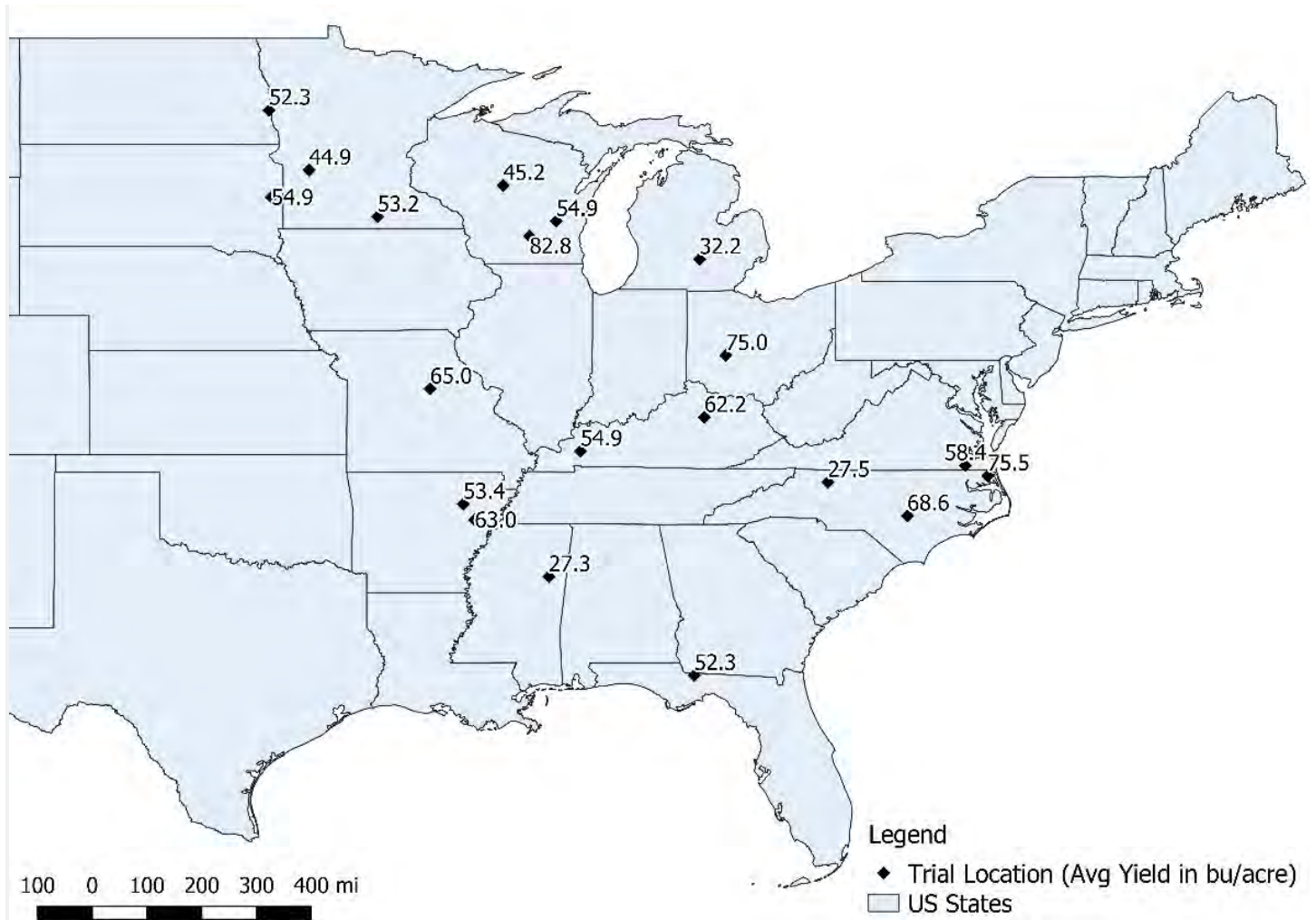


Figure 1. Map of locations showing average soybean yield (bu/acre).

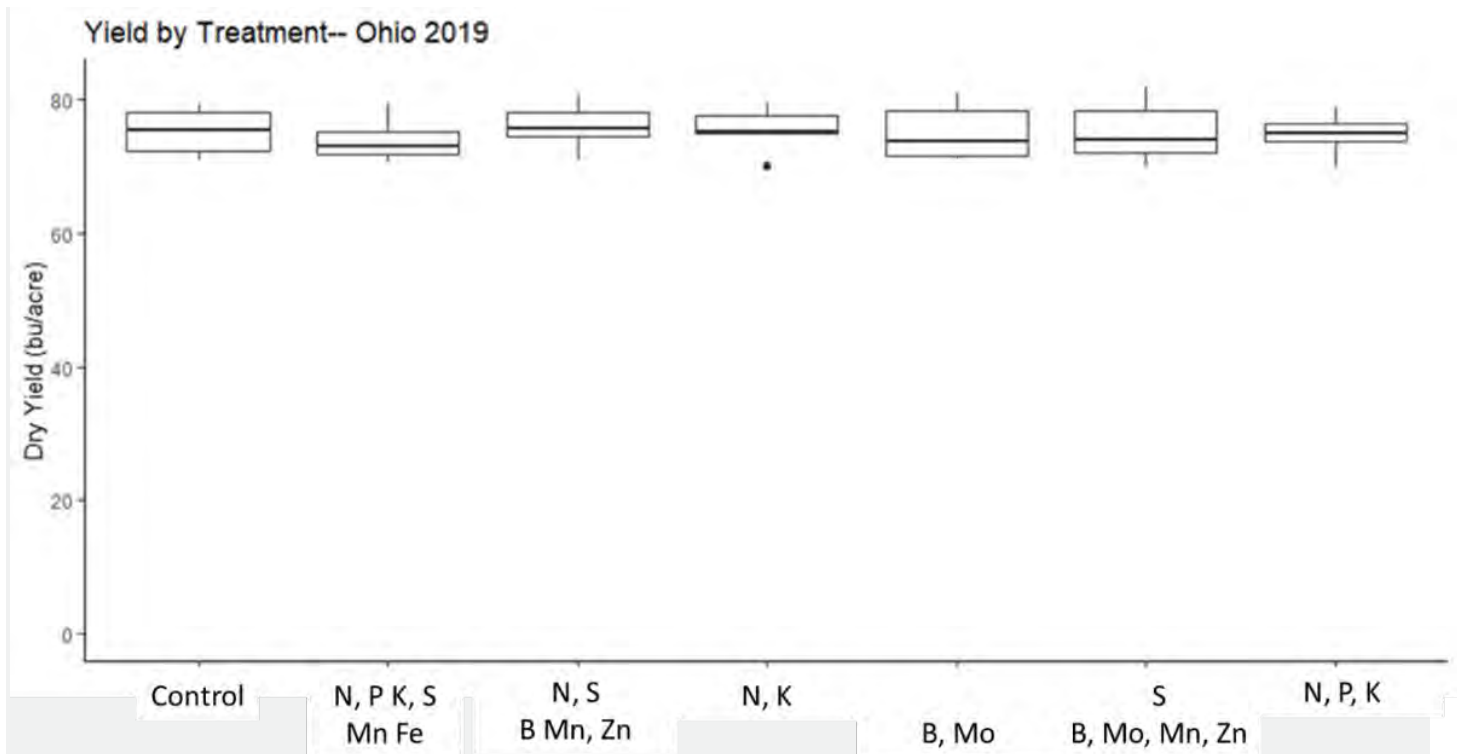


Figure 2. Soybean grain yield for the untreated control (no foliar fertilizer application) and foliar fertilizer products. Differences in yield were not statistically significant.

Although, yield response to micronutrient foliar fertilizer application is rare, there are cases where applications are warranted. In Ohio, manganese is the micronutrient that is most likely to be deficient in soybean. In our work, 2 out of 36 trials have shown a statistically significant yield increase with the application of manganese foliar fertilizer. One responsive location was in northern Ohio in a field with high sand content and dry soil conditions. (Manganese is oxidized to an unavailable form under dry conditions.) The second response location was in northwest Ohio in a field with high clay and high pH.

Author(s):

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Western Bean Cutworm Numbers Remain Low Across Ohio



We are now in the second week of monitoring for Western bean cutworm (WBC) in Ohio. Similar to last week, WBC adult numbers remain low in all monitoring counties. Trap counts for the week of June 29 – July 5 resulted in a total of 56 WBC adults (0.67 average moths per trap) (Figure 1). Overall, 26 counties monitored 84 traps across Ohio. No counties reported capturing more than 1 moth / day over the 7-day monitoring period; therefore, all counties currently remain below the recommended levels that indicate scouting for egg masses should begin.

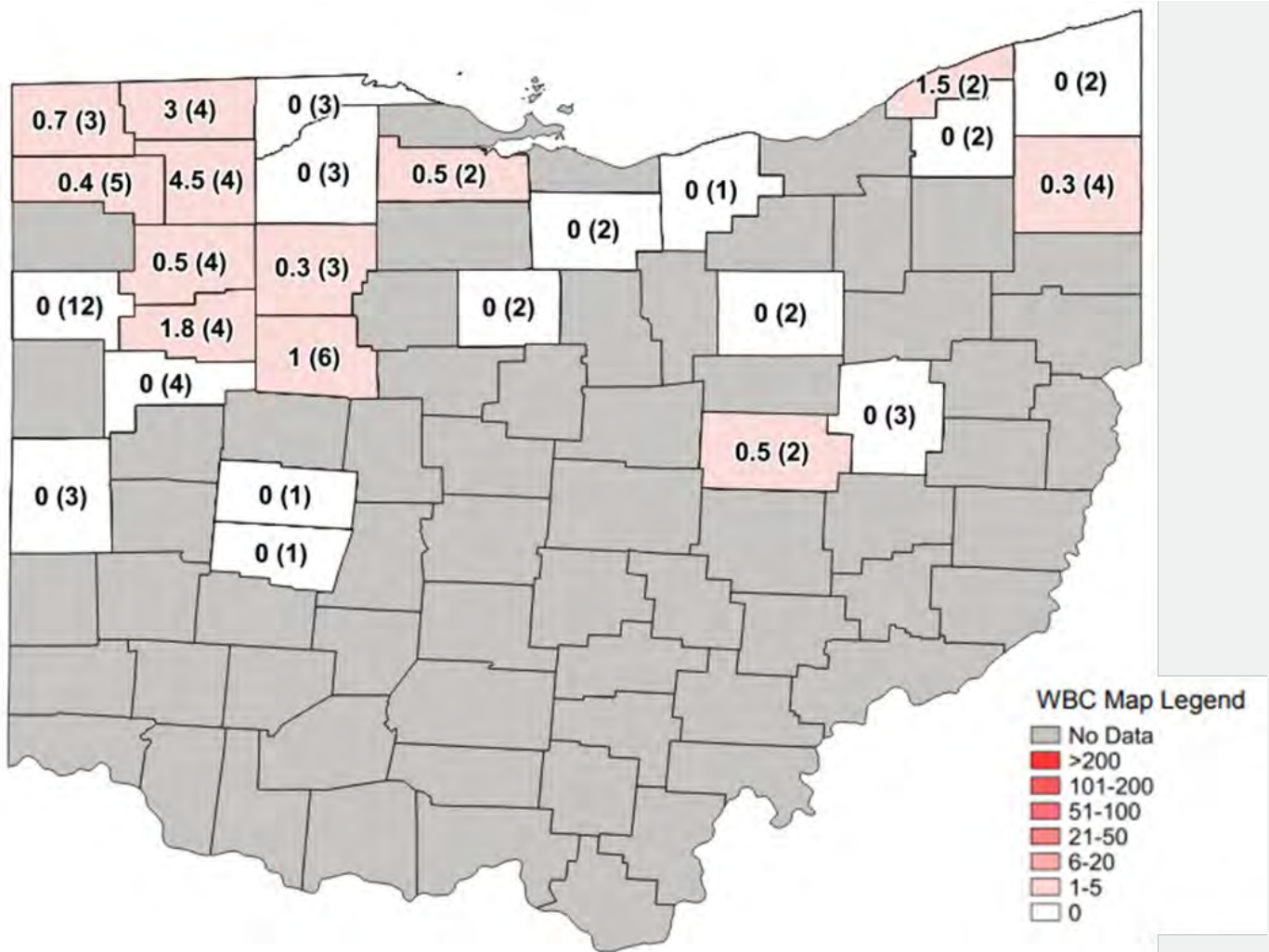


Figure 1. Average Western bean cutworm adult per trap followed by total number of traps in the county in parentheses for week ending July 5, 2020.

Further information on WBC can be found in our fact sheet: <http://ohioline.osu.edu/factsheet/ENT-40> and a free article in the *Journal of Integrated Pest Management*: <http://jipm.oxfordjournals.org/content/1/1/A1>

Author(s):

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July Brings on the Heat

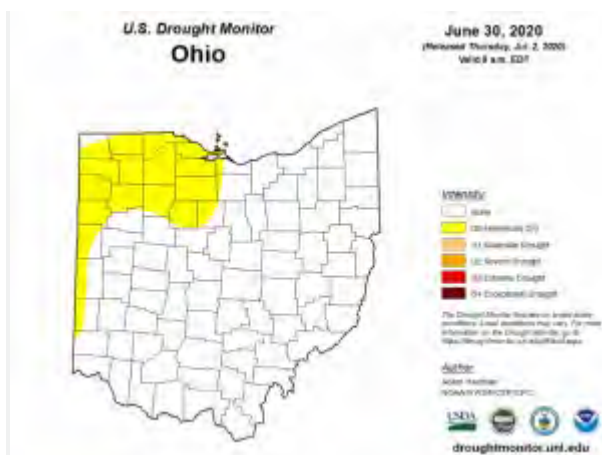


Figure 1: U.S. Drought Monitor for Ohio as reported on July 2, 2020.

Hot and dry conditions have certainly set in across the Buckeye State. Temperatures this past week have averaged 2-8°F above average, with most locations stringing together at least five consecutive days above 90°F and more to come. Based on the forecast, Columbus will likely reach 11 days this Friday, the longest stretch of 90-degree weather since July 21-31, 1999!

Along with hot temperatures there has been a lack of widespread rainfall, generally less than 0.25” statewide over the last seven days, with only brief heavy downpours for a few lucky folks across Ohio. Not only are we falling short on typical rainfall (~1” per week), but hot daytime temperatures have led to intense evaporation rates (0.25-0.30” per day). This has caused rapidly drying soils and decreasing stream flows. Abnormally dry conditions (not official drought) are now being reported (as of Thursday July 2) for about 17 percent of Ohio (Figure 1), with an expansion of these conditions anticipated this week. *Please see this week’s article on Drought and Fungicide.* If you are seeing drought impacts in your area, consider submitting a report to the [Drought Impact Reporter](#). For more information on recent climate conditions and impacts, check out the latest [Hydro-Climate Assessment](#) from the [State Climate Office of Ohio](#). No major weather systems are expected over the next few days across Ohio, but scattered storms with locally heavy rain are possible. Highs will generally top out in the 90s and lows in the upper 60s to low 70s. By Friday, a weak cold front will try to sweep through the state which will likely bring a better chance of

widespread showers and storms and slightly cooler temperatures this weekend with highs in the 80s. Overall, we are expecting 0.25-0.75" (locally heavier) of rain over the next 7 days (Figure 2).

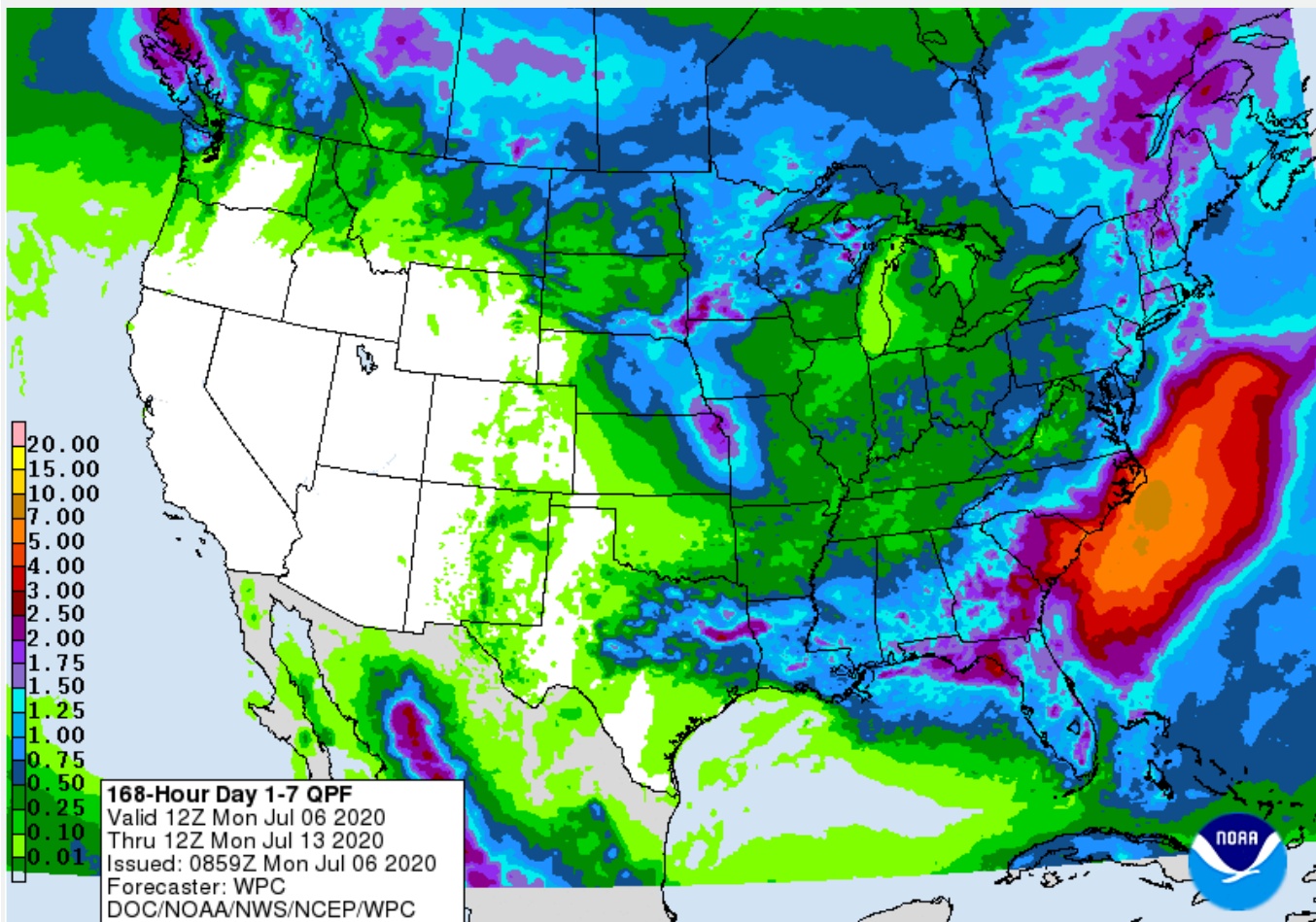


Figure 2: Forecast precipitation for the next 7 days. Valid from 8 pm Monday July 6, 2020 through 8 pm Monday July 13, 2020. Figure from the Weather Prediction Center.

The latest [NOAA/NWS/Climate Prediction Center](#) outlook for the 8-14 day period (July 14-20) shows elevated probabilities of *above average temperatures and below average precipitation* (Figure 3). Normal highs during the period should be in the mid-80s, normal lows in the mid-60s, with 0.85-1.05" of rainfall per week. The [16-Day Rainfall Outlook from NOAA/NWS/Ohio River Forecast Center](#) supports below average precipitation across Ohio as well, especially in northwest Ohio where conditions are already quite dry. The forecast suggests deteriorating pasture conditions, added crop stress, and a lack moisture ahead of pollination and double-crop plantings.

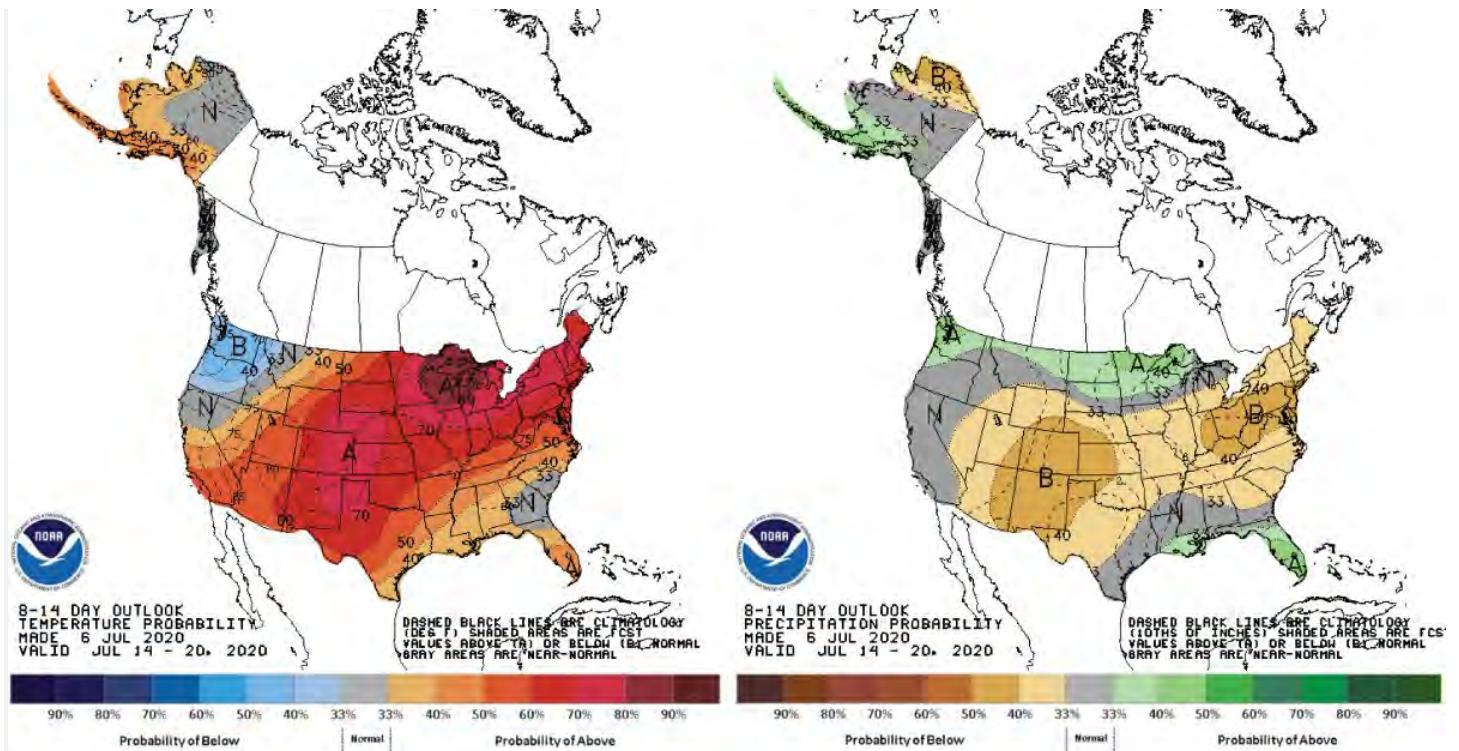


Figure 3: Climate Prediction Center 8-14 Day Outlook valid for July 14-20, 2020 for left) temperatures and right) precipitation. Colors represent the probability of below, normal, or above normal conditions.

Author(s):
 Aaron Wilson

Mid-Season Weed Management in Soybeans – Hot, Dry Edition



A few weed-related observations while we try to stay cool and hope for a day of rain or at least popup thunderstorms.

- One of the frequent questions during extended dry weather is – do I wait for rain before applying POST herbicides, or just go ahead and apply before the weeds get any larger and tougher to control. Our experience has been that it's best to go ahead and apply when weeds are still small, even if it's dry, and herbicides will usually do what they are supposed to. Letting them get larger without any sure forecast for rain can make for a tough situation that requires higher rates or a more injurious mix. On the other hand, waiting to apply can be fine if there is a good chance of rain within the next few days. It's not always an easy decision.
- The deadline for applying dicamba to Xtend soybeans was June 30. Tavium can still be applied where the soybeans were planted less than 45 days ago and have not exceeded V4, an alternative to dicamba will have to be used. We should point out that very hot days and warm nights are not appropriate conditions for applying dicamba anyway.
- The replacement for dicamba on Xtend soybeans is usually going to be glyphosate or a mix of glyphosate with either fomesafen (Flexstar, etc), Cobra/Phoenix, or Ultra Blazer. Will they cause soybean injury? Yes. Will the injury be worse under hot conditions? Probably. Do you want weed control? We assume yes. Using a less aggressive adjuvant approach can reduce the injury. Example – applying fomesafen with MSO + AMS will be less injurious than COC + UAN. Be sure to use adjuvants appropriate for the weed species and size though.
- Applying POST herbicides early or late in the day may have some potential to reduce injury. Keep in mind however that the activity of most POST herbicides on weeds is reduced during overnight hours. In previous OSU research where we applied herbicides at 3-hour intervals from 6 am to 9 pm, activity was substantially reduced from 9 pm through 6 am. So activity was decreasing after 6 pm and ramping back up after 6 am. Our studies included fomesafen, glyphosate, Firstrate, 2,4-D, and glufosinate. Of these herbicides,

2,4-D was the only one not affected by time of day. Giant ragweed was the only broadleaf weed in the 2,4-D study, which occurred in wheat stubble.

- Applying a mix or premix that contains a site 15 herbicide – acetochlor, metolachlor, pyroxasulfone, dimethenamid – often increases the risk and severity of soybean injury. It's late enough in the season that we would question the value of including residual herbicides. Weed emergence is tapering off, and the dry forecast will prevent these herbicides from being active anyway.
- While it has not been much of an issue in Ohio, fomesafen can carryover and injury corn. This is most likely to occur for late-season applications followed by dry conditions that reduce the rate of degradation. We are at this point now, so consider a switch from fomesafen to another group 14 herbicide. There is no risk of carryover to corn for Cobra/Phoenix or Ultra Blazer.
- POST cutoff restrictions for a few soybean herbicides (DBH = days before harvest; from Table 18 of Weed Control Guide): clethodim – 60 DBH; Cobra/Phoenix – 45 DBH; Enlist Duo/One – no later than R2; fomesafen – 45 DBH; Fusion – prior to bloom; glyphosate – through R2; glufosinate – up to R1 and 70 DBH; Ultra Blazer – 45 DBH.
- We have had discussions with growers about doublecrop soybeans – whether to use a residual herbicide approach or just use POST herbicides. Herbicides that cause much injury and slow down growth should be avoided in doublecrop soybeans since time from planting to harvest is short. So the argument for a residual herbicide approach is probably best made in nonGMO or RR soybeans, where use of a site 14 herbicide might be required to control glyphosate-resistant weeds. Planting a LL, LLGT27, or Enlist soybean would allow use of effective POST herbicides without risk of injury. The argument against a residual herbicide approach is the possible lack of rainfall to get them working soon enough, their lack of activity on some glyphosate-resistant weeds, and possible increased carryover risk from applying this late. There are cost considerations also when making this comparison.
- The dry weather forecast has some growers abandoning plans for doublecrop soybeans. This is just a reminder to implement some type of weed control measures in wheat and barley stubble, with the goal of preventing weed seed and increases in the soil seedbank. Marestalk, foxtail, and ragweeds are common weeds in stubble, and waterhemp could be an issue. In previous OSU research on control of marestalk with herbicides in stubble, which can be difficult, applying before the end of July resulted in the most effective suppression of seed. Mowing or tillage can also be used to control weeds. Where mowing and herbicides will be combined, herbicides should be used first.
- Wheat stubble does provide the opportunity to work on Canada thistle, curly dock and dandelion, among other perennials. Most effective control of these weeds will occur where they are left undisturbed from late summer into October or early November, which allows them to reach a size when herbicides are most effective. In other words – don't mow or treat them so late in summer that they don't have enough time to regrow prior to a fall herbicide treatment.

Author(s):

Mark Loux

Potassium Deficiency?



Potassium deficiency symptoms of corn and soybean include yellowing/browning of lower (older) leaves with edges exhibiting symptoms first. Potassium deficiency symptoms can indicate low soil test potassium (K), but may also be related to recent dry soils, compaction, and poor root growth.

In 2013-2015, the Lindsey Lab collected 593 soil samples from close to 200 soybean fields in Ohio. Twenty-three percent of the soil samples were in the build-up range, indicating K was likely limiting soybean yield. If you see plants exhibiting symptoms of K deficiency, collect a representative soil sample from the “bad” area of the field and “good” area of the field for comparison. In most Ohio soils, a soil test K value of >120 ppm (240 lb/acre) should be adequate. See Table 1 for the new Mehlich-3 K critical levels. If soil test K is <120 ppm, fertilizer may be added in-season according to Tables 2 (corn) and 3 (soybean). We do not recommend using foliar products to supply K.

Potassium (Mehlich-3 K)		
Crop	Sandy soils (CEC <5 meq/ 100g)	Loam and clay soils (CEC >6 meq/ 100g)
Corn, Soybean	100 ppm	120 ppm
Wheat, Alfalfa	100 ppm	120 ppm

Table 1. New Mehlich-3 K critical levels for fields crops in the Tri-State Region.

Soil CEC	Mehlich-3 K (ppm)	Corn Yield Potential (bushels per acre)			
		150	200	250	300
Sands (<5 meq/ 100 g)	50	115	125	135	145
	75	80	90	100	110
	100-130	50	60	70	80
	>130	0	0	0	0
Loams and Clays (>6 meq/ 100 g)	50	175	185	195	205
	75	130	140	150	160
	100	85	95	105	115
	120-170	50	60	70	80
	>170	0	0	0	0

Table 2. Corn potassium recommendations based on soil test K.

Soil CEC	Mehlich-3 K (ppm)	Soybean Yield Potential (bushels per acre)			
		30	50	70	90
		----- lb K ₂ O/ acre -----			
Sands (<5 meq/ 100 g)	50	115	140	165	185
	75	85	110	130	155
	100-130	55	80	100	125
	>130	0	0	0	0
Loams and Clays (>6 meq/ 100 g)	50	175	200	225	245
	75	135	155	180	200
	100	90	115	135	160
	120-170	55	80	100	125
	>170	0	0	0	0

Table 3. Soybean potassium recommendations based on soil test K.

If soil test K values are >120 ppm and plants are exhibiting K deficiency symptoms, K uptake by the plant is poor and may be caused by dry soil, compaction, poor root growth, or a combination of these factors. Rainfall and continued root growth will help alleviate these issues. Soybean cyst nematode may also limit root growth and K uptake. If poor areas of the field have not been recently tested for soybean cyst nematode, consider collecting a soil sample for analysis.

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Emergency Forages to Plant Mid-Summer



First and second cutting hay yields are being reported as lower than usual in many areas of Ohio this year. Forages took a hit from the late freezes and cold weather this spring, followed by dry weather after first cutting. Fortunately, hay quality is much better than usual.

If forage inventories are going to be short, emergency forages that can still be planted this summer include the warm-season annual grasses planted by mid-July as well as oat, spring triticale, and Italian ryegrass planted during the last week of July into early August. All those forages will be best harvested as silage/haylage or grazed. Brassica crops (turnip, turnip hybrids, rape) can be planted in early August for grazing in late autumn.

Soil moisture is the big concern for any forage planting now. Much of the state is already seeing dry soils and temperatures are high, so the general outlook for seed germination of any kind is not promising right now. The decision to plant or not will have to be made for each individual field, considering soil moisture and the rain forecast. Rainfall/soil moisture in the few weeks immediately after seeding is the primary factor affecting successful establishment of any crop.

Where soils are very dry right now, the wait-and-see approach is prudent. Waiting to plant might take out the option for warm-season grasses since they should be planted by July 15-18. But we still have at least two more weeks before the ideal time to plant oat, spring triticale, Italian ryegrass, and brassica crops (last of July into August). We can hope for rain by then.

As mentioned above, warm-season grasses (sudangrass, sorghum-sudangrass, forage sorghum, millets, teff) will need to be planted by the end of next week (July 15-18). Corn planted up to July 15 is also an option for strip-grazing in autumn. If sufficient soil moisture is present, dry matter yields can reach 2 to 4 tons of dry matter per acre, depending on the species. Last year, western Ohio producers had success interseeding sorghum-sudangrass into weak alfalfa stands; however, soil moisture was not lacking when they planted.

This summer, soil moisture in an existing hay crop will be greatly depleted unless there have been recent rains.

Oat, spring triticale, and Italian ryegrass can be planted from the last week of July to mid-September, with forage yields declining as planting is delayed past early August. Brassicas should be planted by early August for acceptable levels of available forage for grazing in late autumn.

For other options to consider, such as stretching the existing forage inventory, follow the links below:

- Hay yields off? Don't panic, there's time to take action!
<https://u.osu.edu/beef/2020/06/03/hay-yields-off-dont-panic-theres-time/#more-9000>
- Stretching Forage Supplies on Dairy Farms.
https://dairy.osu.edu/sites/dairy/files/imce/PDF/Feed_PDF/Stretching%20forage%202019%20weiss%20FINAL%20B.pdf

For more details on emergency forage options, follow the links below:

- Emergency Forages to Plant Yet This Year for Mechanical Harvest,
<https://forages.osu.edu/news/emergency-forages-plant-yet-year-mechanical-harvest>
- Emergency Forages to Plant Yet This Year for Grazing,
<https://forages.osu.edu/news/emergency-forages-plant-yet-year-grazing>
- Harvest Management of Summer Annual Grasses, (showing data from July planting)
<https://forages.osu.edu/news/harvest-management-summer-annual-grasses>
- Oats as a Late Summer Forage Crop, <https://u.osu.edu/beef/2020/06/24/oats-as-a-late-summer-forage-crop/>
- Soybeans for Hay or Silage, <https://fyi.extension.wisc.edu/forage/soybeans-for-hay-or-silage/>
- Teff as an Emergency Forage, <http://nmsp.cals.cornell.edu/publications/factsheets/factsheet24.pdf>
- Millets Forage Management, <https://www.extension.iastate.edu/sites/www.extension.iastate.edu/files/iowa/MilletFS55.pdf>

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Application of Manure to Double Crop Soybeans to Encourage Emergence



Wheat harvest will soon be wrapped up in Ohio and some farmers will plant double-crop soybeans. The summer manure application window following wheat harvest is typically the 2nd largest application window each year. In recent years there has been more interest from livestock producers in applying manure to newly planted soybeans to provide moisture to help get the crop to emerge.

Both swine and dairy manure can be used to add moisture to newly planted soybean fields. It's important that the soybeans were properly covered with soil when planted to keep a barrier between the salt and nitrogen in the manure and the germinating soybean seed. It's also important that livestock producers know their soil phosphorus levels, and the phosphorus in the manure being applied, so soil phosphorus levels are kept in an acceptable range.

An acre-inch of water is 27,154 gallons. The application of 10,000 gallons per acre of dairy manure would be about 0.37 inches of moisture. The application of 7,000 gallons of swine manure would be about 0.26 inches of moisture. While we strongly encourage the incorporation of livestock manure whenever possible, the use of manure to help with double-crop soybean emergence does not really allow for incorporation.

If soybeans are emerged, swine finishing manure is likely to kill the emerged plants. We applied swine finishing manure to early V3 soybeans at the Hoytville research farm earlier this year and while the manure did not kill the soybeans, there was significant leaf burning. Swine nursery manure and sow manure are unlikely to kill emerged soybeans. We are on our 3rd season of using a drag hose to flatten soybeans at two of our Ohio Agricultural Research and Development Center stations. The manure hose has not appeared to cause much damage to emerged soybeans at the V1, V3, and V5 stages.

If manure is incorporated prior to planting double-crop soybeans be sure the manure salt and nitrogen is not placed in the planting zone. Placing the manure in contact with germinating seeds can result in severe emergence problems.

If red clover was frost seeded in the wheat, young clover is easy to kill with a summer manure application. Several livestock producers have told me stories of accidentally killing clover stands when applying manure to wheat stubble just after wheat harvest.

As always, print out the weather forecast when surface applying manure. Remember the “not greater than 50% chance of 0.5 inches of rainfall in the next 24 hours” rule in the Western Lake Erie Basin.

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Corn Growth in Hot and Dry Conditions



In recent days we have been experiencing 90 degree F days with limited precipitation, and so we are starting to see some leaf rolling in corn. Some of this may be related to reductions in soil moisture, but may be related to restricted root systems as well. Depending on the stage of corn at the time of these conditions, different effects on yield may be expected. Corn ear development occurs throughout the growing season, and extreme temperature or moisture stress at different growth stages will decrease different aspects of grain yield. Below is a quick summary of the yield component most affected by environmental stress at different growth stages:

- V5-7: Number of kernel rows. Corn plants are determining the number of kernel rows as early as V5 in some corn hybrids. By V7, the number of kernel rows in the primary ear has been determined for most hybrids.

- V9-VT: Number of potential kernels per row (row length). Each potential kernel comes from one floret on the ear (female flower), and as conditions are more favorable for development the plant will initiate more florets. The number of potential kernels on the ear can be set through late vegetative stages (through V16).
- VT/R1: Number of potential kernels that are fertilized. High temperatures and moisture stress can cause pollen release to occur before silk emergence resulting in poor pollination, and can decrease pollen grain viability. Ear elongation is occurring during R1, and if stress occurs total ear length could be decreased. Yield losses have been estimated up to 13% per day of stress.
- R2-R3: Kernel number to be filled. Stress at the blister (R2) and milk (R3) stage can cause fertilized kernels to be aborted due to poor carbohydrate availability. Carbohydrate production will decrease as temperature and moisture stress increase because photosynthesis is reduced. The limited production of sugars will cause the plant to abort kernels, typically those that were the last to be pollinated (at the tip).
- R4-R5: Kernel size. At the dough (R4) and dent (R5) stages, carbohydrate accumulation within the kernels will be reduced due to environmental stress. At the start of R5, only 45% of the dry matter in each kernel has been accumulated, leaving half of the starch to be added during R5. However, the kernel contains 90% of its dry matter halfway through the R5 growth stage (milkline halfway down the kernel).

Given corn growth is maximized at 86 degrees F, temperatures exceeding this can result in reduced growth rates. Leaf area may decrease under stress conditions leading to less area available to photosynthesize, and internodes may not lengthen as much leading to shorter plants. Moisture stress can also be observed as leaf rolling. Rolled leaves help to shade the leaves by reducing the area in direct interception of light and to thicken the boundary layer (leading to less evaporation and slower water movement out of the leaves). However, leaf rolling can be seen even if soil moisture is evident under high temperatures and lower relative humidity levels. Be sure to watch the video on this topic [here](#).



Higher temperatures (especially at night) can lead to more respiration, which could reduce yield by metabolizing sugars (rather than moving them to the kernels). Hot days also mean faster GDD accumulation during the season and can shorten the number of days the crop has to photosynthesize and create sugars. For example, let's say a hybrid needed 1350 GDDs to reach maturity after flowering. With a daytime temperature of 86 F and night temperature of 68 degrees F, it would take 50 calendar days to accumulate 1350 GDDs. Conversely, with a day temperature of 86 F and a night temperature of 63 F, it would take 56 calendar days to reach that same GDD accumulation.

In parts of the state there may be soil moisture present but root systems are being affected by soil compaction restricting growth. Another issue that has been observed is rootless or floppy corn. Seed planted in loose dry soil that becomes compacted after planting may be prone to this as well. If leaf rolling is showing up in your fields, consider digging some plants to assess the root systems and levels of soil moisture within the field.

Figure 1 – Corn showing leaf rolling symptomology.

Figure 2 – Rootless corn showing nodal roots developing outside soil environment.

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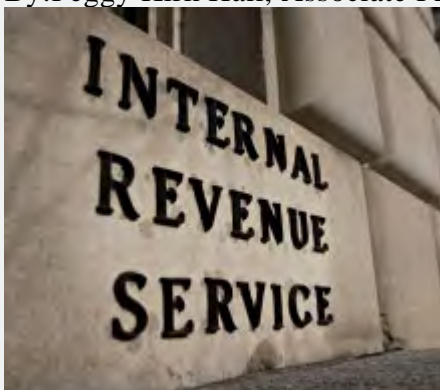
Author(s):

Alexander Lindsey, Peter Thomison

Other Articles

Join us for the OSU Income Tax Schools Summer Update and Federal Income Tax and Financial Update Webinar

By: Peggy Kirk Hall, Associate Professor, Agricultural & Resource Law Monday, June 29th, 2020



Written by Barry Ward, Director, OSU Income Tax Schools

Significant tax related changes as a result of the new legislation passed in response to COVID-19 have created some questions and perhaps consternation over the past few months. Taxpayers and tax professionals alike are wrestling with how these changes may affect tax returns this year and beyond. OSU Income Tax Schools is offering a Summer Update to address these issues and other important information for tax professionals and taxpayers.

The OSU Income Tax Schools Summer Update: Federal Income Tax & Financial Update Webinar is scheduled for August 13, 2020 and will be presented as a webinar using the Zoom platform.

Webinar content

- New tax provisions implemented by the CARES Act and Families First Coronavirus Response Act and how to account for them such as the new net operating loss rules, the payroll tax credit, etc.
- Paycheck Protection Program Loan Issues: loan applications, forgiveness issues and the IRS ruling on loan expenditures that are forgiven under PPP are not tax deductible and how to account for them in preparing a return, etc.
- Dealing with the IRS in these difficult times. Also, what it means to the practitioner as to “dos” and don’ts” regarding the announcement that beginning this summer the IRS will allow the electronic filing of amended returns.
- The “Hot IRS Audit Issues – Pitfalls for S Corporations and Partnerships.” Basis of entities as to the rules and related rulings, how to track basis in these entities, creation of basis where none had been computed in prior tax years, losses in excess of basis and when they are not allowed, definition of an excess distribution, taxation of excess distributions, distribution of appreciated property, conversion of C corporations to S corporations - do and don'ts, computation of the Built-In Gains Tax, inference and imputation of a reasonable wage for purposes of the computation of the qualified business income deduction, etc.
- Other rulings, developments, and cases.

Webinar personnel

- John Lawrence, CPA, John M. Lawrence & Associates: Instructor
- Barry Ward, Director, OSU Income Tax Schools: Co-Host & Question Wrangler
- Julie Strawser, Program Assistant, OSU Income Tax Schools: Co-Host and Webinar Manager

Details

- August 13th, 2020: 10 am – 3:30 pm (lunch break: noon – 12:50 pm)
- Cost: \$150
- Registration information and link to the registration page is at <https://farmoffice.osu.edu/osu-income-tax-schools>
- This workshop is designed to be interactive with questions from the audience encouraged.

Continuing education offered

- Accountancy Board of Ohio (5 hours)
- IRS Office of Professional Responsibility (5 hours)
- Continuing Legal Education, Ohio Supreme Court (4.5 hours)

Agriculture - a climate villain? Maybe not!

A proposal to rethink agriculture in the climate calculations

Date: July 7, 2020

Source: Linköping University

Source: <https://www.sciencedaily.com/releases/2020/07/200707113331.htm>

The UN's Intergovernmental Panel on Climate Change (IPCC) claims that agriculture is one of the main sources of greenhouse gases, and is thus by many observers considered as a climate villain. This conclusion, however, is based on a paradigm that can be questioned, writes Per Frankelius, Linköping University, in an article in *Agronomy Journal*.

The fundamental process in agriculture is large-scale photosynthesis, in which carbon dioxide is captured by crops and at the same time oxygen is produced. A fraction of the carbon is bound in the plant roots, while most of it is bound in the form of carbohydrates that are harvested and used in other sectors of society. This involves various form of cereal, oilseed crops, vegetables and grassland.

"The fact that the carbon is bound in the crops, which at the same time produce oxygen, just as growing forest does, is a positive effect that is not included in the IPCC calculations. These only consider the greenhouse gases that have a negative impact on the climate. This is also the case in The Greenhouse Gas Protocol, which is a well established standard for calculating the emission of greenhouse gases," says Per Frankelius, associate professor in business administration at Linköping University, who has recently written an article in the *Agronomy Journal*, published by the American Society of Agronomy.

"This view is based on a paradigm that has essentially never been questioned. Politicians and decision-makers must understand the complete range of the climate impact of agriculture, otherwise there is a risk that many decisions that influence long-term sustainability in a negative manner will be taken," says Per Frankelius.

The justification that crops are not included as a positive factor is probably that carbon dioxide is formed in the next step along the chain, when the crops are consumed by humans. "But that takes place in another sector: it's not part of agriculture," Per Frankelius points out.

Per Frankelius gives an example calculation in the article in *Agronomy Journal*:

Many different crops are cultivated as agricultural products, and all of them perform photosynthesis. One common crop is cereals, such as wheat, and in 2019, global production of cereals was 2.7 billion tonnes. This corresponds to approximately 1 billion tonnes of carbon, which in turn corresponds to 3.8 billion tonnes of carbon dioxide. The figure would be significantly higher if we included other crops such as oilseed crops and sugar beet.

"The total agricultural production has been estimated to be 9200 million tons by FAOSTAT. Different crops have different water content, but a good guess is that the total production corresponds to approximately 9100 million tonnes of carbon dioxide," adds Per Frankelius.

Agriculture produces also grasslands and grazing that bind carbon, and a further 2.7 billion tonnes of carbon is bound in the soil.

"So is agriculture one of the world's largest climate villains, or does the sector actually have a positive impact on climate?" asks Per Frankelius.

He does not question the fact that agriculture also produces a significant amount of negative greenhouse gases, and it is important to reduce this in a sustainable manner.

Per Frankelius, who is also process manager at Agtech 2030, an innovation platform at Linköping University, presents in the article no less than seven concrete measures that can both advance the sector and reduce emissions. The measures range from ensuring that fields are green throughout the year to the marketing of animal ecosystem services, the use of fossil-free mineral-based fertilisers, the spread of biochar, replacing diesel by fossil-free biodiesel, electricity, fuel cells or even steam to power engines, planting trees in rows along the edges of fields and placing solar panels there to follow the sun with a recently patented technology, and various ways to reduce soil compaction. He refers to concrete examples in all cases.

The conclusions Per Frankelius draws are unambiguous: in order to achieve long-term sustainability, all aspects of global agriculture must be developed, not wound down or given less advantageous economic conditions. One key to success is innovation.

Linköping University. "Agriculture - a climate villain? Maybe not! A proposal to rethink agriculture in the climate calculations." ScienceDaily. ScienceDaily, 7 July 2020.
<www.sciencedaily.com/releases/2020/07/200707113331.htm>

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