

## TUSCARAWAS COUNTY AGRICULTURE &amp; NATURAL RESOURCES

June 3, 2021



Dear Farm Manager,

I hope you find this update to be of value. Should you have any questions, please contact me at [zoller.1@osu.edu](mailto:zoller.1@osu.edu) or 330-339-2337 or 330-827-0249.

**THANK YOU**...to the OSU Extension eFields Cooperating Farms for planting research plots in the last few weeks. These plots will be monitored through harvest and results shared in the 2021 eFields Report. For more information about eFields and to view previous reports, please see: <https://digitalag.osu.edu/efields>

**POTATO LEAFHOPPER**...has arrived. Growers should begin scouting their alfalfa fields now within the first two weeks after the first harvest. New spring seedings of alfalfa must be checked regularly, as they can be extremely damaged by relatively low numbers of PLH. Action thresholds can be exceeded very quickly in these slow-growing new stands.

Additional information is available in this OSU Extension C.O.R.N. newsletter:

<https://agcrops.osu.edu/newsletter/corn-newsletter/16-2021/potato-leafhoppers-have-arrived-alfalfa-field-near-you> and at these sites:

- For a video with detail on damage, ID, and control options visit: <https://forages.osu.edu/video/potato-leafhopper-identification-and-damage-alfalfa>
- Ohio State University Extension's factsheet on potato leafhopper in alfalfa is at: <https://ohioline.osu.edu/factsheet/ENT-33>
- An excellent resource for other forage-related questions is the OSU Extension Forage Page at: <https://forages.osu.edu/home>



**BEEF QUALITY ASSURANCE (BQA)**...sessions are scheduled at Sugarcreek Stockyards for beef & dairy producers with a certification that expires in 2021. Please RSVP to 330-339-2337 to let us know which session you will attend.

- July 21 at 1pm
- July 29 at 7pm
- August 10 at 1pm
- August 25 at 7pm

**KEEP AN EYE**...on the beef bull. Many producers with spring calving herds just turned out their bulls. In the May Off the Hoof, we reminded everyone to [subject their herd bulls to a breeding soundness exam](#) (BSE). A BSE is the best insurance we available to ensure we don't turn out a bull that is infertile or incapable of breeding cows. However, the BSE does not indicate if the bull is willing to breed cows. I was reminded of this very recently in the herd that I used for the "I bought a farm" YouTube video series. To get these heifers bred, we synchronized them for AI and then turned out a mature bull that had passed a BSE. When I inseminated these heifers, the weather turned very poor (middle of December) and the estrus response rate in the heifers was low, so I wasn't expecting high conception rates to AI. Just to get an idea of how well we did, I spent some time in the pasture watching for return heats. As I expected, several heifers had return heats but what really stuck out was the bull was NOT breeding them. Some of the heifers were jumping on the bull and he seemed disinterested. I was concerned about the bull and told the owner that he needed to consider finding another bull. I could not assure him the bull was not getting the job done as research has shown that mature bulls will only breed a female in heat 1-3 times even though she is in heat for as long as 12 hours. This bull however showed absolutely no interest. For a variety of reasons, the owner decided to not get another bull. Pregnancy rates were only 61% in this group of heifers. The decision may have cost this producer significantly.

Bottomline: keep an eye on your bull to make sure he is working. Multiple return heats indicate a bull that is not getting females pregnant. If possible, replace the lazy bull. It will cost some money to make a switch, but this cost is likely much lower than the cost of open females.

(Source: OSU Extension Beef News: <https://u.osu.edu/beef/2021/06/02/keep-an-eye-on-that-bull/#more-10949>)

**FERTILIZING HAY & PASTURE FIELDS**...is important to maximize yield potential. Fertilizer can be topdressed on hay or pastures at any time during the growing season, but right after the first cutting and early fall provide times when the soils are usually firm enough to support fertilizer spreading equipment and the nutrients are applied to actively growing plants when they are most needed.

A recent soil test should be the guide for what nutrients to apply and how much. If nutrient deficiencies are suspect, then tissue tests can be helpful in diagnosis along with the soil test values. Where high rates of phosphorus and potassium are recommended, there is an advantage to splitting the application, with half applied now after the first harvest and the remainder applied in the fall.



The Ohio State University Extension has an Excel tool to help you determine the right rates to apply based on your soil test report. The OSU Fertility Recommendation Calculator and a user guide are available at <https://forages.osu.edu/forage-management/soil-fertility-forages>.

Strategic applications of nitrogen might be needed on pure grass hay and pasture stands. Moderate amounts of nitrogen (30-50 pounds N/Acre) can be applied in June through early July after the first cutting or after the spring flush and reproductive stages of the cool-season grasses are over in pastures. This application will stimulate summer hay growth or pasture grass growth that can be stockpiled for use when pastures slow down later in the season. This application should be limited in acreage for pastures, based on how much grass growth is needed to carry the herd or flock.

See this OSU Extension C.O.R.N. newsletter for additional information:

<https://agcrops.osu.edu/newsletter/corn-newsletter/16-2021/fertilizing-hay-and-pastures>

**LEGAL RULINGS**...related to pesticides have been announced recently. Peggy Hall, OSU Extension Field Specialist, Ag & Resource Law, provides the following:

- **Roundup award.** The Ninth Circuit Court of Appeals dealt another loss to Monsanto (now Bayer) on May 14, 2021, when the court upheld a \$25.3 million award against the company in *Hardeman v. Monsanto*. The lower court's decision awarded damages for personal injuries to plaintiff Edward Hardeman due to Monsanto's knowledge and failure to warn him of the risk of non-Hodgkin lymphoma from Roundup exposure. Monsanto argued unsuccessfully that the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) preempted the plaintiff's claim that California's Proposition 65 law required Monsanto to include a warning about Roundup's carcinogenic risks on its label. That requirement, according to Monsanto, conflicted with FIFRA because the EPA had determined via a letter that a cancer warning would be considered "false and misleading" under FIFRA. The Ninth Circuit disagreed that the EPA letter preempted the California requirements.

The Court of Appeals also held that the trial court did not abuse its discretion in allowing the plaintiff's expert testimony. Monsanto had challenged testimony from a pathologist whom it alleged was not qualified to speak as an expert. But the court agreed that the witness testimony met the standard that expert opinions be "reliably based" on epidemiological evidence.

Monsanto also challenged the damages themselves. The award in *Hardeman* included \$20 million in punitive damages that the district court reduced from \$75 million originally awarded by the jury. While \$75 million seemed "grossly excessive," the appellate court reasoned, \$20 million did not, especially considering Monsanto's reprehensibility, because evidence of the carcinogenic risk of glyphosate was knowable by Monsanto.

- **Roundup settlement.** In a second Roundup case, a California district court last week rejected a motion to approve a \$2 billion settlement by Monsanto (now Bayer) to a proposed class of users exposed to Roundup or diagnosed with non-Hodgkin lymphoma who have not



yet filed lawsuits. The offer by Bayer in Ramirez, et al. v. Monsanto Co. included legal services, compensation, research and assistance with non-Hodgkin lymphoma diagnosis and treatment, and changes on the Roundup label advising users of a link to non-Hodgkin lymphoma, but would require class members to waive their right to sue for punitive damages if they contract non-Hodgkin lymphoma and stipulate to the opinion of a seven-member science panel about whether Roundup causes non-Hodgkin lymphoma.

The judge determined that the settlement would accomplish a lot for Bayer by reducing its litigation and settlement exposure, but it would greatly diminish the future settlement value of claims and “would accomplish far less for the Roundup users who have not been diagnosed with NHL (non-Hodgkin lymphoma)—and not nearly as much as the attorneys pushing this deal contend.” The court also determined that the benefits of the medical assistance and compensation components of the settlement, to last for four years, were greatly exaggerated and vastly overstated. The proposed stipulation to a science panel also received the court’s criticism. “The reason Monsanto wants a science panel so badly is that the company has lost the “battle of the experts” in three trials,” the court stated. Concluding that “mere tweaks cannot salvage the agreement,” the court denied the motion for preliminary approval and advised that a new motion would be required if the parties could reach a settlement that reasonably protects the interest of Roundup users not yet diagnosed with non-Hodgkin lymphoma.

Bayer responded to the court’s rejection immediately with a “five-point plan to effectively address potential future Roundup claims.” The plan includes a new website with scientific studies relevant to Roundup safety; engaging partners to discuss the future of glyphosate-based producers in the U.S. lawn and garden market; alternative solutions for addressing Roundup claims including the possible use of an independent scientific advisory panel; reassessment of ongoing efforts to settle existing claims; and continuing current cases on appeal.

### **OSU Extension Ag & Natural Resources Mission:**

**Ohio State University Extension Agriculture and Natural Resources empowers Ohio’s agriculture and natural resources communities, provides outreach and education based on unbiased research, and cultivates relationships to strengthen the economic viability and quality of life for Ohioans.**



**CROP PROGRESS & CONDITION**...as reported by Ohio NASS is summarized below:

### Crop Progress: Week Ending 05/30/21

Crop/Activity	Percent Completed			
	This week	Last week	Last year	5 Year average
Days Suitable for Fieldwork..	4.2	6.4		
Corn Planted.....	92	76	78	72
Corn Emerged .....	70	38	52	50
Soybeans Planted.....	84	66	64	56
Soybeans Emerged .....	58	28	39	33
Winter Wheat Jointing .....	98	94	99	97
Winter Wheat Headed .....	78	46	69	75
Alfalfa Hay 1st Cutting .....	49	16	19	NA
Other Hay 1st Cutting .....	44	10	18	NA
Oats Planted .....	97	94	95	95
Oats Emerged.....	94	88	83	85
Oats Headed .....	19	3	4	6

### Crop Condition: Week Ending 05/30/21

Crop	Very poor	Poor	Fair	Good	Excellent
	<i>(percent)</i>	<i>(percent)</i>	<i>(percent)</i>	<i>(percent)</i>	<i>(percent)</i>
Corn .....	0	2	19	71	8
Winter Wheat .....	0	1	22	57	20
Oats .....	0	1	27	62	10
Pasture and Range ....	0	2	16	71	11





## TUSCARAWAS COUNTY AGRICULTURE & NATURAL RESOURCES

Dear Farm Manager,

June 9, 2021

I hope you find this information to be of value. Please contact me at 330-827-0249 with your questions.

**CORN LIVE**...will air Thursday, June 10, at 8am. The webinar will be the first session of a new series which will be offered throughout the growing season to address timely issues related to agronomic crop production and management as they emerge.

Guest speakers for this week's CORN Live session include Nathan Douridas, Farm Manager at the Farm Science Review (FSR), and John Fulton, Professor and OSU Extension Specialist in Food, Agricultural, and Environmental Engineering. Douridas will discuss the overall nitrogen plan at FSR and discuss the technology, equipment, and tools utilizing at FSR to manage nitrogen in the field. He will also give an update on crop progress at FSR. Fulton will discuss field trials on nitrogen rate and placement in corn and how his research can be used to refine nitrogen application decisions on farms in Ohio.

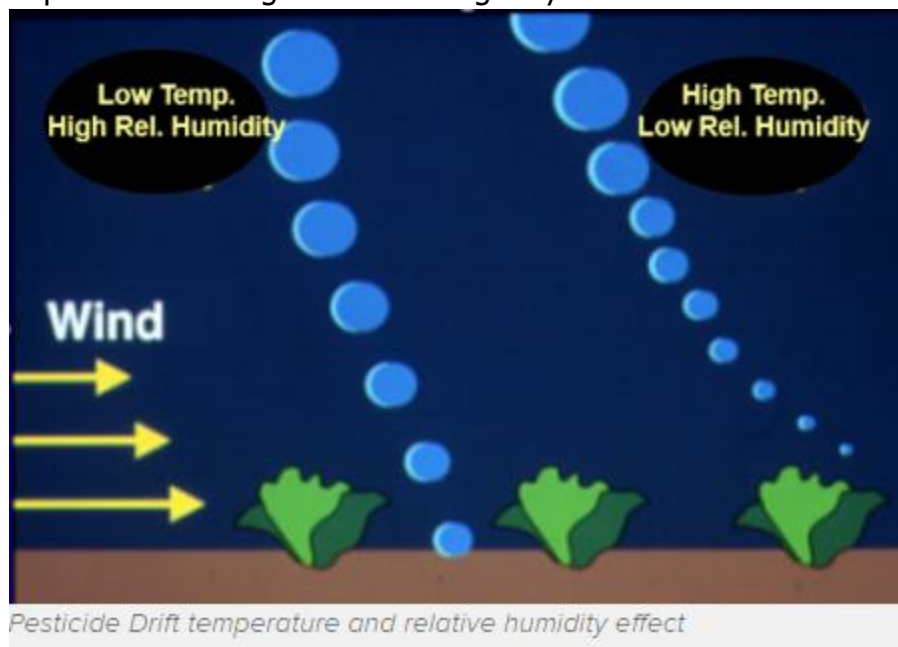
Register at [www.go.osu.edu/cornlive](http://www.go.osu.edu/cornlive). 1 hour of NM CCA CEUs will be offered.

**HIGHER TEMPERATURES**...increase spray drift risk. Since evaporation of liquid from a droplet decreases its mass, it also influences the drift distance of the droplet. Evaporation rates of droplets by time vary depending on the initial size of droplets at the time they are released from the nozzle, temperature, and relative humidity. Effect of temperature and relative humidity will be much greater for small droplets especially those smaller than 100 micron which is the approximate diameter of human hair.

Let me give you some examples to illustrate the influence of just the temperature and relative humidity on spray drift. I will tackle the effect of wind on drift in another article. These examples are coming directly from the Ohio State University Extension Publication FABE-525, "Effect of Major Variables on Drift Distances of Spray Droplets (<https://ohioline.osu.edu/factsheet/fabe-525>). For this illustration, I will assume a wind speed of approximately 5 mph, relative humidity of 50%, and the nozzle height from the top of the target is 18 inches. I will give you drift distances of different sizes of droplets under two temperatures: 68°F and 86°F. Droplets under 100 microns will almost always drift some distance away from the discharge location, however, they may at least have a chance to deposit on the target at 68°F. However, the same droplet at 86°F temperature will likely evaporate at some distance away from the discharge location. For example, a droplet with an initial size of 70



microns at 68°F will likely deposit on the target after a drift distance of 6 feet. However, at the time of deposition on the target, the final droplet size will be reduced from 70 to 44 microns (a reduction of 37% in size). The same 70-micron droplet at 86°F will completely evaporate after traveling only 13 feet. In contrast, a 150-micron droplet under similar conditions will be affected much less by the temperature. It will lose its size by only 2 or 3% of its size at 68°F and 86°F, respectively. It will deposit on the target after drifting only about 3 feet.



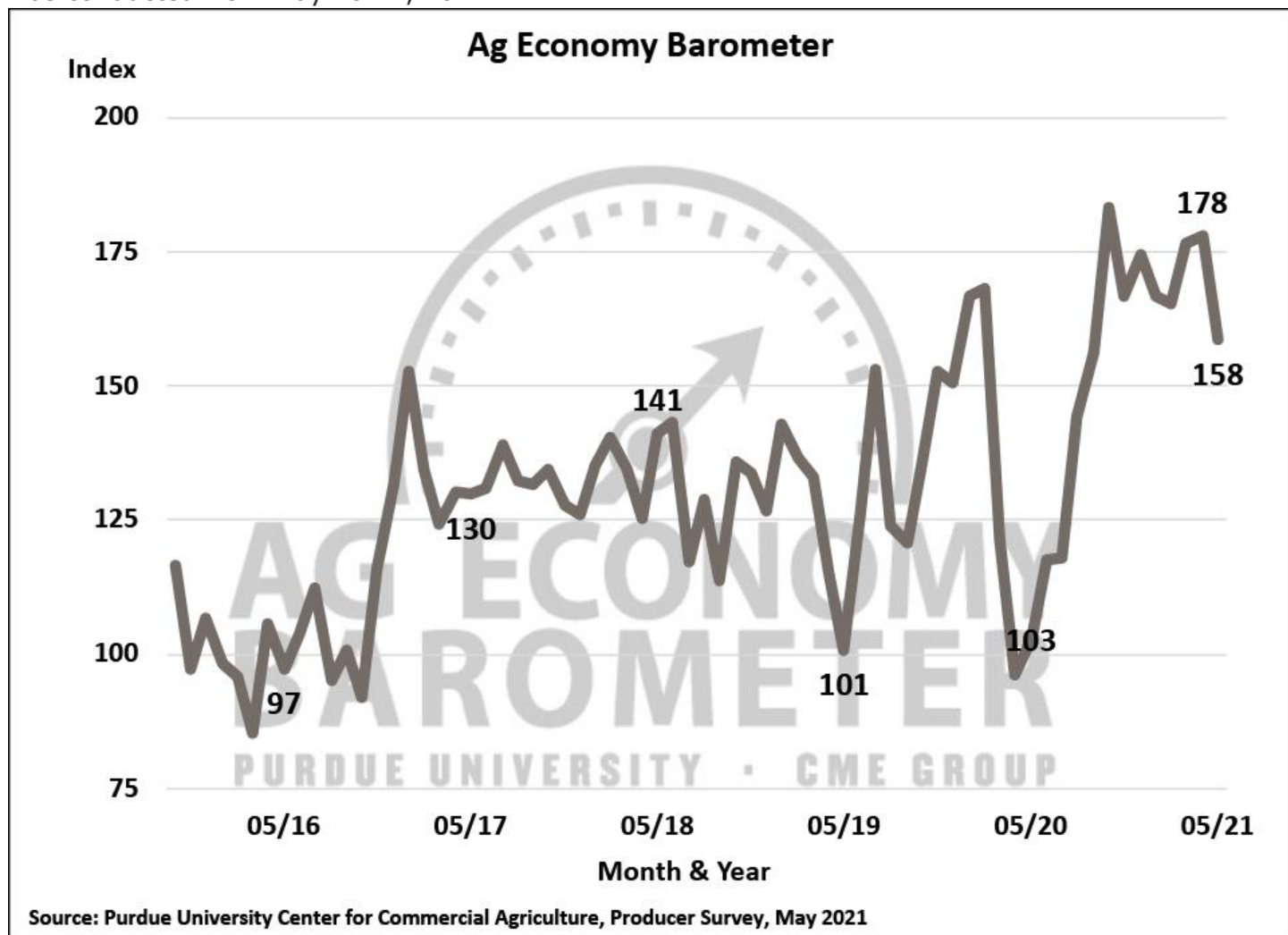
So, these numbers tell us one very important message: If you must spray at high temperature and low relative humidity conditions, here are some options you can choose to diminish the effect of high temperatures on spray drift. The first option is to choose nozzles that will reduce the number of droplets smaller than 100 microns. Check the nozzle manufacturers' websites to see which nozzles will provide droplets larger than 100 microns under the spray pressure conditions you will be doing your spraying. The second option is to reduce spray pressure and adjust the sprayer travel speed accordingly to make sure the gallons per acre application rate remains the same. Always remember, the higher the spray pressure, the higher the number of drift-prone droplets discharged from the same nozzle. The third option is to add so-called "drift retardant" adjuvants in the spray mixture to bump up the droplet size spectrum and reduce the number of drift-prone droplets. However, if you want to choose this last option, always check the pesticide label to make sure they allow adding drift retardant chemicals into the spray mixture. Some pesticides provide a list of specific drift reduction products or adjuvants that can be used. So, please check the pesticide label before adding drift retardant chemicals or other adjuvants to the spray mixture.

(Source: OSU Extension C.O.R.N. newsletter: <https://agcrops.osu.edu/newsletter/corn-newsletter/17-2021/high-temperatures-mean-higher-risk-spray-drift>)

**AG ECONOMY BAROMETER**...dropped sharply in the June 1 report. The *Ag Economy Barometer* declined 20 points in May to 158 which is the lowest barometer reading since September 2020 when the index stood at 156. The *Ag Economy Barometer* sentiment index is calculated each



month from 400 U.S. agricultural producers' responses to a telephone survey. This month's survey was conducted from May 10-14, 2021.

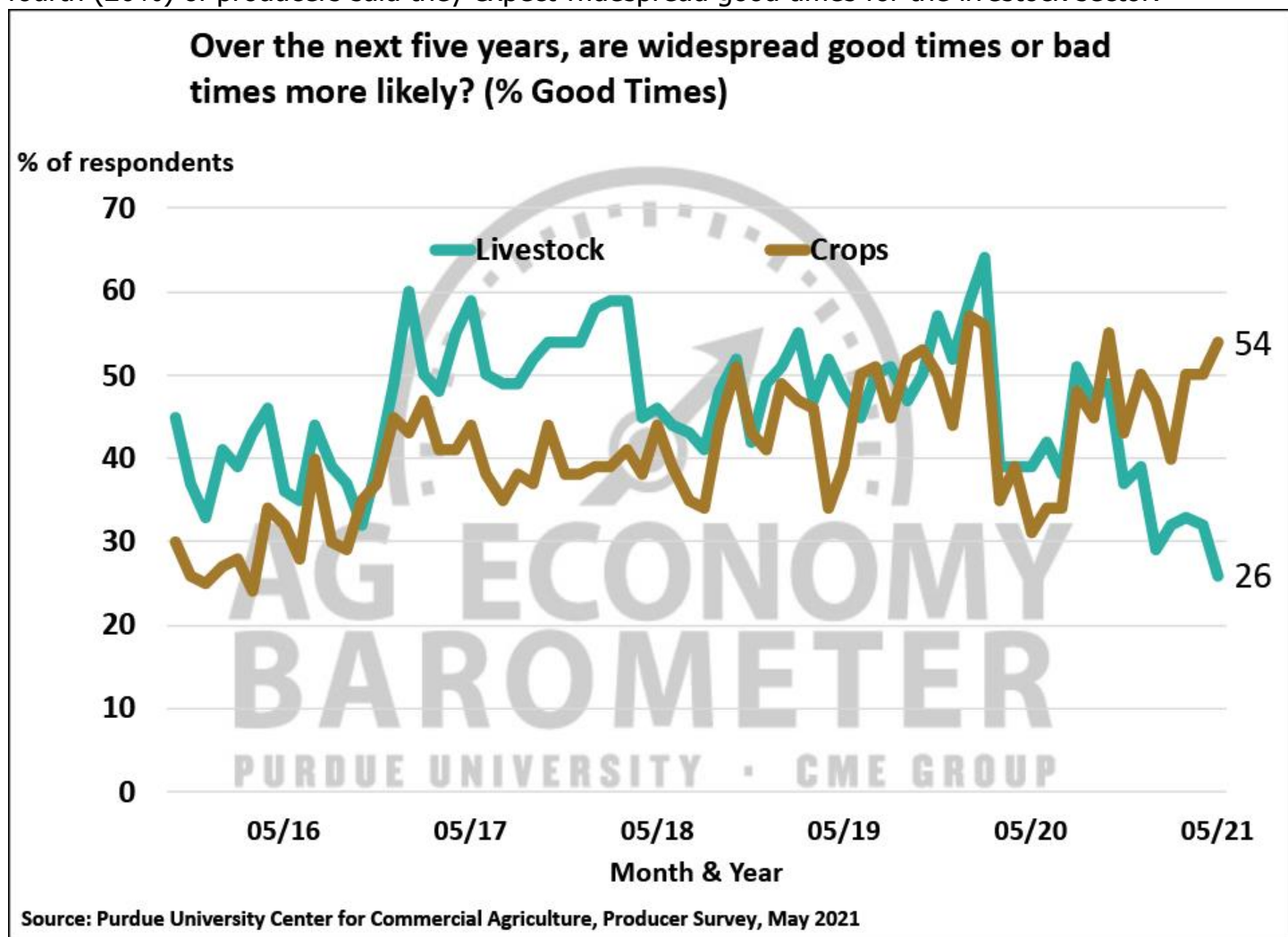


Producers expressed less optimism about their farms' financial performance in May than a month earlier as the *Farm Financial Performance Index* declined to 126 from a record high 138 in April. Although May's index was 12 points lower than a month earlier, it was still the second highest reading since the financial performance question was first posed in spring 2018.

On the May survey producers who grow corn or soybeans were asked about their expectations for cash rental rates in 2022. Two-thirds (65%) of the corn/soybean growers in our survey said they expect next year's cash rental rates in their home area to rise above 2021's. In a follow-up question, producers who said they expect rental rates to rise were asked by how much they expect them to rise. Over 40 percent (43%) of respondents said they expect 2022 cash rental rates to rise by 10 percent or more with nearly as many producers (39%) indicating they expect cash rental rates to rise from 5 to as much as 10 percent.



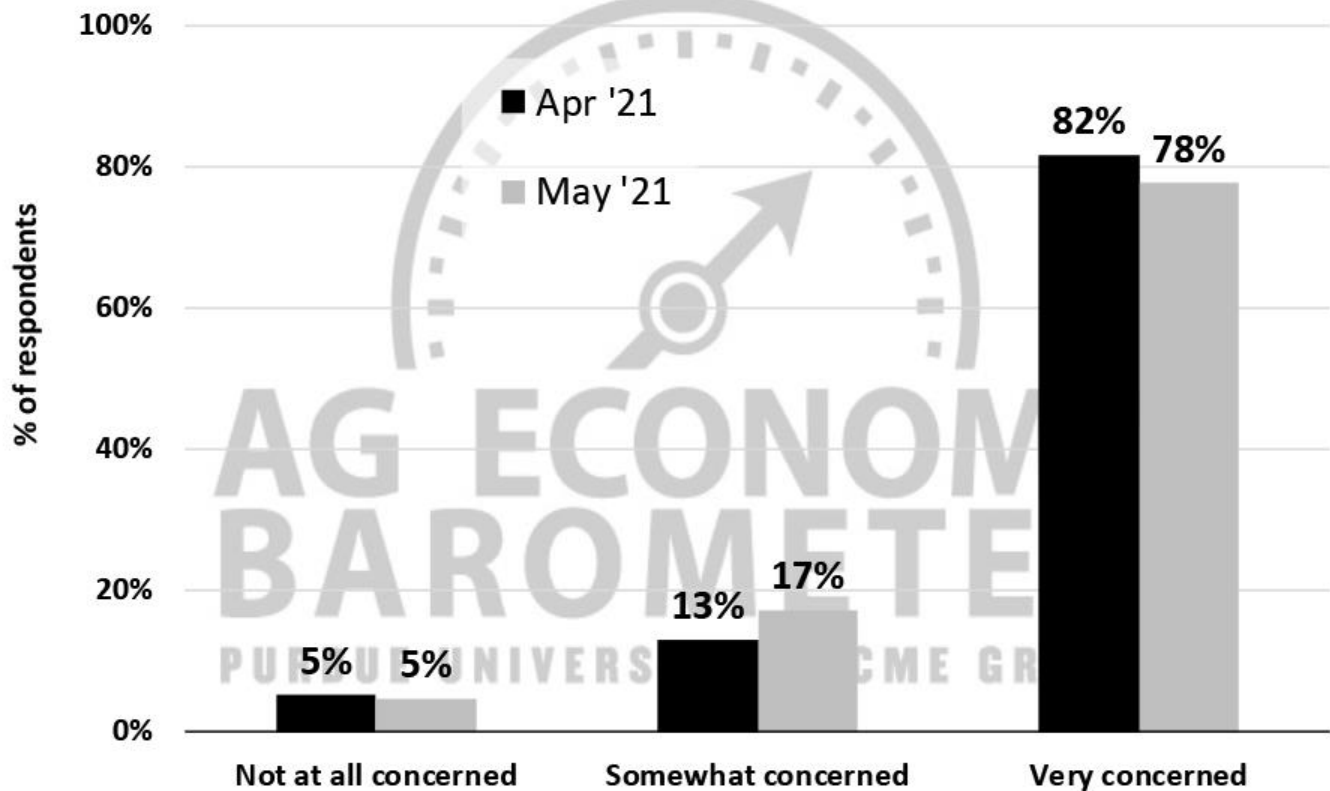
Producers' expectations for good vs. bad times in U.S. agriculture have undergone a marked shift. For example, in May just 27 percent of respondents said they expect good times in U.S. agriculture during the next five years, the lowest reading in the survey's history and down 12 points from a month earlier. A driver of this shift appears to be a large divergence in expectations for the crop vs. the livestock sectors in the upcoming five years. This month over half (54%) of respondents said they expect widespread good times for the crops sector in the next five years whereas just one-fourth (26%) of producers said they expect widespread good times for the livestock sector.



Producers remain very concerned about possible changes to U.S. tax policy. In a series of questions first posed last month, survey respondents confirmed that changes in tax policy being considered will make passing their farm on to the next generation more difficult (78% very concerned). Additionally, 83 percent of producers expect capital gains tax rates to rise over the next five years, 71 percent are very concerned about a possible loss of the step-up in cost basis for inherited estates and 66% say they are very concerned about a possible reduction in the estate tax exemption for inherited estates.



**How concerned are you that changes in estate tax policy currently being considered by Congress will make it more difficult to pass your farm on to the next generation of farmers in your family?**



Source: Purdue Center for Commercial Agriculture, Producer Survey, April-May 2021

The complete report is available here:

<https://ag.purdue.edu/commercialag/ageconomybarometer/wp-content/uploads/2021/05/May-2021-Ag-Economy-Barometer.pdf>

**BEEF QUALITY ASSURANCE (BQA) RECERTIFICATION**...for those needing to renew in 2021 will be held the following dates and times. Sessions will take place at the Sugarcreek Stockyards. Please RSVP to the Extension office at 330-339-2337.

- July 21 at 1pm
- July 29 at 7pm
- August 10 at 1pm
- August 25 at 7pm

**ENERGY RESOURCES**... are available from OSU Extension at this site: <https://energizeohio.osu.edu/>. Topic areas include fossil energy and sustainable energy.

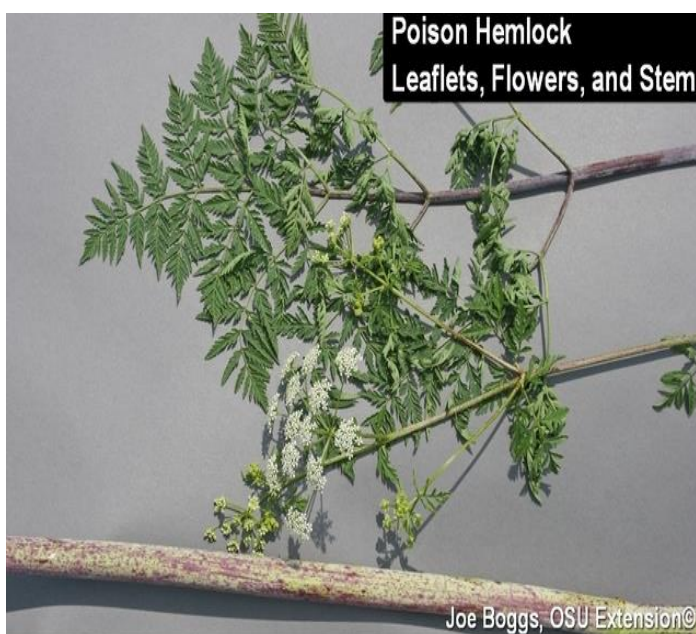


**PLANNING FOR THE TRANSITION OF YOUR FARM**...to the next generation is a time-consuming process. While many farmers dream of seeing their legacy passed on to the next generation, many postpone initiating a plan for the transition of their business for a variety of reasons. Many claim that there is not enough time to discuss these matters. Or if planning does occur, it simply involves the senior generation drafting a will describing how the farm assets should be divided among heirs.

The main question that the principal operator of a farm or agribusiness should ask is: "Do I want to pass my farm operation to my heirs as an ongoing business or do I want to pass it on as a group of assets?" If asset transfer is the goal, then an estate plan can be developed to determine who will get what, when they will get it and how they will receive it. If the goal is to keep the business intact for the next generation, then a transition plan needs to be developed.

This OSU Extension Fact Sheet (<https://ohioline.osu.edu/factsheet/anr-47>) is an excellent resource to help families think through the steps necessary for a successful transition plan.

**POISON HEMLOCK**...is very prevalent throughout the county. Poison hemlock contains highly toxic piperidine alkaloid compounds, including coniine and gamma-coniceine, which cause respiratory failure and death when ingested by mammals. The roots are more toxic than the leaves and stems; however, all parts of the plant including the seeds should be considered dangerous. It is a common misconception that poison hemlock sap will cause skin rashes and blisters. In fact, poison hemlock toxins must be ingested or enter through the eyes, cuts, or other openings to cause poisoning.



The OSU Extension Weed Control Guide provides several recommended products for control of Poison Hemlock. Please contact me for product suggestions.



**DECIDING WHETHER TO KEEP LATE & OPEN COWS**...is the focus of an article in this OSU Extension Beef newsletter: <https://u.osu.edu/beef/2021/06/09/open-and-late-calving-cows-the-conundrum/#more-11001>.

### **Open Cows**

In most cases involving open cows, they should be in the cull pen. Open cows are a profit drain, no matter if we can roll them over or not. At the simplest form; Profit = (revenue – expense). An open cow is not going to generate any revenue in the form of a weaned calf, while continuing to consume resources (feed) that could be better utilized or perhaps sold. Cull cow prices have been strong as of late and timely culling can generate significant revenue for the farm.

### **Late Calving Females**

What about the producer who has fall and spring herds? There are potential benefits to a fall calving season, that said economics must be considered and often do not favor holding over those females. However, a cookie cutter approach does not always work from one farm to another. There are several points that are often covered when evaluating females that are unfashionably late to the parturition party.

Why did she calve late? – Figuring out why we have late calving females is important but is not always as clear cut as we would like it to be. If we cannot determine the root cause of the problem then, we should consider the value of culling that female from the herd, to maintain a production schedule that maximizes the profit potential of a group of calves. Below are some of the “why” questions I have discussed with producers since last fall.

**Repeat Offender** – “Was she late to calve last year?” If she is chronically late to calve, culling is often the most economic option.

**The Bull** – The bull is probably not the one to blame here, unless there is a significant portion of the herd open/late calving or we know that the bull was injured or lame.

**Nutrition** – “Was fertility compromised by a lack of nutrition, particularly energy and minerals?” This question often leads to a nutrition discussion.

**Lost Pregnancy** – “Was she a victim of statistics and simply lost an early term pregnancy and came back into heat?” Quite possible, we know that a varying percentage of females that are checked bred in early gestation, lose an embryo or fetus.

Once we determine the “Why”, all the following should be considered and acceptable before we consider rolling any cow over into the fall calving herd: Body Condition, Udder, Feet/Legs, Temperament.

**Cow Age** – If we consider the cost of developing a heifer from calving to her first calf it can be a more difficult decision on what to do with a late calving younger female, especially in a smaller herd. Was she one of those two-year-olds that struggled to get rebred on an annual basis, often at little



fault of their own? One may be more inclined to hang onto these females to recoup some of the cost in developing them, just be aware that there is a cost of holding that female over. In a time of high feed cost and strength in the cull market, 2021 might not be the year to retain cows regardless the reason they were late to calve.

**QUESTIONS ABOUT OHIO'S LINE FENCE LAW**...are very common. This OSU Extension Ag Law Bulletin provides answers to some of the more common questions:  
<https://farmoffice.osu.edu/sites/aglaw/files/site-library/Line%20Fence%20Law%20FAQs%20.pdf>

**MYTHS ABOUT TICKS**...are discussed by Tim McDermott, DVM and Extension Educator, in this OSU Extension Beef newsletter: <https://u.osu.edu/beef/2021/06/09/learn-the-myths-about-ticks-to-keep-yourself-tick-safe/#more-10932>.

Veterinarians have a long history of dealing with the various pests that affect both companion animals and livestock. Mosquitos, flies, fleas, lice, mites, and ticks have caused severe illness as well as major economic loss for over one hundred years of animal care history. Over that time we have heard of some odd treatment protocols, homemade recipes, and unusual methods that are based more on myth than reality. The reality is that ticks and tick-borne diseases are expanding rapidly in Ohio and we do not have matching public health outreach to educate on the risks that these new ticks bring with them as well as to dispel the myths that are out there regarding prevention of tick-vectored disease. Here are some common myths regarding ticks and tick-vectored disease.

**Myth #1** – “Ticks are only present in the woods.” This is a very common myth that I hear frequently. While it is true that some species of ticks such as Blacklegged tick or Lone Star tick prefer a wooded habitat, some tick species such as the American Dog tick and Gulf Coast tick can tolerate a more open habitat such as a pasture, meadow, or backyard lawn. I recently read an article where they had discovered that there were ticks in the grasses that are right up next to the beach! Make sure you realize you can encounter a tick in about any habitat.

**Myth #2** – “Ticks need to be attached for a whole day to transmit disease.” This is a recommendation based on CDC research regarding Lyme disease from Blacklegged (Deer) ticks. We are now seeing some new research regarding different transmission times depending on what the pathogen is, (bacteria, virus) what life stage the tick is, (larval, nymphal, adult) as well as what disease we are concerned about. For example it is suspected that Rocky Mountain Spotted Fever has a different transmission after attachment timeframe that Lyme disease would have.

**Myth #3** – “Ticks are only active in the summer.” Many ticks have multi-year life cycles to complete their growth. While the warmer weather of late spring through summer has an increased amount of tick activity, ticks can be active all 12 months of the year. How many times have we seen a period of



warm weather in the winter or fall? Ohio weather is anything but predictable! Make sure you realize that you could potentially encounter a tick at any time of the year.

To keep yourself, your family and your animals tick safe this year make sure to develop a personal and family protection plan that includes protective clothing, tick checks, pet protection, proper removal methods as well as knowledge of where, when, and how you can encounter ticks and tick-vectored disease.

**REVISED OSU EXTENSION BUDGETS**...are available at this site: <https://farmoffice.osu.edu/farm-management/farm-budgets>

**VALUE OF BALER PRESERVATIVE APPLICATORS**...is discussed in this OSU Extension Beef newsletter: <https://u.osu.edu/beef/2021/06/09/value-of-baler-preservative-applicator/>.

A basic 25-gallon baler liquid applicator can be purchased for around \$500. It is not complicated; it is a small electric sprayer that you mount on the baler. The next thing you would probably want is a baler-mounted moisture tester so you can see the moisture of the hay as you bale. They can be purchased for \$350-\$500. So, for less than \$1,000 you can outfit your baler with the ability to apply a hay preservative when conditions are not perfect for baling but be able to get the hay off the field before the rain destroys the quality.

### **How Much Will it Cost to Apply Preservative?**

You can buy various types of preservatives in multiple unit sizes. One product for example, if you buy a 50-gallon drum (450 pounds) it costs about \$450 or \$1.00 per pound. If you buy a 275-gallon tote (2,380 pounds) it costs about \$2,000 or \$0.84 per pound.

Hay Stem Moisture	Small Square and Round Baler Application Rate	Application Cost Per Ton based on (\$1.00/pound)
22% and under	4 pounds/ton	\$4.00
23% - 26%	8 pounds/ton	\$8.00
27% - 30%	16 pound/ton	\$16.00
Above 30%	DO NOT BALE	



Hay Stem Moisture	Large Square Baler Application Rate	Application Cost Per Ton based on (\$1.39/pound)
22% and under	6 pounds/ton	\$6.00
23% - 26%	10 pounds/ton	\$10.00
27% - 30%	DO NOT BALE	
Above 30%	DO NOT BALE	

## How Much Preservative to Apply?

It is like calibrating a sprayer, but instead of gallons per acre you need to calculate pounds per ton. First, you need to figure out how many tons per hour of hay you bale. Count the number of small square bales you make in three minutes. Let's say it is 15 bales. Then weigh several of those bales to get an average weight. Let's say they are 40 pounds. If you bale 15 bales in 3 minutes then in an hour of continuous baling you will bale 300 bales with an average weight of 40 pounds.  $40 \times 300 = 12,000$  pounds per hour or 6 tons/hour. If you are trying to apply 4 pounds of preservative per ton you will need  $(6 \times 4)$  24 pounds per hour. If the preservative weighs 9 pounds per gallon that is 2.7 gallons per hour ( $24/9=2.7$ ) or 0.045 gallons per minute ( $2.7/60=0.045$ ). Remember to take into account the specific gravity since the preservative is slightly heavier than water. In my example, the specific gravity factor is 1.06 ( $0.045 \times 1.06=0.048$  gallons per minute).

Calculating Preservative Tips for Small Square Baler	Example	Your Numbers
<b>Number of small bales in 3 minutes</b>	15	
<b>Average Bale Weight</b>	40	
<b>Tons per Hour</b> (Bales in 3 minutes $\times$ 20 $\times$ Bale Weight/2000) ( $15 \times 20 \times 40 / 2000 = 6$ )	6	
<b>Desired Preservative Rate (#/ton)</b>	4	
<b>Pounds of Preservative per hour</b> (Preservative Rate $\times$ Tons per Hour) ( $4 \times 6 = 24$ )	24	
<b>Gallons of Preservative per Hour</b> (Pounds of Preservative per Hour/ weight of 1 gallon of Preservative) ( $24 / 9 = 2.67$ )	2.7	
<b>Flow Rate of Preservative in Gallons per Minute</b> (Gallons of Preservative per Hour/60) ( $2.7/60 = 0.045$ )	0.045	
<b>Adjust for Specific Gravity</b> (Gallons per minute $\times$ specific gravity factor) ( $0.045 \times 1.06 = 0.048$ )	0.048	
<b>Flow Rate Needed Using One Spray Tip</b>	0.048	



## TUSCARAWAS COUNTY AGRICULTURE &amp; NATURAL RESOURCES

June 16, 2021

Dear Farm Manager,

It is hard to believe that we are half-way through the month of June! I hope you find this newsletter to be of value. Please contact me at 330-827-0249 or [zoller.1@osu.edu](mailto:zoller.1@osu.edu) with your questions.

**MILKWEED & HEMP DOGBANE**...are very prevalent in fields throughout the county. These two plants are related but have some distinct differences that can help identify them and implement control measures when needed.

Common Milkweed



Hemp Dogbane



Similarities between the two include having creeping roots; leaves that appear on opposite sides of the stem; and they produce a milky sap. Differences include that young milkweed leaves have fine hairs and hemp dogbane are nearly hairless; milkweed stems are generally thick and green, but hemp dogbane stems are usually red to purple and thinner in comparison; hemp dogbane frequently branches in the top canopy, while milkweed will typically not branch unless mowed; and seed pod shape is



distinctly different after flowering with milkweed producing an upright tear drop shaped pod and hemp dogbane producing a long bean-like pod that hangs from the plant.

Both milkweed and hemp dogbane are considered poisonous to livestock. Toxicities can occur from fresh or dried leaves, stems, and roots. While death from poisoning is rare, reduced production efficiency is common if consumed. Symptoms range from mild to severe and include vomiting, diarrhea, coordination loss, tremors, heart problems, respiratory distress, and death.

Please contact me to discuss control options. Additional information is available in this OSU Extension Beef newsletter: <https://u.osu.edu/beef/2021/06/16/milkweed-and-hemp-dogbane-whos-who/#more-11044>

**ROUGHSTALK BLUEGRASS**...is appearing in wheat and forage fields across Ohio. This weed has reached population levels high enough to inhibit the harvest of cereal grains, reduce the quality of forages, and crowd out newly established forages.

Roughstalk Bluegrass is very similar to turf bluegrass species. However, Roughstalk Bluegrass leaves are folded in the bud and have a membranous ligule that can be absent or be very long. "Rough" stalk Bluegrass gets its name from small hairs on the leaf surface and margin. This bluegrass, like turf-type bluegrasses, has a broad collar and a boat-shaped leaf tip. Roughstalk Bluegrass has yellow-green leaves that are shiny. The leaves can turn red during drought and heat stress. The plant goes to seed from mid-May to June, with an open panicle, like Kentucky Bluegrass.

Controlling this weed species takes diligence and scouting early in the season. Early April is a good time to start scouting for Roughstalk Bluegrass seedlings. Preventing this weed species from going to seed is very important. Use of grass herbicides as part of your overall weed management program can be successful, including best management practices such as proper seeding rates, planting dates, and fertility programs will also help to keep this weed from getting established in your fields.

More information can be found in this OSU Extension C.O.R.N. newsletter: <https://agcrops.osu.edu/newsletter/corn-newsletter/18-2021/roughstalk-bluegrass-cereal-grain-and-forage-crops>



**EMPLOYING YOUTH?**...if so, following is a quick refresher about particular items of importance. For additional details and explanation, refer to our law bulletin on "[Youth Labor on the Farm: Laws Farmers Need to Know.](#)"

1. **The agricultural "exemption" applies only to your children and grandchildren.** Many farmers know that there are unique exemptions for agricultural employers when it comes to employment law. Youth employment is no different. In Ohio, youth employment laws do not apply to children working on a farm owned or operated by their parent, grandparent, or legal guardian. This means that your children, grandchildren, and legal guardianship children working on farms you own or operate may perform tasks that are considered "hazardous," receive a wage less than federal and state minimum wage and work longer hours. Keep in mind that this exemption does not apply to youth who are your cousins, nieces, nephews, and other extended family members—those family members are subject to youth employment laws.
2. **Lawn mowing and similar tasks are special.** [Ohio Revised Code § 4109.06\(9\)](#) explicitly states that youth engaged in "lawn mowing, snow shoveling, and other related employment" are not subject to Ohio's youth employment laws. This means that farms may hire youth to mow the grass and do similar tasks around the farm without having to comply with labor laws regarding working hours and wage requirements.
3. **Treat youth like adults for verification, workers compensation and taxes.** The law doesn't deal with youth uniquely when it comes to Form I-9 employment verification, workers compensation coverage, and withholding taxes. A farm employer must complete these same requirements for youth employees.
4. **Don't start them too young.** Minimum working age is a tricky area of law. Federal law allows youth under the age of 14 to be employed as long as certain requirements are met, such as having written parental consent and limiting work hours and tasks. States may preempt federal law by being more restrictive. Ohio law, however, doesn't address youth under 14 and doesn't explicitly permit or prohibit them from being employed. Be aware that the Ohio Department of Commerce has stated that it interprets this silence in Ohio law as a prohibition against employing youth under 14. This creates a compliance risk for employers who want to employ a youth under 14, as Ohio may deem that a violation of state law. Before hiring youth under 14 for jobs other than the specifically



exempted tasks of lawn mowing, snow shoveling or similar work, consult with your attorney.

5. **Keep younger youth away from “hazardous” jobs.** State and federal laws are clear on this point: youth under the age of 16 cannot perform “hazardous” tasks. This restriction includes operating heavy machinery with moving parts, working inside silos and manure pits, handling toxic chemicals, working with breeding livestock, sows and newborn calves, and other dangerous tasks. An exception is that 14- and 15-year-olds may operate tractors and other machinery if they have a valid 4-H or vocational agricultural certificate of completion for safe tractor and machine operation. See the complete list of prohibited hazardous tasks in our law bulletin on “Youth Labor on the Farm: Laws Farmers Need to Know.”
6. **Don’t make them work too early or too late.** During the summer months, youth between 16 and 18 years of age may work as early or as late as needed. Youth under the age of 16, however, may not start work before 7 am or work past 9 pm.
7. **Give the kids a break.** If youth are working longer hours, you must give them a break from working. All youth under the age of 18 must receive a 30-minute break for every 5 hours worked.
8. **Know how much to pay.** If a farm grossed less than \$323,000 in 2020, the employer must pay employees the federal minimum wage of \$7.25 per hour. If the farm grossed more than \$323,000 then the employer must pay employees the Ohio minimum wage of \$8.00. Two exemptions allow a farmer to pay less than both the federal and state minimum wage to youth. If the farm is owned or operated by a youth’s parent, grandparent, or legal guardian the minimum wage requirements do not apply. Second, if the farm is a “small farm,” which means that the farm did not use more than 500 man-days of agricultural labor during any calendar quarter of the preceding year, then the farm is not required to pay the federal or state minimum wage to any youth employed on the farm.
9. **Sign a wage agreement.** This requirement catches many employers off guard. Ohio law requires that before any youth can begin work, the youth and the employer must sign a wage agreement. Be sure to keep this signed agreement with the youth’s employment records. A sample wage agreement from the Ohio Department of Commerce is available [here](#).
10. **Do your recordkeeping.** Just as you would with other employees, maintain a file on each of your youth employees. The file should include the



youth's full name, permanent address, and date of birth, the youth's wage agreement, and any 4-H or vocational agricultural certificates. Also keep time slips, payroll records, parental consent forms, and name and contact information of youth's parent or legal guardian.

Summer is a hot time to employ our youth and school them about farming and farm-related businesses. But don't let legal compliance ruin your summer fun. If you have youth working on the farm and have concerns about any of the items in this quick overview, be sure to talk with your attorney. Doing so will ensure that the summer job is a good experience for both you and your young employees.

(Source: OSU Extension Farm Office <https://farmoffice.osu.edu/blog>)

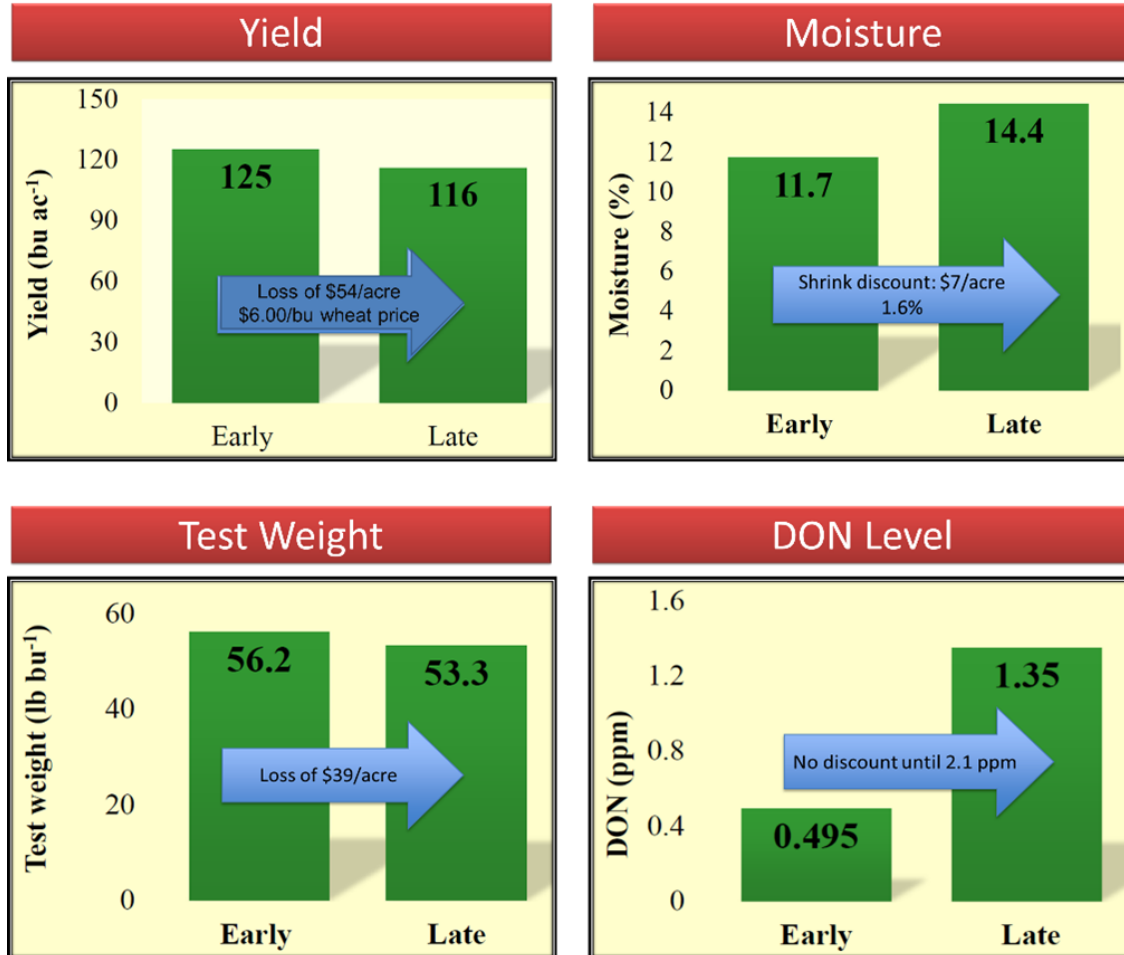
**DELAYING WHEAT HARVEST**...puts the crop at risk for increased disease, lodging, sprouting, harvest loss, and grain contamination with mycotoxins. Even though head scab seems to be relatively low across the state this year, delaying wheat harvest could cause increased levels of vomitoxin contamination of grain, particularly if it rains for several days leading up to harvest.

In 2018, we evaluated wheat harvested on June 29 (at 12% moisture content) and July 8 (at 14% moisture content). Grain moisture increased between June 29 and July 8 due to 0.58-inch rain between the two dates. When the wheat harvest was delayed until July 8, yield decreased by 9 bu/acre, test weight decreased by 2.9 lb/bu, and DON level increased by 0.86 ppm (see figure).

These reductions in yield and test weight and increase in DON are likely attributed to the re-wetting of dry grain, showing the importance of the timely



wheat harvest.



### *Wheat Harvest*

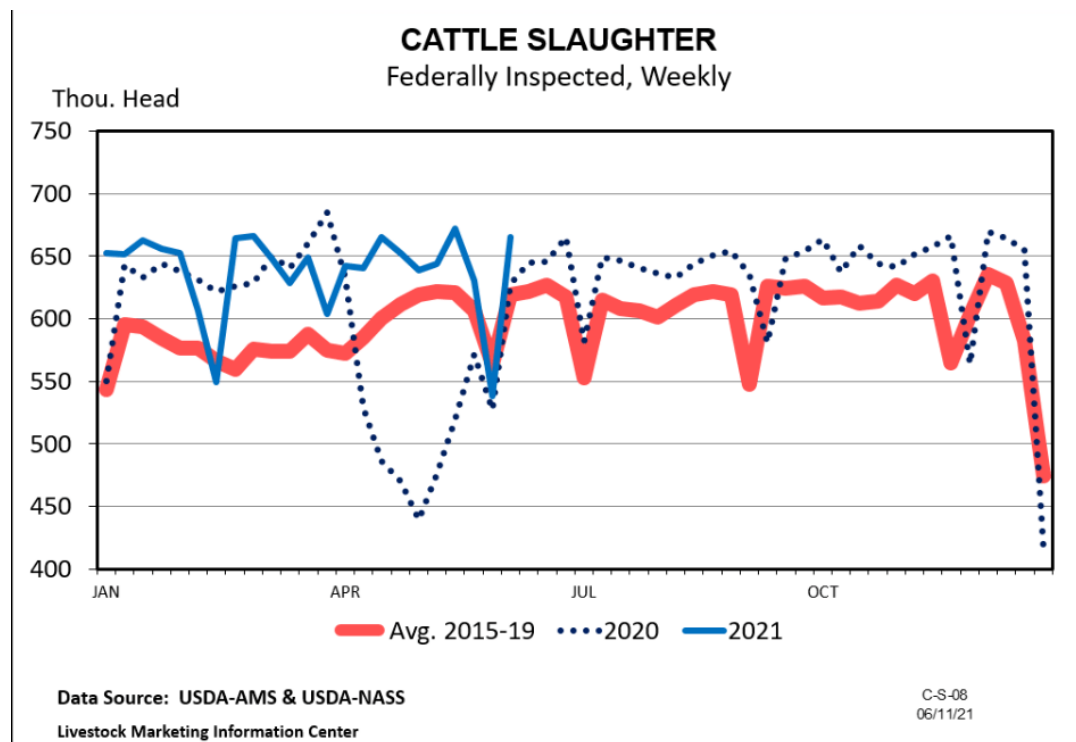
(Source: OSU Extension C.O.R.N. newsletter:

<https://agcrops.osu.edu/newsletter/corn-newsletter/18-2021/don%E2%80%99t-delay-wheat-harvest>)

**CURRENT FEEDER CATTLE MARKET**...may provide a pricing opportunity.

Market reactions to shocks are always interesting to watch. The price response in the cattle markets to the JBS cyber-attack was relatively limited as the market seemed to view this as a short term impact. Conversely, the market response to COVID was much greater, as the impacts were expected to last longer and there was a lot more uncertainty about what would happen. In both cases, the impacts on feeder cattle markets were smaller due to the time lag that exists between the sale of feeder cattle and their eventual movement into the beef system.





As an illustration, feeder cattle markets have been much more impacted by rising corn prices than they were the JBS cyber-attack. There was little reason to believe that the attack would influence the market several months into the future, but new crop 2021 corn prices are up roughly \$1 per bushel from spring. That is a factor that is expected to impact markets for some time and will impact the values of feeder cattle moving through markets this summer.

I think this is an important distinction to make with respect to feeder cattle and fed cattle markets. Both will be impacted by shocks, but fed cattle are much more vulnerable to short-term shocks. For something to impact feeder cattle values, the market really has to perceive that the impacts will be longer-lasting. It is also important to understand that markets are constantly changing and making adjustments to these shocks. Uncertainty and volatility just seem to be the norm in cattle markets right now.

There is a natural tendency to be afraid of pricing cattle too early and leaving money on the table, which often prevents producers from moving on a market like we currently have. Is it possible that the market will return to the levels we saw in early April? Absolutely. But, we have no way to know if that will happen. Risk management is not about cherry-picking highs in the market. It's about managing downside price



risk over time. And, I think it's a good time to review where the market is and see if this is an opportunity worth taking advantage of.

(Source: Dr. Kenny Burdine, Univ. of Kentucky Extension,  
<https://u.osu.edu/beef/2021/06/16/is-the-current-feeder-cattle-market-a-pricing-opportunity/#more-11065>)

**COOLER WEATHER RETURNS**...and looks to be with us for the next several days. After a couple of cold fronts on Sunday and Monday, another weak cold front will drop south across the state on Tuesday. A widely scattered shower cannot be ruled out. Behind this front, even cooler air will settle in, with overnight lows Wednesday and Thursday expected to reach the mid-40s to low-50s and daytime highs mainly in the 70s with low humidity. Temperatures will warm a bit into the weekend, as the southerly flow will bring a return to more humid conditions and an increased chance of showers and storms. Overall, we are expecting light rain totals this week across the south, with 1-2" across northern Ohio.

The latest NOAA/NWS/Climate Prediction Center outlook for the 6-10-day period (June 20 – 24) shows elevated probabilities of below-average temperatures and above-average precipitation. Normal highs during the period should be 80-85°F, normal lows 60-65°F, with 1.00-1.15 inches of rain per week. The 16-Day Rainfall Outlook from NOAA/NWS/Ohio River Forecast Center also supports above-average precipitation over the next couple of weeks.

(Source: OSU Extension C.O.R.N. newsletter: <https://agcrops.osu.edu/newsletter/corn-newsletter/18-2021/cooler-weather-returns>)

**FORAGE FIELD DAYS**...sponsored by the Ohio Forage and Grassland Council & OSU Extension are schedule in June, July, and August at various farms across Ohio. Details about each farm, scheduled topics, and registration information is available in this OSU Extension Beef newsletter: <https://u.osu.edu/beef/2021/06/16/registration-is-open-for-the-ofgc-2021-summer-forage-field-days/#more-11028>

**BEEF QUALITY ASSURANCE**...recert for those needing to renew in 2021 will be held at Sugarcreek Stockyards. Call 330-339-2337 to register for one of the following:

- July 21 at 1pm
- July 29 at 7pm
- August 10 at 1pm
- August 25 at 7pm



## TUSCARAWAS COUNTY AGRICULTURE &amp; NATURAL RESOURCES

June 23, 2021

Dear Farm Manager,

**WHEAT HARVEST**...is rapidly approaching and many acres of double-crop soybeans will be planted. Cultural practices, such as row spacing, seeding rate, and relative maturity, may be adjusted to help maximize soybean yield in the double-crop system.

**Row spacing.** Double crop soybean should be produced in narrow rows at 7.5- or 15-inch row spacing. The later in the growing season soybeans are planted, the greater the yield increase due to narrow rows.

**Seeding rate.** The harvest population for mid-to-late-June planting should be between 130,000 to 150,000 plants/acre. The harvest population for early-July planting should be greater than 180,000 plants/acre. Harvest plant population is a function of seeding rate, quality of the planter operation, and seed germination percentage and depends on soil moisture conditions, seed-soil contact, and disease pressure. Generally, seeding rates between 200,000 to 250,000 seeds/acre result in these targeted harvest plant populations.

**Relative maturity.** Relative maturity (RM) has little effect on yield when soybeans are planted during the first three weeks of May. However, the effect of RM can be greater for late planting. When planting soybeans late, the latest maturing variety that will reach physiological maturity before the first killing frost is recommended.

	Planting Date	Suitable RM
Northern Ohio	June 1-15	3.2-3.8
	June 15-30	3.1-3.5
	July 1-10	3.0-3.3
Central Ohio	June 1-15	3.4-4.0
	June 15-30	3.3-3.7
	July 1-10	3.2-3.5
Southern Ohio	June 1-15	3.6-4.2
	June 15-30	3.5-3.9
	July 1-10	3.4-3.

Additional information is available here: <https://agcrops.osu.edu/newsletter/corn-newsletter/19-2021/double-crop-soybean-recommendations-2021>



**CORN LIVE**...will air June 24 at 8am. This week the program will feature a crop report, weed management in soybeans, and wheat harvest update.



**USDA's Ag Marketing Service**...issued an administrative complaint on May 4, 2021, against Barnesville Livestock LLC ("Barnesville") and an Ohio resident for allegedly violating the [Packers and Stockyards Act](#) ("P&S Act"). An investigation conducted by the AMS revealed that the Ohio auction company failed to properly maintain its custodial account resulting in shortages of \$49,059 on July 31, 2019, \$123,571 on November 29, 2019, and \$54,519 on December 31, 2019. Companies like Barnesville are required to keep a custodial account under the P&S Act. A custodial account is a trust account that is designed to keep shippers' proceeds from the sale of livestock in a secure and centralized location until those proceeds can be distributed to the seller. According to the AMS, Barnesville failed to deposit funds equal to the proceeds received from livestock sales into the custodial account. Additionally, Barnesville reported a \$15,711 insolvency in its Annual Report submission to AMS. Operating with custodial account shortages and while insolvent are both violations of the P&S Act. The AMS alleges that Barnesville's violations place livestock sellers at risk of not being paid fully or completely. If Barnesville is proven to have violated the P&S Act in an oral hearing, it may be ordered to cease and desist from violating the P&S Act and assessed a civil penalty of up to \$28,061 per violation.

(Source: Jeff Lewis, Attorney and Research Specialist, OSU Extension Ag & Resource Law Program)

**DAIRY HERDS**...in Ohio produced 491 million pounds of milk during May, up 3.2 percent from a year ago, according to Cheryl Turner, State Statistician of the USDA, NASS, Ohio Field Office. Production per cow in Ohio averaged 1,890 pounds for May, 10 pounds above May 2020. The dairy herd was estimated at 260,000 head for May, up 7,000 head from a year earlier.

(Source: Ohio NASS)

**OHIO FARM CUSTOM RATES**...are published by OSU Extension and are available here:

<https://farmoffice.osu.edu/sites/aglaw/files/site-library/farmBusiness/Ohio%20Farm%20Custom%20Rates%20Draft%202020%20Final%20Revised.pdf>



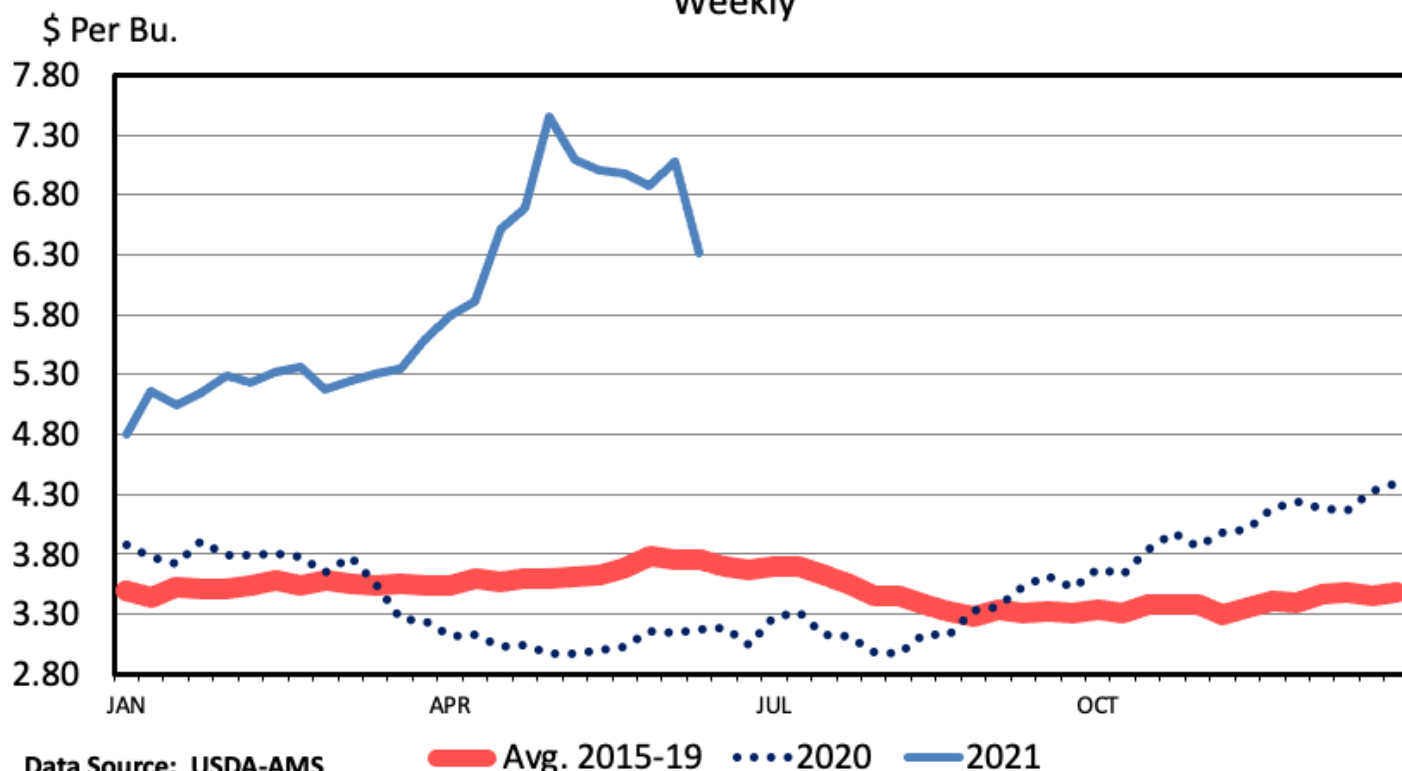
**HIGH CORN PRICES**...often cause beef producers to consider lower priced alternative feeds. Dr. Jeff Lehmkuhler, Extension Professor, University of Kentucky, discusses whole vs. cracked corn in this OSU Extension Beef newsletter: <https://u.osu.edu/beef/2021/06/23/to-crack-or-not-to-crack-a-common-question/#more-10971>

**USDA ACREAGE REPORT**...will be released next week. Any surprises can have a result on futures prices. If acreage is lower than expected, that could suggest a smaller corn crop and higher prices. If acreage is higher than expected, that could suggest a larger corn crop and lower corn prices. Weather information can have a similar impact such as timely rains in the Midwest.

Corn prices have been a little lower over the last few weeks. A lot can happen during a growing season and new information in corn markets will impact expectations for cattle prices. Acreage estimates and crop progress will be key to watch as the summer progresses.

## OMAHA CORN PRICES

Weekly



Data Source: USDA-AMS

Livestock Marketing Information Center

(Source: OSU Extension Beef newsletter: <https://u.osu.edu/beef/2021/06/23/upcoming-acreage-report/#more-11092>)



**CHARACTERISTICS OF HIGHER PROFIT GRAIN FARMS**...is discussed by the University of Illinois Farmdoc (<https://farmdocdaily.illinois.edu/2021/06/characteristics-of-higher-profit-farms-2011-through-2020.html>). Data from the Illinois Farm Business Farm Management Association (FBFM) for 2011 through 2020 was used to analyze selected differences between the highest profit grain farms (high one-third) and the lower profit grain farms (low one-third). The analysis was done for 2020 and for the 2011 through 2020 ten-year average. Farms in the higher profit group were larger, had higher corn yields, crop shared a larger percent of their acres, and had higher gross returns and lower costs. Management returns, a profit measurement, was significantly greater for the higher profit farms.

**Table 1. Differences Between the High and Low Third - 2020**

	<u>Northern</u>	<u>Central-High</u>	<u>Central-Low</u>	<u>Southern</u>
Corn Yield (bu)	5	5	7	2
Soybean Yield (bu)	0	2	2	3
Tillable Acres	355	350	221	764
% Owned	-10	-4	-7	-5
% Crop Share	11	16	11	6
% Cash Rent	-1	-12	-1	-1
Gross Farm Returns	\$ 136	\$ 122	\$ 114	\$ 74
Crop Costs	\$ (35)	\$ (27)	\$ (36)	\$ (40)
Power & Equipment Costs	\$ (49)	\$ (40)	\$ (37)	\$ (50)
Total Economic Costs	\$ (138)	\$ (128)	\$ (127)	\$ (165)
Management Returns	\$ 263	\$ 253	\$ 242	\$ 248
% Acres Corn	1.1	-1.5	-0.2	0.8
% Acres Soybeans	-0.8	0.9	0.9	3.7

Source: Illinois FBFM Association farmdocDAILY

**Table 2. Differences Between the High and Low Third - 2011 - 2020 Average**

	<u>Northern</u>	<u>Central-High</u>	<u>Central-Low</u>	<u>Southern</u>
Corn Yield (bu)	9	12	14	16
Soybean Yield (bu)	4	4	4	6
Tillable Acres	329	326	274	506
% Owned	-10	-8	-6	-6
% Crop Share	9	14	7	2
% Cash Rent	1	-6	0	4
Gross Farm Returns	\$ 118	\$ 106	\$ 104	\$ 132
Crop Costs	\$ (41)	\$ (34)	\$ (34)	\$ (32)
Power & Equipment Costs	\$ (43)	\$ (36)	\$ (34)	\$ (35)
Total Economic Costs	\$ (140)	\$ (144)	\$ (132)	\$ (103)
Management Returns	\$ 256	\$ 246	\$ 233	\$ 235
% Acres Corn	-2.7	-3.2	-2.5	0.6
% Acres Soybeans	2.2	2.8	2.2	0.4

Source: Illinois FBFM Association farmdocDAILY

Many factors contribute to some farms being more profitable than other farms. A few of these factors, such as weather, farm operators cannot control. However, many factors, such as crop and machinery costs, operators can control. As in past studies of this type, not one single factor is the main contributor to the difference in profitability, but many factors put together.



**BEEF QUALITY ASSURANCE (BQA) RECERTIFICATION**...for those needing to renew in 2021 will be held the following dates and times. Sessions will take place at the Sugarcreek Stockyards. Please RSVP to the Extension office at 330-339-2337.

- July 21 at 1pm
- July 29 at 7pm
- August 10 at 1pm
- August 25 at 7pm

**TRAPS**...have been placed in three fields in the county to monitor Western Bean Cutworm (WBC) activity weekly. The green buckets, containing a pheromone and insecticide, are placed at the field edge (see photo below). Thank you to Spillman Farms, Carlene Farms, and Everett Farms for cooperating in this OSU Extension on-farm research.



## TUSCARAWAS COUNTY AGRICULTURE &amp; NATURAL RESOURCES

July 1, 2021

Dear Farm Manager,

Weather has been favorable for hay making, but the recent heat and humidity has been difficult on people and livestock. Fortunately, we are receiving much-needed rain today.

**WESTERN BEAN CUTWORM**...traps have been placed in Tuscarawas and several counties across Ohio. Western bean cutworm is a pest of corn in Ohio and has increasingly caused concern for growers since reports of resistance to Cry1F hybrids. Monitoring for WBC is an important tool to track populations and make management decisions for our growers. Monitoring for WBC adults requires green bucket traps set with a pheromone and checked weekly. When trap counts result in an average of more than 1 moth/day (or a county average of 7 or more moths), we recommend scouting for WBC egg masses. While the pheromone is specific to WBC, occasionally other moth species can be found in the trap, such as yellow striped armyworms. It is important to look for identifying features on WBC moths, which include boomerang and dot markings on the wings.



Additional information is available in this OSU Extension C.O.R.N. newsletter:

<https://agcrops.osu.edu/newsletter/corn-newsletter/20-2021/western-bean-cutworm-monitoring-underway-ohio>

**TAILGATE SAFETY TRAINING**...resources have been developed by OSU Extension and are available here: <https://agsafety.osu.edu/resources/tailgate-safety-training-employees>. Conducting regular



safety meetings is a key component of any organized workplace safety program. One very effective method is to conduct tailgate safety training on a regular basis. Short, frequent, safety training sessions keep safety in the forefront of employee's daily routine. Employees remain interested, losses of production are minimized, and minimum preparation by the employer is needed.

Tailgate Safety sessions are generally held daily or weekly depending on the workplace, and sessions should last no longer than 20 minutes. Even if you do not have employees, I encourage you to review the list of training resources.

**BEEF QUALITY ASSURANCE (BQA) RECERTIFICATION**...for those needing to renew in 2021 will be held the following dates and times. Sessions will take place at the Sugarcreek Stockyards. Please RSVP to the Extension office at 330-339-2337. A special thank you to the Tuscarawas County Cattle Association for co-sponsoring these trainings.

- July 21 at 1pm
- July 29 at 7pm (Light refreshments provided by TCCA)
- August 10 at 1pm
- August 25 at 7pm (Light refreshments provided by TCCA)

**POISON HEMLOCK**...is on Ohio's Noxious Weed List (<https://farmoffice.osu.edu/blog-tags/ohio-noxious-weeds>) and can be seen in large numbers across the county. Peggy Hall, OSU Extension Ag & Resource Law Program, addresses three components of Ohio Noxious Weed Law:

**Along roadways and railroads.** The first window just closed for mandatory mowing of noxious weeds along county and township roads. Ohio law requires counties, townships, and municipalities to destroy all noxious weeds, brush, briars, burrs, and vines growing along roads and streets. There are two mandated time windows for doing so: between June 1 and 20 and between August 1 and 20. If necessary, a cutting must also occur between September 1 and 20, or at any other time when necessary to prevent or eliminate a safety hazard. Railroad and toll road operators have the same legal duty, and if they fail to do so, a township may cause the removal and bring a civil action to recover for removal costs.

**Along partition fence rows.** Landowners in unincorporated areas of the state have a duty to cut or destroy noxious weeds and brush within four feet of a partition fence, and the law allows a neighbor to request a clearing of the fence row if a landowner hasn't done so. If a landowner doesn't clear the fence row within ten days of receiving a request to clear from the neighbor, the neighbor may present a complaint to the township trustees. The trustees must visit the property and determine whether there is a need to remove noxious weeds and if so, may order the removal and charge removal costs against the landowner's property tax bill.

**On private land beyond the fence row.** A written notice to the township trustees that noxious weeds are growing on private land beyond the fence row will trigger another township trustee process. The trustees must notify the landowner to destroy the weeds or show why there is no reason to do so. If the landowner doesn't comply within five days of receiving the notice, the



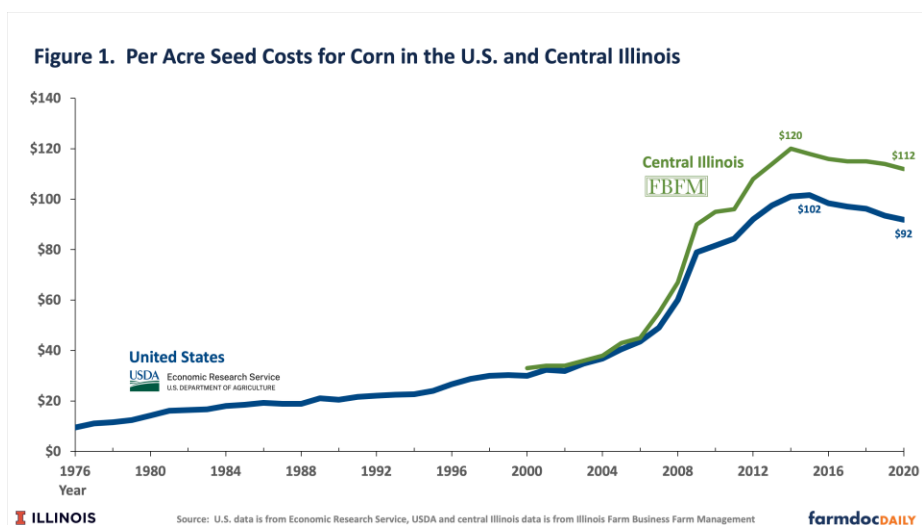
trustees may arrange for destruction of the weeds. The township may assess the costs against the landowner's property tax bill.

Even with noxious laws in place, we recommend talking before taking legal action. If you're worried about a noxious weed problem in your area, have a talk with the responsible party first. Maybe the party isn't aware of the noxious weeds, will take steps to address the problem, or has already done so. But if talking doesn't work, Ohio law offers a way to ensure removal of the noxious weeds before they become a bigger problem.

We explain the noxious weed laws in more detail in our law bulletin, [Ohio's Noxious Weed Laws](#). We've also recently illustrated the procedures in a new law bulletin, [Legal Procedures for Dealing with Noxious Weeds in Ohio's Rural Areas](#). Also see the OSU Agronomy Team's recent article about poison hemlock in this edition of C.O.R.N, [available through this link](#).

**CUSTOM RATES**...for a variety of tasks are developed by OSU Extension and are available here: <https://farmoffice.osu.edu/sites/aglaw/files/site-library/farmBusiness/Ohio%20Farm%20Custom%20Rates%20Draft%202020%20Final%20Revised.pdf>.

**EXPECT CORN SEED COST**...to rise in 2022. In this article (<https://farmdocdaily.illinois.edu/wp-content/uploads/2021/06/fdd290621.pdf>) the University of Illinois Farmdoc authors expect, based on historical trends, that corn seed costs in 2022 will increase.



Three periods of seed costs are evident in Figure 1. From 1975 to 2005, per acre seed costs increased steadily, with an average per acre increase in the U.S. of \$1.13 per year.

During the second period from 2006 to 2013, corn prices rose due to the increasing use of corn in producing ethanol. As a result, expected corn revenue reached higher levels, and per acre seed costs



increased. In the U.S., seed costs increased from \$44 per acre in 2006 to \$102 per acre in 2015, an average yearly increase of \$6.50 per acre.

The third period constituted a lower commodity price period, corresponding with leveling growth of corn use in ethanol. During the 2015 to 2020 period, seed costs declined slightly from \$102 in 2015 to \$92 in 2020.

Corn prices moved higher in late 2020 and have persisted through 2021. Historical relationships would suggest that those higher corn prices could lead to higher seed costs in 2022.

Over time, seed costs have been positively related to expected gross revenue for corn. In addition, seed costs have trended upward over time. Currently, gross revenue for corn is expected to be higher in 2022 than in recent years. As a result, seed costs for corn should be expected to increase. An increase in the \$6 to \$10 per acre range is expected on an average, national basis.

**CONTROLLING FLIES**...improves cattle performance, as described in this OSU Extension Beef newsletter: <https://u.osu.edu/beef/2021/06/30/shoo-fly-dont-bother-me-or-my-cows/#more-11116>.

**Biting flies** are the major pests of cattle and can be split into two groups based on their mouthparts. Biting flies can have a piercing/sucking mouthpart or a scissor-like mouthpart. Stable flies fall into the piercing/sucking category and like to attack the legs of animals. According to Oklahoma State University, beef cattle in a feedlot setting with more than 5 flies per foreleg can decrease their average daily weight gain by 0.48 lb/day. The university states that this can increase an animal's time in the feedlot by up to 30 days – a large increase in costs especially with current feed prices.

**Horn flies**, on the other hand, are considered to be the greatest pest of cattle on pasture. Economic hits of about \$700 million per year are felt by the U.S. beef industry from this fly (University of Florida). Male and female flies take blood meals and spend the entirety of their life on cattle. The action threshold for horn flies is 200 flies/animal and when flies are properly controlled, growing and finishing cattle are able to gain 1.5 more pounds per day.

**Heel fly**, often called northern cattle grubs, is the last to discuss. Eggs are laid on the hair of cattle and the larvae burrow into the skin, eventually migrating to the crest of the neck and the spine. Once along the back of the animal, the larvae will again cut through the hide to breathe through a hole called a warble. This not only causes cattle to decrease performance and weight gain, but also reduces value of the hide for leather use and potentially the amount of carcass if warbling is extensive.

**TICKS**... and tick-borne diseases are expanding rapidly in Ohio. Here are some common myths regarding ticks and tick-vectored disease.



**Myth #1** – “Ticks are only present in the woods.” This is a very common myth that I hear frequently. While it is true that some species of ticks such as Blacklegged tick or Lone Star tick prefer a wooded habitat, some tick species such as the American Dog tick and Gulf Coast tick can tolerate a more open habitat such as a pasture, meadow, or backyard lawn.

**Myth #2** – “Ticks need to be attached for a whole day to transmit disease.” This is a recommendation based on CDC research regarding Lyme disease from Blacklegged (Deer) ticks. We are now seeing some new research regarding different transmission times depending on the pathogen, (bacteria, virus) tick life stage, (larval, nymphal, adult) as well as what disease we are concerned about. For example, it is suspected that Rocky Mountain Spotted Fever has a different transmission after attachment timeframe that Lyme disease would have.

**Myth #3** – “Ticks are only active in the summer.” Many ticks have multi-year life cycles to complete their growth. While the warmer weather of late spring through summer has an increased amount of tick activity, ticks can be active all 12 months of the year.

To keep yourself, family, and animals tick safe this year make sure to develop a personal and family protection plan that includes protective clothing, tick checks, pet protection, proper removal methods as well as knowledge of where, when, and how you can encounter ticks and tick-vector disease.

(Source: Tim McDermott, DVM & Extension Educator, OSU Extension Sheep newsletter:

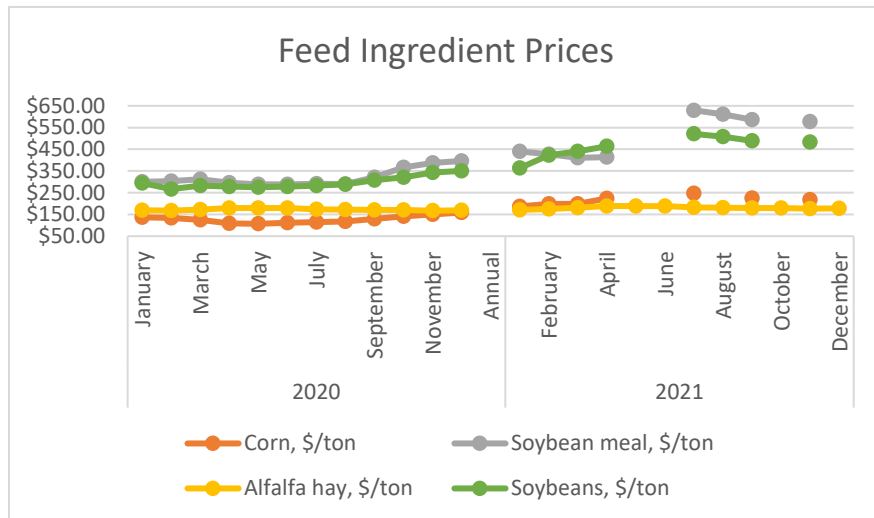
<https://u.osu.edu/sheep/2021/06/22/learn-the-myths-about-ticks-to-keep-yourself-safe/#more-4443>)

**SHIFT IN FEED PRICES**...cause shrinking profits. The ever-changing markets always makes livestock farming a challenge. And yet, there is limited control of price received for the milk, meat, etc., so most of the control lies with efficiency of production and managing the cost of production. However, where possible, the price received for the food product should be maximized.

At the onset of the pandemic, livestock farmers were quite concerned about availability and price of feeds, but it was quickly realized that agriculture is an essential business. With this aspect and harvest of the major feed grains already have taken place, feed was in ample supply at reasonable price (Figure 1, March 2020). During the fall of 2020, prices for corn and soybeans began to shift upward in response to lower stocks, both domestically and internationally, and the increased international demand. As we have moved further from the domestic harvest, this upward shift in corn and soybean prices has continued to occur, whereby it is projected to peak in July 2021 with corn at \$6.91/bu and soybeans at \$15.62/bu. After this point, the prices are expected to decline, but the realization is that the prices will remain above the year prior and historical prices. This will cause a squeeze on profits for livestock farmers.

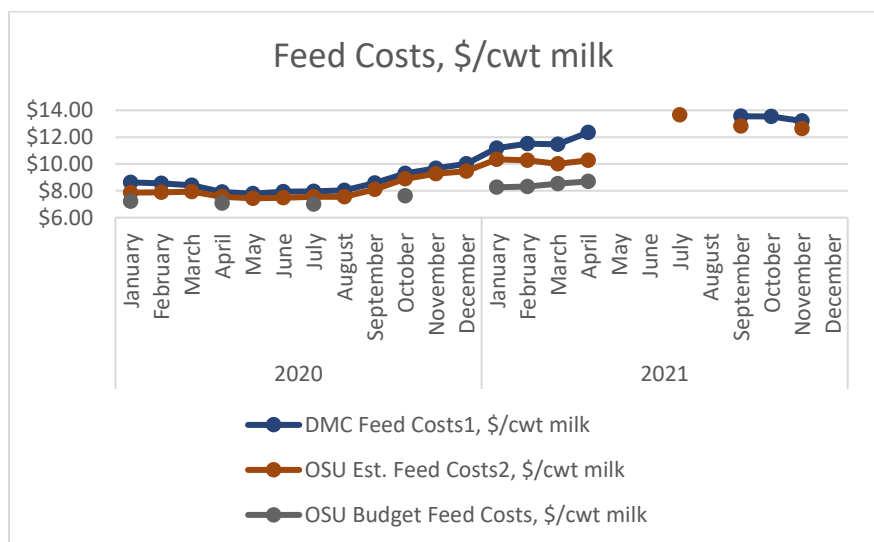


**Figure 1.** Feed ingredient prices during 2020 and 2021. Corn (56 lb/bu; 35.7 bu/ton) and soybean (60 lb/bu; 33.3 bu/ton) prices after April 2021 are futures prices and soybean meal prices after April 2021 were estimated from soybean prices. Hay prices after April 2021 were estimated based on 2020 trends.



The rise in feed costs on dairy farms beginning in September 2020 (Figure 2) certainly reflect the increased prices for feed ingredients shown in Figure 1. All three methods used in Figure 2 to estimate feed costs reflect the same trends, but divergence becomes more evident as costs increase.

**Figure 2.** Projected feed costs (\$/cwt milk) for dairy farms in the US using the formula for the Dairy Margin Coverage (DMC) program, a formula used by OSU in developing the 15 Measures of Dairy Farm Competitiveness, and using the OSU Dairy Enterprise Budget for a cow consuming a diet whereby 80% of the forage is corn silage and 20% is hay. The feed prices used were those from Figure 1 and commodity prices by USDA and reported in Buckeye Dairy News (<https://dairy.osu.edu/>). The price for corn silage was left constant at \$46.62/ton.



## Management Options

### *Increasing Income*

- 1) Efficiently increase milk yield - We typically express efficiency of milk yield as yield per unit of dry matter intake (DMI). You can use actual milk, fat-corrected milk (FCM), or energy-corrected milk (ECM). The best is to use ECM because it takes into account the fluid (lactose), protein, and fat yields (water in milk has limited value) and typically the range is 1.4 to 1.6 lb ECM/lb DMI. Efficiency can be increased by increasing yield from the same amount of DMI (A) or by achieving the same yield from less DMI (B). Improvement in efficiency can often occur by: A) removing bottlenecks to performance with improved ventilation, reducing health issues, improving reproductive performance, reducing stress, improving animal comfort, improving quality of forage, properly formulated diets, etc. and B) increasing forage in the diet and sometimes by substituting a lower digestible forage for some of the higher digestible forage in a diet (e.g. replacing some brown midrib (BMR) corn silage with non-BMR corn silage). The risk with this latter approach is that milk yield may decrease, leading to no change or a decrease in feed efficiency.
- 2) Increase milk fat or protein yield - Over the past two plus years, major shifts in the price for milk fat versus milk protein have been occurring as depicted in Figure 5. Milk fat prices exceeded milk protein prices during the first half of 2019. By October 2019, price for milk protein exceeded that for milk fat and has remained higher since. However, there have been major swings in price for milk protein, e.g. more than doubling between May and July 2020 and about a 50% drop occurred from November 2020 to April 2021. Protein price remains higher than fat at this time, yet volatility in prices for these components are expected to continue. Even though breeding decisions on selection for high component sires are a long-term approach, they are very important in maximizing component yields. In the short term to respond to the changes in the prices for milk fat versus milk protein, feeding changes can be implemented. Many of these aspects are addressed in the Dairy Industry Brief 43-20 published in 2020 located at: <https://dairy.osu.edu/sites/dairy/files/imce/DIB%2043-20%20DIB%2043-20%20Consider%20dietary%20changes%20to%20take%20advantage%20of%20changes%20in%20milk%20component%20prices.pdf>

### *Decreasing Feed Costs*

- 1) Reduce prices for purchased ingredients in rations. Reduction in price paid for typical ingredients used in rations can sometimes be achieved by shopping among different suppliers, purchasing in bulk instead of bagged, paying cash instead of using credit, buying larger quantities at once, or use of forward contracting.
- 2) Don't cut corners; make sure the feeding decision is the right one. One common example in this scenario is feeding a single TMR to all lactating cows on the farm, regardless of their level of milk production. This commonly increases total feed costs in comparison to feeding different



rations to the different groups. All too often, the fresh cows may be short-changed and lead to low peak milk yield that impacts the entire lactation and cows in later stages of lactation are overfed. This especially impacts the use of high-priced feed additives in rations which are typically most beneficial to fresh cows and cows at peak milk production.

- 3) Use lower priced ingredients for purchased feeds. The primary purpose of the specific ingredients in rations is to provide the nutrient needs of the animals, yet it is recognized that some ingredients can have other attributes. Every other month, feed prices and their calculated economic value are provided in the Buckeye Dairy News at:  
<https://dairy.osu.edu/newsletter/buckeye-dairy-news>
- 4) Reduce feed shrink. Feed shrink refers to any grown or purchased feed that gets lost along the way and never gets consumed by the animals. This shrink occurs during harvest, storage, loading in feed equipment, wasted by the animals at the feed bunk, and includes the refusals that are removed from the bunk and dumped as waste. The feed losses vary at each stage, which can be huge, but when you consider adding up the shrink from each stage, the losses can be enormous. Farmers should carefully evaluate each stage of feed storage and handling to reduce shrink. The cost of the feed wasted adds to overall feed cost without milk being produced from it to cover the costs. Look closely, its not like looking for a needle in a hay stack.
- 5) Reduce the number of free loafers. Scenarios that include such animals are:
  - a. Excess heifers on the farm that will not be used for replacements. The replacement heifer market is rather weak, especially for springing heifers. The heifers not needed for replacement need to be identified early and marketed. You are not running a dairy heifer sanctuary.
  - b. Unprofitable cows in the herd. These cows may exist because their milk yield is so low they are not even paying for direct expenses. They may be present because of being non-pregnant or chronically ill. Sometimes, they are even contributing to overstocking that is reducing the performance of all cows. The open and ill cows are often right under our noses, but you really have to go looking for the others.
  - c. Cows too long in the dry pen. At least 45 to 50 days are needed for cows to be dry, but typically 60 days is used as the target. Many dairy farmers today have reduced the number of days dry by 10 to 15 days so cows are producing milk longer to pay for expenses. A long dry period may be caused either by an incorrect breeding date, failure to confirm pregnancy, or abortion after pregnancy diagnosis. When cows are dried-up early due to low milk production, the decision as to whether the cow remains on the farm should be made.

(Source: Dr. Maurice Eastridge, OSU Animal Sciences)



**PIPELINE AG SAFETY ALLIANCE (PASA)**...provides educational resources that promote safe digging and excavation. A recent safety tip dealt with pipeline depth. Is there a rule for how deep a pipeline is buried?

Not all pipelines are installed to the same depth. Operators may own and operate numerous pipelines, with varying installation dates and depths, which is part of why it is so important to contact 811 by phone or [ClickBeforeYouDig.com](https://www.clickbeforeyoudig.com) prior to any soil disturbing activities. The pipeline operator may want to be on site if the digging will occur near the utility. Corrosion and terrain modifications can also impact pipeline depth.





## TUSCARAWAS COUNTY AGRICULTURE & NATURAL RESOURCES

July 10, 2021

**PROPER FERTILITY**...is critical to the production of hay and haylage crops grown on more than 1 million acres across Ohio. In addition, there are over 1.3 million acres of pastureland on nearly 39,000 farms (50% of all farms) in the state of Ohio (NASS, 2017). Fertilizer costs represent 40 to 60% of the variable input costs of forage hay production (Ward et al., 2016, 2018), and so managing these costs is key to an Ohio forage producers' ability to stay competitive. Furthermore, water quality issues in the state underscore the need for Ohio farmers to manage on-farm nutrients as efficiently as possible.

To make better and up to date forage fertility recommendations, we want to hear back from producers as to what current practices are already implemented on farms across the state. Understanding current practices and limitations to forage fertility will guide us in determining the type and kind of related research to conduct in order to revise current recommendations.

Please take this short voluntary survey regarding current forage fertility practices. This survey is part of a research effort conducted by The Ohio State University and should take 10 minutes or less to complete. Once again, your feedback is appreciated as we evaluate current forage fertility guidelines. Survey Link: [https://osu.az1.qualtrics.com/jfe/form/SV\\_4JcgVRsdxM16pmK](https://osu.az1.qualtrics.com/jfe/form/SV_4JcgVRsdxM16pmK)

Results from this survey in addition to forage fertility research will allow for revision of current recommendations for forage crops, grasses and legumes that follow guidelines already established in the Tri-State Fertility Guide. If you have any questions regarding the survey, contact Garth Ruff at [ruff.72@osu.edu](mailto:ruff.72@osu.edu).

(Source: OSU Extension C.O.R.N. newsletter <https://agcrops.osu.edu/newsletter/corn-newsletter/21-2021/forage-fertility-where-we-are-and-why-it-matters>)

**YEW**...is a common landscape plant that can be deadly to livestock. Many plants have poisonous compounds that can cause all kinds of concerns, and even death, if consumed. Yew is right at or near the top of plants that cause livestock death. A disheartening scenario is when Yew trimmings are thrown over the fence by the livestock owner or neighbor thinking that the trimmings would make a great snack for the livestock. Fresh or dry trimmings, it doesn't matter. The result will be the same – death.

(Source: OSU Extension Beef newsletter: <https://u.osu.edu/beef/2021/07/07/so-lush-so-green-and-oh-so-poisonous/#more-11152>)



**GROWING SEASON WEATHER OUTLOOK**...provided by Meteorologist Jim Noel, in this OSU Extension C.O.R.N. newsletter: <https://agcrops.osu.edu/newsletter/corn-newsletter/21-2021/growing-season-outlook> July will likely go down as a bit wetter than normal with temperatures slightly warmer than normal mostly due to overnight lows being higher. It does not appear we will see maximum temperatures above 95 much in July which is good news. Rainfall is normally 3-4 inches in July across the state and it looks like most places will be in the 2-5 inch range. Isolated higher totals are also possible. So even the locations with below normal rainfall should not be too dry. If anything we may battle the slightly wetter and more humid side of things.

The remainder of the growing season trend looks to continue with slightly wetter and warmer than normal. You can see all the latest outlooks at the NOAA Climate Prediction Center located here: [https://www.cpc.ncep.noaa.gov/products/predictions/long\\_range/lead01/off01\\_prclp.gif](https://www.cpc.ncep.noaa.gov/products/predictions/long_range/lead01/off01_prclp.gif)

### Harvest Outlook

The autumn harvest outlook indicates the warmer than normal trend will persist with rainfall trending normal.

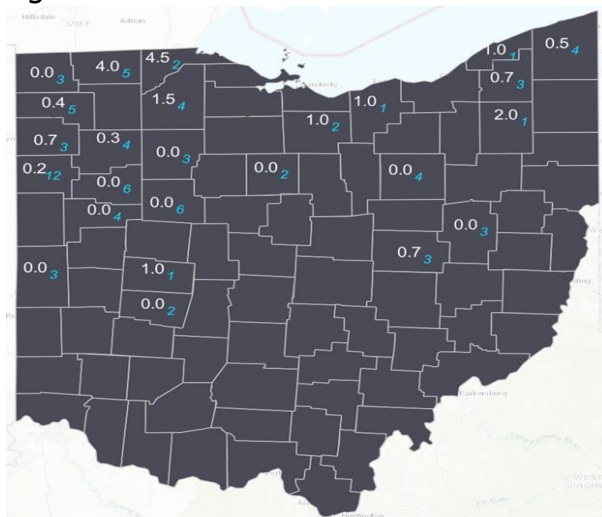
### La Nina

It appears there could be another La Nina this winter into spring but we will know more in the next few months. We will keep you informed. Typically, La Nina has negative impacts on crops in Ohio so it is worth paying attention to.

### Rainfall Pattern Across the Corn and Soybean Region

The pattern through mid to late July supports normal to above normal across much of the crop growing states with the exception of the far western areas of the Plains as shown on the graphic above. This would likely be supportive to crops overall.

**WESTERN BEAN CUTWORM**...trap monitoring continues across Ohio. Traps monitored from June 28 – July 4 had a total of 55 adult moths (0.6 statewide average moths per trap; Figure 1). This is an overall increase from monitoring last week.



**MANURE SCIENCE REVIEW**...will be held Tuesday, August 10 from 10:00am to 3:00pm at MVP Dairy near Celina, Ohio. Attendees will see and hear about this state-of-the-art dairy's 80-cow rotary milking parlor, manure handling and management for the 4,400-cow herd, and regenerative farming practices.

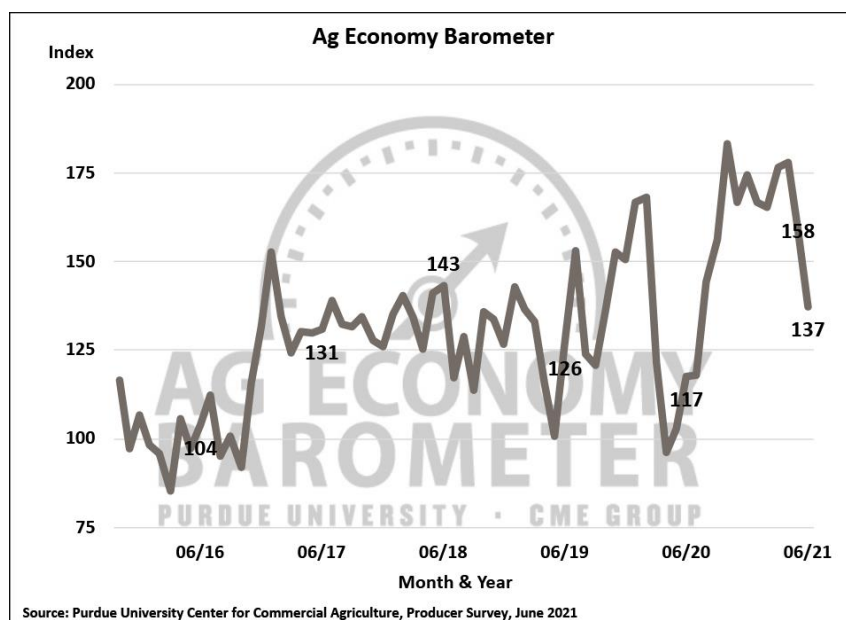
Speakers will provide updates on the effectiveness of saturated buffers in reducing runoff in Grand Lake Saint Mary's as well as issues of legacy phosphorus runoff and the KDS/Quick wash system for manure nutrient recovery. Field demonstrations will include solid and liquid applicators, the Cadman Side-dress System, Oxbo Equipment, in-season manure side-dress demos, and more.

Continuing education credits have been approved for Certified Crop Advisors, Certified Livestock Managers and Indiana State Chemist certifications. Registration costs are \$25 per person until August 1<sup>st</sup> and \$30 per person after that date. For program and registration details, click on the link at [ocamm.osu.edu](https://ocamm.osu.edu) or contact Mary Wicks ([wicks.14@osu.edu](mailto:wicks.14@osu.edu); 330.202.3533).

(Source: OSU Extension C.O.R.N. newsletter <https://agcrops.osu.edu/newsletter/corn-newsletter/21-2021/manure-science-review-coming-august-10th>)

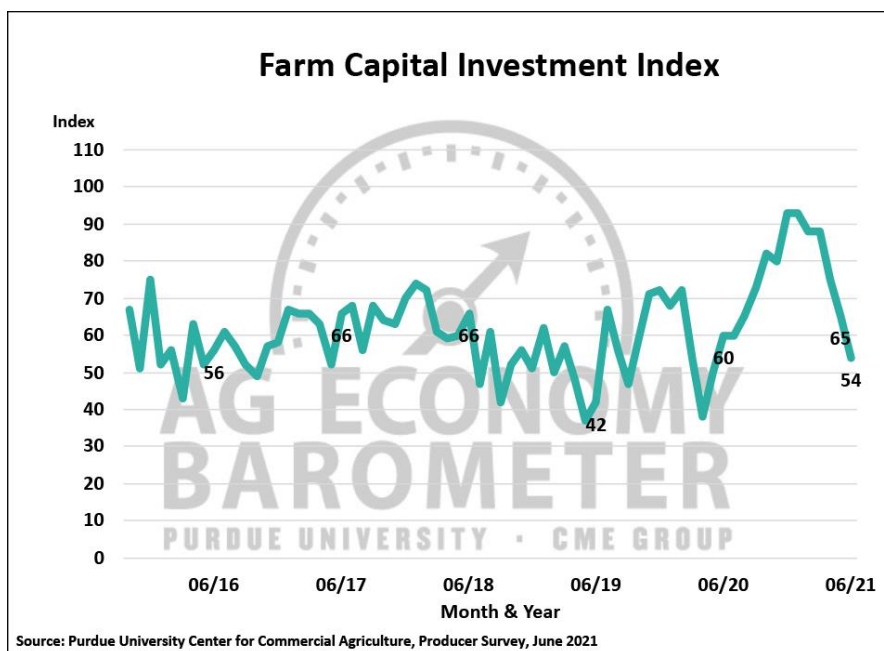
**AG ECONOMY BAROMETER**...is published by Purdue University. The most recent report (<https://ag.purdue.edu/commercialag/ageconomybarometer/wp-content/uploads/2021/07/June-2021-Ag-Economy-Barometer.pdf>) was released on July 6. Responses are from 400 U.S. farmers surveyed the last week of June.

For the second month in a row, the *Ag Economy Barometer* declined sharply, falling to a reading of 137, which was 21 points below a month earlier, and the weakest ag producer sentiment reading since July 2020. Producers in June were less optimistic about both current conditions on their farming operations as well as their expectations for the future.



Since peaking in April, producers' perception of their farms' financial performance has fallen sharply. This month's *Farm Financial Performance Index*, which is based on a question that asks producers about expectations for their farm's financial performance this year compared to last year, declined 30 points (24%) from a month earlier to a reading of 96. This was the index's weakest reading since last July.

Weakening perceptions of farm financial performance spilled over into the *Farm Capital Investment Index* which declined 11 points to a reading of 54, the lowest investment index reading since May 2020. Weakness in the investment index appears to be driven more by plans to hold back on constructing new farm buildings and grain bins than farm machinery. The percentage of producers who said they've reduced plans for new construction rose to 61% from 58% in May and the percentage planning to increase new construction fell to just 9% vs. 14% a month earlier. This contrasts with results from a similar question regarding farm machinery purchases. The percentage of producers who plan to reduce their machinery purchases fell just 2 points to 44% while those planning to hold purchases constant rose to 45% from 40% with the percentage planning to increase purchases falling to 10% vs. 14% back in May.



## Summary

The *Ag Economy Barometer* declined sharply for the second month in a row as producers' perception of current conditions and future expectations for their farming operations declined. In June, farmers became noticeably more concerned that their farms' financial performance will be weaker than a year earlier as the *Farm Financial Performance Index* fell 24% in just one month. Farmers expect their input costs to rise much more rapidly in the year ahead than they have over the last decade contributing to their concerns about their farm finances. Among corn and soybean producers nearly one-half expect to see farmland cash rental rates rise over the next year and among those who



expect rates to rise, there is an expectation that rates will rise sharply. Farms that normally hire non-family labor reported more difficulty in hiring labor this year than in 2020 which also contributed to some producers' anxiety. Finally, approximately 9% of all the farms in our survey reported that they have engaged in discussions with a company about leasing some of their farmland for a solar energy project while slightly less than 3% of all farms in the June survey said they have signed a solar lease for some of their farmland.

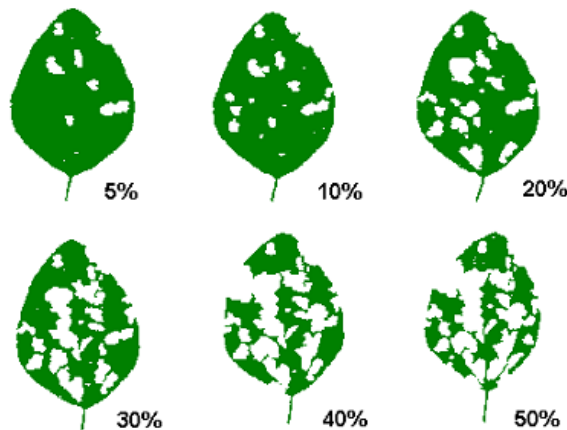


## TUSCARAWAS COUNTY AGRICULTURE &amp; NATURAL RESOURCES

July 14, 2021

**SOYBEAN PLANTS**...can tolerate a lot of defoliation without sacrificing yield. When scouting soybean fields to assess levels of damage, it is important not to let one's eye and mind overestimate what is truly there. Japanese beetles and grasshoppers tend to hit edges of fields first before they start moving farther into the centers of the fields. And Japanese beetles tend to feed in aggregations and at the tops of plants producing a startling appearance that easily catches one's eye standing at the edge of a field looking in. It is imperative to assess the whole field and the entire plant from top to bottom to get a true picture of defoliation levels. It is very rare that we reach economic levels of defoliation here in Ohio.

A visual guide to defoliation is useful because it is very easy to over-estimate defoliation in soybean. Whether it is one species of foliage-feeding insect, or several foliage-feeding insects present in soybean the same percent defoliation guidelines can be used for all of them collectively.



A rescue treatment is advised when defoliation levels reach 40% in pre-bloom stages, 15% in bloom, and 25% during pod fill to harvest. These defoliation levels apply to the plant as a whole, not just certain leaves. Damage is often worst at the top of the canopy but on closer examination most of the plant is relatively unharmed. Make your decision based on the average condition of whole plants, not a scan of the top canopy. Also, defoliation tends to be worse on field edges, so make your assessment based on the field as a whole, including interior.

Additional information is available in this OSU Extension C.O.R.N. newsletter:

<https://agcrops.osu.edu/newsletter/corn-newsletter/22-2021/soybean-defoliation-it-takes-lot-really-matter>



**FARM SCIENCE REVIEW**...will be in-person this year! Ever want to climb into the cockpit of a plane and glide over a field? At this year's Farm Science Review Sept. 21–23, visitors will have that chance without leaving the grassy ground under them.

The upcoming, annual farm trade show will offer a series of virtual reality experiences such as operating a crop duster, high-tech planters, combines, and other equipment. Sitting in a mini IMAX-type theater, visitors to FSR can watch videos projected on a domed screen around them. They'll get an expansive view—a bit wider than peripheral vision—so they can feel as if they're flying a plane. Or riding a high-tech planter. Or peering into a beehive. To film the videos, Ohio State University Extension educators mounted cameras to various spots on planters, tractors, combines, and other vehicles, so viewers can get a perspective they wouldn't normally get.

"It's a little bit like having a bug's eye view of all of these places," said Brooke Beam, Extension educator in Highland County. OSU Extension is the outreach arm of The Ohio State University College of Food, Agricultural, and Environmental Sciences (CFAES), which hosts FSR. One of the videos was taken by drones that flew over fields throughout the state to highlight the variety in Ohio agriculture: different crops, diverse soil types, and an assortment of terrain.

A new marketplace pavilion will offer visitors a chance to try products that smaller businesses in food and agriculture are promoting, such as a dairy that might be starting a type of ice cream or a specialty cheese.

*FSR hours are 8 a.m. to 5 p.m. Sept. 21–22 and 8 a.m. to 4 p.m. Sept. 23. Tickets for the event are \$7 online and at OSU Extension county offices and participating agribusinesses, or \$10 at the gate. Children ages 5 and under are free. For tickets and more information about FSR, visit [fsr.osu.edu](https://fsr.osu.edu). High resolution photos and social media assets for FSR 2021 are available at [go.osu.edu/fsr2021mediaassets](https://go.osu.edu/fsr2021mediaassets)*

**TAR SPOT**...has been confirmed in one Ohio field. The confirmation was made by Dr. Pierce Paul, OSU Extension Plant Pathology Specialist. While it's only one, the fact that it has been confirmed in neighboring states has some folks concerned. Tar Spot is a relatively easy disease to diagnose. As the name suggests, it usually shows up as raised, black spots, primarily on the leaf. The size of the spots may vary, but they all have a very similar appearance – raised, circular-to-irregularly shaped, black spots.



This is the earliest we have seen Tar Spot in the state since it was first reported in 2018. Results from studies out west suggest that yield losses due to Tar Spot tends to be highest when it develops and spreads before tasseling (VT) on susceptible hybrids. Warm, wet, and humid conditions seem to favor the development and spread of Tar Spot, so keep your eyes on the weather, and watch the progress of the disease. If it continues to spread, a fungicide application may be warranted, but efficacy of fungicides against Tar Spot is still being investigated. Find more details on Tar Spot at: <https://crop-protection-network.s3.amazonaws.com/publications/tar-spot-filename-2019-03-25-120313.pdf>.

Additional information is available in this OSU Extension C.O.R.N. newsletter: <https://agcrops.osu.edu/newsletter/corn-newsletter/22-2021/tar-spot-showing-early-year-note-diagnosis>.

**SPEEDING UP HAY CURING**...is discussed in this OSU Extension C.O.R.N. newsletter: <https://agcrops.osu.edu/newsletter/corn-newsletter/22-2021/steps-speed-field-curing-hay-crops> and a few highlights are provided below:

### **Haylage vs. Hay**

Consider making haylage/silage or baleage instead of dry hay. Haylage is preserved at higher moisture contents, so it is a lot easier and quicker to get it to a proper dry matter content for safe preservation compared with dry hay. Proper dry matter content for chopping haylage or wrapping baleage can often be achieved within 24 hours or less as compared with 3 to 5 days for dry hay. "Hay in a day" is possible when making hay crop silage. The forage is mowed first thing in the morning and laid in wide swaths to be raked in the late afternoon and chopped as haylage starting in early evening. Proper dry matter content for haylage ranges from 30 to 50% (50 to 70% moisture) depending on the structure used.

Wrapped baleage usually requires 24 hours to cure. Wrapped baleage should be dried to 40 to 55% dry matter (45 to 60% moisture).

Dry hay should be baled at 80 to 85% dry matter (15 to 20% moisture), depending on the size of the bale package. The larger and the denser the dry hay package, the drier it must be to avoid spoilage. For example, safe baling moistures for dry hay without preservatives are 18-20% for small square bales (80 to 82% dry matter), 18% or less for large round bales, and less than 17% for large square bales. See below for more information on baling with preservatives.

### **Mechanically Condition the Forage**

Faster drying of cut forage begins with using a well-adjusted mower-conditioner to cause crimping/cracking of the stem (roller conditioners) or abrasion to the stems (impeller conditioners). Adjust roller conditioners so at least 90% of the stems are either cracked or crimped (roller conditioners) or show some mechanical abrasion (impeller conditioners).

### **Consider Desiccants**

Desiccants are chemicals applied when mowing the crop that increase the drying rate. The most



effective desiccants contain potassium carbonate or sodium carbonate. They are more effective on legumes than grasses and most useful for making hay rather than silage or baleage. Desiccants work best under good drying conditions.

### **Maximize exposure to sunlight**

I once heard someone say "You can't dry your laundry in a pile, so why do you expect to dry hay that way?"

Exposure to the sun is the single most important weather factor to speed drying. The trick is to expose to sunshine as much of the cut forage as possible.



*Wide windrows are one or several techniques to speed hay drying.*

The swath width should be about 70% of the actual cut area. The mowers on the market vary in how wide a windrow they can make, but even those that make narrow windrows have been modified to spread the windrow wider.

Another way to spread out and aerate the crop for faster drying is with a tedder. Tedders are especially effective with grass crops. They can cause excessive leaf loss in legumes if used when the leaves are dry. Tedders can be a good option when the ground is damp, because the crop can be mowed into narrow windrows to allow more ground exposure to sunlight for a short time, and then once the soil has dried a bit the crop can be spread out with the tedder. Tedding twice may decrease drying time.

Research studies and experience have proven that drying forage in wide swaths can significantly speed up drying. Faster drying in wide swaths results in less chance of rain damage and studies by the University of Wisconsin showed that wide swaths (72% of the cut width) result in lower neutral detergent fiber (NDF) and higher energy in the stored forage.

### **Consider Preservatives**

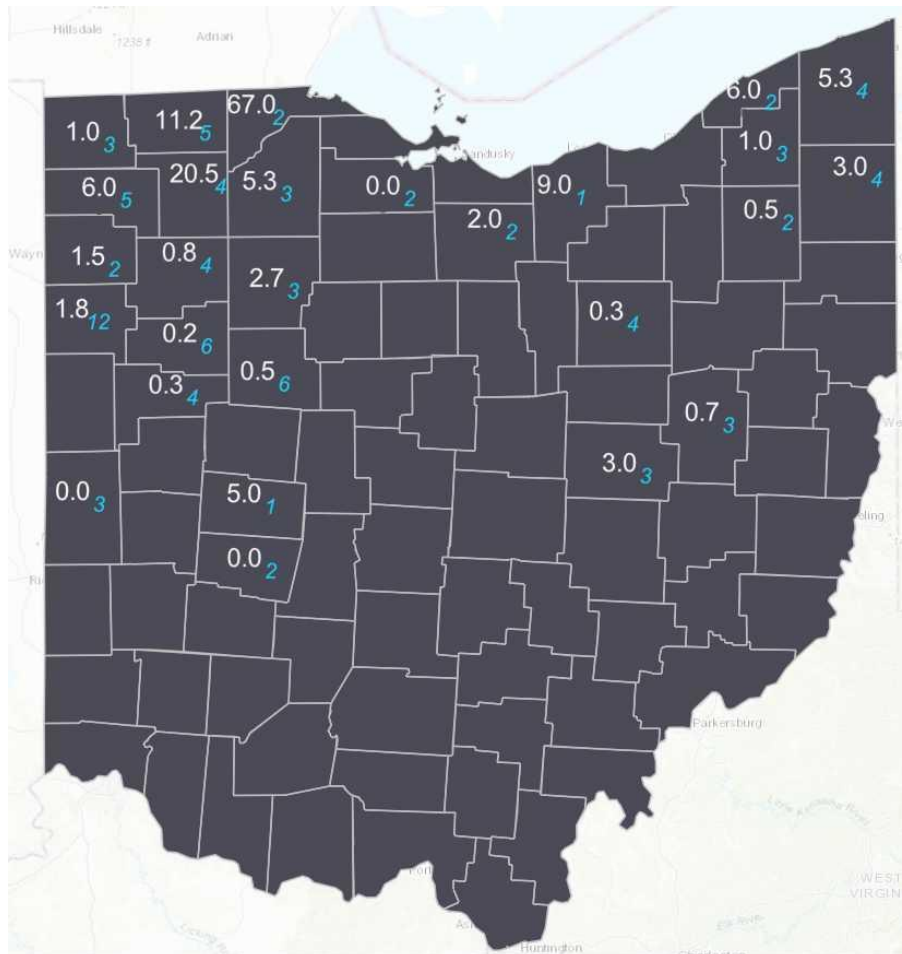
Sometimes the rain just comes quicker than we have time for making dry hay. As mentioned above, making haylage helps us preserve good quality forage in those short rain-free windows. A second option is to use a preservative. The most effective preservatives are based on propionic acid, which is caustic to equipment, but many buffered propionic preservatives are available that minimize that problem.



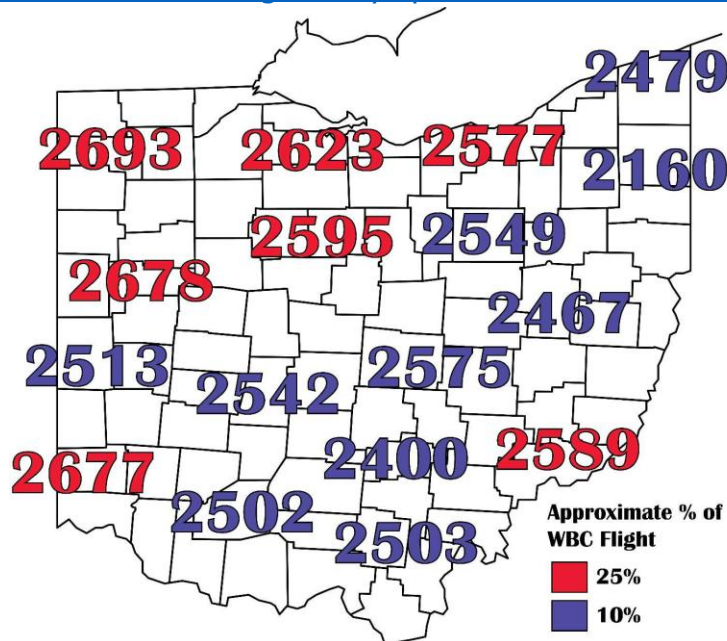
While the acid works to limit the production of mold and fungal spores that can lead to additional heating, any type of bale made over 20% moisture always has the potential to heat. Although mold production may be limited, discoloration and caramelization of the higher moisture stems can still occur. This heating can also degrade proteins in the hay, reducing overall feed quality despite still helping to preserving the hay from spoilage and hopefully making it safe to store indoors. Keep in mind that preservative treated hay should be fed within a year or less, as the preservative effect will wear off over time.

If baling on the wet side, watch those bales carefully! If hay is baled at higher moisture contents that are pushing the safe limits, keep a close watch on them for two to three weeks. Use a hay temperature probe and monitor the internal temperature of the hay during the first three weeks after baling. See the following article for more information on monitoring wet hay: <https://agcrops.osu.edu/newsletter/corn-newsletter/15-2021/hay-barn-fires-are-real-hazard>

**WESTERN BEAN CUTWORM**...numbers are beginning to increase across Ohio.

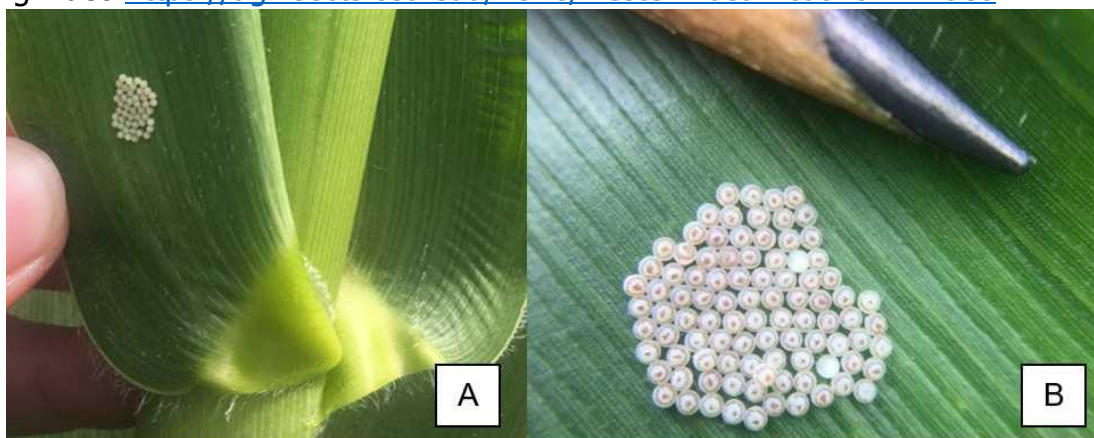


numbers accumulate to 2704, approximately 50% of WBC flight will have occurred. For more information on calculating GDD and WBC please see the following article: <https://cropwatch.unl.edu/2021/degree-days-prediction-western-bean-cutworm-flight>



### Scouting guidelines

Counties with adult WBC trap counts averaging 7 or more moths per week should begin scouting for WBC egg masses in corn fields that are pre-tassel approaching tassel. Freshly laid egg masses are white and turn a purplish color as they mature (Figure 3), close to hatch. To scout, randomly choose at least 20 consecutive plants in 5 locations within a field (a total of 100 plants per field). Inspect 3–4 leaves on the uppermost portion of the corn plant. It is very useful to look at leaves with the sun behind them – often the shadow of the egg mass will reveal it without having to examine the leaf closely. Field corn should be treated with a foliar treatment if more than 5 % of inspected plants have eggs or larvae. Sweet corn should be treated if more than 4 % of inspected plants have eggs or larvae (processing market), or 1 % of plants (fresh-market). For more scouting information, view our WBC scouting video <https://aginsects.osu.edu/news/western-bean-cutworm-video>



## Treatment

If the number of egg masses/larvae exceed the threshold mentioned above, foliar applications of insecticides are available, especially those containing a pyrethroid. Timing an insecticide application is critical and must happen before the caterpillar enters the ear, but after the eggs hatch. If the eggs have hatched, applications should be made after 95% of the field has tassels. If the eggs have not hatched, monitor the egg masses for the color change. Newly laid egg masses will be white but turn purple as they mature. Hatch will occur within 24–48 hours once eggs turn purple.

(Source: OSU Extension C.O.R.N. newsletter <https://agcrops.osu.edu/newsletter/corn-newsletter/22-2021/western-bean-cutworm-numbers-begin-increase-across-ohio>)

**BEEF QUALITY ASSURANCE (BQA) RECERTIFICATION**...for those needing to renew in 2021 will be held the following dates and times. Sessions will take place at the Sugarcreek Stockyards. Please RSVP to the Extension office at 330-339-2337.

- July 21 at 1pm
- July 29 at 7pm (Light refreshments provided by Tuscarawas County Cattle Association)
- August 10 at 1pm
- August 25 at 7pm (Light refreshments provided by Tuscarawas County Cattle Association)

**MOBILE MEAT HARVEST**...gauging interest. Whether you shop for local meat, raise livestock, operate a slaughterhouse, or create value-added products, the meat processing bottleneck affects you!

The project *Planning To Advance Mobile Meat Slaughter and Processing in Ohio and Central Appalachia*, conducted by [The Appalachian Center for Economic Networks, Inc. \(ACEnet\)](#) and project consultants, aims to draft and support a plan for a possible solution.

Will you commit ten minutes of your time to [share your values and needs in a short survey](#)? We want to hear from as many farmers, processors, and consumers in the Ohio and Central Appalachian region as we can and appreciate any feedback.

Start the survey: [https://corexmsffsgb599k6k6d.qualtrics.com/jfe/form/SV\\_2iwNa7YVbJjpRtA](https://corexmsffsgb599k6k6d.qualtrics.com/jfe/form/SV_2iwNa7YVbJjpRtA)  
(Source: OSU Extension Beef newsletter <https://u.osu.edu/beef/2021/07/14/do-you-have-opinions-about-mobile-meat-harvest-in-ohio/>)

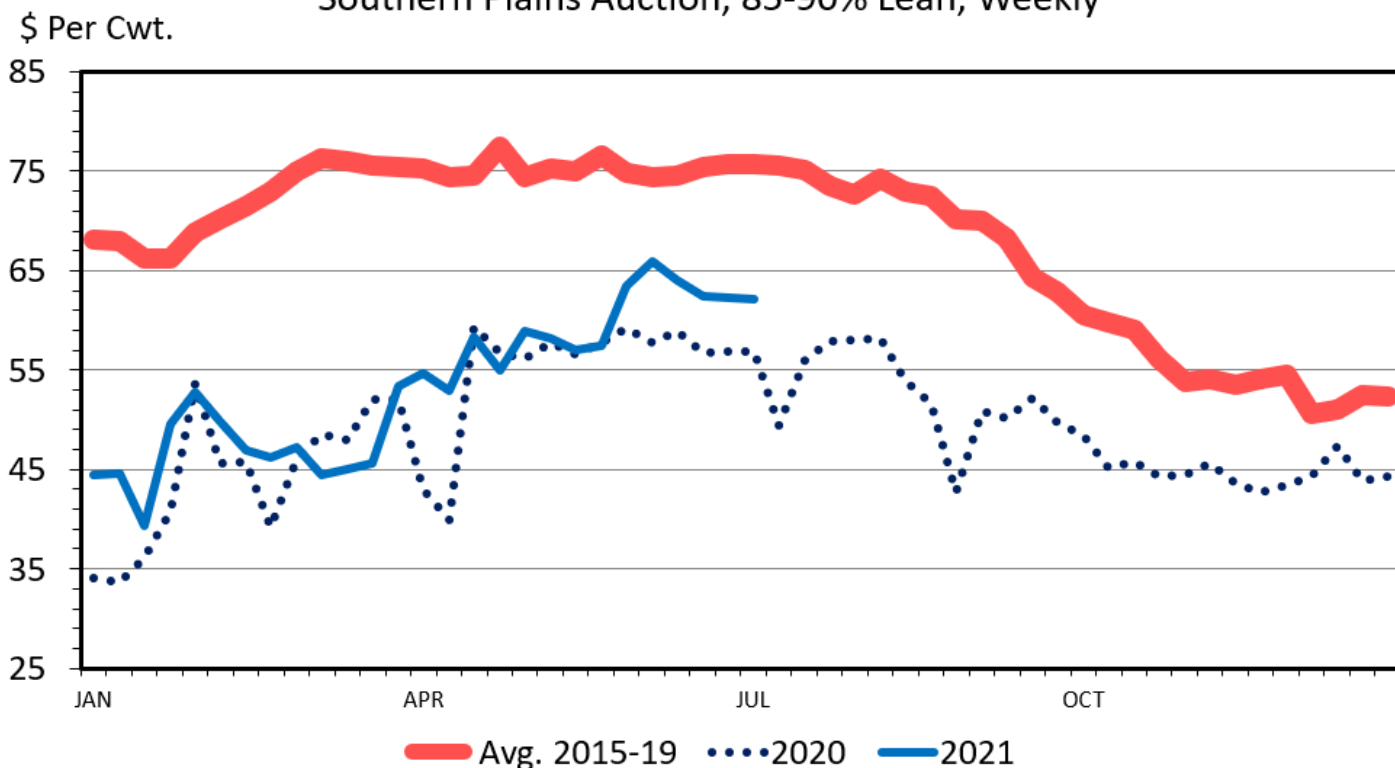
**GROUND BEEF DEMAND**...drives beef and dairy cull cow markets. Cull beef cows contribute to ground beef production as a source of 90% lean trimmings, which are blended with 50% lean trimmings to make the majority of our ground beef and hamburger. The other two sources of lean trimmings are dairy cows and lean beef imports. Fed cattle trimmings are the main source of 50% lean trim.



Beef cow slaughter has been averaging 9.9 percent above 2020 slaughter and 12.4 percent higher than 2019 slaughter. This means a larger supply of lean trimmings from beef cull cows. All else equal, we would expect lower cull cow and lean trim prices due to larger supplies. However, this has not been the case this year.

## SLAUGHTER COW PRICES

Southern Plains Auction, 85-90% Lean, Weekly



Data Source: USDA-AMS

Livestock Marketing Information Center

Southern Plains slaughter cow prices have averaged 8.1 percent above 2020 and 14.7 percent above 2019 prices. Fresh 90% lean trimmings have averaged 4 percent below 2020 prices but 11 percent higher than 2019 prices. Lower dairy cow slaughter and beef imports (the other two sources of lean trim) have helped support cull cow and ground beef markets. Ground beef demand is the other factor driving cull cow values and lean trimmings prices.

Much like other meat prices, ground beef prices have averaged higher this year. Data through May 2021 from the Bureau of Labor Statistics shows that ground beef prices have averaged \$4.04/lb or 0.5 percent higher than 2020. Lean ground beef prices have averaged 1.6 percent and 9.9 percent above 2020 and 2019 prices, respectively. The only way to have higher prices with larger supplies of cull cows and lean trimmings is with strong ground beef demand.

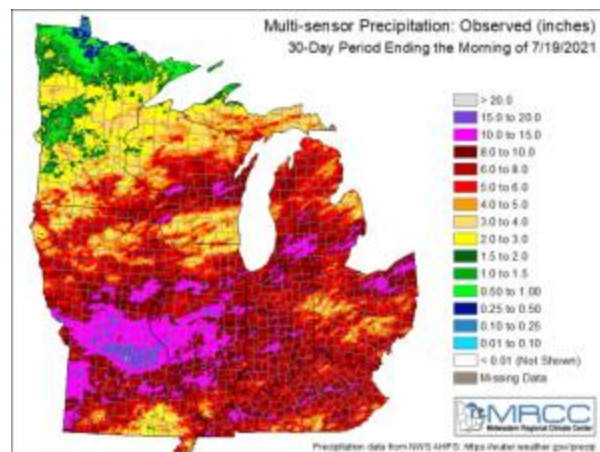
(Source: OSU Extension Beef newsletter <https://u.osu.edu/beef/2021/07/14/ground-beef-demand/#more-11186>)



## TUSCARAWAS COUNTY AGRICULTURE &amp; NATURAL RESOURCES

July 21, 2021

**WET START**...to summer. Since the start of summer, a strong heat dome has dominated the weather in the west, leaving an active jet stream and weather pattern across the Ohio and Missouri Valleys.



### Forecast

The week ahead looks a bit more benign. Mostly dry and sunny conditions are expected Tuesday through Thursday. Skies will remain a bit hazy due to western wildfire smoke. A weak front moving through on Tuesday could provide a few isolated storms late in the day, mainly across northern counties. Temperatures are expected to run about average this week, with highs in the mid to upper-80s and lows in the mid-60s across southern counties. Upper-70s to mid-80s for highs with upper-50s to low-60s expected on Wednesday and Thursday across the north. A better chance of widespread summertime thunderstorms is expected on Friday through the weekend, with highs in the mid to upper-80s.

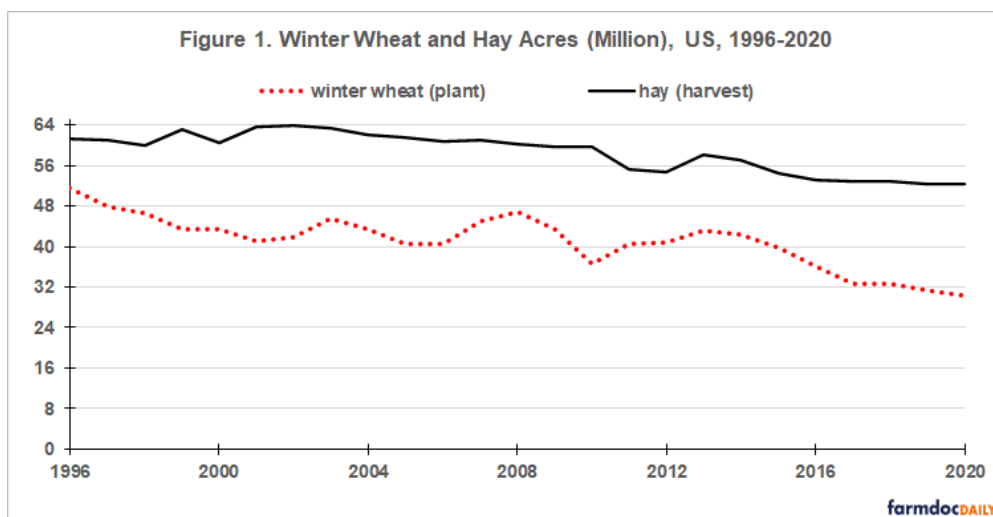
The [Climate Prediction Center's](#) 6–10-day outlook for the period of July 27 – August 2 and the [16-Day Rainfall Outlook from NOAA/NWS/Ohio River Forecast Center](#) indicate a shift in the pattern, with above average temperatures and below average precipitation expected. Climate averages for this period include a high temperature range of 83-87°F, a low temperature range of 62-66°F, and average rainfall of 0.70-0.90 inches.

**COVERED CROPLAND VS. COVER CROPS**...is the focus of this University of Illinois Farmdoc publication (<https://farmdocdaily.illinois.edu/wp-content/uploads/2021/01/fdd130121.pdf>). Cover crops have environmental benefits, with many resulting from cover crops that over-winter, thereby absorbing nitrates in the early spring and building organic matter in soils over time. Because they over-winter, winter wheat and hay have many attributes ascribed to cover crops. Even though cover crop acres have increased, the increase has been more than offset by declines in wheat and hay acres, implying a step backward, not forward.

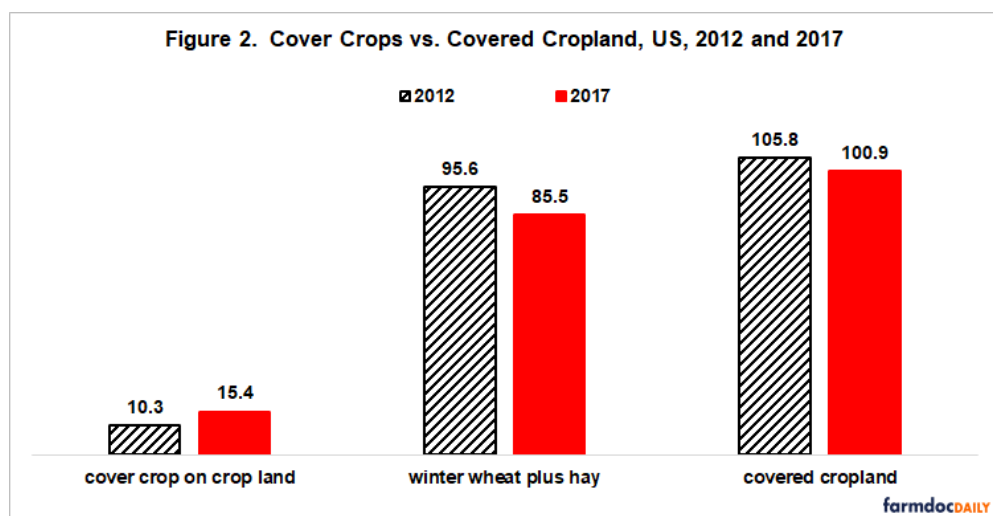
**Wheat and Hay Acres:** The 1996 farm bill eliminated annual set asides. With a few exceptions, farms were allowed to plant whatever was desired, most likely resulting in the rotation with the highest expected return.



Since 1996, acres planted to winter wheat have declined by -41% (-21.0 million) while acres of all hay harvested declined by -14% (-8.8 million) (see Figure 1).



**Cover Crops vs. Covered Cropland:** According to the *Census of Agriculture*, 5 million more acres of cover crops were planted in 2017 than 2012 (see Figure 2 and Data Notes 2 and 3). This 5 million acre increase in cover crops was more than offset by a 10 million acre decline in wheat and hay acres, resulting in a 5 million acre decline in covered cropland. The decline in covered cropland is likely to be even larger. An unharvested small grain planted as a cover crop, such as wheat, is included in acres planted to the small grain. Acres of other fall-seeded crops, such as winter oats and barley, may have also declined.



## Concluding Observations

Winter wheat and hay acres have many attributes portrayed as desirable in cover crops. Between 2012 and 2017, acres of winter wheat and hay declined more than acres of cover crops increased. In net, covered cropland acres declined by 5 million and thus took a step backward.

Unlike cover crops, winter wheat and hay generate environmental benefits while earning immediate economic returns. A winter wheat – soybean double crop rotation may generate environmental benefits while enhancing



economic returns per acre. This observation led to a policy proposal to change the goal of US public research policy from enhancing yield to “growing 2 commercial crops per acre where 1 grew before” (see [October 28, 2020 farmdoc daily](#) article). Seeking to cover more cropland more often with commercial crops potentially offers a rare win-win public policy by increasing US agricultural output while enhancing environmental quality.

The proposal raises important questions, including:

1. What is the optimal rotation of crops in terms of economic returns and environmental benefits, including nutrient loading? For example, are environmental benefits and economic returns greater from planting 2 commercial crops per acre in a year or from planting 1 longer-season commercial crop plus an overwintering cover crop?
2. What differential geographic impacts, if any, result from multiple commercial crops per acre vs. a commercial – cover crop rotation vs. current crop rotations?

**ESTABLISHING WARM SEASON GRASSES**...requires patience, as described in this OSU Extension Beef newsletter: <https://u.osu.edu/beef/2021/07/21/patience-in-prairie-modeled-pasture/>. The expected wait time for a native warm-season grass stand to reach the state considered “fully established” is three years; three whole years. In order to prepare for establishment and follow through with maintenance, the forage manager has to prepare a completely different strategy from the typical cool-season perennial plan. Preparing the site before seeding; how to exclude the area from harvest for an extended period of time; how to treat for weeds; how to fertilize; and how to harvest are all slightly different.

The primary concern of seedling native prairie grasses in year one is to establish a strong root system and then develop tillers above ground. The bunch type growth habit of these plants leads to patchy looking rows with open ground in between where annual and perennial weeds can encroach before tiller development takes off. Weed control in year one and two are critical to prevent competition for nutrients and sunlight. Tolerance to herbicides varies by grass type and should be considered before application.

One of the greatest benefits of the prairie ecosystem is the immense diversity of plants, animals, and insects that reside in the grassland. Combining native grasses, legumes, and forbs becomes complicated when managed as an agronomic crop. Depending on the intensity of the weed pressure on the site, it may be best to wait to introduce broadleaf plants (legumes and forbs) by interseeding in year three of establishment. This allows two seasons of broadleaf weed control before diversifying the pasture mix and significantly limiting weed control options.

If cool-season forages are interseeded into warm-season forages, they will likely only last one to two years under grazing and in hay systems the warm-season forages would likely struggle to develop good root systems because of competition with the cool-seasons. Due to the physiological differences in plant growth, the best way to manage warm-seasons and cool-seasons on the same farm is in separate pastures.

If considering adding warm-season annual grasses with warm-season perennials, competition is still an issue and neither crop will grow to its full potential.

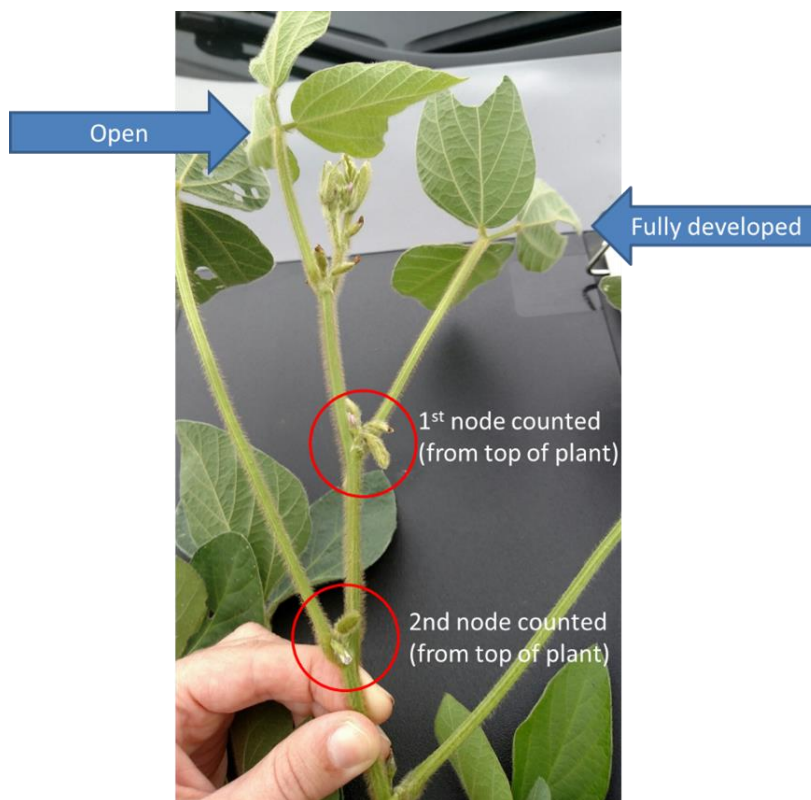
When managed with care and patience a prairie modeled pasture planting can provide high yielding, good quality forage in the hottest and driest part of the growing season. Having both warm-season and cool-season options on the farm can decrease the need for stored feed, increase the total potential yield of the farm, improve soil health, and provide wildlife benefits while also meeting the needs of ruminant livestock.



There are numerous conservation programs that support the establishment of prairie modeled pasture in various complexities. To learn more about cost-share programs available in your area, contact your local Farm Service Agency, Soil and Water Conservation District, or Pheasants and Quail Forever service personnel to evaluate the feasibility of native warm-season forages on your farm.

**TO SPRAY OR NOT TO SPRAY**...foliar products to soybeans at the R3 stage is discussed in this OSU Extension C.O.R.N. newsletter: <https://agcrops.osu.edu/newsletter/corn-newsletter/23-2021/spray-or-not-spray%E2%80%A6foliar-products-r3>.

A soybean plant is at the R3 growth stage when there is a pod at least 3/16 inch long (but less than 3/4 inch long) at one of the four uppermost nodes on the main stem with a fully developed trifoliolate leaf. A leaf is fully developed, and the node is counted, when the trifoliolate leaf at the node immediately above it is open (Figure 1). Soybean plants within a field may be at different growth stages. Over half of the plants need to be at a certain growth stage for the whole field to be considered that growth stage. For more information on soybean growth stages R3 through R6, see this YouTube video: <https://www.youtube.com/watch?v=Z0A1fkU4oBU>.



### **When should I spray a foliar fungicide?**

First, consider the disease triangle. For a disease to develop, there must be a 1) host (Is your soybean variety resistant or susceptible?), 2) pathogen (Is there a history of a certain disease in your field? Do you see any visual symptoms of disease?), and 3) conducive environment. Most foliar diseases, such as brown leaf spot and frogeye leaf spot, are favored by wet conditions.

In the soybean agronomic trials, brown leaf spot and frogeye leaf spot tend to be the two most common soybean diseases (Figure 2). In these trials, we've measured a yield response to foliar fungicide applied at R3 in 9 out of 28 environments, ranging from 4 to 8 bu/acre. At the responsive locations, which tended to be in



central and southern Ohio, there was foliar disease present (brown spot and frogeye leaf spot). Additionally, these positive yield responses occurred in years with greater precipitation. Very little to no yield response occurred in dry years and in years when soybeans were flooded. If you have visual symptoms of disease, a conducive environment, and susceptible variety, R3 is a good time to spray a foliar fungicide.



### **When should I spray a foliar insecticide?**

Often, if a farmer plans on spraying a foliar fungicide, they will tank-mix a foliar insecticide. From last week's article on soybean defoliation, "*It is very rare that we reach economic levels of defoliation here in Ohio.*" (Click here to read the entire article: <https://agcrops.osu.edu/newsletter/corn-newsletter/22-2021/soybean-defoliation-it-takes-lot-really-matter>). Over the past several years, we've tested foliar insecticide in 28 Ohio environments. Out of those 28 environments, we've only measured a yield response (+5 bu/acre) to foliar insecticide applied at R3 one time. In the other 27 environments, soybean yield was unaffected by foliar insecticide with defoliation levels in the mid- to upper canopy at <15%.

### **When should I spray foliar fertilizer?**

In Ohio, the most common micronutrient deficiency is manganese. However, even then, we've only measured a yield response to manganese foliar fertilizer in two out of 20 Ohio environments. Soybeans are most likely to respond to foliar fertilizer when there are visual symptoms of deficiency. Intervenial chlorosis is a visual symptom of manganese deficiency (Figure 3). Manganese deficiency tends to occur in fields with high pH or high organic matter (muck), especially if soils are droughty. In dry soil, manganese is converted to a form that is unavailable for plant uptake.



*Figure 3. Manganese deficiency symptoms include interveinal chlorosis.*

Recently, soybean agronomists across the U.S. evaluated foliar fertilizers in 46 environments and found no soybean yield increase when the products were applied prophylactically (e.g., no visual deficiency symptoms). For more information on this study, see: <https://www.youtube.com/watch?v=0DtNagk6ghI>. In most situations, foliar fertilizers are unnecessary.

## Summary

When soybean plants are yellow due to saturated soil conditions as seen in northern Ohio last week, it can be tempting to apply foliar products to help the plants 'recover' (Figure 4). These fields often already have a lower yield potential and are unlikely to respond to foliar products in the absence of disease, insects, and nutrient deficiency.

Multiple trials in Ohio and across the U.S. have shown that prophylactic applications of foliar fungicide, insecticide, and fertilizer provide no yield benefit. Before applying these products, it's important to scout your fields for disease, insects, and nutrient deficiencies.

**FUNGICIDE EFFICACY**...for corn disease control is discussed in this OSU Extension C.O.R.N. newsletter: <https://agcrops.osu.edu/newsletter/corn-newsletter/23-2021/fungicide-efficacy-control-corn-diseases>. Many corn fields in Ohio are rapidly approaching silking (R1), and foliar diseases such as Gray leaf spot have been observed where the environment has been conducive to disease development, prompting growers to consider fungicide applications. The information below was developed by the Corn Disease Working Group (CDWG) as part of the Crop Protection Network. The Crop Protection Network is a multi-state and international collaboration of university and provincial extension specialists, and public and private professionals who provide unbiased, research-based information to farmers and agricultural personnel.

The efficacy table is available here: <https://crop-protection-network.s3.amazonaws.com/publications/fungicide-efficacy-for-control-of-corn-diseases-filename-2021-07-14-205804.pdf>.

**BEEF QUALITY ASSURANCE (BQA)**...teaches best management practices, helps promote consumer confidence, and has positively impacted U.S. beef. Maintaining market access and added value for cattle raised by BQA certified producers has been significant in the past few years. On the fed cattle side, we know what happens when one of the major packers is out of the market for a period of time. Producer participation in the program has kept Tyson at Ohio markets and buying Ohio cattle. Depending on the week and who you ask, that is a value of \$5-15/cwt.

Evidence of added value has also been seen in the feeder cattle market. In 2019, Colorado State analyzed market data from the Western Video Markets and determined that BQA certified cattle sold with a premium of \$2.71/cwt on average compared to cattle where BQA certification was not documented.

Results of the study revealed a premium of \$16.80/head for cattle that had BQA listed in the lot description compared to no mention and holding other factors constant. This value was determined by applying the \$2.71/cwt premium found in CSU's statistical analysis to the average weight of cattle in the study data.

Aside from BQA, another reason to keep beef quality at the forefront is the increased demand for local beef products. While demand for local beef had been growing prior to COVID-19, the pandemic accelerated that demand to a point that many, (or any) of us had never seen.



The real question is: how much of that added demand for local beef is here to stay? That answer varies from processor to processor that I have spoken to, however they all believe that those customers who had a positive eating experience will be back to purchase local beef.

That should excite those producers who are set up for the direct marketing of quality beef. That said, the pandemic also brought to light, that there are several first-time direct marketers that need some guidance in producing that high quality product if they want to remain in that direct-to-consumer lane of beef production. This brings us back to genetics, nutrition, and cattle management topics such as BQA.

(Source: OSU Extension Beef newsletter: <https://u.osu.edu/beef/2021/07/21/keeping-quality-in-mind/#more-11085>)

BQA sessions are scheduled at the Sugarcreek Stockyards on the dates below. Additional sessions will be scheduled later in the year. If you attended certification in 2018, you want to register for one of the upcoming trainings. Thank you to the Tuscarawas County Cattle Association (TCCA) for their support! Please call 330-339-2337 to pre-register.

- July 29 at 7pm (Light refreshments provided by TCCA)
- August 10 at 1pm
- August 25 at 7pm (Light refreshments provided by TCCA)

**FARM OFFICE LIVE**...returns this Friday, July 23, at 10am. Presented by OSU Extension, this program will feature updates about legislation, CFAP 2, taxes, carbon agreements, 2020 Farm Business Analysis, and provide answers to your questions. Registration information is provided below.

A promotional poster for the 'Farm Office Live' event. The background features a blurred image of the US Capitol building. The poster is divided into several sections. At the top left, a red box contains the text 'CFAES'. Below this, the main title 'Join us for the next FARM OFFICE LIVE' is centered. To the right of the title, the 'OSU Extension's Farm Office Team' is listed with names: Peggy Kirk Hall, David Marrison, Dianne Shoemaker, Julie Strawser, and Barry Ward. Below the team list, the date and time 'July 23, 2021 10:00 - 11:30 a.m.' are displayed in a box. Underneath this, a 'Save the date!' section mentions 'We'll be back August 27 10:00 - 11:30 a.m.'. On the left side, under the title, 'July's Topics:' are listed: State and Federal Legislative Updates, Coronavirus Food Assistance Program 2, Legislative Proposals with Tax Implications, Carbon Agreements, 2020 Farm Business Analysis Results, and Your Questions. Below the topics, a note says 'Join us and share your questions, concerns, and topics of interest. Each session will include a short update and lead into a Q&A time on additional topics of interest.' At the bottom left, the Ohio State University logo and 'COLLEGE OF FOOD, AGRICULTURAL AND ENVIRONMENTAL SCIENCES' are shown. At the bottom center, the registration link 'go.osu.edu/farmofficelive' is provided. At the bottom right, the website 'farmoffice.osu.edu' is listed. A small tagline at the bottom right reads 'Farm Office is your farm's ag law and farm management resource center.'



## TUSCARAWAS COUNTY AGRICULTURE & NATURAL RESOURCES

July 28, 2021

**THE TIME TO SEED PERENNIAL FORAGES**...is fast approaching. The month of August provides a window of opportunity for establishing perennial forage stands or filling in seedings made this spring that have gaps. Rainfall and adequate soil moisture in the few weeks immediately after seeding is the primary factor affecting successful establishment.

This OSU Extension C.O.R.N. newsletter (<https://agcrops.osu.edu/newsletter/corn-newsletter/24-2021/seeding-perennial-forages-late-summer>) provides management tips for a successful establishment of perennial forages. A few highlights are provided below:

- **Check herbicide history of field.** A summary table of herbicide rotation intervals for alfalfa and clovers is available at <http://go.osu.edu/herbrotationintervals>. Forage grasses are not included in that table, so check the labels of any herbicides applied to the field in the last 2 years for any restrictions that might exist.
- **Seed selection:** Be sure to use high quality seed of adapted varieties and use fresh inoculum of the proper Rhizobium bacteria for legume seeds. "Common" seed (variety not stated) is usually lower yielding and not as persistent, and from our trials the savings in seed cost is lost within the first year or two through lower forage yields.
- **Planting date:** Planting of alfalfa and other legumes should be completed between late July and mid-August in Northern Ohio and between early and late August in Southern Ohio. Most cool-season perennial grasses can be planted a little later. Check the Ohio Agronomy Guide for specific guidelines (see <http://go.osu.edu/forage-seeding-dates>).
- **Planter calibration:** If coated seed is used, be aware that coatings can account for up to one-third of the weight of the seed. This affects the number of seeds planted in planters set to plant seed on a weight basis. Seed coatings can also dramatically alter how the seed flows through the drill, so calibrate the drill or planter with the seed to be planted.
- **Seed placement:** The recommended seeding depth for forages is one-quarter to one-half inch deep. It is better to err on the side of planting shallow rather than too deep.

Scout your new forage seeding this fall on a regular basis. Post-emergence herbicide options exist for alfalfa that control late summer and fall emerging winter annual broadleaf weeds. A mid- to late fall application of Butyrac (2,4-DB), bromoxynil, Pursuit or Raptor are the primary herbicide options for winter annual broadleaf weeds. ***Fall application is much more effective than a spring application for control of these weeds especially if wild radish/wild turnip are in the weed mix.*** Pursuit and Raptor can control winter annual grasses in the fall in pure legume stands but not in a mixed alfalfa/grass planting.



**AGRONOMY UPDATE**...sponsored by OSU Extension will be held Thursday, **August 26, 1pm – 4pm** at Durbin Farms, 4227 Durbin Rd. SE, New Philadelphia. Please call 330-339-2337 or email [zoller.1@osu.edu](mailto:zoller.1@osu.edu) by August 24. Topics include:

- **Parts & Equipment Shortages are Real – Be Prepared: Thoughts on 2021 Harvest & 2022 Planting**
  - Dr. John Fulton, OSU Food, Agricultural, and Biological Engineering
- **Are You Ready for Carbon Markets?**
  - Mike Estadt, OSU Extension Educator, ANR, Pickaway County
- **OSU Extension Agronomy & Farm Management Resources**
  - Chris Zoller, Extension Educator, ANR, Tuscarawas County
- **Lessons Learned from Building a Farm Shop**
  - Matt & Luke Durbin, Durbin Farms

**MEATLESS MEAT INDUSTRY**...is discussed in this University of Illinois Farmdoc Daily article: <https://farmdocdaily.illinois.edu/wp-content/uploads/2021/07/fdd220721.pdf>.

## **What is Meatless Meat?**

The meatless meat industry produces two categories of products: plant-based meat and lab-grown meat. Both of these products are distinct from alternative meat products such as veggie burgers or tofurkey because they are formulated to look, smell, and taste like animal meat. Their nutritional profiles also are designed to resemble that of meat. Plant-based meat products, true to their name, are processed using only ingredients derived from plants. Formulations vary by brand – the brand “Impossible Burger” is made mostly of soy protein concentrate, coconut oil, and sunflower oil. It uses soy leghemoglobin, a compound derived from soybean, to imitate meat’s bloodiness and juiciness (Impossible Foods, 2020). Another brand, “Beyond Meat”, uses a pea-rice-mung bean formula, along with coconut oil, pomegranate juice, and beet juice. Lab-grown meat, meanwhile, is created taking starter cells from an animal biopsy or embryo and cultivating them into myocytes, muscle cells, along with fat and tissue cells. These are then proliferated in a liquid media in a piece of equipment called a bioreactor, and these cells are grown around micro-scaffolding in order to form cuts of meat. There is also an ‘animal-free’ method which involves creating a piece of animal DNA (using DNA code stored in genome databases) and inserting it into a non-animal host organism (Waschulin & Specht, 2018). Similarly, the media in which the cells grow typically has been fetal bovine serum, but formulations without animal components are also under development (2018).

## **State of the Industry**

The Good Food Institute estimates that meatless meat sales comprise 1.4% of total meat sales in the U.S. (2021). The market for these products is valued at \$14 billion (Theurer et al., 2019) and Barclays predicted that the market would expand to \$140 billion in the next decade, capturing 10% of the globe’s \$1.4 trillion meat industry (2019).

The plant-based meat products are currently on the market in the U.S. and Europe and Asia, where they are sold in restaurants and grocery stores. Lab-grown meat is still in its R&D phase and has not yet entered the market in the U.S.



Of the start-ups, there are three main competitors in the U.S. market. The first is Beyond Meat, a U.S.-based public company founded in 2009 and valued at \$4.8 billion (Franklin & Sen, 2019).

Impossible Meat is the second company which sells plant-based meat products. It is a private company founded in 2011, and the company was valued at \$777 million as of November 2019 (Franklin & Sen, 2019).

The third plant-based meat start-up is The Meatless Farm Company. Based in the U.K., its formula and product offerings are similar to that of Beyond Meat. It is the exclusive provider of plant-based meat to Whole Foods, and its products are also available in the United Arab Emirates, Canada, China, and Europe (Meatless Farm, 2020).

Large, established meat companies are also entering the plant-based meat market. Companies such as Tyson, ADM, JBS, Kellogg's, and Nestlé have developed brands for their plant-based products.

For lab-grown meat, the Good Food Institute reports that there are nearly fifty start-ups globally working on cultivated meat products, 19 of which are in the U.S., the rest in 15 other countries (Good Food Institute, 2019). The largest lab-grown meat company in the U.S. is Memphis Meats, which has raised \$180 million from investors (Weiner-Bronner, 2020). Memphis Meats has successfully grown beef meatballs and cuts of chicken and duck from cell culture. Another prominent one is Aleph Farms, an Israeli company that specializes in growing steaks currently valued at \$14 million (Lewis, 2020). It garnered attention in 2019 when it successfully grew a steak on the international space station, to demonstrate how its production process uses few natural resources (Yeung, 2019). Mosa Meats, a Dutch start-up, grew the world's first piece of meat from steer cells in 2013, based on research funded by Google at Maastricht University (Mosa Meat, 2020).

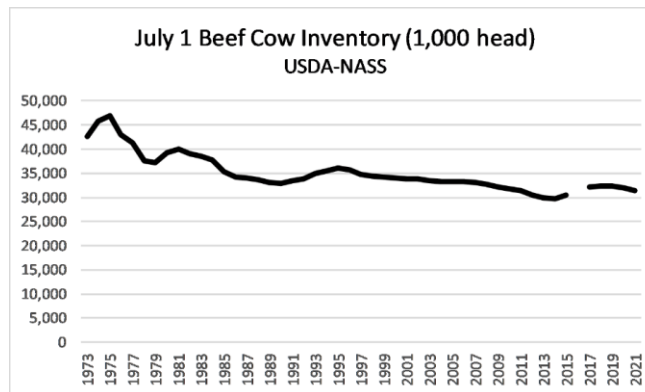
**AG LAW UPDATE**...from Jeff Lewis, OSU Extension Ag & Resource Law Program is provided here: <https://farmoffice.osu.edu/blog/fri-07162021-432pm/ag-law-harvest>. Highlights from the post:

- **President Biden signs executive order to reduce consolidation in agriculture.** President Biden's recent [Executive Order on Promoting Competition in the American Economy](#) seeks to address inadequate competition within the U.S. economy that the administration believes holds back economic growth and innovation. With respect to agriculture, the Order seeks to break up agricultural markets "that have become more concentrated and less competitive." The Biden Administration believes that the markets for seeds, equipment, feed, and fertilizer are dominated by a few large companies which negatively impacts family farmers and ranchers. The Biden Administration believes that the lack of competition increases the costs of inputs for family farmers all while decreasing the revenue a family farmer receives. The Order directs the USDA to consider issuing new rules: (1) making it easier for farmers to bring and win lawsuits under the Packers and Stockyards Act; (2) prohibiting chicken processors from exploiting and underpaying chicken farmers; (3) adopting anti-retaliation protections for farmers who speak out about a company's bad practices; and (4) defining when meat producers can promote and label their products as a "Product of the USA." The Order also requires the USDA to develop a plan to increase opportunities for small farmers to access markets and receive a fair return and encourages the Federal Trade Commission to limit when equipment companies can restrict farmers from repairing their own farm machinery.

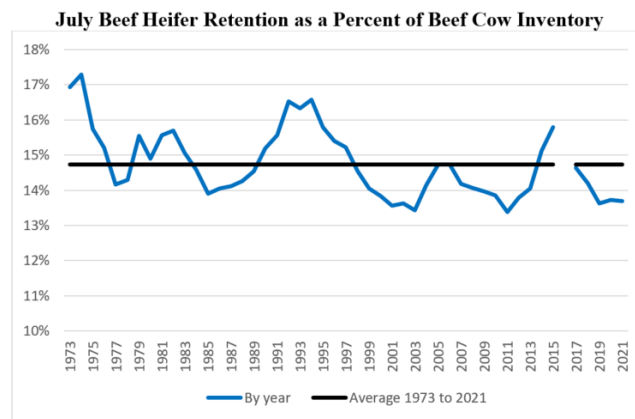
**BEEF COW NUMBERS CONTINUE TO DECREASE**...at the national level, but there is reason to be optimistic into the future. In this OSU Extension Beef newsletter (<https://u.osu.edu/beef/2021/07/28/beef-cow-numbers-continue-to-decrease-at-national-level/#more-11227>) Dr. Kenny Burdine, University of Kentucky Extension describes what these declines may mean for the beef industry. Most all beef related inventory categories were lower, with all cattle and calves down 1.3% from July 1, 2020. Beef cow inventory, which was off a little more



than 2% from last year, was the largest mid-year decrease in beef cow numbers since 2012, but still leaves the beef cow just 3% off its recent high in 2018. Note the gap in 2016 – no estimate was made that year.



Heifer retention estimates also paint a picture of decreasing beef cow numbers in the future. While beef heifer retention in nominal terms has been pretty flat the last three years, I like to examine that number as a percent of beef cow numbers. Put simply, if heifer retention is smaller than the culling rate, this suggests decreases in beef cow inventory. The figure below attempts to capture this as it compares heifer retention as a percentage of beef cow inventory on an annual basis (blue line) to the average of this measure going back to 1973 (black line). There was no estimate in 2016, which is why the gap exists. Note that each of the last three years have been about 1% below that long run average. Culling patterns for the balance of 2021 will be impacted by weather patterns and calf prices, but I feel pretty confident that this trend of decreasing beef cow numbers will continue into 2022.



Source: USDA-NASS and Author Calculations

Decreases in inventory should also line up with future increases in packing capacity, and the two together are significant reason for optimism in the next few years.

**BQA RECERTIFICATION**...sessions are scheduled at Sugarcreek Stockyards (see below). Please pre-register by calling 330-339-2337

- July 29 at 7pm (refreshments provided courtesy of the Tuscarawas County Cattle Association)
- August 10 at 1pm
- August 25 at 7pm (refreshments provided courtesy of the Tuscarawas County Cattle Association)

**FARM SCIENCE REVIEW**...will be held September 21, 22, and 23 at the Molly Caren Agricultural Center near London, Ohio. The FSR features exhibitors, field demonstrations, educational sessions, and so much more. Please stop in the Extension office to get tickets. Additional information about the FSR is available here: <https://fsr.osu.edu/>.

**LINKS TO USEFUL OSU EXTENSION RESOURCES**...are provided below:

- Farm Management - <https://farmoffice.osu.edu/>
  - Ohio Farm Business Analysis & Benchmarking Program - <https://farmprofitability.osu.edu/>
  - Farm Budgets - <https://farmoffice.osu.edu/farm-management/farm-budgets>
  - Custom Rates - <https://farmoffice.osu.edu/farm-mgt-tools/custom-rates-and-machinery-costs>
  - Ohio Ag Manager - <https://u.osu.edu/ohioagmanager/>
- Dairy - <https://dairy.osu.edu/>
- Beef - <https://u.osu.edu/beefteam/>





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## TUSCARAWAS COUNTY AGRICULTURE & NATURAL RESOURCES

August 5, 2021

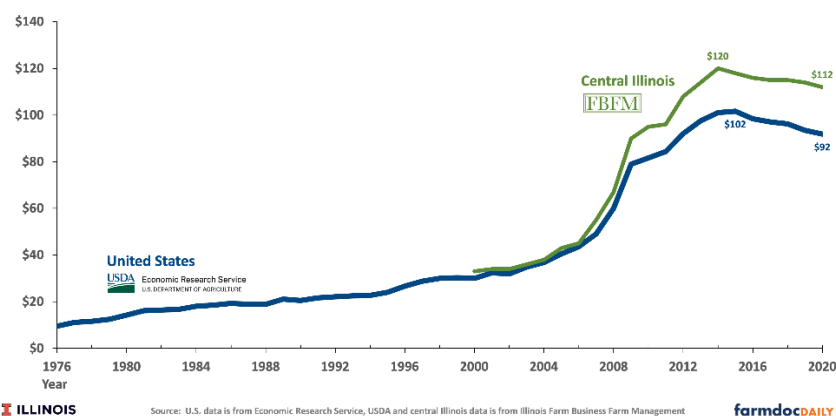
**AGRONOMY UPDATE**...will be held **August 26** from 1pm to 4pm at Durbin Farms, 4227 Durbin Road SE., New Philadelphia. Program topics and speakers include:

- **Parts and Equipment Shortages are Real – Be Prepared: Thoughts on 2021 Harvest & 2022 Planting**
  - Dr. John Fulton, OSU Food, Agriculture, and Biological Engineering
- **Are You Ready for Carbon Markets?**
  - Mike Estadt, OSU Extension Educator, ANR, Pickaway County
- **OSU Extension Agronomy & Farm Management Resources**
  - Chris Zoller, OSU Extension Educator, ANR, Tuscarawas County
- **Lessons Learned from Building a Farm Shop**
  - Matt & Luke Durbin, Durbin Farms

There is no fee to attend, but pre-registration is requested by August 24. Registration can be done by email to [zoller.1@osu.edu](mailto:zoller.1@osu.edu) or by calling 330-339-2337.

**IF HISTORY IS ANY INDICATOR**...expect higher corn seed costs in 2022. The complete analysis is available in this University of Illinois Farmdoc newsletter <https://farmdocdaily.illinois.edu/wp-content/uploads/2021/06/fdd290621.pdf>). Figure 1 shows per acre seed costs for corn from two sources. The blue line provides seed costs for the entire United States and is prepared by the Economic Research Service (ERS), an agency of the U.S. Department of Agriculture. The green line shows per acre seed costs incurred by central Illinois farmers enrolled in Illinois Farm Business Farm Management (FBFM).

Figure 1. Per Acre Seed Costs for Corn in the U.S. and Central Illinois



Three periods of seed costs are evident in Figure 1. From 1975 to 2005, per acre seed costs increased steadily, with an average per acre increase in the U.S. of \$1.13 per year.

During the second period from 2006 to 2013, corn prices rose due to the increasing use of corn in producing ethanol. As a result, expected corn revenue reached higher levels, and per acre seed costs increased. In the U.S., seed costs increased from \$44 per acre in 2006 to \$102 per acre in 2015, an average yearly increase of \$6.50 per acre.

The third period constituted a lower commodity price period, corresponding with leveling growth of corn use in ethanol. During the 2015 to 2020 period, seed costs declined slightly from \$102 in 2015 to \$92 in 2020.

Corn prices moved higher in late 2020 and have persisted through 2021. Historical relationships would suggest that those higher corn prices could lead to higher seed costs in 2022.

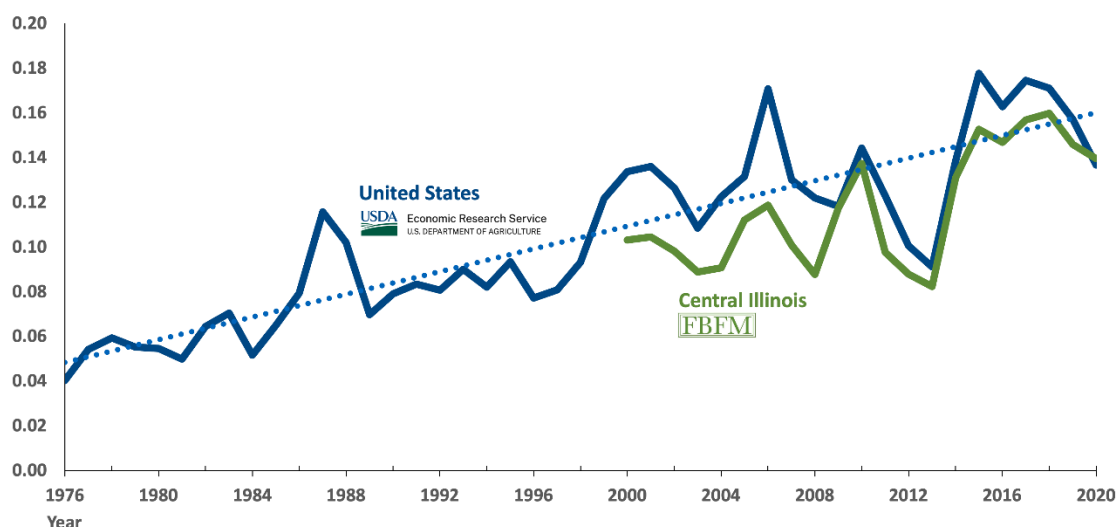
A statistical evaluation was conducted to determine the factors impacting per acre seed costs in the United States. U.S. data were used rather than central Illinois data because a longer time series exists for U.S. data. Two factors explained over 90% of the variability in per acre seed costs.

**Expected Gross Revenue:** Increases in expected gross revenue usually led to higher per acre seed costs. For this analysis, expected gross revenue equals the trend yield times the previous year's corn price. Prices are time-dependent and last year's result is a good projector of next year's price.

The expected gross revenue of corn was highly statistically significant. Overall, results from the regression suggest that a \$100 increase in gross revenue results in a \$7 increase in seed costs; however, the increase (decrease) enters the relationship over time. The expected revenue difference between 2021 and 2022 would likely lead to a \$6 to \$7 increase in seed costs.

**Time:** Over time, seed costs have increased relative to expected gross revenue. Figure 2 shows per acre seed costs divided by expected gross revenue, thereby illustrating the upward trend in seed costs as a percent of expected gross revenue. Over the 1975 to 2020 period, seed costs on a per acre basis have increased an average of \$2.70 per year.

**Figure 2. Per Acre Seed Costs Divided by Expected Gross Revenue**



ILLINOIS

Source: U.S. data is from Economic Research Service, USDA and central Illinois data is from Illinois Farm Business Farm Management

farmdocDAILY



A number of reasons can be given for increasing seed costs over time. Hybrids have continually increased in yield leading to a higher value for seed. Moreover, biotechnology traits in corn hybrids have led to management advantages over time, which could lead to reductions in pesticides and tillage costs. Over time, hybrids have become more specialized to a geographical area and soil type. For all these reasons, seed and genetic improvements in seed have become more valuable over time.

In addition, seed and crop genetics have become increasingly concentrated. Over time, many seed companies have consolidated and merged. Now three companies — Bayer, Corteva, and Syngenta — have a large share of biotechnology traits and have large investments in crop genetics. The role of competition in seed pricing is not well understood. Still, the consolidation trends reduce the number of firms competing with one another for a share of farmers' purchases.

## Summary

Over time, seed costs have been positively related to expected gross revenue for corn. In addition, seed costs have trended upward over time. Currently, gross revenue for corn is expected to be higher in 2022 than in recent years. As a result, seed costs for corn should be expected to increase. An increase in the \$6 to \$10 per acre range is expected on an average, national basis.

**SCOUT ALFALFA FIELDS**...for the presence of Potato Leafhopper (PLH). Sweep netting is the best way to scout for PLH. If alfalfa is more than seven days from a cut and plants are under normal stress, a good rule of thumb for an action threshold for treatment is when the number of PLH (nymphs+adults) in a 10-sweep set is equal to or greater than the height of the alfalfa. For example, if the alfalfa is 10 inches tall, and the average number of PLH per sample is 10 or higher, treatment is warranted. If the average is nine or lower, the grower should come back within a few days to see if the population is continuing to increase (treatment warranted), staying the same (come back again in a few days), or declining (treatment not warranted). Vigorous alfalfa can tolerate higher numbers, and stressed alfalfa can tolerate fewer, so you may need to adjust your action threshold based on the condition of the alfalfa. Keep in mind that an early cutting may also be an option.

(Source: OSU Extension C.O.R.N. newsletter <https://agcrops.osu.edu/newsletter/corn-newsletter/2021-25/don%E2%80%99t-get-burned-hopperburn%E2%80%94check-alfalfa-potato-leafhoppers>)

**BEEF-DAIRY CROSSBREEDING**...calf death loss was examined in a case study, as described in this OSU Extension Buckeye Dairy Newsletter <https://dairy.osu.edu/newsletter/buckeye-dairy-news/volume-23-issue-4/assessing-calf-death-losses-beef-dairy-crossbreeding>.

The case study was developed for educational purposes; and the information may or may not be applicable to other situations. The overall objective was to assess calf death losses at calving for a 12-month period (March 2020 to March 2021). Therefore, the patterns of calf death losses were assessed on the following variables by:

1. Length of dry period (primarily cows with <44 days),
2. Gestation length and twin pregnancies,
3. Parity (first calf heifer and multiparous cows),
4. Sire (beef and Holstein bulls),
5. Calendar week, and
6. Calendar month.

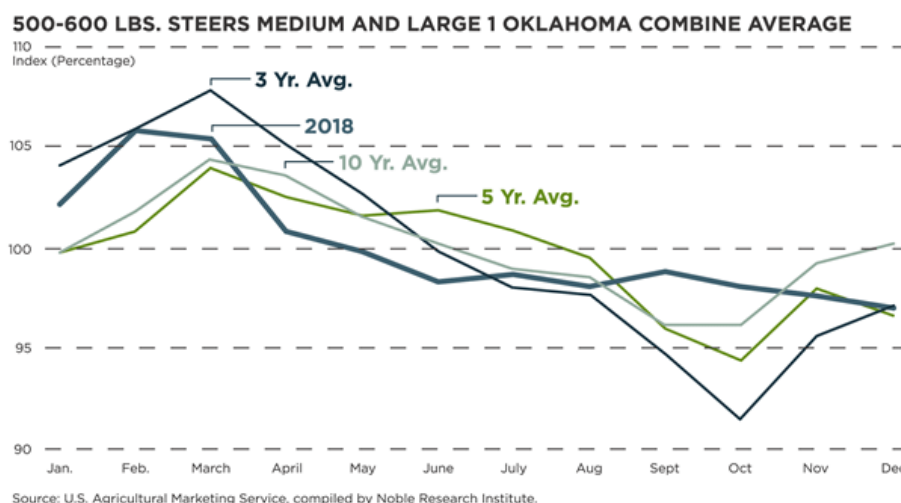


The overall calf death loss at the maternity was 5.4% (340 out of 6,488 calvings). The pattern of calf death losses (n = 340) at calving were further analyzed to identify opportunities for improvement within the beef-dairy crossbreeding program (calving difficulty was not recorded). Please click the link above to learn about the outcomes of this case study.

**FALL CALVING PROFITABILITY**...can be achieved. Management considerations are highlighted below. Please see the full article in this OSU Extension Beef newsletter: <https://u.osu.edu/beef/2021/08/04/fall-calving-is-it-profitable/#more-11201>.

**Seasonality of Cattle Prices** – As with most things in agriculture, supply and demand has a great impact on prices. Griffiths et al, 2017 from the University of Tennessee analyzed several studies comparing spring and fall calving systems. After comparing the systems on a 205-day weaning age and two separate feed resource scenarios they concluded that even though spring-calving cows had heavier calves at weaning and lower feed costs than the fall-calving cows, the higher prices of steer and heifer calves captured by fall-born calves were able to cover the higher feed expenses and lighter weaning weights by the fall-born calves.

During the spring when there is demand for calves to graze wheat in the plains, and grass here locally, prices on a per cwt basis are significantly higher due to a tighter supply of calves. That tight supply of fall born calves contributes to seasonality of the markets and our annual high for stocker calves and feeder cattle.



**Mud** –As rainfall patterns shift here in Ohio and the rest of the eastern Cornbelt, indications are that our springs are going to be warmer and wetter over time.

As mud becomes more of an issue, especially in the last trimester of gestation for a beef cow, research conducted at the Ohio State University has shown suggests that a cow in muddy conditions requires an additional 1.8 Mcal Net Energy/day to maintain adequate body condition, Nickles et al, 2020.

**Management Considerations** – Historically, one of the biggest drawbacks to fall calving has been the increased cost to feed and maintain a lactating cow over winter. That feed cost can be offset by higher calf values in the spring of the year.

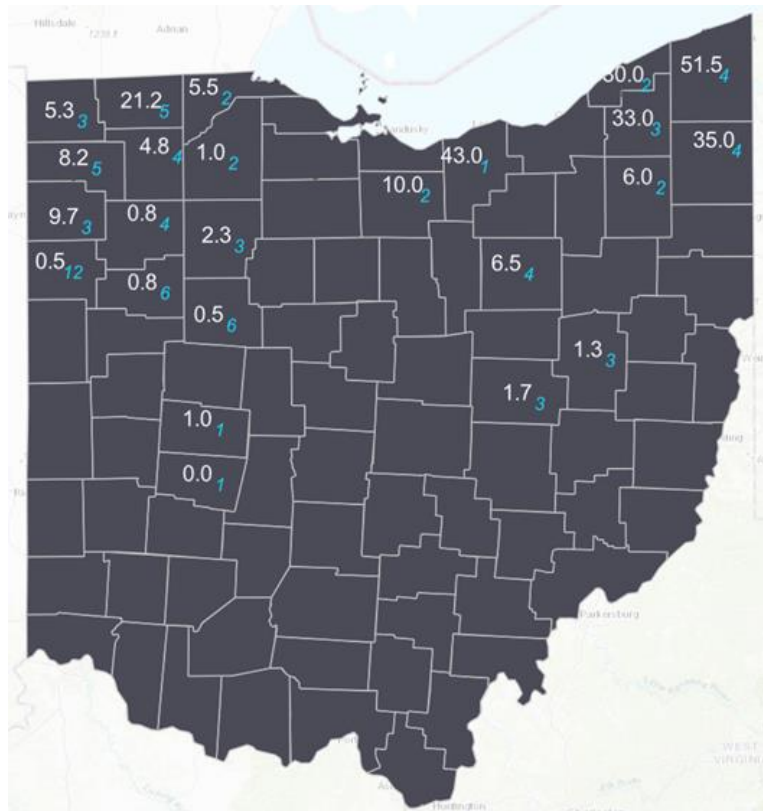
In the past couple of years, hay quality and quantity have been limiting factors for some cattlemen. If forage is at a premium and cow condition is being compromised with fall calving cows why not consider reducing the caloric needs of the cow by ending lactation around 120 days of age?



In addition to improving management of available forage, we can also better manage calf performance once they are weaned. Weaned calves can be fed a grower ration until marketing later in the spring. In order to do so, there is a transfer in feed cost from the cow to the calf.

**Final Thoughts** – Having a defined calving season is better than none at all. What works in other parts of the country may or may not work for your herd, however it is always good to evaluate various management systems and current on farm practices.

**WESTERN BEAN CUTWORM**...trap counts declined in the last week. Ten counties remained above scouting threshold and include Ashtabula, Defiance, Fulton, Geauga, Huron, Lake, Lorain, Paulding and Trumbull.



(Source: OSU Extension C.O.R.N. newsletter <https://agcrops.osu.edu/newsletter/corn-newsletter/2021-25/western-bean-cutworm-update>)

**CARBON MARKETS**...are emerging and require a great deal of caution before entering into any agreements. This OSU Extension Ag Law Blog (<https://farmoffice.osu.edu/blog/tue-08032021-126pm/considering-carbon-farming-take-time-understand-carbon-agreements>) explains a number of important legal considerations.

Highlights from the Ag Law Blog:

- **New terminology.** Carbon markets and carbon agreements speak a new language, containing many terms we don't ordinarily use in the agricultural arena. The terms are not fully standardized, and their meanings may differ from one program to another. Understanding these new terms and their legal significance to the carbon agreement relationship is important.
- **Initial eligibility criteria.** Each carbon program has specific requirements for participating in the program. Common eligibility criteria are:



- **Location.** The program may be open only to farmers in a particular geographic location, such as within a specified watershed, region, or state.
  - **Acreage.** A minimum acreage requirement often exists, although that can vary from 10 acres to 1,000 or more acres. Some projects may allow adjacent landowners to aggregate to meet the minimum acreage requirement, but that can raise questions of ineligibility should one landowner leave the program.
  - **Land control.** If the farmer doesn't own the land on which carbon practices will occur, an initial requirement may be to offer proof that the farmer will have legal control over the land for the period of the agreement, such as a written lease agreement or certification by the tenant farmer.
- **Payment.** While the goal of a carbon agreement is often to generate carbon credits to be traded in the carbon market, there are varied ways of paying a farmer for adopting the practices that create those credits. One is a per-acre payment for the practices adopted, with the payment amount tied to the reduction of carbon resulting from the adopted practices. Another approach incorporates the carbon market—a guaranteed payment that can increase according to market conditions. Concerns about market transparency abound here. Yet another method is to calculate the payment after verification and quantification by a third-party.
  - **Acceptable carbon practices.** Carbon practices are the foundation for generating carbon credits. An agreement might outline acceptable carbon practices a farmer must adopt as the basis for the carbon credit, such as NRCS Conservation Practices.
  - **Additionality.** Many agreements require “additionality,” which means there must be new or “additional” carbon reductions that occur because of the carbon agreement, which would not have occurred in the absence of the agreement.
  - **Time periods.** Two time periods might exist in an agreement. The first is the required length of time for participation in the program, which may vary from one year to ten or more years. The second relates to the concept of “permanence,” or long-term carbon reductions.
  - **Verification and certification.** Here's an important question—how do we know whether the carbon practices do generate carbon reductions that translate into actual carbon credits? Verification and certification help provide an answer. But verification is a testy topic because there is uncertainty about how to identify and measure carbon reductions resulting from different practices on different soils in different settings. Predictions that are based upon models are common, but there is disagreement over appropriate and accurate methodology for the models.
  - **Data rights and ownership.** The verification question naturally leads us to a host of data questions. Data is critical to understanding and verifying carbon practices, and every agreement should include data sharing and ownership provisions. What data must be shared, who has access to the data, how will data be used, and who owns the data are questions in need of clear answers in the agreement.
  - **Legal remedies.** There's always the risk that a contract will go bad in some way, whether due to non-performance, non-payment, or disputes about performance and payment. A carbon agreement could include provisions that outline how the parties will remedy these problems. An agreement might define circumstances that constitute a breach, and the actions one party may take if breach conditions occur. An agreement could also list reasons for withholding payment from a farmer; one concern is that insufficient data or proof of carbon reductions or carbon credit generation could be a basis for withholding payment. There could also be penalties for early withdrawal from the program or early termination of the agreement. It's important to decipher any legal remedies that are contained within a carbon agreement.



For more information on carbon agreements, see [this listing from the Ohio Soybean Council](#) of programs available to Ohio farmers with a side-by-side comparison of those programs, and this report on [How to Grow and Sell Carbon Credits in US Agriculture](#) from Iowa State University Extension.

**SILAGE HARVEST**...will be here sooner than we think and now is the time to prepare. This OSU Extension Buckeye Dairy Newsletter (<https://dairy.osu.edu/newsletter/buckeye-dairy-news/volume-23-issue-4/creeping-towards-harvest>) provides detailed management recommendations. Important considerations include: moisture, chop length, and chop height.

### Moisture:

Silage storage type and recommended moisture content for corn silage harvest:

Storage Type	Moisture %
Upright	60-65
Upright Oxygen Eliminating	50-60
Bunker	65-68
Bag	62-68

### Chop Length:

The theoretical length of cut (**TLC**) ranges from ½ to ¾ inch. Shorter cut silage will pack better but will not be as effective of a fiber source if it were longer. If you use a kernel processor, TLC is around the ¾ inch recommendation because the plant is being crushed and compaction in the bunk will be greater. Using a kernel processor will then not only increase digestibility and fermentation capacity of the silage, but indirectly increases the amount of physically effective fiber through increased TLC.

### Chop Height:

Average height of chop is between 7 and 18 inches and can alter the digestibility and yield of silage. According to Pennsylvania State University, raising the cutter bar from 7" to 19" will decrease neutral detergent fiber (**NDF**) content by about 8% and increase starch content by about 2 percentage points. However, the increase in cutter height decreased yield by about 7%.

**FARM SCIENCE REVIEW**...will be held in-person this year on September 21, 22, and 23. Additional information about the Farm Science Review is available here <https://fsr.osu.edu/home>. Be sure to stop by the Extension office to purchase pre-sale tickets.





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## TUSCARAWAS COUNTY AGRICULTURE & NATURAL RESOURCES

August 11, 2021

**CORN LIVE**...sponsored by OSU Extension, will air **Thursday, August 12, at 8am**. This week's segment will feature Matt Reese, Ohio's Country Journal, and several OSU Extension Educators discussing yield estimates for corn and soybean.

Soybean specialist Laura Lindsey will join to comment on the overall growing season and yield potential moving forward, along with corn and wheat pathologist Pierce Paul who will discuss disease pressure in corn and yield loss potential.

One hours of crop management CCA CEUs are available for attending this free online session. Register to attend at [www.go.osu.edu/cornlive](http://www.go.osu.edu/cornlive).

**ADJOINING LANDOWNERS**...may be responsible for clearing noxious weeds from fence rows. The [Ohio line fence](#) law does allow a township to step in and clear the fence row of noxious weeds, brush, briars and similar vegetation if a complaint is filed by one landowner against an adjacent landowner who refuses to clear the weeds. The costs for doing so are assessed back on the refusing landowner whose fence row was cleared. If the noxious weeds arise from both sides of the fence, are growing in the fence, and must be cleared from both sides of the fence, the township trustees would have the authority to assess the costs of removal back on both landowners. I've never heard of that happening, but it's certainly one of those "be careful what you wish for" situations. (Source: Peggy Hall, OSU Extension Ag & Resource Law Program)

**OHIO EXPERIENCED**...its 15<sup>th</sup> wettest July on record (1895-present). Even more interesting, daytime highs for July 2021 rank as the 33<sup>rd</sup> coolest, yet overnight lows rank as the 27<sup>th</sup> warmest, the 7<sup>th</sup> largest spread on record. Indeed, this was the result of numerous cloudy/rainy days that kept daytime temperature in check, not to mention, the occasional influx of wildfire smoke from active fires in the western states.

### Forecast

Hot and humid conditions are taking over this week. The sultry air will provide the opportunity for scattered showers and storms each day through Friday. Highs will range from the mid-80s to the mid-90s, with overnight lows in the upper 60s to low 70s through Friday. The weekend is looking drier and a little more comfortable, with highs in the low to mid 80s.

The [Climate Prediction Center's](#) 6–10-day outlook for the period of August 15 – 19 and the [16-Day Rainfall Outlook from NOAA/NWS/Ohio River Forecast Center](#) indicate near to above average temperatures and below average precipitation (Figure 2). Climate averages for this period include a

high temperature range of 82-86°F, a low temperature range of 60-65°F, and average rainfall of 0.70-0.90 inches.

Additional information is available in this OSU Extension C.O.R.N. newsletter:

<https://agcrops.osu.edu/newsletter/corn-newsletter/2021-26/weather-update-hot-and-humid-conditions-return>.

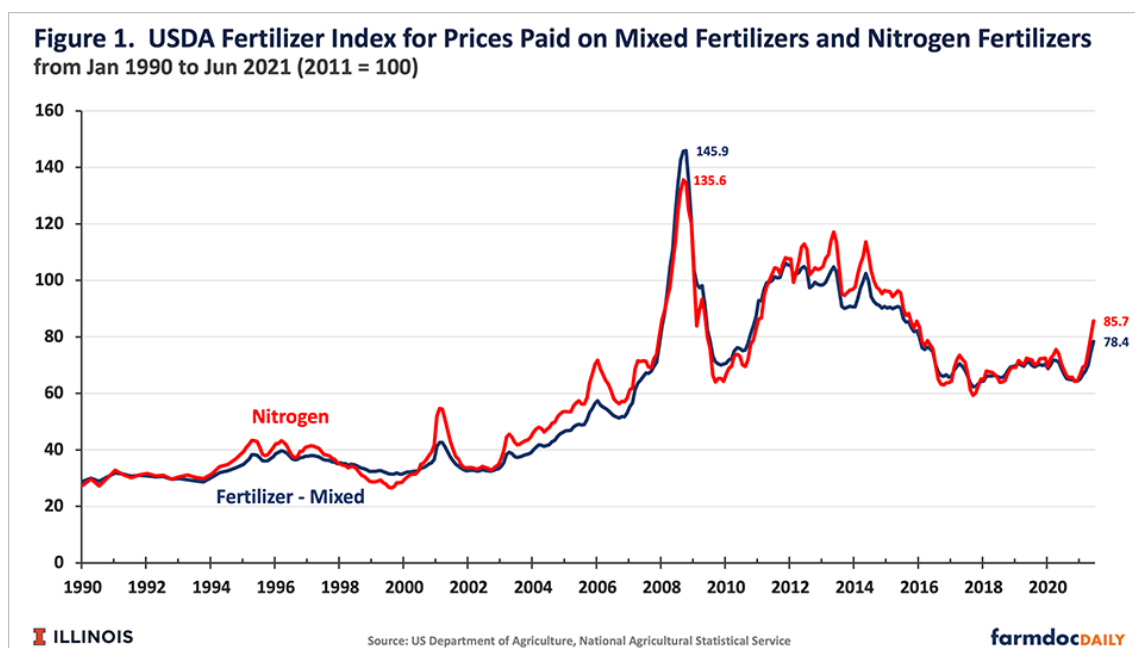
**FERTILIZER PRICES IN 2022**...are expected to increase, as discussed in this University of Illinois analysis: <https://farmdocdaily.illinois.edu/wp-content/uploads/2021/08/fdd060821.pdf>. High fertilizer prices lead to projections of near record-high fertilizer costs in 2022 for both corn and soybeans, though short of the all-time high levels set in 2008.

### USDA Index Values from 1990 to 2021

The U.S. Department of Agriculture (USDA) regularly calculates index values of prices paid for fertilizers. Figure 1 shows those indices for:

1. fertilizers – mixed, hereafter referred to as mixed fertilizers. The mixed fertilizer index is for fertilizers including nitrogen, phosphorus, and potash.
2. nitrogen fertilizers. Nitrogen fertilizers primarily are used to supply nitrogen, including anhydrous ammonia, 28% and 32% nitrogen solutions, and urea.

Since the beginning of reporting in 1990, indices exhibited variability, as one would expect with commodities. Both indices began in 1990 with values in the high 20s and then exhibited upward trends through the mid-2000s. From 1990 to 2005, however, several periods of higher prices followed by declines do exist, with more than 10% decline happening in early-2001 and again in 2006 (see Figure 1).



Many commodities prices, including fertilizers, increased dramatically from mid-2006 until late 2008. Both fertilizer indices hit all-time highs in 2008: mixed fertilizer was 145.9 in October and nitrogen was 135.6 in September (see Figure 1). Rising demand in emerging markets and long-term supply concerns contributed to the record-setting commodity prices. Later in the year, the 2008 financial crisis disrupted all markets, leading to falling commodity prices, including fertilizers. From 2008 highs, fertilizer indices fell and reached lows in late 2009; 70.1 index value for mixed fertilizers in November and 64.0 value for nitrogen in September. Then, indices rose again and spiked several times. For example, the nitrogen index increased and then declined in late 2011, mid-2012, and mid-2013. From 2013 through 2017, fertilizer prices generally decreased, reaching and maintaining low values through 2020.

Both indices increased in 2021. The mixed fertilizers' index value was 65.1 in January, reaching 78.4 in June. The nitrogen index increased from 66.7 in January to 85.7 in June. The June values are much higher than year-earlier levels but are not at all-time highs. The last time these indices were at comparable levels was in December 2015. Historical prices suggest that continued price increases through 2021 and 2022 are possible. Of course, declines could occur as well.

## Summary

Fertilizer prices currently are at high levels, increasing substantially from year-ago levels, but have not reached all-time highs. Fertilizer prices were the highest in 2008, with those prices then declining during the severe phases of the 2008 financial crisis. Fertilizer costs for 2022 likely will be well above average, with much of the overall cost level depending on fertilizer prices moving forward, as well as farmer behavior. History suggests that fertilizer prices can change rapidly, likely bringing modifications to fertilizer cost projections. Further note that several periods of sharp declines have occurred in history.

**AGRONOMY UPDATE**...will be held **August 26** from 1pm to 4pm at Durbin Farms, 4227 Durbin Road SE., New Philadelphia. Program topics and speakers include:

- **Parts and Equipment Shortages are Real – Be Prepared: Thoughts on 2021 Harvest & 2022 Planting**
  - Dr. John Fulton, OSU Food, Agriculture, and Biological Engineering
- **Are You Ready for Carbon Markets?**
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- **OSU Extension Agronomy & Farm Management Resources**
  - Chris Zoller, OSU Extension Educator, ANR, Tuscarawas County
- **Lessons Learned from Building a Farm Shop**
  - Matt & Luke Durbin, Durbin Farms



**HAZY DAYS**...may impact corn and soybean yields, as described in this OSU Extension C.O.R.N. newsletter: <https://agcrops.osu.edu/newsletter/corn-newsletter/2021-26/hazy-days%E2%80%A6how-does-light-influence-corn-and-soybean>.

Capturing sunlight energy, which drives photosynthesis, is important to maximize crop yield. Typical plant canopy-level instantaneous light values (also known as photosynthetic photon flux density) on sunny days range from 1200 to 1800  $\mu\text{mol}/\text{m}^2/\text{s}$  while typical instantaneous plant canopy-level values for cloudy days are 100 to 400  $\mu\text{mol}/\text{m}^2/\text{s}$ . In general, sunny days (all else equal) are better for crops, especially if moisture is non-limiting.

For soybean, photosynthetic photon flux densities that exceed 700  $\mu\text{mol}/\text{m}^2/\text{s}$  produce minimal gains in leaf-level photosynthetic efficiency, which ultimately can translate into yield production. As the sun moves across the sky, leaves can orient themselves perpendicular to incoming direct light to increase interception or parallel to the light to decrease direct interception as too much direct light can be harmful for plants. Changing orientation in the upper canopy can also allow for more light to be intercepted by lower leaves allowing for more leaves to optimize photosynthetic rates at a time.

Corn (having a slightly different photosynthetic pathway) can continue to increase photosynthesis with increasing light and tends to benefit from more sun if temperatures and water levels are not limiting growth. Upper leaves in corn grow more vertically and are smaller but become larger and more horizontal lower in the canopy. This orientation works to increase light penetration into the canopy and optimize interception.

So, with the wildfire haze and just regular cloudy days, how have our average radiation values for June and July compared to past years? In 2021, the daily average photosynthetic photon flux density was lower for June and July as compared to the last 4 years (2017-2020) (Table 1). Given these are daily values, the cumulative effects of this reduction will likely equate to lower overall yield potential because of the additive nature of light loss. However, cooler temperatures could help extend the season and help crops gain yield from more days with active growth during the grain fill period. The levels of light seen in 2021 may still be sufficient if other factors end up being more limiting to yield production; factors like water stress, biotic factors, and adequate mineral nutrition still play a major role in yield gains during the season.

*Table 1: Daily average photosynthetic photon flux density during daylight hours in Wood County, Ohio.*

Year	June	July
	$\mu\text{mol}/\text{m}^2/\text{s}$	
2021	679	694
2017 to 2020	730	738
Difference	-51	-44

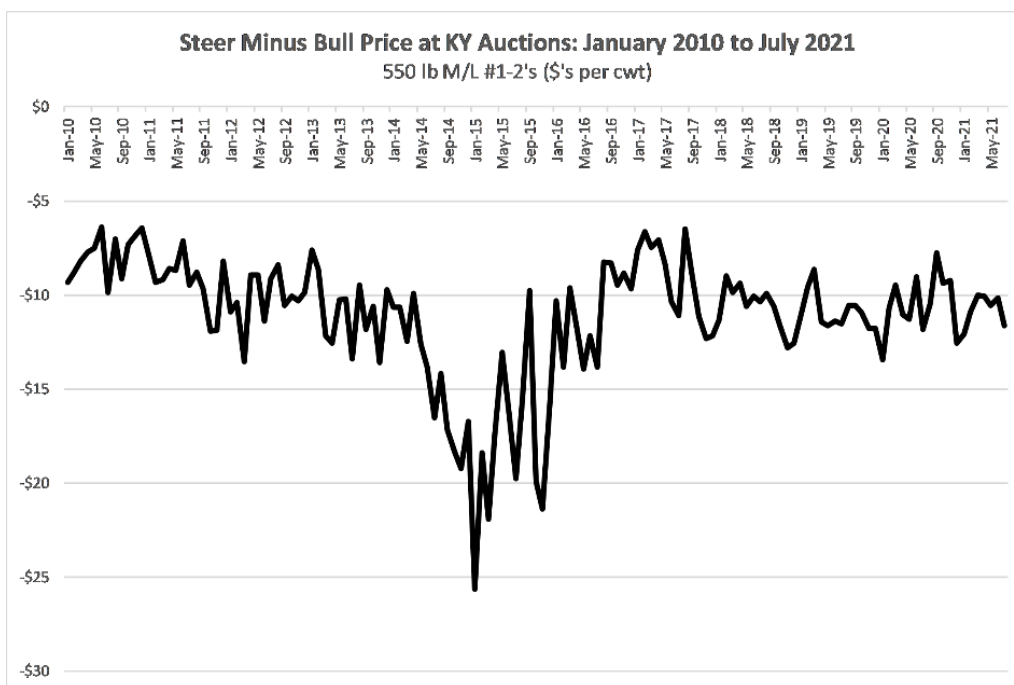


**RENTAL AGREEMENTS**...that are written are always preferred, but there are often questions about what to include. Ag Lease 101 (<https://aglease101.org/>) was developed by the North Central Farm Management Extension Committee and provides several example documents for land and building rental arrangements.

Additionally, OSU Extension has the following publications that can be useful when developing lease arrangements:

- Law Bulletin - [What's in Your Farmland Lease? A Checklist of Farm Lease Provisions](#)
- Law Bulletin - [Creating an Enforceable Farm Lease](#)
- Law Bulletin - [Protecting Interests in a Verbal Farm Lease Situation](#)
- Law Bulletin - [Leasing Your Land for Hunting](#)
- [Crop Share Leasing in Ohio Fact Sheet](#)
- [Legal Aspects of Ohio Farmland Leases Fact Sheet](#)

**STEER-BULL PRICE DIFFERENTIAL**...is discussed by Dr. Kenny Burdine, Livestock Economist, University of Kentucky, in this OSU Extension Beef newsletter: <https://u.osu.edu/beef/2021/08/11/the-steer-bull-price-differential-a-historical-perspective/#more-11336>. When examining historical prices, it is difficult to argue that there is not a price advantage to selling steers.



Going back to January of 2010, there has not been a single month when the average price of 550 lb bulls exceeded that of 550 lb steers in Kentucky. The figure above plots this data by month from January 2010 to July 2021. The bull discount got very wide at times during 2014 and 2015, but



otherwise has been running in a general range of \$7 to \$14 per cwt. Over that entire time period, the bull discount has averaged \$11.12 per cwt.

A logical follow up question would involve the likely weaning weight differences between steers and bulls. In the figure above, I tracked the price differential at the same sale weight. On a 550 lb calf, that \$11.12 per cwt historical price difference amounts to a little more than \$60 per head, but also ignores potential weight differences between the two. I like to frame this discussion by asking how much more a bull calf would have to weigh at weaning to make up for that difference. To answer this question, we have to understand the value of additional lbs (value of gain) and not confuse this with sale price. Price slide refers to the decrease in price per cwt that occurs as the weight of cattle increases. Because of price slide, the value of additional lbs is typically less than the sale price. This is a key concept in cattle marketing that impacts most all decisions that producers make. I will walk through a quick illustration.

The average price of a 550 lb bull calf from 2010 to 2020 in Kentucky auction markets was \$150 per cwt or \$825 per head. If the price slide in the market were \$10 per cwt, for each 100 lb increase in the bull's weight, his price decreases by \$10 per cwt. So, if a bull weighed 600 lbs, rather than 550 lbs, his price would have been \$145 per cwt (\$5 per cwt less) and his total value would be \$870. This is \$45 more dollars than the 550 lb bull, which means that those additional pounds were worth roughly \$0.90 each. At that rate, the bull's weight would need to exceed the weight of the steer by 67 lbs for their values to be similar. As price slide increases, the value of additional lbs decreases. So, if the price slide were \$15 per cwt, rather than \$10 per cwt, the value of those additional lbs would be even less. Using a larger price slide of \$15 per cwt would make the value of those additional lbs worth only about \$0.60, which would mean that the bull would need to outweigh the steer by roughly 100 lbs for his value to be comparable. Similarly, a smaller price slide would result in higher values of gain and fewer additional lbs needed to offset the price differential.

This discussion is quickly summarized in the table below. In the table, I work through these calculations for price slides of \$5, \$10 and \$15 per cwt. The table below is largely for illustration purposes, but does provide a framework from which producers can make similar calculations based on calf prices and price slides in any market.

**Price Slides and Value of Additional Weight**

	<b>\$5 / cwt price slide</b>	<b>\$10 / cwt price slide</b>	<b>\$15 / cwt price slide</b>
Value of 550 lb bull, initial price of \$150 per cwt	\$825 per head	\$825 per head	\$825 per head
Value of 600 lb bull	\$885 per head	\$870 per head	\$855 per head
Value of additional 50 lbs	\$60	\$45	\$30
Value of each additional lb	\$1.20	\$0.90 per lb	\$0.60 per lb
Lbs needed to add \$60 of value per head	50 lbs	67 lbs	100 lbs



Finally, I would mention that implants likely need to be considered as part of this discussion too. While I leave implant specifics to my animal science colleagues, implanted steers have the potential to see much better rates of gain and narrow that weight difference considerably. So, unless a producer is selling into a market that does not allow implants, they may offer the potential to receive steer prices, but see lower impacts on weight gain.

Every producer has to decide for themselves whether castrating bulls makes sense for their operation. I am fully aware that there is a cost to working calves and some producers may choose not to do this due to facility or time limitations. I have not attempted to delve into those additional costs in this article, but rather have focused on the value differences, so that producers can weigh those against the additional costs. There is pretty consistent evidence that bulls will sell at a discount to steers in the marketplace and the additional pounds needed for bulls to offset that discount can be significant. I would also point out that there are individuals in the market who make money by purchasing bulls, castrating them, backgrounding them for a period of time, and re-selling them. I just mention this as evidence that this is a common way that value is added to cattle. So, producers who typically sell bulls may want to consider the potential value that can be added to their calves through this practice as they look for ways to increase profitability in the future.

**BEEF QUALITY ASSURANCE**...training will be held August 25<sup>th</sup> at Sugarcreek Stockyards. The program will begin at 7pm and the TCCA will provide refreshments. Additional trainings will be scheduled following harvest.

**FARM SCIENCE REVIEW**...will be held September 21, 22, and 23 at the Molly Caren Agricultural Center near London. Pre-sale tickets are available from the Extension office.





## TUSCARAWAS COUNTY AGRICULTURE & NATURAL RESOURCES

August 18, 2021

**AGRONOMY UPDATE...** will be held **August 26** from 1pm to 4pm at Durbin Farms, 4227 Durbin Road SE., New Philadelphia. Please RSVP to 330-339-2337 or [zoller.1@osu.edu](mailto:zoller.1@osu.edu) by August 24. Program topics and speakers include:

- **Parts and Equipment Shortages are Real – Be Prepared: Thoughts on 2021 Harvest & 2022 Planting**
  - Dr. John Fulton, OSU Food, Agriculture, and Biological Engineering
- **Are You Ready for Carbon Markets?**
  - Mike Estadt, OSU Extension Educator, ANR, Pickaway County
- **OSU Extension Agronomy & Farm Management Resources**
  - Chris Zoller, OSU Extension Educator, ANR, Tuscarawas County
- **Lessons Learned from Building a Farm Shop**
  - Matt & Luke Durbin, Durbin Farms

**BEEF QUALITY ASSURANCE...** will be held August 25<sup>th</sup> at 7pm at the Sugarcreek Stockyards. The Tuscarawas County Cattle Association will provide drinks. Please call 330-339-2337 to pre-register.

**AGRICULTURAL WORKERS...** are usually categorized in two ways. They are either an “employee” or an “independent contractor.” Depending on how an agricultural worker is labeled determines the duties and liabilities of the agricultural employer.

Generally speaking, if an ag employer has the right to control the work of an ag worker, then the ag worker is probably an employee. This means that the ag employer must abide by a whole host of federal and state laws that relate to labor and employment and can be found liable for any damages caused by their employees under the doctrine of vicarious liability. Vicarious liability is a legal doctrine that may hold an employer responsible for the actions of an employee -- so long as the employee was acting in the ordinary course of business. A good example of the vicarious liability doctrine in action is when a court decides to hold a farmer and/or farm business responsible for any spray drift damages resulting from an employee’s application of herbicide.

On the other hand, ag employers that use independent contractors are usually not liable for any damages that result from the actions of an independent contractor. This obviously makes the use of



independent contractors very appealing but comes at a higher cost than using an employee to do the work.

Simple enough right? Be careful with employees and spray drift or use independent contractors and be worry free. Not really. Although a big concern for ag employers are the liability issues that stem from employees' actions, having employees requires ag employers to fulfill multiple obligations under state and federal labor and employment laws, obligations that otherwise would not exist if an ag employer used an independent contractor to complete the work. Those obligations can include wages, overtime pay, hour restrictions, migrant and seasonal worker protections, tax concerns, and others. So, you see, labeling a worker as an employee or independent contractor goes far beyond just preventing a lawsuit against the ag employer.

Ag employers often think they are using independent contractors to complete work around the farm. But innocently, the ag employer may actually be using an employee to complete work around the farm and is probably violating federal and state law and exposing itself to fines and lawsuits. An ag employer must be careful when determining who is an employee and who is an independent contractor when looking for help on the farm.

More information is available in this OSU Extension Ag Law Blog: <https://farmoffice.osu.edu/blog>.

**SOYBEAN APHIDS**...may be in your fields. Based on recent scouting, we have noticed increasing populations of soybean aphids. As we go into the critical growth stage of soybean, this is also the most important time to check your fields for soybean aphids and see if you have exceeded the threshold of an increasing population of 250 aphids per plant.



To scout for soybean aphid, walk at least 100 ft from the field edge and count the number of aphids from 5 plants in 10 different locations. If your average is greater than 250 per plant, you'll need to come back and re-scout 3-4 days later. If the aphid population increased in that time, an insecticide application is recommended. Keep in mind that to accurately determine the threshold, scouting should be performed at least weekly and multiple times a week if aphids are active in fields.

See this OSU Extension C.O.R.N. newsletter: <https://agcrops.osu.edu/newsletter/corn-newsletter/2021-27/remember-soybean-aphids-they-might-be-your-fields>



**SOYBEAN COST & RETURN DATA**...from growers enrolled in the OSU Extension Ohio Farm Business Analysis and Benchmarking Program is described in this OSU Extension Ohio Ag Manager newsletter: <https://u.osu.edu/ohioagmanager/2021/08/12/soybean-production-costs-returns-in-the-u-s-and-ohio/>.

The table below summarizes gross returns, total expenses, net return per acre, and soybean price received for owned and rented soybean acres, Ohio Farm Business Analysis and Benchmarking Program, 2012 – 2019.

Year	Owned Land				Rented Land			
	Gross Return/Acre (Owned Land)	Total Expenses/Acre (Owned Land)	Net Return/Acre (Owned Land)	Price/Bushel (Owned Land)	Gross Return/Acre (Rented Land)	Total Expenses/Acre (Rented Land)	Net Return/Acre (Rented Land)	Avg. Price/Bushel Received (Rented Land)
2012	\$641	\$422	\$218	\$14.09	\$654	\$452	\$201	\$13.88
2013	\$599	\$443	\$156	\$13.08	\$594	\$435	\$158	\$12.94
2014	\$548	\$446	\$102	\$10.07	\$502	\$423	\$79	\$10.29
2015	\$428	\$396	\$32	\$8.83	\$426	\$432	-\$4.95	\$9.37
2016	\$510	\$413	\$97	\$9.30	\$508	\$442	\$66	\$9.42
2017	\$493	\$401	\$91	\$9.54	\$491	\$462	\$28	\$9.55
2018	\$546	\$423	\$123	\$8.95	\$554	\$443	\$110	\$8.85
2019	\$498	\$445	\$52	\$8.87	\$512	\$454	\$58	\$8.90
<b>Ave.</b>	<b>\$532</b>	<b>\$423</b>	<b>\$108</b>	<b>\$10.34</b>	<b>\$530</b>	<b>\$442</b>	<b>\$86</b>	<b>\$10.40</b>

**NOW IS THE TIME**...to clean grain bins prior to harvest. If the grain bins are already empty, they need to be thoroughly cleaned on the inside and outside. The walls and the floors need to be swept clean. It would be best to use a shop vacuum to reach and remove all grain remnants that are tucked into cracks and crevices as well as the central feed out auger. Be sure to clean off ledges above hatch doors and if there is a ladder on the interior of the bin, be sure that hollow rungs are cleaned out. While working in the bin, look for holes and cracks to the outside are detected and fixed.

On the outside of the bins, clean up any spilled grain, remove or mow weeds from around the base of the bin, and if there is an aeration fan, check the plenum for any accumulation of grain and remove it.

Other areas that should be cleaned to remove any accumulations of grain include augers, grain pits, grain elevator belts, grain driers, grain carts and truck beds, and combines and combine heads. Grain accumulations in any of these pieces of equipment could have been infested during the summer months. The rule of thumb is, if you can look into any of these pieces of grain handling equipment and be able to tell what the last grain crop that was run through it, it is not clean enough.



If a bin has had a known insect problem in the recent past where a residual population of the insect(s) could be hidden under the perforated aeration floor, fumigation might be the only option to destroy these hidden insects. The most likely product to be used for this purpose is aluminum phosphide (phosphine gas) which is sold under a number of different trade names such as Phostoxin, Fumitoxin and Weevil-Cide. When determining the proper dosage for treating the empty bin, one has to remember that the dosage is based on the total volume of the area into which the fumigant is being released.

Additional information and safety precautions can be found in this OSU Extension C.O.R.N. newsletter: <https://agcrops.osu.edu/newsletter/corn-newsletter/2021-27/it%E2%80%99s-time-clean-your-grain-bins-and-everywhere-else-around-your>.

**BEEF CATTLE INVENTORY EXPECTATIONS**...in the next few years are discussed by Dr. Andrew Griffith, University of Tennessee Extension, in this OSU Extension Beef newsletter: <https://u.osu.edu/beef/2021/08/18/expectations-of-cattle-inventory-the-next-few-years/#more-11351>.

Relatively low cattle prices the first half of 2021 and drought concerns in some major cattle producing regions will definitely result in a lower beef cattle inventory on January 1, 2022. This means a reduced supply of calves and feeder cattle, which should support prices in 2022. As prices increase, more heifers will be expected to be retained. This time of retention will further support feeder cattle prices. There is a chance that beef cattle inventory sees a slight increase in 2023 but certainly by 2024. However, the cattle market should be in a bull market at least through 2024 given the current situation.

These expectations could be disrupted by outside factors such as drought or supply disruptions. However, one cannot make decisions based on expectations of unknown disruptions.

**NEW INSECT IPM GUIDE**...now available from OSU Extension. This guide contains information on the biology and management of field crop insect pests in Michigan and Ohio. Content is available for many agronomic crops including field corn, soybean, wheat, alfalfa, and grass forages.

To access this Michigan State University & Ohio State University publication, please click here: <https://aginsects.osu.edu/news/msu-osu-insect-ipm-guide>.

**USE SCIENCE-BASED PRACTICES**...when weaning beef calves. When calves undergo prolonged periods of stress they are predisposed to disease and a failure to thrive in later stages of the marketing chain. There is scientific evidence to indicate that multiple stressors at weaning is physically and psychologically stressful for calves and should be avoided.

There are several alternative weaning methods to choose from apart from abrupt weaning, including: fence-line, two-stage, and the use of a trainer cow. Fence-line weaning keeps the calf from nursing, but still allows for social contact between cows and calves through a fence-line. Calves are typically separated from the cows by a fence-line for anywhere from 3-7 days until the calf and cow adopt independent activities.



Exploratory behavior is common in cattle, and calves will commonly pace the fence-line at weaning. Weaning calves into a familiar pasture is one way to help reduce their pacing and walking behaviors.

Two-stage weaning utilizes anti-suckling nose-flaps that are placed in the nostrils of a calf and prevent nursing, while still allowing social contact with the cow. The nose flaps are usually left in the calf for 7-14 days and are then removed when the calf is completely separated from the cow. Two-stage weaning is a viable option, however, to insert the nose flaps you will need to process calves through the chute and then a second time when you are ready to remove the nose flaps. While it is not common, it is a possibility that some calves may lose their nose flaps. Nose flaps are approximately \$2.25/unit, and these can be disinfected and used again the following year.



The use of a trainer cow at weaning is a method in which calves are abruptly weaned, but a mature, non-lactating cow is placed with the calves to help encourage calves to find the feed bunk and water faster, and to help decrease separation distress. The use of a trainer cow is a non-invasive, non-labor intensive management strategy that is a viable option for producers to implement. This method can easily be done in both pasture and feedlot settings, depending on availability of resources. This is also an ideal weaning method if a cull cow is used as the “trainer cow”, as it is an easy way to supplement the cull cow and add body condition before marketing this cow. There are, however, considerations that should be made prior to using a trainer cow as an alternative weaning method. If a cull cow or non-pregnant cow is used as the “trainer cow”, producers must control the cow’s estrus cycle in order to prevent her from displaying estrus as this can increase walking behaviors in calves, especially bull and steer calves. If weaning calves in a feedlot, or if supplementing calves and the trainer cow on pasture, producers must provide enough bunk space such that calves are not intimidated by the trainer cow at the bunk in the early stages of weaning.

While weaning is inevitably stressful for calves, these alternative methods have been shown to minimize the amount of stress placed on calves during weaning. By using low stress handling techniques and decreasing the number of stressors simultaneously place on calves at weaning, you will be setting your calves up for success in the next phase of production.

Additional details are available in this OSU Extension Beef newsletter:

<https://u.osu.edu/beef/2021/08/18/science-based-weaning-methods-for-beef-calves/#more-11327>.



**USDA LAND VALUES**...2021 survey has been released and is available here:

<https://downloads.usda.library.cornell.edu/usda-esmis/files/pn89d6567/5m60rq58k/zk51wf530/land0821.pdf>.

The table below summarizes farm real estate, cropland, and pasture average values for Ohio from 2017 – 2021 and provides the percentage change from 2020 to 2021. Because these are averages, there are values above and below the number provided below. Many factors can influence these numbers.

Category	2017	2018	2019	2020	2021	Change 2020-2021
Farm Real Estate Value per Acre (OH)	\$6,010	\$6,200	\$6,290	\$6,350	\$6,600	3.9%
Cropland Average Value per Acre (OH)	\$6,150	\$6,320	\$6,400	\$6,460	\$6,800	5.3%
Pasture Average Value per Acre (OH)	\$3,240	\$3,370	\$3,350	\$3,370	\$3,440	2.1%

(Source: USDA Land Values Survey, 2021 Summary)

**CONFINED SPACES**...on farms can be dangerous and deadly. Three farmers at a dairy in Mercer County died last week after entering a manure storage area. Examples of confined spaces on farms include manure pits, silos, and grain bins.

There are four primary dangers for working in confined spaces, the major risk being chemicals and gases that displace or consume oxygen, causing breathing difficulty for the worker. Another danger is the presence of toxins that can damage the respiratory and nervous systems and even cause death. Each confined space has its own specific dangers as well. For example, hazards specific to manure pits include hydrogen sulfide gas, oxygen displacement by gases, and drowning. Meanwhile in silos, the specific hazard is displacement of oxygen by nitrogen dioxide gas. All other hazards of confined spaces can still occur in manure pits and silos.

The gases in manure pits and silos pose a particularly difficult hazard because they are invisible. We as humans have a hard time responding to dangers we cannot see or touch. If you were to map the gases in a manure pit, you would see they appear in layers; they stratify based on weight compared to atmospheric air. Heavier gases sink to the bottom, while those lighter than atmospheric air will be found at the top. Hydrogen sulfide, carbon dioxide, carbon monoxide, and methane are all gases found in manure pits. Going back to our air map, we would see hydrogen sulfide near the bottom, carbon dioxide between the hydrogen sulfide and air, carbon monoxide mixing with air because of their similar weights, and methane above atmospheric air.

Of the manure pit gases, hydrogen sulfide and carbon monoxide are the only truly toxic gases, whereas carbon dioxide and methane have displaced and used oxygen for their formation, depriving the "air" in a manure pit of oxygen for respiratory use. However, all have maximum concentration thresholds that can be found in the accompanying table.



Silo Gases, although different in chemical makeup, still pose the same invisible threat. Nitrogen dioxide gas causes respiratory distress and can cause death within minutes if present in great enough concentration. It is also heavier than air, so will settle near the silage surface.

Confined spaces are a necessity on grain farms and livestock operations. Maintenance of these spaces is also a necessity. The last necessity we also need to remember when working in confined spaces is the safety of ourselves, our families, and our workers. Talking and educating the members associated with the farm can be the first step in preventing confined space emergencies.

#### Hazardous Gases and Concentration Thresholds\*

Gas	Weight	Human Health Threshold
Methane	Lighter than air	Death at 500,000 PPM
Carbon Monoxide	Similar to air	50 PPM
Carbon Dioxide	Heavier than air	1,500 PPM
Hydrogen Sulfide	Heavier than air	5 PPM
Nitrogen Dioxide	Heavier than air	5 PPM

\*Created from Ohio State University Factsheet AEX-591.9.3 and Michigan State University Factsheet "Beware of Manure Pit Hazards."

(Source: Haley Zinda and Dr. Dee Jepsen, OSU Extension, for publication in Farm and Dairy, August 19, 2021)



## TUSCARAWAS COUNTY AGRICULTURE &amp; NATURAL RESOURCES

September 2, 2021

**FALL ARMYWORMS**...are being found in forage crops and lawns. True or common armyworm is a different species than the fall armyworm. The true armyworm is the species that causes problems in cereal crops in the spring of the year. Fall armyworm migrates into Ohio during the summer and could cause problems into late summer.



Tuscarawas County alfalfa field destroyed by Fall Armyworm (photo taken 9-1-2021)



Fall Armyworm

Fall armyworms are much easier to kill when they are smaller, and feeding accelerates rapidly as they grow, so early detection is important. Look for egg masses glued not only to vegetation but to structures like fence posts. Egg masses have a fluffy-looking cover. When the cover is peeled back, eggs are pearly and tan when new, and turn darker as they approach egg-hatch.

Fall armyworm caterpillars vary in color from greenish to tan to dark brown with stripes along the body. They can be easily confused with other species, but a good identifier is an inverted white "Y" shape behind the head. Another species, true armyworm, feeds at night but fall armyworm will feed during the day.

Insecticides will not penetrate egg masses well; it's best to spray caterpillars when they are less than  $\frac{3}{4}$  inches long, at which point most armyworm-labeled pyrethroids will kill them reasonably well. For larger caterpillars, products containing chlorantraniliprole will provide longer residual which may help with control of the harder-to-kill caterpillars over  $\frac{3}{4}$  inches.

In forages, a threshold that can be used is 2-3 fall armyworm larvae per sq foot. If larvae are smaller (less than  $\frac{3}{4}$  inch), they can still do a lot of feeding and are worth treating with an insecticide application. An early cut can help limit damage to the alfalfa, but one must check the field for



survivors. If survivors are abundant, an insecticide application may be warranted to protect nearby fields. Armyworms get their name from moving in large bodies (marching) to new feeding areas.

In corn, armyworms can randomly feed on leaves, with holes occurring throughout the leaf surface. The more damaging stage is when they feed on developing silks and kernels after entering the ear. Once they enter the ear, control by insecticides is much more difficult. Most Bt corn varieties with above ground protection is labelled for armyworm control, but resistance to several Bt traits has appeared in the US. While we have not found Bt resistance in armyworms in Ohio, we would recommend growers scout ALL corn (Bt or non-Bt) for any evidence of damage or resistance. If feeding is found, please contact ([tilmon.1@osu.edu](mailto:tilmon.1@osu.edu), or [michel.70@osu.edu](mailto:michel.70@osu.edu)) or contact me.

Fall armyworm does not overwinter in Ohio. Moths come up from the South early in the season and temporarily colonize the area, especially in grassy areas. The current caterpillars are second generation. If we have a warm fall we could possibly see a problem third generation, especially in forage, cover crops, and winter wheat planted before the fly-free date (see map below). Because of this, scouting for fall armyworm should continue for the rest of the season. Closely observe hay and pasture crops even after cutting or grazing, especially where the crop was heavily damaged. Additional treatment later might be necessary. Moths prefer light-colored surfaces for egg-laying. Check fence rails, fence posts, and tree limbs in and around pastures and hayfields.



Please visit the Forages chapter in the Michigan State/Ohio State Field Crops Insect Pest Management Guide for management notes and labeled insecticides in forages. <https://aginsects.osu.edu/sites/aginsects/files/imce/MSU%20-%20OSU%20Insect%20IPM%20Guide.pdf>

Hay fields that are near harvest should be harvested now, and then the regrowth closely monitored for fall armyworm activity. In Kentucky, the fall armyworms have been reported to be present in hayfields after harvesting the crop. This and the fact that we could get another generation are reason to continue monitoring closely.



Badly damaged alfalfa or grass hay fields should be cut and then rested the rest of this fall with no fall cutting. Fertilize according to soil test recommendations. Monitor the regrowth closely to catch any re-infestation that occurs. Established alfalfa should come back from fall armyworm damage. Recovery of the cool-season perennial grasses will depend on the relative severity of the damage, the overall health of the stand going into the infestation, and how many young tillers were not consumed. It is hard to predict how they will recover, time will tell.

(Source: OSU Extension C.O.R.N. Newsletter: <https://agcrops.osu.edu/newsletter/corn-newsletter/2021-29/unusual-fall-armyworm-outbreaks-are-taking-many-surprise>)

**WEATHER OUTLOOK**...as we close out summer and the growing season we expect some week-to-week swings in the climate pattern for September. This means expect a warm week followed by a cooler week followed by a warmer week. The same applies to rainfall. We expect dry and wet periods. Overall, September appears to favor normal temperatures and slightly wetter conditions especially in southern areas. The driest areas appear to favor northwest Ohio.

The ocean patterns are similar to last year but not quite as extreme so we may see an autumn pattern somewhat similar to last year which is a whole lot of typical conditions. With that said, there is no information in our climate signals to indicate anything else but a typical first freeze for this fall.

Looking ahead to October, most indications show a somewhat warmer and possibly drier period followed by about a normal November.

When you put it all together, we anticipate a slightly warmer September to November period with precipitation close to normal. With the possibility of another weak La Nina this winter it may turn a bit wetter but confidence in that is low to medium at this time.

(Source: OSU Extension C.O.R.N. newsletter: <https://agcrops.osu.edu/newsletter/corn-newsletter/2021-29/climate-outlook-autumn-harvest>)

**LIVESTOCK MEDICATION RECORDS**...and their necessity are highlighted below. More details are provided in this OSU Extension Beef newsletter: <https://u.osu.edu/beef/2021/08/25/livestock-medication-records-are-they-really-necessary/#more-11221>.

In livestock production, a medication may be necessary to treat diseases and restore health. Feed additives containing medications must be used only according to the label instruction. However, if precautions are not taken, problems can arise when an animal tests positive for a drug residue violation in meat, milk and eggs. Remember, these are food producing animals and it is the responsibility of the owner to ensure a safe product is available to consumers. Drug and chemical residues in meat, milk and eggs are of public health concern.

The Food and Drug Administration (FDA) regulates the use of livestock medications in the United States and establishes tolerance levels for residues in meat, milk, and eggs. Following label recommendations and maintaining accurate and proper treatment records helps ensure that violations do not occur.



When treating food animals with any medications, the following must be recorded:

- Name of the drug used;
- Identity of the animal treated;
- Date of each administration of the drug to the animal;
- The dose;
- Route of administration. How the drug was given (for example, by mouth or by injection into muscle);
- The lawful written order of a licensed veterinarian in the context of a veterinarian-client-patient relationship (if applicable);
- Name of the person who gave the drug;
- Length of the withdrawal period; and
- Date the withdrawal period ends (milk can return to the bulk tank or treated animal can safely be sent to slaughter on or after this date).

An ounce of prevention is worth a pound of cure! Drug and chemical residues entering the food chain (milk, meat, or eggs) are of public health concern. Review and adjust health protocols at least once per year with your veterinarian. It really is in your financial best interest to avoid residues entering the food chain to maintain your market channels. In the event you receive an FDA letter indicating a residue violation was found in milk or meat, please contact your veterinarian immediately to develop the response letter documenting the corrective actions.

**IVERMECTIN**...is commonly used in the livestock industry. Ivermectin used in livestock production is not to be used in humans for the treatment of COVID-19. Below is a statement from the OSU Wexner Medical Center:

***We have had some inquiries about the use of Ivermectin. At Wexner Medical Center, the medication is most often used to treat individuals with scabies or lice. Our COVID-19 practice guideline lists Ivermectin under the category of "Medications NOT Recommended for COVID-19 Treatment." This is consistent with recommendations from the National Institutes of Health, the U.S. Food and Drug Administration and a recent bulletin issued by the Ohio State Board of Pharmacy.***

**PREPARING FOR HARVEST**...was the topic of a recent OSU Extension Agronomy Meeting. Dr. John Fulton, OSU Extension Agricultural Engineer, discussed the importance of being proactive, having parts on hand and in the shop (equipment and parts shortage may last for another two years), and reviewed suggested equipment maintenance.

Prior to harvest:

- Check threshing and auger components
- Identify missing hardware
- Inspect drive components
- Calibrate yield monitors
  - See this OSU Extension Fact Sheet <https://ohioline.osu.edu/factsheet/anr-8>
- Optimize combine adjustments
- Keep equipment manuals on hand and available in the field



Additional harvest information is available at this OSU Digital Ag site:

<https://digitalag.osu.edu/precision-ag/research-focuses/harvest-technologies>

**FARM SCIENCE REVIEW**...will take place September 21, 22, and 23 at the Molly Caren Ag Center near London. Be sure to stop by the Extension office to purchase tickets.

**CARBON MARKETS**...were discussed by Mike Estadt, OSU Extension Educator, Pickaway County, at a recent OSU Extension Agronomy Meeting. Highlights from his presentation:

- Increasing carbon dioxide levels have resulted in higher average global temperatures and weather changes
- World governments and private corporations have pledged to reduce/offset carbon dioxide emissions
- A carbon credit is a contractually agreed upon payment to a farmer to use practices that keep carbon in the soil. No commodity is traded or sold, but is an investment made by a company in hopes of a positive environmental return

Practices that reduce carbon dioxide or capture carbon:

Agriculture

- Conservation tillage
- Cover crops
- Conservation set asides
- Reduced nitrogen application
- Capture methane from livestock

Forestry

- Plant trees
- Extend timber rotations
- Replant rather than natural regeneration
- Increase stocking
- Shift species type

Good candidates for a carbon market program:

- Farmers wanting to make changes regardless of payment
- A good fit to the land management goals
- Farmers with good digital records and are comfortable sharing the data

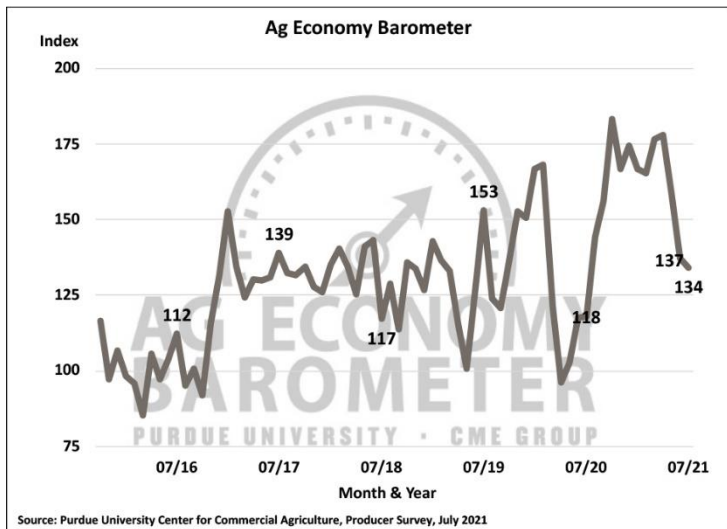
Before entering into contractual agreement, farmers are strongly encouraged to consult an attorney.

**AG ECONOMY BAROMETER**...is a published based on surveys of U.S. farmers. The latest report is available here: [https://ag.purdue.edu/commercialag/ageconomybarometer/wp-content/uploads/2021/08/July-2021-Ag-Economy-Barometer\\_FINAL.pdf](https://ag.purdue.edu/commercialag/ageconomybarometer/wp-content/uploads/2021/08/July-2021-Ag-Economy-Barometer_FINAL.pdf).

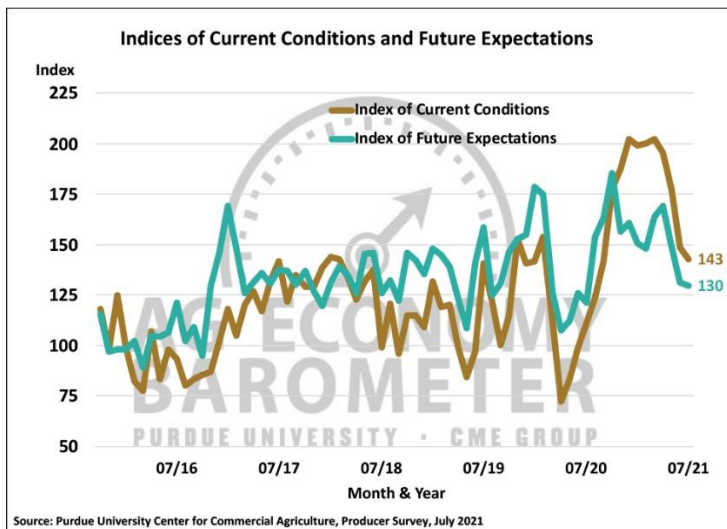
On the heels of a sharp two-month decline, the *Agricultural Economy Barometer* stabilized at a reading of 134 in July, just 3 points below a month earlier. This month's sentiment index was the weakest barometer reading since July of 2020 and marked a return to sentiment readings observed



from 2017 through 2019 when annual average barometer readings ranged from 131 to 133. Ag producers' sentiment regarding current conditions weakened in July.



The *Index of Current Conditions*, at 143, fell 6 points below June's value as principal crop prices weakened. The *Index of Future Expectations* also softened, but at 130 was just 2 points below a month earlier.



Ag producer sentiment appeared to stabilize in July, following a sharp two-month decline, as the *Ag Economy Barometer* was just 3 points lower than in June. Producers remain concerned that farm input prices are likely to rise much more sharply in the coming year than in the recent past and nearly half of corn/soybean farmers expect farmland cash rental rates to rise, potentially squeezing profit margins.

More detailed information about the latest Ag Economy Barometer is available from the website address provided above.



**AUGUST HAY PRODUCTION ESTIMATES**...and implications for winter feeding are discussed by Dr. Kenny Burdine, University of Kentucky Extension, in this OSU Extension Beef newsletter: <https://u.osu.edu/beef/2021/09/01/august-hay-production-estimates-and-planning-for-winter-feeding/#more-11420>.

USDA breaks hay up into two broad categories – Alfalfa and Alfalfa Mixtures and All Other Hay. Both are important, but it tends to be the All Other Hay category that has the most winter feeding implications for cow-calf operations. At the national level, All Other Hay production is estimated to be down by about 3.8% due to fewer harvested acres and lower yields. However, national data seldom tell the full story because hay markets tend to be very localized.

In the table below, I have hand-picked some state production estimates from this report. You will notice I grabbed some representative states from the south and a couple from the drought stricken northern plains. South Dakota really stands out, which is estimated to see a 46% decrease in non-alfalfa hay production this year. While lower acreage is a small factor, this decrease is largely driven by an expected 41% drop in yield. A similar story can be told in Montana, where harvested acreage was actually estimated to be up slightly, but production is expected to be down by 38%. In the south, yield largely explains much higher production expectations in Texas and Alabama, but also explains lower production expectations in Arkansas and Mississippi. Both acreage and yield were estimated to be pretty flat in Kentucky.

The August Crop Production report serves as an important reminder of how different production can be across states and even within individual states. While it is worthwhile to consider winter hay needs anytime, it becomes more important as we move closer to the winter hay-feeding season. Estimates need to be made based on the anticipated number of head to be carried through winter and an estimated number of winter-feeding days based on current expectations for fall grazing. This can be compared to the quantity of hay that has already been put up and expected yields from any fall cuttings. In most cases, if producers feel they will need more hay, it is best to start planning early. Hay typically becomes harder to find, and more expensive, when it is sourced in the winter. And, it is always better to have a little extra hay come spring, than to run out a few weeks prior to grazing.

### **Hay Production Estimates in Selected States (2020 and 2021)**

<b>State</b>	<b>2020 Production (1,000 tons)</b>	<b>Est. 2021 Production (1,000 tons)</b>	<b>Change from 2020 to 2021</b>
Alabama	2,325	2,700	+16%
Arkansas	2,667	2,451	-8%
Kentucky	4,920	5,040	+2%
Mississippi	1,625	1,386	-15%
Montana	1,728	1,067	-38%
South Dakota	2,125	1,150	-46%
Texas	9,065	10,500	+16%
United States	73,745	70,927	-4%

Source: USDA-NASS August Crop Production Report



**MENTAL HEALTH**...in agriculture is an important topic. OSU Extension has recently hired Bridget Britton as a Field Specialist, Behavioral Health. Bridget holds degrees in social work and previously worked as the family and consumer sciences educator in Carroll County. She is certified to teach Mental Health First Aid, Trauma 101, and the Question, Persuade, Refer Suicide Prevention program.

In her role as a behavioral health field specialist, Bridget will lead the development of resources to address the educational needs of farm and rural residents and expand the breakdown on mental health barriers in agriculture.

State and local resources:

- Ohio State University Extension Farm Stress resources website at [u.osu.edu/farmstress](http://u.osu.edu/farmstress)
- Ohio Department of Agriculture's farm stress website at [agri.ohio.gov/wps/portal/gov/oda/gotyourback](http://agri.ohio.gov/wps/portal/gov/oda/gotyourback).

National resources:

- The National Suicide hotline at 800-273-8255 or online at [suicidepreventionlifeline.org](http://suicidepreventionlifeline.org)
- National Farm Bureau's Farm State of Mind website at [fb.org/land/fsom](http://fb.org/land/fsom).

Bridget is in the Tuscarawas County office of Ohio State University Extension and is available for one-on-one discussions with individuals or families. She can be reached at 330-339-2337 or [britton.191@osu.edu](mailto:britton.191@osu.edu).



## TUSCARAWAS COUNTY AGRICULTURE &amp; NATURAL RESOURCES

September 8, 2021

**FALL ARMYWORM**...damage has been observed in various locations throughout the county. The primary target has been alfalfa, but damage has also been observed on grasses. Management options are highlighted below. This OSU Extension C.O.R.N. newsletter (<https://agcrops.osu.edu/newsletter/corn-newsletter/2021-30/managing-forage-stands-damaged-fall-armyworm>) provides more details.

Pictures of two Tuscarawas County alfalfa stands seeded late July and damaged by Fall Armyworm:



Fall Armyworm feeding was evident in the established alfalfa field in the background.

### Fields with minor to no damage seen.

If the hayfield or pasture shows any feeding damage at all and is reasonably close to having enough growth for harvest, cut or graze it as soon as possible. This is perfect timing to take the last cutting of the season (see article on that topic at <https://agcrops.osu.edu/newsletter/corn-newsletter/2021-29/autumn-forage-harvest-management>). If there are large numbers of fall armyworms present (more than 2 to 3 per square foot) and they are  $\frac{3}{4}$ -inch or larger, they will “harvest” the entire field for you while you sleep another night or two. So be aware of what is in your hayfield!

If your hayfield is not quite ready for harvest or is regrowing from a recent harvest, scout it now and continue to scout for fall armyworm every few days until you do harvest it. Be prepared to make a rescue treatment if fall armyworm numbers reach the threshold of 2-3 per square foot.

### Fields with severe fall armyworm damage.

If an established hayfield or pasture has already been severely damaged by fall armyworm, cut it down and salvage what you can or mow off and remove the stems or graze it to prevent any windrows from smothering of the regrowth. This mowing will stimulate the plants to regrow. But be aware that fall armyworms have been seen to survive a cutting, so they could continue to devour the crown buds and any regrowth. Those surviving fall armyworms could also move to adjacent fields including soybean and corn (especially non-Bt corn hybrids).



**Established alfalfa** should recover from having the leaves being stripped off. Essentially, the fall armyworm took the best half of your last harvest. Cutting of the remaining stems will stimulate the fall regrowth process.

The speed of recovery will depend on how many crown buds in alfalfa were devoured by the insect. Regrowth will be slower if crown buds were fed on and new crown buds need to be initiated. Be patient, but it is also very important to stop the feeding from continuing.

Be on the alert for any second infestation from another generation that might occur yet this fall. The Ohio State University Extension entomologists and extension educators across the state are monitoring for further fall armyworm moth flights and which could potentially lead to another generation.

**Established grass hayfields and pastures** will likely show variable recovery depending on the extent of fall armyworm feeding on new tillers and the soil moisture situation. With severe feeding and dry soil conditions, permanent damage and loss of stand could occur. With more limited feeding and good moisture conditions, recovery should occur this fall.

**New seedings made late summer** with severe feeding by fall armyworm in the early seedling stages are likely to be completely lost. Going forward, if your new seeding has no signs of fall armyworm, be monitoring every few days for fall armyworm until frost.

It is essential to continue monitoring the forage stand and apply timely control of fall armyworm if 2 per square foot are present to prevent additional feeding. We have time for recovery this fall, assuming additional feeding does not occur, and the damage already done is not so severe as to have killed the stand.

**FALL ARMYWORM**...may also feed on corn, even those with Bt (as has been documented in states to the south). Although we have not seen any Bt resistance with fall armyworm in Ohio, we also don't often see fall armyworm at all. Now is the time to check corn ears for feeding damage. At this point, control would be difficult since the caterpillars are protected in the ears. So why is checking Bt corn important? If and when, we have a fall armyworm invasion again, we need to make sure that these traits are holding up as we expect. We have had a large enough issue with forage and turf—we don't need another issue in corn. Finally, keep in mind that most fall armyworm are pupating now which means adults will be flying soon.

(Source: OSU Extension C.O.R.N. newsletter: <https://agcrops.osu.edu/newsletter/corn-newsletter/2021-30/are-fall-armyworm-infesting-corn-too>)



**LATE-SEASON POD FEEDING**...by stink bug, grasshopper, and bean leaf beetle have been reported across Ohio. As we start to approach the end of the growing season the larger concern with these insects is the potential for pod feeding, rather than foliage feeding. Pod feeding directly impacts grain quality. Crop stage is also an important consideration. Late-planted fields or double-cropped soybeans which are still green when other fields are drying down can be “trap crops,” attracting the insects that are leaving the other maturing fields. Such fields bear close watching.

Please see this OSU Extension C.O.R.N. newsletter (<https://agcrops.osu.edu/newsletter/corn-newsletter/2021-30/late-season-pod-feeding-bean-leaf-beetle-grasshopper-and-stink>) for additional information.

**TAR SPOT**...has been reported in 21 Ohio counties this year, from as far south as Clark County and as far east as Holmes County. In most of the effected fields, only a few stromata (black tar-like spots) are observed on a few leaves, but in other cases, large sections of fields are affected and there is evidence of an increase in disease severity (percentage of leaf surface covered with stromata) as the crop matures. Severely affected fields show premature drying and wilting of leaves. Another interesting observation is the different in the pattern of development of stromata among hybrids. Disease severity varies considerable among hybrids; some affected hybrids develop many small spots (stromata) that do not seem to increase in size over time, whereas other hybrids develop fewer, but much larger stromata.

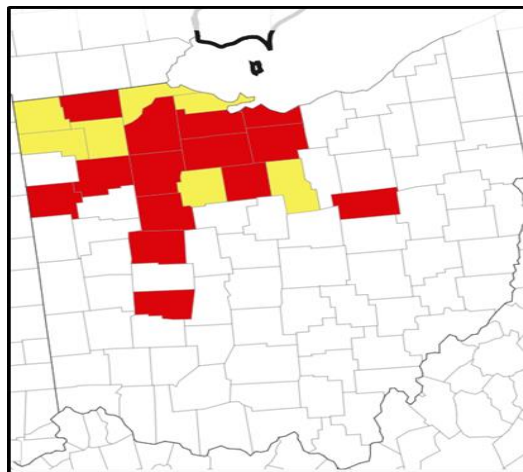


Among the many questions being asked by stakeholders are “how is the disease spread round?”, “why so much more tar spot in 2021?” and “why are some fields under rotation with soybean and/or tillage still showing symptoms of tar spot”. Fungal spores move around mainly by rain or wind, with rain being mostly responsible for short-distant spread within a field from crop residue and diseased leaves, whereas wind can carry spores over long distances between fields within counties and even between counties and states. However, the two means of spore movement do not necessarily work in isolation. Rain helps to stimulate the release of spores from crop residue, which are then carried by wind, and later washed out of the air and onto leaves by rain. So, the fact that some fields without a history of tar spot (did not have the disease previously) and some under rotation and tillage, with little or no corn stubble on the soil surface, still developed tar spot suggests that in 2021 wind was



likely the primary means of disease spread. Spores were likely picked up and transported from field to field within and across states, and the fact that some fields developed the disease quite early (before R1) allowed more time for it to spread to healthy plant within a field and between fields.

Map of Ohio showing counties in which tar spot has been reported during the 2021 growing season (red = reported and confirmed in the Paul Lab, yellow = reposted and awaiting confirmation). However, it should be noted that red or yellow does not mean that all fields in a highlighted county has tar spot, it means that the disease was found in at least one field in that county. In addition, the map does not show how severe the disease is in a given county. A single spot, on a single leaf, in a single field was sufficient for a county to be highlighted as being positive for tar spot.



For additional information about Tar Spot, please see this OSU Extension C.O.R.N. newsletter: <https://agcrops.osu.edu/newsletter/corn-newsletter/2021-30/tar-spot-more-widespread-cross-state-ohio-2021>.

**OPEN HEIFER OPTIONS**...are discussed by Kevin Laurent, Extension Specialist, University of Kentucky, in this OSU Extension Beef newsletter: <https://u.osu.edu/beef/2021/09/08/open-heifer-options-making-lemonade-out-of-lemons/#more-11293>. Open cows and open heifers are part of the business. What we choose to do with open females can affect our bottom line. This discussion focuses on replacement heifers and what options are available when the vet finds her empty.

**Give her another chance or cull her?** It may be tempting to give open heifers another chance especially if you have both a fall and spring calving season. The problem with this option is research shows that there may be upwards of 20% reduction in conception rates on heifers that failed to conceive in the first breeding season. Ask yourself, if she was a slow breeder as a yearling, what will her chances be of breeding back as a 2-year-old? If we choose to cull her, what is the best way to market a 900-1100 lb. open heifer?

**Option 1:** Sell at the sale barn. Obviously, the easiest option, but be prepared for a pretty severe discount mainly because there are simply not that many heifers of that weight class at the sale barn

on any given day. Remember, the cattle market moves in load lots of 48-50,000 pounds. It may take order buyers several weeks to assemble 45-50 open heifers of that weight class to make a load.

**Option 2:** Feed them. Open replacement heifers are still of an acceptable age to be finished for slaughter. Most heifers at pregnancy check time are about 18 months of age and can be easily finished with 3-4 months of additional feeding. Local beef is in big demand and if slaughter space can be scheduled this may be an acceptable option.

**Option 3:** Retain ownership and send them to the feedlot. This is one option that most small to medium size cow calf producers have probably not considered. Recent data from the PVAP-Feedlot program on 18 open replacement heifers showed an average profit of \$132 per head while feeder calves on the same load lost \$98 per head. The primary reason for this difference is due to the discounted starting value of the open replacement heifers, however as you can see in the following table, the replacement heifers outgained and out graded the feeder calves.

Type	No Head	Start Wt.	Start Price (\$/cwt)	Final Wt.	Average Daily Gain	% Prime and CAB	Profit/Head (\$)
Replacement Heifers	18	1054	92.06	1517	3.99	83	131.64
Feeder Calves	45	733	125.27	1230	2.89	18	-97.89

There appears to be great potential for producers to pool open replacement heifers in late summer and send to the feedlot as opposed to selling at a discount. But there are some additional factors to consider.

#### **Considerations for retaining ownership and finishing open replacement heifers:**

- Be mindful of the age of heifers. Heifers that are skeletally mature may be downgraded to Commercial or Utility grade and severely discounted. Try not to feed heifers that are older than 20 months.
- Manage heifers much like feeder calves. Make sure to booster respiratory vaccines and deworm before shipping to the feedlot.
- If you choose to feed heifers on your farm and have never finished cattle, take advantage of upcoming Master Finishing programs that will be offered this fall.

**TO REMAIN...** economically viable, a beef cow must produce and wean a calf annually. One of the first steps in determining if a female will do that in 2022 is confirming yet this year that she is, indeed, with calf. No one plans for a cow or heifer to remain open, yet we all have some that fail to breed in a timely fashion, or at all. Considering the value of cull cows and cull bulls presently, the



reproductive and ultimately the economic efficiency of a beef herd can easily be enhanced with a post breeding pregnancy examination for every cow and heifer.

During the fifth session of the 2021 Ohio Beef Cattle Management School that was hosted via ZOOM by the Ohio State University Extension Beef Team this past winter, a portion of the program included discussion on the economic significance of confirming pregnancy in beef cows and the various diagnostic methods that are available.

Please click this link (<https://u.osu.edu/beef/2021/09/08/preg-checking-greater-economic-return/>) to access the recording.

**HARVEST AID OPTIONS**...for corn and soybeans include herbicides, frost, or both, as described in this OSU Extension C.O.R.N. newsletter: <https://agcrops.osu.edu/newsletter/corn-newsletter/2021-30/harvest-aids-corn-and-soybeans>.

Weedy fields should generally be harvested as late as possible to give maximum time for weeds to die and dry down and rot. Vines can be especially problematic, and burcucumber seems to be having a good year based on comments we have received. Our experience is that a combination of herbicide, time, and frost can be the most effective way to mitigate problems with vines. They need to become rotted and brittle enough to be prevent them from tangling up harvesting equipment.

One of the problems with preharvest herbicide applications is how to apply in mature crop, and how to maximize coverage of weeds with low-volume aerial applications. Low spray volume limits the effectiveness of contact herbicides labeled for this use – Gramoxone, Aim, Sharpen (soybeans only). Gramoxone can be effective for dessication of some weeds when applied by ground equipment in the recommended volume of 20 gpa. Sharpen and Aim are not likely be effective enough across a range of weed species unless mixed with another herbicide. Systemic herbicides will generally be the better choice in low-volume applications. Glyphosate and dicamba are labeled for use in corn and soybeans, and 2,4-D is labeled for use in corn only.

Information on preharvest herbicides is listed at the end of the corn and soybean herbicide description sections in the Weed Control Guide for Ohio, Indiana, and Illinois, and [here](#). The crop must be physiologically mature at time of herbicide application. Labels specify what the measure of this is – black layer formed, dented, % of pods with mature brown color, etc. The minimum interval between application and harvest to avoid residue problems is also specified, and ranges from 3 to 15 days.

**ROADWAY LAWS**...for farm machinery are discussed in this OSU Extension Ag Law publication: <https://farmoffice.osu.edu/sites/aglaw/files/site-library/Roadway%20Law%20Bulletin.pdf>. I encourage you to review and be familiar with the information contained in this publication.



**NOXIOUS WEEDS...** are plants that can injure agricultural crops and livestock due to their invasiveness, toxicity, and other harmful characteristics, and can also negatively impact people and ecosystems. Like most states, Ohio has established processes for minimizing the negative impacts of noxious weeds. This OSU Extension Ag Law Bulletin (<https://farmoffice.osu.edu/sites/aglaw/files/site-library/NoxiousWeedLawBulletin.pdf>). This OSU Extension Ag Law Bulletin ([https://farmoffice.osu.edu/sites/aglaw/files/site-library/LawBulletins/Noxious\\_weed\\_law\\_procedures.pdf](https://farmoffice.osu.edu/sites/aglaw/files/site-library/LawBulletins/Noxious_weed_law_procedures.pdf)) describes in more detail the legal procedure for controlling noxious weeds.

**C.O.R.N. LIVE...**produced by OSU Extension returns September 16<sup>th</sup> from 8am – 9am and will feature a preview of the crop plots at the Farm Science Review. Nate Douridas, Farm Manager of the Molly Caren Ag Center, site of the Farm Science Review, will give an update on harvest as they begin to open fields for field demonstrations. He will give an early look at yields and moisture and what to expect during the field demonstrations this year. Then join us for a walk through the Agronomic Crops Plots. These plots demonstrate research conducted on farms around the state and offer CCA credit opportunities during the show. There is also an opportunity to learn about current and future advances in on-farm technology from the Digital Ag team. Join us online next Thursday, September 16, from 8-9am and be more prepared to make the most of your visit to Farm Science Review this year! Please register at <http://go.osu.edu/cornlive>. 1 CCA CEU in Crop Management has been applied for.



**FARM SCIENCE REVIEW...**will be held at the Molly Caren Agricultural Center on September 21, 22, and 23. Stop by the Extension office to purchase pre-sale tickets.



**WHEAT MANAGEMENT TIPS**...are presented in this OSU Extension C.O.R.N. newsletter:

<https://agcrops.osu.edu/newsletter/corn-newsletter/2021-30/wheat-management-fall-2021>. A few highlights:

- Select high-yielding varieties with high test weight, good straw strength, and adequate disease resistance. Do not jeopardize your investment by planting anything but the best yielding varieties that also have resistance to the important diseases in your area. Plant seed that has been properly cleaned to remove shriveled kernels and treated with a fungicide seed treatment to control seed-borne diseases. The 2021 Ohio Wheat Performance Test results can be found at: <https://ohiocroptest.cfaes.osu.edu/wheattrials/>
- Optimum seeding rates are between 1.2 and 1.6 million seeds/acre. For drills with 7.5-inch row spacing this is about 18 to 24 seeds per foot of row. When wheat is planted on time, actual seeding rate has little effect on yield, but high seeding rates (above 30 seeds per foot of row) increase lodging and risk of severe powdery mildew development next spring.
- Plant after the Hessian Fly Safe Date. Planting before the Fly Safe Date increases the risk of insect and disease problems, including Hessian fly and aphids carrying Barley Yellow Dwarf Virus. This disease is most damaging when plants are infected by the virus in the fall. The best time to plant is within 10 days after the Fly Safe Date



- Planting depth is critical for tiller development and winter survival. Plant seed 1.5 inches deep and make sure planting depth is uniform across the field. No-till wheat seeded into soybean stubble is ideal, but make sure the soybean residue is uniformly spread over the surface of the ground. Shallow planting is the main cause of low tiller numbers and poor winter survival due to heaving and freezing injury.
- Follow the Tri-State Fertilizer Recommendations for Corn, Soybeans, Wheat, and Alfalfa ([https://agcrops.osu.edu/FertilityResources/tri-state\\_info](https://agcrops.osu.edu/FertilityResources/tri-state_info)). Apply 20 to 30 lbs. of actual nitrogen per acre at planting to promote fall tiller development. A soil test should be completed to determine phosphorus and potassium needs. Wheat requires more phosphorus than corn or soybean, and soil test levels should be maintained between 30-50 ppm (Mehlich-3 P) for optimum production. Do not add any phosphorus if soil test levels are higher than 50 ppm.
- For no-till wheat, select burndown herbicides to control existing weeds prior to planting. For more information on herbicide options, see: <https://agcrops.osu.edu/newsletter/corn-newsletter/2020-30/burndown-herbicides-no-till-wheat>



## TUSCARAWAS COUNTY AGRICULTURE &amp; NATURAL RESOURCES

September 15, 2021

**CROP PROGRESS IN OHIO**...for the week ending September 12 is provided by USDA National Ag Statistics Service (NASS).

**Crop Progress: Week Ending 09/12/21**

Crop/Activity	Percent Completed			
	This week	Last week	Last year	5 Year average
Days Suitable for Fieldwork ..	6.5	5.0	-	-
Corn Dough .....	99	93	99	94
Corn Dented.....	84	73	74	68
Corn Mature.....	28	10	13	20
Corn Harvested for Silage.....	55	34	50	NA
Soybeans Setting Pods .....	96	92	100	98
Soybeans Dropping Leaves....	30	10	31	25
Alfalfa Hay 3rd Cutting .....	90	85	94	92
Alfalfa Hay 4th Cutting .....	59	43	34	38
Other Hay 2nd Cutting.....	96	90	100	96
Other Hay 3rd Cutting .....	64	49	77	65

**GLYPHOSATE SCARCITY**... is forcing decisions about where this product has the most value. We have talked with suppliers who are already saving the glyphosate for spring/summer next year and going with other options for fall burndown for wheat and later fall applications for winter weeds. In the end, we have alternatives, but at increased cost or reduced effectiveness in certain situations. A continued shortage will cause more problems in next year's crops than it does now though.

Herbicide options for burndown of existing weeds prior to emergence of no-till wheat include glyphosate, Gramoxone, Sharpen, and dicamba. Among these, the combination of Sharpen plus either glyphosate or Gramoxone probably provides the best combination of efficacy on marestalk, flexibility in application timing and residual control. While Gramoxone alone should control small seedlings of marestalk and other winter annuals, its overall effectiveness is usually boosted by mixing with another herbicide, which could include Sharpen, or dicamba if applied if applied early enough ahead of planting. Dicamba labels have the following restriction on preplant applications – “allow 10 days between application and planting for each 0.25 lb ai/A used”. A rate of 0.5 lb ai/A would therefore need to be applied at least 20 days before planting. We do not know of any 2,4-D product labels that support the use of 2,4-D prior to or at the time wheat planting. There is some risk of stand reduction and injury to wheat from applications of 2,4-D too close to the time of planting. Liberty and other glufosinate products are also not labeled for use as a burndown treatment for wheat. This is not an injury risk issue – the company controlling the glufosinate label just won't spend the money to label it for burndown in additional crops. Be sure to use the



appropriate adjuvants with any of these and increase spray volume to 15 to 20 gpa to ensure adequate coverage with Sharpen or Gramoxone.

Another option in fields that are not that weedy now is to skip the at-plant burndown and instead apply postemergence herbicides in early November. There are several effective postemergence herbicide treatments for wheat that can be applied at that time to control most winter annual weeds. Effective postemergence treatments for the weeds commonly encountered include Huskie, Quelex, or mixtures of low rates of dicamba with either Peak, tribenuron (Express etc), or a tribenuron/thifensulfuron premix (Harmony Xtra etc). We discourage application of 2,4-D to emerged wheat in the fall due to the risk of injury and yield reduction. It's also possible to use a combination of tribenuron or tribenuron/thifensulfuron with a low rate of metribuzin (e.g. up to 2 oz/A of 75% formulations). The dicamba mixtures have been effective on dandelion in OSU research. Where winter annual grasses are present, be sure to use the appropriate postemergence herbicide based on the grass species. The [wheat herbicide effectiveness table](#) in the weed control guide has ratings on several key grasses. Fall-applied herbicides are more effective on these grasses than spring-applied. Note – the Anthem Flex ratings are for residual control only, not control of emerged plants.

(Source: OSU Extension C.O.R.N. newsletter: <https://agcrops.osu.edu/newsletter/corn-newsletter/2021-31/life-time-glyphosate-scarcity-%E2%80%93-part-1-burndown-no-till-wheat>)

**FARM SCIENCE REVIEW**...is September 21, 22, and 23 and will feature exciting areas to learn about agricultural practices being studied at OSU and view some of the latest technology in action. Pre-sale tickets are available at the Extension office.

### **Agronomy plots area**

One major yield thief in both corn and soybeans is compaction. We will show how the utilization of tracks and various types of tires can affect your crop, especially in pinch row compaction. Very high flexation tires can decrease field compaction by lowering inflation pressure once in the field. Deflating after road travel will maximize the tire footprint. See this demonstrated in the plots with a tractor that has tires on one side inflated to road pressure and the other to field pressure. Knowing the correct inflation pressure to the exact psi is critical. Stop in the morning to enter a raffle to win a high accuracy tire pressure gauge by guessing the inflation pressures on this tractor both for road travel and field use. Winners will be announced each day at noon.

Our work with producers around that state to maximize corn and soybean yields is demonstrated in a set of high yield plots. The plots are receiving the exact amount of water they need each week utilizing soil moisture sensors to determine the irrigation amount need. The plots are also being spoon-fed nutrients to make sure nothing limits their ability to maximize yield. These maximum yield plots are much taller and greener this year than the traditional management plots.

Another area we have focused on is cover crops. Cover crop management can be a challenge though at times. One of the management challenges demonstrated this year is whether your agronomic crop should be planted once the cover crop is terminated or while it is still green. Cover crops can be killed utilizing herbicide or a roller-crimper. Crimping these cover crops at the proper growth stage is important for termination. Before we terminate cover crops, we must establish them. One of the challenges with establishment is herbicide carryover. Various herbicides have different effects on our



ability to establish the cover crop. Learn more about the interaction of herbicides and cover crops in our plots. We also inter-seeded 11 different species of potential cover crops for you to see how well they can survive under a corn canopy.

Additional information about FSR, including the schedule of field demonstrations and CCA credit opportunities, is available here: <https://agcrops.osu.edu/newsletter/corn-newsletter/2021-31/fsr-2021-finally-only-week-away>.



**IT'S TIME...** to break the stigma of discussing mental health issues. September is National Suicide Prevention Month, and with that comes the opportunity to raise awareness to help prevent even one more suicide from happening.

- The agricultural community is [1.5 times](#) more likely to die by suicide than any other population in the United States according to a CDC study published in 2017. Suicides are up by over 40% in the last 20 years according to this same study. Farmers and foresters experience unique stressors, whether related to health insurance, market prices, weather, or legal issues it all compounds impacting the mental and physical health of our ag community.
- Farmers have easier access to lethal means in the way of guns and medication that has not been prescribed to them. Allowing for suicide to be more obtainable.
- We all struggle to talk about suicide and mental health. Though the conversations are happening they are still quiet. The stigma or fear of admitting a person needs support is still very real. Bringing this conversation out to the light allows for more open discussion.

The OSU Extension farm stress team has developed a website with more information and resources on the topics of mental health and farm stress for our ag community at <https://u.osu.edu/farmstress/>. Visit and subscribe today for the most up today information!

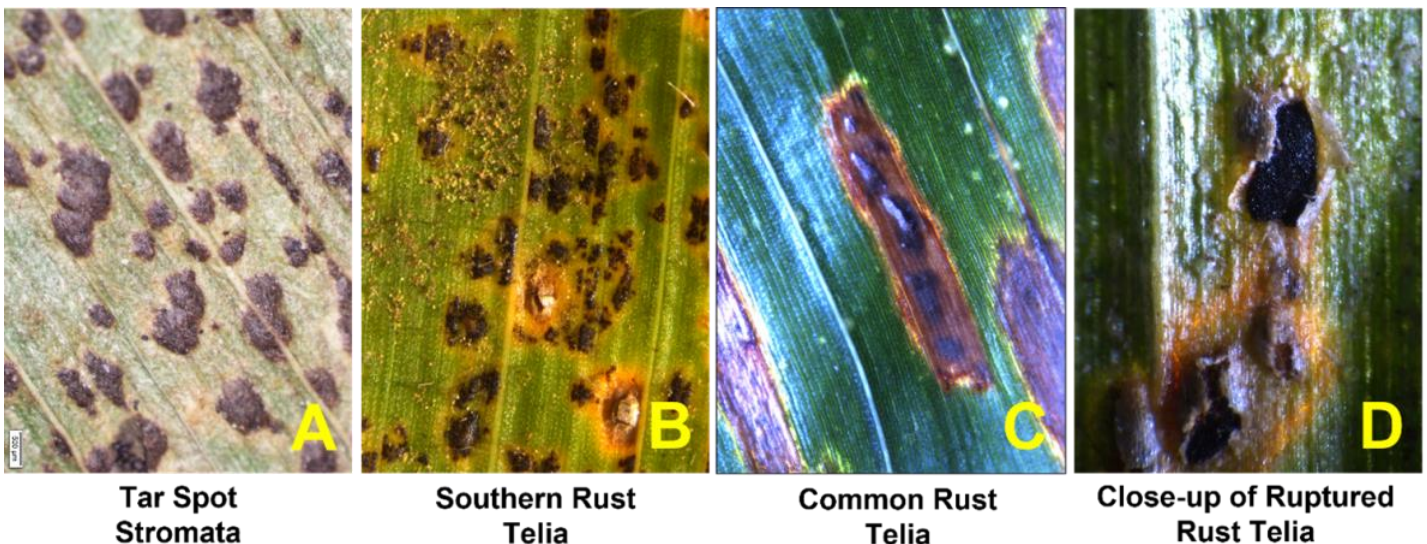
Contact Bridget Britton, OSU Extension Behavioral Health Field Specialist, at [britton.191@osu.edu](mailto:britton.191@osu.edu) or 330-365-8160.

**TAR SPOT**...has been detected in 20 Ohio counties, including Holmes and Wayne. It is a disease that is relatively easy to identify based on visual signs and symptoms, but as we approach the end of the season, it may become increasing difficult for untrained eyes to tell tar spot apart from late stages of some other disease. Yes, tar spot, as the name suggests, is characterized by the presence of raised, black, tar-like spots called stomata predominantly on leaf blades (**A**). However, not all raised, black, tar-like spots on a leaf are tar spot.

Two other diseases that produce raised, blackish spots on leaves towards the end of the season are southern rust (**B**) and common rust (**C**). Both are very prevalent this year in fields with tar spot. Yes, it is true that rusts, as the name suggests, give leaves a typical yellowish-orangish rusty color, but this is the color of urediniospores, only one of several types of spores produced by corn rust fungi. As the crop begins to dry down and temperatures drop, the rust fungi will produce a different type of spore called teliospores, and these develop in raised, black, structures called telia.

In other words, rust pustules usually change from their typical rusty color to a black, tar-like color as they age. So, do not automatically conclude that you have tar spot or tar spot is the only disease affecting your crop simply because the lesions are black. Take a closer look and send samples to a lab for examination if you are unsure. This is particularly important if you are trying to compare hybrids for susceptibility to tar spot or rust, and if you want to determine whether the fungicide you applied is effective against one or both diseases.

Misdiagnosis may lead to errant conclusions. Here are a few tips to help you tell the difference between tar spot and rust telia. Tar spot stromata do not rupture the leaf or have a split on the top. In addition, they cannot be easily broken or rubbed away with your fingers. Rust telia, on the other hand, usually break or rupture the upper surface of the leaf tissue (**D**). In other words, they usually have a split on top and if you rub them with your finger, the spores are released, leaving your finger with a dark-rusty to blackish tinge.



(Source: OSU Extension C.O.R.N. newsletter: <https://agcrops.osu.edu/newsletter/corn-newsletter/2021-31/diagnosis-tar-spot-late-season>)

**2021 MARKETING YEAR AVERAGE PRICES**...for corn and soybeans were revised recently. The MYA for corn is \$5.45 per bushel and \$12.90 per bushel for soybeans. For both corn and soybeans, the 2021 prices are the third-highest price since projections have been made, likely leading to high 2021 farm incomes, particularly in the eastern corn-belt. Given historic relationships, high 2021 prices should not necessarily be expected in future marketing years. Highlights of information provided in this newsletter (<https://farmdocdaily.illinois.edu/wp-content/uploads/2021/09/fdd140921.pdf>) are provided below.

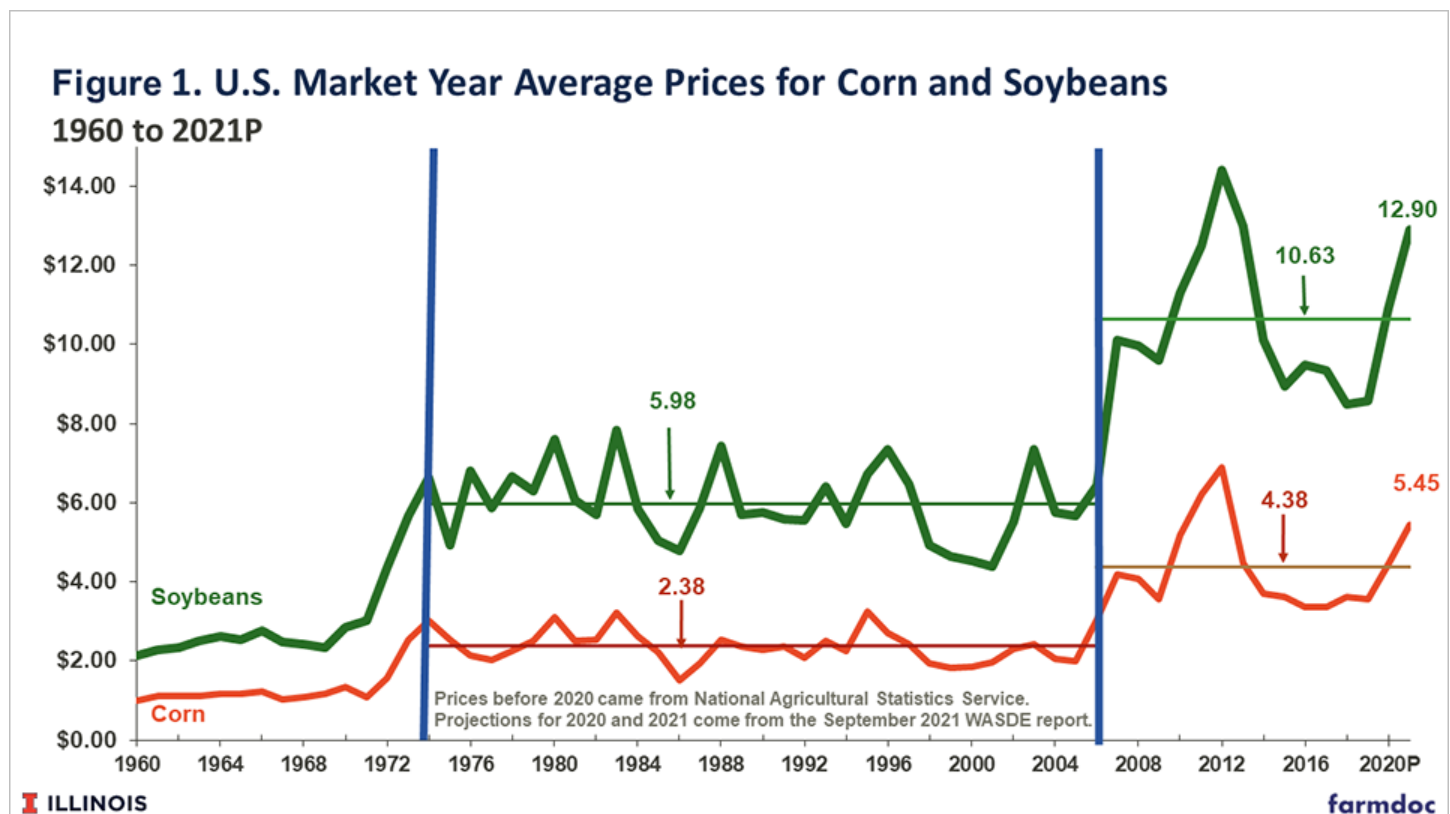
## Corn

The Office of the Chief Economist (OCE) releases market information and MYA price projections in its monthly World Agricultural Supply and Demand Estimates (WASDE) report. In the September 2021 report, the 2021 MYA projection was \$5.45 per bushel for corn. This September projection is lower than the \$5.70 projection made in the May report, the first projection of 2021 MYA by the OCE. OCE's



estimate of MYA corn price has declined by \$.35 since May. Still, a \$5.45 MYA price would be the third-highest price in history. The 2020 forecast will be final at the end of September and likely will be very close to \$4.45.

Both corn and soybeans did not trend up or down from roughly 1974 to 2006, varying around an average of \$2.38 per bushel (see Figure 1). Changes in long-run plateaus usually are associated with a change in demand. For example, corn and soybean prices reached a higher level around 1974 because of increased crop export demand. A new plateau again was reached around 2006 because of increasing corn use in ethanol production, along with continuing strong export demand for soybeans.



From 2007 to 2021, MYA prices for corn averaged \$4.38 per bushel, ranging from a low of \$3.36 in the 2016 and 2017 marketing years to a high of \$6.89 per bushel in 2012. From 2007 to 2021, MYA prices were below the average of \$4.38 in ten of sixteen years, or 63% of the time. Within that period, a six-year run of prices below the long-run average also occurred from 2014 to 2019.

Without compelling evidence for a structural change leading to increased demand, there is a strong likelihood that the 2021 projection of \$5.45 does not signal a new era of prices, and that corn prices likely are in the same regime that has existed since 2006. This would suggest that corn prices will continue to average near \$4.38, and that there will be declining prices below \$4.38 sometime in the future.

## **Soybeans**

The September 2021 WASDE report contains a 2021 MYA projection of \$12.90 per bushel for soybeans. The 2021 soybean projection has declined from the initial projection of \$13.85 per bushel in the May report. The 2021 forecast of \$12.90 is \$2.00 per bushel higher than the 2020 forecast of \$10.90 per bushel.

Similar to corn, the 2021 soybean projection is the third highest in history. The 2012 price of \$14.40 and the 2013 price of \$13.00 per bushel exceeded the current \$12.90 projection.

Periods of long-run plateaus typically coincide for corn and soybeans. From 1974 to 2006, soybean prices averaged \$5.98 per bushel. A new plateau was reached in 2006, and the average price from 2007 to 2021 has been \$10.64 per bushel. During the 2007-2021 period, the high was \$14.40 per bushel in 2012 and the low was \$8.48 in 2021. The MYA price for soybeans was below the \$10.64 average in 60% of the years from 2007 to 2021.

Similar to corn, the 2021 soybean projection of \$12.90 likely does not signal that prices have reached a new higher plateau. Rather, soybean prices likely will decline in the future.

## **Commentary**

Expectations are for high prices in the 2021 market year. In Illinois and much of the eastern corn-belt, yields are projected to be above-trend levels. Relatively high prices and above-trend yields should lead to relatively high farm incomes in much of the eastern corn-belt. However, incomes will be lower in the western corn-belt as drought has impacted Iowa, Minnesota, North Dakota, and South Dakota yields.

Current high prices likely are not harbingers of continued high prices in future years. Generally, a commodity price regime change occurs when demand conditions change. No long-term changes in demand can be identified at this point. Instead, supply responses and higher yields will likely lead to lower prices, and future prices of these commodities are expected to continue to vary around the 2007-2021 averages of \$4.35 per bushel for corn and \$10.64 per bushel for soybeans. Moreover, prices in the future will include periods when prices fall below these long-run averages, like the period from 2014 to 2019 when MYA prices averaged \$3.53 per bushel for corn and \$9.15 for soybeans.

Having noted the likely decline in prices, the timing of this decline is unpredictable, depending on the realization of supply and demand factors. As an example, MYA prices were at record levels of \$6.22 for corn and \$12.50 per bushel for soybeans in 2011, well above average prices. Another record of \$6.89 for corn and \$14.40 for soybeans was set in 2012, when a large drought in the Midwest caused low supplies. Similarly, a yield shortfall in 2022 could lead to higher prices than exist today. Other demand events also could impact prices.

Still, one should expect lower corn and soybean prices sometime in the future. As a result, prudent farm management should account for this possibility.



**WHEN DEVELOPING A GRAZING SYSTEM**...water is often the top concern, as discussed in this OSU Extension Beef newsletter: <https://u.osu.edu/beef/2021/09/15/water-is-everything/#more-11259>.

An important consideration, if an option, is will the livestock go to the water or will you take the water to the livestock? When possible, it is almost always the best option to take the water to the livestock because water is generally the most powerful force determining where livestock will spend their time. A three-year study at the Forage System Research Center in Missouri showed that when cattle had to travel more than 800 feet to water, uneven grazing occurred: overgrazing close to the water and undergrazing on the opposite end of the paddocks. In addition, when cattle have to travel long distances to water, they tend to go in groups so an adequate supply of water needs to be available so all of the cattle can receive an adequate supply.

How about water quality? If you have ponds or streams in paddocks and use them as a water source, we know that when it is hot, cattle like to stand in water, especially non-moving, shaded water, which will reduce quality. Pollution can come from erosion along the banks of the ponds and streams, and from manure and urine while standing in the water. For ponds we do know that installing a tank with the pond as the source improves water quality or fencing out the pond with a small corner with a stone base and limiting standing in the pond will improve quality.

There are different thoughts on what to do with streams in paddocks and I am not sure what the right answers is, but I do know that rotating to paddocks without streams limits exposure to paddocks with streams. Cattle like to stand in water not moving, so if you make part of a stream available for water, use a portion where the water is moving with a stone base. Finally, if given a choice, cattle that have access to clean water from a different source they will generally use that. I have one paddock where I had a spring developed with a stream running through it and the cattle use the stream less. Finally, I do know that during the summer, if your cattle are on fescue and you have a stream with standing water and shade, I bet I know where they will be during the day.

**ATYPICAL CASES OF BSE**...commonly referred to as "mad cow" disease have been confirmed in Brazil. The impact of this announcement on U.S. beef is discussed in this OSU Extension Beef newsletter: [https://tuscarawas.osu.edu/sites/tuscarawas/files/imce/Program\\_Pages/ANR/Newsletters/ANR%20Newsletter%20September%20%202021.pdf](https://tuscarawas.osu.edu/sites/tuscarawas/files/imce/Program_Pages/ANR/Newsletters/ANR%20Newsletter%20September%20%202021.pdf).



## TUSCARAWAS COUNTY AGRICULTURE & NATURAL RESOURCES

September 30, 2021

**MINIMIZING CORN LOSS**...at the combine is always important. This OSU Extension C.O.R.N. newsletter (<https://agcrops.osu.edu/newsletter/corn-newsletter/2021-33/minimizing-corn-harvest-losses-combine>) provides management recommendations. Harvesting at a bit higher moisture may also be economically beneficial.

**FALL ARMYWORMS**...might still be of concern. We did have some low temperatures last week—most areas had 40 to 60 straight hours of temperatures below 65°F (this was the temperature when mortality significantly impacted fall armyworm larvae). As adults are migratory (often flying with winds in the atmosphere), they may be more cold-tolerant than the larvae, so it may not be surprising to still see some moths. However, we do not yet know how the cold snap affected the larvae. Fields should continue to be scouted for the presence of fall armyworm larvae at least for this week and likely until we get a significant frost. Check alfalfa, forage, cover crops, winter wheat, and even turf for damage and small larvae. As we get closer to the winter, we want to protect against any further damage that could compromise winter survival and regrowth in the spring. (Source: OSU Extension C.O.R.N. newsletter: <https://agcrops.osu.edu/newsletter/corn-newsletter/2021-33/don%E2%80%99t-let-your-guard-down-fall-armyworm-just-yet>)

**TICKS AND TICK-BORNE DISEASES**...are a growing problem for people and animals in Ohio. The Ohio State University is surveying livestock producers and veterinarians about their knowledge of ticks and diseases. The survey is for any Ohio livestock producer over 18 years of age. Those who complete the survey will receive a \$5.00 gift card to the business of their choosing. You may access the survey here: [https://osu.az1.qualtrics.com/jfe/form/SV\\_9KXdJTr05f5BrBs](https://osu.az1.qualtrics.com/jfe/form/SV_9KXdJTr05f5BrBs). Should you have questions about the survey, please contact Dr. Pesapane in the OSU Department of Veterinary Preventive Medicine at [pesapane.1@osu.edu](mailto:pesapane.1@osu.edu) or 614-292-7570.

**ENTERPRISE BUDGETS**...for 2022 have been released by OSU Extension and are available here: <https://farmoffice.osu.edu/farm-management/enterprise-budgets>. Each year, preliminary crop enterprise budgets are unveiled at the Farm Science Review which reveals our best estimates for costs and returns for the main row crops in Ohio for the upcoming year. With continued high crop prices projected for 2022 there is some optimism, however, higher costs will likely decrease profit margins to levels lower than 2021 margins.

Production costs for Ohio field crops are forecast to be higher compared to last year with higher fertilizer, seed, chemical, fuel, machinery and repair costs leading the way.



Variable costs for corn in Ohio for 2022 are projected to range from \$477 to \$583 per acre depending on land productivity. Variable costs for 2022 Ohio soybeans are projected to range from \$266 to \$302 per acre. Wheat variable expenses for 2022 are projected to range from \$213 to \$262 per acre.

These are increases over last year of 19%, 18%, and 25% for corn, soybeans and wheat, respectively.

If the current grain prices and costs endure through next year, profit margins will likely be positive although higher costs may create losses for some producers. Grain prices currently used as assumptions in the 2022 crop enterprise budgets are \$4.80/bushel for corn, \$12.20/bushel for soybeans and \$6.90/bushel for wheat. Projected returns above variable costs (contribution margin) range from \$226 to \$472 per acre for corn and \$288 to \$529 per acre for soybeans. Projected returns above variable costs for wheat range from \$191 to \$344 per acre.

Return to Land is a measure calculated to assist in land rental and purchase decision making. The measure is calculated by starting with total receipts or revenue from the crop and subtracting all expenses except the land expense. Returns to Land for Ohio corn (Total receipts minus total costs except land cost) are projected to range from \$54 to \$283 per acre in 2022 depending on land production capabilities. Returns to land for Ohio soybeans are expected to range from \$166 to \$393 per acre depending on land production capabilities. Returns to land for wheat (not including straw or double-crop returns) are projected to range from \$99 per acre to \$242 per acre.

Total costs projected for trend line corn production in Ohio are estimated to be \$919 per acre. This includes all variable costs as well as fixed costs (or overhead if you prefer) including machinery, labor, management and land costs. Fixed machinery costs of \$78 per acre include depreciation and other overhead. A land charge of \$207 per acre is based on data from the Western Ohio Cropland Values and Cash Rents Survey Summary. Labor and management costs combined are calculated at \$82 per acre. Details of budget assumptions and numbers can be found in footnotes included in each budget.

Total costs projected for trend line soybean production in Ohio are estimated to be \$619 per acre. (Fixed machinery costs: \$62 per acre, land charge: \$207 per acre, labor and management costs combined: \$53 per acre.)

Total costs projected for trend line wheat production in Ohio are estimated to be \$541 per acre. (Fixed machinery costs: \$36 per acre, land charge: \$207 per acre, labor and management costs combined: \$48 per acre.)

Current budget analyses indicate favorable returns for soybeans compared to corn or wheat but crop price change, harvest yields and other factors through fall and into summer of next year may change this outcome. These projections are based on OSU Extension Ohio Crop Enterprise Budgets.

In addition to projected row crop budgets for 2022, there are newly updated forage budgets posted to our Farm Office site. These include Alfalfa Hay, Alfalfa Haylage and Corn Silage. Also recently updated are two Market Beef Budgets which include Market Beef Budget (Self-Fed) and Market Beef Budget (Bunk-Fed).

(Source: Barry Ward, Leader, Production Business Management, OSU Extension)

**SCOUT NOW FOR CRESSLEAF GROUNDSEL**...and other winter weeds in pastures and hayfields. Dr. Mark Loux, OSU Extension Weed Scientist, offers management recommendations in this OSU Extension C.O.R.N. newsletter: <https://agcrops.osu.edu/newsletter/corn-newsletter/2021-33/scout-now-cressleaf-groundsel-and-other-winter-weeds-hayfields>.

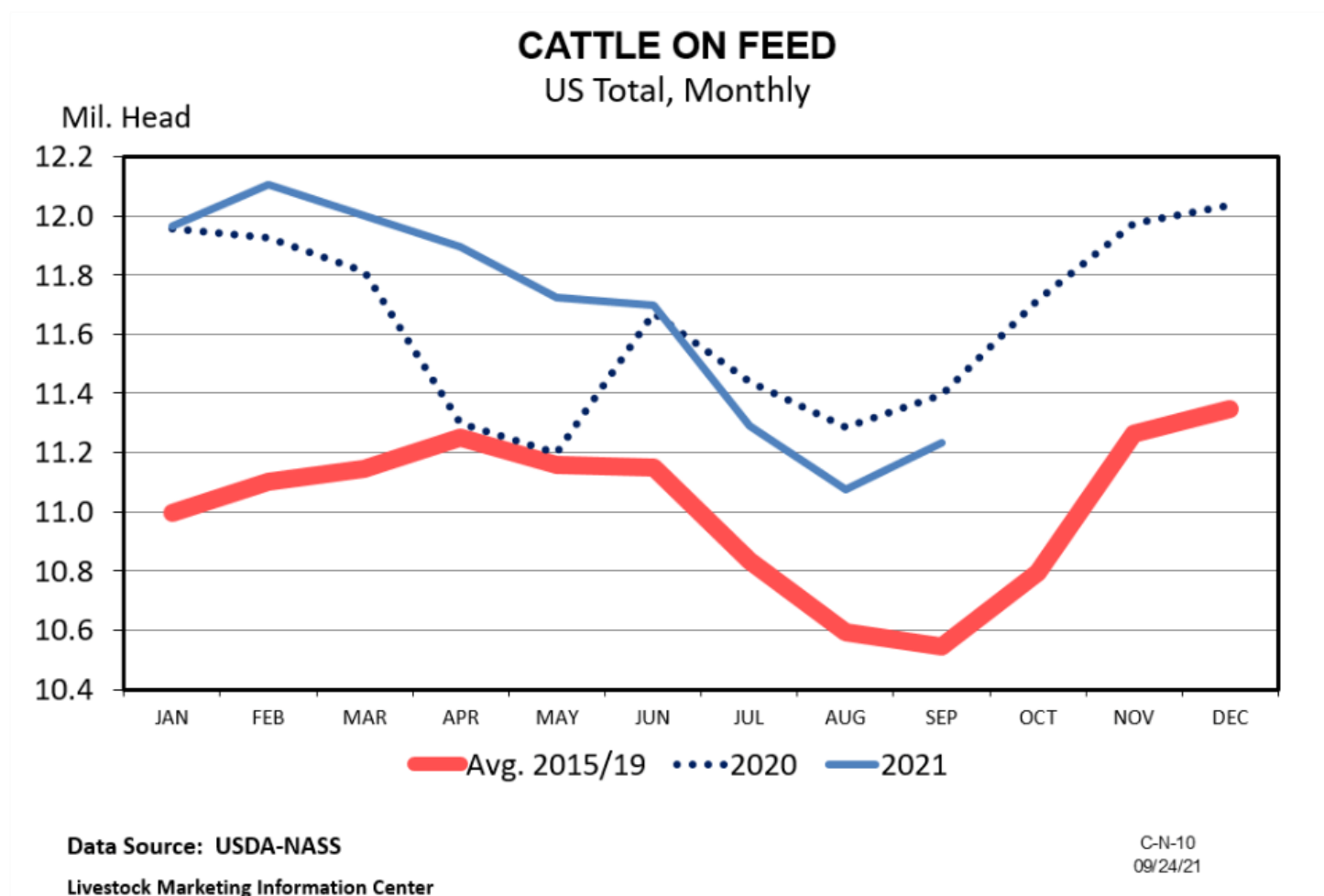
Fall herbicide options for grass hay and pastures, and non-crop areas, are considerably greater in number and often also effectiveness than those labeled for use in a first-year legume or legume/grass stand. For example, herbicides for a new stand of pure alfalfa include 2,4-DB (Butyrac), Pursuit, Raptor, and clethodim. The mixture of grasses and legumes removes all of these options except 2,4-DB, which we have sometimes characterized as “almost an herbicide on a good day”. A bit of an exaggeration, but it has a very limited spectrum of control and weed size range. In an established stand, dormant application of metribuzin or Velpar can also be an effective option. Glyphosate is of course an option in a stand of pure RR alfalfa (if you can get it). There are a number of more effective options in grass hay and pasture. Most of the herbicides in the pasture section of the OH/IN/IL Weed Control Guide can be used for grass hay also, as long as they specify a minimum interval between application and cutting for hay. The absence of legumes allows use of products and premixes containing 2,4-D, dicamba, metsulfuron, triclopyr, and aminopyralid. Be sure to understand the restrictions on feeding or grazing aminopyralid-treated hay or areas prior to use.

Poison hemlock deserves specific mention here because it got a lot of press in Ohio this year. While it has substantial toxicity when ingested, and can cause reactions on skin of sensitive individuals, it's otherwise fairly benign. It has been fairly endemic to southern Ohio for a while, and is apparently creeping north. In addition to toxicity to animals when ingested, cressleaf groundsel and poison hemlock share the property of being weeds that appear to “all of a sudden” show up in spring, when they were really present the previous fall. Herbicides are more effective on these weeds in the fall, but there is a general lack of awareness and scouting for them at that time of the year. Waiting until spring to control them, when they become clearly evident, increases the difficulty of control. And killing sizable plants in spring results in dead plants that are still toxic, which does not resolve issues in hay. 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 provide adequate control 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).



**SEPTEMBER CATTLE ON FEED REPORT**...is discussed by Dr. Kenny Burdine, University of Kentucky, in this OSU Extension Beef newsletter: <https://u.osu.edu/beef/2021/09/29/september-cattle-on-feed-summary/#more-11604>.

Based on a mid-year comparison to total cattle on feed numbers from the July Cattle report, these monthly reports account for about 84% of total cattle of feed. The September 1 estimate came in just over 11.2 million, which was about 1.4% below the 2020 level. Cattle on feed inventory has been running below year-ago since July. A link to the full report can be found [here](#).



Placements did tick upward for the month of August. This is normal, but the magnitude of the increase from July was larger than one would typically expect. August placements were 2% above 2020 after being quite a bit below last year for July. It's hard to read too much into this given how strange 2020 was. I also think it is very likely that drought conditions in much of the country forced some early sales of cattle into the feedlot sector. The increase seemed to be more in the heavier weight groups, which is largely consistent with that narrative. Marketings were virtually unchanged from 2020 to 2021, although they were about 3.5% below 2019.



From my perspective, the September Cattle on Feed report continues to confirm that we have turned the corner on feedlot inventory and numbers should be generally trending downward over the next few years. Certainly, this is positive news for an industry that has struggled with packing capacity recently. But, I also think it is important to note that feedlot inventory, while trending downward, is still relatively high. Note in the chart above that while current inventory is below 2020, it is well above the 5-year average. As an example, the September 2021 number is still 2.2% higher than September 2019.

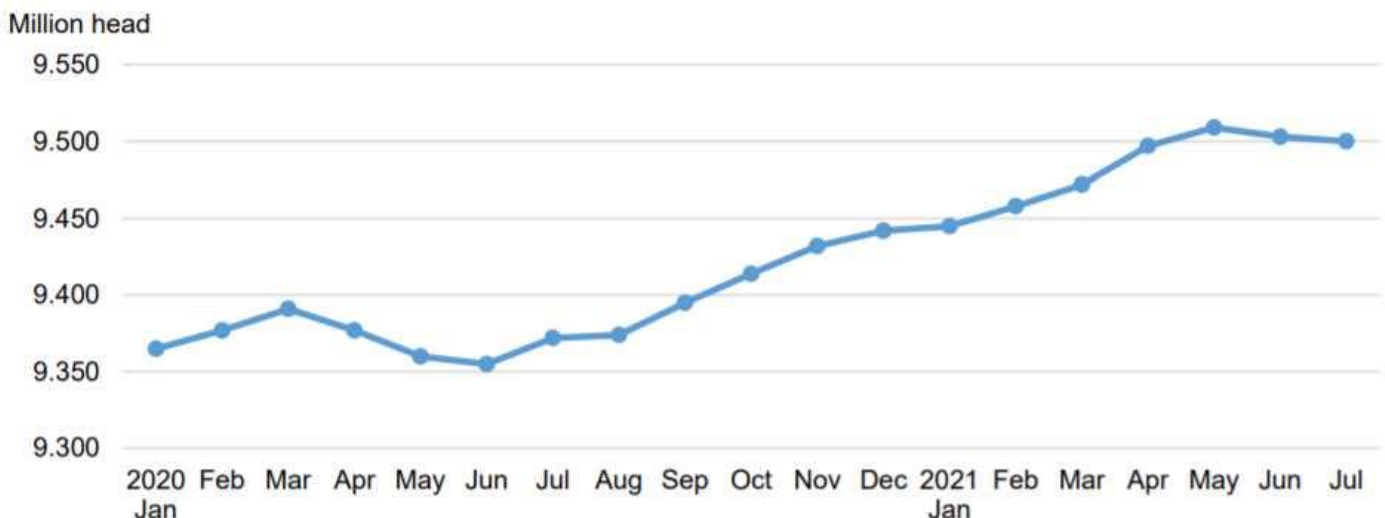
After expanding from 2014-2018, the US Beef cow herd reached a high in 2019. Since then, we have seen two years of declining beef cow numbers. Given drought conditions in much of the US and beef cow slaughter thus far in 2021, I think there is no question that this will be another year of contraction. The contracting beef cow herd and shrinking calf crops will lead to smaller numbers of cattle to be finished over the next several years. But it is important to understand that due to the time lag between calf crops and the placement of those calf crops on feed, and the pandemic related issues seen in 2020, we are just now starting to see the impacts of beef herd liquidation in these Cattle on Feed reports.

**USDA DAIRY FORECAST**...is presented in this OSU Extension Buckeye Dairy newsletter: <https://dairy.osu.edu/newsletter/buckeye-dairy-news/volume-23-issue-5/highlights-recent-usda-dairy-forecast>.

## Supply and Use

July 2021 milk production was 2% higher than the same month in 2020, the number of dairy animals peaked in May 2021 at 9.509 million head, and the July number came in at 9.500 million head. Increased culling and slaughter of dairy cows at federally inspected plants contributed to these changes. Milk production for July 2021 was 14 lb higher than July 2020, averaging 2,015 lb/cow.

### Number of milk cows in the United States



Source: USDA, National Agricultural Statistics Service.



## Federally inspected dairy cow slaughter

Thousand head



Sources: USDA, Agricultural Marketing Service data as reported by USDA, National Agricultural Statistics Service.

Corn and soybean meal prices were lowered in the recent report. The 2021-2022 marketing year average for corn was reduced to \$5.45/bushel. Soybean meal for 2020-2021 is projected at \$360/ton. The hay market continues to be strong. Alfalfa hay in July was \$201/ton, up \$2/ton from June 2021 and \$29/ton more than July 2020.

## Dairy Forecast

Milk cow inventory has been reduced by 15,000 from the previous month to 9.485 million head because of increased culling and higher slaughter numbers. The estimated milk at 24,010 lb/cow in 2021 is 10 lb lower than the previous month's projection. USDA ERS is expecting milk production to be 227.8 billion lb for 2021.

## Milk Price Forecast - 2021

Category	Forecast Price
Class III	\$16.65/cwt
Class IV	\$15.55/cwt
All Milk	\$18.15/cwt

## Milk Price Forecast - 2022

Category	Forecast Price
Class III	\$16.45
Class IV	\$16.05
All Milk	\$18.40



**MEAT GOAT PRODUCTION**...and budgeting detailed information is provided in this OSU Extension Sheep newsletter: <https://u.osu.edu/sheep/2021/09/28/mat-goat-production-and-budgeting/#more-4654>.

**CONVENTIONAL & ORGANIC ENTERPRISE NET RETURNS**...are discussed in this Purdue University article: [https://ag.purdue.edu/commercialag/home/resource/2021/09/conventional-and-organic-enterprise-net-returns-2/?utm\\_medium=email&utm\\_source=delivra-AgNews-202109&utm\\_campaign=Resource-ConventionalandOrganicEnterpriseNetReturns&utm\\_source=delivra&utm\\_medium=email&utm\\_campaign=Newsletter%202021-09&utm\\_id=42004858&utm\\_term=Read+more+on+Conventional+and+Organic+Enterprise+Net+Returns](https://ag.purdue.edu/commercialag/home/resource/2021/09/conventional-and-organic-enterprise-net-returns-2/?utm_medium=email&utm_source=delivra-AgNews-202109&utm_campaign=Resource-ConventionalandOrganicEnterpriseNetReturns&utm_source=delivra&utm_medium=email&utm_campaign=Newsletter%202021-09&utm_id=42004858&utm_term=Read+more+on+Conventional+and+Organic+Enterprise+Net+Returns)

## Crop Yields

Table 1 shows the average conventional and organic crop yields for alfalfa, corn, oats, soybeans, and winter wheat. The ratio illustrated in the last column of the table was computed by dividing the organic crop yield by the conventional crop yield. Alfalfa and oats exhibited the smallest differences in crop yields between conventional and organic crops. The yield drags for corn, soybeans, and winter wheat were 32 percent, 37 percent, and 53 percent, respectively.

**Table 1. Average Conventional and Organic Crop Enterprise Yields, 2016 to 2020**

	Organic	Conventional	Ratio
Alfalfa (tons/acre)	3.71	4.51	0.823
Corn (bushels/acre)	127.1	186.2	0.683
Oats (bushels/acre)	55.8	72.4	0.770
Soybeans (bushels/acre)	35.0	48.2	0.725
Winter Wheat (bushels/acre)	31.8	67.0	0.474

Source: FINBIN Database



## Gross Revenue, Total Expense, And Net Return to Land

Gross revenue, total expense, and net return to land per unit for alfalfa, corn, oats, soybeans, and winter wheat are presented in table 2. Gross revenue includes crop revenue, crop insurance indemnity payments, government payments, and miscellaneous income. Total expenses include all cash and opportunity costs, other than those associated with owned farmland. Farmland costs included in the total expense reported in table 2 were comprised of cash rent, real estate taxes, and interest, which would be lower than the full opportunity cost on owned land. Just to give the reader some idea as to how large this excluded cost may be, you would need to add an estimated \$0.25 per bushel (\$0.85 per bushel) to the total expense for conventional corn (conventional soybeans) if you wanted to account for the full opportunity cost on owned land. Also, note that the per unit net returns presented in table 2 represent a net return to land rather than an economic profit.

**Table 2. Average Conventional and Organic Gross Revenue and Total Expense per Unit, 2016 to 2020**



	Gross Revenue	Total Expense	Net Return to Land
Alfalfa (\$ per ton)	134.09	96.75	57.09
Organic Alfalfa (\$ per ton)	170.38	131.99	59.97
Corn (\$ per bushel)	3.76	3.76	0.71
Organic Corn (\$ per bushel)	8.94	5.99	3.96
Oats (\$ per bushel)	3.46	3.50	0.56
Organic Oats (\$ per bushel)	6.13	6.11	1.22
Soybeans (\$ per bushel)	10.26	8.81	3.77
Organic Soybeans (\$ per bushel)	20.39	15.47	8.50
Winter Wheat (\$ per bushel)	5.07	5.55	0.40
Organic Winter Wheat (\$ per bushel)	9.43	13.43	-2.67

Source: FINBIN Database

Though conventional and organic crops face different market phenomena, it is common to compare conventional and organic crop prices. Comparing organic to conventional gross return per unit



reported in table 2, the smallest ratio of organic to conventional gross return was for alfalfa (1.28) and the largest ratio (2.39) was for corn. Organic oat and soybean prices were approximately double their conventional counterparts, while organic wheat price was approximately 1.75 times higher than conventional wheat price. It is important to note that these price ratios represent five-year averages. The price ratios for individual crops vary from year to year. For example, during the 2016 to 2020 period, the corn price ratio ranged from 1.84 in 2020 to 2.74 in 2017.

Examining gross revenue and total expense per unit for each enterprise reported in table 2, it is evident that economic losses occurred for oats and winter wheat grown conventionally, and for winter wheat grown in an organic rotation. Economic profit was approximately zero (i.e., breakeven level) for conventional corn and organic oats. The lack of profits for the organic small grains has important implications for organic crop rotations. Numerous organic crop rotations include a small grain in the rotation. Market opportunities for organic small grains vary substantially by region, and it can be difficult to find markets for these crops. It is also useful to examine differences in net returns per unit for each crop (e.g., corn versus organic corn). The largest differences in net return per unit occurred for corn and organic corn, and for soybeans and organic soybeans. The difference in net returns per unit between the two crop rotation systems was very small for alfalfa.

It is important to note that the net returns reported in table 2 are on a per-unit basis. Given the differences in crop yields between conventional and organic crops, it is often more relevant to examine differences in per acre net returns than per-unit net returns. The average difference in net returns to land between the organic and conventional crops was \$73 per acre. The largest difference was \$370 per acre for corn. The difference for soybeans was \$115 per acre, while the difference for oats was \$27 per acre. The differences for alfalfa and winter wheat were -\$35 and -\$112 per acre, indicating that the conventional alfalfa and winter wheat were more profitable than organic alfalfa and winter wheat.

### **Difference In Net Returns Among Farms**

The results above focus on differences in average net return to land. Economists have long pointed out the large differences in financial performance among farms. To account for the differences among farms, we used the FINBIN database to examine net returns for conventional and organic corn and soybean enterprises.



**Figure 1. Net Return per Acre by Decile for Conventional and Organic Corn**

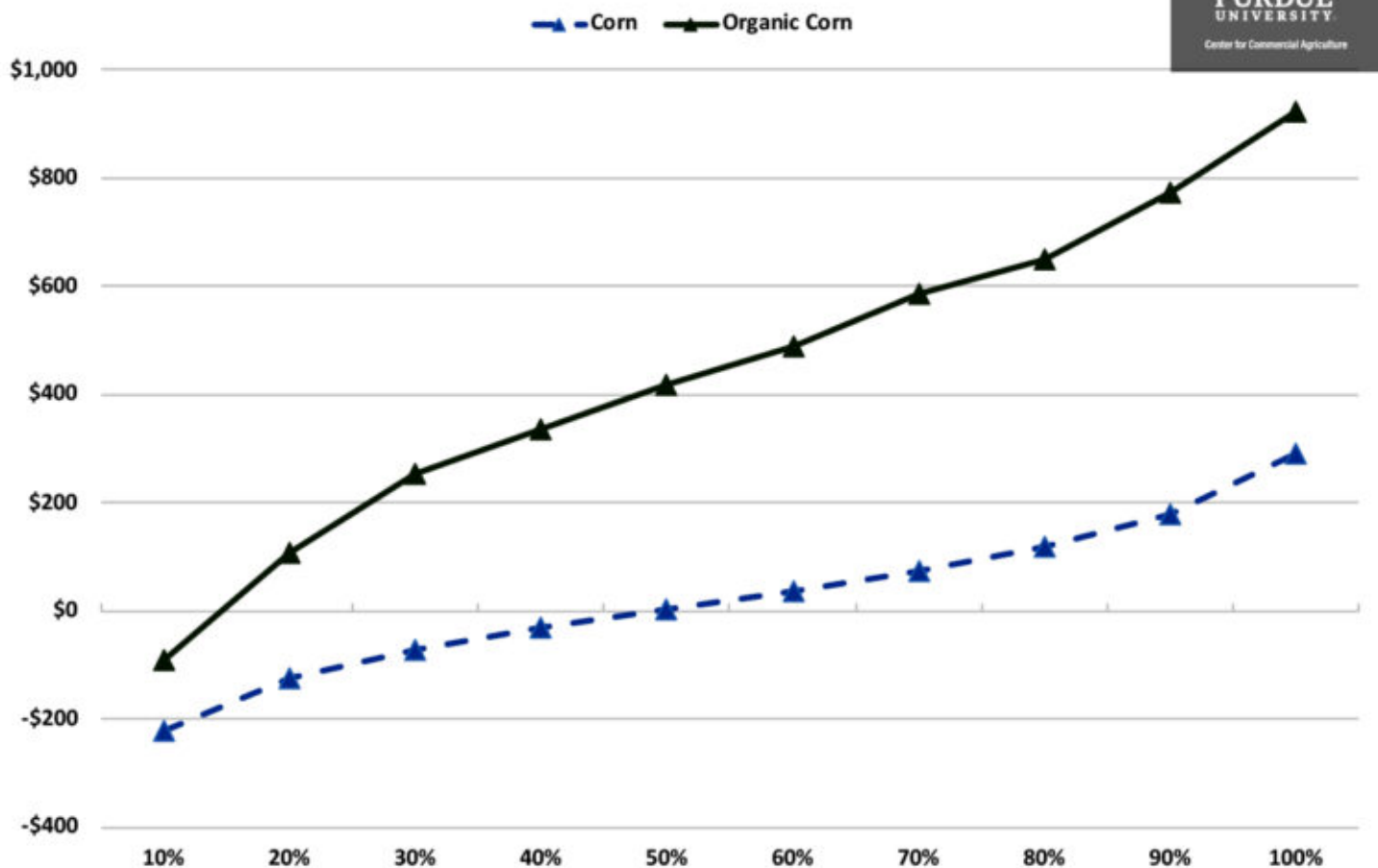
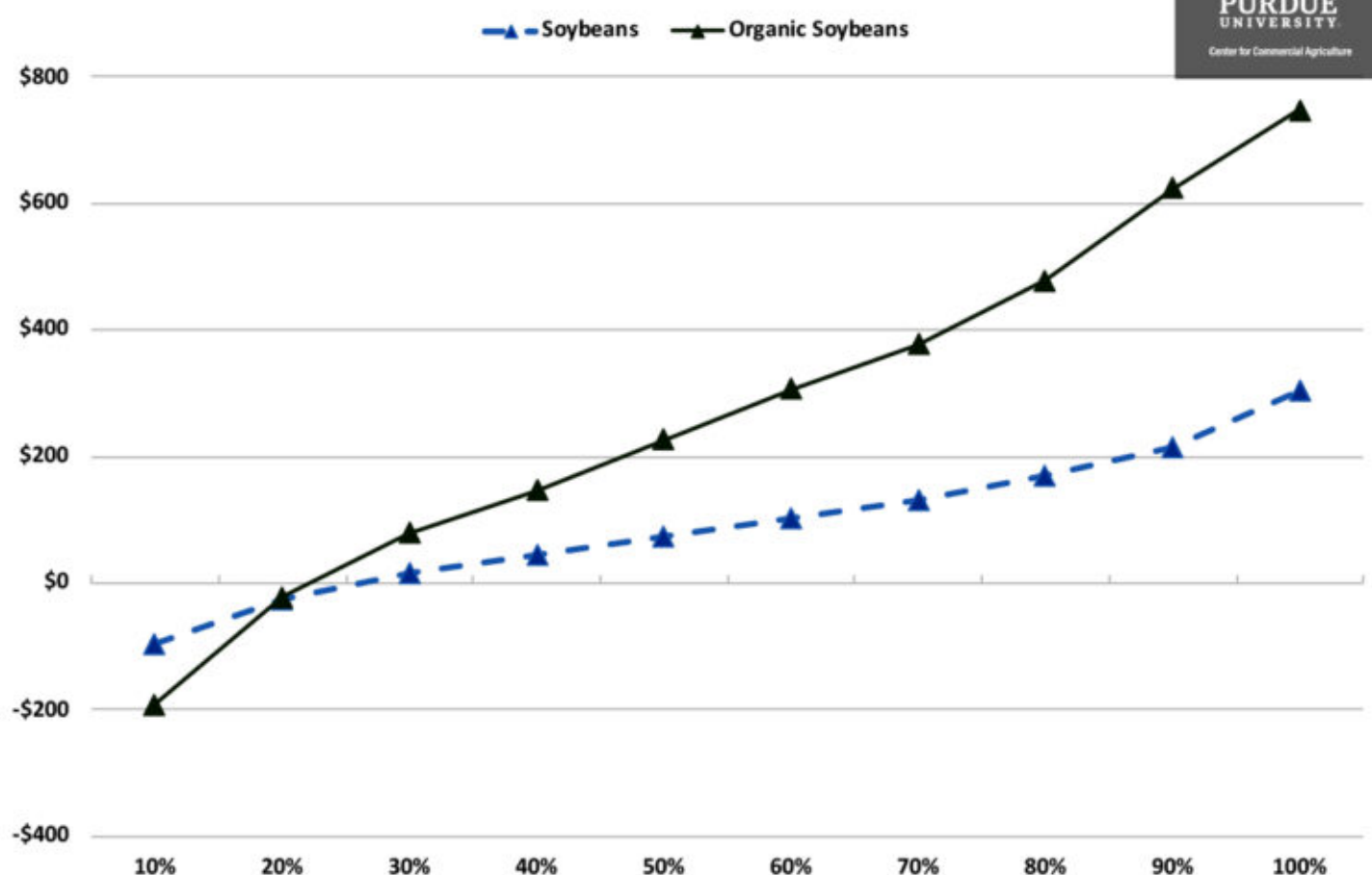


Figure 1 presents the comparisons among enterprise deciles (ten equal groups) for conventional and organic corn using 2016 to 2020 FINBIN data. Net return in this figure was computed by subtracting land expenses from net return to land, and exclude government payments, operator labor, and a management charge. The median net returns per acre for conventional corn and organic corn were \$21 and \$450, respectively. The difference in net return per acre for the bottom and top deciles was \$511 for conventional corn and \$1,013 for organic corn. Despite the larger median net return, it is important to note that there were quite a few organic farms with lower net returns for corn than their conventional counterparts in the top deciles.



**Figure 2. Net Return per Acre by Decile for Conventional and Organic Soybeans**



Comparisons among enterprise deciles for conventional and organic soybeans are presented in figure 2. The median net returns using FINBIN data for the 2016 to 2020 period for conventional soybeans and organic soybeans were \$88 and \$278, respectively. The difference in net return per acre for the bottom and top deciles was \$401 for conventional soybeans and \$938 organic soybeans. Even though the median net return for organic soybeans is higher than the median net return for conventional soybeans, the organic producers in the lowest decile had lower net returns than the conventional soybean producers in the lowest decile.

What can we make of the results in figures 1 and 2? First, there is a larger difference in net returns between the organic producers than there is between the conventional producers. This result could be due to learning effects or the more complicated rotations associated with organic crop production. Second, obtaining a boost in net returns from organic soybean production appears to be much more difficult than it is for organic corn. This could be due to weed control issues often encountered when producing organic soybeans. The results in figures 1 and 2 stress the importance of examining the sensitivity of budgeted net returns for organic crops to changes in price, yield, and cost assumptions before transitioning acres.



## Summary And Conclusions

This article compared crop yields, gross revenue, total expense, and net returns for conventional and organic corn and soybeans. FINBIN data (Center for Farm Financial Management, 2021) were used to make the comparisons in this article. Consistent with previous work, organic corn and soybean enterprises had lower crop yields, higher crop prices and gross returns, and higher net returns. However, there was a much wider difference in enterprise net returns among organic corn and soybean enterprises than there was among conventional corn and soybean enterprises. It is also important to note that the difference in net return to land for oats was relatively small, and that conventional alfalfa and winter wheat exhibited higher net return to land than organic alfalfa and winter wheat.

This article summarized net returns for conventional and organic crop enterprises. Organic crop rotations tend to include small grains and/or forages as well as crops grown while in transition to organic production. For comparisons of conventional and organic crop rotations see Langemeier et al. (2020) and Langemeier and O'Donnell (2021).

**FARMER QUESTIONS ABOUT THE PANDEMIC**...are answered in this OSU Extension Dairy newsletter (<https://dairy.osu.edu/newsletter/buckeye-dairy-news/volume-23-issue-5/answering-farmers%E2%80%99-questions-about-pandemic-2021>) by Dr. Gustavo Schuenemann and Jeff Workman, OSU College of Preventive Medicine.

Times like these should remind everyone of the importance of having a robust food production system to ensure a nation's food security. Below are the frequently asked questions we receive when visiting farms.

To answer these questions, we should look at the unbiased science. The challenge with looking at the science regarding COVID-19 is that portions of the science do not yet exist, or are not yet confirmed through replication and hard evidence. Time must pass in order to generate data.

Science is evolving as researchers around the world continue to study and learn more to create unbiased new knowledge that informs all of us. Answering one research question may lead to several new research questions, or the correct answer backed by science is no longer relevant moving forward as the virus has changed.

The "gold standard" that we typically use in the U.S. for sharing information and making decisions regarding public health are the recommendations coming from the Centers for Disease Control and Prevention (CDC). The CDC develops and changes their recommendations based on the available scientific data at any given time.

### **There are coronaviruses on my farm — is this the same as COVID-19?**

No, there are animal coronavirus infections that are caused by different strains of coronavirus, such as calf diarrhea, winter dysentery in cows, and bovine respiratory disease complex (shipping fever).



To prevent losses, producers vaccinate their animals to protect against diseases caused by coronavirus.

### **When and how will the COVID-19 pandemic end?**

We can't yet say exactly when the pandemic will end, but we do know that the pandemic will essentially be over when the individuals who make up the population achieve some level of immunity which ultimately stops the spread.

### **How do you get immunity?**

Immunity may be natural, or infection-induced, in which a person is infected with the virus and recovers. Immunity can also be vaccine-induced in which a vaccine helps the body to produce antibodies. Individuals who make up the population must achieve immunity to stop the spread and ultimately end the pandemic.

### **What is herd immunity?**

Herd (or group) immunity occurs when a large portion of the population (or herd) has some level of immunity to a virus. This means if someone who didn't have enough immunity becomes exposed and infected, the likelihood of them passing it on to someone else is much less because the majority of their contacts in their surroundings already have immunity.

When a virus infects an individual, the individual either recovers or succumbs, and the virus can only survive by spreading to another host individual. We see in other viruses, such as the measles and mumps, in which the US population already has herd immunity, there are occasional small, isolated outbreaks, but the virus is unable to develop into a pandemic.

### **Is immunity a sure thing?**

Typically, immunity from most viruses is never 100%. For example, we achieve immunity from the chickenpox virus through natural infection or vaccination, but there are still a few cases of reinfection identified worldwide. Influenza (flu) viruses have the ability to mutate, adapt, change, and jump across species.

As the flu virus changes, a person who has been vaccinated over several years, and also has some infection-induced immunity, may still become infected. However, they have some immunity that lessens the severity of their infection and results in a faster recovery.

### **Why should I get vaccinated?**

The safest way to achieve some degree of immunity against COVID-19 is through vaccination. The current COVID-19 vaccines have been shown to be as high as 94% effective at preventing COVID-19 hospitalizations. The Delta variant is the newest strain of concern because it appears to be more contagious and severe than earlier strains of COVID-19. All indications thus far are that individuals who are fully vaccinated have protection from the Delta variant. It is important to keep in mind, if we learn that immunity wanes over time, or that the virus has significantly changed so that the current vaccine-induced immunity (or infection-induced immunity) is no longer effective, there could be



recommendations for booster shots or other vaccine formulations at some point in the future. Individuals should choose whichever vaccine is available and they have the opportunity to receive.

Current efficacy percentages reported are developed from subsets of people, and the true efficacy numbers will become much more valid and reliable as datasets become much larger and time passes.

Keep in mind that the efficacy of the annual influenza vaccines is typically only 40 to 60%. All three COVID-19 vaccines have been found to be safe and effective. Everyone is biologically different and side effects vary. The reward (immunity or some degree of immunity from COVID-19) outweighs the risk (potential vaccine side effects).

To conclude, the safest way to achieve immunity or some degree of immunity is by becoming fully vaccinated (individuals need both doses of a two-dose series). If an individual doesn't achieve immunity that fully prevents infection, they may achieve a degree of immunity that decreases the severity of symptoms and duration.

We all do personal risk assessments and consider the risk-benefit ratio each and every day without even thinking about it. There is risk in getting up in the morning and going to work. There is risk in driving a vehicle, operating machinery, flying on an airplane, and so on. Essentially everything we do in life has some degree of risk, but when individuals determine the benefit or reward outweighs the risk, they must carry on and move forward. Talk to your doctor or health care provider to discuss the best option for you and your family.



## TUSCARAWAS COUNTY AGRICULTURE & NATURAL RESOURCES

October 16, 2021

**WINTER FEED COSTS**...are typically the single largest expense in most livestock grazing systems. Dr. Steve Boyles, OSU Extension Beef Specialist, discusses the topic in this OSU Extension Beef newsletter: <https://u.osu.edu/beef/2021/10/06/developing-a-winter-feeding-program/#more-11591>.

Extending the grazing to reduce the cost of feeding stored feed will greatly increase profits. Labor can be reduced 25% or more. Rotational grazing takes about three hours per acre per year as opposed to hay production, which takes seven hours per acre per year. The cost for grazing a cow per day is \$.25 compared to \$1.00 per day to feed hay to a cow.

The first step is to evaluate the potential, available, existing feed. Crop residue can be an abundant winter feed. Corn stalks can maintain a spring calving cow in good body condition for about 60 days after corn harvest. The feed value will decline quickly after the 60-day period. Cattle will select and eat grain, then husks and leaves, and last cobs and stalks. Strip grazing increases utilization, rations the feed, and reduces the need for supplementation. The crop fields should be grazed so that adequate residue remains soil erosion control.

Stockpiled perennial grasses can be grazed in the late fall/early winter. The general recommendation is to clip or make hay in the field during the end of July and apply 30 to 50 pounds of nitrogen per acre. High-producing, clean, well-drained fescue and orchard grass meadows would be a good choice. Let the forage grow until you need it. Strip grazing will increase utilization. Winter annual forage crops can be used to provide grazing. Brassicas are easy to establish, fast-growing, high-yielding, and high-quality and can withstand cold temperatures. Turnips can reach maximum quality in as little as 60 days. The tops can tolerate temperatures down to 20 degrees and the bulbs down to 10 degrees. Cows and sheep will eat both the tops and bulbs.

Grazing and presetting round bales prior to feeding can reduce trampling and extend the grazing season. Setting rounds 20 feet on center in the fall when the weather is fit and moving a temporary electric fence to feed them reduces winter feeding time. Hay should be fed away from drainage ways and near livestock watering sources. Feeding hay in low fertility areas will improve the fertility and future pasture quality.

Livestock heavy use areas or pads should be located outside the flood plains. If the pad is located close to a watercourse, run off and manure from the pad should be managed to protect the stream from pollution. These areas should be located at least 300 feet away from neighboring residences and away from wells. A manure management system should be designed to handle any accumulated manure on the pad.

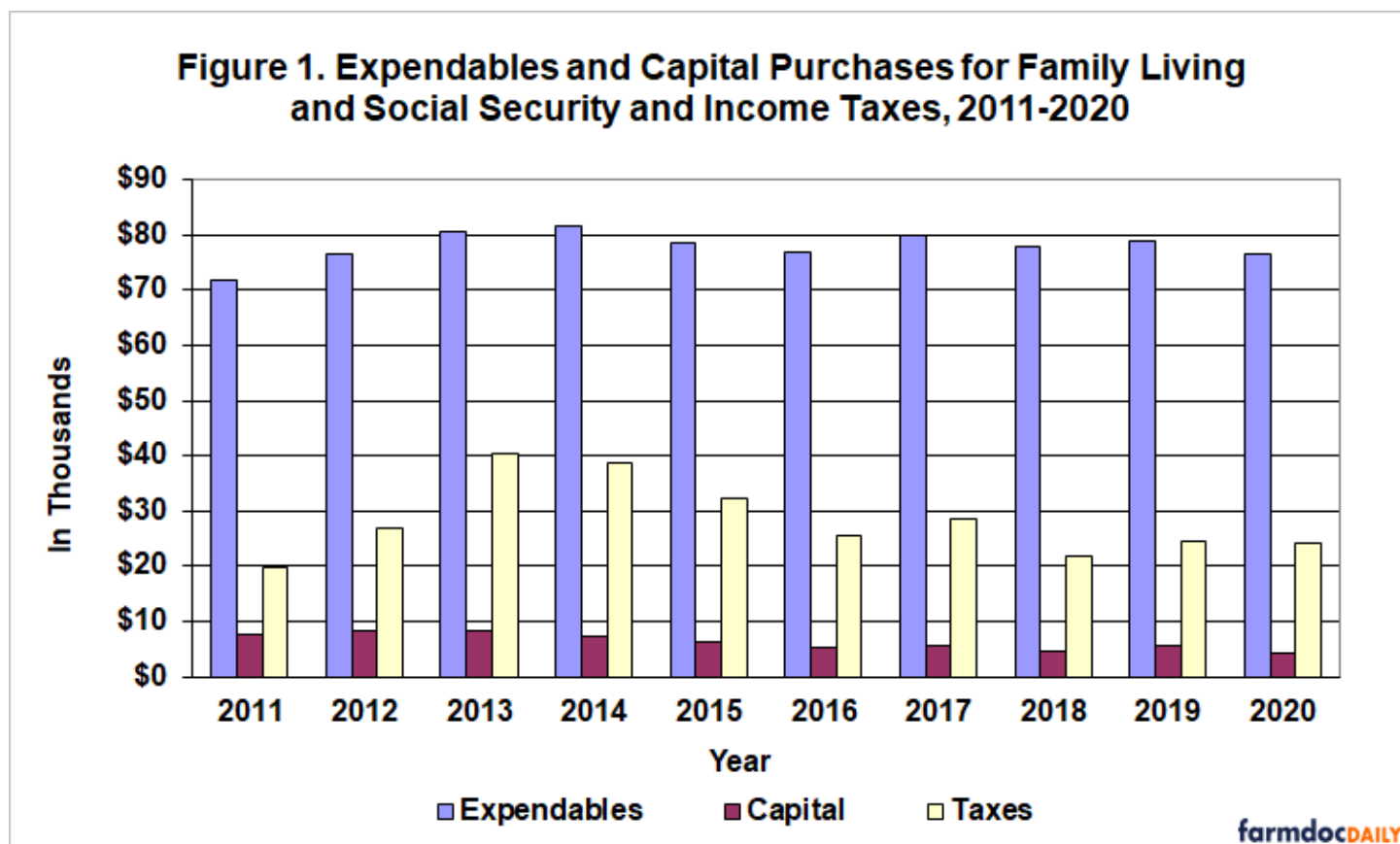


More details on these options can be found in OSU Extension Bulletin 872: [Maximizing Fall and Winter Grazing of Beef Cows and Stocker Cattle](#)

**AGRICULTURAL SALES TAX EXEMPTION**...for Ohio farmers is discussed in this OSU Extension Law Bulletin [https://farmoffice.osu.edu/sites/aglaw/files/site-library/LawBulletins/Ag\\_Sales\\_Tax\\_Bulletin\\_Oct2021.pdf](https://farmoffice.osu.edu/sites/aglaw/files/site-library/LawBulletins/Ag_Sales_Tax_Bulletin_Oct2021.pdf).

**DO NOT FORGET FAMILY LIVING EXPENSES**...when developing budgets for 2022. This topic is discussed in this University of Illinois Farmdoc article: <https://farmdocdaily.illinois.edu/wp-content/uploads/2021/10/fdd151021.pdf>

In 2020, the total noncapital living expenses of 1,088 farm families enrolled in the Illinois Farm Business Farm Management Association (FBFM) averaged \$76,672—or about \$6,400 a month for each family (Figure 1). This average was about 2.8 percent lower than in 2019. Another \$4,354 was used to buy capital items such as the personal share of the family automobile, furniture, and household equipment. Thus, the grand total for living expenses averaged \$81,026 for 2020 compared with \$84,340 for 2019, or a \$3,314 decrease per family.

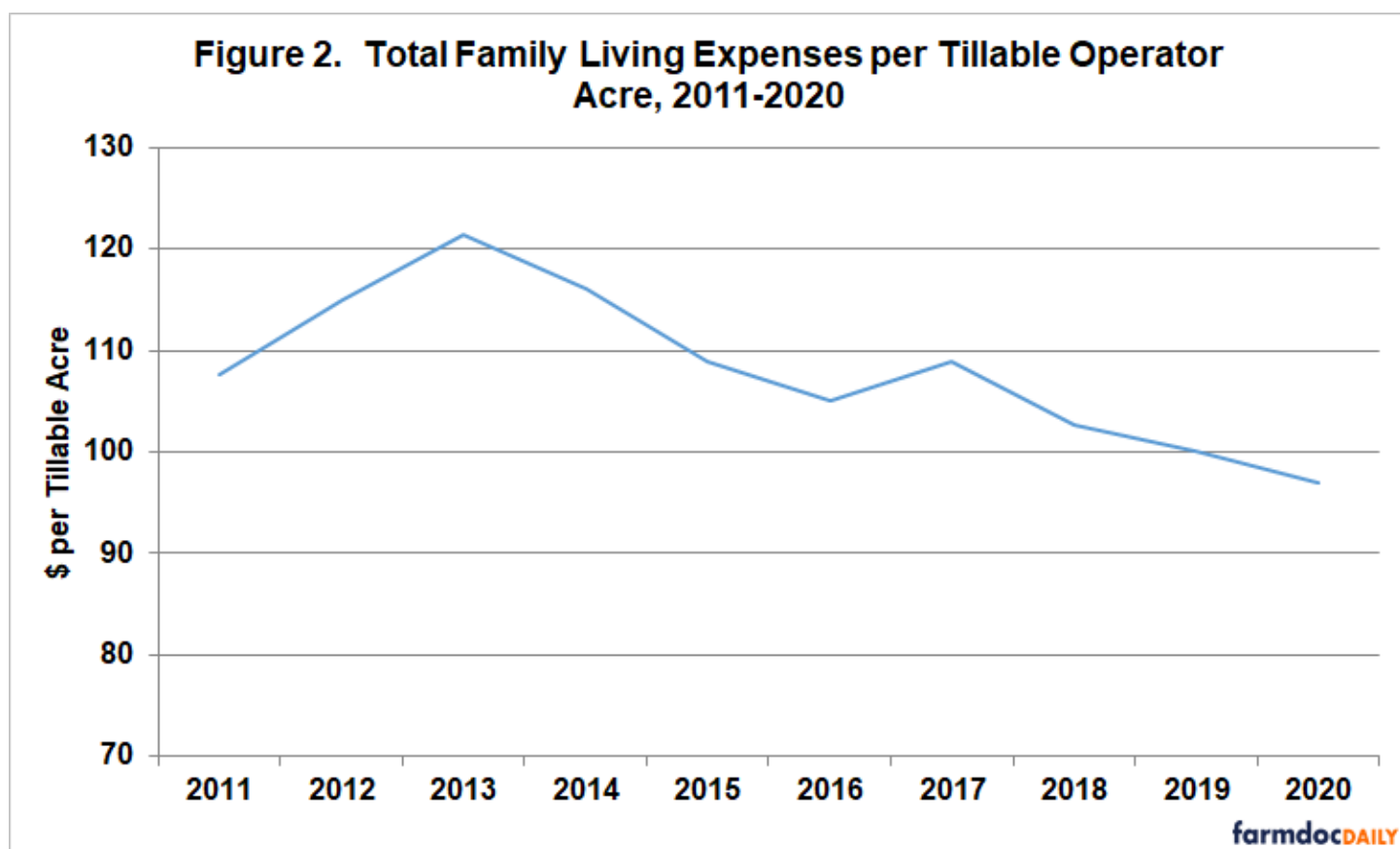


Income and social security tax payments decreased 1.3 percent in 2020 compared to the year before. The amount of income taxes paid in 2020 averaged \$24,214 compared to \$24,525 in



2019. Net nonfarm income increased, averaging \$47,892 in 2020. Net nonfarm income has increased \$12,438, or 35.1 percent in the last ten years.

In Figure 2, total family living expenses (expendables plus capital) are divided by tillable operator acres for 2011 to 2020. In 2011, all of the family living costs per acre averaged about \$108 per acre. This increased to \$121 per acres in 2013, but has decreased to \$97 per acre in 2020. \$108 was the 10-year average of total family living expense per acre. If we compare this to the 10-year average of net farm income per acre of \$158, then 68% of the net farm income per acre is family living expense. If we look at the average year over year change for the last ten years for family living per acre, the annual change was *negative* 0.3% per year. The five-year annual change per year would average *negative* 2.2%. Therefore, as you work on your crop budgets, keep in mind that a \$97 per acre family living is equal to a 49 cent per bushel price change on 200 bushels per acre for corn.



When you take total family living expenses minus net nonfarm income this equals \$40 per acre in 2020 and was \$48 per acre for the five-year average. This would be the part of family living that is covered by the farm income. In addition, there is another \$29 per acre in social security and income taxes to be covered by the farm in 2020. The five-year average for these taxes was \$31 per acre. A 20 cent price change on 200 bushels of corn per acre is equal to the 2020 family living cost that



would be covered by the farm. If you added the amount of social security and income taxes that would be a 35-cent price change on 200 bushel of corn per acre.

**SPOTTED KNAPWEED**... is a detrimental weed that shares similarities to many less threatening pasture plants. The color of the flower is like that of red clover, the growth habit is similar to chicory, and the flower shape is similar to Canada thistle and ironweed. However, the combination of growth habit, color, and flower shape is unique to spotted knapweed. Spotted knapweed may possess as many as 200 pink to purple blooms per plant. The mature seed heads resemble Canada thistle, a tight cluster of seeds with a fluffy pappus attached. The pappus helps the seed move with wind, water, animals, and vehicles.



Spotted knapweed (far left) is often confused on first glance with other flowers like red clover, chicory, or ironweed. Growth habits are drastically different between all of these plants. (Photo Sources: Steve Dewey of Utah State University and Christine Gelley of OSU Extension)

Mowing for control is marginally successful. It does help prevent the development of seed, but the plant is able to flower below the height of a mower deck. Biological control using various insects has proven beneficial in western systems but are difficult to secure in the eastern part of the United States. Chemical treatment with readily available broadleaf herbicides and glyphosate for spot treatment has been successful in grass pastures of our region if timed appropriately. Adequately fertilizing pastures can be helpful for increasing the health and competitiveness of desirable plants against the onslaught of this invader.

Some commonly used broadleaf herbicides that are also effective on spotted knapweed include:

- Aminopyralid
- Aminopyralid + 2,4-D
- Clopyralid 3,
- 2,4-D amine or ester
- Dicamba
- Dicamba + 2,4-D
- Picloram 22K
- Others may work as well, but effectiveness is unknown or only considered fair in comparison.

The best control tools for spotted knapweed and many other weeds are early detection and early action. Hand pulling and spot spraying young plants that are few and far between can be effective on



new invasions. However, heavy infestations will likely take a more creative and lengthy approach to treat including a combination of management tactics.

(Source: OSU Extension Beef newsletter: <https://u.osu.edu/beef/2021/10/06/recognizing-the-risks-of-broadleaf-weeds-in-pasture/#more-11478>)

**SENATE BILL 52**...became effective earlier this week. The new laws expand local involvement in the siting and approval of utility-scale solar and wind facilities, as follows:

- County commissioners may designate “restricted areas” where such facilities may not locate.
- County citizens may petition for a referendum to approve or reject restricted area designations.
- Developers must hold a public meeting overlooking a proposed facility in the county where it would locate.
- County commissioners may prohibit or limit a proposed wind or solar facility after learning of it at the public meeting.
- County and township representatives must sit on the Ohio Power Siting Board committee that reviews facility applications.

The new laws also require wind and solar developers to submit decommissioning plans and performance bonds to address removal of a facility at the end of its lifetime.

Additional information about this topic is available from OSU Extension at:  
<https://farmoffice.osu.edu/our-library/energy-law>.





## TUSCARAWAS COUNTY AGRICULTURE & NATURAL RESOURCES

October 21, 2021

**FALL ARMYWORM**...damage is once again being reported throughout the county. Scouting wheat, rye, alfalfa, and cover crops is strongly encouraged.

**COMBINE FIRES**...have been reported in several counties across Ohio. Unfortunately, Ohio ranks fourth in the nation for combine fires. Other states leading the list include Minnesota (1st), Iowa (2nd), Illinois (3rd), Kansas (5th), Nebraska (6th) and South Dakota (7th). This OSU Extension C.O.R.N. newsletter (<https://agcrops.osu.edu/newsletter/corn-newsletter/2021-36/prevent-combine-fires-during-fall-harvest>) discusses the topic of combine fires. A summary is provided below.

### TIPS TO PREVENT COMBINE FIRES INCLUDE:

- **Have a daily maintenance plan during the harvest period.** Keeping machinery well maintained plays a large role in preventing fires from these sources. Cleaning up spills, blowing off chaff, leaves, and other plant materials on a regular basis, proper lubrication of bearings/chains, and checking electrical connections should be part of the daily routine. Farmers may choose to do their daily maintenance in the morning while waiting for the dew to burn off the crops. However, performing maintenance at night will highlight any hot-spots or smoldering areas as the machine is cooling down. Removing chaff at the end of the day will reduce the amount of debris available to spark a fire.
- **Eliminate static electricity.** A chain may also be mounted on the bottom of the machine to drag on the ground while in the field. This decreases the buildup of static electricity.

### IF A FIRE BREAKS OUT, IT'S IMPORTANT TO HAVE AN EMERGENCY PLAN IN PLACE:

- **Call 911 or your local first responders at the first sign of a fire.** Don't wait to know if you can contain a fire yourself, rapid response is important to saving valuable equipment. Combine fires are often in remote locations where a specific address may not be available and access is limited. Emergency response times will be longer in these situations.
- **Have (2) ABC fire extinguishers mounted on the combine.** A 10-pound ABC dry chemical fire extinguisher in the cab or near the ladder of the cab is quick access to protect the operator. A second extinguisher (20-pound ABC) is recommended to be mounted on the outside of combines where it is accessible from the ground. It's possible that one unit will extinguish a small fire; having the second unit will help with any additional flare-ups. Don't forget to check that the extinguishers are fully charged at the beginning of the season. Not having extinguishers ready when needed leads to a helpless feeling of watching one of your most expensive pieces of equipment go up in flames.
- **Have a water truck positioned by the field.** Hot mufflers and catalytic converters from other vehicles driving in the field can pose a risk to the dry field fodder. Smoldering materials



may go by 15 to 30 minutes before being noticed. A small gust of wind could rapidly turn that smoldering into a fire. In extreme dry conditions, a water truck may help protect against field fires. Never use water on fires that are electrical or fuel-sourced.

- **Have an emergency plan in place and discuss it with the other workers or family members.** Knowing what to do in the event of a fire emergency is important. Knowing the address to the field and how to contact fire departments directly instead of through the 911 system are important safety conversations for the entire harvest crew.

Don't get caught thinking it can never happen on your farm. Take preventative action and be prepared.

**DARK DUST CLOUDS**...during harvest operations are not unusual, but some are reporting that the dust is thicker and darker than normally experienced. One possible explanation for this could be the fact that leaves in several corn fields died prematurely because of mid- to late-season diseases such as tar spot, gray leaf spot, and particularly, northern corn leaf blight. These leaves were then exposed to wet, humid conditions which caused them to produce lots and lots of fungal spores. For instance, under wet conditions, northern corn leaf blight lesions produce large amounts of dark-colored spore that are easily suspended in the air once the plants are disturbed by the combine. In addition, saprophytic fungi such as *Alternaria*, which also produce dark-colored spores, may also grow on dead plant tissue exposed to wet, humid late-season conditions, adding to the number of dark particles in the dust cloud during harvest.

**Respiratory Alert – Harvesting fields with dry, moldy leaves may expose farmers to dust.** Dust in grain harvested from fields that were severely affected by foliar disease contain a mixture of tiny pieces of diseased leaves and fungal spores, all of which may cause irritation and allergic reactions. Breathing dust can have adverse effects on the human respiratory system. For field with ear rots, dust (pieces of moldy cobs and husks) may also be contaminated with mycotoxins.

Wearing a disposable, 2-strap N95 mask (respirator) helps protect the worker from breathing in dusty, moldy and toxic substances. This type of personal protection equipment will filter out at least 95% of the dust and mold in the air. The 1-strap mask does not have this level of protection and is basically worthless in agricultural environments.

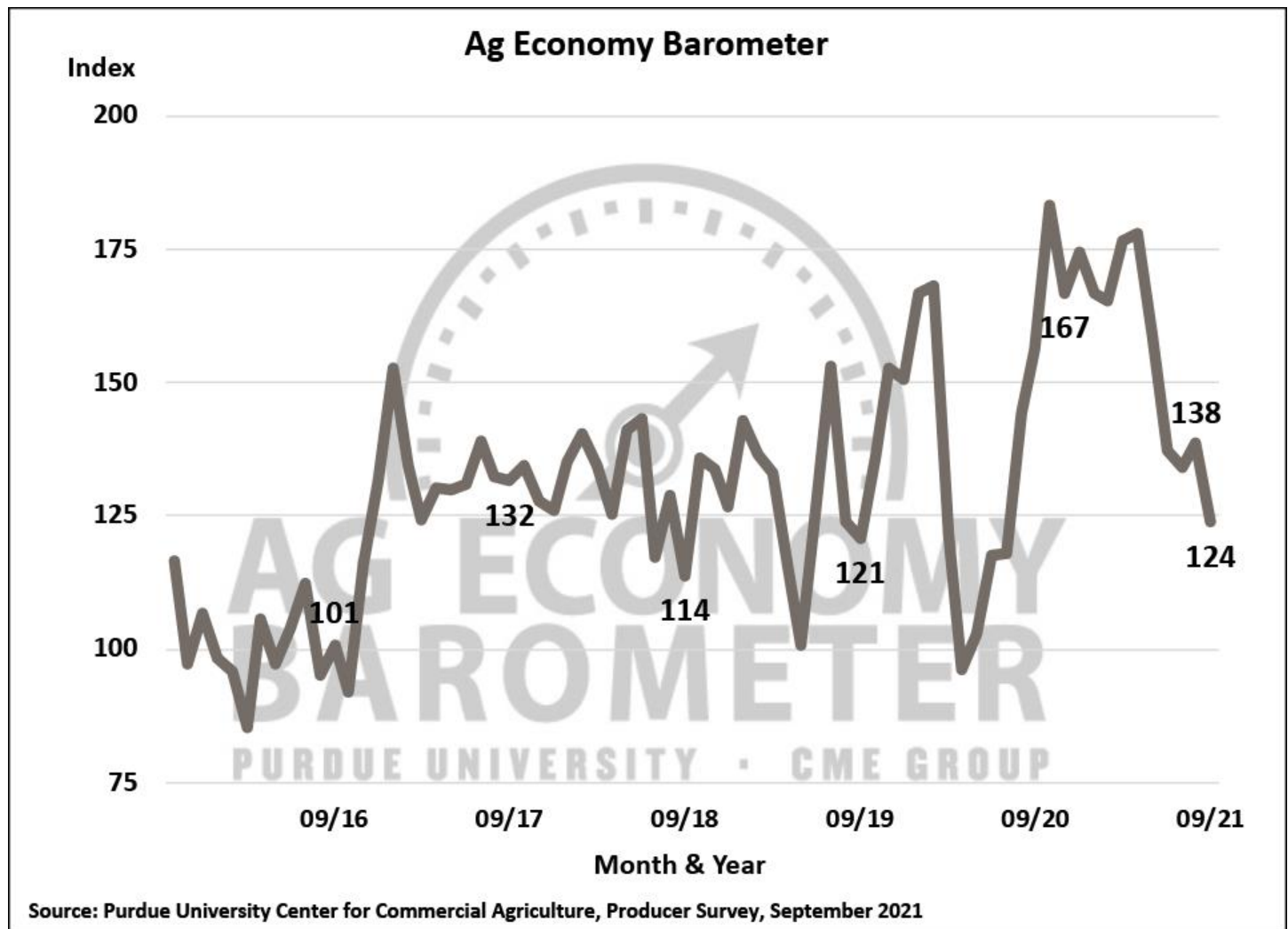
For additional information about respiratory protection, please see this OSU Extension C.O.R.N. newsletter: <https://agcrops.osu.edu/newsletter/corn-newsletter/2021-36/harvesting-corn-fields-moldy-leaves-and-stubble>.

**ALTERNATIVE ON-FARM GRAIN STORAGE**...options are discussed in this OSU Extension C.O.R.N. newsletter: <https://agcrops.osu.edu/newsletter/corn-newsletter/2021-36/alternative-options-farm-grain-storage>.

**FARMER SENTIMENT DECLINED**...in the September Ag Economy Barometer published by Purdue University. Sentiment among agricultural producers weakened in September as the *Ag Economy Barometer* declined 14 points to a reading of 124. This is the weakest farmer sentiment reading since

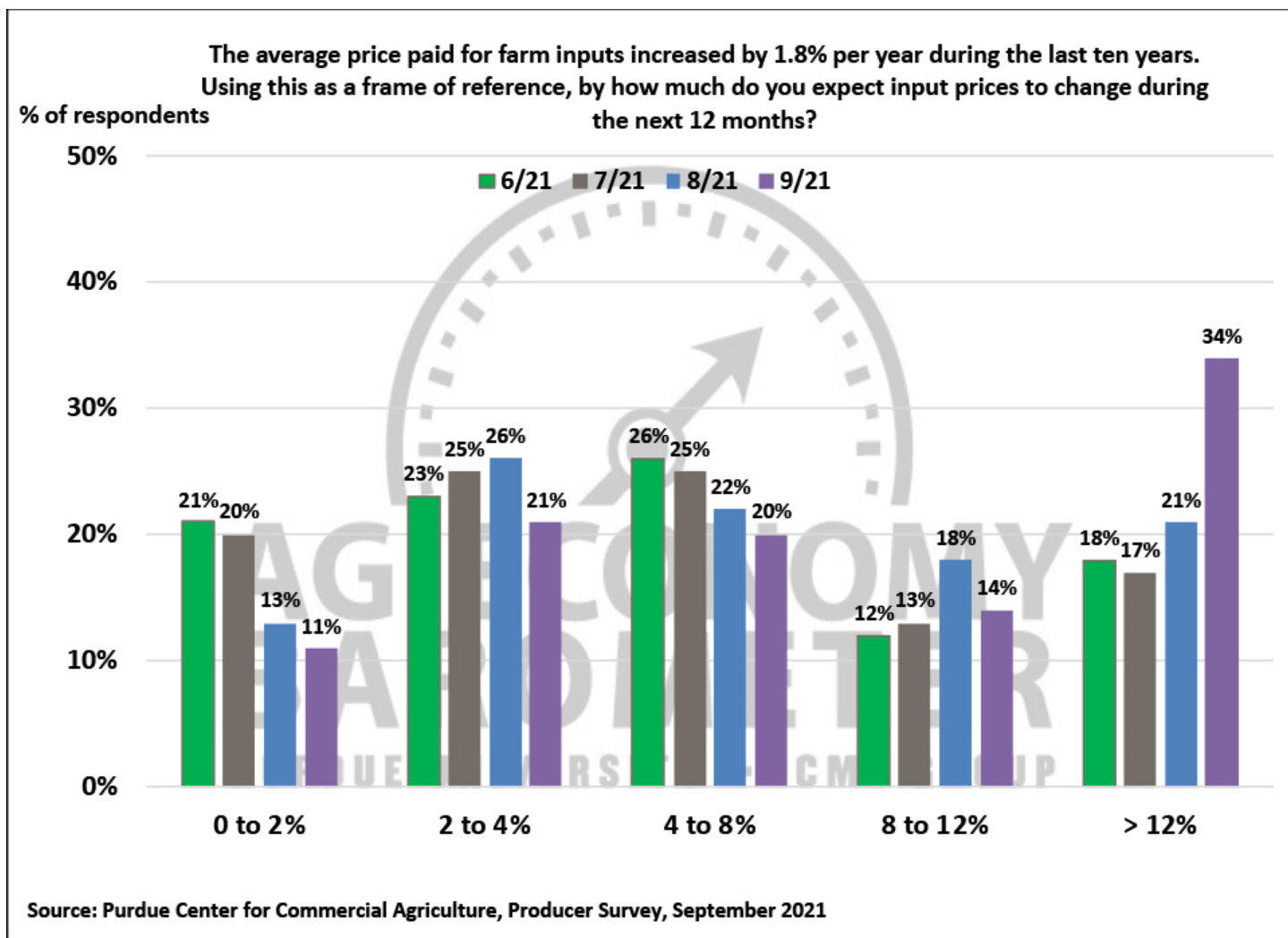


July 2020 when the index stood at 118. Producers were less optimistic about both current and future conditions on their farms and the agricultural sector than they were a month earlier. Selected highlights are provided below. The entire report is available here: <https://ag.purdue.edu/commercialag/ageconomybarometer/wp-content/uploads/2021/10/September-2021-Ag-Economy-Barometer-1.pdf>.



Concerns about rising input costs rose sharply in September, contributing to the weakness in farmer sentiment. This month, just over one-third of respondents said they expect farm input prices to rise by more than 12% in the upcoming year, which is more than 6 times the average farm input inflation rate of the last decade. Moreover, inflation expectations were higher this month across the board. The percentage of respondents expecting input inflation to rise above 12% jumped from 21% last month to 34% this month, while responses to all of the lower inflation categories provided on the survey declined. Notably, the percentage of producers expecting input inflation to rise above 12% has doubled since July.

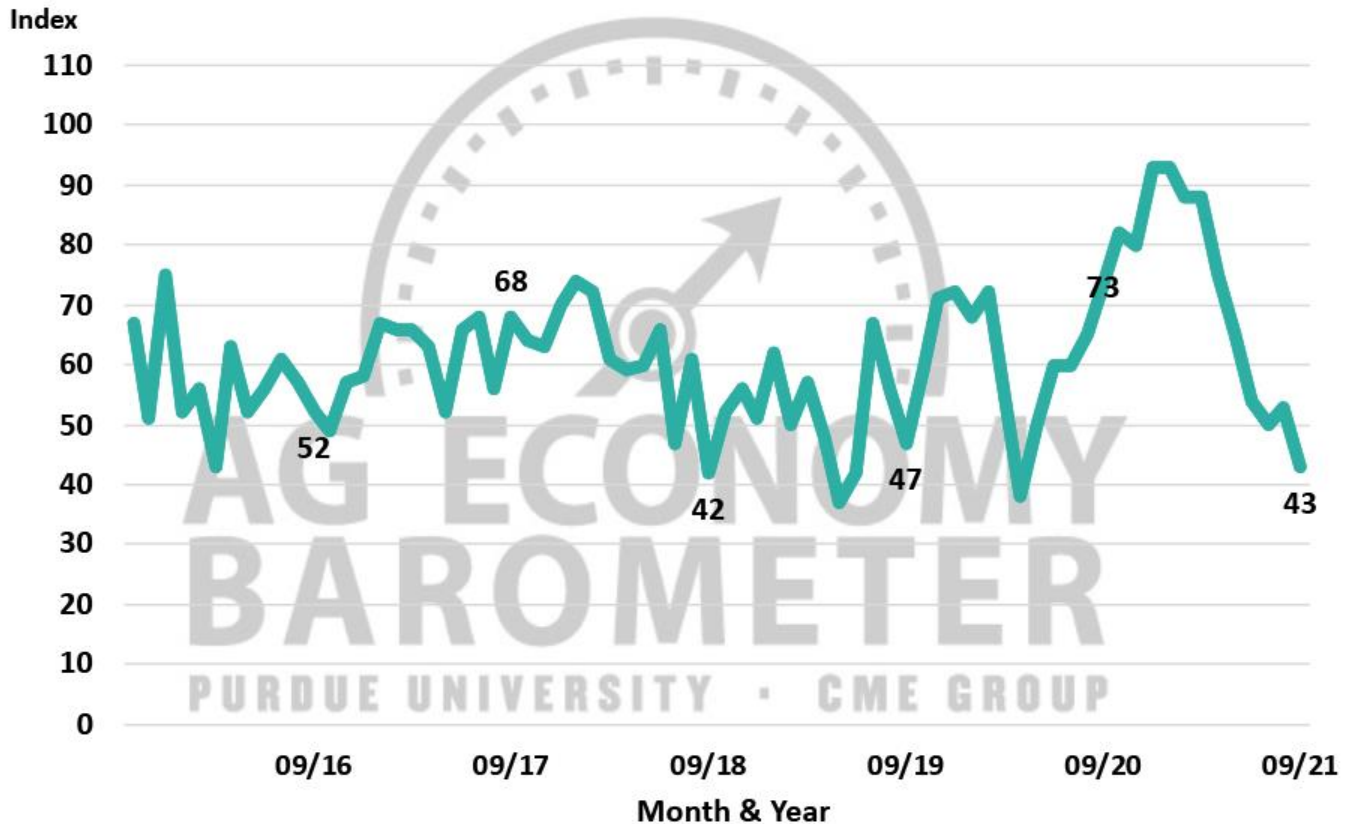




The decline in farmer sentiment was reflected in a weaker *Farm Capital Investment Index*. The index declined 10 points to a reading of 43, which was the lowest value for the investment index since April 2020. Moreover, the investment index is now down more than 50 percent since the beginning of the year. Farmers' plans for machinery purchases were somewhat weaker than in August with just 8 percent of respondents planning to increase purchases in the upcoming year, down from 10 percent last month. This month's survey included a new question to capture the impact of supply chain challenges in the farm machinery industry on investment plans. Nearly half (45%) of respondents said that their farm machinery purchase plans have been impacted by low farm machinery inventories, which helps explain weak sentiment regarding whether or not now is a good time to make large investments in their farm operation. One bright spot was an improvement in farmers' plans for new construction. New construction plans rose this month with 13 percent of respondents expecting to increase construction of grain bins and farm buildings compared to 8 percent expecting those purchases to rise on the August survey.



## Farm Capital Investment Index



Source: Purdue University Center for Commercial Agriculture, Producer Survey, September 2021

**CASH RENT QUESTIONS**...are being asked by farmers and landlords. Ag Lease 101 (<https://aglease101.org/>) is a product of the North Central Farm Management Extension Committee that provides detailed information about leasing and includes sample lease documents.

The USDA National Agricultural Statistics Service collects cash rent data by county. The table below summarizes average cash rent for selected counties as of October 2020.

County	Average Cash Rent/Acre (Cropland)
Carroll	\$51
Coshocton	\$97.50
Guernsey	\$42
Harrison	\$33.50
Holmes	\$105
Stark	\$90
Tuscarawas	\$68



**CROP PROGRESS**...for the week ending October 17, as provided by Ohio National Agricultural Statistics Service (NASS).

### Crop Progress: Week Ending 10/17/21

Crop/Activity	Percent Completed			
	This week	Last week	Last year	5 Year average
Days Suitable for Fieldwork ....	4.7	4.5	-	-
Corn Mature.....	95	87	85	85
Corn Harvested for Grain.....	25	19	23	29
Soybeans Dropping Leaves.....	95	90	96	94
Soybeans Harvested.....	54	33	63	57
Alfalfa Hay 4th Cutting .....	83	82	90	89
Other Hay 4th Cutting.....	75	65	NA	NA
Winter Wheat Planted .....	59	42	81	69
Winter Wheat Emerged.....	29	9	34	36

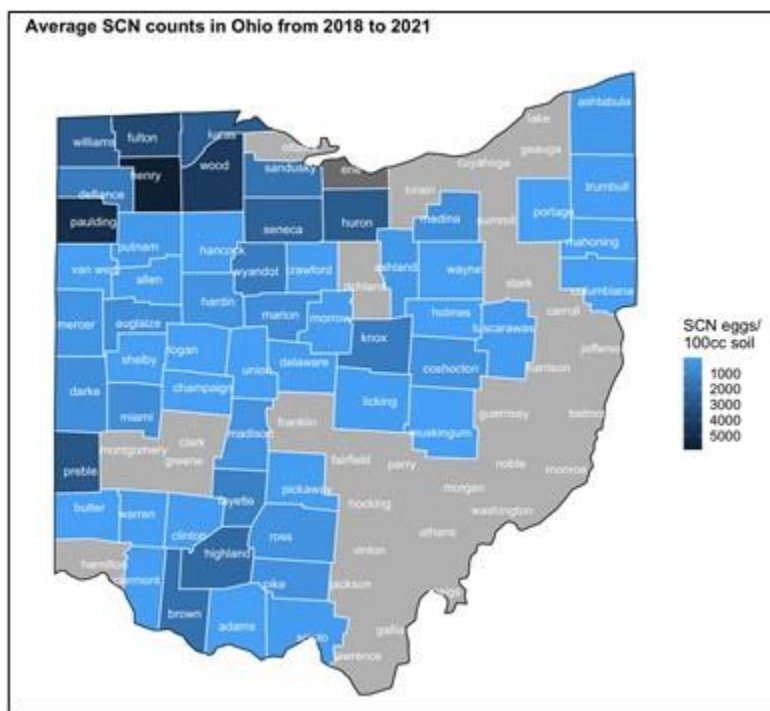


## TUSCARAWAS COUNTY AGRICULTURE & NATURAL RESOURCES

October 27, 2021

**SOYBEAN CYST NEMATODE (SCN)**... remains the most economically important pathogen of soybean and can cause yield loss between 15 and 30% with absolutely no visible symptoms. Resistance to SCN remains the most effective management strategy when rotating to a non-host crop is not an option. The predominant source of resistance in most commercially available soybean cultivars comes from Plant Introduction (PI) 88788, which confers resistance to SCN Type 0 (formerly race 3). Soybean varieties labeled 'SCN-resistant' most likely have resistance from PI 88788. The use of the same source of resistance over the past 20 years has placed selection pressure on SCN populations resulting in a shift in virulence, leading to adaption to now infect PI 88788-derived resistant soybean cultivars. In other words, nematodes reproduce at higher levels than before on soybeans developed with PI 88788 resistance.

Since 2018, with funding from the soybean check-off through the [Ohio Soybean Council](#) and [The SCN Coalition](#), and in collaboration with OSU Extension Educators and growers, we extensively sampled soybean fields in Ohio. To date, a total of 741 soil samples from 57 counties in Ohio were submitted for SCN testing (Fig.1).



Soybean cyst nematode is silently gaining territory in Ohio as SCN numbers are rising. The ability to reproduce on soybean cultivars with 'SCN-resistance' will lead to an imminent loss in our battle to



protect Ohio soybean production. To take action, we need to know our numbers. Managing SCN begins with an adequate and correct soil sample. Fall is a great time to sample for SCN and we are excited to help with this task by processing up to **TWO soil samples, per grower, to be tested for SCN, free of charge.**

If you are interested in having a field (or two) sampled, please contact me. I will collect and submit soil samples to the lab for SCN analysis.

(Source: OSU Extension C.O.R.N. newsletter: <https://agcrops.osu.edu/newsletter/corn-newsletter/2021-37/take-test-beat-pest>)

**TIME STILL AVAILABLE...**for herbicide applications (<https://agcrops.osu.edu/newsletter/corn-newsletter/2021-37/still-big-window-fall-herbicide-treatments>). In OSU weed science plots, we have typically applied most of our fall herbicides in early to mid-November but have occasionally applied into December and maintained effectiveness on winter annuals and dandelion. When we get a period of very cold weather in later November, there is typically a decline in dandelion and thistle (change from green to purplish) so that control decreases, but we seem to still control the winter annuals. So, we should still have up to 6 weeks yet to apply herbicides, although we may be up against increasingly wet field conditions.

Following our previous article on fall herbicides, where we discussed how to proceed without glyphosate, we were told that 2,4-D prices have increased considerably, and supply may be short. There are apparently some ongoing adaptations of fall herbicide programs to minimize use of 2,4-D and glyphosate both, and we are getting questions about using dicamba as the base for treatments instead of 2,4-D. Among all the herbicides we have used in fall, dicamba seems to be affected by cold weather the most and require considerable help from another herbicide to obtain comprehensive control. Some considerations based on our research:

- Do not apply dicamba alone – it won't be effective enough and misses some key weeds (same can be said for 2,4-D which misses chickweed)
- When using dicamba as a base to mix with lower rates of 2,4-D or glyphosate, use a dicamba rate of at least 0.5 lb ai/A. In the mixtures mentioned below, use a rate between 0.25 and 0.5 lb ai/A, depending upon how effective the mix partner is.
- Mixtures of dicamba and metribuzin can be "good enough". Our most typical mix has been 0.25 lb ai dicamba plus 0.38 lbs ai metribuzin. We have not tested mixtures of dicamba with simazine.
- We have not tested mixtures of dicamba with ALS inhibitors containing rimsulfuron, tribenuron, and/or chlorimuron (e.g. Basis, Express, Canopy), but our assumption is that these should work.
- In our research, we do not use adjuvants with dicamba/2,4-D. If they are mixed with glyphosate, we add AMS. Treatments containing metribuzin, simazine, and the ALS inhibitors are usually applied with crop oil concentrate.



**Different topic** – the shortage or anticipated shortage of various products has caused some growers to buy and take possession of herbicide this fall, including filled shuttles, for use next spring. Be sure to know the storage requirements for situations like this – minimum temperature, etc. Also be aware that changes in the product – separation or settling out of certain components – can occur over time, and there may be recommended procedures to prevent this or restore the integrity of product at the end of long storage. Check with manufacturer and distributor representatives for the appropriate information.

**CROP ENTERPRISE BUDGETS**...for 2022 are available from OSU Extension at: <https://farmoffice.osu.edu/farm-management/enterprise-budgets#2022>. Production costs for Ohio field crops are forecast to be higher compared to last year with higher fertilizer, seed, chemical, fuel, machinery and repair costs leading the way.

Total costs projected for trend line corn production in Ohio are estimated to be \$919 per acre. This includes all variable costs as well as fixed costs (or overhead if you prefer) including machinery, labor, management, and land costs. Total costs projected for trend line soybean production in Ohio are estimated to be \$619 per acre. (Fixed machinery costs: \$62 per acre, land charge: \$207 per acre, labor and management costs combined: \$53 per acre). Total costs projected for trend line wheat production in Ohio are estimated to be \$541 per acre. (Fixed machinery costs: \$36 per acre, land charge: \$207 per acre, labor and management costs combined: \$48 per acre).

With expected increases in input costs, I encourage you to review these budgets as you plan for 2022.

**OCTOBER BEEF OUTLOOK REPORT**...released October 18 by USDA is summarized and available on the OSU Extension Farm Office website: <https://farmoffice.osu.edu/news/usda-october-beef-outlook-report>. Price projections from the report:

### **Cattle Price Forecasts – 2021**

The five-area marketing region report for the first week of October put live steer prices at \$122.56 per cwt. This is \$15 higher than the same week in 2020. Large supplies of fed cattle pushed the fourth-quarter 2021 price forecast down \$4 to \$127 per cwt.

Feeder steer prices (750-800 pounds) at Oklahoma City National Stockyards averaged \$152.55 per cwt for the week ending October 4, 2021. This is more than \$8 above the average price from the same week last year. Based on the expectation of higher placements, the fourth-quarter price was lowered to \$151 per cwt from the previous month's estimate. The annual forecast for feeder steer prices for 2021 came in at \$144.80 per cwt.

### **Cattle Price Forecast – 2022**

USDA-ERS raised the fed cattle price for the second half of 2022, based on demand and tighter supplies.



It is anticipated that feeder cattle supplies will be tighter in 2022. Based on this, USDA-ERS increased the annual forecast for feeder cattle to \$155.50 per cwt.

**OHIO FARM BUSINESS ANALYSIS & BENCHMARKING PROGRAM**...at Ohio State University Extension has released the 2020 Crop Enterprise and 2020 Dairy Enterprise Business Summaries. The reports are available here: <https://farmprofitability.osu.edu/business-summaries>.

**FALL IS AN EXCELLENT TIME**...to collect and submit soil samples for nutrient analysis. Sampling is particularly important with the high costs of agricultural inputs. *If soil test P and soil test K levels are within the maintenance range it is extremely unlikely that there will be a yield response with additional fertilizer application.* For more information on the state soil fertility guidelines, see the newly revised 'Tri-State Fertilizer Recommendations for Corn, Soybeans, Wheat, and Alfalfa available here: [https://agcrops.osu.edu/FertilityResources/tri-state\\_info](https://agcrops.osu.edu/FertilityResources/tri-state_info)

This OSU Extension C.O.R.N. newsletter (<https://agcrops.osu.edu/newsletter/corn-newsletter/2021-37/fall-soil-fertility-sampling>) provides additional information.

**ENVIRONMENTAL ASSESSMENT**...of winter feeding areas is discussed in this OSU Extension Beef newsletter: <https://u.osu.edu/beef/2021/10/27/environmental-assessment-of-winter-feeding-areas/#more-11596>. Outdoor wintering can be a tremendous cost-saving tool, but the environmental risks must be carefully evaluated. Time taken to properly locate the outdoor winter-feeding area is time well spent. Highlights from the article are provided below:

**Site Selection for Winter Feeding Areas:** Care needs to be taken when deciding which areas of the farm are to be utilized as winter pastures or feeding areas.

**Basic Needs of the Livestock:** Basic needs such as access to water, adequate feed, shelter from high winds, and relatively dry soil conditions are all critical when selecting the area where the livestock will be placed.

**Topography:** Topography is important for three major reasons: drainage, risk of erosion, and protection from high winds. In general, higher ground drains best. However, high ridge tops are prone to experience high winds and should generally be avoided unless a tree line or windbreak is available. Look for natural land features (such as knolls) that can be excellent locations for practices such as heavy-use pads. These slightly elevated areas provide positive drainage and are naturally protected from surface water flow from adjoining areas. Low-lying areas should also be avoided.

**Soil Characteristics:** Soils vary greatly in their ability to drain water, support weight, and hold nutrients. Before selecting your livestock wintering area, it is essential that you know the characteristics of the soils on your farm.



**Aspect:** Ideally, outdoor winter-feeding areas should have southern or southeastern exposure to the sun. Sunlight helps to reduce soil moisture, increase soil temperature, and improve animal comfort.

**Environmental Sensitivity of the Area:** On a given farm, there can be a wide array of environmentally sensitive areas. These may include areas such as stream corridors, springs or seeps, subsurface drainage tiles, ditches, wellheads, etc. Care should be taken to insure that animal waste is not allowed to accumulate in and around these sensitive areas.

**Aesthetics:** Non-farm neighbors may not understand your goals and why you have chosen outdoor wintering. Keep in mind that their opinion of your environmental ethic will be greatly influenced by what they see. When all other factors are equal, choose winter feeding locations that are well away from adjoining property lines and public roads.

For additional information related to this topic, please see:

[https://agmr.osu.edu/sites/agmr/files/imce/pdfs/Beef/GrazingEnvironmentalAssessment\(1\).pdf](https://agmr.osu.edu/sites/agmr/files/imce/pdfs/Beef/GrazingEnvironmentalAssessment(1).pdf).

**CROP PROGRESS**...for the week ending October 24 is provided by Ohio National Agricultural Statistics Service:

### Crop Progress: Week Ending 10/24/21

Crop/Activity	Percent Completed			
	This week	Last week	Last year	5 Year average
Days Suitable for Fieldwork ....	4.4	4.7	-	-
Corn Harvested for Grain.....	41	25	31	41
Soybeans Harvested .....	70	54	72	72
Alfalfa Hay 4th Cutting.....	86	83	92	NA
Other Hay 4th Cutting.....	80	75	NA	NA
Winter Wheat Planted .....	75	59	91	85

**FARM & RURAL STRESS RESOURCES**...are available from OSU Extension. See <https://u.osu.edu/farmstress/get-help-now/> for resources, information, and contacts.



## TUSCARAWAS COUNTY AGRICULTURE & NATURAL RESOURCES

November 4, 2021

**FARMLAND VALUES & CASH RENTAL RATES**...in Ohio is the topic of this OSU Extension article:

<https://farmoffice.osu.edu/news/farmland-values-and-cash-rental-rates-ohio-%E2%80%93-will-strong-markets-continue>. Farmland prices have strengthened in recent months and there are a number of key fundamentals that will likely continue to support land values in the near term. High crop prices and margins along with last year's COVID-19 related government payments and continued low interest rates have all contributed to stronger land markets. Higher production costs and recent minor decreases in crop prices may decrease profit margins this next year and take some strength out of the market but farmland will likely continue to see increases in value through the end of this year and into the next year. Similar factors have impacted cash rental markets in Ohio and will likely continue to pressure rental rates higher in the near term.

Recent data from the United States Department of Agriculture National Ag Statistics Service (NASS) August Land Values 2021 Summary shows Ohio Farm Real Estate increasing 3.9% from 2020 to an average of \$6,600 per acre in 2021. Ohio Cropland (bare cropland) showed an increase of 5.3% from 2020 to 2021. Average Cropland value is \$6,800 per acre in 2021 according to this survey. Pastureland value in Ohio increased 2.1% to \$3,440 per acre in 2021. Average cash rents in Ohio increased 2.6% in 2021 to \$160 per acre according to this survey. The National Ag Statistics Service (NASS) also summarizes average cash rental rates by county available through Ohio

NASS: [www.nass.usda.gov/Statistics by State/Ohio/Publications/County Estimates/2021/OH 2021 cashrent CE.pdf](http://www.nass.usda.gov/Statistics_by_State/Ohio/Publications/County_Estimates/2021/OH_2021_cashrent_CE.pdf)

According to the Western Ohio Cropland Values and Cash Rents Survey, cropland values in western Ohio are expected to increase in 2021 by 3.8 to 5.3 percent from 2020 to 2021 depending on the region and land class. Cash rents are expected to increase from 3.6 to 3.9 percent depending on the region and land class. For the complete survey research summary go to: <https://farmoffice.osu.edu/farm-management-tools/farm-management-publications/cash-rents>

This survey and the results are reflective of the thoughts of survey participants in early 2021. Recent farmland sales would lead us to believe that farmland value has likely increased more than the 3.8 to 5.3 percent that the summary indicates for 2021. Continued high crop prices along with relatively strong predicted yields throughout much of Ohio have lent more strength to farmland markets in Ohio.

Others survey results in the eastern Corn Belt may be useful in gauging the magnitude of Ohio farmland value change thus far in 2021. The Federal Reserve Bank of Chicago (7<sup>th</sup> Fed District) surveys ag lenders in their districts each quarter. (The 7<sup>th</sup> Fed District includes parts of Michigan, Indiana, Illinois, Wisconsin, and all of Iowa.) Their survey in July showed the value of good farmland in their district had increased by 14 percent from July 1, 2020 to July 1, 2021. The mid-year survey conducted by the Illinois Society of Professional Farm



Managers and Rural Appraisers of their members revealed an increase of 20% in farmland values from the beginning of 2021. While Ohio is not Illinois nor does Ohio sit in the 7<sup>th</sup> Fed District, these surveys may give some guidance on the level of change in farmland values in Ohio in 2021.

**OHIO'S RECREATIONAL USER LAW**...is summarized in this OSU Extension Ag Law Bulletin (<https://farmoffice.osu.edu/sites/aglaw/files/site-library/RecreationalUserStatuteJuly2019.pdf>). Hunting season has begun, and Ohio's deer gun season is only a few weeks away. If you have questions about allowing hunters, I encourage you to review the bulletin.

**USDA DAIRY OUTLOOK**...was released mid-October and a summary is available on the OSU Extension Ohio Ag Manager website at: <https://u.osu.edu/ohioagmanager/2021/10/21/usda-october-dairy-outlook-report/>. The price forecasts (as of mid-October) for the remainder of 2021 and 2022 are provided below.

Based on declining milk cow numbers, increased feed costs, and higher culling rates, USDA-ERS has revised to 9.475 million the average number of head of dairy cows for 2021, 10,000 less than the forecast from the previous month.

Reduced milk production is expected for the final two quarters of 2021. Average milk production per cow is reduced by 50 pounds per cow from the previous month and is projected to be 23,960 pounds per year. Total milk production for 2021 is forecast at 227 billion pounds, 0.8 billion pounds below the July forecast.

### 2021 Dairy Forecast

Class	2021 Forecast Price
III	\$17.05/cwt.
IV	\$15.70/cwt.
All Milk	\$18.45/cwt.

### 2022 Dairy Forecast

It is expected that milk cow numbers will continue their decline into the first quarter of 2022. As a result, USDA-ERS is projecting 9.45 million head, a reduction of 30,000 from the previous month's forecast. Milk production per cow has been lowered by 25 pounds from the previous month's estimate to 24,350 pounds per cow.

Class	2022 Forecast Price
III	\$17.10/cwt.
IV	\$17.15/cwt.
All Milk	\$19.20/cwt.



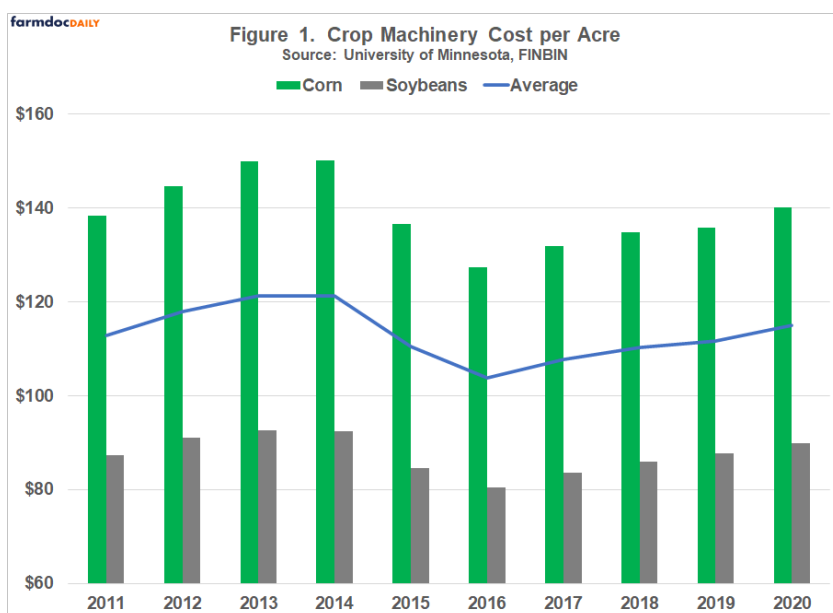
**BENCHMARKING CROP MACHINERY COST & INVESTMENT**...is discussed in this University of Illinois Farmdoc newsletter: <https://farmdocdaily.illinois.edu/wp-content/uploads/2021/10/fdd291021.pdf>.

Crop machinery cost per acre is computed by summing depreciation, interest, property taxes, insurance, leasing, repairs, fuel and lubricants, and custom hire and rental expense; and dividing the resulting figure by crop acres or harvested acres. Interest should include both cash interest paid and an opportunity charge on machinery and equipment that is owned. In regions where double-cropping predominates, using harvested acres is preferable.

Crop machinery investment per acre is computed by dividing total crop machinery investment (i.e., investment in tractors, combines, and other machinery) by crop acres or harvested acres. Again, in regions where double-cropping is prevalent, using harvested acres gives a more accurate depiction of machinery investment.

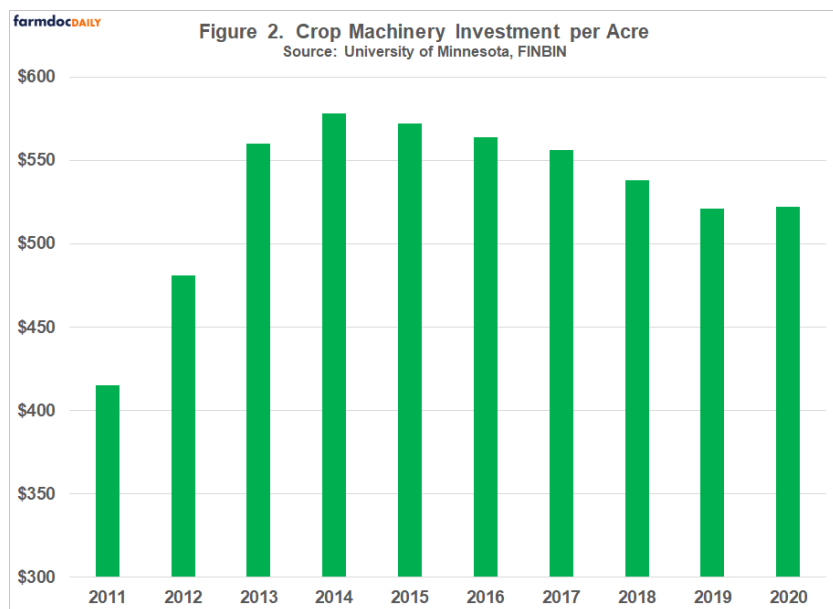
Machinery investment per acre typically declines with farm size. Thus, it is important for farms to compare machinery investment per acre with similarly sized farms and to examine the trend in this benchmark for a particular farm. A farm with relatively high machinery investment per acre needs to determine whether this high value is a problem. If the farm faces serious labor or timeliness constraints, this benchmark may be relatively high. However, if this benchmark is high due to the purchase of assets used to mitigate income tax obligations or for some other reason, the farm needs to think about their long-term strategy with respect to purchasing machinery and equipment.

Using the Center for Farm Financial Management’s FINBIN database, Figure 1 illustrates the trend in machinery cost per acre from 2011 to 2020 for crop farms. The chart illustrates crop machinery cost for corn, soybeans, and the average for the two crops. Discussion will focus on the average for the two crops. Crop machinery cost peaked in 2013, reached a low in 2016, and has been increasing ever since. In 2020, the average machinery cost per acre for the two crops was \$115.



To obtain some feel for how variable machinery cost is between farms, we compared the average machinery cost per acre for corn farms from 2016 to 2020 with the averages for corn farms in the low 20 percent group with respect to net return per acre and for corn farms in the high 20 percent group with respect to net return per acre. The five-year average crop machinery cost per acre for corn was \$134. The low profit group had an average machinery cost per acre of \$165 or 23.2 percent higher than the average machinery cost. In contrast, the high profit group had an average crop machinery cost of \$120 per acre or 10.1 percent lower than the average machinery cost.

Figure 2 presents crop machinery investment per acre for farms with data included in the FINBIN database. Unlike the crop machinery cost computations which focused on corn and soybean production, the crop machinery investment computations incorporated into Figure 2 were for all farms categorized as crop farms. Crop machinery investment peaked in 2014 at \$578 per acre, and then declined to \$521 and \$522 in 2019 and 2020, respectively. Why did average machinery investment per acre decline? We don't have a specific answer to this question. However, the fact that capital purchases were relatively strong from 2007 to 2013, and then declined as net farm income weakened, is an important factor explaining the trend in crop machinery investment per acre. The crop machinery investment per acre for the case farm is relatively low compared to the FINBIN average for 2020 of \$522 per acre.



Potential variability in crop machinery investment per acre was examined by comparing average machinery investment per acre to averages for farms in the low and high 20 percent groups in terms of net farm income. Again, data from 2016 to 2020 were utilized. The five-year average crop machinery investment per acre was \$540. Farms in the low 20 percent group had an average machinery investment per acre of \$626 or 15.9 percent higher than the average machinery investment. In contrast, farms in the high 20 percent profit group had an average machinery investment per acre of \$490 or 9.3 percent lower than the average machinery investment. In addition to examining machinery investment per acre for the two profit groups, we examined



machinery investment benchmarks for crop farms. Farms in the 30<sup>th</sup> percentile, meaning that 30 percent of the farms had values higher than this group, had an average machinery investment per acre of \$828, while farms in the 70<sup>th</sup> percentile had an average machinery investment per acre of \$288. When interpreting the average for the 70<sup>th</sup> percentile, a word of caution is in order. Farms with very low crop machinery investment values tend to have older machinery that is largely depreciated out. Whether these farms can continue operating with this machinery for several more years is an open question.

**FEEDER PRICE “STICKER SHOCK”**...is discussed in this OSU Extension Beef newsletter:

<https://u.osu.edu/beef/2021/11/03/dont-let-feed-price-sticker-shock-paralyze-your-management/#more-11688>. We all know that feed prices are higher this fall than they were this time last year. But what we need to remind ourselves is that the biology of our cows has not changed since last year, meaning that we still need to provide balanced nutrition for desired outcomes. So how do we overcome “Feed Price Sticker Shock” and avoid management paralysis? Management recommendations as described by Kevin Laurent, University of Kentucky, are highlighted below. Please read the entire article for more details.

**Inventory your feed resources and test your hay/forage.** With current feed prices, if there was ever a time to test your hay it is this year.

**Maintain body condition and supplement cows if needed.** Make sure cows are in body condition score 5-6 by calving time. This means no visible backbone, hooks/hip bones or middle ribs. Supplementing hay this fall and winter and having cows in proper condition at calving will result in stronger calves at birth and higher quality colostrum.

**Don’t try and make it on hay alone.** Obviously if your hay is good enough to maintain body condition you can just feed hay. But we know most of the time our hay is not sufficient to get this done.

**Don’t abandon preconditioning and backgrounding programs.** Currently price spreads between unweaned bawling calves and weaned value added calves has narrowed dramatically. Average prices for the week of 10/17/21-10/23/21 for medium and large 1-2 525-575 lb steers were \$154.11 – \$146.35, whereas 675 to 825 value added steers ranged from \$153.13 – \$151.58. With this value of gain, preconditioning and backgrounding budgets still look favorable even in the face of higher feed costs. Remember, calves need to gain to make these programs work.

**Finally, try and stay positive.** There is lots of negativity out there so try and filter the negative and concentrate on the good. Its times like these that challenge us to do a little better and rethink some of our habits and practices. Market dynamics are good so let’s negotiate our way through these high input times so we can be there to reap the benefits of better prices and times.

**SOYBEAN CYST NEMATODE (SCN)**...can cause significant yield loss in soybeans. Funding from the Ohio Soybean Council allows OSU Extension to offer two free samples to monitor SCN levels. If you are interested in this project, please contact me to arrange a time to collect samples from two fields.



**PASTURE, RANGELAND, & FORAGE (PRF)**...is a management tool beef producers may want to consider. Cattlemen and hay producers have an opportunity to enroll in an area-based insurance program that protects them against yield losses caused by low precipitation. This management tool is designed to give the policy holder the ability to help cover the replacement feed costs when a loss of forage for grazing or harvested for hay occurs because of the lack of rainfall. Area-based means that indemnity payments will not be based upon individual producer's experience, rather, payments will be based upon a grid deviation from historically normal rainfall. A producer will have to make several choices including the coverage level of forage production they wish to insure, the rainfall index (months of precipitation), the productivity level of the field or fields they wish to enroll and the number of acres they wish to insure.

Additional information is available in the link provided above. If you are interested in enrolling, speak with a crop insurance agent. Deadline to enroll is December 1, 2021.

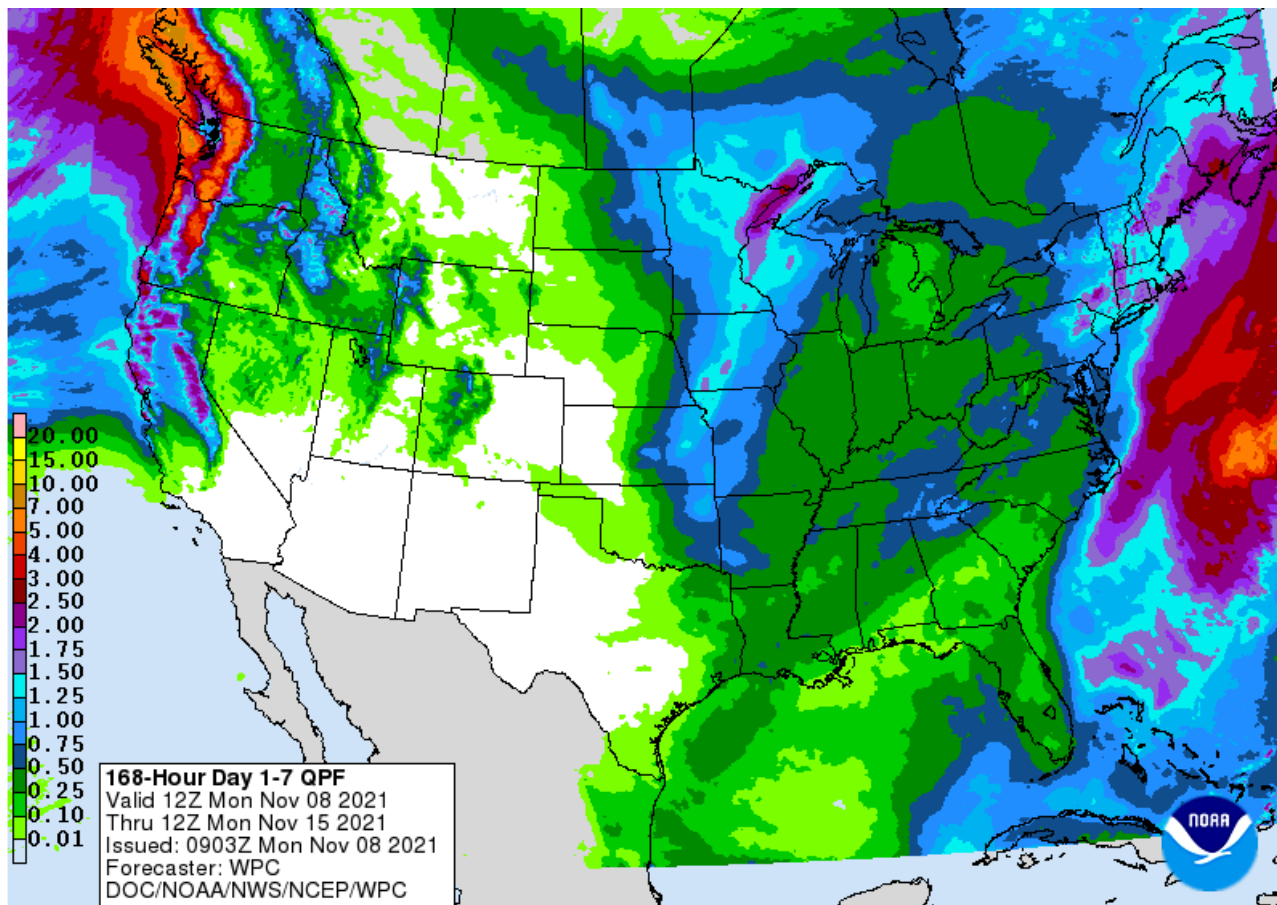


## TUSCARAWAS COUNTY AGRICULTURE &amp; NATURAL RESOURCES

November 11, 2021

**AFTER THE WARMEST OCTOBER ON RECORD**...recent temperatures have brought the growing season to an end. Dr. Aaron Wilson, OSU Extension Meteorologist, provides a forecast in this OSU Extension C.O.R.N. newsletter: <https://agcrops.osu.edu/newsletter/corn-newsletter/2021-38/weather-update-seasonal-rollercoaster>. A summary is provided below:

A strong cold front will approach the region on Thursday, bringing widespread rain showers and gusty winds. High temperatures will reach the 60s across Ohio for Tuesday through Thursday, 50s on Friday, then upper 30s to mid-40s over the upcoming weekend. There could be a few rain and/or snow showers across the north this weekend as well. The [Weather Prediction Center](#) is currently predicting 0.25-0.50" of precipitation over the next 7 days, with slightly greater amounts for the far northeast and southeast portions of the state.



*Precipitation forecast from the Weather Prediction Center for 7a Monday Nov 8 – 7a Monday Nov 15.*



**OHIO GRAIN FARMER SYMPOSIUM**...will be held December 1 in Plain City. This event offers farmers throughout the state the chance to hear about the latest agricultural issues and trends impacting their operations surrounded by fellow farmers and industry experts. Registration deadline is November 19. An agenda and registration details can be found here: [https://docs.google.com/document/d/12TPmw3\\_wf7uCT1iTT2If0xauCwt2Us27UQnwtu0w/edit](https://docs.google.com/document/d/12TPmw3_wf7uCT1iTT2If0xauCwt2Us27UQnwtu0w/edit).



**RECRUITING AND HIRING FARM EMPLOYEES**...is discussed in this OSU Extension Ag Law Blog: <https://farmoffice.osu.edu/blog/thu-11042021-627pm/help-wanted-recruiting-during-labor-shortage>. There are many items employers must be aware of when recruiting and hiring employees. Highlights from this article include:

**Walking the fine line of job descriptions.** One of the first thing an employer should do when beginning the recruitment process is to define the job qualifications in order to identify the minimum qualifications an employer is willing to accept in a new employee. However, some care should be taken in this step. If an employer has unrealistic expectations, it may make it difficult to fill the position. Then, out of frustration or urgency, an employer will fill the position with someone that does not meet the stated minimum qualifications. This creates a problem if an employer ends up hiring an employee that does not meet the minimum qualifications after previously rejecting other applicants with similar qualifications. Those rejected applicants may have a lawsuit for employment discrimination. On the other hand, if an employer's written expectations are too low, an employer may have a difficult time defending its decision to reject an individual who met the stated minimum qualifications while the employer searched for someone who met what the employer was really looking for. An employer needs to be consistent and stick to its stated qualifications when making employment decisions or risk opening itself up to employment discrimination lawsuits.

**Defining the essential functions of the job is essential.** Creating a comprehensive and detailed job description and a list of job qualifications helps employers narrow its applicant pool and provides a basis to make certain employment decisions. It also helps employers define the essential functions of a job which helps employers stay compliant with Ohio and federal employment laws. For example, The [American with Disabilities Act](#) ("ADA") makes it clear that an employer does not need to employ someone who cannot perform the essential functions of the job. This does not mean that every function performed by an employee is "essential." The [Equal Employment Opportunity Commission](#) ("EEOC") makes it clear that marginal functions of the job are not "essential." Some of the factors that help determine what functions are essential include:

- The employer's judgment as to which functions are essential;
- Written job descriptions prepared before advertising or interviewing applicants;
- The amount of time spent on the job performing the function; and
- The consequences of not requiring the employee to perform the function.

**Job Applications.** Most employers understand it is unlawful to discriminate against employees or potential employees based on race, religion, sex, national origin, age, or disability. On job applications, however, employers need to be



careful when asking what may seem like innocent questions that relate to things like age, religion, national origin, marital status, children, criminal history, U.S. citizenship, medical history, or disability. Asking these types of questions may lead to a finding that an employer engaged in a discriminatory practice. For example, it is permissible to ask if an applicant is legally permitted to work in the United States; it is impermissible to ask where someone was born. It is permissible to ask if someone is able to perform the essential functions of the job; it is impermissible to ask if someone has any health issues that would prevent them from doing the job. These are just a couple examples of the types of questions an employer is allowed to ask on an application. Employers should consult with an attorney to make sure that all questions on an application are compliant with state and federal standards.

**Pre-employment drug and alcohol testing.** There are no laws that prohibit employers from testing its employees for drugs and alcohol. However, there are laws that regulate the timing of such tests. To help employers, the ADA separates testing into two categories, “pre-offer” testing and “post-offer” testing. In the pre-offer stage, an employer may test a potential employee for any illegal drug use but cannot test for alcohol. Illegal drug use is not protected under the law. However, employers need to be careful from automatically disregarding all employees that test positive for controlled substances. A person with chronic back pain may have a perfectly legal reason for having certain substances in their system, especially if they are under a strict pain management program. Once an employer learns of an employee’s legal justifications for certain controlled substances, an employer cannot use the information as basis to refuse employment, terminate, or discipline an employee. In the post-offer stage, employers are allowed to test for alcohol. Testing for alcohol is considered a medical examination, and employers are only allowed to subject their employees to medical examinations once an offer of an employment has been given. Regardless of which type of testing an employer seeks to use, employers must be consistent in the way they implement such testing. Testing must be done in a non-discriminatory manner, meaning an employer must make all employees take the same test or forgo any testing at all.

**Background Checks.** Ohio does not prohibit the use of background or credit checks on potential employees. There are, however, several regulations that relate to employers that use background or credit checks. First, background and credit checks are subject to the federal Fair Credit Reporting Act (“FCRA”) which requires employers to obtain written consent from the applicant, give the applicant notice of the employer’s intention to reject their application based on the results of the background check, and notify the applicant of any final decision to reject the applicant because of the background check. Additionally, employers need to be careful about how they handle prior arrests and convictions. If an employer does decide to reject an application based on any prior arrests or convictions, the employer needs to consider the nature of the job, the nature and severity of the offense, and how much time has passed since the offense. For example, if a farmer is looking to hire a general farm laborer, a conviction for driving under the influence from 10 years ago may not be sufficient grounds to reject an application. Unless the position requires the applicant to drive on a consistent basis, the offense may not really be related to the nature of the job. Furthermore, enough time may have passed that would make it discriminatory to reject an application for this type of offense.

**Interviewing.** Interviews are ripe for potential discrimination claims because they are less structured than applications and insert the “human element.” When conducting an interview, employers should stick to a script. A script will help an employer avoid potential discrimination lawsuits and gives the employer the ability to carefully select its interview questions. When asking questions, an employer is not liable for any information that an applicant willingly provides. For example, if the questions is “tell me about yourself” and an applicant provides information about a medical condition or their family, an employer cannot be found liable for any discriminatory practices. An employer cannot, however, use the information to make any employment decisions. If an applicant is providing too much information, it is best for the



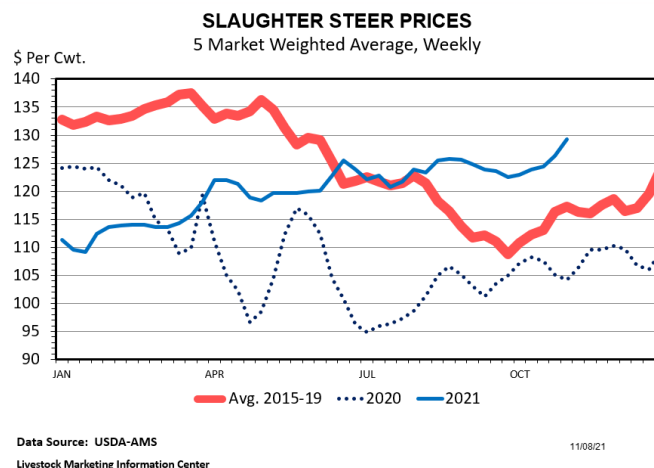
employer to quickly move on to the next subject to avoid eliciting any other information that could be used against an employer in a discrimination lawsuit.

**Hiring.** When deciding to choose one applicant over another, employers need to have a fair and equal system in place. Employers need to be able to point to a specific procedure that demonstrates an employer's nondiscriminatory reason for choosing one applicant over another. For example, if one applicant is more qualified than another for a job, it is easy to prove a nondiscriminatory purpose for hiring the more qualified candidate. If there are two equally qualified candidates, it is even more important to have a nondiscriminatory procedure in place when deciding between the two applicants. For example, an employer could have a policy in place that states if two equally qualified candidates apply for the same position, the candidate that applies first shall be given the job offer.

**New hire reporting.** All employers are required by the U.S. Customs and Immigration Services to verify the identity and employment eligibility of all employees by filing out [Form I-9](#). Ohio employers are also required by the [Ohio Department of Family and Job Services](#) ("ODFJS") to report the hiring, rehiring, and return to work of paid employees. The new hire report must be completed within 20 days after the employee is hired or returned to work.

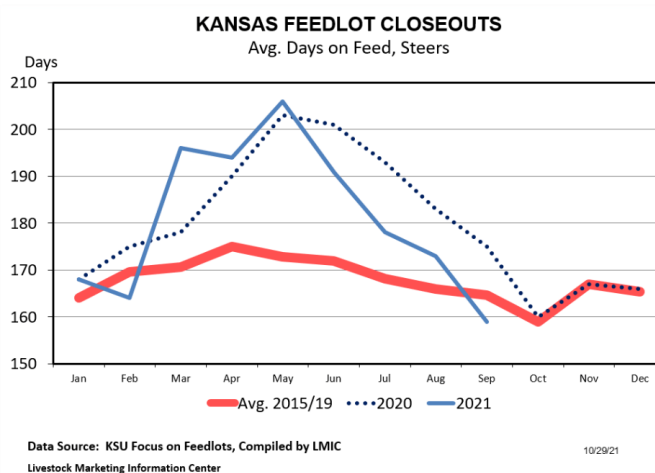
**Conclusion.** In these trying and difficult times, compliance with state and federal regulations may be the last thing on an employer's mind. However, these laws are always in effect, regardless of circumstance. Complying with state and federal laws will only help employers defend any employment decisions and to avoid potential employment discrimination lawsuits.

**FED CATTLE MARKET DYNAMICS**...appear to be changing, according to Dr. Kenny Burdine, Extension Livestock Marketing Specialist, University of Kentucky. See this OSU Extension Beef newsletter: <https://u.osu.edu/beef/2021/11/10/fed-cattle-market-dynamics-appear-to-be-changing/#more-11751>. Fall is always a critical time for calf markets as so many spring born calves are sold. However, it has been very interesting to watch fed cattle prices this fall as well. I generally pay close attention any time a market moves counter to its normal seasonal pattern and that has been the case for fed cattle prices this year. The 5 Market Weighted Average weekly price chart is shown below. Note that a normal trend (red line) is for slaughter cattle prices to make their peak in the spring and move steadily downward through summer and early fall. Yet in 2021, fed cattle prices have trended upward since spring and did not put in a fall bottom at all. The last few weeks have been especially encouraging as prices have risen by more than \$6 per cwt since the first week of October.



Several factors are behind this and are worth discussion. While export levels decreased from August to September, they remained over 20% above 2020 levels and kept the US on pace to exceed the annual record set in 2018. Growth is being seen in most of our major export markets and this continues to be a market driver.

The combination of fewer cattle on feed and much higher feed prices is leading to decreases in the number of days those cattle are on feed. Notice in the chart below how sharply “days on feed” has dropped since May in the Kansas State Focus on Feedlots data – this is way beyond what is seasonally normal. The more current feedlots are, the more leverage they have as they sell fed cattle into the packing industry, which explains some of the recent price improvement in slaughter cattle markets.



Fundamentally, current fed cattle prices should have little direct impact on feeder cattle values since feeder cattle are several months away from harvest. But a strong fall fed cattle market certainly creates optimism for spring, and the expectation of spring fed cattle prices is impacting feeder cattle prices now. On Friday November 5, CME® Live Cattle futures for April 2022 settled right at \$140 per cwt. This was roughly \$8 per cwt higher than the December contract, which is the current CME® live cattle contract being traded. Even contracts for the summer months are trading above that December price. Put simply, it appears that dynamics have shifted such that fed cattle prices should be much stronger in 2022 and that is welcome news for feeder cattle markets.

**SOYBEAN CYST NEMATODE (SCN)**...can cause severe yield loss of soybeans. Soil sampling is used to detect the levels of SCN in a field. Generous funding from the Ohio Soybean Council provides an opportunity for growers to have two free soil samples analyzed for SCN. If you are interested in participating, please contact me to discuss field location and arrange a time for me to take the samples.

**PRIVATE PESTICIDE LICENSE & FERTILIZER CERTIFICATE RECERTIFICATION**...will be held on Monday, March 28, 2022, at Buckeye Career Center. An afternoon and evening session will be held to accommodate your schedule. A direct mailing will be sent to those due to recertify in 2022. Opportunities in other counties can be provided later this year.


**THANK YOU**...to the cooperating farms who participated in the OSU Extension eFields On-Farm Research Program this year. Projects included soil health, soybean seeding rates, corn seeding rates, and double-crop soybean evaluation. Project results will be released in print in early January. Additional information about the OSU Extension eFields program is available at: <https://digitalag.osu.edu/efields>.



## TUSCARAWAS COUNTY AGRICULTURE &amp; NATURAL RESOURCES

November 18, 2021

**PRECISION U**...sponsored by OSU Extension, will be held on January 5, 12, and 19, 2022. The first two sessions will be virtual. The final session will be held in-person. Be sure to put these dates on your calendar and make plans to participate.



### Save the Date

Jan 5, 9-10 am: Adapting to Supply Chain Shortages (online)

Jan 12, 9-10 am: Is Sulfur Limiting Your Yields? (online)

Jan 19, 9:30-1: Equipment and Ag Tech for nutrient and weed control delivery (in-person)

More details to come.

**WITH FERTILIZER PRICES RISING**...can you afford to fertilize your hay fields? The question is addressed in this OSU Extension Beef newsletter: <https://u.osu.edu/beef/2021/11/17/can-i-afford-to-fertilize-my-hay/#more-11670>. You can't afford not to apply fertilizer properly and strategically.

### Soil Testing

First and foremost, now more than ever is the time to make sure we have up to date soil tests. We can't manage what we haven't measured and knowing the nutrient content of forage fields is critical to knowing which soil nutrients will offer the most return on investment.

Lime has gone up little if any, in price, in recent years. To optimize the efficiency of the fertility we do have, correcting soil pH should be high priority during times of expensive soil nutrients.

Don't just spread manure on the most conveniently located field. Apply it where the soil test indicates it's most needed. Not sure what the nutrient content of your manure is? Perhaps having your manure analyzed for nutrient content this year might be dollars well spent.

### Hay Type & Nitrogen

What kind of hay are you growing . . . grass or legume? If it's a field full of legume or field heavily mixed with legume, nitrogen is likely not needed at all. On the other hand, if the goal is to optimize the productivity of



stands that are predominantly grass, yields will be benefited by properly timing the application of a correct amount and source of nitrogen.

Strategically timing nitrogen might mean foregoing an early spring application since it's not uncommon to grow more first cutting hay than we can make and harvest in a timely fashion. However, 50 units of nitrogen applied to a grass hay field immediately after first or second cutting can significantly boost yield of the subsequent cutting.

Applying nitrogen after a first cutting onto warm soils at times of high air temperatures increases the risk of volatilization of urea-based nitrogen sources. Use a stable source of nitrogen such as ammonium sulfate. If using urea and rainfall is not on the horizon, including a nitrogen stabilizer or urease inhibitor is likely warranted. If phosphorus is being applied at the same time, the nitrogen that comes along with a phosphorus source like 18-46-0 is stable and effective.

### **P & K**

Perhaps the most difficult decision will be what to do about phosphorus and potash needs. Each ton of harvested hay removes with it 12 pounds of P<sub>2</sub>O<sub>5</sub> phosphorus and 49 pounds of K<sub>2</sub>O potash. If soil nutrient levels of phosphorus and potash are at critical minimum levels, perhaps the only phosphorus and potash that needs to be applied this year are the amounts removed through harvest. If levels are at the minimum critical levels of 30 ppm for phosphorus when using the Mehlich-3 extraction method, and 120 ppm for potash on loam and clay soils, phosphorus and potash could wait to be replaced at the end of next growing season if you are of the opinion fertilizer prices may moderate before then.

If soil test results indicate phosphorus and potash levels are above the minimum critical level mentioned above for forages, it may be cost effective to skip a year of phosphorus and potash application. Regardless, now may not be the best time to proceed with an aggressive soil nutrient build up program.

And, if you do choose to replace all the phosphorus and potash removed by a hay crop, how much will that cost per ton of hay removed? Using crop removal rates suggested earlier and when assuming phosphorus and potash cost near 60 cents per pound, a ton of forage is removing from the field between \$35 and \$40 dollars' worth of fertility. If it's predominantly grass hay and you add 20 units of N per ton of hay produced, at today's fertilizer prices you'll add about \$15 to that total.

### **Summary**

If you value hay at \$100 or more per ton and harvesting optimum yields of high-quality hay is essential to the success of your operation, fertilization, even despite very high soil nutrient cost becomes a no brainer. You can't starve profit into a cow, or a hay field!



**CROP PROGRESS**...for the week ending November 14 is provided by the Ohio National Agricultural Statistics Service.

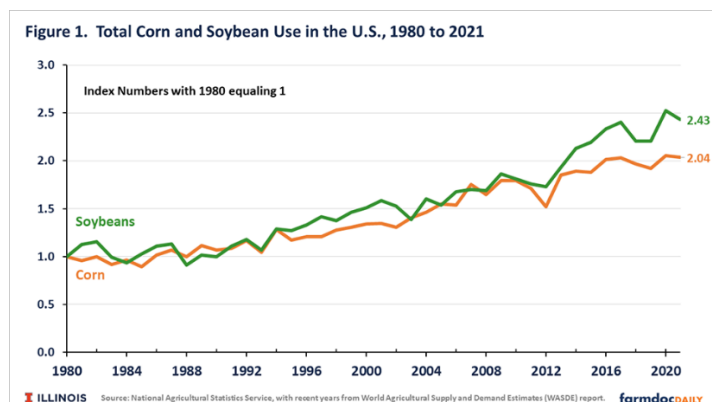
**Crop Progress: Week Ending 11/14/21**

Crop/Activity	Percent Completed			
	This week	Last week	Last year	5 Year average
Days Suitable for Fieldwork..	4.5	4.8	-	-
Corn Harvested for Grain .....	78	65	77	78
Soybeans Harvested.....	88	81	92	92
Winter Wheat Planted.....	92	86	100	98
Winter Wheat Emerged .....	84	74	95	90

**LONG-TERM CORN & SOYBEAN USE**...and the implications for planting decisions in 2022 and beyond are discussed in this University of Illinois Farmdoc Daily newsletter: <https://farmdocdaily.illinois.edu/wp-content/uploads/2021/11/fdd091121.pdf>.

**Corn and Soybean Use in the U.S.**

The U.S. Department of Agriculture reports the yearly use of corn and soybeans produced in the U.S., with the World Agriculture Supply and Demand Estimates (WASDE) report updating projections for the current and previous year every month. Figure 1 shows both corn and soybean use, with all yearly corn and soybean values divided by the 1980 value of the respective crop. This procedure causes corn and soybean use values to be indexes with values of 1.00 in 1980. The projected 2021 values are 2.04 for corn and 2.43 for soybeans. Corn use in 2021 is 2.04 times that of the 1980 value. Soybean use is 2.43 times the 1980 value.

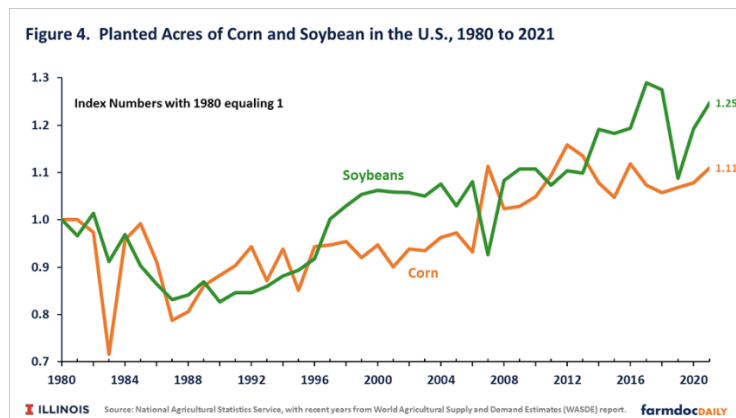


Causes of major growth in use differ for corn and soybeans. Corn use has increased due to the ethanol build, while soybean use has increased due to exports. The ethanol build for corn was more pronounced than growth in exports for soybeans, but the growth in corn use from expanding ethanol production has plateaued. Soybean's exports have been more stable and could conceivably continue to grow into the near future. Growth in soybean exports comes primarily from demand for use as a livestock feed to produce meat as meat consumption rises in China and other developing countries.



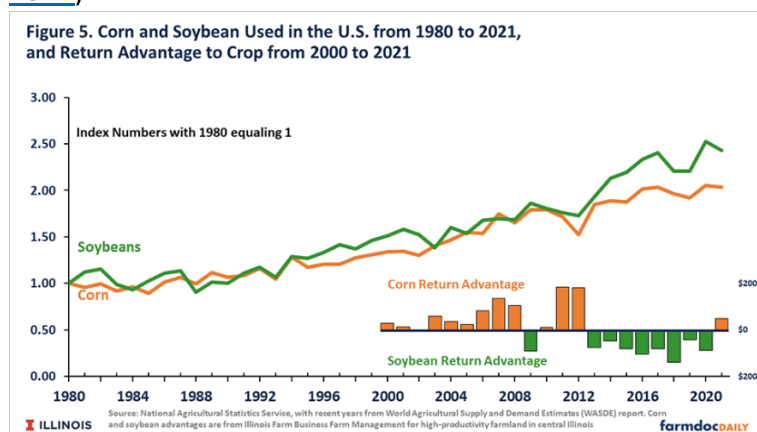
These historical trends in use have the same pattern as acreage. Figure 4 shows planted corn and soybean acreage in the U.S. In Figure 4, index values are created by dividing yearly values by the respected crops 1980 value, similar to the construction of Figure 1. Growth in planted acres has paralleled those for use:

1. Relative to 1980, soybean acres exceeded corn acres from 1996 to 2004,
2. Corn and soybean acres were roughly equal from 2005 to 2012, and
3. Soybean acres have exceeded corn acres since 2012.



## Impacts of profitability

Changes in corn and soybean use then have impacts on relative corn and soybeans profitability. Figure 5 contains the use indices shown in Figure 1 but adds corn-minus-soybean returns from 2000 to the present. These returns are not available before 2000. Corn-minus-soybean returns measure the relative profitability of corn and soybeans, with positive values indicating that corn is more profitable than soybeans and negative values showing that soybeans are more profitable than corn. These values come from Illinois Farm Business Farm Management (FBFM) for high-productivity farmland in central Illinois (see *farmdoc daily*, [November 2, 2021](#)).



There is a high degree of correlation between use indices and corn-minus-soybean returns. From 2002 through 2011, corn was more profitable than soybeans, and relative corn use was roughly equal to soybean use. Soybeans have been more profitable than corn from 2013 to 2019, and relative soybean use has exceeded corn use.



The need for more bushels in soybean use has been driving the relative profitability of corn and soybean. As the need for more soybeans has grown, the relative profitability of soybeans has increased so that acres are drawn into soybeans. This phenomenon has occurred across the Midwest, where corn and soybeans are the major crops.

### **Growth in the Longer-Run**

At this point, exports seem the most likely avenue of growth for both corn and soybeans. Export demand growth will not only impact each crop's export levels directly but will also impact other uses of corn and soybeans.

Take domestic livestock feed demand as an example. Livestock feed directly impacts the food and residual category of corn and the crush category of soybeans. U.S. feed consumption will provide meat for domestic consumption and for exports. Growth in domestic meat consumption has limited potential because the U.S. population is relatively stable, and per capita consumption of meat seems unlikely to grow significantly. Moreover, increases in livestock feeding efficiency could reduce corn and soybean use for meeting domestic consumption, and a continued switch from beef and pork to chicken could reduce corn and soybean use as poultry production is more feed efficient than beef or pork. As a result, corn and soybean use in meeting domestic meat consumption likely has limited growth possibilities. Export growth for US meat and livestock likely represents the most potential for increased corn and soybean use as feeds.

Biofuels present another possibility for growth. Maintaining current corn use levels in producing ethanol is likely achievable, but continued growth is not assured. There is potential for oil from soybean crush to be used in the production of biodiesel. A movement in this direction likely has positive impacts on soybean use.

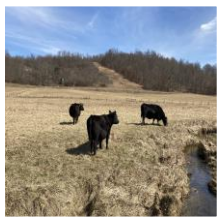
### **Implications for Planting Decisions**

Currently, corn is projected to be more profitable than soybean in 2022, counter to years from 2013 to 2019 when soybeans were more profitable than corn. Over the next five years, growth in soybeans and corn use will likely be driven by exports. In the past, exports have had a larger direct impact on soybean use relative to corn. Past trends do not have to continue in the future, but continuing growth in soybean exports seems reasonable. As a result, relatively more soybean acres will be needed in the future compared to corn acres.

These trends lead to two suggestions for farmers. First, farmers will have to continue to watch export demand to gain insights into likely changes in corn and soybean relative profitability. That examination needs to not only include soybean exports but also 1) corn exports and 2) meat and livestock exports. Second, export demand will likely continue to favor soybeans, and farmers need to consider adjusting rotations in the face of this reality.

**BEEF QUALITY ASSURANCE (BQA)**...certification and recertification for beef and dairy producers will be held:

- Date: Thursday, December 9, 2021
- Time: 7pm
- Location: Sugarcreek Stockyards. Pre-Registration is requested to have materials prepared. Please call: **330-339-2337**



**OBSERVING AN ATTITUDE OF GRATITUDE**...is the title of an article by Christine Gelley, OSU Extension ANR Educator, Noble County. This article is from a recent OSU Extension Beef newsletter available here: <https://u.osu.edu/beef/2021/11/10/observing-an-attitude-of-gratitude/#more-11742>.

Everyone I talk to is waiting for a time when life will slow down, they can take a deep breath, and feel that feeling of accomplishment that the hard work has been worth the effort. That they've made it to where they want to be. If only we could feel a little of that feeling every day...

Come to think of it, what's stopping us? Maybe observing a little more of an attitude of gratitude could help us through those days when the workload is too heavy, and the world is too hard. Taking a few minutes each day to appreciate the little things that blend into the canvas of the day may be just what we need.

A couple years ago just before Thanksgiving, my daughter brought home a "Gratitude Scavenger Hunt" paper from pre-school. In 2019 and 2020 we did the scavenger hunt together on Thanksgiving Day. I found it again today and thought, "This could be done anywhere anytime. Why not in the pasture? That would be a good way to pause, take a deep breath, and soak up the moment."

Let's do it together and see if it works.

1. *Find something outside that you enjoy looking at.*  
Trees. I enjoy watching the leaves rustle in the wind and watching for wildlife that moves from the cover of the woodland to a grassy meadow.
2. *Find something that is useful for you.*  
My boots. Whatever the weather or the terrain, they wait by the door each morning ready for the day ahead.
3. *Find something that is your favorite color.*  
The purple blooms of fading flowers like ironweed or New England aster or the changing leaves of sumac or sweetgum in the tree line.
4. *Find something that makes you happy.*  
Animals grazing. Watching animals enjoy a buffet of fresh grass makes me feel content.
5. *Find something that makes you laugh.*  
My daughter. The way she talks to and cares for her animals is as comedic as it is endearing.
6. *Find something in the morning that you enjoy.*  
Dew drops or frost crystals clinging to blades of grass.
7. *Find a friend or a pet that you love spending time with.*  
Bandit and Brindle. My trusty couple of German Shepherd mutts.
8. *Find something that tastes good.*  
Beef. Lamb. Chicken. Turkey. Venison. Wild chives. Shall I go on?
9. *Find something that you love doing outside with friends.*  
Well, I am an Extension Educator, so I have to say a good pasture walk and talk checks the box.
10. *Find something that you are grateful for.*  
The land beneath my feet.

Usually, this column is bursting with advice on how to better manage your pasture or your livestock, but today it is about managing your mental and emotional stress. Physicians, philosophers, and priests all agree that the practice of expressing gratitude improves your physical and mental well-being. It doesn't have to be done in a counselor's office or



a pew. It can be done in the pasture. It can happen in the cab of a tractor, the seat of a side-by-side, the back of a four-wheeler, on a fence line, at the dinner table, or wherever you have a few seconds to pause.

Regularly taking time to be grateful for big and little things in your life can lead to increased optimism, motivation, satisfaction, self-esteem, and confidence while decreasing feelings of frustration, envy, and regret. Mutual appreciation and expression of gratitude leads to healthier relationships. Simply listing things you are thankful for before bed can help you achieve more restful sleep.

There are thousands of ways to express gratitude and there are 365 days in the year. Don't wait for Thanksgiving to be thankful. Don't stop being thankful when the table is cleared. Your livestock and crops probably won't thank you for the gesture, but if you keep that attitude of gratitude all year long your body, your mind, and the people you love sure will.



## TUSCARAWAS COUNTY AGRICULTURE & NATURAL RESOURCES

December 9, 2021

**OHIO'S MINIMUM WAGE LAW IS CHANGING...**in 2022. Beginning January 1, 2022, the Ohio minimum wage will rise to \$9.30, up from the current \$8.80, for non-tipped employees. However, as an agricultural employer, the law provides some exemptions to paying federal or state minimum wage. In this post, we review minimum wage requirements, agricultural exemptions to minimum wage, and who qualifies for the agricultural exemptions.

**Ohio versus federal minimum wage.** As discussed above, Ohio's minimum wage will rise to \$9.30 for non-tipped employees but federal minimum wage will remain at \$7.25. An agricultural employer is required to follow both state and federal laws, but when the two sets of laws differ, there may be some confusion about which one applies. Normally, federal law reigns supreme and usually preempts, or overrides, state law. But in this case, the federal law sets the floor for minimum wage. This means that employers across the country that are subject to the Fair Labor Standards Act ("FLSA") cannot pay less than \$7.25 per hour to their employees. However, if a state law requires that employers pay their employees more than the federal minimum wage, then the employer must meet the state's minimum wage standard. Thus, Ohio employers must pay the Ohio minimum wage, unless an exemption applies.

**Ohio's "small employer" exemption.** Starting in 2022, Ohio employers that grossed less than \$342,000 in 2021 are not required to pay Ohio's \$9.30 minimum wage. Instead, those employers are required to pay the \$7.25 federal minimum wage to their employees, unless another exemption applies.

**Ohio and federal agricultural exemptions.** Under both Ohio and federal law, agricultural employers are exempt from paying the federal or Ohio minimum wage to their employees if any of following apply:

1. The employer did not use more than 500 man-days of agricultural labor during any calendar quarter during the preceding year.
2. The employee is the parent, spouse, child, or other member of the employer's immediate family.
3. The employee:
  - a. is employed as a hand-harvest laborer;
  - b. is paid on a piece-rate basis;
  - c. commutes daily from their permanent residence to the farm; and
  - d. was employed in agriculture for less than 13 weeks during the previous calendar year.
4. The employee is:
  - a. 16 years of age or younger;
  - b. employed as a hand-harvest laborer;
  - c. paid on a piece-rate basis;
  - d. employed on the same farm as their parent or legal guardian; and



- e. paid the same piece-rate wage as employees over the age of 16.
- 5. The employee is engaged in range production of livestock.

**500 man-days exemption.** The “man-days” exemption was intended to exempt small and family-sized farms. A “man-day” is any day during which an employee performs at least one hour of agricultural labor. To calculate a “man-day”, an agricultural employer needs to keep track of the number of people who worked each day and for how long. 500 “man-days” is roughly equal to having seven employees working for at least one hour each, five days a week during a calendar quarter. It is also not just full-time employees that are counted towards the 500 “man-day” exemption, temporary and seasonal workers also count towards the “man-day” exemption.

**Family member exemption.** An agricultural employer is not required to pay family members the minimum wage. This family member exemption applies to employees engaged in agriculture and are either the parent, spouse, child or other member of the employer’s immediate family. However, not every blood relative is considered “other immediate family.” According to the U.S. Department of Labor, the following will be considered as part of the employer’s “other immediate family”: stepchildren, foster children, stepparents, and foster parents. Other family members, including siblings, cousins, nieces, nephews, uncles, and aunts do not count as immediate family members.

**Employed in agriculture.** Ohio law closely resembles, if not mirrors, FLSA requirements when it comes to agricultural exemptions to minimum wage and overtime requirements. But, to qualify for the agricultural exemptions discussed above, an employer must have employees that are employed in “agriculture.” Under the FLSA, “agriculture” has two distinct branches, **primary agriculture** and **secondary agriculture**. Employees engaged in primary agriculture are considered to be employed in agriculture for that workweek. Employees engaged in secondary agriculture are only considered to be employed in agriculture if the activities are performed by a farmer or on a farm in connection with the farming operations.

**What is considered primary agriculture?** Primary agriculture “includes farming in all its branches” and are those activities traditionally viewed as agricultural, including:

- Cultivating and tilling the soil;
- Dairying;
- Producing, cultivating, growing, and harvesting agricultural or horticultural commodities; and
- Raising livestock, bees, fur-bearing animals, or poultry.

Activities that qualify as primary agriculture do not necessarily have to take place on a farm. For example, someone employed in a hatchery that is located in an industrial complex is engaged in a primary agriculture activity (raising poultry) and is considered to be employed in agriculture. On the other hand, even though an activity takes place on a farm, it does not necessarily mean it is considered to be a primary agriculture activity. For example, courts have determined that employees of Dairy Farm A are not engaged in a primary agriculture activity when they process milk produced by Dairy Farm B.



**What is secondary agriculture?** Secondary agriculture includes all activities, including forestry or lumbering operations, that may not themselves be considered agricultural practices but are necessary to agriculture. For an activity to be considered secondary agriculture it must meet two requirements:

- (1) the activity must either be performed by a farmer or on a farm; and
- (2) the activity must be incidental to or in conjunction with such farming operations.

Secondary agriculture includes preparing an agricultural product for market, delivering agricultural products to storage, to market, or to carriers for transportation to market.

Any activity that is performed by a farmer's employees, is also considered to be "performed by a farmer." Moreover, an activity is considered "incidental to or in conjunction with" farming activities if the work being performed is:

- (1) An established part of agriculture;
- (2) subordinate to the farming operations of the farm; and
- (3) not an independent business.

**Mixing it up.** After understanding what work is considered agricultural, it is important to understand the impact of an employee performing both exempt and non-exempt work. If an employee does both exempt and non-exempt work in the same week, then the employee loses their exemption status and must be paid according to federal/Ohio minimum wage and overtime requirements. However, if an employer can separate the employee's exempt and non-exempt work into separate weeks, then the employer would only have to pay the employee federal/Ohio minimum wage and overtime for those weeks that the employee performed non-exempt work.

This is especially important to agricultural employers that also engage in agritourism activities. Having a farm employee perform work related to an agritourism activity does not qualify for the agricultural exemptions under federal/Ohio law. Agricultural employers should be careful when assigning their employees tasks. Assigning tasks outside the realm of agriculture will subject the employer to the provisions of federal and state minimum wage and overtime laws.

**Overtime.** Agricultural employers are exempt from paying their agricultural employees an overtime wage rate. This exemption applies to **all** agricultural employees, not just small farm employees or immediate family members.

**Conclusion.** Determining whether your employees qualify for an agricultural exemption can be a complex issue, with multiple layers of analysis. It is always best to ask an attorney to help clarify whether your employees are considered to be "employed in agriculture" and thus qualify for the agricultural exemptions to minimum wage and overtime laws. Further, it is always a good idea to seek a lawyer's counsel every so often to help make sure your operation is continuing to be compliant with labor and employment laws.

(Source: Jeff Lewis, Attorney & Research Specialist, OSU Extension, <https://farmoffice.osu.edu/blog/fri-12032021-1006am/new-year-new-minimum-wage>)



**SOIL HEALTH WEBINARS**...sponsored by OSU Extension will be offered in 2022. Farmers, industry, and academic experts will weigh in on practical steps to improve soil health and measure impact on crop yield and farm profitability.

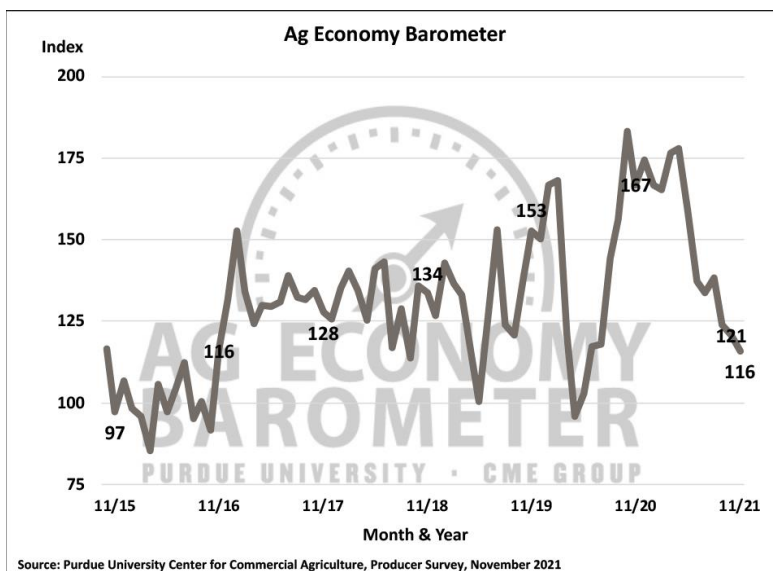
Programs include:

- **January 6<sup>th</sup>**, 8:00-9:00am – *What's Your Soil Health Resolution?* (Farmer Panel)
- **February 3<sup>rd</sup>**, 8:00-9:00am – *What does the Research Tell Us about Cover Crops & Soil Health?*
- **March 3<sup>rd</sup>**, 8:00-9:00am – *What's the Future of Soil Health?*

There is no cost to attend these programs, but registration is required. Register at [www.go.osu.edu/soilhealth2022](http://www.go.osu.edu/soilhealth2022). 1 hour CCA CEU in Nutrient Management will be offered at each session. CCA CEUs are only available to participants attending live sessions (we cannot give CCA credit for watching the recordings).

All programs will be recorded, and recordings will be available to view on our [YouTube channel](#). Last year's Soil Health Webinar sessions can be viewed online [here](#).

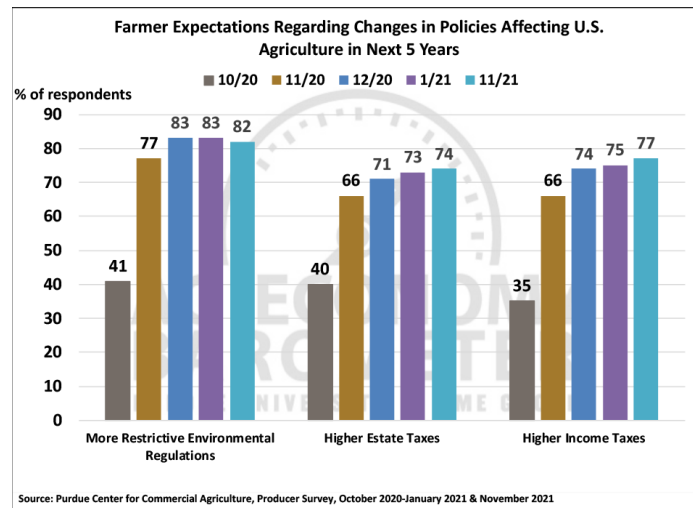
**AG ECONOMY BAROMETER**...is published monthly by Purdue University. The latest report is available here: <https://ag.purdue.edu/commercialag/ageconomybarometer/wp-content/uploads/2021/12/November-2021-Ag-Economy-Barometer.pdf>. The *Ag Economy Barometer* slipped to a reading of 116 in November, down 5 points from October and 30% lower than in November 2020 when the barometer stood at 167. Once again, weakness in the barometer was tied to weaker sentiment regarding current conditions as well as weaker expectations for the future.



Concerns about government policies impacting agricultural producers remain elevated among farmers. Starting in October 2020, various surveys have included questions regarding expectations for environmental regulations, estate taxes and income taxes. In October 2020, the percentage of ag producers expecting more restrictive environment policies, higher estate taxes and higher income taxes ranged from just 35% (income



taxes) to 41% (environmental regulations). There was a marked shift in responses to these questions immediately following the 2020 election as the percentages rose to a range of 66% (estate and income taxes) to 77% (environmental regulations). On the November 2021 survey, 82% of respondents said they expect more restrictive environmental regulations in the years ahead while 74% said they expect higher estate taxes and 77% said they expect higher income taxes.



**BEDDED-PACK MANURE**...is a valuable fertilizer material, as discussed in this OSU Extension Beef newsletter: <https://agcrops.osu.edu/newsletter/corn-newsletter/2021-39/valuing-bedded-pack-manure>. Due to the increase in fertilizer prices, there is renewed interest in the nutrient value of manure. This article will discuss bedded-pack manures that involve straw, sawdust, or wood chips to absorb moisture. The nutrients and organic matter in pen-pack manure are an excellent addition to farm fields. The most common types of bedded manure are beef, dairy, and sheep or goats. Small ruminant bedded pack manure contains the most nutrients per ton followed by beef manure and dairy manure.

Pen-pack manure contains the macro nutrients nitrogen, phosphorus, and potash along with a host of micronutrients. The nutrient content can vary depending on species, feed products fed, and the amounts of straw or sawdust used for bedding. The farm's manure handling and storage practices also impact the nutrient content of manure. Manure stored under roof will usually maintain a higher nutrient value than manure exposed to rainfall.

Pen-pack manure nutrients are measured as pounds of nutrient per ton of manure. Typically, the nitrogen content will be 10 to 16 pounds per ton. About two pounds of this nitrogen is in the ammonium form and the remainder will be in the organic form. While ammonium nitrogen is immediately available to a growing crop, organic nitrogen takes time in a field to mineralize and become available over three or four years. The phosphorus content, in the P<sub>2</sub>O<sub>5</sub> form, will usually be from 6 to 12 pounds per ton. The potash content, in the K<sub>2</sub>O form, will usually be between 10 and 15 pounds per ton.

Applying pen-pack manure can be more precise if you know the application rate being applied in tons per acre. If you are unsure how many tons per acre your solid manure spreader applies there is a simple way to



make a determination. Make a tarp that is 56 inches by 56 inches (21.8 square feet). Fasten it to the ground with weights on the corners and apply manure across the tarp. Fold up the tarp and weigh the manure captured. Many people use a bathroom scales for this. One pound of manure captured on the tarp is equivalent to one ton of manure applied per acre. Thus, if you captured 10 pounds of manure the application rate was 10 tons per acre.

We always want to keep water quality in mind when handling manure. The goal is to make good use of the manure nutrients and keep the manure nutrients out of streams and ditches.

For more information about how and when to sample manure, Penn State Extension has a good publication available on-line at <http://extension.psu.edu/plants/nutrient-management/educational/manure-storage-and-handling/manure-sampling-for-nutrient-management-planning>

**LIME IS A CRITICAL COMPONENT**...of successful crop production. This OSU Extension C.O.R.N. newsletter article (<https://agcrops.osu.edu/newsletter/corn-newsletter/2021-40/lime-considerations>) discusses management considerations.

It is important to test soil pH and determine whether any lime needs to be applied for future crops. Proper soil pH is important for nutrient availability, herbicide activity, and crop development. For most soils, additional lime is not needed every year. Consider these points before liming your fields:

- Do I need lime? Each year we hear stories of people adding lime to their fields without a soil test. The grower has a source of free waste-product lime that they pick up and apply to their fields. In many cases their soil pH was fine, but they did not want to pass up a "good deal". Without knowing the soil pH, a grower may inadvertently raise their soil pH to the high 7's. At this elevated pH, certain nutrients may become limited, and the productivity of their crop may be reduced and require special management practices. Western Ohio has the greatest risk of elevating soil pH from careless applications of lime. A soil analysis is the best step to determine if a field needs lime.
- What is the pH of my subsoil? Generally, a laboratory recommends lime when the soil pH drops two to three units below the desired value. The desired value depends upon the crop and the pH of the subsoil. In parts of Ohio where the subsoil pH is less than 6.0 for mineral soils (eastern Ohio), additional lime is recommended after the soil pH drops to 6.2 for corn and soybean, and 6.5 for alfalfa. In other parts of the state (generally western Ohio), the subsoil pH for mineral soils is greater than 6.0 and lime is not needed until the soil pH drops below 6.0 for corn and soybeans, and 6.2 for alfalfa. Private laboratories may not take in account the subsoil pH and use recommendations based on a subsoil pH less than 6.0 for all parts of the state, possibly recommending lime applications several years earlier than needed for some areas.
- What is the Effective Neutralizing Power of my lime source? An important item from a lime analysis report is the Effective Neutralizing Power (ENP) value, which is required for material sold as lime for agricultural purposes in Ohio. This value allows a producer to compare the quality among lime sources because ENP considers the purity, neutralizing power (including fineness) and moisture content. In



other words, the ENP tells you how much of that ton of lime neutralizes soil acidity. The unit for ENP is pounds/ton (be careful not to use %ENP, which may also be on a lime analysis report). The ENP allows a producer to compare different lime sources because they can now determine price per pound or ton of actual neutralizing material.

- Should I use “hi cal” or dolomitic lime? In most situations it does not matter, so a producer can select the least expensive of the two lime sources. Transportation is often the largest cost of a lime material, so generally the closest lime source (quarry) is often the most economical.

Several parts of the state are historically low in soil magnesium (eastern and southern Ohio). Adequate soil magnesium is important to reduce the risk of such problems as grass tetany for grazing animals. Soil test magnesium levels need to be greater than 50 ppm (100 lb) for optimal corn, soybean, wheat, and alfalfa production on fine to medium textured soils and greater than 35 ppm on coarse textured soils. Often areas low in magnesium also need lime, which has made the application of dolomitic lime an economic solution for both concerns.

The ratio between calcium and magnesium is important. Soils should contain more calcium than magnesium. Extensive research has shown that crops yield the same over a wide range of calcium to magnesium ratios and will not affect crop production if the calcium to magnesium ratio is larger than 1. High calcium lime should be used in situations where the soil test calcium to magnesium ratio is less than 1, or in other words, the soil magnesium levels are greater than the soil calcium levels. I have not observed any Ohio soil tests where the magnesium levels are above the calcium levels. Also keep in mind that almost all dolomitic lime sources will contain more calcium than magnesium. Unfortunately, some producers have been led to believe that magnesium levels in dolomitic lime may be undesirable. The level of magnesium is unimportant if the calcium level is above magnesium. The focus should be selecting lime on its Effective Neutralizing Power (ENP) rather than its calcium level.

- How about gypsum as a lime source? Gypsum is not a lime source. It does not have the right chemical composition to neutralize soil acidity, such as carbonate (gypsum is calcium sulfate). Gypsum is used as an amendment for soil physical properties and/or as a fertilizer providing calcium and sulfur.

In summary, make sure you take a soil test to determine if lime is needed, determine if magnesium is needed, know the historic pH of your subsoil, and then use the ENP to select the most cost-effective lime material. A soil test every three to four years will determine the lime requirements for your fields. Additional information on ENP and lime sources and liming rates may be found at the following location: <https://agcrops.osu.edu/FertilityResources> scroll down to the ‘pH and Liming’ section.

**WITH HERBICIDES ANTICIPATED**...to be in short supply in 2022, OSU and other university Extension weed scientists have developed management strategies to consider. The complete article is available here: <https://agcrops.osu.edu/newsletter/corn-newsletter/2021-40/alternative-spring-burndownpostemergence-strategies-when>. The two main active ingredients that we’re hearing about right now are glyphosate (Roundup, others) and glufosinate (Liberty, others), for which prices have increased substantially. 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 shortages, primarily glyphosate, on corn and soybean production. As you search for alternatives to these two herbicides and others, the weed control guides and technical guides produced by University Extension and industry are an important tool for planning weed management programs and herbicide purchases. Links to the university publications are at the end of this article.

**Some guiding principles based on our experience that may help with decisions, especially where glyphosate will not be in all applications:**

1. Spring tillage is an option to replace herbicide burndown. Can cause long-term compaction problems if tilled when too wet. Waiting until weeds are large makes tillage less effective. Weeds that survive tillage will be difficult to control with POST herbicides. In other words, till when soil conditions are fit and before weeds are huge.
2. Where it's only possible to use glyphosate once, it may be needed most in the burndown. Saflufenacil can be added for enhanced control of rye and ryegrass, and marehail. ACCase herbicides (e.g. clethodim, quizalifop) can then be used for POST grass control in soybeans. Glufosinate, Enlist Duo, or XtendiMax/Engenia can be used for many broadleaf weeds, especially the glyphosate-resistant ones. Where residual herbicides are omitted, or do not provide enough control, we would expect POST treatments to struggle more in the absence of glyphosate with weeds such as lambsquarters. So use residuals. Glyphosate is still more than just a grass herbicide.
3. If glyphosate is omitted from burndown, grasses become a bigger issue than broadleaf weeds. Options for annual grasses: Gramoxone; rimsulfuron – if small, corn only; ACCase herbicides – clethodim (wait 7 days to plant corn), quizalifop (soybeans only) – need 60 degree days, apply alone if possible, weak on winter annuals under cold conditions. Where trying to reduce glyphosate rates, a rate of 0.38 lb ae/A will control most annual grasses.
4. Burndown programs typically contain two to three “burndown” herbicides in order to ensure control of a diversity of weeds under various environmental conditions. This is why glyphosate is not used alone in burndown programs, but mixed with 2,4-D, dicamba, or Sharpen. We suggest following this same strategy when glyphosate is omitted – try to have at least two herbicides with substantial burndown activity in the mix. Increasing rates of components of the burndown mix should be generally helpful, in accordance with label guidelines for soil type, weed size, time until planting, etc. There are also other herbicides that can improve control in some mixes although we don't consider them “burndown” herbicides on their own – chlorimuron, atrazine, metribuzin.
5. There are generally more options for burndown and POST applications in corn compared with soybeans, so it might make sense to save a limited supply of glyphosate and glufosinate for use in soybeans.



6. Control of little barley and annual (Italian) ryegrass in a burndown requires glyphosate, ACCase herbicides are not effective enough in spring. For annual bluegrass – ACCase can work - 60 degree day, no tank mixes. High rates of metribuzin can provide fair control of bluegrass.
7. For burndown of a legume cover prior to corn, clopyralid and dicamba are the most effective herbicides. For cereal rye, Gramoxone plus atrazine or metribuzin may be best option in the absence of glyphosate.
8. It's possible to chop and bale a cover, then use glyphosate POST to kill regrowth. The addition of an ACCase herbicide may help control regrowth in soybeans. POST corn herbicides will not kill the rye, including nicosulfuron, rimsulfuron, and Group 27 herbicides (Impact, Shieldex, Laudis etc).
9. Mixing ACCase herbicides with dicamba or 2,4-D (no glyphosate) can cause reduction in grass control due to antagonism. Apply separately to avoid this.
10. Increasing the number of applications can help with weed and herbicide management when certain products are short or glyphosate rates need to be reduced. For example, three applications instead of two: 1) Fall or early spring burndown when weeds are small; 2) residuals plus possibly additional low-rate burndown at planting; 3) POST.
11. Best opportunity to omit glyphosate or reduce the rate will be: 1) in fields treated the previous fall, or those with a low population of small weeds; and 2) where the POST program is comprehensive enough to control weeds that escape the burndown – Enlist, XtendiFlex, LL GT27 (their effectiveness also depends upon whether glyphosate is being used POST).
12. Take all necessary steps to maximize herbicide activity - optimize adjuvants and sprayer parameters (nozzles, volume, pressure, speed) per label guidelines.
13. Check on availability of premix herbicides that may contain glyphosate or another herbicide that is unavailable as a single ingredient product. Examples that contain glyphosate – Sequence, Halex GT, Acuron GT, Extreme, Flexstar GT.

### **Burndown programs that deemphasize use of glyphosate – pros and cons.**

#### ***Can be used in corn and soybeans***

#### **Gramoxone + 2,4-D + metribuzin/atrazine (atrazine – corn only)**

Strengths: best non-glyphosate option for rye burndown; adequate for general spring weeds including maretail <6" tall; can be applied before either corn or soybeans (depending on rate); has activity on grasses

Weakness: perennial weeds; large maretail; annual ryegrass; special training required to apply



Comments: Metribuzin rate for corn varies by soil type and is limited to a maximum of 5.33 oz of 75DF.

#### **Sharpen + glyphosate (low rate 0.38 - 0.56 lb ae/A) + 2,4-D**

Strengths: adequate cereal rye and other cover crop burndown; marestail control; can be applied before either corn or soybeans (depending on rate)

Weakness: large weeds; overall weed control is fair due to low glyphosate rate

Comment: Rates higher than 1 oz require wait of 15 to 30 days to plant soybeans. Must wait 2 weeks to plant soybeans if 1 oz is mixed with flumioxazin or sulfentrazone product.

#### **Sharpen + 2,4-D + metribuzin/atrazine (atrazine – corn only)**

Strengths: good foliar and residual marestail control; good initial Palmer/waterhemp control; burndown and residual in one pass

Weakness: does not control grasses (atrazine control grass up to an inch when applied with oil); must wait 2 weeks to plant soybeans if mixed with flumioxazin or sulfentrazone product. Metribuzin rate for corn varies by soil type and is limited to a maximum of 5.33 oz of 75DF.

#### **Basis Blend/other rimsulfuron products + 2,4-D + metribuzin/atrazine**

Comments: some grass control; limited burndown activity on several key species; better used in corn due to long wait to plant soybeans (15 to 60 days)

#### **Harmony Extra/similar products + 2,4-D + metribuzin**

Comments: average (70-80%) control on many key broadleaves; no grass control; additional residuals and POST products necessary for in crop weed control; can be used in corn or soybean

#### ***Corn only***

#### **Acuron/Lexar/generic equivalents/Resicore + atrazine**

Strengths: winter and summer annuals; burndown and residual in one-pass; can add more atrazine or 2,4-D

Weakness: poor control of cereal rye and ryegrass; corn only



## ***Soybeans only***

### **2,4-D + metribuzin + clethodim**

Strengths: some grass suppression including cereal rye and ryegrass;

Weakness: 2,4-D antagonizes clethodim activity; cool weather limits clethodim activity; use rate of clethodim is not high enough if used before corn planting

### **Metribuzin + 2,4-D + chlorimuron product**

Comments: good fit in fields that were treated prior fall; Some chlorimuron products contain metribuzin – suggest supplementing with additional metribuzin so total is the equivalent of 6 to 12 oz of 75DF. Does not control grasses. Canopy/Cloak Ex contains tribenuron, which improves control of chickweed.

**PRECISION UNIVERSITY**...will return in January 2022. Just as ag technology is always updating, so too is Precision University. This year our focus is **Using Ag Technology to Manage 2022 Challenges**. Based on feedback from last year, it will be delivered in 2 webinars and a half-day, in-person event.

The **January 5** webinar will focus on adapting to supply chain shortages. A panel of industry representatives will share what they are seeing and how to work around what you might not have.

The **January 12** webinar will turn your attention to sulfur. Some have seen responses to sulfur application while others have not. Dr. Shaun Casteel, Purdue University, and Dr. Steve Culman, The Ohio State University, will share results from their on-farm sulfur research. Dr. John Fulton, The Ohio State University, will also discuss recent research on sulfur and share tips for conducting your own on-farm research to determine if sulfur is a limiting factor on your farm.

On **January 19**, we will round out the 2022 Precision University with a hands-on look at equipment that will help farmers adapt and fine tune nutrient and crop protection delivery. This event will take place from 9:30-1pm at the Champion Center in Springfield and will include breakfast and lunch.

The webinars are set for 9-10am and are free to attend. The in-person event has a cost of \$35. You can register at <http://go.osu.edu/PrecisionU>.



## TUSCARAWAS COUNTY AGRICULTURE & NATURAL RESOURCES

December 17, 2021

**DETERMINING PASTURE RENTAL RATES**...is something many livestock producers and landowners wonder how to calculate. This OSU Extension Beef newsletter article (<https://u.osu.edu/beef/2021/12/15/pasture-rental-rates-do-you-know-your-price/#more-11870>) addresses this topic.

Here are some options and consideration before entering into a pasture lease agreement.

- **Know each party's responsibility-** The two parties are the Livestock owner and landowner. There two parties should come to an agreement and understand their responsibilities. The landowner should cover the real estate taxes, cost of infrastructure (fence, barns, water) and their repairs, farm insurance. Livestock owners should calculate and budget what he or she can afford to pay in rent. Responsibilities such as fertilizing, mowing, and fixing damaged fence, should be reflected in the final rental agreement.
  - **Communicate and put it in writing-** When discussing lease agreements make sure to record and write down rates, responsibilities, contract length, stocking rates, disaster clause, and other specific discussions made during the negotiation process.
  - **What rental method works best for you?** – There are several pasture rental methods that can be used but is each operation is set up differently, make sure to do your research evaluate which method works best for your farm operation.
1. Animal Unit Method takes into account the average animal units time the average hay price on a per ton basis times the pasture quality factor. An animal Unit is equal to 1000 lbs. and pasture quality factors include:

Factor	Description
0.12	Unimproved, poor
0.15	Fair to good
0.18	Very good
0.20	Excellent
0.22	Lush legume pasture

Ohio mixed grass hay prices for the last week of November ranged from \$80-\$150 per ton.

Livestock type	Animal Unit
Mature Cow with unweaned calf at side or heifer two years or older	1.25
Bull, two years or older	1.3
Young cattle, one to two years old.	0.8
Weaned calves or yearlings	0.6



As an example, let's say your cow herd size is 1000 lbs. with a newly born calf weighing around 250 lbs. by her side and the current local hay market is \$80/ ton for fair grass mixed hay which is equivalent to the pasture you are wanting to lease =  $1.25 \text{ AU} \times \$80/\text{ton} \times .15 \text{ pasture quality factor} = \$15 \text{ per head per month}$ . Factors such as current hay prices, pasture quality, and animal units can have a direct effect on the pasture rental rate.

2. Per acre rental method is an easy and common method used by producers. In 2020 USDA, NASS Ohio field office reported that the average pasture rental rate equaled \$26/ acre ranging from \$17/ acre in southeast Ohio to a high of 50.50/acre West Central Ohio. USDA NASS also reported current pastureland value price for Ohio equaled \$3,370, find more details at <https://www.nass.usda.gov>.
3. Pasture rental rates utilizing yields and Land capability from soil survey considers soil productivity based on average yield and the amount of forage or feed one animal unit for 30 days. The productivity and suitability of soil for grazing can be found in the Ohio soil survey. Local Soil and Water Conservation districts can provide county soil ratings or go to <https://websoilsurvey.sc.egov.usda.gov/> to learn more about your soil suitability rating. Rental rates can be based on seasonal cost and grazing period cost. Season cost takes in account the price of hay per ton and equivalent pasture value x soil survey yield. Example – \$80/ton hay value or 40/ton pasture x 2.5tons/acre rating = \$100/ac. Grazing period cost takes in account pasture value x soil survey yield and grazing period indicated in the soil survey divided by animal unit days also indicated in the soil survey. Example \$40/ton pasture value x 2.5tons/acre x 60 days of grazing/150 animal unit days = \$40/ac.

In summary, there are many factors that can affect the price paid for pasture rental, from pasture quality, water availability, conditions of fence/facilities, current hay prices, and supply and demand. Before approaching the landowner producers need to have their ducks in a row, make sure to have a budget prepared also indicate incentives for the landowner to lease to you over other producers. Incentives such as good pasture management, rotational grazing practices, and good livestock husbandry are always good ways practices to highlight when negotiating. Finally communication is critical, 2022 has many unforeseen issues, don't make a disgruntled landlord one of them due to miscommunication.

**To learn more about pasture rental lease agreements you can go to:**

[What's in Your Farmland Lease? A Checklist of Farmland Lease Provisions](#)

OSU Extension Fact Sheet FR-8, Establishing a Fair Pasture Rental Rate, 2006 [ohioline.osu.edu/factsheet/FR-8](https://ohioline.osu.edu/factsheet/FR-8)

[Maximizing Fall and Winter Grazing of Beef Cows and Stocker Cattle](#), Bulletin 872.1998. Ohio State University Extension

**STRATEGIES FOR DAIRY FARMERS TO MANAGE HIGH FERTILIZER PRICES**...are discussed in this OSU Extension Buckeye Dairy News article: <https://dairy.osu.edu/newsletter/buckeye-dairy-news/volume-23-issue-6/considerations-managing-higher-fertilizer-prices>.

### **Spring 2022 Price Expectations**

In their *Weekly Farm Economics* newsletter, the University of Illinois Farmdoc Daily reviewed price changes from October to April for the years 2008 to 2020. For anhydrous ammonia, 28% of the time the price was lower in April than in October. The largest decline (\$441 per ton) occurred from 2008 to 2009, and the largest increase (\$262 per ton) was realized between October 2020 to April 2021. Whether fertilizer prices will decline in 2022 is anybody's guess. Manufacturing may increase, but uncertainties in winter heating or other delays can impact production and pricing.



## Management Considerations

### Soil Sampling & Testing

Soil testing is always an important management consideration, but its importance is an even better investment with the present fertilizer pricing situation. Sampling is recommended every three years to maintain proper soil fertility and promote healthy plants. Soil testing is also critical for determining soil pH and the need for lime applications. A target soil pH of 6.0 to 6.8 is ideal for most crops.

The Tri-State phosphorus and potassium recommendations define how vital the fertilizer application is in the upcoming year. Using the soil test value, we can answer the question, “Do I need to apply fertilizer this year, or can I wait into the future?” If your soil test value is above the critical level, added fertilizer is not expected to increase the yield of the upcoming crop. When soil test values are above the critical level, the chance of a yield response is highly unlikely. The critical phosphorus soil test level for corn and soybean is 20 ppm and 30 ppm for alfalfa and wheat. The critical potassium soil test does not differ by crop but by soil cation exchange capacity (CEC). For soil with a CEC greater than 5, it is 120 ppm, and when less than 5, it is 100 ppm. All these soil test values are for the Mehlich 3 soil test.

### Manure Testing

When comparing  $P_2O_5$  and  $K_2O$  availability in manure to commercial fertilizer, there are two things to know. First, the pounds of available P and K nutrient shown on the manure test is equivalent to commercial fertilizer. Therefore, those manure nutrients are a one-to-one replacement for commercial fertilizer. Second, manure is not a good substitute when starter fertilizer is needed.

### Apply Recommended Rates

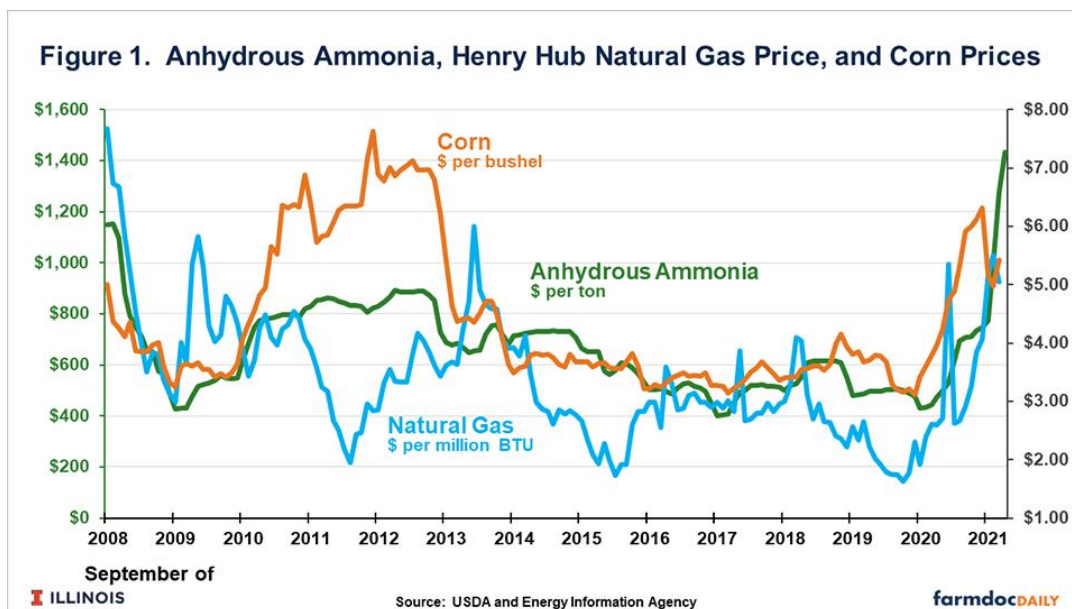
Applying the correct amount of fertilizer will optimize crop yield and minimize environmental concerns. Reference the tables from the Tri-State Fertilizer Recommendations for *Corn, Soybeans, Wheat, and Alfalfa* bulletin from OSU Extension. A pdf copy of this bulletin can be accessed here: <https://go.osu.edu/tristatefertilizerrecommendationpublication>

**NITROGEN FERTILIZER PRICES**...are above expected levels, as discussed in this University of Illinois Farmdoc newsletter: <https://farmdocdaily.illinois.edu/2021/12/nitrogen-fertilizer-prices-above-expected-levels.html>. Nitrogen fertilizer prices are positively related to corn and natural gas prices. Because of current high corn and natural gas prices, one would expect nitrogen prices also to be high. However, in recent months, anhydrous ammonia prices have exceeded levels one would expect, even given higher corn and natural gas prices. Supply disruptions caused by Hurricane Ida may help explain recent high prices, but other factors could also be in play. In any case, high nitrogen fertilizer prices are likely into the spring, which suggests that large reductions in nitrogen rates need to occur.

### Nitrogen Prices Continue to Increase

Since summer, nitrogen prices have risen dramatically, reaching record-high levels (see Figure 1). According to the most recent data from the Agricultural Marketing Service, nitrogen prices have continued to rise into December. On December 3rd, the average price in Illinois for anhydrous ammonia was \$1,434 per ton, up by \$91 per ton from the price two weeks prior. Since last December, anhydrous ammonia prices have increased \$960 per ton, more than doubling in price.





### Factors Explaining Nitrogen Prices

Nitrogen fertilizer prices have historically been related to two fundamental factors: corn prices and natural gas prices.

**Corn Prices:** Over time, rising corn prices coincide with rising anhydrous ammonia prices and vice versa. For example, monthly anhydrous ammonia prices in Illinois have a .72 correlation with national average corn prices reported by the National Agricultural Statistics Service (NASS).

Two reasons have been advanced for this correlation. The first is that rising corn prices can signal more corn acres and more nitrogen fertilizer use. Higher demand for nitrogen fertilizer leads to higher nitrogen prices. A second reason is that higher corn prices mean more income for farmers and a higher ability to pay. As a result, fertilizer manufacturers charge higher prices when corn prices are high. Either reason explains a positive relationship between ammonia and corn prices.

**Natural gas prices:** Natural gas is a significant input into producing anhydrous ammonia. As a result, higher natural gas prices are expected to lead to higher anhydrous ammonia prices. From 2008 to 2020, there is a .46 correlation coefficient between ammonia prices and natural gas prices at the Henry Hub.

### Explanatory Power of Corn and Natural Gas Prices

Until October 2021, the Illinois price of anhydrous ammonia was explained very well by corn and natural gas prices. To illustrate, a statistical regression model that explains Illinois' anhydrous ammonia price was fit. This model uses monthly price observations from 2008 to November 2021. The price variables in the model are:

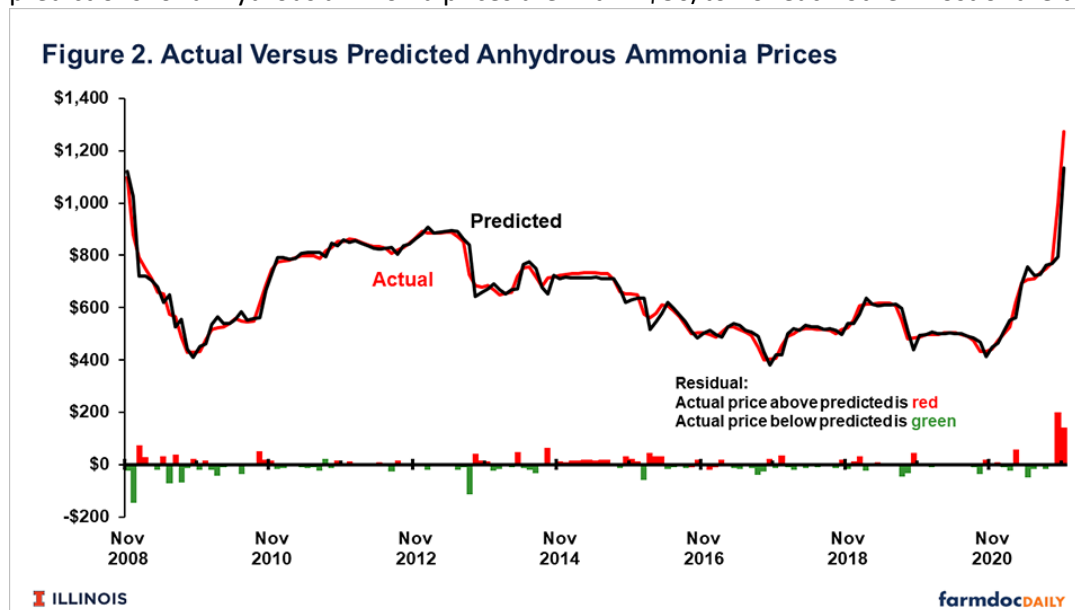
**Corn price.** The national average corn price reported by the NASS was used (see Figure 1). Corn prices were statistically significant. The model indicates that higher corn prices increase ammonia prices and vice versa.

**Natural gas price.** The monthly natural gas price at Henry Hub was used (see Figure 1). These gas prices are reported by the Energy Information Agency, an agency of the U.S. Department of Energy. The model indicates that higher natural gas prices increase ammonia prices and vice versa.

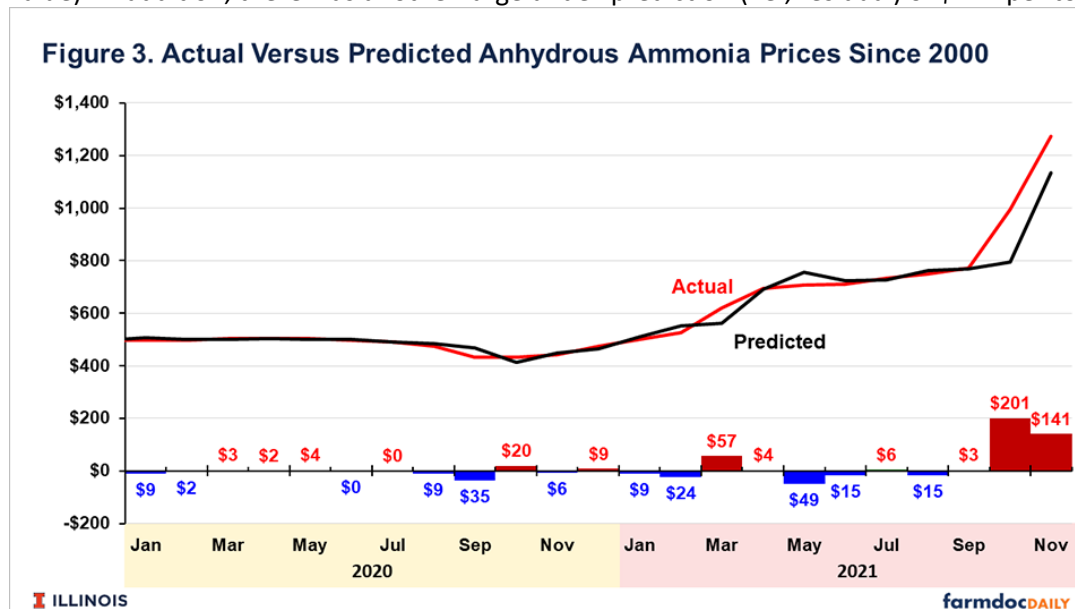
**Lagged anhydrous ammonia prices.** As with most economic relationships, there are lagged relationships. Lagged ammonia prices capture this time dimension. Inclusion or exclusion of lagged ammonia prices does not change the statistical significance or signs of the coefficients associated with corn and natural gas prices.



For most of the period, the model has an excellent fit, meaning the predicted values closely match the actual values (see Figure 2). The model explains 95% of the variability in anhydrous ammonia prices. The actual values and the model predictions for anhydrous ammonia prices are within \$50/ton of each other most of the time.



However, the closeness of the fit breaks down in October and November 2021 (see Figure 3). In October 2021, the model predicted a price of \$795 per acre while the actual price was \$996 per ton. In this month, the model's prediction differed from the actual value — also known as the residual — by \$201 per ton (\$996 actual value – \$795 predicted value). In addition, there was another large under-prediction (i.e., residual) of \$141 per ton in November 2021.



### Commentary

Then, a central question is: What happened this fall that caused ammonia prices to deviate from their typical relationships with corn and natural gas prices? Supply disruptions caused by Hurricane Ida shuttering ammonia plants could have led to short supplies leading to higher prices. While a reasonable explanation, other factors could have led to higher ammonia prices.



If corn and gas prices remain at their current levels, the fitted model predicts an anhydrous ammonia price near \$1,000 per ton in April 2022, a decline from present levels but still very high. However, we note that the predictive power of this model has declined in recent months, such that confidence in predictions from the model have diminished. In any case, it seems reasonable to expect very high nitrogen fertilizer prices in spring.

Given high prices, strategies to reduce nitrogen use should be undertaken, with reductions in nitrogen rates to Maximum Return to Nitrogen (MRTN) levels seem prudent. More detail on strategies is covered in the [November 30th farmdoc Daily](#).

**EMERGENCY PREPAREDNESS THROUGH A FARM WALK-THROUGH**...is something all farms should consider. Jason Hartschuh, OSU Extension Educator, discusses the topic in this OSU Extension Buckeye Dairy News article: <https://dairy.osu.edu/newsletter/buckeye-dairy-news/volume-23-issue-6/emergency-preparedness-through-farm-walk-through>.

When something goes wrong on your farm and emergency service personnel respond either for a fire or farm accident and everything is moving fast, trying to remember every detail responders need to know can be a challenge. Emergency response personnel are required to have continuing education training in order to stay certified. One part of this training can be doing site visits. Unlike urban departments who often must inspect buildings on a regular basis, rural fire departments often never get to visit farms until there is an emergency. Even in rural fire departments, many of the responders are not directly connected to farms, and even if they are, many do not know the hidden hazards around your farm. The best way to bridge the gap between your farm and emergency responders is to invite them to walk around your farm, identify hazards, and help you create an emergency plan.

The emergency action plan can include the farm walk around, plus an equipment close-up review, especially of machinery that may not be utilized on many farms in your area. It will also be worth your time to do a short course on animal handling. You may want to have disposable plastic boots available for biosecurity and so that visitors can walk around in your barn.

## Fire

Fires in livestock facilities can cause many challenges. The first two things that should be discussed is how to handle livestock during the fire, where to move them to, and how to shut the power and backup generators off. Livestock are often scared during a fire, and even once chased out of the barn, they may run back in unless they are secured in another location, not only endangering them but also the responders. One of the first safety steps fireman take during a fire is to shut the power off, making it safe to use water on the fire and not risk electrocution. Shutting the power off also stops fans that may still be running and fueling the fire. If you have any type of fuel going to the building, such as propane or natural gas, it is important to show responders where to turn the gas off.

Chemical storage, especially flammables, need pointed out to responders. Even non-flammables can release toxic gases that will endanger responders. While outside the barn, be sure to point out any buried tanks that may be hazardous if firefighters happen to drive over them or attempt to use that area as a means of entry. A tour within the buildings can be very important, especially when we have put additions onto your barns to expand the facility. Pointing out to responders the areas where buildings are tied together or areas where the buildings have leveraged headers can keep everyone safe in the future.

During the tour, it is important to discuss if hay is still stored in the haymows and if specialized equipment like an aerial fire truck may be needed to reach over the barn to a fire in the middle. As part of the fire tour, be sure to discuss the nearest source where water can be pumped from and if there are any water storage tanks on the farm.



## Rescue/Medical Responses

Emergency medical rescues are another area to have an action plan for with your local fire department. Do you have confined spaces on the farm, such as manure storage, upright silo, bulk milk tanks, or bulk fertilizer tanks? These are all areas that can be hazardous on the farm and can be a risk to you and responders. One of the risks with confined spaces is dangerous gasses. While on the tour, have a discussion with first responders about gas detection equipment that they have available if they need to enter a confined space. Hydrogen sulfide, methane, carbon monoxide, and ammonia are gases of concern. Pit gases from any storage pit, whether closed, open, or under barn storage, can be toxic to both humans and livestock. H<sub>2</sub>S gas concentration levels of 2 to 20 ppm will cause symptoms of nausea, headache, and dizziness. H<sub>2</sub>S levels greater than 100 ppm will cause altered breathing, collapse, and death.

While all animals can turn dangerous on the farm, be sure to tell responders if you keep a bull on the farm. Let them know where he is housed and if any restraint devices are available to restrain him. Another consideration is pinching/crushing hazards on the farm, e.g., these are often air or hydraulic operated gates in milking parlors. Be sure to show responders the emergency shut offs and how to operate all gates. Other hazards are medications and chemicals stored on the farm. Show responders where material safety data sheets are kept and the different storage locations so that accidental poisonings or needle sticks can be responded to quickly. Lastly, be sure to discuss your farm location naming so that if responders are called, they know where to find the victim, such as the old pole barn, dry cow barn, and east addition.

By inviting your local fire department to your farm for a tour and emergency preparedness, planning can make a bad day on your farm a little less stressful.

**A TORNADO IN WESTERN KENTUCKY**...destroyed the University of Kentucky Princeton Research and Extension Center. A video of the damage is available at this link: <https://u.osu.edu/beef/2021/12/15/kentucky-rising-above-tornado-aftermath/#more-11926>. The video below shows the remains of the University of Kentucky research center at Princeton that was destroyed by the tornadoes. This research station has a heavy focus on crop, forage, and beef production.

Many have asked how they can help. The Kentucky Cattlemen's Association office has been in touch with local, state and national contacts to determine what needs there are and how to assist. Presently they are accepting donations for Tornado Relief through their Kentucky Cattlemen's Foundation. All donations will be used to help local producers in need of farm supplies. These donations can be made by calling 859-278-0899, through Paypal at <https://www.paypal.com/donate/...> or by mail at:

KY Cattlemen's Foundation  
Attn: Tornado Relief  
176 Pasadena Drive  
Suite 4  
Lexington, KY 40503

For those interested in donating to restore the UK research station at Princeton, their immediate needs include fencing supplies and solar chargers (they will likely be without electricity for quite some time). You're invited to contact UK Assistant Extension Professor of Beef Cattle Nutrition Katie VanValin, at 270-792-4231, Princeton herd manager Blair Knight at 270-350-5460, or the Hardin County Extension office at 270-765-4121 for an update on supply needs and how best to get them there.

(Source: OSU Extension Beef newsletter: <https://u.osu.edu/beef/2021/12/15/kentucky-rising-above-tornado-aftermath/#more-11926>)



## TUSCARAWAS COUNTY AGRICULTURE & NATURAL RESOURCES

December 22, 2021

**SOIL HEALTH**...webinar series will be sponsored by OSU Extension in early 2022. Farmers, industry, and academic experts will weigh in on practical steps to improve soil health and measure impact on crop yield and farm profitability. Programs include:

- **January 6<sup>th</sup>**, 8:00-9:00am – *What's Your Soil Health Resolution?* (Farmer Panel)
- **February 3<sup>rd</sup>**, 8:00-9:00am – *What does the Research Tell Us about Cover Crops & Soil Health?*
- **March 3<sup>rd</sup>**, 8:00-9:00am – *What's the Future of Soil Health?*

There is no cost to attend these programs, but registration is required. Register at [www.go.osu.edu/soilhealth2022](http://www.go.osu.edu/soilhealth2022). 1-hour CCA CEU in Nutrient Management will be offered at each session. CCA CEUs are only available to participants attending live sessions (we cannot give CCA credit for watching the recordings).

All programs will be recorded, and recordings will be available to view on our [YouTube channel](#). Last year's Soil Health Webinar sessions can be viewed online [here](#).

**FARM BUSINESS SUMMARIES FOR 2020**...from OSU Extension for crop and dairy enterprises are available here: <https://farmprofitability.osu.edu/business-summaries>. If you are interested in participating in the Ohio Farm Business Analysis and Benchmarking Program, input forms are available here: <https://farmprofitability.osu.edu/input-forms>.

**PLANNING FOR THE FUTURE OF YOUR FARM**...workshops sponsored by OSU Extension will be held in 2022. Join OSU's farm management educator David Marrison and legal educators Peggy Kirk Hall and Robert Moore for three in-person workshops and an online workshop in 2022. [Dates and locations for the day-long workshops are:](#)

- Greene County--February 10, 2022
- Wayne County--February 25, 2022
- Wood County--March 4, 2022

The online Zoom webinar will be two hours each night on January 31 and February 7, 21 and 28.

Please contact me for additional information.



**DAIRY OUTLOOK FOR 2022**...was released by USDA on December 15, 2021, as part of their monthly Livestock, Dairy, and Poultry Outlook. The most recent report is available here:

<https://www.ers.usda.gov/webdocs/outlooks/102870/ldp-m-330.pdf?v=4191.4>. A brief summary of dairy pricing is provided below.

### **Dairy Forecasts for 2022**

The number of dairy cows is expected to continue declining in 2022-Q1 and Q2. Accordingly, the annual 2022 forecast has been lowered to 9.385 million head, 10,000 head below the last month's forecast and 65,000 less than the forecast for 2021. The 2022 forecast for milk per cow is 24,265 pounds, 15 pounds lower than last month's forecast. The projection for 2022 milk production has been lowered to 227.7 billion pounds, 0.4 billion pounds below last month's forecast but 1.5 billion pounds above 2021.

Considering the lower projected milk supply, dairy product price forecasts for 2022 have been raised from last month's projections. Wholesale price forecasts for Cheddar cheese, butter, NDM, and dry whey are \$1.775 (+1.0 cent), \$1.940 (+3.0 cents), \$1.510 (+2.5 cents), and \$0.575 (+4.5 cents) per pound, respectively.

With higher projected wholesale prices for cheese and dry whey, the Class III milk price forecast for 2022 is \$18.15 per cwt, \$0.40 higher than last month's forecast. Due to higher butter and NDM price forecasts, the Class IV milk price projection for 2022 is \$19.00 per cwt, \$0.30 above last month's forecast. The all-milk price forecast for 2022 is \$20.75 per cwt, an increase of \$0.50 from last month's projection.

**BQA TRAINING**...for beef and dairy producers will be held at Sugarcreek Stockyards on the following dates and times:

- January 20 at 1pm
- February 28 at 7pm
- March 30 at 7pm

Please call 330-339-2337 to RSVP.

**CERTIFIED CROP ADVISOR (CEUs)**...are available free of charge. These corn and soybean seeding rate 30-minute modules can be completed at your own pace. Topics include:

- Module 1- Collecting Quality Soil Samples for Variable Rate Decisions. Compare whole field, zone, and grid soil sampling and learn how to use Google tools to create grid soil sampling maps. (0.5 NM CEU)
- Module 2- Soybean Seeding Rate. What's the optimum soybean seeding rate for various planting dates? (0.5 CM CEU)
- Module 3- Replant Decisions for Soybean and Management of Late-Planted Soybean. Learn how to adjust your management when you need to replant or plant late. Learn how we do soybean stand counts. (0.5 CM CEU)
- Module 4- Corn Seeding Rate. Recommended corn seeding rates for Ohio and how other management decisions can impact seeding rate. (0.5 CM CEU)



These self-study modules also can be used to earn CCA CEU credit in 0.5 hr increments with up to 1.5 hr in Crop Management and 0.5 hr in Nutrient Management. Register for this training course here: <https://cfaesosu.catalog.instructure.com/courses/seeding-rate-decisions-for-soybean-and-corn-91w-e4-mz>

These modules were made possible through funding support from the Critical Agricultural Research and Extension (CARE) program from USDA-NIFA (Award number 2018-68008-28356).

**CROP ENTERPRISE BUDGETS**...developed by OSU Extension are available here:

<https://farmoffice.osu.edu/farm-management/enterprise-budgets#2022>. The 2022 corn and soybean crop will likely be the most expensive ever planted. The projected total costs vary based on yield and are presented below:

- Corn                   \$904 to \$1,135 per acre or \$6.17 to \$5.15 per bushel
- Soybean             \$578 to \$721 per acre or \$12.74 to \$10.30 per bushel
- Corn Silage       \$852 to \$1,054 per acre or \$44 to \$40 per ton

Anticipated shortages of fertilizers, seed, chemicals, and parts only add to the difficult decisions when planning for next year. I encourage you to consult these budgets as you develop your cropping plan for 2022.

**PRECISION UNIVERSITY 2022**...was going to offer an in-person program, however, due to stress in the supply chain and other unforeseen circumstances, we are not able to present the January 19 in-person portion of Precision University to the caliber that our clientele would expect. Therefore, we have cancelled that day and hope to resume our in-person event in 2023. Webinars will continue on January 5 and 12 as scheduled.

The January 5 webinar will focus on adapting to supply chain shortages. A panel of industry representatives will share what they are seeing and how to work around what you might not have. Topics: Technology Management for 2022; Equipment and Part Shortages; Outlook Having a Plan B. Speakers: Dr. John Fulton (OSU), Jenna Elleman (AgPro), Doug Wical (Sunrise), Sarah Waltner (Raven)

The January 12 webinar will turn your attention to sulfur. Some have seen responses to sulfur application while others have not. Dr. Shaun Casteel, Purdue University, and Dr. Steve Culman, The Ohio State University, will share results from their on-farm sulfur research. Dr. John Fulton, The Ohio State University, will also discuss recent research on sulfur and share tips for conducting your own on-farm research to determine if sulfur is a limiting factor on your farm.

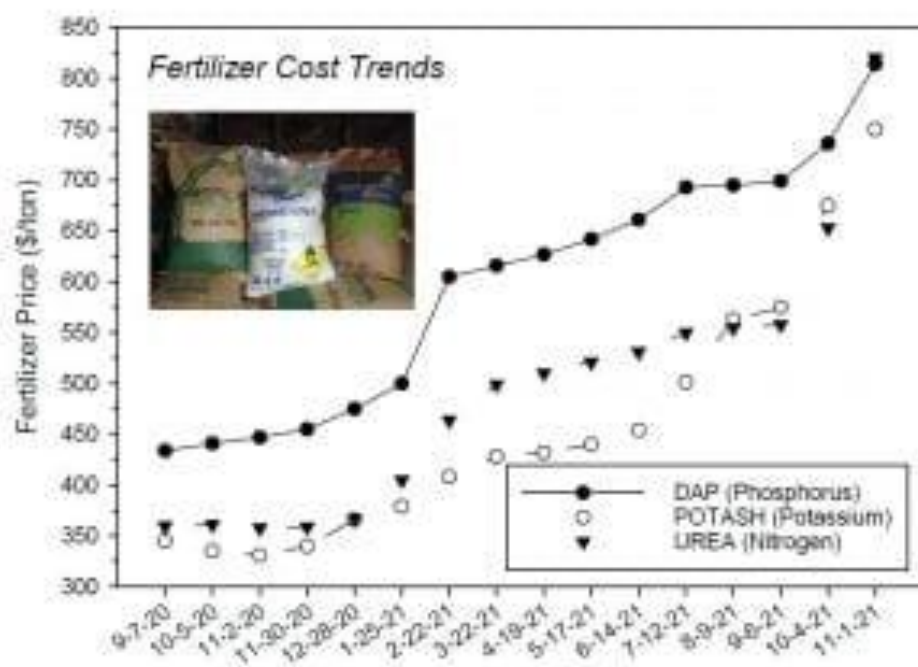
The webinars are set for 9-10am and are free to attend. You can register at <http://go.osu.edu/PrecisionU>.



**HIGH FERTILIZER PRICES**...impacts all crops, including pastures. Management strategies are provided in this OSU Extension Beef newsletter: <https://u.osu.edu/beef/2021/12/22/tips-for-weathering-high-fertilizer-prices/>.

In the last year, the cost of fertilizer had increased more than 125%, 85%, and 115%, for urea (nitrogen), diammonium phosphate (phosphorus), and muriate of potash (potassium), respectively (Figure 1). The price of nitrogen could continue to increase due to the idling of N manufacturing capacity caused by weather issues and increased natural gas and shipping costs. Nitrogen prices could conceivably reach \$1.00/lb N early next year. So, the question becomes what management strategies ruminant livestock producers could use to manage soil fertility as fertilizer markets continue to experience volatility.

Figure 1. Fertilizer price trends for nitrogen (urea), phosphorus (DAP) and potassium (muriate of potash). In the last 12 months fertilizer prices have increased more than 50% (Data from Russ Quinn at DTN).

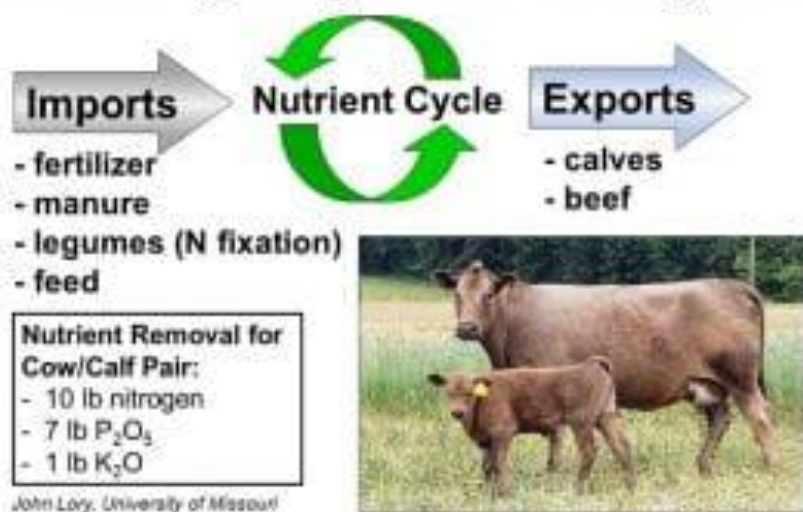


We wish we had a miracle cure for high fertilizer prices, but we don't. And we would caution you to closely scrutinize claims from retailers of products that are offering you something that sounds too good to be true. One competitive advantage that well managed grazing systems have is that nutrient removal is very low and with good grazing management strong nutrient cycles can be developed (Figure 2).



Figure 2. Few nutrients are removed from grazing systems. Nutrients enter grazing systems via feed, fertilizer, and nitrogen fixation in legumes and are recycled by grazing and deposition of dung and urine and decomposition of plant residue and senesced roots (Illustration by Chris Teutsch, UKY).

## Nutrient Cycling in Cow-Calf Systems



Below you will find some strategies that can be implemented to help you get through the current period of high fertilizer prices.

**Soil test pastures and hay fields.** You are probably saying to yourself why in the world would I even bother soil testing when fertilizer prices are so high. It is impossible to manage something without data. A soil test allows you to target fertilizer applications to fields that have the potential to respond. If the P or K soil test level for a given nutrient is in the low range, then the probability of a yield response is high (Table 1). If the P or K soil test level is in the medium or high range, the probability of a yield response diminishes. So, our best advice at this time is that if your soil test value is a SOLID MEDIUM, do NOT apply that P or K fertilizer until prices moderate.

Table 1. Probability of forage yield response for soil test levels ranging from very low to very high (Edwin Ritchey and John Grove, personal communication, April 19, 2021).

UKY Soil Test Level	Probability of Yield Response†
Very High	0%
High	<25%
Medium +	25 to 50%
Medium	50%
Medium -	50 to 70%
Low	70-90%
Very Low	>90%

†These are estimates and will vary with soil type and environmental conditions.



**Monitor soil test levels in hayfields closely.** Since hay removes much higher quantities of nutrients than grazing, it is important to closely track nutrient levels and apply P or K fertilizer when soil test values drop below the MEDIUM range. This will prevent nutrient mining and yield decline.

**Apply lime according to soil test.** Soil acidity or alkalinity can have a profound impact on soil nutrient availability to forage plants (Figure 3). Maintaining soil pH between 6.0 and 7.0 results in the greatest availability of macro- and secondary-nutrients such as nitrogen, phosphorus, potassium, magnesium, and sulfur. In contrast to fertilizer prices, lime costs have remained about the same. If your soil test indicates that you need lime, it will likely be the best buy you can make at the current time.

Figure 3. Soil testing is an important tool for managing soil fertility in pastures, especially when fertilizer prices are high (Photo by Chris Teutsch, UKY).



**Capitalize on nutrients in hay.** Every ton of hay contains approximately 50 lb N, 15 lb P<sub>2</sub>O<sub>5</sub>, and 50 lb K<sub>2</sub>O. The current value of the nutrients in one ton of hay is approximately \$50. How we manage hay feeding will determine the actual value of these nutrients. If we feed hay in one paddock near the barn, then the value of these nutrients will be low because they will be concentrated in one small area. In contrast, if we move feeding points and feed the hay on pastures with lower soil test values, then the value of the nutrients in hay will be higher.

**Implement rotational stocking.** This doesn't sound like much of a nutrient management strategy, does it? In large continuously stocked pastures, animals will consume nutrients in the form of forage and concentrate them around shade and water sources in the form of dung and urine. One way to improve nutrient distribution in pastures is to subdivide and implement rotational grazing. Confining livestock to smaller areas for short periods of time significantly improves dung and urine distribution.

**Replace commercial nitrogen by overseeding clover into pastures.** Legumes fix nitrogen from the air to a plant available form via symbiotic nitrogen fixation, improve forage quality and animal performance, and dilute the toxic effects of the endophyte found in tall fescue. Red and white clover are estimated to fix between 50 and 120 lb N per acre per year.



This fixed nitrogen is indirectly shared with legumes through grazing and the associated deposition of dung and urine, through death and decomposition of above and below ground plant parts, and the senescence of root nodules.

**Frost seed clover in February.** The simplest and most cost-effective way to introduce clover into pastures is by broadcasting 6-8 lb of red clover/A and 1-2 lb of ladino clover/A onto closely grazed pastures in February and allowing the freezing and thawing cycles to incorporate the seed. Allow animals to remain on these pastures until the new clover seedlings have become tall enough to be grazed off. At his point, remove animals and allow the seedling to reach a height of 8-10". At this point, these pastures can be incorporated back into the rotation.

**Determining nitrogen fertilizer needs.** There are no good soil tests for N, so use university rate recommendations. Most rate recommendations are a 'range', so consider an application rate at the lower end of the range when fertilizer N prices are high. Consider your personal experience with N response in your pastures and hayfields. Well managed pastures that have a strong legume component and are rotational stocked can have strong nitrogen cycle. This will tend to make them less responsive to nitrogen fertilizer. Remember, more N drives more grass growth, BUT it is only a good investment if the additional forage will be utilized!

### Take Home Points

Although there is no "silver bullet" for high fertilizer prices, some key management strategies will help you weather these high prices in the short-term and develop grazing systems that are less dependent on commercial fertilizer inputs in the long-term.

1. Soil test pastures to provide baseline data for short- and long-term fertilizer management.
2. Do NOT apply P and K fertilizer to pastures testing MEDIUM until fertilizer prices moderate.
3. Apply needed lime to pastures according to soil test to make nutrients in the soil more available to forage plants.
4. Closely monitor soil test levels in hayfields to prevent nutrient mining and yield decline.
5. Feed hay on pastures with low soil test values.
6. Move hay feeding points around the pasture to improve nutrient distribution.
7. Implement rotational stocking to improve dung and urine distribution in pastures.
8. Frost seed clover into pastures to improve forage quality, help with tall fescue toxicosis, and fix atmospheric nitrogen into a plant available form.
9. Apply fertilizer nitrogen at the lower end of the recommended rate range, knowing that you will use resulting grass growth.

