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.

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 ¾ 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 ¾ inches.

In forages, a threshold that can be used is 2-3 fall armyworm larvae per sq foot. If larvae are smaller (less than ¾ 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, or 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.


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 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](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.


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.

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

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)

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).
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:

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 ¾-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.


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.

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

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) describes in more detail the legal procedure for controlling noxious weeds.

C.O.R.N. LIVE...produced by OSU Extension returns September 16th 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](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/](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](https://agcrops.osu.edu/newsletter/corn-newsletter/2020-30/burndown-herbicides-no-till-wheat)
CROP PROGRESS IN OHIO...for the week ending September 12 is provided by USDA National Ag Statistics Service (NASS).

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 through.

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 marestail, flexibility in application timing and residual control. While Gramoxone alone should control small seedlings of marestail 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.


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 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 stromata 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 effect against one or both diseases.

Misdiagnosis my 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.

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](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%202021.pdf](https://tuscarawas.osu.edu/sites/tuscarawas/files/imce/Program_Pages/ANR/Newsletters/ANR%20Newsletter%20September%202021.pdf).
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%27t-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. Should you have questions about the survey, please contact Dr. Pesapane in the OSU Department of Veterinary Preventive Medicine at 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)


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).
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.


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](image-url)
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**

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**Milk Price Forecast - 2022**

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<tr>
<td>All Milk</td>
<td>$18.40</td>
</tr>
</tbody>
</table>
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.


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>
<thead>
<tr>
<th>Crop Type</th>
<th>Organic (tons/acre)</th>
<th>Conventional (tons/acre)</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alfalfa</td>
<td>3.71</td>
<td>4.51</td>
<td>0.823</td>
</tr>
<tr>
<td>Corn</td>
<td>127.1</td>
<td>186.2</td>
<td>0.683</td>
</tr>
<tr>
<td>Oats</td>
<td>55.8</td>
<td>72.4</td>
<td>0.770</td>
</tr>
<tr>
<td>Soybeans</td>
<td>35.0</td>
<td>48.2</td>
<td>0.725</td>
</tr>
<tr>
<td>Winter Wheat</td>
<td>31.8</td>
<td>67.0</td>
<td>0.474</td>
</tr>
</tbody>
</table>

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

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 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.
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).


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.