CFAES

OHIO STATE UNIVERSITY EXTENSION

NORTHEAST OHIO AGRI-CULTURE NEWSLETTER

Your Weekly Agriculture Update for Ashtabula, Portage and Trumbull Counties

January 12, 2021

How about a little trivia this week?

Can you identify the tractor manufacturer from by this safety warning in an operator's manual?

In This Issue:

- Pesticide and Fertilizer Recertification Update
- Cattle Grazing and Soybean Yields
- Interseeding Cover Crops in Corn
- OSU Extension to Host "Planning for the Future Your Farm" Workshop
- 2021 NE Ohio Pollinator Symposium Winter Series Flyer
- Virtual Pasture for Profit Flyer

Hello Northeast Ohio Counties!

There are many online agriculture programs being offered already in 2021 with more on the way. Check out today's newsletter for upcoming programs and how to sign up. If you have any suggestions, questions, or need help accessing them just let us know!

Another reminder that our online pesticide recertification is open for registration. If your license expires this year make sure to read the first article.

Stay safe and healthy!

Lee Beers
Trumbull County Extension Educator

Andrew Holden
Ashtabula County Extension Educator

Angie Arnold
Portage County Extension Educator

Pesticide and Fertilizer Recertification Update

Happy New Year! I'm sure some of you have received your private pesticide license renewal from the ODA, and are wondering how to get recertified. Admittedly, we are behind this year as we try to navigate changing guidelines from the state, county, and OSU on holding meetings. Hitting a moving target is a little challenging! We will make sure that everyone will get recertified one way or another.

While we prefer in-person programs, that is not possible in the near future. We have been granted permission by the ODA to hold virtual live meetings for pesticide recertification, and we have four sessions scheduled for the upcoming months. You can find those dates below, and registration links as well. These are live events and not recorded. We realize that not everyone has a computer, or reliable internet so we are working on some in-person events later this spring. We will provide updates on those in-person events when those are available.

Thankfully, the deadline for applicators with an expiration in 2020 and 2021 has been extended to July 1, 2020. We hope with the option of having recertification in warmer weather, we can move outside and get together in person. If you have any questions please give us a call and we will answer any questions you have.

- **Horticulture Specialization - New for 2021!**
  - Date: February 4, 2021, Time: Daytime 10AM – 2PM
  - Categories CORE, 3, 4, 5, 6 and Fertilizer
- Normal/Agronomy
  - Date: February 16, 2021, Time: Evening 5PM – 9PM
  - All categories, CORE and Fertilizer
- Normal/Agronomy
  - Date: March 10, 2021, Time: Daytime 10AM – 2PM
  - All categories, CORE and Fertilizer
- Normal/Agronomy
  - Date: April 7, 2021, Time: Daytime 10AM – 2PM
  - All categories, CORE and Fertilizer

You can register now at https://go.osu.edu/NEOPAT21

Cattle Grazing and Soybean Yields

By Eric Hamilton
Source: https://www.agronomy.org/news/science-news/cattle-grazing-and-soybean-yields

By late fall, much of the Midwest is a pleasing landscape of dry, harvested corn fields. It makes for a bucolic rural scene on highway drives. But the corn litter that's left over doesn't seem useful, at least to untrained eyes.

The normal stocking density treatment involved eight cattle grazing corn fields for 45 days. Credit: Morgan Grabau

But to those in the know, that corn residue is a valuable resource. Scattered leaves, husks, kernels, and cobs can serve as food to grazing cattle. When managed well, corn residue can increase farm income, provide affordable food for cattle, and efficiently use the land to feed people.

Morgan Grabau, a member of the American Society of Agronomy, studies the interactions of cattle grazing and crop productivity. She recently presented her research at the virtual 2020 ASA-CSSA-SSSA Annual Meeting.

"Corn residue is an under-used resource. Only 15% of the corn residue acres in the central U.S. are grazed," says Grabau.

One big concern farmers have about cattle grazing corn residue is soil compaction. If cattle compact the soil too much, future crops might not grow well. Addressing the issue of soil compaction is the main focus of Grabau's work.

In the past, Grabau's research team has shown that compaction isn't too bad during fall and winter grazing. When the soil is dry and frozen, it resists stamping cattle hooves. "My research was focused on the effect of grazing in the spring when the soil is thawed and wet," she explains.

Grabau studied two different grazing systems. In one system, researchers let a small number of cattle graze corn fields for 45 days starting in mid-February. The other system tripled the number of cattle but cut grazing time to just 15 days in March. This way, the total amount of grazing was equal. But the time the cattle spent on wet fields varied, which could affect how the soil responds to all that trampling.

The researchers studied corn fields in Nebraska, where around half of the corn fields are grazed after harvest. The team measured various soil properties that contribute to compaction and the yield of the soybeans planted in the fields the following season after cattle were done grazing. The team repeated the experiment over two years.

Little corn residue remains after concentrated grazing in the high stocking density treatment the day that cattle were moved from the fields in March of 2020. Credit: Morgan Grabau

"Much like previous fall grazing studies, minimal effects were seen on soil properties and yield due to spring grazing, regardless of the number of cattle and area grazed," says Grabau.

The soybean productivity of the fields following grazing did show some changes. The highly concentrated grazing for just 15 days actually increased yields slightly.

"This yield increase could be due to more residue removed, causing warmer soil temperatures for plants to grow," Grabau says.

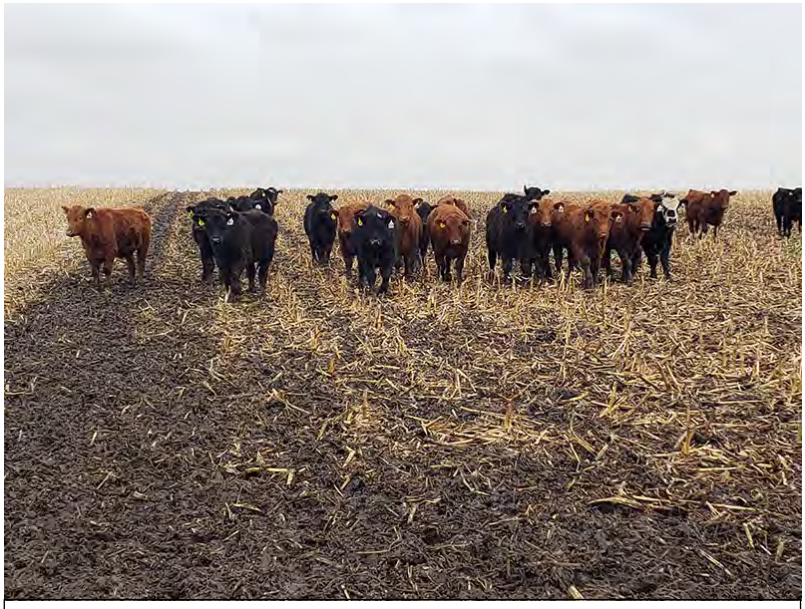
The cattle did cause some soil compaction. But their effects were limited to the surface level of fields.

"Compaction isn't permanent," Grabau says. "Soil can loosen up again as it dries and saturates over and over, and microbial activity in the soil also reduces compaction."

Fortunately, soybean seedlings had no problem establishing themselves in the soil after grazing even with some surface compaction present.
"Even when we created a worst-case scenario, grazing in the spring when the ground was wet, compaction was minimal and subsequent soybean yields were not negatively affected," Grabau says.

Although Grabau says that fall and winter grazing is probably still the best solution, farmers shouldn't be afraid of grazing cattle in the spring.

"The integration of crops and livestock is a beneficial production system," says Grabau. "Grazing cattle on corn residue can be a great way to make even more food for human consumption from corn fields, as both the corn grain and plant residue can be used as feed for livestock."



The high stocking density treatment had 24 cattle grazing corn fields for 15 days. This treatment increased future soybean yields slightly, perhaps because removing the corn residue warmed the soil. Credit: Morgan Grabau

Morgan Grabau is a graduate student in animal science at the University of Nebraska-Lincoln. This project is supported by the Nebraska Agricultural Experiment Station with funding from the Hatch Multistate Research Program of the United States Department of Agriculture National Institute of Food and Agriculture**.**

Interseeding Cover Crops in Corn

By Aaron Brooker and Karen Renner
Source: https://acsess.onlinelibrary.wiley.com/doi/full/10.1002/crso.20095

Seasonal constraints following corn grain harvest in the upper Midwest often limit cover crop seeding and restrict the species that can establish and produce biomass prior to the winter months. Interseeding cover crops in corn fields in the early vegetative stages of corn is an additional option to

Oilseed radish interseeded into corn. Photo courtesy of Edwin Remsberg and USDA-SARE.

establish a cover crop. There is limited information available on which cover crop species are successful when interseeded and at what corn growth stages cover crops can be interseeded without reducing corn yield. Establishment of drill-interseeded cover crops has been successful in Pennsylvania and other states in the northeastern U.S.; however, broadcast interseeding is more efficient and of interest to farmers to expedite field operations.

Fall cover crop biomass from 2015 when rainfall was sufficient for establishment of oilseed radish (left) and annual ryegrass (right).

Field experiments were conducted at the Michigan State University Agronomy Farm (MSUAF) in East Lansing, MI in 2015–2016, 2016–2017, and 2017–2018 and at the Saginaw Valley Research and Extension Center (SVREC) in Richville, MI in 2017–2018. Soils at MSUAF were sandy loams and loams with 2.8–2.9% organic matter, and the soil at SVREC was a loam with 3% organic matter. Fields were chisel-plowed and soil finished prior to corn planting. Nitrogen (160 lb/ac) was applied prior to and at planting at each location, and P and K were applied as needed according to soil tests. Corn was planted in late April or early May each year in 30-inch rows at a population of 32,000 seeds/ac.

Cover crop species evaluated included annual ryegrass, oilseed radish (tillage radish), and crimson clover coated with NitroCoat seed coating seeded at 15, 8, and 15 lb/ac, respectively. A cover crop mixture was also evaluated that included annual ryegrass, oilseed radish, and crimson clover at 10, 2, and 2 lb/ac respectively (commercially available as “PeakBlend Indy,” Center Seeds, Sidney, OH). Broadcast interseeding timings evaluated included the V1, V2, V3, V4, V5, V6, and V7 growth stages (Table 1). There were no glyphosate-resistant weed species at any field site, and glyphosate was applied prior to each interseeding timing to control emerged weeds prior to cover crop seeding.

Table 1. Cover crop interseeding dates and corn harvest dates for MSUAF 2015, 2016, and 2017, and SVREC 2017[a]

Interseeding timing	Seeding date MSUAF 2015	MSUAF 2016	MSUAF 2017	SVREC 2017
V1	May 13	-	-	-
V2	May 21	May 31	June 2	May 23
V3	May 28	June 3	June 6	May 26
V4	June 3	June 7	June 13	June 2
V5	June 8	June 10	June 16	June 8
V6	June 15	June 15	June 23	June 12
V7	-	June 22	June 28	June 19
Corn harvest	Oct. 18	Oct. 24	Oct. 13	Oct. 12

[a] MSUAF, Michigan State University Agronomy Farm, East Lansing, MI; SVREC, Saginaw Valley Research and Extension Center, Richville, MI.

Cover crop and weed emergence was evaluated 30 days after each broadcast interseeding (Figure 1). At least four times throughout the growing season, light penetrating the corn canopy was measured to determine the amount of light reaching the cover crops. Precipitation data for each field site was obtained from the Michigan Enviroweather Network from weather stations located at MSUAF and SVREC. Final density of cover crops and weeds was measured in early October just prior to corn harvest. The aboveground biomass of cover crops and weeds was harvested,

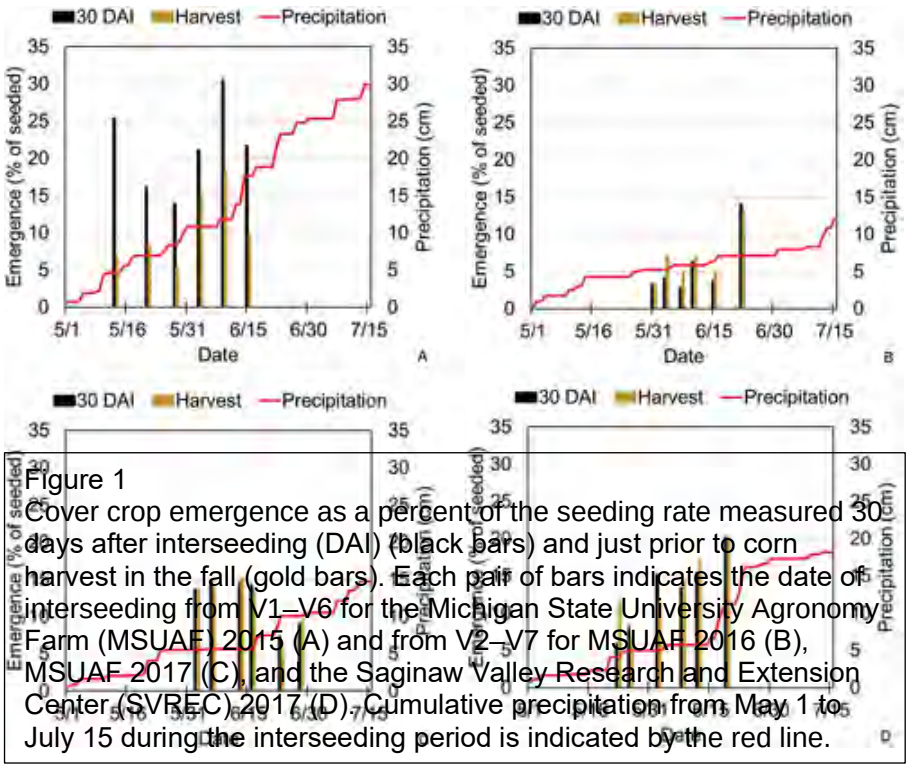


Figure 1
Cover crop emergence as a percent of the seeding rate measured 30 days after interseeding (DAI) (black bars) and just prior to corn harvest in the fall (gold bars). Each pair of bars indicates the date of interseeding from V1–V6 for the Michigan State University Agronomy Farm (MSUAF) 2015 (A) and from V2–V7 for MSUAF 2016 (B), MSUAF 2017 (C), and the Saginaw Valley Research and Extension Center (SVREC) 2017 (D). Cumulative precipitation from May 1 to July 15 during the interseeding period is indicated by the red line.

dried, and weighed (Table 2). Corn grain was harvested using a plot combine and weighed; yields reported are adjusted to 15% moisture counted. In April of the following spring, over-wintering cover crop and winter annual weed density were evaluated.

Table 2. Cover crop and weed biomass measured in the fall of interseeding and the spring following interseeding for the main effects of cover crop species and interseeding timing

	Fall		Spring	
Cover crop treatment	Cover crop	Weed	Cover crop	Weed
	biomass, lb/ac			
Annual ryegrass	166 a[a]	222 a	342 a	123 c
Crimson clover	100 b	203 a	7 c	340 a
Oilseed radish	131 ab	219 a	0 c	267 ab
Mixture	138 ab	187 a	161 b	192 bc
±SEM[b]	(± 21)	(± 57)	(± 36)	(± 1127)
P-value	.0337	.8633	<.0001	<.0001
Interseeding timing	biomass, lb/ac			
V2	198 a‡	443 a	127 a	200 a
V3	163 ab	255 b	214 a	200 a
V4	123 bc	194 bc	151 a	270 a
V5	155 ab	136 c	170 a	253 a
V6	78 c	98 c	168 a	273 a
V7	87 c	120 c	193 a	184 a
±SEM§	(± 24)	(± 62)	(± 38)	(± 128)
P-value	<.0001	<.0001	.2362	.3038
Weedy[c]	-	1346*	-	165
Weed-free[c]	-	111	-	251

* Values with an asterisk are significantly different at α = .05 according to Fisher's LSD.

[a] Within columns, means with the same letter are not significantly different at α = .05 according to Fisher's LSD.
[b] Standard error of mean for LSD comparisons.
[c] Analyzed separately and compared with each cover crop by interseeding timing combination.

Cover Crop Density and Biomass

Rainfall before and after cover crop interseeding differed at each field site. Cumulative rainfall from May 1 to July 15 totaled 12, 5, 6, and 7 inches for MSUAF in 2015, 2016, and 2017 and SVREC in 2017, respectively. Differences in rainfall impacted cover crop emergence and biomass production. There were no major differences in the amount of light penetrating the corn canopy at each field site.

Due to the greater number of seeds per pound, annual ryegrass density was always higher compared with oilseed radish and crimson clover. In October, final stands of annual ryegrass averaged 11 plants/ft^2 while crimson clover and oilseed radish averaged 3 and 1 plants/ft^2, respectively. Annual ryegrass and oilseed radish densities were 12% of the number of seeds interseeded, whereas crimson clover density was 7% of the seeds interseeded, averaged across field sites. Cover crop density was highest at the V5, V6, and V7 interseeding timings when measured 30 days after interseeding. At harvest, V7 had the highest cover crop density averaged over species and field sites. The cover crop mixture was dominated by annual ryegrass with almost no emergence of crimson clover and oilseed radish.

Rainfall following interseeding often improved cover crop establishment. Both rainfall following interseeding and cover crop density were highest for 2015 and lowest for 2016, indicating that frequent rainfall following broadcast interseeding is important for cover crop establishment and survival. Additionally, previous research has shown that annual ryegrass may be more tolerant of dry conditions following interseeding compared with other species, and crimson clover is particularly vulnerable to dry conditions.

Annual ryegrass produced 166 lb/ac of fall biomass, which was statistically greater than crimson clover, which produced only 100 lb/ac when measured in early October prior to corn grain harvest. Oilseed radish and the mixture produced 131 and 138 lb/ac of biomass, respectively. By the following spring, annual ryegrass biomass more than doubled to 342 lb/ac, and the mixture increased slightly to 161 lb/ac due to the annual ryegrass content. Crimson clover rarely overwintered, and oilseed radish does not overwinter in Michigan and other upper Midwest climates. Crimson clover that emerged was generally unhealthy in appearance and often flowered in late summer and early fall; both of these factors may have contributed to its poor winter survival.

Fall biomass production averaged over species was generally greater for early interseeding timings. This was likely caused by the increased amount of time for growth prior to corn canopy closure compared with later interseedings. This suggests that increased biomass production per plant outweighs reduced emergence or survivability early in the season. In the spring, there were no differences in biomass production (mostly annual ryegrass) among interseeding timings. This means that annual ryegrass was able to compensate for differences in fall density and biomass at corn harvest and build biomass in the later fall and early spring.

Weed Density and Biomass

Fall weed biomass was highest when cover crops were interseeded early compared with later interseeding timings. In fact, the V1 interseeding timing was only tested in 2015 because weed biomass was so high in that treatment. There was no difference in weed biomass when cover crops were seeded at the V4 growth stage or later. This is simply because many weeds emerged after a glyphosate application and cover crop seeding at V1, and to a lesser extent, at V2. By the V4 seeding, few weeds emerged at any of the field sites after this time. Overall, there was no indication that interseeded cover crops suppressed summer annual weeds, regardless of the cover crop species.

Corn Grain Yield

Previous research in the northeastern United States and the upper Midwest have shown that cover crops seeded at or after the V4 growth stage in corn do not reduce corn grain yield; however, there was limited information about seeding prior to these stages. Our research showed that yield loss could occur if interseeding at V1 because high densities of weeds emerge after V1 that cannot be controlled with a postemergence herbicide because of cover crop interseeding. We included weedy control plots in this research, and corn grain yield was also reduced in these plots. Corn grain yield was not reduced at any field site when cover crops were interseeded at V2 or later, indicating that cover crops at the densities in our research did not compete with corn in the same way that summer annual weeds do.

Conclusions

Annual ryegrass and crimson clover established when broadcast-interseeded from the V2–V7 corn stages; however, crimson clover emergence was much lower comparatively. Interseeded cover crops are at risk of attrition due to lack of light and rain reaching the soil surface, and this is especially problematic in broadcast-interseeding situations. Farmers can increase interseeded cover crop biomass production by seeding at V2–V4 compared with V6–V7 interseeding, but weed management options need to be considered for this practice to prevent corn yield loss and stop weed seed production. Applying a preemergence herbicide that does not inhibit emergence of a cover crop seeded at V4-V7 may be an important management option to control weeds and prevent the development of glyphosate-resistant weeds (Brooker et al., 2019). Cover crop biomass was measured in early October just prior to

corn grain harvest. Cover crop biomass continued to accumulate until late November each year when a killing frost stopped radish and clover growth. By spring, there was no advantage to early seeding with annual ryegrass, so for overwintering species, the timing of interseeding may not be as important to maximize the ecosystem services that cover crops provide.

These experiments help to fill some of the research gaps for interseeding cover crops in corn; however, there is much more information to be learned. For example, other species within each functional group of cover crops (grass, legume, and brassicas) may perform very differently in interseeded situations compared with the species we used. Our seeding rates were based on discussions with farmers and consultants and recommendations from the Midwest Cover Crop Council and SARE websites. Furthermore, much more information is needed on the performance of cover crop mixtures when broadcast and drill-interseeded in corn.

OSU Extension to Host "Planning for the Future Your Farm" Workshop

By: David Marrison

OSU Extension will host a virtual three part **"Planning for the Future of Your Farm"** workshop on February 15, 22 and March 1, 2021 from 6:30 to 8:30 p.m. via Zoom. This workshop will challenge farm families to actively plan for the future of the farm business. This workshop is designed to help farm families learn strategies and tools to successfully create a succession and estate plan that helps you transfer your farm's ownership, management, and assets to the next generation. Learn how to have the crucial conversations about the future of your farm.

Topics discussed during this series include: Developing Goals for Estate and Succession; Planning for the Transition of Control; Planning for the Unexpected; Communication and Conflict Management during Farm Transfer; Legal Tools & Strategies; Developing Your Team; Getting Affairs in Order; and Selecting an Attorney This workshop will be taught by members of the OSU Farm Office Team featuring Peggy Hall & Jeffrey Lewis, Attorneys from OSU Agricultural & Resource Law Program and David Marrison, Extension Educator for Coshocton County.

Because of its virtual nature, you can invite your parents, children, and/or grandchildren (regardless of where they live in Ohio or across the United States) to join you as you develop a plan for the future of your family farm.

Pre-registration is required as one packet of program materials will be mailed to participating families. Electronic copies of the course materials will also be available to all participants. The registration fee is $40 per farm family. The registration deadline is

February 10, 2021. More information and on-line registration can be obtained at go.osu.edu/farmsuccession

For more information about this webinar contact David Marrison at the Coshocton County Extension office at 740-622-2265 or by email at marrison.2@osu.edu.

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2021 Northeast Ohio Pollinator Symposium

WINTER SERIES

Stay warm at home and think spring with these great winter Wednesday webinars.

February 3rd

- "Why Native Plants Matter to Bees and Other Wildlife"
  presented by Denise Ellsworth, Program Director of Pollinator Education, OSU

February 17th

- "Invasives-Identification, Eradication, and Native Alternatives"
  presented by Rees Davis, Master Gardener, and Andrew Holden, Educator, Ag & Natural Resources for CFAES Ashtabula County OSU Extension

March 3rd

- "Who are the (Non Bee) Pollinators in Your Neighborhood?"
  presented by Judy Semroc, CMNH Conservation Specialist

March 17th

- "Harvesting and Planting Native Seeds"
  presented by Red Beet Row, Agroecology Education Farm

March 31st

- "Our Pollinator Picks for Your Native Garden"
  presented by Carol Blake, Master Gardener
  and Encie Moroski, Master Gardener

Ashtabula County Beekeepers Association

Ohio State Master Gardener Volunteers Of Ashtabula County

Ashtabula Soil and Water Conservation District

Ashtabula County Metroparks

Register now at go.osu.edu/neops

The virtual Pastures for Profit course will consist of three 90-minute webinars offering a variety of pasture and grazing topics. Once registered, attendees will be granted access to the online course including the webinars and complementary resources. Participants that attend all three webinars will have the opportunity to earn a certificate of completion. Registered participants will also receive their choice of a curriculum binder or USB drive of the traditional course by mail.

Wednesday, January 13th 7:00 p.m. Webinar 1:

Core Grazing Education: Evaluating Resources and Goal Setting, Getting Started Grazing, Soil Fertility

Wednesday, February 3rd 7:00 p.m. Webinar 2:

The Science of Grazing: Understanding Plant Growth, Fencing and Water Systems, Meeting Animal Requirements on Pasture

Wednesday, March 3rd 7:00 p.m. Webinar 3:

Meeting Grazing Goals: Pasture Weed Control, Economics of Grazing, Creating and Implementing Grazing Plans

Cost of the course is $50, which includes the Pastures for Profit manual. Current and new members of the Ohio Forage and Grasslands Council are eligible for a $10 discount on registration. **Register by visiting: https://afgc.org/ofgcwebinar.**

Ohio Forage & Grasslands Council

Ohio Department of Agriculture

Ohio Federation of Soil and Water Conservation Districts

USDA United States Department of Agriculture Natural Resources Conservation Service

Central State University 1887

EXTENSION 1890 LAND-GRANT INSTITUTION

The Ohio State University College of Food, Agricultural, and Environmental Sciences

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ARC/PLC for the 2021 Program Year

January 13, 1:00-3:00pm
February 25, 9:00-11:00am

Location: Zoom Webinar **Cost:** Free
Register: go.osu.edu/arcplc2021

Join OSU Extension for a webinar on the ARC/PLC decision for the 2021 program year including updates on current market outlook and decision-tool calculators available to evaluate options. There is no cost to attend these meetings, but registration is required.

Register: go.osu.edu/arcplc2021

For more information contact: Mary Griffith, Griffith.483@osu.edu or 740-852-0975

Photo Credit: Elizabeth Hawkins

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