

# NORTHEAST OHIO AGRICULTURE NEWSLETTER

Your Weekly Agriculture Update for  
Ashtabula and Trumbull Counties

February 27, 2024



*Beautiful weather for cleaning up fencerows!*

## In This Issue:

- OSU Extension Ashtabula County is Hiring!
- Spring Planting
- Weather/Climate Outlook
- Minerals: Too Much of a Good Thing
- Conservation Tillage & Technology Conference March 12-13 in Ada
- Growers and Retailers Needed: Understanding Yield Response to K Applications in Ohio
- Is Sustainable Aviation Fuel the Future of Ethanol?
- Upcoming Extension Programs

## ***Hello Northeast Ohio Counties!***

OSU Extension has a ton of events coming up! Call 330-638-6783 for more details about any of the programs below.

February 29 – Fertilizer Certification

March 2 – March Into Pruning

March 9 and March 16 – NE Ohio Small Farm Financial College

March 11 – Pesticide Applicator Training

March 27 – NE Ohio Agronomy School

March 28 – ONLINE Pesticide Applicator Training

Have a great week!

**Lee Beers**  
**Trumbull County**  
**Extension Educator**

## ***OSU Extension Ashtabula County is Hiring!***

OSU Extension Ashtabula County is currently seeking applications to fill two position vacancies.

### **Extension Educator, Agriculture and Natural Resources**

Ohio State University Extension (OSUE) seeks an Educator to work collaboratively with county, area, and state teams of OSUE professionals and with local agency leaders and volunteers. The Extension Educator, Agriculture and Natural Resources (ANR) in Ashtabula County will be responsible for a broad range of basic to complex duties that could include but are not limited to: providing guidance and/or leadership for developing and conducting a proactive applied research and education program in agriculture and natural resources to meet current and future needs in farm management, livestock and crop production, home horticulture/Master Gardeners, commercial horticulture, farmland use issues, food security, innovative agricultural business opportunities, environmental quality and sustainability, renewable energy, and bio-based products. Plan, teach, deliver, disseminate, and evaluate educational programs and applied research on relevant local issues; give leadership to the development of pro-active educational programs using innovative educational methods; maintain a high level of visibility and facilitate communications with a wide range of clientele to promote the understanding of agriculture and natural resource issues; maintain a program of individual professional improvement in selected subject areas; ensure diversity among potential clientele and learners, and equal access to programs and facilities; work closely with local advisory committees, commodity groups, and volunteers to conduct needs assessment and priority setting to determine emphasis of educational programs; serve as an educational advisor and liaison for OSUE and the University to appropriate public issue and program-related organizations; represent OSUE and the University with federal, state, and local agencies and educational institutions at the local community level; identify, recruit, and develop the volunteer leadership necessary to carry out relevant parts of their programming; provide volunteer management, educational training, and program development to the Ashtabula County Master Gardener Volunteer Program.

To apply for this position please visit [https://osu.wd1.myworkdayjobs.com/en-US/OSUCareers/job/Extension-Educator--Agricultural-and-Natural-Resources---Ashtabula-County\\_R97999-1](https://osu.wd1.myworkdayjobs.com/en-US/OSUCareers/job/Extension-Educator--Agricultural-and-Natural-Resources---Ashtabula-County_R97999-1). Applications are being accepted until March 10, 2024.

### **Extension Educator's Coordinator 3, Agriculture and Natural Resources; 4-H Youth Development**

Ohio State University Extension (OSUE) seeks a Program Assistant to work programatically with county staff and volunteers to plan, conduct, and teach programs in

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Ashtabula County. The Program Assistant will support the 4-H Youth Development and Agriculture and Natural Resource (ANR) programs by assisting with specific educational programs relating to STEM, youth agricultural programs, youth training programs, 4-H school enrichment programs, 4-H project evaluation events, and participate with county committees. Additionally, the Program Assistant will provide support to 4-H and ANR related county level events and opportunities including training/meetings. The Program Assistant will work with partner agencies to schedule events and activities and assist with other 4-H and Agriculture and Natural Resource information.

To apply for this position, please visit [https://osu.wd1.myworkdayjobs.com/en-US/OSUCareers/job/Extension-Educators-Coordinator-3--4-H-ANR---Ashtabula-County\\_R98284-1](https://osu.wd1.myworkdayjobs.com/en-US/OSUCareers/job/Extension-Educators-Coordinator-3--4-H-ANR---Ashtabula-County_R98284-1). Applications are being accepted until February 27, 2024.

For general questions about these positions please contact Lee Beers at 330-638-6783 or [beers.66@osu.edu](mailto:beers.66@osu.edu), or the OSU Extension Ashtabula County office at 440-576-9008. For more detailed questions about benefits, hiring, or specific job duties please contact Beth Smith at [smith.11958@osu.edu](mailto:smith.11958@osu.edu).

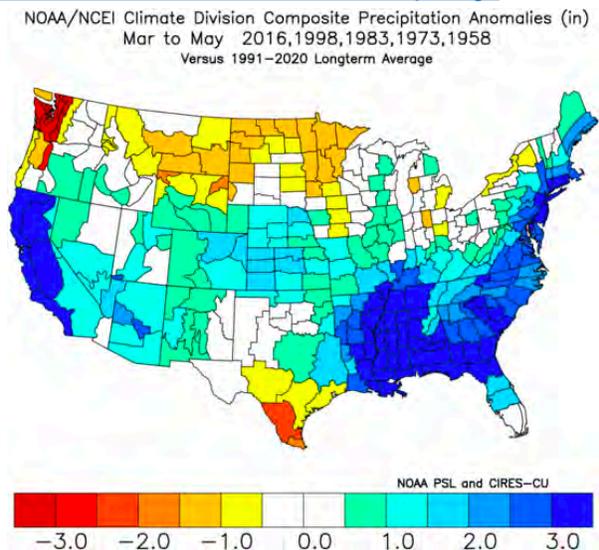
## **Spring Planting Weather/Climate Outlook**

By Jim Noel

Source: <https://agcrops.osu.edu/newsletter/corn-newsletter/2024-05/spring-planting-weatherclimate-outlook>

Spring is quickly approaching. The question is, what is in store for planting season from Mother Nature?

We have a strong **El Niño** ongoing in the eastern Pacific Ocean but it is weakening quickly and should end during planting season. Often effects in the atmosphere can linger a bit longer. The years where strong **El Niño** events come to an end in spring include 2016, 1998, 1982, 1973, 1958 and 1878. You can see this in the first graphic below.

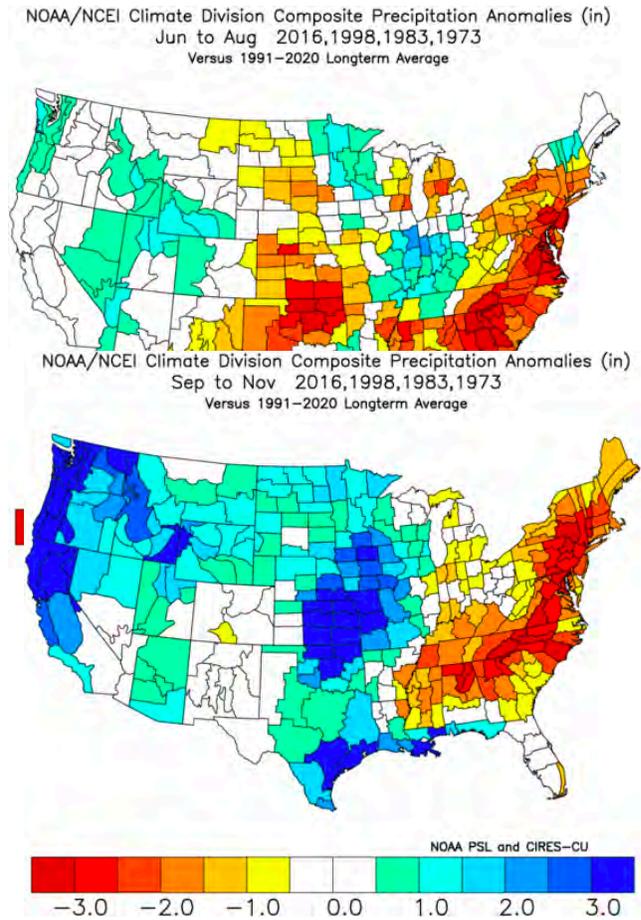


However, as we go into summer and autumn, there is a growing chance of a **La Niña** returning which is opposite of **El Niño**. This means 1958 and 1878 drop off and you can see the summer and autumn precipitation results in images below.

The message is the above normal temperatures are expected to remain with us for most of 2024. Precipitation is likely to turn from drier than normal to slightly wetter than normal through our spring plant in Ohio (not as dry as 2023). As we get into the growing season uncertainty grows for rainfall as it looks like Ohio is likely to experience wide fluctuations with some areas slightly wetter than normal while other areas see potentially some drought development. Since Mother Nature is mad in the oceans right now with extreme water temperature changes, this could stress crop yields more in the eastern Ohio Valley in 2024 versus 2023.

Our vegetative greening up is running 20 days ahead of schedule now and is already into Kentucky. We expect this 10-20 day ahead of schedule greening up to continue through March. See latest green up image provided by the USGS with NOAA data.

Finally, the question is what about the last spring freeze date in 2024? Typically we see the last hard freeze in April. Right now, most data says a near normal April date is most likely. We do not see a late hard freeze into May this year as of now. You can get all the official climate outlooks from NOAA's Climate Prediction Center at <https://www.cpc.ncep.noaa.gov> .



## ***Minerals: Too Much of a Good Thing***

By Dr. Katie VanValin, Assistant Extension Professor, University of Kentucky

Source: <https://u.osu.edu/beef/2024/02/21/minerals-too-much-of-a-good-thing/>

Minerals are an essential nutrient for beef cattle. This means like protein and energy, minerals must be supplied in the diet, however minerals make up a very small portion of the total diet. Many feedstuffs are deficient in one or more essential minerals which is why mineral supplementation is a critical component of meeting the nutritional needs of the herd. So, this begs the question, “if a little is good, isn’t more better?”. The truth is we can have too much of a good thing when it comes to minerals, and this can lead to serious and sometimes fatal consequences.

### Sulfur

The sulfur requirement for beef cattle is 0.15%, with maximum tolerable concentrations of 0.3% in high concentrate diets (15% roughage or less), and 0.5% in high roughage diets (40% or greater roughage). By-product feeds including corn gluten feed and distillers grains can be high in sulfur content. According to the Nutrient Requirements of Beef Cattle (NASEM, 2016), sulfur content of corn gluten feed, dried distillers grains, and distillers solubles averaged 0.58%, 0.66%, and 0.82% S, respectively. Sulfur content of forages also needs to be accounted for and can range between 0.15-0.20% S. Lastly, sulfur content of water can vary greatly from one source to the next but can also add to the total S intake of the animal. Thus, it is possible to overfeed sulfur if careful consideration is not taken when formulating the diets, especially when utilizing by-product feeds. When sulfur is fed above the maximum tolerable concentrations, it is possible for cattle to develop sulfur toxicity which causes Polioencephalomalacia (PEM), a neurological disorder resulting in blindness, ataxia, seizures, and death.

By-product feeds can be a great asset to the feeding program, but care should be taken to avoid complications from over-feeding. Just because a feed ingredient is “free” or “cheap” does not mean we should be feeding as much as the cow wants to consume. Unfortunately, it is not all that uncommon to see rations with sulfur concentrations above maximum tolerable levels, and this is often caused by over feeding of by-product feeds.

### Calcium and Phosphorus

Calcium and phosphorus requirements vary depending on stage of production, but in general the requirements of calcium compared to phosphorus are a 2 to 1 ratio. However, many concentrate feed stuffs such as corn or distillers grains actually have an inversed calcium to phosphorus ratio, meaning they are higher in phosphorus than calcium. Evaluating the calcium to phosphorus ratio of the diet is an important step, when developing a feeding program because when calcium in the diet is low and phosphorus is high, cattle are at risk of developing urinary calculi or stones. A simple solution is to feed a co-product balancing mineral product which will have higher levels

of phosphorus and lower levels of calcium compared to a more typical or 2:1 cow-calf mineral.

### Selenium

Initially, selenium was known for its toxic effects and negative impacts on human and animal health. It was not until 1957 that selenium was recognized as an essential nutrient, and research was conducted to understand the dietary selenium concentrations needed to prevent deficiency and toxicity in livestock. It was not until 1978 that the FDA approved feeding supplemental selenium to beef cattle. Mineral tags will often include verbiage stating that this product was formulated to provide 3 mg of selenium per head per day, which is the maximum level allowed by the FDA. This means that for a free-choice mineral product with a target intake of 3 oz. per head per day the selenium concentration shall not exceed 35.2 ppm, and for a target intake of 4 oz. per head per day selenium concentrations shall not exceed 26.4 ppm.

Regulations on the selenium content of mineral supplements, help to prevent selenium toxicity, and instead we often talk more about selenium deficiency. In Kentucky and other parts of the southeast it is not uncommon for forages to be deficient in selenium, making a good mineral program that includes selenium an important management practice. However, other parts of the world have areas where selenium concentrations in plants can be quite high, resulting in selenium toxicity. For this reason, selenium is another example of a mineral where a little is good, but more is not always better. Minerals have many complex interactions with one another, which can make understanding and developing mineral requirements difficult. At the same time, it is possible to overfeed certain minerals in the diet which can result in serious complications. For this reason, it is recommended to work with a nutritionist to develop a feeding program to meet the needs of your herd while minimizing the potential for negative or unintended complications. For most herds a good quality, complete free-choice mineral is a great starting point for ensuring the mineral needs of the herd are being met, but if concentrates or by-product feeds, a co-product balancing mineral might be recommended. For questions regarding mineral supplementation, reach out to your local county extension office.

## ***Conservation Tillage & Technology Conference March 12-13 in Ada***

By Mark Badertscher

Source: <https://agcrops.osu.edu/newsletter/corn-newsletter/2024-04/conservation-tillage-technology-conference-march-12-13-ada>

The Conservation Tillage & Technology Conference (CTC) will be held in-person March 12-13 at Ohio Northern University in Ada. The first day of this year's conference will feature Alex Harrell, Soybean Yield Champion from southwest

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Georgia with a yield of 206 bushels per acre. His presentation has been made possible by sponsor Brandt Professional Agriculture.

Shawn Conley, Extension Soybean Specialist, University of Wisconsin, will return and be paired with Alex Harrell and Laura Lindsey, OSU Extension, during the Agronomic Crop Management session after lunch, Tuesday. Shawn Conley is always one of the conference's most popular speakers.

Paul Jasa, Extension Agricultural Engineer, University of Nebraska, will return to CTC as another one of the main speakers, sponsored by Calmer Corn Heads, he will speak four times. Pioneer is sponsoring Dr. Nicolas Martin, University of Illinois, speaking on "Do Management Zones Increase Yields?"



With about 60 speakers total, CTC gives plenty of opportunities to gain valuable information. Among the speakers are Barry Fisher, a soil health expert; Dan Quinn, Purdue University; Kevin Erb, University of Wisconsin; Bill Lehmkuhl, Precision Agri Services; Jane Fife, 3 Bar Biologics; Laura Johnson, Heidelberg University; Shawn Lucas, Kentucky State University; Terry Hofecker, Soil 1; and about 25 OSU Extension Educators and campus faculty.

Connect with other farmers and CCAs, experience new ideas, and increase your net income. Historically over 800 individuals will attend each day of this two-day conference, making it the largest agricultural meeting in northwestern Ohio. Plenty of CCA and CLM credits will be available. Take advantage of the opportunity to discuss one-on-one with speakers, exhibitors, sponsors, and other participants. Bring a friend and/or family members.

The meeting and program have been developed by The Ohio State University Extension Specialists along with Agriculture and Natural Resources Educators in local counties with assistance from local Soil and Water Conservation Districts, Ohio Department of Agriculture, and United States Department of Agriculture Natural Resources Conservation Service.

Farmers, consultants, industry representatives, and government officials will meet each day to listen to university specialists, industry representatives, and producers discuss new products and ideas for agriculture. Master Farmer Awards and the Ohio CCA of the Year will be announced.

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Tuesday sessions will include No-till, Cover Crops, and Soil Health; Nutrient Management; Agronomic Crop Management; and Precision Ag & Technology. Wednesday sessions will include No-till, Cover Crops and Soil Health; Agronomic Crop Management; Water Quality; Climate, Carbon, and Soil Health. Registration is \$100 (<https://www.allenswcd.com/cttc/>) and is a flat rate of \$100 if postmarked by March 6, 2024. It is \$150 beginning March 7, 2024. (On-site registration will be \$150.) Registration will include access to all recorded presentations from about April 15 to July 1, including CCA credits. For Crop Consultants, the QR code will be active for that month. (Crop Consultants must register individually to receive CCA credits.) For more information about the conference, go to <https://ctc.osu.edu>.

## ***Growers and Retailers Needed: Understanding Yield Response to K Applications in Ohio***

By John Fulton

Source: <https://agcrops.osu.edu/newsletter/corn-newsletter/2024-05/growers-and-retailers-needed-understanding-yield-response-k>

Potassium (K) is a key nutrient for growing profitable crops in Ohio. Recently in Ohio, consultants, retailers, and farmers have been concerned that soil K values have been decreasing. One cause for this decrease is higher soybean and corn yields leading to higher K removal rates in grain harvested from Ohio fields. Further, moving to annual applications of P and K for corn-soybean rotations has been the trend over the past decade. In recent years, certain regions in Ohio have noted corn and soybean yield responses to K that seem to fall outside the Tri-State Recommendations.

To further investigate the specific conditions and yield response to K, the Ohio AgriBusiness Association, the 4R Nutrient Council, and The Ohio State University have partnered to initiate a new project looking K management across Ohio. In 2023, a pilot study conducted with four, Nutrient Service Providers (NSPs) and support from Ohio Corn and Wheat and Ohio Soybean Council. Results and discussion from the pilot study has prompted a larger, 4-year study investigating crop yield response to K applications in corn-soybean rotations.

Consequently, we are looking for growers and Nutrient Service Providers interested in participating in this four-year K project. Farmers and their consultant would identify fields for the project. The research team would then work with them to block out replicated K treated and untreated areas. Fields need to be in a corn and soybean rotation and have pH levels within acceptable range. Fields would be committed for 4 years. The farmer would need a yield monitor with GPS to

document yield within field plots. The Ohio State University will work with the farmer or consultant to collect needed soil and crop samples each year.

If interested, please reach out to Aaron Heilers ([aheilers@oaba.net](mailto:aheilers@oaba.net)) or John Fulton ([fulton.20@osu.edu](mailto:fulton.20@osu.edu)).

## ***Is Sustainable Aviation Fuel the Future of Ethanol?***

By Andrew Swanson

Source: <https://farmdocdaily.illinois.edu/2024/02/is-sustainable-aviation-fuel-the-future-of-ethanol.html>

U.S. ethanol consumption has been stagnant for almost a decade. Limitations on the blending of ethanol with gasoline and EPA discretionary waivers have prevented any large-scale demand growth for corn-starch ethanol, and cellulosic ethanol has failed to catch fire because of technological, economic, and regulatory hurdles. Low carbon fuel standards in Western states like California provide additional sources of revenue, but these markets may not provide long-term growth opportunities as the same policies provide greater subsidies for electric vehicles and other biofuels that compete with corn-based ethanol. The aviation industry, on the other hand, is an untapped market seeking alternatives to fossil fuels.

Aviation provides a large fuel market that currently has no feasible prospects for electrification. U.S. airlines consumed roughly 16.7 billion gallons of fuel in 2022, and consumption totals for 2023 are projected to be higher (BTS, 2024). Airlines like other large energy consumers are experiencing pressure from their customers, investors, and regulators to reduce green-house gas emissions. However, there are currently no commercially viable electric airplanes. The energy demands of commercial cargo and passenger jets are simply far too great for contemporary battery technology. As a result, airlines and regulators are pushing for alternative liquid fuels that have lower emissions than petroleum jet fuel. These alternative fuels are called sustainable aviation fuels or SAFs for short, and they are produced from plant biomass, vegetable oils, sugars, and alcohols including ethanol.

Could SAF be the next big market for ethanol? Possibly. Aviation fuel presents growth opportunities but also challenges. Whether ethanol producers can overcome these challenges will depend on the decisions of regulators and the ability of ethanol producers to measurably reduce their emissions. This article summarizes the current state of affairs for a prospective ethanol-to-jet-fuel pathway with a focus on public policy incentives and hurdles for corn ethanol to land in the jet fuel market.

## *Current Policy*

SAFs are liquid hydrocarbons made from non-petroleum sources including ethanol. SAFs currently represent less than 1% of the jet fuel market, but they do not require major modifications to current jet engines or fueling infrastructure. The lack of modifications makes SAF an easier technological transition than other fuels. SAFs can be produced through a variety of different processes and feedstocks, and the blend ratios vary by type (DOE-AFDC, 2024). Proposed feedstocks include vegetable oils, beef tallow, and municipal waste. Ethanol can also be converted into jet fuel through additional processing. Since jet fuel has a higher energy density than ethanol, 1 gallon of SAF requires 1.7 gallons of ethanol. So, SAF presents even larger demand growth than simply increasing ethanol consumption by an equal number of gallons.

Despite low current consumption, the SAF Grand Challenge by several government agencies could spur a roughly 200-fold increase of SAF by 2030. SAFs generate multiple types of RINs under the Renewable Fuels Standard, but the Department of Energy estimates that domestic airlines consumed only 15.8M gallons of SAF in 2022 (DOE-AFDC, 2023). The SAF Grand Challenge aims to domestically consume 3B gallons of SAF by 2030 with a long-term goal of 35B gallons by 2050. That is, the Biden Administration wants to increase SAF consumption by almost 200 times within 8 years, and President Biden stated in the summer of 2023 that he expects 95% of SAF to come from biofuels (Renshaw, Kelly, and Douglas, 2023). SAF could become the long-term demand growth that ethanol producers have been seeking for almost a decade, and every billion gallons of SAF supplied is more than a 10% increase from current ethanol consumption.

To accomplish this goal, policymakers have placed their money where their mouth is through the Inflation Reduction Act of 2022 (IRA). The IRA is a comprehensive infrastructure package, designed to improve domestic supply chains, and it provides billions of dollars to programs that directly impact agriculture. Under the IRA, qualifying producers of SAF can earn a minimum \$1.25 tax credit per gallon, and this tax credit could increase to as much as \$1.75 per gallon. These tax incentives are in addition to any fuel credits earned under the RFS or California's LCFS, so stacking these subsidies could be a lucrative opportunity for biofuel producers if they invest in jet fuel conversion processes.

However, there is a catch, and it hinges on the IRA's emissions requirements. To receive these tax credits, a fuel must have 50% less emissions than petroleum jet fuel. This stipulation is like the advanced biofuel requirements under the RFS. Conventional ethanol from corn starch, on the other hand, only needs to have 20% less emissions than petroleum gas to qualify for the RFS. The IRA also states that the process of calculating a fuel's emissions must comply with the standards set by the International Civil Aviation Organization (ICAO). ICAO has its own calculator for determining the

emissions of SAFs called CORSIA. According to CORSIA, SAF from corn-starch ethanol has higher emissions than petroleum jet fuel (ICAO, 2024), and ethanol producers do not currently qualify for IRA tax credits. Ouch.

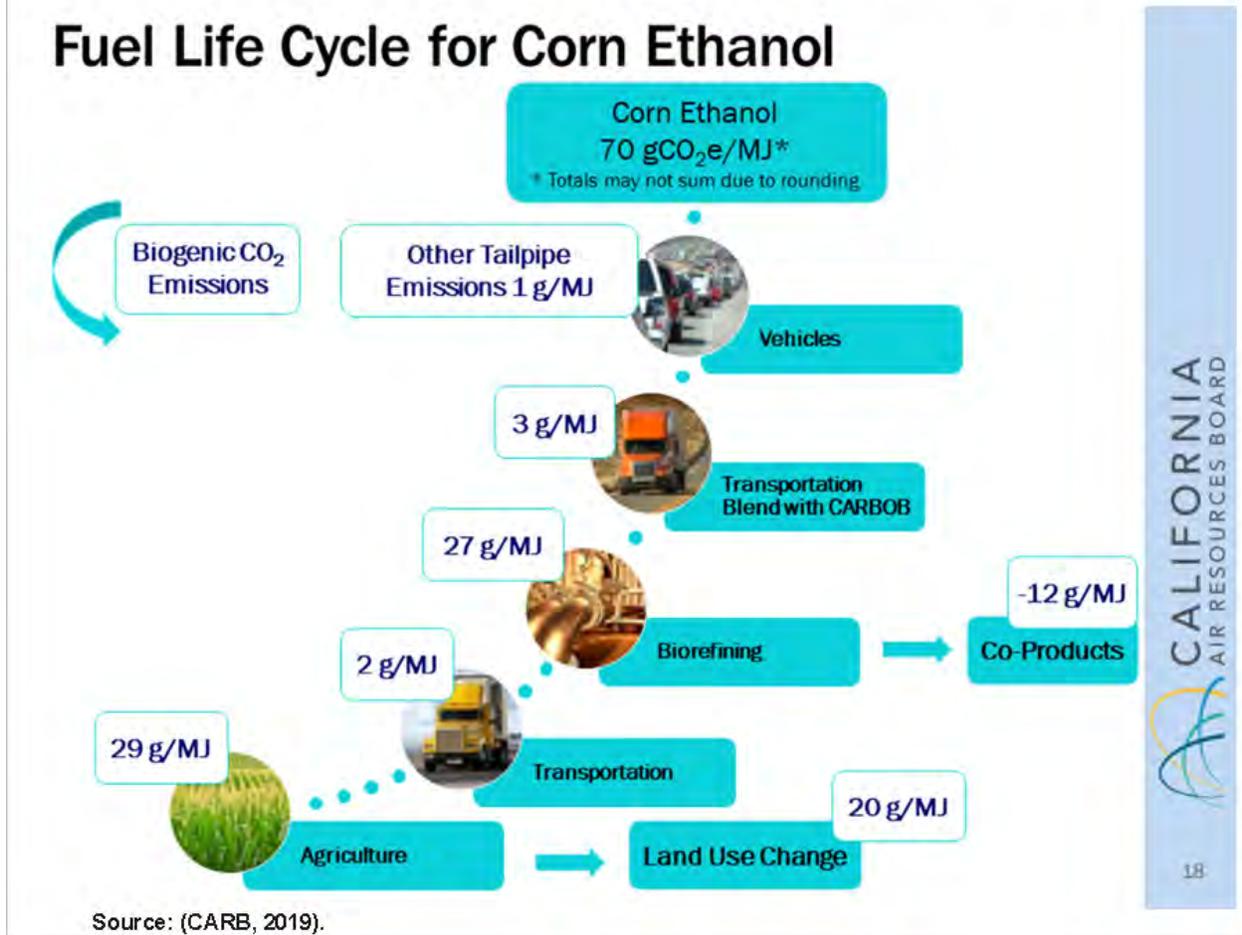
All is not lost for ethanol producers, however. The Biden Administration formally stated in December that the Treasury Department will adopt a different model to calculate ethanol's emissions for SAF (DOT, 2023). This model is called GREET, and the Treasury and Energy Departments plan to make GREET compliant with ICAO standards. Details on the changes are expected in March. According to GREET, corn ethanol represents a 43% reduction in emissions from petroleum gasoline (Lee et al., 2021). So, while the final numbers have not been released, using GREET will certainly reduce the emissions gap between ethanol SAF and the 50% threshold-if not eliminate it completely. Moreover, exploring how GREET determines the emissions of ethanol will reveal how ethanol producers could surpass the 50% threshold.

### *The Emissions of Ethanol and Means to Reduce Them*

Ethanol green-house gas emissions are calculated using a life-cycle analysis that accounts for emissions in the entire production and consumption life of ethanol. This is a farm-to-fumes measurement that includes everything from nitrogen fertilizer use by corn to emissions from consumers' tailpipes. The tailpipe emissions of corn-ethanol form a closed-carbon loop because the corn initially pulled the CO<sub>2</sub> from the atmosphere during photosynthesis, and ethanol's emissions only come from the production of the fuel and feedstock.

Life-cycle emissions are much more difficult to measure than the amount of carbon in a barrel of oil, so many government agencies use their own favored models. Most models for calculating fuel emissions use units called carbon intensity measured in gCO<sub>2</sub>e/MJ. gCO<sub>2</sub>e/MJ measures the grams of carbon dioxide equivalent per megajoule of energy consumed. The GREET model developed by the Department of Energy's Argonne Laboratory is one model as is the ICAO's CORSIA model. The EPA used its own carbon intensity model for implementing the RFS. California uses a form of the GREET model for their Low Carbon Fuel Standard with some adjustments that give corn ethanol a higher emissions rating than the DOE model. Figure 1 below shows an example of the life-cycle emissions of ethanol for a typical ethanol plant selling to fuel blenders in California.

Figure 1. Life-Cycle Emissions for Corn Ethanol



Note: Figure outlines the green-house gas emissions from each component of the life cycle of ethanol including adjustments for land use change and co-products like distillers grain. Emissions from individual plants can vary by productive efficiency, energy sources, and other factors. Source: (CARB, 2019).

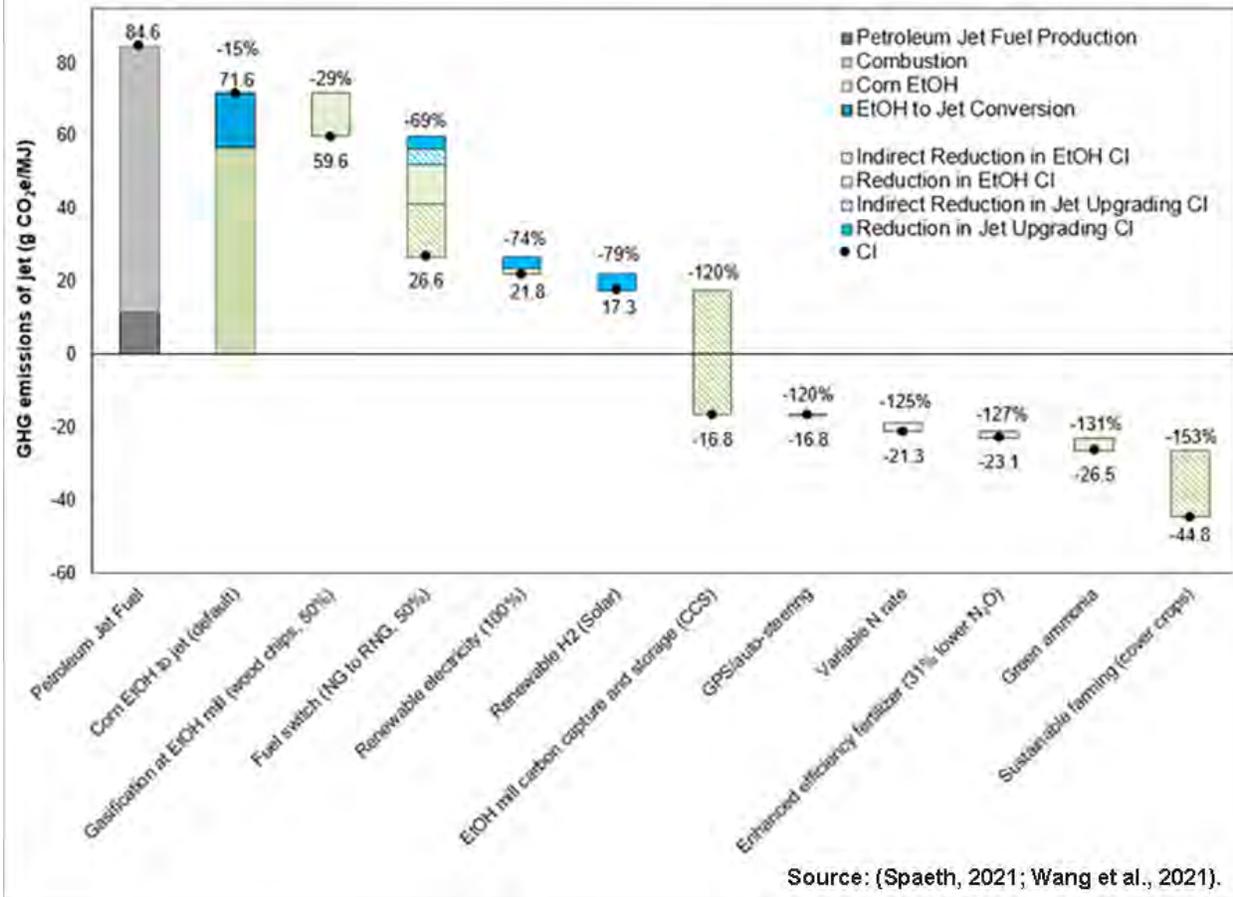
As can be seen from Figure 1, the three largest sources of emissions for corn ethanol are corn production, biorefining, and land use change. Emissions from corn production largely occur from the application of nitrogen fertilizers that can volatilize into nitrous oxide. Emissions from biorefining include the use of fossil fuel energy and CO<sub>2</sub> created during the distillation of corn starch. Ethanol by-products like distillers grain and corn oil help to negate part of the emissions from distilling corn into ethanol through displacing other livestock feed and vegetable oils.

Land use change, the third largest piece, is the most difficult to measure, and the biggest discrepancy between CORSIA and GREET models. Land use change arises

from higher corn prices causing farmers to bring new land into production. For example, millions of acres of Conservation Reserve Program land were converted into corn ground following the passage of the RFS (Lark et al., 2022). This land conversion releases soil carbon stocks and reduces plant biomass. California estimates land use change emissions at 20 gCO<sub>2</sub>e/MJ (CARB, 2015), but estimates can vary widely on the amount of carbon in soils and perennial vegetation and how much land conversion is caused by increasing ethanol demand. CORSIA's land use change is 25 gCO<sub>2</sub>e/MJ while GREET's is close to 7 gCO<sub>2</sub>e/MJ (ICAO, 2022; Lee et al., 2021). Using the GREET land use change estimate would reduce the emissions of corn-ethanol SAF by almost 20% from the CORSIA estimate.

While using GREET should reduce estimated land use change emissions, ethanol plants may also need to reduce emissions from biorefining and agriculture. According to CARB, biorefining and agriculture represent almost 65% of ethanol emissions (CARB, 2019). If corn-ethanol does not qualify for IRA tax credits after the adoption of GREET, then producers must find a way to reduce the emissions of corn farming and the biorefining of ethanol. Researchers at the Department of Energy's Argonne Laboratory have laid out a path for these reductions, and Figure 2 shows a prospective plan to reduce the emissions of ethanol converted to jet fuel using the 2021 version of the GREET calculator. The 2021 version of GREET may not exactly match the model for the Treasury Department, but it should provide a useful approximation.

Figure 2. Carbon Intensity Reductions for Corn-Ethanol SAF



Note: Figure presents several means to reduce the emissions of jet fuel made from corn-starch ethanol. The figure was produced using the 2021 version of the GREET calculator developed by Argonne National Laboratory. Actual reductions and emission levels can vary by plant-specific factors. Source: (Spaeth, 2021; Wang et al., 2021).

GREET’s baseline for petroleum jet fuel is 84.6 gCO<sub>2</sub>e/MJ (Wang et al., 2021). Since a fuel must have a 50% emissions reduction to qualify for IRA tax credits, a fuel must have a carbon intensity no greater than 42.3 gCO<sub>2</sub>e/MJ. The baseline for jet fuel made from ethanol is 71.6 gCO<sub>2</sub>e/MJ with over 10 gCO<sub>2</sub>e/MJ coming from converting ethanol to jet fuel. This carbon intensity is only a 15% reduction from petroleum jet fuel, but as the figure shows, reductions from there are possible. Switching from natural gas (NG) to renewable natural gas (RNG), carbon capture and sequestration (CCS), and carbon farming each reduce the carbon intensity of corn ethanol by over 15 gCO<sub>2</sub>/MJ. In fact, switching from NG to RNG and CCS offer a 30-point reduction. These changes alone would reduce the carbon intensity of ethanol SAF below the 42.3 gCO<sub>2</sub>e/MJ threshold.

However, these technologies are just beginning, and economic and regulatory hurdles could push ethanol plants towards simpler means of reducing their emissions. The largest means of reduction require extensive capital investment and cooperation with third parties such as landowners, farmers, and local utilities. These arrangements could prove to be quite difficult. For example, ethanol producers in multiple states have delayed construction of CCS facilities because of local and regulatory resistance to the construction of CO<sub>2</sub> pipelines (Douglas and Sanicola, 2023). Adjustments like increasing the mix of wet distillers grains relative to dry distillers grains, using more efficient yeasts, and converting corn fiber into ethanol offer smaller but easier to implement reductions in ethanol carbon intensity (Emery, Joyce, and Salles, 2022). So, while ethanol producers wait for expensive, time-consuming investments to pan out, these smaller adjustments could provide a bridge to lower carbon ethanol.

### *Conclusion*

The expected adoption of GREET by the Treasury Department is a welcome sign for ethanol producers wanting to enter the jet fuel market. The IRA provides lucrative tax credits, and the SAF market is expected to experience tremendous growth by 2030. Corn-ethanol producers do not currently qualify, but the door to a corn-ethanol-to-jet-fuel pathway could open by March. Investments in emissions reduction technologies may be necessary to receive the SAF tax credits, though.

The ethanol industry is well aware of its need to decrease its emissions to remain eligible for future programs. The Renewable Fuels Association commissioned the report *Pathways to Net-Zero Ethanol: Scenarios for Ethanol Producers to Achieve Carbon Neutrality by 2050* (Emery, Joyce, and Salles, 2022). This report lays out detailed plans for ethanol plants to reduce their emissions with a goal of being carbon neutral by 2050. Ethanol plants have dozens of means to reduce their emissions. The IRA and SAF may provide the impetus they need to start on this path.

## **Upcoming Extension Programs**

The following programs have been scheduled for NE Ohio farmers. Check back each week as more programs are added to the calendar

### **Northeast Ohio Small Farm Financial College**

March 9 and March 16, 2024

Learn more or register at <https://go.osu.edu/atsffc>

### **Private Pesticide/Fertilizer Applicator Training**

March 11, 2024 – Ashtabula County

March 28, 2024 – Online via Zoom

Register at [Go.osu.edu/NEOPAT](https://go.osu.edu/NEOPAT)

### **Northeast Ohio Agronomy School**

March 27, 2024 - Registration Open!

<https://go.osu.edu/neohioagronomy2024>

### **Pruning Classes**

March 2<sup>nd</sup> – Hartford Orchard LLC

March 30<sup>th</sup> – Sage's Apple Orchard



**CFAES**

OHIO STATE UNIVERSITY EXTENSION

# Fertilizer Applicator Certification Training

**FEBRUARY 29, 2024 6 – 9 P.M.**

**[go.osu.edu/trumbullfert2024](https://go.osu.edu/trumbullfert2024)**

Do you apply fertilizer to 50 acres or more for crops that are primarily for sale? If so, you are required by Ohio law to attend a training session or take a test to become certified. OSU Extension Trumbull County is offering a training session (no test) that will meet all certification requirements. **Pre-Registration is required a week in advance.** Cost for this training session is \$35/person and includes training materials, and handouts. To register online with a credit or debit card please visit <https://go.osu.edu/trumbullfert2024>. You can also register by completing the back portion of this flyer and mail with check to the address below. Please make checks payable to Ohio State University Extension.

**Location:** OSU Extension Trumbull County, 520 West Main St, Cortland, OH 44410

**Cost:** \$35/person

**Contact information:** 330-638-6783 or [beers.66@osu.edu](mailto:beers.66@osu.edu)

 **THE OHIO STATE UNIVERSITY**  
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TRUMBULL COUNTY EXTENSION PRESENTS

# 2024 Northeast Ohio Agronomy School

Our Agronomy School is back for 2024! Join us for a day of learning with OSU Extension Educators and State Specialists. Lunch will be provided and sponsored by WI Miller and Sons. Pesticide and CCA credits will be offered.

**DATE:** March 27, 2024

**TIME:** 9:00AM to 3:00PM

**LOCATION:** St. Mary's Church, 103 N Maple St, Orwell, OH 44076

**COST:** \$15

**PRE-REGISTRATION REQUESTED:** Register online at <https://go.osu.edu/neohioagronomy2024> or with the QR code.

For more information, visit [trumbull.osu.edu](http://trumbull.osu.edu) or call 330-638-6783



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**CFAES**

**Topics Include:**

White Mold in  
Soybean

Tile Drainage

Battle for the Belt -  
Soybean

Battle for the Belt -  
Corn

Weed Control Update

Q&A



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TRUMBULL COUNTY EXTENSION PRESENTS

# March Into Pruning! 2024 Pruning Clinic

OSU Extension is teaming up with Hartford Orchards LLC to provide a hands-on pruning clinic! The morning will start with a brief overview of pruning inside before we head out to the orchard. Please dress for the weather and bring your favorite pruners, loppers, or saws!

**DATE:** March 2, 2024

**TIME:** 9:00AM to 11:AM

**LOCATION:** Hartford Orchards LLC, 6953 OH-305, Hartford, OH 44424

**COST:** \$20 – Includes free hand pruners!

**PRE-REGISTRATION REQUESTED:** Register online at [go.osu.edu/pruning2024](https://go.osu.edu/pruning2024) or with the QR code.



For more information, visit [trumbull.osu.edu](https://trumbull.osu.edu) or call 330-638-6783

**CFAES**

**Topics Include:**

Fruit Tree Growth

Tools of the Trade

Proper Pruning  
Techniques

Knowing When to  
Stop!

Small Fruit Pruning  
Discussion

Q&A

EVENT SPONSOR:

Hartford  
Orchards LLC



# Fruit Tree Pruning

**CFAES**

with the Ashtabula County Master Gardeners

Tuesday, March 5, 2024

6:00 PM to 8:00 PM

OSU Extension – Ashtabula County

\$5 per person



## Pruning Backyard Fruit Trees

Do you need some help or have questions about pruning your backyard fruit trees? Join Master Gardener volunteer, Alice Vervais, as she teaches the basics of pruning fruit trees. Learn the “when, how and why” of pruning fruit trees. This is a hands-on class so please remember to bring your clippers.

This program will be held in the downstairs meeting room at the OSU Extension Office in Jefferson, Ohio. 39 Wall Street, Jefferson, OH 44047.

The cost for this event is \$5 and will be paid at the door. Cash only please.

Pre-registration is requested as class size is limited.

Call OSU Extension at 440-576-9008 to reserve your spot or to ask questions.

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This program is brought to you by the  
**Ashtabula County Master Gardener Volunteers**

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**College of Food, Agricultural,  
and Environmental Sciences**

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# NORTHEAST OHIO SMALL FARM FINANCIAL COLLEGE

Small and beginning farmers are encouraged to participate in this new in-depth farm management educational program!

This course will offer 10 hours of farm management education that will help start your farm on the path to financial success.

Instructors include OSU Extension Educators Andrew Holden and Lee Beers, and Farm Management Field Specialist in, David Marrison.

This two Saturday course will feature both live, in-person lectures, recordings from other state specialist, hands-on activities, take home assignments, and the ability to apply what is taught directly to your new or current farming operation.

**DATE:** Saturday, March 9 and Saturday, March 16, 2024

**TIME:** 9:00 AM – 3:00 PM

**LOCATION:** TBD

**COST:** \$100 per participant, \$50 per additional family member

Register here: [go.osu.edu/NEOSFFC](https://go.osu.edu/NEOSFFC)

Call Andrew Holden at 440-576-90089 with any questions!



**CFAES**

## Topics:

### **Starting Your New Farm Business**

Goals and Expectations  
Mission Statements  
Business Plan  
Farm Business Structure

### **Recordkeeping, Budgets and Taxes**

Enterprise Budgets  
Projecting Farm Income  
Cost of Production  
Introduction to Farm Taxes

### **Managing Your Small Farm's Finances**

Balance Sheets  
Cash Flow Statements  
Financial Statements  
Managing Income and Expenses

### **The Legal Side of Farm Financial Management**

Farm Financing  
Loan Options for Small Farms  
Farm Leases and Contracts  
Risks on the Farm  
Liability Insurance

## Sponsors:

OSU Extension-Ashtabula & Trumbull Counties

OSU Beginner and Small Farms Program

Farm Financial Management and Policy Institute (FFMPI)

Risser Farm Management Fund

Bruns Insurance Services