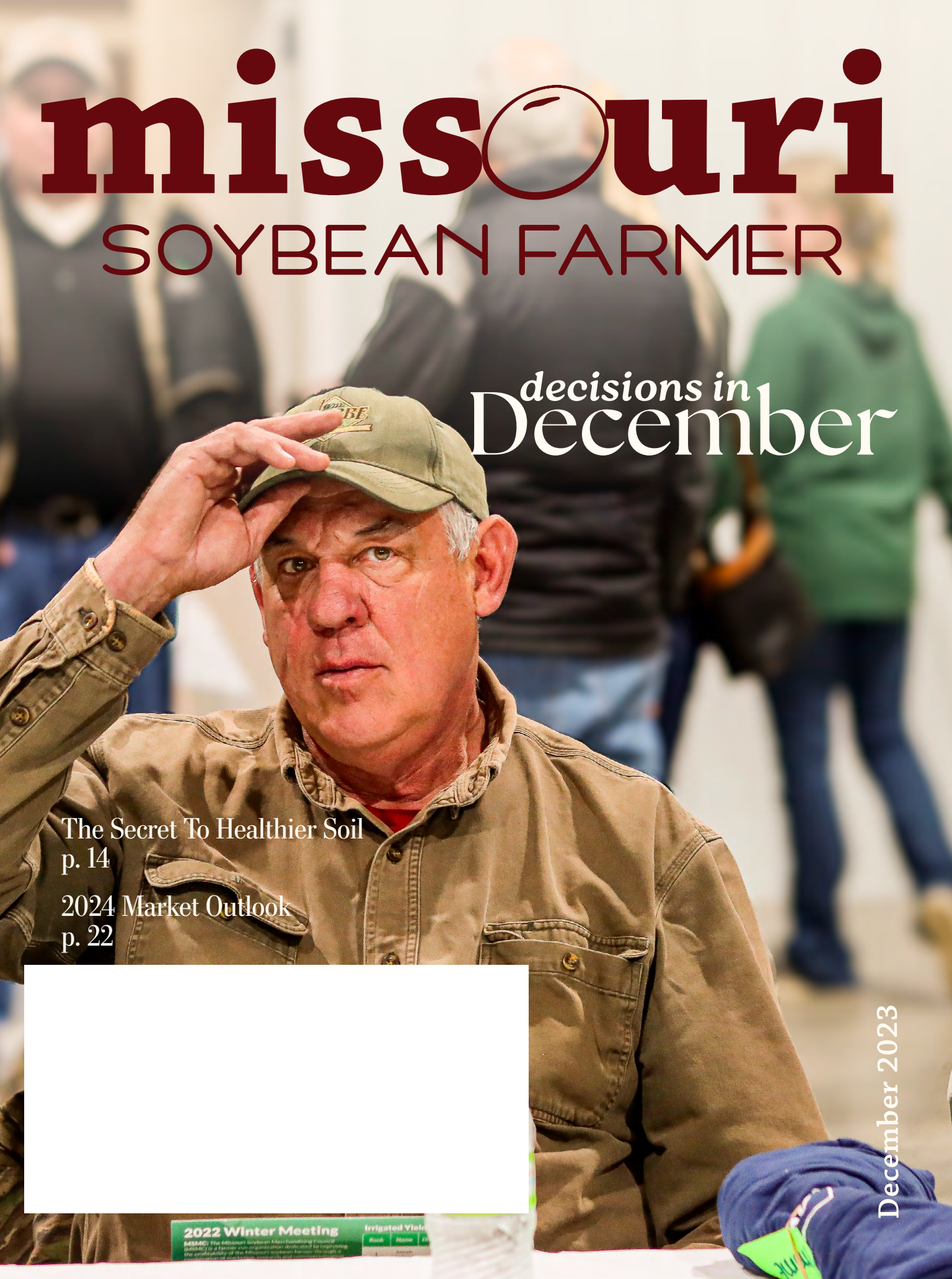
missouri SOYBEAN FARMER



decisions in December

December 2023

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[1]Data is based on an average of 2022 on-farm and IMPACT™ trial comparisons made in the U.S. of top 25 demand planned A-Series Enlist E3® varieties through November 20, 2022. Comparisons are against Asgrow® XtendFlex® varieties and within a +/- 3 RM of the competitive brand. Product responses are variable and subject to any number of environmental, disease and pest pressures. Individual results may vary. Multi-year and multi-location data are a better predictor of future performance. DO NOT USE THIS OR ANY OTHER DATA FROM A LIMITED NUMBER OF TRIALS AS A SIGNIFICANT FACTOR IN PRODUCT SELECTION. Refer to www.pioneer.com or contact a Pioneer sales representative or authorized dealer for the latest and complete listing of traits and scores for each Pioneer® brand product.

INSIDE THIS ISSUE OF

missouri SOYBEAN FARMER

DECEMBER 2023 | VOLUME 27 | ISSUE 6

Cover Shot

The cover photo of the December issue was captured by Samantha Turner. Pictured is Warren Stemme, Missouri Soybean Association member from District 6.

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Missouri Soybean Farmer is published six times annually and is an excellent opportunity to reach row-crop farmers.

Contact Samantha Turner at (573) 635-3819 or sturner@mosoy.org for advertising information.

From The Field

Notes from Missouri Soybeans' Leadership Team

According to Solomon, "To every thing there is a season, and a time to every purpose under the heaven." (Ecclesiastes 3:1) He goes on to say in the second verse, "... a time to plant, and a time to pluck up that which is planted."

We have just come through our season of harvest. During this past year, I went through a broad spectrum of emotions. At times, I felt joy, happiness and satisfaction. Other situations brought disappointment and sadness. But most of all, I felt thankfulness.

After every harvest is a time to reflect and be thankful for what the Lord has provided for us as producers. The Thanksgiving holiday is a beautiful time to gather with family and friends for this purpose. But the thought of thankfulness doesn't begin and end with that day. I am very thankful for what crops we did have to harvest. Every farmer I have talked to has been surprised by how the crops yielded on so little rainfall.

Many times this season, my family and I have talked about the ability of crops to withstand such extreme heat and drought. This, no doubt, is due to genetics developed in recent years. I am just a little young to remember some of the dry times of the 80s, but my dad remembers them well. He tells of many varieties of both soybeans and corn that just flat died and yielded single digits or even zero.

I am thankful for the research and development progress in recent years. Missouri Soybeans is at the cutting edge of this reaserch and development. This is only possible with the farmers of Missouri being willing to support Missouri Soybeans through the checkoff. So, considering that, I want to thank the producers for giving Missouri Soybeans the means and support to help fund and advance soybean production. We have seen the results of this support firsthand this season.

Looking forward to the next growing season, we make many agronomic decisions as producers. You will find that Missouri Soybeans has many resources available to assist. To find more of that information, I encourage you to look at mosoy.org.

I pray you also had a plentiful harvest, despite the drought. I also pray you have a happy, healthy Thanksgiving.

Matt Wright - Missouri Soybean Association President

Decisions, decisions, decisions.

Life is full of decisions, and as a farmer, they can sometimes seem as overwhelming as a Cheesecake Factory menu. Some decisions are routine, like what to pick up for lunch or whether to book ahead of time for a report. Others can have far-reaching consequences, like whether to upgrade your dryer or buy overpriced land.

The decisions you make throughout the season for your soybean crop fall somewhere in the middle, but they're important nonetheless. The Missouri Soybean Merchandising Council (MSMC) recognizes this and is committed to providing farmers with more high-quality, timely information to help them make informed decisions.

MSMC knows that knowledge is power. That's why the organization has invested in improving and expanding research capabilities at the Bay Farm Research Facility; Fisher Delta Research, Extension & Education Center; MU Breeding Program; Missouri Foundation Seed; MU Strip Trial Program; and MU Variety Testing Program, to name a few. The goal is to produce knowledge that farmers can use to improve profitability and ensure operational sustainability for the next generation of growers.

However, all the knowledge in the world is only valuable if it's accessible and known to the producer. MSMC is working to expand its existing communications efforts while also creating new avenues to disseminate the knowledge gained through our checkoff-funded research. You'll see more prominent positioning as Missouri Soybeans' staff push information to you in person, in print and online. Combined, these efforts will help you get the most return for your time and money.

MSMC is making a real impact for Missouri soybean farmers through their checkoff investment, and the organization has an aggressive, unified vision for the future.

Merry Christmas and a healthy, fulfilling 2024 to everyone!

Aaron Porter - Missouri Soybean Merchandising Council Chairman

Letter from the Executive Director

It's the most wonderful time of the year. While some of you have just started your Christmas journeys and maybe are still avoiding the radio stations blasting a holiday tune, I have celebrated Christmas for the past few months. For those who know me, I am Charlie Brown's biggest fan and cherish "A Charlie Brown Christmas" and a classic Hallmark movie. While the trope is often the same, there is a comfortable reassurance the films provide.

At Missouri Soybeans, we hope to provide that same comfort and affirmation. We hope our gift to you this Christmas is peace of mind that we have you covered in Jefferson City and across the state. We will continue to fight for you and do all we can to ensure you have a safe, prosperous 2024. We encourage you to relax and set your mind right, and we pray you get to spend this holiday season with family and loved ones.

In 2023, Missouri Soybeans spent a lot of time focusing on our top three priorities, strategic planning and spending time forecasting for our program areas. We also recently published our fiscal year 2023 Annual Report, highlighting our achievements this past year. One of the biggest highlights was the inaugural trade mission. In our mission, we discovered the global appetite for soy is growing. Eight farmers shared stories of how they are curbing that hunger with agriculturalists and stakeholders in the U.K. and European Union.

Additionally, I am in constant awe of our SOYLEIC soybean and breeding programs. This past year, we inched closer to 100,000 SOYLEIC acres across 20 states. The collaboration continued with universities across the U.S., and we established new partnerships with companies including Seedway, Scoular and others. SOYLEIC soybeans also released its first maturity group 1 license in the U.S., the earliest commercial non-GMO high-oleic soybean variety to date. This growth of SOYLEIC soybeans is checkoff sell back at its finest.

In FY23, we also saw our communications program bloom and bring in new opportunities for Missouri Soybeans. With redesigned communications materials and new outlets, our organization strengthened our channels and how we reach soybean farmers.

However, in 2024, we must get back to the basics. You will hear me say that a lot this coming year. It is our motto heading 2024. Get back to the basics. This is how we will survive and thrive. Why do we have a checkoff? Why does the association exist? We need to be able to answer those questions.

Our mission is to do God's work and help support you to do God's work. We must be diligent and focused to deliver. A strategic plan doesn't work without dedication. It doesn't work without you. It doesn't work without our good Lord.

At Missouri Soybeans, we wish you and your families a happy, healthy Merry Christmas and New Year.

God Bless,

Gary Wheeler

Executive Director/CEO
Missouri Soybean Association
Missouri Soybean Merchandising Council
Foundation for Soy Innovation

Our Boards

MISSOURI SOYBEANS

SOYBEAN POLICY UPDATE

During the period between Thanksgiving and Christmas, a farmer's responsibility is to concentrate on decisions that will pave the way for a successful growing season the following year. You're analyzing data, quantifying input costs and signing contracts worth thousands of dollars. You're making the demanding and stressful decisions – the ones that won't pay off for at least another eight months.

Rest assured, the Missouri Soybean Association (MSA) staff understands that you need to be on your farm making those decisions. So, we are in the hallways and the rooms where the policies that affect you are made. We re-evaluate our political priorities each year and strive to ensure that elected officials address the issues you care about. Your concerns, your farm and your future drive our mission.

In this issue of the *Missouri Soybean Farmer*, readers will receive a preview of the 2024 Missouri legislative session and learn how Missouri Soybeans is working to ensure that legislators understand the issues crucial to farmers. We also look at the potential impacts of unique federal and global events in the upcoming year.

State Legislation

While it is still too early to forecast precisely what themes and debates will take center stage next year, we have taken several steps to leverage the brief intermission between sessions to prepare. After all, each new year promises the potential of a pivotal policy shift that could reshape the political and agricultural landscapes.

One such opportunity was the biodiesel plant tour that our farmers hosted at Mid-America Biofuels LLC. During the visit, legislators had the opportunity to witness the intricate processes involved in biodiesel production, from soybean crushing to the final fuel product. The tour provided a platform for discussing the importance of biodiesel to Missouri's economy and soybean farmers' role in its production. This experience not only fostered a deeper understanding of biodiesel's impact on our state, but it also laid the groundwork for a continued dialogue on the growth and sustainability of the Missouri-made fuel industry.

As always, Dec. 1 marks the beginning of the pre-filing process for the state's regular legislative session. Each year, thousands of bills are filed that touch on nearly every conceivable issue. This January, MSA will support several bills that focus on protecting property rights, fighting against the unjust use of eminent domain and supporting the expansion of rural health insurance options. Missouri Soybeans, led by a committee of farmer-leaders, has been actively studying the accessibility of Missouri's water resources for agriculture production. Attempts by other states, as well as out-of-state corporations, to gain access to your resources should not be tolerated. We will be defending your rights to your water through this initiative.

Federal Legislation

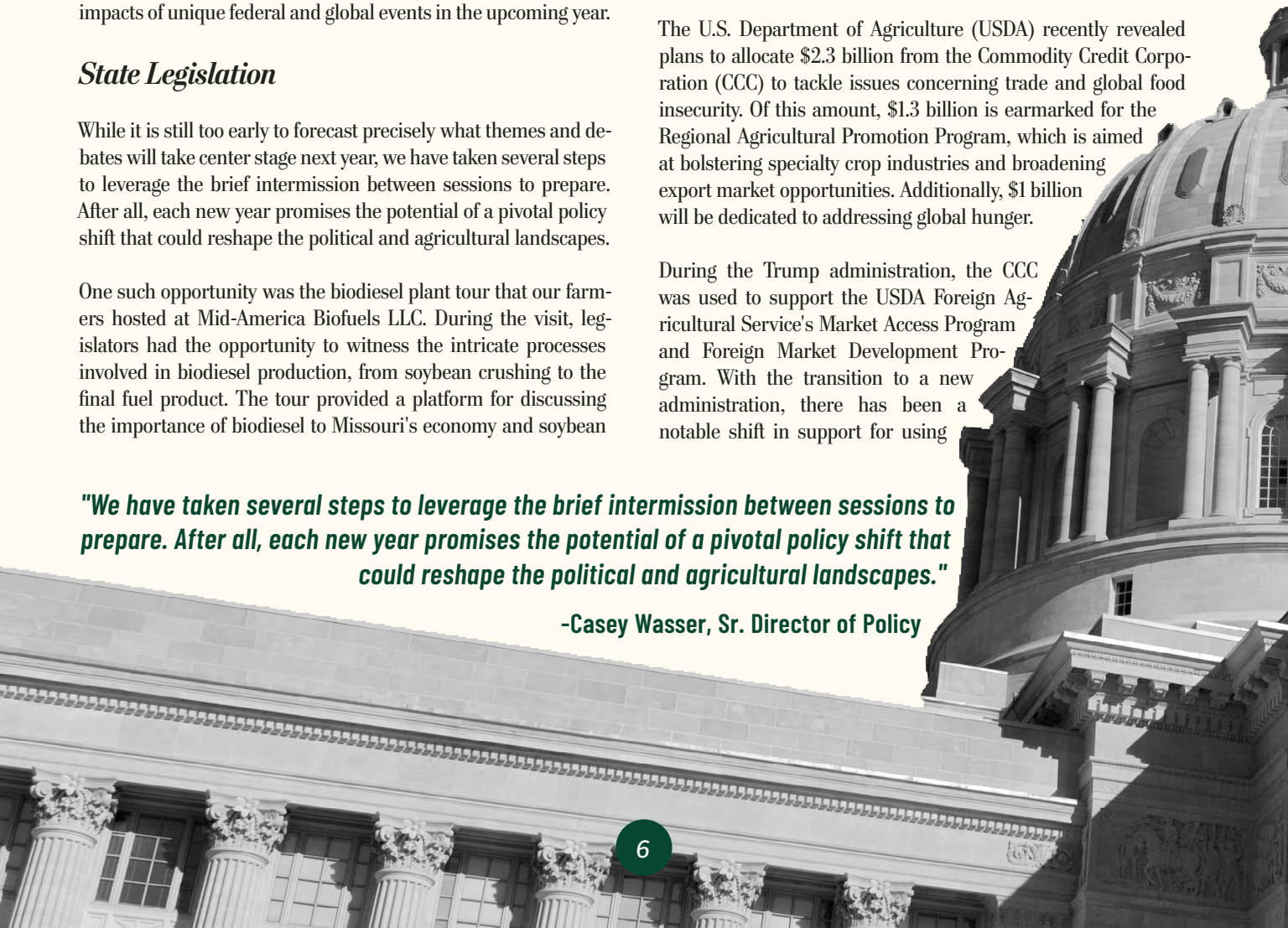
Commodity Credit Corporation

The U.S. Department of Agriculture (USDA) recently revealed plans to allocate $2.3 billion from the Commodity Credit Corporation (CCC) to tackle issues concerning trade and global food insecurity. Of this amount, $1.3 billion is earmarked for the Regional Agricultural Promotion Program, which is aimed at bolstering specialty crop industries and broadening export market opportunities. Additionally, $1 billion will be dedicated to addressing global hunger.

During the Trump administration, the CCC was used to support the USDA Foreign Agricultural Service's Market Access Program and Foreign Market Development Program. With the transition to a new administration, there has been a notable shift in support for using

"We have taken several steps to leverage the brief intermission between sessions to prepare. After all, each new year promises the potential of a pivotal policy shift that could reshape the political and agricultural landscapes."

-Casey Wasser, Sr. Director of Policy



"Our commitment to supporting initiatives that enhance trade remains, reflecting our dedication to fostering economic growth and cooperation, irrespective of political shifts."

-Casey Wasser, Sr. Director of Policy

CCC in this way. However, regardless of partisan interests, the need to expand our markets has never been more evident. We support the recent allocation announcement and eagerly anticipate the renewed focus on trade. Our commitment to supporting initiatives that enhance trade remains, reflecting our dedication to fostering economic growth and cooperation, irrespective of political shifts.

MSA board member, Garrett Riekhof, discussing farm bill priorities with Sen. John Boozman (R-AR) at a round table event hosted by Sen. Eric Schmit (R-MO).

Farm Bill Delays

On Sept. 30, the deadline for farm bill renewal came and went without Congress making substantial progress. Nevertheless, Missouri farmers emphasized the need to avoid funding disruptions for vital agricultural programs during a late October visit by Sens. Eric Schmitt (R-MO) and John Boozman (R-AR), the latter serving as the ranking member on the Senate Agriculture Committee.

Boozman and the rest of the Senate and House Agriculture committees later successfully negotiated for a full-year extension of the current farm bill while committing to continue conversations on a new version. However, the agreement's passage required a vote from Congress and hinged upon the success of a stopgap spending bill aimed at averting a government shutdown on Nov. 17.

At press time, Congress had not yet finalized its decision on the bill, but we look forward to reporting on its movement in February.

Still, we would be remiss if we didn't acknowledge major disruptors that have and should take priority. For the first time in history, the United States House of Representatives voted to remove its speaker, Kevin McCarthy (R-CA), from leadership. Shortly after, the Israel-Hamas War escalated at alarming levels, demanding global attention. While safeguarding the interests of our farmers remains our topmost priority, we extend our heartfelt thoughts and prayers to our nation's leaders and our global community in the upcoming months.

Want to know more?

MSA federal and state PAC contributors gain access to an exclusive newsletter for updates during the state legislative session on policy and regulatory movement in Jefferson City and anywhere Missouri soybean farmers stand to be affected. The newsletter also provides more details on Missouri elections and the role MSA and you can play to impact the outcomes. Visit MoSoy.org or scan our QR code for more details.

FORMING A FOUNDATION ON THE FLOOR

BY SAMANTHA TURNER

Sen. Cindy O'Laughlin believes a firm foundation stems from faith, family and fairness. As majority floor leader for the Missouri Senate, O'Laughlin continues to live and serve the state's constituents by these strong values.

First elected in 2018, O'Laughlin represents northeast Missouri in the state Senate. In 2022, her peers selected her as the majority floor leader, the first female to hold this position in the state's history.

O'Laughlin's journey began on a family farm in Iowa, and she later moved to Grant City, Missouri. Her educational path led her to Northwest Missouri State University for two years, followed by the University of Missouri-Columbia, where she earned a Bachelor of Science in business administration.

Before being elected to the Missouri Senate, O'Laughlin served as a school bus driver, an administrator at a local Christian school and a member of her local school board.

A FOUNDATION IN FAITH

Today, O'Laughlin resides in Shelbina, Missouri, with her husband and several dogs, including basset hounds, as well as several rescue dogs. In that rural community, O'Laughlin raised her four sons and a foster daughter.

When asked about her choice to become a foster parent, O'Laughlin explained, "When I encounter challenges, my instinct is to ask, 'Is there anything I can do to make this situation better?'" This mindset played a pivotal role in her decision to pursue a career in public office.

"There is a lot you can do if you are willing to do it," said O'Laughlin. "You can often get discouraged when considering the cost, time or other resources. But I think you should try to help if you can."

O'Laughlin credits many of her characteristics as a senator to her entrepreneurial background in the trucking company.

O'Laughlin Inc., a family-owned and operated trucking business since 1950, was originally established by her father-in-law, Leo O'Laughlin, and primarily focused on trucking services. Today, O'Laughlin Inc. offers local trucking without storage and ready-mix concrete in Shelbina, Macon, LaBelle and Marceline. O'Laughlin's oldest son now owns and operates the family business, alongside herself and husband.

O'Laughlin's years of experience within the trucking industry and working in a small business have shaped much of the senator's thinking and her beliefs on how state government should be run.

"Government can be the source of the problem in many ways," said O'Laughlin. "I felt it could be more successful if run like a small business."

FAIRNESS ON THE FLOOR

Today, as O'Laughlin oversees the Senate floor, she can demonstrate the validity of her beliefs through her leadership.

O'Laughlin is credited with improving the efficiency of the Missouri Senate during her first year serving in that role.

"Before I was floor leader, I observed what was happening," said O'Laughlin. "I thought it could be done differently and with more success. I knew we were quickly approaching an impasse and felt I was the only one who could be acceptable to both sides."

Those who work closely with the the senator and her political peers says that she demonstrates both fervor and fairness on the floor.

"The Missouri Senate is fortunate to have the strong leadership of Sen. Cindy O'Laughlin," said Lt. Gov. Mike Kehoe. "Having previously served as floor leader, I know Sen. O'Laughlin is the right person for the job. She understands the importance of agriculture to our state's economy and works hard to protect our state's top industry and Missouri farm families."

In many ways, O'Laughlin has been a soybean supporter and friend of agriculture in the Senate.

"I am willing to fight for rural Missouri," said O'Laughlin. "I try to educate myself and stay connected to agriculture, and I will do what I can to get things done."

O'Laughlin supported the biodiesel tax credit within HB 3 in 2022. This bill provides that any taxpayer with a tax year beginning before Jan. 1, 2023, but ending during the 2023 calendar year is allowed a tax credit for fuel sold or produced during the portion of such tax year that occurs during the 2023 calendar year. This clarifies that all biodiesel made and biodiesel blends sold so far qualify for credit, regardless of tax year.

This ensures all current production capacity is covered and qualifies for the 2 cents per gallon credit, and each plant can apply for the credit on a first-come, first-served basis.

As floor leader, O'Laughlin was also instrumental in passing the ag omnibus bill.

Floor time is very precious at the end of session, and her fellow soybean supporters shared she prioritized the bill and gave it quality time on the floor to get it passed.

"I appreciate Sen. O'Laughlin as a friend and supporter of agriculture," said Matt Wright, Missouri Soybean Association president. "Through her years of service, she has not forgotten that her district is weighted heavily toward agriculture. "

Wright expanded, "I specifically remember testifying in a hearing where her first question was, 'How is this bill going to affect the family farmers?' I knew then we were going to be OK."

LESSONS FOR LEADERS

Navigating through Jefferson City, forging valuable connections and seeking guidance from mentors is essential. O'Laughlin, for instance, found a mentor in former Sen. Doug Libla.

"Libla possesses a lot of common sense," O'Laughlin remarked. "We believe that our impact on the world is not confined to the senate; we've already made a meaningful difference."

Libla, from southeast Missouri, echoed these sentiments.

"She's an excellent listener, a sharp thinker and upfront with you," Libla praised.

Libla also added that O'Laughlin is a very dedicated hard worker, with lots of energy. These qualities are particularly welcomed on the Senate floor.

O'Laughlin also emphasized the significance of seeking external perspectives by leaning on friends and family.

"We don't communicate our goals enough, and we're not listening to others," O'Laughlin pointed out. "If I assume the President Pro Tem position, this will be a top priority."

When asked for advice on pursuing a political career, O'Laughlin emphasizes the importance of not feeling the need to prove oneself.

"Potential candidates should inquire about what a candidate will do if they aren't elected," O'Laughlin suggested. "You want a representative with diverse interests. Focusing solely on reaching Jefferson City can lead to a skewed perspective."

Beyond her leadership in Jefferson City, O'Laughlin has played pivotal roles on various statewide boards, including the Associated Builders and Contractors, the Children's Trust Fund, and the Missouri Club for Growth. She's also a member of the National Rifle Association, Missouri Cattlemen's Association, the Missouri Farm Bureau and Macon First Baptist Church.

Missouri Soybeans deeply appreciates O'Laughlin's unwavering dedication to the state's soybean producers. The Missouri Soybean Association's collaboration with state senators like O'Laughlin is crucial and highly effective.

To find out more about Missouri Soybeans' policy priorities, visit mosoy.org.

SPRING SUCCESS STARTS with DECEMBER DECISION MAKING

SPECIAL FEATURE BROUGHT TO YOU BY: BECK'S

It's December. Harvest is over, snow is falling and Christmas shopping is in full swing. And whether we want to believe it or not, planting season is upon us. When we think about maximizing soybean performance come spring, there are many agronomic factors to consider, even in December.

VARIETY SELECTION

Adam Noellsch, Beck's Missouri regional product specialist, says the first thing to consider is your soybean variety. "Selecting soybean varieties should be your first step," he explains. "Choosing the varieties you want to use on your farm early on allows you to then start the planning process for management decisions that follow."

FERTILITY

Soil is the medium that allows seeds to germinate, emerge, take root and develop into plants. Productive soil has appropriate soil tilth, drainage, microbial activity and nutrient availability to support plant growth. Alex Long, Beck's field agronomist in Missouri, explains that a simple soil test before planting can help growers assess their nutrient availability come spring.

Soybean nutrient availability depends on soil pH, as 14 of the 17 essential elements for crop growth are derived from the soil. Soil pH impacts the solubility of minerals or nutrients and, therefore, the availability of plant uptake. Restricted root growth can compound the problem as the plant cannot reach enough of the soil profile to compensate for reduced nutrient availability.

Commercial fertilizers and natural soil biology will be less effective if the pH is not managed. The optimal pH for plant growth is dependent on the crop, but the best soil pH for soybeans would be between 6.0 and 6.5.

FIVE SOYBEAN SUCCESS STRATEGIES TO CONSIDER

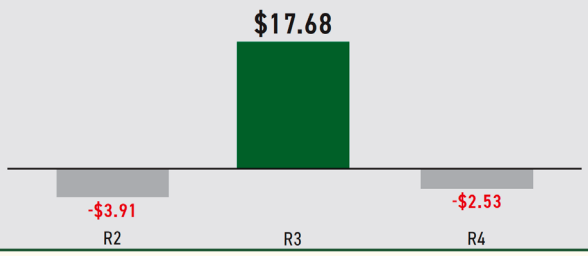
Beck's has been identifying PFR Proven products and practices to help farmers determine which ones to implement. For a product or a practice to become PFR Proven, it must be tested for three years and provide a positive yield gain and positive ROI over all three years. Here are the top PFR Proven success strategies for soybeans for higher yields.

Fungicide Timing

Fungicides primarily prevent or mitigate disease pressure, but they can also increase water-use efficiency, photosynthetic rate, nitrate reductase activity, lengthen the window for grain fill and improve stress tolerance. Beck's seven-year PFR data shows a $17 per acre. ROI advantage from an R3 application of a fungicide and an insecticide. Multiyear data summaries using various soybean fungicides indicate that R3 is the optimum growth stage for making a foliar fungicide application. The R3 growth stage in soybeans is identified by having at least one pod that is three-sixteenths inches in. long at one of the four uppermost nodes on the main stem with a fully developed leaf.

SUCCESS STRATEGY #1 - FUNGICIDE TIMING:

R3 is the key time to apply a fungicide in soybeans. R3 is when there is a 3/16 in. pod at one of the top four nodes.

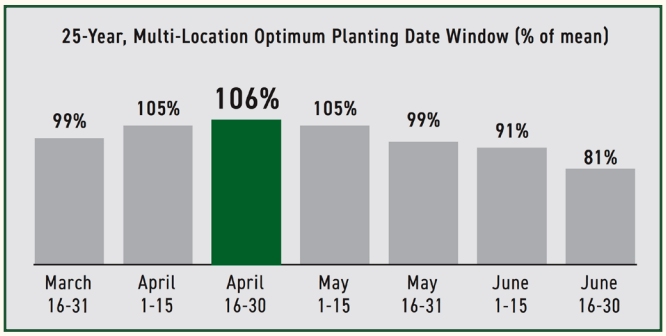


Seeding Rates and Planting Date

Multiyear, multilocation PFR data shows that planting soybeans early is a critical factor in driving higher yields. By doing so, you're increasing the node count. Research shows that when planting is delayed, there isn't a significant benefit to switching to an earlier maturity soybean. Earlier planting dates can result in earlier canopy coverage, which creates cooler soil temperatures. Because nodules perform best at roughly 72 degrees cooler soil temperatures create an agronomic advantage.

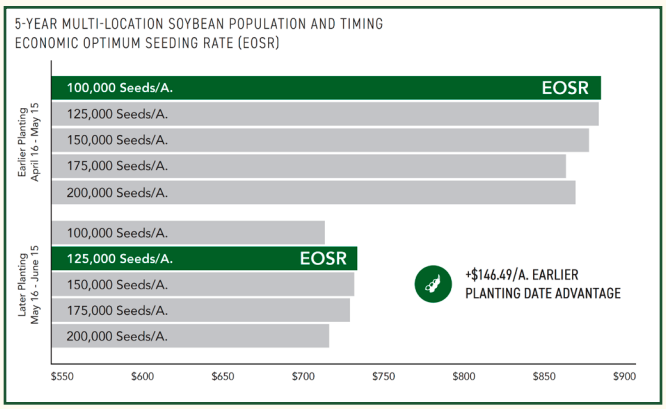
It's important to remember that soybean yields correlate with the number of nodes per acre., not necessarily the number of plants per acre. Nodes are the part of the stem where each leaf branches off. Earlier planting allows the plants to put on more nodes. Lower seeding rates encourage each plant to increase branching, thus increasing nodes per acre.

Five-year multilocation data indicates the power of early planting as every population planted early beat all later-planted populations. Lighter soils, poorly drained soils and narrower rows respond best to higher planting populations.



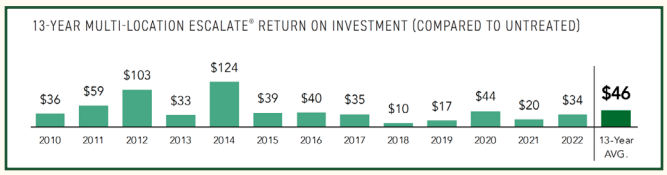
This PFR data indicates an early-planted population of 100,000 seeds per acre. can produce higher yields than a later-planted population of 175,000 or 200,000 seeds per acre. We don't necessarily condone planting 100,000 seeding rates; however, this data indicates two things:

1. Seeding soybeans in excess of 150,000 is likely less profitable.
2. Any seeding rate planted early out-yields every seeding rate planted later, and in most cases, it's better to keep a reduced soybean stand that was planted early than to replant.



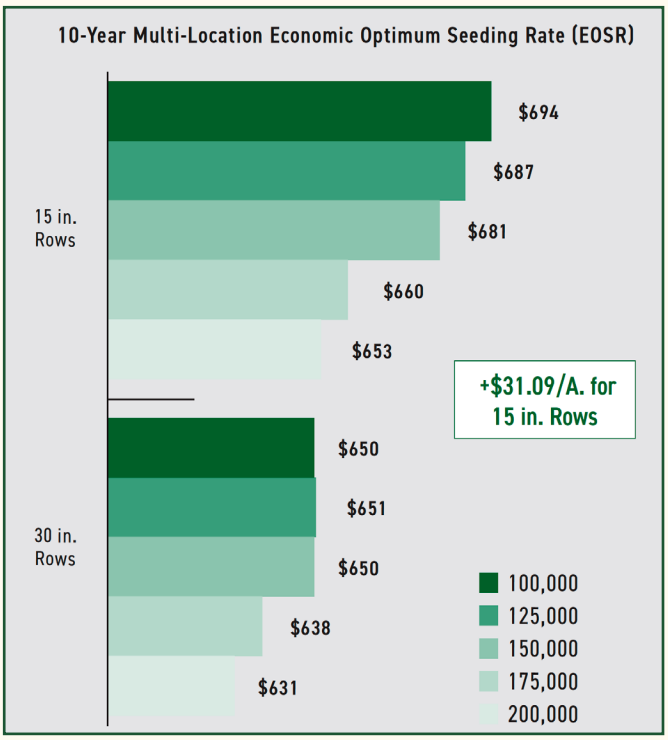
Seed Treatments

As earlier planting dates tend to drive yield, seed treatments will play an increasingly more important role in protecting the plants from diseases and insects. Seed treatments like the formulation in Beck's Escalate yield enhancement system are updated every year and continue to show remarkable value over 13 years of testing. With the addition of the ILEVO and TWO.O components, Escalate provides three modes of additional protection against sudden death syndrome and two modes of action on nematodes – with a combined effect of 4.6 bushels per acre over industry-standard fungicide and insecticide treatments.



Row Width

Beck's PFR team found that narrower row spacings consistently provide a higher ROI. Narrower row widths harvest more sunlight, especially when combined with earlier planting. This practice also helps shade the rows for improved weed control.



PLAN TODAY FOR A BETTER TOMORROW

While spring might seem far off, implementing a plan today will drive success for soybean performance come spring. For more PFR Proven data, visit beckshybrids.com/resources/pfr-proven-studies. From our team to you, we wish you and your family a very Merry Christmas.

Year-End Tax Planning FOR FARMERS

By: Kim Hill, Chief Financial and Information Officer

As the end of the year approaches, farmers should start thinking about tax planning. There are several things that farmers can do to reduce their tax burden, including:

1. Fully fund a retirement contribution with a tax-deferred contribution.

Farmers can contribute to their retirement accounts until April 15 of the following year, but the plans must be established by December 31. This is a great way to save money on taxes and build a secure retirement.

2. Manage revenue and expenses.

Farmers can consider the timing of their crop sales and input purchases to reduce their taxable income. For example, farmers may want to wait to sell their crops until the following year if they have a high-income year. Or they may wish to prepay for inputs in the current year if they expect input costs to rise in the following year.

3. Consider purchasing large equipment.

Purchasing large equipment can be an excellent way to reduce taxable income through depreciation. However, it is essential to remember that farmers generally spend $3 to save $1 on taxes when they purchase large equipment. There are also several considerations on how depreciation works on equipment, especially if trading in an older piece of equipment.

4. Review the asset list for any dead assets that can be removed.

Assets depreciated over three to 15 years don't always last that long. By eliminating deceased assets from your asset list, you can create a depreciation deduction for the portion that hasn't previously been captured.

5. Increase revenue to keep the overall tax rate low.

If farmers have a decreased income year, they may want to consider increasing their revenue to support their overall tax rate. Some ways to do this include selling fully depreciated farm equipment or leasing out farmland.

Transfer on Death (TOD)

Farmers should also consider adding a Transfer on Death (TOD) to their investment accounts. A TOD is a type of investment recognized under state law that allows farmers to designate beneficiaries who will receive their investment assets after their death without going through probate. This can save farmers' families time and money.

Farmers must contact their brokerage firm or other financial institution to add a TOD to an investment account. They will provide farmers with a form to complete, which they will need to sign and return.

Year-end tax planning is essential for all farmers, regardless of their income level. Farmers can reduce their tax burden and save money by taking the time to plan. Farmers should consult with a tax adviser to learn more about their tax situation and develop a tax planning strategy.

THE SECRET TO HEALTHIER SOIL

By Brady Lichtenberg

Soil is the foundation of a healthy operation, but it can be easy to take it for granted. After all, it's just dirt, right? Wrong. Soil is a complex ecosystem teeming with life, and it's essential for growing healthy crops.

One of the best ways to improve soil health is to plant cover crops. Cover crops are grown to protect and enhance the soil rather than be harvested. They can help to reduce erosion, improve water infiltration, suppress weeds and increase soil organic matter.

THE SECRET TO SOIL

When coupled with reduced tillage, implementing cover crops can help farmers build a healthier, more productive soil profile. The first step when working toward improved soil health is to begin viewing the soil as the living ecosystem that it is. Many beneficial micro-organisms live in the soil that, when managed appropriately, can go to work for soybean producers across the state. Without getting too far into the weeds, these beneficial fungi and bacteria in the soil must eat. Cash crops and cover crops both exude starches consumed by these micro-organisms, so by adding a living root to the soil during the winter, farmers essentially provide those root exudates year-round. Then, when terminating cover crops and planting cash crops in the spring, these micro-organisms feed on the dead cover crop material. After consumption, this decayed plant material mixes with existing soil components, increasing soil organic matter.

It is crucial to acknowledge the importance of fostering a diverse and robust soil microbiome, as various species of bacteria and fungi flourish under distinct conditions. A strategic mix of cover crop species is paramount to creating an environment conducive to this diversity. Incorporating a blend of cereal grains, brassicas and legumes offers the optimal conditions for a thriving microbiome.

One fundamental aspect to grasp when striving to enhance soil health is recognizing that substantial changes don't occur overnight. Rebuilding these microorganism communities and increasing soil organic matter demands a multiyear commitment. As our understanding of soil microbes and their symbiotic relationships with cash crops deepens, it becomes evident that cover crops serve a broader purpose than merely providing winter field cover.

BOOMING WITH BENEFITS

While the benefits of soil health improvements won't likely be seen after the first year of cover crop implementation, there are several other benefits that farmers can take advantage of in Year One.

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The first is nutrient management and erosion control. Cover crops do an excellent job of keeping things in the right place. With current fertilizer prices, nobody wants to think about that kind of investment leaving their field. Cover crops can significantly reduce the nutrient runoff a farmer's field can experience, keeping those nutrients in place and available for next year's cash crop. Their living roots and above-ground cover can also significantly reduce erosion problems.

Cover crops emerge as a cost-effective tool to mitigate such losses when farmers weigh the potential cost of replenishing lost nutrients and topsoil that would otherwise have been depleted from their fields. Here are some examples of cover crop species that can aid in achieving these objectives: winter cereal rye, winter triticale, winter barley and winter wheat.

The second benefit is improved water efficiency. Cover crops change the physical structure of a field in a way that creates a more porous surface and slows the water flow rate during a significant rain event. This allows the water a more susceptible surface to soak into, as well as giving it more time to do so. This helps store more water in the field for cash crops rather than just letting it run down a waterway. Also, after termination, the layer of dead thatch that the cover crops have left behind serves as a mulch layer to slow surface evaporation, which helps cash crops get through periods of hot, dry weather.

Cover crops also help with weed suppression. With concerns about the growing number of herbicide-tolerant weeds, farmers can turn to cover crops for some help. A few species do an excellent job of suppressing small-seeded annual weeds. Some species physically alter the growing environment and choke out weeds via shade or more aggressive water and nutrient uptake. Others actively release chemicals that kill or prevent weeds from germinating. Winter cereal rye is known for its weed-fighting characteristics.

Finally, legumes are plants that – because of a symbiotic relationship with a beneficial bacterium – can take atmospheric nitrogen, convert it to a form usable by cash crops and store it below the surface of the soil. This requires fewer nitrogen inputs to achieve your fertility prescription. The catch is that these plants don't start producing a lot of nitrogen until they flower, which sometimes can conflict with the optimal planting time for a cash crop. Some examples of legumes that will provide free nitrogen are crimson clover, hairy vetch and winter peas. Many other species of cover crops can take in extra nitrogen that cash crops leave behind and store it over the winter. The nitrogen is then available for next year's cash crop.

MAXIMIZING MANAGEMENT

While cover crops can provide a wide array of benefits, there are some management considerations to keep in mind to prevent learning curve-related headaches.

Cover crops are a complex add-on to a current operation. They can require changes in several aspects of the yearly management plan. For this reason, it is best to start small. Farmers don't have to convert the whole farm at once. Instead, they can select portions of a farm that are generally easier to manage, more convenient to monitor and pose the least risk. Then, as the experience level and comfortability grow, farmers can expand practices working well to new areas. Also, deciding locations, species, seeding methods, termination methods and timing months in advance will pay dividends when it comes time to act.

One issue with using cover crops, specifically cereal grains, before corn is the potential for the cover crop to put on a lot of vegetative growth before conditions allow for termination. Cereal rye is known for its ability to grow rapidly in the spring when temperatures warm up and the ground is still moist. This leaves a lot of residues that can make it difficult to plant. It also leaves more than the ideal amount of dead plant material on which soil microbes feed. As these microbes break down the dead thatch, they also consume nitrogen, the same nitrogen intended for corn. This can cause slowed establishment, reduced stand counts. It also can require producers to apply more nitrogen fertilizer than initially planned. To avoid this issue, the recommendation is to use a cover crop that will winter kill, such as oats, or prioritize termination before the cover crops start growing.

CREDITS FOR COVER CROPS

As efforts in climate-smart agriculture and sustainability grow, so too do incentive programs for cover crops. Currently, three categories of programs can help farmers in Missouri offset some of the costs associated with cover crop implementation.

The first category includes government cost-share programs, which pay farmers a

predetermined amount to implement cover crops on their row-crop acres. Incentivizing the environmental benefits cover crops can provide (reduced erosion, nutrient loss, better water infiltration, etc.). Federal programs including the Conservation Stewardship Program (CSP) and the Environmental Quality Incentive Program (EQIP) are lucrative options. CSP provides excellent financial incentives for producers to implement cover crops when coupled with other practices that address soil health, water quality, etc.

EQIP delivers a slightly more flexible option that can be tailored to the farmer's operation, but it comes with similar federal government paperwork and some competition for selection. Another government-led option is the soil and water conservation cost-share practices under the Missouri Department of Natural Resources. This is the easiest of the three options but has a lifetime producer cap of $20,000.

The second category includes grant programs for farmers. Missouri Soybeans has partnered on three projects that received funding via the United States Department of Agriculture's investment of $3.1 billion into the Partnerships for Climate Smart Commodities initiative. The University of Missouri's Center for Regenerative Agriculture administers the Climate Resilient Crops and Livestock (CRCL) grant with a firm cover crop component. An essential "soy-rye" initiative pays producers to use a cereal rye cover crop before their soybean cash crop. A diverse mix option is available, too. There are also stackable incentives for later termination and grazing cover crops. Farmers for Soil Health is an opportunity focused on increasing cover-cropped acres in 20 states. It provides $50 per acre over three years ($25, $15, $10) to incorporate cover crops on row -crop land.

The Soil and Water Outcomes Fund takes a slightly different approach to incentivizing conservation practices. With this program, farmers choose the conservation practices they plan to implement (cover crops, reduced tillage, etc.), and their payment is based on those practice changes.

The third category includes a market-based carbon programs. Large corporations are being pushed to meet sustainability goals by their shareholders. When cover crops grow, they capture atmospheric carbon in the soil. If these acres were enrolled in a carbon program, a third-party company would verify and quantify the number of credits a farmer produced, then sell those credits to corporations and send a particular portion of that money to the farmer. There are a lot of different carbon programs out there, all with unique requirements and financial agreements. Several can be "stacked" (or used on the same acres) with some previously mentioned programs, providing two revenue streams for the same practice. Regarding carbon programs, producers are encouraged to read the contracts carefully and do what they feel is best for their operation.

As agriculture embraces sustainability and environmental responsibility, cover crops emerge as a tool for building healthier soils and supporting a resilient farming ecosystem. This adoption safeguards the foundation of farming operations and paves the way for a more sustainable and productive agricultural future. When making decisions this December, consider cover crops — one of the best investments you can make in the family operation.

Visit mosoy.org to learn more about cover crops and how to get started.

The Gift of Better Mental Health

By Karen Funkenbusch,
Extension Instructor and State Health and Safety Specialist

It's the end of the growing season. Crops are in the bins. Money is in the bank. Tax receipts are piling up. All are signs of another successful year on the farm.

And yet, there's a melancholy as holiday music cranks up. It's hard to put your finger on it, but maybe it's time to do some year-end planning that includes a mental health checkup.

MU Extension provides mental health programs to help farmers, ranchers and their families cope with stress. It offers resources to promote rural mental health awareness and free telehealth counseling sessions by a trusted, ag-friendly professional. Resources and services are also provided to veteran farmers by the Governor's Challenge to Prevent Suicide among Service Members, Veterans and their Families.

Before the year end, set aside a day for yourself and assess your feelings. Just like you would plan what seed and chemicals you need next year, plan how to improve your mental health for the year ahead. You wouldn't let your machinery go without a winter checkup, so do the same for yourself. Know the behavioral signs of stress that may manifest in physical symptoms: weight loss or gain, changes in appetite, stomach or gastrointestinal problems, poor sleep, clenching or grinding of teeth, chest pain and poor hygiene.

Behavioral signs of stress include loss of interest in things you used to enjoy, wanting to withdraw from people and activities, poor concentration, confusion, forgetfulness, uncertainty or trouble making decisions, relationship problems, feeling anxious or irritable, change in personality, negative thinking and increased smoking or drinking.

Physical signs may be more noticeable but often develop gradually. Physical symptoms include difficulty breathing, fatigue, body aches and rising blood pressure. Slow down, take breaks, exercise and get a physical checkup if you feel stressed. And reach out to friends, family, clergy or medical professionals.

Knowing which tools are available is an excellent first step in dealing with feelings of stress and anxiety. Everyone experiences – and manages – stress in different ways.

If self-care strategies don't work, contact loved ones or an online therapist for additional support. MU Extension coordinates with the North Central Farm and Ranch Stress Assistance Center and the Missouri Department of Agriculture to provide resources through USDA National Institute of Food and Agriculture grants. Farmers, ranchers and immediate family members can receive free, confidential teletherapy.

Consider telehealth counseling as a convenient, confidential option.

The "Cheers" theme, "Where Everybody Knows Your Name," brings comfort to some

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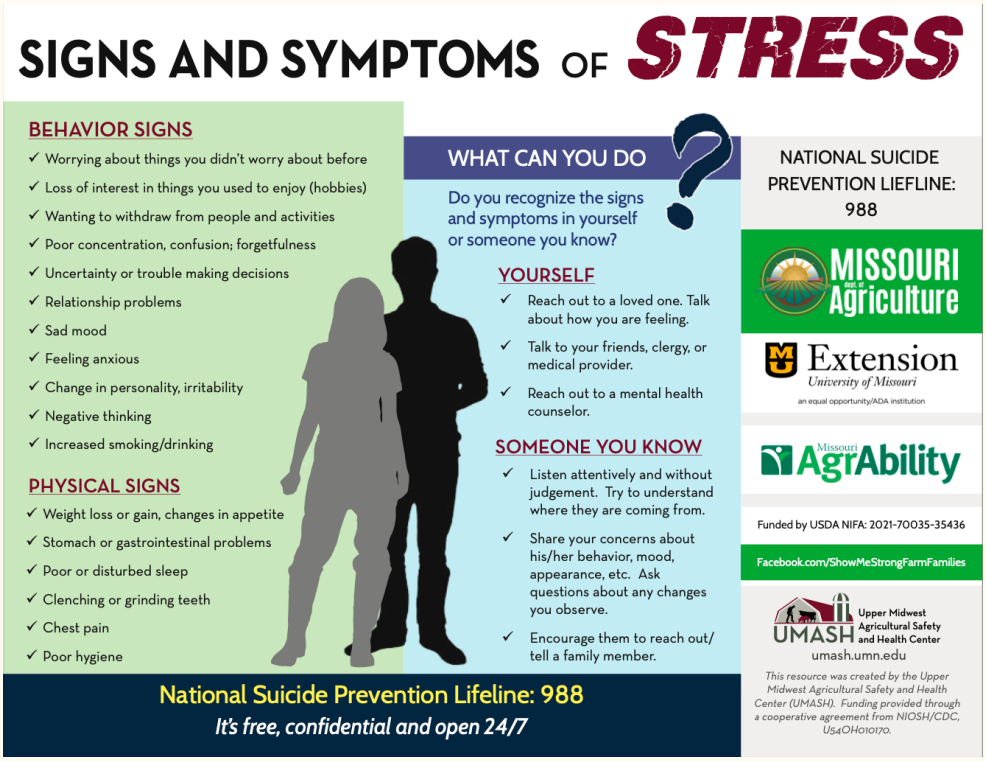

but discomfort to others. The unfortunate stigma attached to mental health treatment might keep some from seeking help in a small town, where "everybody knows your name" or, as likely, "everybody knows your truck."

The jingle is part of why telehealth is growing in popularity as a treatment option for rural Missourians seeking mental health help. Telehealth offers convenience and anonymity.

Telehealth encompasses health care, including counseling services delivered remotely, reducing or eliminating the need to travel. Telehealth brings health care to you through a cellphone or the internet, regardless of where you live.

Missouri has the most significant shortage of providers in the U.S., according to "Growing Stress on the Farm," published in 2020 by the Missouri Coalition for Community Behavioral Healthcare, Missouri Department of Mental Health, Missouri Farm Bureau, Missouri Hospital Association and MU Extension. Each of Missouri's 99 rural counties is a designated Mental Health Professional Shortage Area.

Telehealth gives rural residents more choices in health care providers. It also may reduce the need to take time off work or obtain childcare, saving patients money and time.

Telehealth may not be for everyone, but it provides a valuable option for many. It may not feel safe or comfortable at first, but with some preparation, it can be a convenient tool to improve your mental health once you learn a few simple things so you can use a smartphone, tablet or computer with internet services.

Not all telehealth services require a computer. It would be best if you prepared in advance, but your health care provider will help you learn how to access services.

MU Health Care has tips to prepare for a telehealth visit at https://www.muhealth.org/your-visit/convenient-care/telehealth. Each provider may have different methods, so ask before your visit.

Mental health programs offer many resources to help farmers, ranchers and their families.

If the end of the growing season is causing concern, resources are available to help.

MU Extension coordinates with the North Central Farm and Ranch Stress Assistance Center and the Missouri Department of Agriculture to provide resources through USDA National Institute of Food and Agriculture (NIFA) grants. These resources include free telehealth sessions for farmers, ranchers and immediate family members. To request free teletherapy counseling, visit www.muext.us/PSCFarmRanch, email adpsc@missouri.edu or call 573-882-4677.

The Missouri Department of Agriculture's AgriStress Helpline also offers free, confidential help to farmers and their families. Producers can call or text 833-897-2474 to speak to a healthcare professional. The helpline is available 24 hours a day, seven days a week. Learn more at agriculture.mo.gov/stress.php. NIFA awarded the Farm and Ranch Stress Assistance Network grant to MDA to support the distribution of mental health resources and training through MU Extension.

Through a North Central Region Farm and Ranch Assistance Network federal grant, MU Extension is part of Iowa Concern, providing stress counselors and attorneys for legal education, information and referral services for farm families. The toll-free number is 800-447-1985.

The 24-hour National Suicide & Crisis Lifeline provides free, confidential services. If you or someone you know is in crisis, call or text 988 or go to 988lifeline.org.

Find other resources in the MU Extension and Show-Me Farm Safety Mental Health Toolkit at muext.us/MHtoolkit.

As we near the end of this growing season, make the best decisions by being kind to yourself. Recognize your triggers to help you prepare for stressful situations so you can take steps to avoid or cope with stress. It's OK not to be OK, and it's OK to ask for help.

Photo from University of Missouri Extension

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2024 SOYBEAN OUTLOOK RESETTING EXPECTATIONS

BY BEN BROWN, UNIVERSITY OF MISSOURI

This year was characterized by stubbornly high input costs, persistent dry weather and optimism for domestic demand growth to offset recent uninspiring export demand. Now, Missouri producers have turned their attention to 2024 with the hope of better yields, lower production costs and stable prices. While getting all three would be preferred, two out of three appear realistic.

Two important agricultural economic concepts are needed to understand the demand outlook for 2023 soybeans: change in demand and quantity demanded. While similar in sound, their meanings have vastly different implications for U.S. soybean demand. A change in market describes a shift in consumers' desires to purchase the product or service based on factors such as incomes, consumer preferences, substitutes and complements, population, etc.

A change in demand is where the whole demand curve moves out or in. For soybean producers, the desire is for the demand curve to move out, creating higher prices at the same level of supply. The reverse is also true: Prices fall with the same production level when the demand curve moves in. A change in quantity demanded refers to a movement along the demand curve caused only by a change in price. Prices move up or down the curve based on whether supply decreases or increases. For standard goods, a person's consumption of an item declines as the price goes down.

There are two ways to get higher prices: 1.) Move the demand curve out by finding new uses for the good or drawing more consumers to the product, or 2.) Reduce the supply and move up the curve to higher prices.

So, what do these concepts have to do with the outlook for U.S. soybeans? First, let's start with 2023 production. U.S. producers reduced soybean acreage to 4.9 million acres in 2023 compared to the previous two years. Additionally, the U.S. experienced two consecutive years of below-trend national yields. At just more than 4.1 billion bushels, the U.S. supply of soybeans at the end of 2023 is 350 million bushels, or 7% lower than expected at the start of the year.

All this is to remind readers that even if the quantities of soybeans demanded are less than usual or even expected, it does not mean soybean demand is necessarily bad; it could mean the market has moved up the curve.

The prior paragraph directly applies to 2023 U.S. soybean exports. U.S. soybean export commitments started the marketing year down 38% from average and have struggled to make up the lost ground. It is estimated that soybean exports for 2023/24 will be the second lowest in the past decade – only behind 2018/19 when African Swine Fever in China reduced demand for global soybeans while China increased tariffs on US soybean imports. Soybean exports for 2023/24, already behind 6% from the pace needed, may decline further before the year is finished, due to a lack of exportable supplies, a strong U.S. dollar relative to other currencies and increased transportation costs. The smaller volume of export sales for January and February delivery is concerning as this is the window when the U.S. typically moves a large majority of soybeans. The good news for soybean exports is that because it is believed the curve has not shifted, soybean exports are expected to increase in future years if supply rises.

Domestically, the use of soybean oil continues to increase. The domestic investment

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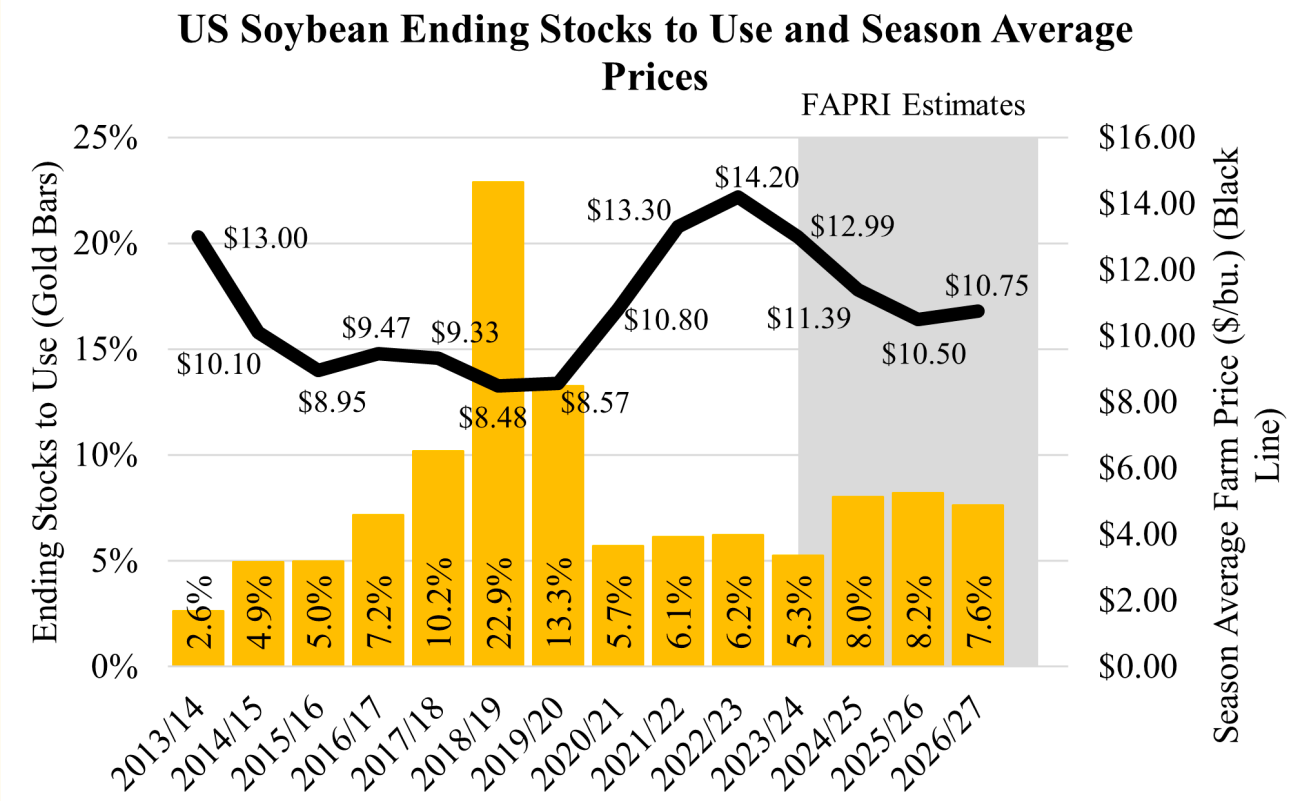


in soybean crush facilities and the growth in soybean oil use have shifted the demand curve. In two years, biomass-based diesel production capacity has increased 68%. Almost all the growth comes from rapid renewable diesel production expansion to serve domestic markets. The Food and Agricultural Policy Research Institute (FAPRI) expects domestic soybean crush to increase 90 million bushels this year over last year and continue to increase during the next five years.

This assumes no federal or state policy changes as FAPRI considers only current policy in place. The expansion rate could be quicker if states considering policy changes pass legislation to create or expand renewable fuel programs. U.S. exports of vegetable oils, including soybean oil, have nearly all disappeared as domestic consumers gobbled up available supplies. At the same time, vegetable oil imports into the United States are expected to reach an all-time high this year – just under 7 million metric tons. The U.S. became a net soybean oil importer in 2022/23. With the expansion in soybean crush facilities, any reduction in 2023 soybean exports may be offset by increases in soybean crush. The critical point is that while the total use of soybeans is expected to fall 220 million bushels in 2023/34, it is likely to rebound quickly in 2024/25 with higher production.

U.S. soybean prices have declined from costs experienced earlier in the year. The crop insurance harvest price of $12.84 per bushel was 7% below the projected price of $13.37 amidst a drought. With the expectation South America will produce a record 164 million metric ton crop this winter – up nearly 300 million bushels from last year – and the U.S. has a 4.5 billion bushel crop next summer on trend yields and 87.2 million planted acres, it is estimated soybean prices fall to $11.50 per bushel next year. However, given the tightness in the global soybean balance sheet, any reduction in supply moves along the demand curve quickly to higher prices.

For 2024, producers are deciding on planted acreage, and many have already bought some inputs for next year. Production costs will likely be lower in 2024 than they were in 2023. Total direct costs for soybean production in 2024 are expected to be down nearly 12% compared to 2023, with indirect costs roughly flat. However, only some costs will be lower as hired labor, liability insurance and interest expenses have all increased. However, producers should see relief on fertilizer, pesticide and seed costs. Pulling revenue and expenses together, the cost drop is expected to be larger than the price drop, resulting in increased returns for producers compared to 2023. This analysis uses a farm cash price of $11.39 per bushel. November 2024 futures price traded near $13 in early November, offering producers a chance at higher profits.

There are several reasons to be excited about the 2024 soybean outlook. First, it should be reassuring to producers that soft international demand for 2023 soybeans is more of a change in quantity demanded than a change in direction. Second, the investment in domestic soybean crushing facilities and increasing demand for soybean oil are creating a shift in orders by moving the demand curve out. Finally, the expected drop in 2024 input costs relative to 2023 is more significant than the anticipated decline in 2024 soybean prices, creating a slightly higher expected per acre return in the year ahead.

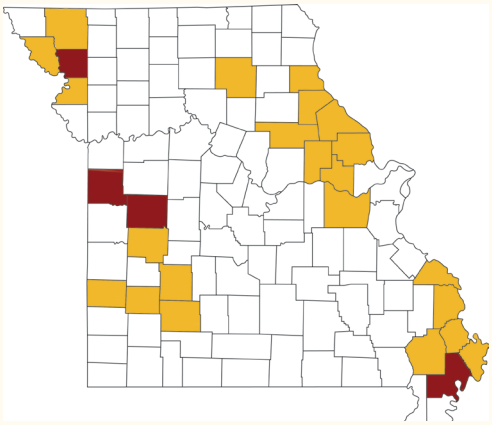
FOLIAR FUNGICIDE APPLICATIONS TO SOYBEAN

By Mandy Bish, Assistant Professor of Plant Pathology and State Extension Specialist

Fungicide applications can protect soybean yield when foliar diseases are present. However, Missouri soybean fields do not typically have high foliar fungal disease pressure. Yet we still see approximately 60% to 65% of Missouri soybean acreage treated with fungicide, based on a recent informal survey of retailers, crop advisers and extension specialists in the state.

What is the return on investment (ROI) for these foliar fungicide applications to Missouri soybeans?

The Missouri Soybean Merchandising Council (MSMC) partnered with MU Extension in 2018 to address this question through on-farm research. The study has continued annually and involves replicated strip trials on Missouri soybean fields, alternating fungicide-treated and non-treated soybean strips. Tests have been conducted on areas throughout the state, and the fungicide application is at the R3 (beginning pod) growth stage.



The median (or midpoint) yield increase is 1.5 bushels per acre (bu/a) for fungicide-treated soybeans compared to non-treated soybeans in the 54 completed strip trials. University scientists across nine states and Ontario, Canada, found a similar number when analyzing more than 240 small plot research trials. Fungicide applications were projected to increase yield by 2.7%, a 1.6 bu/a increase in a field that averages 60 bu/a.

Both studies support a yield increase that corresponds with fungicide applications to soybeans. However, the odds of a fungicide application resulting in a positive ROI are low. For example, if we estimate fungicide application costs at $40 per acre and soybean prices at $13 per bushel, we need approximately a 3.1 bu/a yield increase to break even. Of the 54 Missouri strip trials, 22% reached or exceeded that break-even point. Figure 1 shows the average yield difference between fungicide-treated and non-treated soybeans for each strip trial. The best-case scenario was a 12 bu/a yield increase in fungicide-treated soybeans; the worst was a 3 bu/a yield loss in fungicide-treated soybeans.

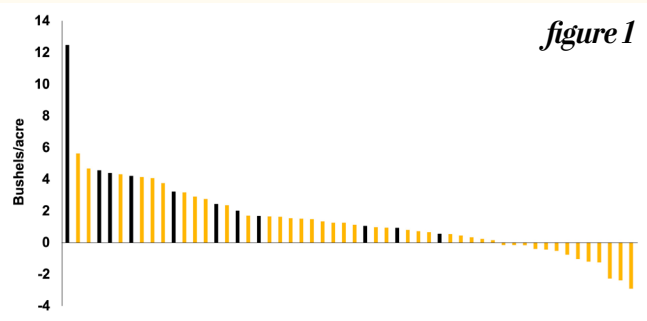


figure 1

We are still learning what factors contribute to these different outcomes. Both scenarios occurred in east-central Missouri in fields with similar agronomic practices, low disease pressure and application of a product with two modes of action: Group 7 DMI (demethylation inhibitor) plus Group 11 QoI (quinone outside inhibitor). One difference between the trials was rainfall following fungicide application. The black bars in Figure 2 indicate locations where detectable precipitation occurred within 48 hours of application; gold bars indicate a lack of rain. In general, precipitation within 48 hours of application corresponded with less risk of yield losses due to fungicide application.

This also seems consistent with what we know about fungicide injury to soybeans, which is more likely to occur under hot and dry conditions. Results from 2023 strip trials should provide additional insights into the importance of precipitation given the arid growing season.

What are common soybean diseases that fungicides can control?

The confirmation of soybean rust disease in the U.S. in 2004 resulted in a substantial increase in fungicide applications to soybeans, which were minimal before that time. Soybean rust occurs in southeast Missouri occasionally and is a severe threat when present due to its ability to spread rapidly. However, most diseases in Missouri soybeans are not as aggressive as soybean rust, and there are opportunities to scout before making fungicide applications.

Frogeye leaf spot (FLS) is generally the most concerning foliar soybean disease across Missouri. We observed the condition in 11 of the 54 strip trials. Symptoms appeared late in the season at deficient levels in 10 plots with no effect on yield. However, symptoms appeared early in one plot, resulting in a 4 bu/a yield loss in non-treated soybeans. The best way to determine whether a fungicide application is warranted for FLS management is to know how the soybean variety is rated for FLS resistance and scout. A fungicide application should be considered if disease symptoms appear during the vegetative or early reproductive stages. Fungicide resistance is already an issue with this disease, and so it is important to avoid unnecessarily exposing the pathogen to fungicides.

Septoria brown spot is the most common disease of Missouri soybeans, but it does not typically cause yield losses that warrant fungicide applications. As expected, we observed the condition in 100% of strip trials. Symptoms usually develop early in the season, with red to brown spots forming on leaflets of the lower canopy. Warm and wet weather can spread the disease to the upper canopy when concerns over yield losses can arise.

Cercospora leaf blight, target spot and white mold are diseases becoming more common in Missouri, and soybean yield may be better protected with fungicides under certain conditions.

What diseases are not controlled with fungicide applications?

Viruses and bacteria can cause foliar soybean diseases but are not managed by fungicides. We observed bacterial blight and more soybean vein necrosis virus (SVNV) than usual during 2023.

Diseases such as sudden death syndrome, Phytophthora root rot and brown stem rot cannot be controlled by foliar fungicides. These can be tricky because disease symptoms can appear on leaves, and fungi or fungi-like pathogens cause the disease. However, those pathogens live in the soil and infect roots. Foliar fungicide applications do not reach the target pest.

What fungicides are most effective?

The Crop Protection Network, which consists of state extension pathologists across the U.S., publishes a fungicide efficacy guide annually and includes the University of Missouri input. Products with multiple modes of action are more likely to delay the onset of fungicide resistance.

Final thoughts: Fungicides are a crucial component of disease management in soybeans. They can provide a positive ROI when used to protect soybean yield from disease. It's crucial to preserve the effectiveness of fungicides. This requires minimizing unnecessary applications that expose the pathogen to fungicides and increase the risk of fungicide resistance. Farmers already must manage herbicide-resistant waterhemp. No one wants to try to control a resistant pathogen growing inside the soybean plant.

Helpful websites:

- MU Strip Trials Annual Report: https://ipm.missouri.edu/cropPest/stripTrial.pdf
- Soybean Fungicide Efficacy Guide: https://cropprotectionnetwork.org/publications/fungicide-efficacy-for-control-of-soybean-foliar-diseases
- MU Field Crop Pathology Website: https://bishm.mufaculty.umsystem.edu/home
- MU Plant Diagnostic Clinic: extension.missouri.edu/programs-plant-diagnostic-clinic

cold flow operability: OVERCOMING A CHILLING CHALLENGE

By Scott Fenwick, Technical Director at Clean Fuels Alliance America

If you've ever tried to start your diesel engine when temperatures are well below freezing, you've likely experienced the chilling sound of silence as your key turns in the ignition. This is a common scenario in the Midwest, where frigid mornings can catch even the most seasoned heavy-duty machinery operators off guard.

Whether using petroleum diesel or biodiesel, cold flow operability is one of the key challenges all diesel fuels face, especially in colder climates. While these challenges may deter you from exploring low-carbon diesel fuel alternatives such as biodiesel, there are several proven solutions that allow these cleaner fuels to be used successfully as the seasons change.

Understanding cold flow operability can help biodiesel users properly maintain their equipment year-round. Cold flow operability refers to the ability of a fuel to flow and perform adequately in low-temperature conditions. All diesel fuels, including biodiesel, can freeze or gel as the temperature drops. If this happens, it can lead to various operational issues, including clogged fuel filters, fuel system damage and reduced engine performance.

These challenges are regularly studied by institutions such as the National Renewable Energy Laboratory (NREL) and others thanks to the support from Clean Fuels Alliance America, the national trade association that represents biodiesel, renewable diesel and sustainable aviation fuel. NREL's latest edition of the Biodiesel Handling and Use Guide outlines key low-temperature performance metrics including:

Cloud Point: Fuels contain waxes and other materials that can crystallize and separate from the fuel at low temperatures. A fuel's cloud point is the highest temperature at which wax begins to form and small solid crystals can first be observed, giving the fuel a cloudy appearance. This is an important parameter of all diesel fuels since the presence of solidified waxes can clog filters and negatively impact engine performance. The cloud point is the most conservative measurement, down to which all fuels should still provide the expected performance.

Cold Filter Plugging Point: This measurement of fuel operability is a critical property used to measure the lowest temperature at which diesel fuel will freely flow through a standardized filtration device when cooled under certain conditions and has been correlated to light-duty engine performance. Winter operability of diesel fuel, including biodiesel, is often benchmarked by cold filter plugging point testing.

Pour Point: The pour point is the lowest temperature at which fuels can be poured or pumped. Fuels with a higher pour point may contain so many agglomerated crystals that the fuel may not flow adequately, making it unsuitable for cold weather use. The pour point is an important indicator for distributors to determine if the fuel can be pumped, especially if temperatures are unsuitable for diesel engines.

The technical team at Clean Fuels understands the importance of cold flow operability and its challenges. The association's collaboration with NREL highlights solutions that are being developed to ensure a sustainable and smooth transition for using biodiesel in the winter months. To address the challenges associated with cold flow operability, various strategies can be implemented:

Storage and Handling: In order to achieve optimal performance, it is important to protect the fuel in diesel engines from the cold by storing vehicles or equipment in an enclosed area such as a barn or garage during the winter months. If equipment, and the fuel, must be stored outside, all attempts should be made to keep the fuel clean and dry. This will help keep the fuel tank warm and improve startup. This is often why fuel terminals and retail stations store their fuel in underground storage tanks where temperatures are more constant.

Increased Blending with No. 1 Grade Diesel: One common approach is blending biodiesel with No. 1 grade diesel, which has better cold flow properties. By blending with increased volumes and percentages of No. 1 diesel or kerosene, the finished fuel blend will achieve improved cold-weather performance while still promoting the use of renewable fuels.

Cold Flow Additives: Specialized fuel additives can be introduced to improve the cold flow properties of diesel fuels. These additives alter the properties of the fuel to prevent gelling and wax crystallization at low temperatures. Clariant, the leading provider of cold flow additives for middle-distillate fuels, is in the final development stages of an additive that will provide the same operability that you can expect from a winterized diesel fuel even for blends up to B50 (or 50% biodiesel). It is important to note that not all cold-flow fuel additives work equally as well in all fuels. Tests should be performed to find the additive that works best with your fuel and at the correct dosage.

Seasonal Blending: Some regions practice seasonal blending, adjusting the biodiesel blend ratio according to the temperature. For example, in Minnesota, the first state to adopt a biodiesel mandate, blends of 20% biodiesel are required in the summer months, while blends are reduced to 5% in the winter and early spring.

Overcoming challenges such as cold flow operability ensures that biodiesel remains a viable and effective alternative fuel source for decarbonizing the on- and off-road transportation sectors while supporting billions of dollars in economic activity for rural America. While there are no perfect fuels for every application and season, biodiesel blends and the contributions that today's soybean farmers make are leading to advancements in engine technologies to help reduce carbon emissions and particulate matter (soot) that improve the health of nearby neighbors and neighborhoods.

FORT WORTH, TEXAS 2024

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CLEAN FUELS CONFERENCE

FEBRUARY 5 – 8

As the clean fuels industry accelerates, billions of dollars are being invested in soybean crush facilities to meet the demand.

Join us at the **2024 Clean Fuels Conference** to learn more about this exciting time for our industry.

CleanFuelsConference.org

Materials supported by the United Soybean Board, soybean farmers and their checkoffs.

Improving Non-Productive Acres with Native Plantings

By: Joshua Marshall, Senior Farm Bill Wildlife Biologist, Pheasants Forever, Inc. and Quail Forever

Coming from a long line of farmers, I know our state's struggles, uncertainties and rewards of growing grain crops. It only takes one bad year to hurt profit margins. Even in today's modern world, with vast tools and technological resources, we cannot control the weather. With many variables and high stakes, farmers are always looking for ways to keep their land productive. The good news is that many programs and practices are available to help farmers achieve their goals.

The Conservation Reserve Program (CRP), which has been around for nearly 40 years, was designed to enroll marginal and sensitive agricultural land into a permanent cover that stops soil and nutrient loss. The program has come a long way since 1985, boasting more than 43 different enrollment options today that can be tailored to fit landowners' goals. With the change in how CRP is administered and utilized over the past several decades, many practices such as prairie strips, pollinator habitat and buffers have risen to the top as the most beneficial for farmers and the land.

On almost any operation, some acres do not produce profits. These acres can be the edge of a field that borders a timberline or woody draw. They may be acres in hard-to-farm locations, such as coves or small fields broken off from larger fields. It may even be an area where topography is causing the soil to wash away. CRP can be used to seed those acres into a permanent cover that receives a yearly rental rate paid to the landowner or producer.

Native grasses and pollinator mixes are the most preferred practices for wildlife and soil health benefits. These native plant mixes bring together cover and food instrumental to wildlife survival. Birds such as quail or pheasants benefit by creating the habitat needed to complete their life cycle and survive. Farmers can receive a constant annual return by reengineering odd production areas by enrolling these acres into the program.

CRP can also be used in conjunction with fields producing high yields. CRP prairie strips are a practice that allows landowners to plant native strips either between crops or on the edge to help reduce nutrient, soil and water runoff. Iowa State University conducted studies with native prairie strips and found that strategically adding 10% of your acres into native prairie plantings on no-till corn and soybeans would result in a 44% reduction in water runoff, 95% reduction in soil loss, and 90% and 84% reduction in phosphorus and nitrogen runoff, respectively.

Native plants have been known for years to have deep and broad roots that hold the soil and build quality soil health. Adding them to a producer's odd areas or within a field can help lift the burden and stress of making every acre profitable.

Another federal program that offers incentives for adding prairie strips is the Environmental Quality Incentive Program (EQIP). Like CRP, EQIP provides cost-share to help landowners or producers implement conservation practices on their acres. There are critical differences between the two programs. EQIP does not pay a yearly rental rate like CRP. Instead, it produces a predetermined portion of the average rate for a conservation practice. Also, unlike CRP, EQIP can provide cost-share on acres that do not have the cropping history required by CRP. In addition, EQIP delivers a whole list of practices that can be used on a property, from terraces and native prairie plantings to high tunnel greenhouses or cover crops. Through EQIP, acres that would typically not qualify for cost-share now do, and more farmers can benefit their acres by establishing native prairie. Whole fields or contour buffers can be planted in native pollinator habitats through EQIP. The wide array of practices gives farmers more flexibility and control over what acres they want to improve.

In Missouri, we are blessed to have many partners and professionals who offer programs with incentives and cost-share that can be used to help farmers gain more out of their acres through native plants and pollinator habitat. Dozens of different state, federal and non-government organizations offer free recommendations and cost-share opportunities to farmers trying to do the most with their farms while protecting their most valuable resource, the soil.

Farmers have always been at the forefront of soil health and productivity because they recognize that if they take care of their land, their land will take care of them. To learn more about these or the other programs, stop in at your local county USDA office.

For more questions on maximizing acreage and programs available, contact the director of conservation agriculture and farm operations, Clayton Light, at clight@mosoy.org.

GENERATOR *Safety*

When you have lost power, a portable generator can temporarily provide needed electricity. However, it may present serious hazards if not used properly. **Follow these tips to ensure everyone's safety:**

- Select a generator that can provide the amount of power you expect to need.
- **Read all instructions** before using.
- Always operate the generator on a **stable, dry surface.**
- Set up your generator in a **well-ventilated** area outside the home—out and away from your garage, doors, windows, and vents into the home. Generators produce **DEADLY** carbon monoxide.
- Use a **heavy-duty extension cord** to connect appliances to the outlets on the generator.
- **NEVER plug a portable generator into your home.** This can cause electricity to feed back through your home onto the utility's system. This "**backfeed" can be deadly** for line workers and anyone near downed power lines.
- Always allow the generator to **cool before refueling.**

Learn more about generator and storm safety at **SafeElectricity.org.**

Missouri Electric Cooperatives

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Safe Electricity.org

Sowing the Seeds of Leadership

by Madelyn Warren

The Missouri Soybean Association (MSA) is thrilled to introduce the talented individuals embarking on a transformative journey as part of the third class of the IA-MO Policy Leaders Fellowship (PLF).

PLF aims to equip these future leaders with a comprehensive understanding of the soybean industry, including how factors such as weather, government policies and global economics impact the prices they receive at the grain elevator. Through this yearlong experience, participants will gain insights into the policies, laws and regulations that shape the agricultural landscape and rural America while engaging with public and private industries to discover their role in supporting the soybean industry.

"As we embark on the third year of PLF, we're not just continuing the program; we're elevating the experience for our fellows," said Baylee Asbury, director of outreach and education. "We've already witnessed the remarkable impact of our past participants, who have taken on leadership roles within the Association and Merchandising Council. We're confident this year's cohort will carry the torch even further."

This year's participants from Missouri include:

- Ethan Fordyce – District 1, Harrison County
- Brooke Zell – District 2, Linn County
- Reed Plunkett – District 3, Marion County
- Roth McElvain – District 3, Marion County
- Chance Kurzweil – District 4, Cass County
- Klinton Holliday – District 5, Cooper County
- Jane Zuroweste – District 6, Lincoln County

The fellows kicked off their experience in late August at the Center for Soy Innovation, where they dove headfirst into a series of ice-breaking activities, forging connections and building the foundation for a year of growth and collaboration. They also spoke with career and leadership coach Whitney Kinne and later heard from national partners including Clean Fuels Alliance America and the American Soybean Association (ASA). Finally, they listened to Rural and Farm Finance Policy Analysis Center director Scott Brown and Bayer Crop Science industry affairs lead Samantha Davis give their remarks on the 2023 Farm Bill and its impact on their farms.

The experience will continue in late January at MSA's annual meeting and again at the 2024 Commodity Classic in Houston where the fellows will participate in learning sessions and port tours while experiencing the latest in on-farm technologies. It will culminate in mid-July at the ASA's board of directors meeting with Capitol Hill visits and meetings with trade partners in Washington, D.C.

Bayer is the presenting sponsor for PLF and is integral to ensuring its success.

"Bayer is incredibly proud to support this unique partnership," said Davis. "We believe in investing in the next generation of agricultural leaders, and any time public and private entities can come together to do that, our field is better for it. The Policy Leaders Fellowship is a testament to that commitment. The program not only equips young farmers with essential knowledge but also instills leadership skills that will shape the future of the soybean industry."

The Missouri Soybean Association's commitment to nurturing the leaders of tomorrow is evident through initiatives such as the IA-MO Policy Leaders Fellowship. As these young soybean farmers embark on this transformative journey, they will be better prepared to face the challenges of the ever-evolving soybean industry and make meaningful contributions to the future of agriculture.

The IA-MO Policy Leaders Fellowship is partially funded by the Missouri Soybean Merchandising Council. This sponsorship is only used for educational tours and personal or professional development opportunities. Under no circumstances have checkoff dollars been used for lobbying purposes.

SIDES FOR THE SEASON

Crusty Rolls

Ingredients:

6 cups all-purpose flour
1 cup defatted soy flour
1 3/4 cups lukewarm water
2 packages active dry yeast
4 teaspoons granulated sugar
2 teaspoons salt
2 tablespoons soy oil
3 egg whites, beaten stiff
Cornmeal, for sprinkling on baking sheets
1 egg white
1 tablespoon water
Sesame seeds or poppy seeds (optional)

Directions:

Combine all-purpose flour and soy flour in a large bowl; stir to mix well. Put water in another large bowl; sprinkle yeast on water and stir to dissolve. Add sugar, salt, oil and 2 cups of the combined flours to yeast mixture; beat well. Stir in 3 beaten egg whites. Stir in enough of the remaining combined flours to make a soft dough that leaves the sides of the bowl.

Turn out dough onto a lightly floured surface. Adding any remaining combined flours as needed, knead until dough is smooth and elastic with tiny blisters on the surface; this will take about 5 minutes. Place dough in a lightly oiled bowl; turn to coat all sides. Cover with a damp cloth and let rise in a warm, draft-free place about 30 minutes or until doubled.

Punch down dough. You can shape the rolls now or, for superior results, let the dough rise until doubled again. Prepare the baking sheets by spraying them with nonstick cooking spray, then lightly sprinkle them with cornmeal. Lightly beat 1 egg white with 1 tablespoon water to make egg wash. Divide dough into three equal portions. Divide each portion into 12 pieces. Shape each piece into a 3-inch circle, then flatten slightly to make a 4-inch circle or a 6-inch oblong.

Use a very sharp knife to make shallow cuts on the top of each roll. Place rolls on prepared baking sheets and brush with egg wash. Sprinkle with sesame seeds or poppy seeds if desired. Let rise in a warm, draft-free place until doubled.

While rolls are rising, preheat oven to 425 degrees. Place a large, shallow pan on the bottom rack and carefully fill with boiling water (to provide steam that will make the rolls crusty). When rolls have risen, brush again with egg wash. Bake in preheated 425 degrees oven for 20 minutes or until golden.

Broccoli Casserole

Ingredients:

1 tablespoon soy margarine
1/2 cup chopped onion
1 (16-ounce) bag frozen chopped broccoli
1/2 pound processed American cheese, cubed
3 cups cooked rice
1 cup firm tofu, drained and cubed
1 (10.5-ounce) can cream of mushroom soup
1 (10.5-ounce) can cream of chicken soup
1/4 cup bread crumbs

Directions:

Melt margarine in small saucepan. Add onion; cook and stir until translucent. Cook broccoli according to package directions. Add cheese cubes to hot, drained broccoli; stir until cheese is melted.

Combine cooked onions, cooked rice, broccoli-cheese mixture, tofu and soups. Mix well. Spread mixture evenly in 2-quart baking dish that has been sprayed with nonstick cooking spray. Sprinkle bread crumbs on top.

Bake in preheated 375 degrees oven for 20 minutes. Serve hot.

Looking Back

MSA Board Secretary Brooks Hurst shares memories from the farm and the grassroots work he does with MSA and ASA.

Q: Tell us a little about yourself.

A: I am a farmer from Tarkio, Missouri. My wife, Amy, and I have four kids, Finn, Tucker, Landry and Elliott. My family and I attend the St. John's Luthern church in Westboro, Missouri. I love to cheer on the Mizzou Tigers and St. Louis Cardinals.

Q: Tell us about your farm.

A: I farm with my grandpa, uncle and three brothers. On our generational operation, we raise corn and soybeans.

Q: What is your involvement in agriculture?

A: I serve as the secretary and District 1 director for the Missouri Soybean Association. I work on the Missouri Soybean Association's grassroots advocacy efforts in Jefferson City and Washington, D.C. I also serve as a director for the American Soybean Association.

Q: Who is your biggest influence?

A: My dad was probably my biggest influence.

Q: Should tractors be red or green?

A: Tractors on our farm are green.

Q: How do you take your coffee?

A: Coffee is black, strong and hot.

Q: What are you listening to while working?

A: I like to listen to the radio, but sometimes with four kids the silence is nice.

Q: What is your favorite planting or harvest snack?

A: Iced tea and jerky.

Q: Tell us about your favorite memory on the farm.

A: My favorite memories are fall Saturdays riding around with my dad.

Q: Does your family implement any sustainable practices?

A: We have no-till, have dabbled in cover crop, rotate every year and have terraces.

Q: Who is your favorite farm influencer to follow?

A: I don't think I really follow influencers.


HURST BROS. FARMS
TARKIO, MO
GW 80,000
US DOT 471568
TIMPTE

Legal Notice To Missouri Soybean Producers

An election will be held to elect four (4) soybean producers to the 13 member Missouri Soybean Merchandising Council, which manages the funds collected through the soybean checkoff program. The terms of office will be for three (3) years and the election will be as follows: four (4) members are to be elected; one (1) each from Districts 1, 2, 3 and 7. (See Map) Ballots will be mailed by the Missouri Department of Agriculture on March 1, 2024, to each registered producer in the four (4) Districts. Ballots must be returned to the Missouri Department of Agriculture in Jefferson City, by mail, postmarked no later than April 5, 2024.

Any duly registered commercial producer of soybeans is eligible to vote for the Council candidates from his/her District. Producers must be registered to vote. Current registered producers whose address has changed in the last five (5) years should re-register or contact the Missouri Department of Agriculture at 573-751-5611 or P.O. Box 630, Jefferson City, MO 65102 by February 2, 2024, to receive a ballot. Non-registered producers must register prior to February 2, 2024, at the USDA County FSA Office or online at: www.agriculture.mo.gov/councils/ to receive a ballot for this election.

Any qualified producer may be nominated and have his/her name placed on the ballot, provided he/she presents the Director of the Missouri Department of Agriculture a nominating petition signed by at least 100 soybean producers prior to February 2, 2024. Such petitions are available at the Missouri Department of Agriculture in Jefferson City, MO. Please direct any questions to Missouri Department of Agriculture, P.O. Box 630, Jefferson City, MO 65102, or 573-751-5611.

2024 Winter Meeting Dates

District 1:
R/Farm Distillery | Feb. 1, 6-8 p.m.

District 2:
Roger and Brian Ehrich - Sumner | TBD

District 3:
Service and Supply Co-Op - Center | Feb. 8, 6-8 p.m.

District 4:
Seed and Farm Supply - Lamar | Feb. 22, 6-8 p.m.

District 5:
Marshall & Fenner Farms | Jan. 10, 6-8 p.m.

District 6:
Marylou Community Building - Truesdale | Feb. 8, 6-8 p.m.

District 7:
Fischer Delta REEC | Mar. 8, 6-8 p.m.

RSVP Here or Call 573.635.3819

GET MORE FROM MOSOY

MISSOURI SOYBEANS' ANNUAL REPORT

Learn more about what the Missouri Soybean Association and Missouri Soybean Merchandising Council have been doing during the past year!

MISSOURI SOYBEANS' 2024 SEED GUIDE

Checkout the Missouri Soybean Seed Guide to learn more about the varieties funded by your checkoff dollars!

MISSOURI SOYBEANS

HELP US IMPROVE THE *MISSOURI SOYBEAN FARMER*

Missouri Soybeans is seeking YOUR help! We are looking for your input on the *Missouri Soybean Farmer* magazine. Are you enjoying the stories? Do you have ideas for topics? Now is the time for your voice to be heard!

To do this, we ask that you take a short (5-minute) survey and express your opinions on our publication. Respondents will also be entered to win a $100 Amazon gift card!

Complete the survey by Dec. 31 for a chance to win a $100 Amazon gift card. To be entered for a chance to win, include your name, email and phone number.

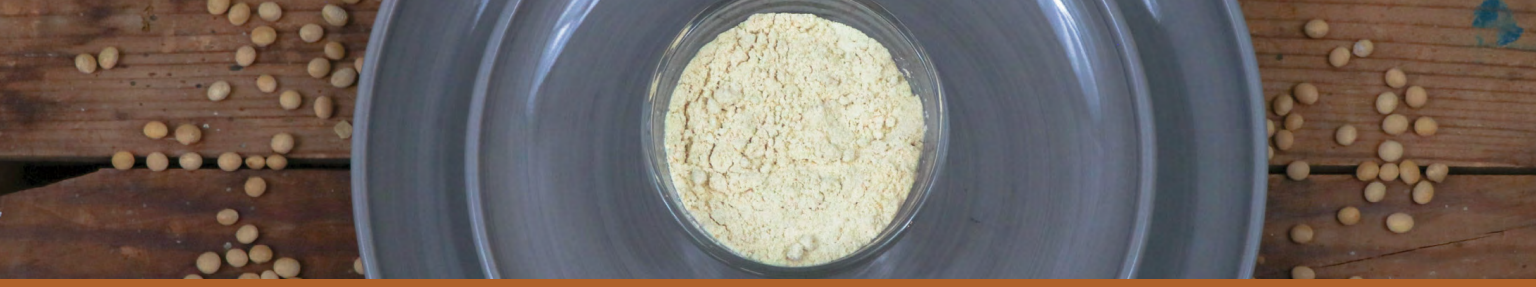
(You can still complete the survey without including your personal information, but you won't be entered to win.)

Take the 2023 Readership Survey for a chance to win!

Scan Here:

Or Visit:

mosoy.org/survey



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