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On behalf of the American Soybean Association

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Introduction

Chairman Delgado, Ranking Member Fischbach, and Members of the House Committee on Agriculture Subcommittee on Commodity Exchanges, Energy, and Credit, it is an honor to testify before you on the impact of the bioeconomy in rural America and what it means for America's soy farmers. My name is Gary Wheeler, Executive Director and CEO of the Missouri Soybean Association (MSA), Missouri Soybean Merchandising Council (MSMC), and Foundation for Soy Innovation (FSI).

MSA is a statewide membership organization designed to increase the profitability of Missouri soybean farmers through legislative advocacy, public policy initiatives, and education efforts across the state. MSMC is a farmer-run organization dedicated to improving the profitability of the Missouri soybean farmer through a combination of marketing, research, and commercialization programs. FSI builds strategic partnerships and leverages resources throughout the soy value chain to advance innovation and grow demand through partnership and scholarship.

The Missouri soy organizations are affiliates of either the American Soybean Association (ASA), which represents America's 500,000[1] soybean farmers on domestic and international policy issues important to the soybean industry, or the United Soybean Board (USB), which invests checkoff funds in programs and activities that advance soybean marketing, production, technology, and the development of new uses. MSA, MSMC, FSI, ASA, and USB are all farmer-led organizations.

America's soybean growers play an essential and growing role in the bioeconomy. It may be obvious to the members of this committee that America's abundant supply of soybeans helps feed America and the world. However, it is likely less known that U.S. companies now also offer approximately 1,000 soy biobased products made with ingredients grown on American family farms—thanks to the versatile chemical composition of soybeans.

When processed, soybeans are divided into protein and oil. Soybean protein (approximately 80% of the bean) is primarily used in plant-based foods like tofu and livestock animal feed, but it is also an ingredient in plastic composites, synthetic fiber, paper coatings, adhesives, and more. Soybean oil (the remaining 20%) is one of the most versatile natural oils; its molecular structure and suitable fatty-acid profile can be used in many applications, including biodiesel.

Bioproducts made with soy protein and oil are sustainable. Unlike fossil fuel-based feedstocks, soybeans capture carbon dioxide from the atmosphere. They also fix their own nitrogen for energy, limiting chemical-based fertilizer applications. In addition, most soybean acreage in the U.S. uses conservation tillage, which disturbs less soil, reduces fuel use, and helps sequester carbon on cropland. End users continue to increase demand for sustainably produced products, and soy growers are ready to help deliver manufactured products with environmental benefits that include lower greenhouse gas emissions, reduced energy costs, lower volatile organic compounds (VOCs), reduced exposure to toxic chemicals by workers, credits toward LEED certification of certain finished products, and reduced processing costs and environmental compliance fees.

There are also economic advantages to using soy in manufacturing and producing consumer goods. Soybeans are renewable and abundant—this year soy growers are harvesting an immense crop of 4.4 billion bushels—which has enabled soy ingredients to maintain an historic price advantage over petrochemical equivalents and has helped reduce America's dependence on foreign oil. Soy-based bioproducts also create jobs. Released in 2021, USDA's most recent report on the economic impact of the U.S. biobased products industry found that American-made biobased products added $470 billion and more than 4.6 million direct and indirect jobs to the U.S. economy.[2]

Across America, cities, communities, companies, and government agencies are transitioning to plant-based products, limiting reliance on petroleum-based products while reducing greenhouse gas emissions. The increased production of biobased products to meet this demand contributes to the development and expansion of the U.S. bioeconomy, where society looks to agriculture for sustainable sources of fuel, energy, chemicals, and products.

Biobased Soy Products

Through the soybean checkoff, U.S. soybean organizations are partnering with major companies and universities to create new rapidly renewable materials made with soy. It would be impossible to walk through the many biobased soy products on the record today, but I am pleased to use this hearing as an opportunity to highlight several soy biobased success stories and outline opportunities that this committee and the Biden administration have to further strengthen the bioeconomy.

In Missouri, we collaborated with the Cole County sheriff's department to demonstrate that Goodyear soy tires perform so well that they meet the demands of law enforcement. The Goodyear Tire & Rubber Company discovered that soybean oil mixes more readily with rubber compounds than other oils and reduces energy consumption, which improves tire manufacturing efficiency. Because of this achievement, Goodyear received the prestigious Tire Technology International Award for Innovation and Excellence in the "Environmental Achievement of the Year" category at the 2018 Tire Technology Expo. Incidentally, this same soy-based technology is now also delivering grip, stability, and durability in Skechers brand running shoes for men, women, and children thanks to a collaboration with Goodyear.

Goodyear's 2020 use of soybean oil increased 73% over 2018 usage, and this year the company announced a new sustainable soybean oil procurement policy and a commitment to phasing out petroleum-derived oils from its products by 2040, using soybean oil in its place.

Another exciting opportunity for highways, buildings, and more is PoreShield™, a revolutionary soy-based concrete protector that is the result of a partnership between Perdue University, Indiana Department of Transportation, and the Indiana Soybean Alliance. In addition to providing long-lasting concrete protection, PoreShield™ prevents pollution by replacing traditional, toxic concrete protectors and sealants, reducing VOCs by 90%, and eliminating the need for harmful solvents. As a nontoxic product, PoreShield™ is safe for the environment and

workers and requires no personal protective equipment while applying. The product received the 2021 Indiana Department of Environmental Management Governor's Award for Environmental Excellence, and it also drew the attention of the U.S. Department of Agriculture, which invited Indiana soybean growers to highlight PoreShield™ at the U.N. Climate Change Conference (COP26) this month (Nov. 2021).

According to the Federal Highway Administration, there are more than four million miles of paved roads in the U.S. On average, 400 bushels of soybeans are used for every two-lane mile receiving a full surface PoreShield™ treatment. Using soy in such sustainable road construction and maintenance presents countless opportunities to support U.S. soybean farmers and boost local economies.

Soy has also demonstrated success in construction and paving by winning the American Chemical Society (ACS) 2021 Cooperative Research Award in Polymer Science and Engineering for "putting soy-based thermoplastics to work in the construction industry." The United Soybean Board and the Iowa Soybean Association contributed to research on a soy oil polymer that can replace petroleum-based polymers in asphalt paving. The cost-effective asphalt biobased polymer debuted in 2019, and it has been demonstrated in multiple municipalities and tested in 30 states. The soy-based polymer improves performance even while it promotes environmental stewardship—not only because it's biobased, but also because it allows for more recycled asphalt content. Importantly, soy-based polymer is cost competitive with asphalt paving materials that depend on foreign oil instead of U.S.-grown soybeans.

To highlight an exciting bioproduct currently in development, MSMC is partnering with Dr. Ram Gupta of the Kansas Polymer Research Center at Pittsburg State University to develop biodegradable, soy-based, high-performance golf balls. In general, golf balls are made of three layers: core, inner layer, and outer layer. We plan to use soybean-based composites for the core and soybean oil-based polyurethane coating as the outer layer. Golf is played by more than 60 million people around the world. In the United States alone, over 24 million people enjoy playing the game, including more than 8,000 professional players. More than 850 million golf balls are produced every year to fulfill that demand, but many are lost on the course or in the water and are never recovered, permanently cluttering natural areas. Utilizing soybean materials to serve this $550 million market will support agriculture and make the game of golf more eco-friendly, or what I like to call staying green on the green!

It's critical that we continue to push the envelope when it comes to new market uses and soybean research. The unique relationships between land-grant universities and checkoff investments drive innovative technologies and traits that become industry standard. In one successful public-private partnership, the Curators of the University of Missouri and the USDA Agricultural Research Service are joint owners of the patent for SOYLEIC®, and MSMC is the exclusive licensee. The patented process is the product of a partnership between the University of Missouri, USDA, MSMC, and USB.

SOYLEIC® is a non-GMO, high-oleic seed trait that can be incorporated into today's soybean varieties, resulting in high oleic oil and meal. High oleic soybeans can be used in high-

performing industrial applications. They also lack trans fats and have an extended shelf life, and the oil is more stable in baking and frying, helping create nutritious food for humans and feed for animal diets.

This type of public-private partnership is key to the success of growing a renewable rural America. The demand for high oleic soybeans is growing significantly, creating diversified and value-added options for farmers and opportunities for downstream customers in the U.S. and abroad. Proceeds from the sale of soybean varieties developed through the research program are then reinvested into soybean research—and growing demand and preference for U.S. soy around the world.

Soy-Based Biofuels

When talking about the benefits of soy-based bioproducts, perhaps there is no better example than soy-based biofuels. Biodiesel, renewable diesel, and sustainable aviation fuel are made from a variety of readily available feedstocks, including soybean oil. After the Food and Drug Administration started regulating trans fats in 2006, the demand for soy oil for food dropped significantly. Around the same time, we were developing new cooking oil options like high-oleic, soybean growers and others also worked to promote commercial production of biodiesel made from soybean oil—a biobased product that supports farmers and rural communities and diversifies our fuel supply while reducing emissions.

The growth of the biodiesel industry, and more recently the renewable hydrocarbon diesel industry, has been spurred by strong federal and state-level policies that promote cleaner, lower-carbon energy sources, including the Renewable Fuel Standard. Biodiesel offers lower emissions solutions in the transportation and heating sectors, among others. With just under half of the homes in the northeast still reliant on home heating oil in the colder months, biodiesel blended into "Bioheat®" offers a lower-carbon alternative that meets state low-carbon standards while sparing homeowners from retrofitting their home heating systems. Looking toward the transportation sector, as the administration seeks to move toward an electric vehicle-focused approach to lowering GHG emissions, biodiesel and renewable diesel can offer GHG emissions reductions of at least 50% compared to petroleum diesel in aging vehicles that still require liquid fuel and in heavy-duty vehicles that are more difficult to electrify.

Of note, government and corporate entities around the country are already utilizing biodiesel as an opportunity to achieve lower emissions. For example, New York City requires all 11,000 city fleet vehicles to use biodiesel—from vehicles used by the police and fire departments to those used by the department of sanitation and other off-road city equipment vehicles. New York City also uses Bioheat® to heat municipal and private buildings across the city. Other cities like Washington, D.C. are also transitioning their fleets to biodiesel. In 2018, D.C. used 120,000 gallons of biodiesel in its vehicle fleet, which resulted in 1,000 fewer tons of GHG emissions. Last year, the D.C. Department of Public Works announced it would begin running 17 garbage trucks on B100, or 100% biodiesel—an 86% GHG emissions reduction from a traditional petroleum-fueled garbage truck. The results are so clear that the city plans to double the size of

its B100 vehicles in the next year. Through funds granted by EPA's Diesel Emissions Reduction Act program, D.C. Water Authority is expanding its use of B100 to 31 vehicles where it also benefits worker health. Soy farmers are proud of the success of biodiesel not only for the new market opportunities the fuel created for us, but also for being able to grow a clean energy solution right in our fields. Many of us use biodiesel in our own farming equipment.

Center for Soy Innovation

In Missouri, our own organization is setting an example by using these products. Our new Center for Soy Innovation in Jefferson City, Missouri, opened in March 2020 as a collaboration between MSMC, MSA, FSI, and other partners. The center showcases soy-based building materials and demonstrates new uses for soybeans, and it serves as a hub for biobased business development and incubation. Our living, hands-on displays illustrate the decades of research made possible by American soybean farmers and our industry partners, who continue to find new and innovative uses for soy. Some of the soy-based products on display include:

- Biodiesel, which powers the center's furnace.
- Columbia Forest Products' PureBond® plywood. The soy flour-based PureBond® adhesive won an EPA Green Chemistry Award and represents the first cost-competitive, environmentally friendly adhesive that replaced toxic urea-formaldehyde (UF) resin.
- Huntsman's Building Solutions's Heatlok® soy spray foam insulation. A high-performing versatile spray foam made with 14% renewable soybean oil and recycled plastics. Heatlock® is used in a wide variety of applications, including insulating the underside of bridges and tunnels. It can provide strength to structures and reduce water seepage and damage from freezing and thawing.
- Sherwin Williams paint, which received an EPA Presidential Green Chemistry Challenge Award in 2010 for its breakthrough paint formulation that uses both soybean oil and recycled plastic bottles. This technology eliminates use of thousands of barrels of oil and hundreds of thousands of VOCs.
- Signature Flooring high-performance carpet with soy backing, which offers a durable solution for commercial, high-traffic installations, has excellent moisture resistant properties and emits low VOC levels for improved indoor air quality. The Pentagon installed similar door mats in 2010 and continues to use them as a durable, cost-effective solution to help reduce the environmental footprint of the world's largest (and heavily trafficked) office building.
- SYNLawn® artificial turf, which uses soybean oil to displace 60% of the petroleum in its backing. This same turf is installed at Kennedy Space Center's Visitor Complex in the rocket launch viewing area and in more than 200,000 other installations in the U.S. plus 19 other countries. The SYNLawn® company is adding 10% more soy to its products in 2021 and will start using sugarcane and other agricultural products as well.
- Cargill's Anova, a biobased asphalt rejuvenator, is featured in our parking lot. This product offers an important benefit, as it allows for increased use of recycled asphalt.

The Center for Soy Innovation was a $4 million investment in the Jefferson City community, bringing capital, jobs, and visitors to the region. There is no other facility like it, aggregating a soy education center, conference space, and research facility all under one roof. I invite all the members of this committee to visit the center for an up-close look at the soy biobased industry in action.

How can the government support biobased?

Biofuels policy

The federal government is in a unique position to support and promote biobased products and the bioeconomy through policy and purchasing power. Since 2005, the federal government has supported growth in the biofuels sector through the Renewable Fuel Standard (RFS). The RFS, paired with other supports like USDA's Higher Blends Infrastructure Incentive Program, increases access to and demand for biofuels across the country. Unfortunately, over the past several years, EPA has failed to release annual Renewable Volume Obligations (RVOs) under the RFS in a timely manner. Failure to update these volume obligations has created uncertainty in the biofuels market, which directly impacts biofuel producers and has a negative downstream effect on growers. To date, the administration has yet to fulfill its statutory requirement to release its 2021 or 2022 RVO under the RFS. Without action on RVOs, the administration is missing a prime opportunity to promote lower-carbon fuel options for consumers and continues to stymie biofuels industry growth due to a lack of certainty in federal support.

Federal procurement and coding

Beyond biofuels policy, the federal government has a unique opportunity to support the bioeconomy through its purchasing power. The U.S. government is the single largest consumer in the world, purchasing more than $550 billion in goods and services each year. Through the 2002 Farm Bill and subsequent farm bills, federal purchasing requirements for biobased products have been mandated and expanded. This requirement in the Federal Acquisition Regulation, supported by the USDA BioPreferred program, spurs growth in the biobased sector while creating new markets for soybean growers. Since 2002, ASA has supported farm bill provisions that created and enhanced the Federal BioPreferred Program at USDA. ASA has encouraged USDA to actively promote the use of biobased products to federal agencies and other buyers.

Because someone develops a better product by using biobased content, it unfortunately does not mean that product has a guaranteed buyer. Federal agencies have a huge opportunity to drive demand for these products by doing what the Farm Bill promotes, which is to buy biobased products that are designated by USDA's BioPreferred Program.

Much like the USDA BioPreferred program, the North American Industry Classification System (NAICS)—the standard used by federal statistical agencies in classifying businesses for the purpose of collecting and publishing statistical data about the U.S. economy—can be a tool to help spur growth in the biobased products space. NAICS is used domestically for various contracting and tax purposes, like state governments offering tax incentives for specific NAICS-

coded industries. NAICS is also used by several federal agencies for procurement programs, requiring a NAICS code be provided for each good or service procured. Unfortunately, NAICS does not currently include codes for biobased products manufacturers.

Through the 2018 Farm Bill, Congress issued a statutory directive to the Department of Commerce to develop a NAICS code specifically for biobased products manufacturers in coordination with USDA. Since that time, all annual revisions of NAICS codes have excluded biobased products. Without a NAICS code, many biobased products manufacturers get buried in other product classification codes that do not properly identify their products (e.g., plastic, chemicals, packaging, etc.). Without these dedicated codes, data collection, statistical reporting, and consumer trend tracking are nearly impossible, thus hampering growth in the bioeconomy. ASA has urged the Office of Management and Budget, through its annual NAICS revision process, to heed Congress' directive to include a specific code for biobased products.

Research and community development

Aside from federal procurement and coding, the government's support of research and community development can advance the renewable economy in America.

Federal support of land-grant universities and extension services is especially critical, and soy growers support increasing funding for these rural fixtures. These institutions are responsible for educating the next generation of farmers, ranchers, and citizens; through public-private partnerships—such as the collaboration that created SOYLEIC®—they provide the foundation for America's leadership in research and development; and by fostering innovation and entrepreneurship, they boost communities and economies.

Another exciting new development is the inclusion of a pilot program in the bipartisan infrastructure bill to study the environmental benefits of biobased construction materials and consumer goods. As mentioned earlier, soybean farmers have long supported the development of a wide variety of biobased products and are hoping that this pilot program will provide another opportunity to highlight the benefit of these products—especially soy-based construction materials, which have proven success in projects administered by state departments of transportation but have yet to be utilized by the U.S. Department of Transportation (DOT).

Furthermore, USDA, DOT, Department of Defense, and other agencies can use their programs to promote use of biobased products across the nation through their partnerships with states and local communities. There will never be a robust bioeconomy without leadership that literally paves the way for others to see that biobased products perform as well as—or better than—alternatives. It is essential that federal agencies incorporate biobased products throughout their programming.

Lastly, we are grateful that funding from USDA Rural Development contributed to the construction of our Center for Soy Innovation. Rural development programs can drive community demand for biobased products during the USDA-supported construction of local buildings and infrastructure projects. Rural communities would benefit through increased

demand for biobased products using the very same products grown in local farmers' fields, while at the same time contributing to the sustainability of USDA-supported facilities.

Conclusion

Chairman Delgado, Ranking Member Fischbach, and members of the subcommittee, thank you again for the opportunity to testify on the importance of biobased products and the significant contributions of America's soybean farmers to the bioeconomy. The nation's 500,000 soybean farmers are unified in their effort to grow market opportunities by providing the best raw materials to create sustainable, biobased products. U.S. soy farmers are leaders when it comes to using leading-edge technologies and best management practices to increase economic and environmental sustainability, and I am grateful for the opportunity to represent my peers in the soy industry here today.

The soy industry stands ready to work with the committee and subcommittee, Congress, and the Biden administration to help grow the bioeconomy, create jobs, and enhance American sustainability.

Thank you.

1 USDA National Agricultural Statistics Service

2 Daystar, J., Handfeld, R.B., Pascual-Gonzalez, J., McConnell, E. and J.S. Golden (2020). An Economic Impact Analysis of the U.S. Biobased Products Industry: 2019 Update. Volume IV. A Joint Publication of the Supply Chain Resource Cooperative at North Carolina State University and the College of Engineering and Technology at East Carolina University.

Gary Wheeler
Working Bio
June 15, 2021

Missouri's soybean farmers selected an innovative and committed servant leader to helm the Missouri Soybean Association, Missouri Soybean Merchandising Council and Foundation for Soy Innovation. Gary Wheeler is a deeply engaged advocate for partnerships and the power of forward-thinking who has led Missouri's soybean organizations through significant operational and strategic challenges with a track record of success.

Wheeler holds a Master of Business Administration from William Woods University and a Bachelor of Science degree in agricultural business from Murray State University. He previously served Missouri agriculture in roles with the Missouri Department of Agriculture, Missouri Corn Growers Association and Missouri Corn Merchandising Council. Wheeler also served in the Missouri Army National Guard.

Beyond his professional role, Wheeler enjoys spending time with his family, golfing, reading and on other outdoor pursuits.