

INSIDE: KING SOYBEAN - COULD ACRES SURPASS CORN IN 2018?

# IOWA SOYBEAN review®

February 2018



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**Kirk Leeds**

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## Investing Checkoff Dollars

*“Investing should be more like watching paint dry or watching grass grow. If you want excitement, take \$800 and go to Las Vegas.” - Paul Samuelson*

Paul Samuelson was an American economist, the first American to win the Nobel Memorial Prize in Economic Sciences and likely the most influential economist of the second half of the 20th century.

Although I have virtually no understanding of the “science” of economics and I couldn’t wait to complete the handful of economics classes I took at Iowa State University years ago, I have found this quote from Dr. Samuelson to be worthy of consideration. Successful investing requires patience and a long-term view. It requires a certain amount of discipline to not get overly distracted by current trends or fads.

Today in the soybean world, we are facing the daunting task of selling more soybeans to reduce the significant carryover caused by the year-after-year record-setting

global soybean harvest. The U.S. Department of Agriculture (USDA) is projecting U.S. ending stocks of 530 million bushels this year. Clearly, we have plenty of beans to sell.

The farmer directors on the Iowa Soybean Association (ISA) board who have the responsibility to invest the state’s portion of the national soybean checkoff and other non-checkoff resources understand that a longer-term view of supply and demand is a prudent approach. Yes, we need to do all we can to sell more soybeans, but we also recognize that it was not that long ago when the U.S. was short of soybeans and we lost market share to South American producers.

Farmers also understand to remain competitive, ongoing efforts to reduce costs and increase yields – while doing so in an environmentally sustainable way – are critically important to their financial well-being. As I have been told countless times by farmers across the state, selling more soybeans at a price below their cost of production doesn’t significantly help their bottom line.

Over the next few months, ISA will be reviewing all our current investments to make sure that our efforts continue to provide maximum value and have the greatest possible impact for the farmers we serve. As we look to the future, we must be prepared to deal with the very real possibility that U.S. soybean production will soon reach 5 billion bushels a year. How do we best partner with others to sell this sizable crop?

The future also promises ongoing and increasing competition from other soybean growing regions of the world and other competing products. How do we best partner with others to ensure Iowa soybean farmers remain among the most competitive in the world?

The decisions that need to be made might not be as thrilling as an \$800 gambling spree in Las Vegas, but the potential long-term impact of these investments are certainly of greater importance.

## HELPING YOU DELIVER ON DEMAND

Whether it’s improving soybean meal to outperform the competition or sharing the growing opportunity of high oleic soybeans, the soy checkoff has been working behind the scenes to help farmers satisfy their customers’ needs. We’re looking inside the bean, beyond the bushel and around the world to keep preference for U.S. soy strong. And for U.S. soybean farmers like you, the impact is invaluable.

See more ways the soy checkoff is maximizing profit opportunities for farmers at [unitedsoybean.org](http://unitedsoybean.org)







**Carol Balvanz**

Policy Director, Iowa Soybean Association  
 cbalvanz@iasoybeans.com

## ISA's Research Legacy

The Iowa Soybean Association (ISA) is recognized for excellence in enhancing the long-term sustainability of Iowa soybean farmers. That's our vision statement. Sometimes vision statements are just words. But having worked for ISA for the past 12 years, I can tell you that this one is backed by action.

Many of you have recently attended the ISA Farmer Research Conference held in early February. The conference, run by farmers for farmers, highlights each year's work in ISA's On-Farm Network®, Environmental Programs & Services, and Analytics teams, which include more than 500 farmer participants across the state. The field trials, watershed plans and conservation structures these farmers put in place provide data for the rest of Iowa's farmers as we seek long-term sustainability and crop production improvements.

This farmer-led research effort requires ongoing sources of funding.

The Iowa Legislature has provided a base for generating investments through an appropriation to the Integrated Farm and Livestock Management Program (IFLM). The \$375,000 appropriation is leveraged into 10 to 15 times that amount through outside grants and farmer checkoff support, providing the resources for ISA to study and demonstrate innovative practices in soil and nutrient management, water quality and cropping systems. The legislature has recognized the value of these farmer-led research programs, and we appreciate their continuing support.

Most organizations gain legislator support through Political Action Committee (PAC) financial support directly to candidate campaigns. At ISA, we don't have a PAC, and therefore, do not have PAC dollars to distribute. We encourage our members to contribute to the candidates who they feel best represent their interests. As an organization, we offer legislators

the currency of credible and unbiased data and information.

The data and results compiled by our On-Farm Network, environmental and analytics teams directly benefit farmers and bring real-world scenarios to legislators, most of whom don't farm. We are frequently asked to testify before legislative committees and provide information to legislators working on specific bills. We also fund studies on various topics to provide legislators with Iowa-specific information that's rooted in farmer reality.

Research isn't always a hard-to-read report produced by academics. ISA's On-Farm and environmental research puts real data from real farmers in the hands of decision makers. We believe the information pays dividends for legislators who are working for a sustainable future for all of Iowa.



## Gold Club Recognition

The Iowa Soybean Association (ISA) Gold Club is a unique level of membership made up of a diverse group of contributors. From individual farmers to small businesses to large corporations, Gold Club members not only support the association's programs, they also enjoy special benefits. For an annual investment of \$500, Gold Club members have complimentary access to ISA events and services and enjoy free tickets to popular farm shows.

We offer our sincere appreciation to Gold Club members, and we thank them for their support and involvement with the Iowa Soybean Association. We welcome new Gold Club members and encourage you to consider joining the group. For more information, contact Heather Lilienthal at hlilienthal@iasoybeans.com to learn how this level of membership can benefit you, your customers and the state's soybean industry.

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- 4 tile water samples evaluated
- Recognition in ISA publications and website.



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# LEADERS IN THEIR FIELD

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“Win each day,” advises Jim Knuth of Farm Credit Services. “When you do, you’ll not only win the day, but the week, months and years. That’s the true path to success.”

The comment was directed to a room of farmers and agricultural advocates attending the Iowa Soybean Association (ISA) recent annual awards banquet Dec. 14 in Ankeny. Recipients included up-and-coming leaders, long-time research innovators and committed environmentalists from around the state. Those recognized for outstanding service to the soybean industry and Iowa agriculture include:



## Rising Star

**Andrey Shirbroun, Farmersburg**

The Rising Star Award, presented by Farm Credit Services of America, recognizes an ISA member’s son or daughter who actively promotes agriculture on the local or national level and plans to continue ag studies in college. Andrey Shirbroun, son of Joe and Suzanne Shirbroun, is a senior at Central Community School District and has been actively involved with ISA to discover the importance of research and data collection, including participating in a rootworm beetle survey and collecting tile water samples from his family’s farm. Shirbroun plans to attend Southwest Wisconsin Technical College to major in ag business and pursue a career in agronomy retail. The award includes a \$1,000 stipend to assist Shirbroun with educational expenses.



## New Leader

**Sam Showalter, Hampton**

Sam Showalter was presented the New Leader Award, sponsored by DuPont Pioneer, based on his involvement and commitment to promoting the soybean industry and agriculture. Showalter is a fifth-generation farmer, raising soybeans, corn, hogs and cattle with his family on their Franklin County farm. In addition to being an active ISA District Advisory Council member, he was one of 10 participants in the United Soybean Board’s 2016 *See for Yourself* Program to the Panama Canal and Costa Rica where he gained a firsthand look at the impact Iowa’s soy checkoff dollars have domestically and abroad.



## Innovator in Production Research

**Lindsay Inc., Masonville**

The Innovator of Production Research Award was presented to Lindsay Inc. of Masonville. Sponsored by John Deere, the award recognizes leadership in the use of production technology to discover, validate and effectively manage practices to improve efficiency, profitability and competitiveness of Iowa soybean farmers.

Lindsay Inc. — comprised of Dennis and Barb Lindsay and their two sons, Brian and Jeff and their families — has conducted many nitrogen and fertilizer trials through the On-Farm Network® and recently participated in research examining nitrogen modeling, seed inoculant and fungicide trials.

Though he’s driven by data, Dennis Lindsay reminded the audience that what may work one year may not yield the same results the next year.

“Ultimately, Mother Nature has the final say in what works and what doesn’t,” he says.



## Friend of the Iowa Soybean Farmer

**Rep. Helen Miller, Webster County**

The Friend of the Iowa Soybean Farmer Award was presented to Rep. Helen Miller for championing the importance of agriculture among to fellow legislators. Miller is in her eighth term in the Iowa House of Representatives and serves on the Administration, Rules and Agriculture House Committees, in addition to the Ag/ Natural Resources Appropriation Subcommittee. In 2011, Miller also founded the Urban-Ag Academy to inform legislators from non-agricultural districts of the issues affecting rural Iowans.

“Those of us who work around ag policy, ask ourselves how we can involve legislators in the conversation and the Urban-Ag Academy does just that,” says Don Brown of Cargill, the award sponsor.



## Environmental Leader

**Nick Meier, La Porte City**

The Environmental Leader Award, presented by Monsanto, was awarded to Nick Meier, a long-time conservationist in Black Hawk County and recognized environmental leader for farmers across the state. From replicated strip trials and long-term cover crops trials to the installation of a saturated buffer and bioreactor, Meier practices many conservation efforts in conjunction with ISA’s On-Farm Network® — a program he considers instrumental to the success on his farm.

“It’s humbling to receive this award,” says Meier. “ISA works very hard to make our water better; I’m pleased to do my part.”

## Legacy of Leadership

**Mark Jackson, Rose Hill**

Sponsored by Stine Seed Company, the Legacy of Leadership Award was presented to Mark Jackson of Rose Hill. Along with his wife JoAnn and son Mike, Jackson grows soybeans and corn and manages a wean-to-finish swine operation on their Mahaska County farm. Mark has served ISA since 2003 on various committees, including research, market development and legislative. Mark is past president of ISA and served nine years as a director with the American Soybean Association. He is also past chairman for the county Farm Bureau and Natural Resources Conservation Service (NRCS), and a past director on the Iowa Soybean Promotion Board.

“It’s about leadership, passion and commitment,” says Jackson. “I’m surrounded by leaders who are dedicated to making the soybean industry better, and I’m humbled that peers would recognize the small role I’ve played in that pursuit.”







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## USDA Focuses on Exports, Soybeans Lead the Way

By Matthew Wilde

There's renewed emphasis to increase agriculture exports at the U.S. Department of Agriculture (USDA) that will benefit soybean farmers.

Daniel Whitley, associate administrator of USDA's Foreign Agriculture Service (FAS), delivered that message to farmers and soybean industry officials in late November during the U.S. Soybean Export Council (USSEC) International Marketing Dialogue in St. Louis. With another record soybean crop to sell, attendees were all ears.

The desire to move more U.S. commodities, meat and other agricultural products abroad starts at the top with U.S. Secretary of Agriculture Sonny Perdue and Ted McKinney, USDA undersecretary of trade and foreign agriculture affairs, Whitley says. FAS links U.S. agriculture to the world to enhance export opportunities and global food security.

"We're fortunate to have Sec. Perdue — this guy gets it," Whitley says. "He understands trade and the importance of agriculture.

"And, Undersecretary McKinney eats, sleeps and breathes exports," he continues. "He's already visited Colombia, Panama and India. Our focus is to leave no stone unturned."

The nation exported \$140.5 billion in agricultural products in fiscal year 2017, Whitley says. Soybeans accounted for about 17 percent of the total at \$24 billion.

Nearly 2.2 billion bushels of U.S. soybeans were exported in 2016/17, according to government data. More than 1.33 billion bushels were sold to China, the nation's top export customer.

Recently released USDA projections peg 2017/18 soybean exports at 2.16 billion bushels, down 65 million from previous estimates based on slower purchase commitments through December and increased competition. The nation's farmers produced nearly 4.4 billion bushels of soybeans last year, according to the USDA Annual Crop Production Report released last month.

Whitley told farmers FAS, along with industry partners like USSEC, will do everything possible to boost sales abroad. "Nobody outproduces and outcompetes American agriculture," he says.

The annual two-day Marketing Dialogue helps shape USSEC programs and direction for fiscal year 2019 and beyond. That includes investing soybean checkoff dollars in initiatives to build demand and preference for U.S. soybeans and soy products.

Iowa Soybean Association Chief Operating Officer Karey Claghorn is encouraged the USDA wants to increase exports and work with industry partners around the world to do so. In addition to its Washington, D.C. staff, FAS has a global network of 93 offices covering 171 countries.

"The partnership between FAS, USSEC and other government agencies is critical to keeping markets open and working through barriers and other trade issues that pop up," Claghorn says.

A recent example is USDA, with the help of USSEC, working to find a practical solution to China's concerns of

foreign material (FM) in U.S. soybeans — primarily weed seed of quarantine concern. All shipments exceeding 1 percent foreign material will now receive an additional declaration on phytosanitary certificates and a "systems approach" will be implemented to reduce it.

Whitley contends China is and will likely always be the nation's No. 1 soybean export customer. Last year, the country purchased \$15 billion worth of U.S. soybeans outpacing No. 2 Mexico nearly tenfold at \$1.6 billion.

"It's vital we in Washington, D.C. understand your (farmer) interests to keep those markets open and open new markets," Whitley says.

Public-private partnerships are key to farmer success, Claghorn adds. So are checkoff investments in USSEC and other trade organizations to provide technical assistance to livestock and aquaculture farmers and other end users to build preferences for U.S. soy.

"That drives demand," Claghorn says.

*Matthew Wilde can be contacted at [mwilde@iasoybeans.com](mailto:mwilde@iasoybeans.com).*



*At a U.S. Soybean Export Council event, Daniel Whitley, associate administrator of the U.S. Department of Agriculture's Foreign Agriculture Service, reassures farmers that increasing soybean sales abroad is a high priority. Photo by Matthew Wilde.*



# KING SOYBEAN?

Acres for the legume could surpass corn in 2018

By Matthew Wilde

**S**oybeans may become the nation's acreage king this year, but corn will still don the crown in Iowa.

If analysts' and U.S. Department of Agriculture' (USDA) projections are realized, soybeans will supplant corn as the dominant crop nationwide for the second time ever and for years to come. It's an acreage shift, financial experts say, that farmers need to take into consideration when formulating marketing plans.

Private analytics firm Informa Economics IEG (IEG) predicts, as of late January, farmers nationwide will plant nearly 91.2 million acres of soybeans and about 89.2 million acres of corn this spring. Soybeans and corn accounted for 89.5 million and 90.9 million acres, respectfully, last year, according to USDA data.

The government estimates soybean and corn plantings at 91 million acres each this year. The USDA Prospective Plantings Report is set for release March 31. USDA acreage projections for 2019-2027 favor soybeans over corn by as much as 4 million acres each year.

The acreage gap gradually narrowed the last few years due to economics and increased soybean demand, says IEG Vice President Bill McCary, director of acreage and production. The company's surveys of farmers and agribusinesses point to soybeans sliding into the top spot after several years of excellent yields.

"Right now, soy is the winner," McCary says. "If you consider yields, prices and cost, beans pencil out better. Plus, if something goes wrong, you're risking less with soybeans."

The soybean-corn price ratio after harvest through December, when most seed-purchase decisions are made, was

about 2.6-to-1 or higher, McCary says. Any ratio over 2.5-to-1 typically favors soybeans.

Government statistics show national soybean yields averaged 49.5 bushels per acre last year. That ranks second all-time behind 2016 at 52 bushels per acre. Prior to 2004, average yields only exceeded 40 bushels per acre once and haven't dipped below that mark since.

"The yield potential of soy makes me even more comfortable projecting a large soybean planting," McCary continues. "2016 was jelly-side up for soybeans; it will take a while for farmers to forget that result."

## Demand equals acres

Chad Hart, Iowa State University

Extension and Outreach economist and crop markets specialist, leans toward USDA's near- and long-term acreage projections. Though he wouldn't be surprised if soybeans topped corn by about 700,000 acres as IEG surmises due to soaring protein demand.

Global demand for soybeans has grown 229 percent since 1990-91, industry records show. Corn is up 123 percent during the same time.

"That's where soybeans have the advantage," Hart says. "Demand for corn is pretty good, but the last seven years, soybeans have set records."

Profit potential also makes soybeans an attractive crop, Hart says.

Oilseed analyst John Baize of Falls Church, Virginia, is in the IEG acreage camp.



John Baize, oilseed analyst from Falls Church, Virginia, says soybean demand has outpaced corn and other crops perpetuating acreage increases.

International soybean demand will likely keep growing by more than 551 million bushels a year, Baize says, as the middle class in Asia grows and adds protein to their diets. China leads the way, importing 60 percent of the soybeans traded globally. The USDA predicts overall Chinese imports will grow by about 110 million bushels to nearly 3.5 billion, possibly more, this marketing year.

"It does signal, barring some big issue, that soybean plantings will be at or above corn for the foreseeable future," Baize says.

## Production and marketing

U.S. farmers produced a record 4.43 billion bushels of soybeans in 2017, USDA data shows. Despite good demand, March soybean futures traded just below \$9.75 per bushel in early January — hovering near break-even for many producers, depending on yields and production costs.

Barring a weather disaster, McCary doesn't expect a price surge anytime soon given 2018 acreage expectations.

"If I were a farmer, I would probably sell the board now," he says.

Baize adds, "Farmers better look at hedging a substantial portion of their crop at a price they can live with. Prices could fall through the floor."

## Homegrown

In Iowa, IEG predicts 10 million acres of soybeans will be planted,

equal to 2017. The company projects 13.2 million acres of corn, 300,000 less than last year, according to the USDA Acreage Report.

Hart says soybean acres could slightly increase statewide. The livestock, ethanol and processing industries, along with entrenched infrastructure, almost ensures more corn will always be raised in the state, officials say.

"In northwest Iowa, I think you will see more soybeans," Hart says. "Like the Dakotas, beans are yielding better. and some farmers are returning to a corn-soybean rotation rather than continuous corn, which dominated the area for a while."

Sean Blomgren, an Iowa Soybean Association member and seed dealer from Boone, wouldn't be surprised if soybean acres exceed 10 million statewide. Farmers started returning to 50/50 rotations four years ago, he says.

"I think that trend is continuing," Blomgren adds. "My customer base already is predominantly 50/50. When you have \$9 soybeans and \$3 corn, soybeans pencil out a lot better."

The DeKalb and Asgrow dealer says companies do a good job anticipating seed demand.

"I don't see any indicators that forecast availability will be an issue," he says.

Matthew Wilde can be contacted at [mwilde@iasoybeans.com](mailto:mwilde@iasoybeans.com).

## SOYBEANS ACRES COULD SURPASS CORN FOR FIRST TIME IN 34 YEARS

The only time soybean acres exceeded corn nationally was in 1983 due to the USDA's Payment-in-Kind (PIK) Program. Nearly 63.8 million acres of soybeans were raised compared to 60.2 million acres of corn. The program compensated farmers not to grow certain crops such as corn to reduce production. Soybeans weren't included. Farmers either received money or surplus grain. Nearly 16 million acres of cropland was taken out of production.

Source: USDA



# A NEW NORMAL?

Soybean checkoff investments in research are paying off

By Matthew Wilde

**S**oybean yields are soaring. It's no accident, according to scientists and industry officials. Public and private-sector research to increase and protect yields and improve agronomic practices are working.

From 2014-16, new all-time highs were set in stair-step fashion culminating in a whopping 52 bushels per acre, according to U.S. Department of Agriculture (USDA) data.

Last year, the nationwide average was a second-best 49.5 bushels per acre despite much of the Soybean Belt experiencing varying levels of drought. Prior to 2004, average yields only exceeded 40 bushels per acre once and

haven't dipped below that mark since.

Have soybean yields hit a new normal?

"Hopefully yes," says Ed Anderson, Ph.D., Iowa Soybean Association's (ISA) senior director of research. "We're starting to see an accelerated increase in the rate of genetic gain and yield potential."

"I think that soybean checkoff investments in academic and production research, combined with industry investments — primarily breeding for yield and yield protection — are paying off," he continues.

There's no doubt favorable weather, particularly in August, fills pods,

experts say. Ample August rain in 2016 allowed Iowa farmers to harvest a record 60 bushels of soybeans per acre, on average. Last year, August was relatively dry, and the statewide average was 56 bushels per acre, ranking No. 3 alltime.

Dennis Lindsay, a former ISA director from Masonville, says 5.3 inches of rain in August of 2016 contributed to his "best soybean crop ever," averaging 66 bushels per acre. Last year, 1.3 inches in August resulted in yields averaging in the mid-50s per acre.

Research to drive genetic gain and yield potential; protect plants from diseases, pests and adverse climactic conditions; and help farmers make better agronomic decisions not only allow plants to amply produce when the weather and other conditions are favorable but limits yield reductions when conditions aren't favorable.

"I still believe Mother Nature holds the trump card every year," Lindsay says. "But the genetics and events going into soybeans are definitely paying off."

## Going up?

Since the 1970s, Anderson says soybean yield increases have averaged about .45 bushels per acre annually. Approximately one-third of the increase can be attributed to agronomics and cropping systems improvements. Two-thirds of improvements are due to ongoing breeding for increased yield potential and yield preservation. ISA and the North Central Soybean Research Program (NCSRP) invest soybean checkoff funds in public-sector research to boost and protect yields.

Here are a few examples:

- About \$55 million has been provided by ISA to Iowa State University's (ISU) soybean breeding programs and crop protection research, such as finding ways to limit sudden death syndrome and soybean cyst nematode losses, among other areas of study.
- The Iowa Soybean Research Center was created at ISU in 2014 as a way to build more public and private partnerships for production research programs that are important to the entire soybean industry.
- In NCSRP's 25-year existence, it's invested about \$45 million in soybean research at multiple public universities, including an ongoing project to accelerate genetic yield gain and yield potential in soybean breeding lines. The study uses high-density DNA marker data and genomic data simultaneously in a single predictive model to make yield predictions.

"The faster and more accurate we can make selections, the quicker we will develop higher yielding cultivars," says Aaron Lorenz, Ph.D., an assistant professor in the University of Minnesota Agronomy and Plant Genetics Department, co-leading the NCSRP yield improvement study.

The goal of checkoff research investments is to enable yield increases of .6 bushels per acre in 5-10 years and 1 bushel or more within 15-20 years, Anderson says.

It's possible the .6 goal may be met, Anderson says. Researchers are working to find out.

"Time will tell if the last few years of incredible yields are due to optimal growing conditions, the research going into genetics and agronomics or both," he says.

Scott Irwin, Ph.D., a national and international leader in the field of agricultural economics at the University of Illinois, recently examined the reasons behind exceptional soybean yields the last several years.

While not an easy task to disentangle the complex impacts of weather, genetics and management on yields, he used a crop weather regression model to estimate the separate impacts of weather and technology, which includes genetics on yields going back to 1970.

Results show that U.S. average yields in 2014, 2015 and 2017 could be explained by the continuation of the linear improvement in technology and good growing season weather.

## Industry push

A Monsanto executive recently told farmers and industry officials that record yields are primarily the result of the industry pouring resources into soybeans since the mid-1990s. Monsanto's research and development budget in 2017, which includes soybeans, was more than \$1.6 billion.

The company's work in molecular genotyping, DNA, molecular markers and seed chipping technology — some of which is done at its Ankeny research facility — have contributed to yield advancements, according to Warren Kruger, Ph.D., Monsanto North American Varietal Crops Breeding Lead.

He says technology, modern plant breeding, traits — engineering plants to tolerate herbicides like glyphosate and dicamba — and better germplasm is unlocking yield potential.

"The lines of the breeding technologies at Monsanto are improving the rate of genetic gain over historic rates," Kruger says. "It's very impressive what the investments in soybeans have yielded."

## On-farm research

Production research also plays a vital role in soybean yield enhancement.

Lindsay, whose family won ISA's 2018 Innovator of Production Research Award, says the organization's On-Farm Network® is an invaluable asset. It works with farmers across Iowa to conduct trials to learn firsthand what does and does not work for their operation.

"I can't put a dollar amount on it, but we benefit," Lindsay says.

Beck's Superior Hybrids focuses on its Practical Farm Research program to help customers increase soybean yields. It conducts unbiased agronomic research on seed treatments, row width and population, fungicide and other agronomic items.

Research shows Beck's Escalate SDS™ seed treatment increases yields, on average, 8-10 bushels per acre.

"There's a lot of value to growers in the studies we're doing," says Doug Clouser, product lead.

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Dennis Lindsay, a former Iowa Soybean Association director from Masonville, believes soybean demand has spurred research spending contributing to yield hikes.







# MAKING THE CASE FOR PUBLIC RESEARCH

By Allison Arp

Common sense would say to double a product’s output, inputs would have to be increased as well.

As farmers know, the agriculture industry doesn’t always follow conventional wisdom. Between 1948 and 2011, soybean yields doubled. During that same time, the amount of land available for farming decreased by 25 percent and farm labor decreased by 78 percent. The explanation for this improbable result? Research. Specifically, public research.

Investment in public research and development grew quickly between 1948 and the 1980s, but with an exception of a small surge from 2009-2012, investments have slowed. The Iowa Agriculture and Home Economics Experiment Station (AES) at Iowa State University (ISU) provides the infrastructure (faculty scientists, staff support, facilities) that makes public agriculture research happen. The current AES state appropriation is about what it was 23 years ago (1995 = \$30 million; 2018 = \$29.9 million).

If funded public research declined, would farmers notice? The answer is, probably not right away. According to the USDA, accumulated results from past research investments have kept agricultural research moving forward.

In addition, when a research project is funded it can take anywhere from two to 10 years to make it to production, so the research funded today may not have an impact until the late 2020s. Once a project does make it to production, its impact can last decades.

“Public sector research is the foundation of modern agriculture,” says Kendall Lamkey, chair of the Department of Agronomy at ISU. “Most of the genetics farmers are growing in their fields now trace their pedigree to the public sector. To me, the value and return-on-investment in public agricultural research have been greater than that of any other research.”

One of the ways publicly funded research is so important in furthering agriculture is the sector’s dedication to developing fundamental science. This process emphasizes long-term improvements rather than short-term rewards, meaning it gets less attention both from privately funded researchers and the farming public in general.

According to Ed Anderson, Iowa Soybean Association (ISA) senior director of research, publicly funded institutions are more likely to produce innovations than privately funded research.

“PUBLIC SECTOR RESEARCH IS THE FOUNDATION OF MODERN AGRICULTURE.”

— KENDALL LAMKEY



Kendall Lamkey, chair of the Department of Agronomy at ISU, says public sector research is the foundation of modern agriculture.

“While many exciting innovations, technological advancements and useful products are conceived and developed in industry, public research institutions are more often the center and source of the most creative, innovative and ground-breaking scientific, engineering and technological discoveries,” says Anderson.

The new and innovative discoveries made by public research are found on a quest to answer the question ‘why.’ According to Lamkey, one of the major differences between public and private research is wanting to know why.

“The big role of our public research is to answer the fundamentals and the why of how things work,” Lamkey says. “Private research isn’t always interested in the why. It’s enough for them to measure response. They don’t need to know why it responds, just that it does.”

Getting a response out of a product made by private research is an important part of productivity but knowing the why behind the product’s success is the value public research brings to farmers.

If a fungicide product successfully combats a disease pathogen, farmers need to know why to improve future management. Was the application timing perfect? Is the product especially effective against the disease pathogens present? Was there any disease pressure for the fungicide to work against? Publicly funded research at universities, such as ISU, looks at the opportunities and issues farmers have and helps them determine why they are happening and what they can do about them.

Conducting the research is only the beginning. Getting the results to farmers for them to use is a crucial aspect of agricultural research. According to former ISA director Sheila Hebenstreit,



farmer access to research results is the most beneficial aspect of public research.

“One of the best things about public research is that it’s accessible to everyone,” the Jefferson, Iowa, farmer says. “Farmers, industry experts,

everyone can take that research and put it right to work, whereas when it comes from the private sector, it’s on a for-profit basis. I’m not opposed to that, but once it’s proprietary, then it’s not available to everyone – the public-sector information is open-access.”

Another benefit of public research for farmers is the ability to have geographically relevant data. Funding for ISU projects means the research will be conducted on Iowa soils with Iowa weather conditions. Regionally funded research through the North Central Soybean Research Program addresses issues that may cross state borders but will still have an impact across the Midwest. Privately funded research is often done on research farms in one

state, and then the data is presented for all soybean-growing states and growing environments. While this data can be helpful, data collected in a farmer’s own state or region can be more applicable for decision making.

An important factor brought up by Lamkey, Anderson and Hebenstreit is the role of public research in training the next generation of scientists.

“The public sector is where the new researchers are trained as agronomists, breeders, pathologists, etc.,” says Hebenstreit. “While those students may go into private or public research after graduation, they will have a good base of training from their university.”

Much like the research done by the public sector, the students they train will have an impact on the future of the agriculture industry for decades. Whether the student works for a private company or begins their career in the public sector, eventually the research ends up where it can do the most good, in a farmer’s field.

*Some information in this article came from the USDA.*

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Greg Tylka

# MAPPING UNCHARTED TERRITORIES

By Carrie Laughlin

## First-of-its-kind research and new partnerships drive opportunities for Iowa Soybean Research Center

The Iowa Soybean Research Center is just moving into its third year and already making a huge impact on the soybean industry.

An ongoing project funded by the center is researching how soil microbes affect the structure of soybean roots in a first-of-its-kind study. The goal of the research is to understand how root genetic diversity and the microorganisms surrounding the roots in the soil affect the soybean plant.

“This project is something not being studied anywhere else in the world,” says Greg Tylka, Iowa State University (ISU) professor of plant pathology and

director of the Iowa Soybean Research Center. “These ISU researchers are the only two people executing this type of research for soybeans. Iowa’s Soybean Research Center is focused on how to grow better soybeans.”

The ISU researchers are creating a map of the microbiome on different parts of the soybean root system and seeing how the microbiome changes as the plant grows.

After the changes are mapped, the researchers will work on identifying how microbes affect root growth — and which microbes can withstand low phosphorus, drought and high-

temperature stress. Understanding microbes impact on root growth could help improve plant growth and health — an important step in growing better soybeans and providing opportunities for creating new soybean varieties.

Projects like this are central to the mission of the Iowa Soybean Research Center. The center is a partnership between ISU and the Iowa Soybean Association (ISA) and is housed in ISU’s Agronomy Hall. The center works to facilitate collaboration between public and private entities aimed at meeting the needs of Iowa soybean farmers.

### Building more partnerships

Moving forward, the center hopes to create more partnerships with farmers and the ag industry to better identify pertinent and unique research topics.

The first step was hiring Steve May, a market development and ag communications consultant, who will focus on expanding the center’s research partnerships.

Ed Anderson, Ph.D., ISA director of research, says the addition of May to the Iowa Soybean Research Center is not to replace or remove the current checkoff, agency and company investments at ISU. May will build more research partnerships that may be viewed as broader scoped in bringing value to farmers and the soybean industry.

“Steve has many years of experience working with companies to build relationships and funding support for our On-Farm Network® and similar groups,” Anderson says. “This year, we decided to work with Steve to let him gain a better and deeper understanding of the center, and then to leverage his knowledge of companies and company decision-makers to help us try to promote and build interest in the center and generate paid memberships for the Iowa Soybean Research Center Industry Advisory Council (IAC).”

IAC members, consisting of farmers, researchers and ag industry professionals, provide input on basic and applied soybean research priorities and projects, especially those not considered company-specific and highly proprietary, and then contribute funds for the development of the best researchers and research directed at those priority areas.

Tylka says a goal this year is to broaden the range of partnerships

from technology providers and seed dealers to ag equipment retailers, co-ops and grain elevators.

“The center’s approach is to start with ideas from farmers or the industry,” Tylka says. “It’s exciting and how we want the center to work. Adding new and diversified partners will ultimately help us identify



Steve May

new and unique research needs.”

May says his previous work experience in ag publishing helped him learn how to uncover opportunities within organizations.

“Large organizations have a unique budget process, and by working in that environment, it helps to understand who, and how, to approach them,” May says. “The exciting part about the Iowa Soybean Research Center is we have access to world-class intellectual capital. We have the opportunity to unite shared values from growers, the industry and the university for the common cause of advancing soybean production.”

### Farmer connections

Since the Iowa Soybean Research Center relies on farmer input to drive research, connecting with soybean farmers is vital.

“The center provides and facilitates several opportunities for farmers and university researchers to interact,” Anderson says. “The center hosts the IAC meetings, and three soybean farmers sit on the council. It has hosted a campus and experiment station tour and cookout, researcher group tour and farm visits as well as two think tanks which have brought many researchers and farmers together to discuss current work and future priorities.

The center is working to expand future ISU faculty and staff farm tours to include visits three times a year in the spring, summer and fall.

The Iowa Soybean Research Center also launched a website last fall where farmers, academic researchers and industry professionals can find updates on research projects, news, podcasts, videos and a calendar of events.

The website can be found at [iowasoybeancenter.org](http://iowasoybeancenter.org).



“THE CENTER PROVIDES AND FACILITATES SEVERAL OPPORTUNITIES FOR FARMERS AND UNIVERSITY RESEARCHERS TO INTERACT.”

— ED ANDERSON





# THE BUTTERFLY EFFECT

By Carol Brown

The loss of a little butterfly could have big implications for Iowa farmers.

The eastern monarch butterfly population has decreased 80 percent during the past two decades. The United States Fish and Wildlife Service (USFWS) will decide in 2019 if the iconic orange and black insect should be considered a threatened or endangered species.

The consequence of such a designation, ag leaders say, could lead to new regulations and restrictions on herbicide and pesticide use.

Iowa State University (ISU) began the Monarch Conservation Consortium in 2015 to help restore monarch habitat and increase their population, which could be advantageous for farmers.

The consortium, which includes the Iowa Soybean Association (ISA) and representatives from 42 other organizations, encourages farmers to make changes on the landscape — planting and preserving milkweeds — to help monarchs and themselves.

“If a stable population of migrating monarchs is going to be sustained, there needs to be enough breeding habitat available to complete its lifecycle in Iowa and across the entire breeding range,” says Theo Gunther, ISA’s representative on the consortium.

## Milkweed key

ISA’s policy on pollinators, monarchs and endangered species supports the efforts by the Iowa Department of Agriculture and Land Stewardship and the consortium. Any activity that may be harmful to the monarch could be under scrutiny and accompanied by fines or other penalties. This path is neither beneficial nor desired by any group working with the consortium.

Monarchs lay eggs on milkweed leaves and it is the only plant the caterpillars eat. Although natural milkweed patches can be found in Iowa, it essentially has been eradicated from acreages and roadside ditches.

In prior decades, farmers battled

persistent milkweeds in crop fields. But with effective broad-spectrum systemic herbicides, milkweed has been controlled. Now, the consortium is asking farmers to put milkweed back.

## Strategy to help

The consortium released a plan for improved habitat last summer — the Monarch Conservation Strategy. Iowa is in the center of the monarch’s summer breeding range. According to a U.S. Geological Survey (USGS) study released in April, as many as 1.6 billion milkweed stems may be needed in North America over the next 20 years to help replenish the monarch.

Over the last three years, Iowa Conservation Reserve Program (CRP) seedings that include milkweed and pollinator plants have increased by thousands of acres.

“By establishing high diversity mixes within CRP, managing and/or replacing existing vegetation with seed mixes that benefit the monarch,

landowners and farmers are creating healthy environments for all pollinators,” says Amanda De Jong, Farm Service Agency (FSA) state executive director. “Together, these insects are responsible for pollinating more than one-third of the foods we eat and 80 percent of plants.”

## Farmers take action

Nonproductive crop acres can maintain pollinator plants and not interfere with growing crops. Jeff Frank, ISA District 4 director and farmer near Auburn, planted a pollinator plot this fall.

“The tract is a little over 11 acres and wasn’t currently in CRP,” says Frank. “It was on a poorer tract of land and it was an easy way for me to do my part.” He also has noticed pollinator plants, including milkweed in roadside ditches in his area.

Wayne Fredericks, past ISA president and farmer from Osage, says that milkweeds are a non-issue. “If they get into your field, your herbicide will work to eliminate stray stems.” He has converted nearly seven acres to pollinator plots in several fields. These areas weren’t conducive to row crop farming because of soil conditions or difficulty with maneuvering equipment.

“They were areas that showed low profitability compared to the balance of the farm. So, I’ve improved my bottom

line and I am more sustainable,” says Fredericks.

Farmers can offset the profit from the cash crop by enrolling these areas in CRP and use cost-share assistance to purchase seeds. Fredericks receives more money through these payments than what he could from harvesting crops.

## Plant habitat this spring

The USFWS 2019 deadline is imminent and 2018 will be crucial for monarch populations. The USFWS can balance ongoing and planned conservation efforts in their decision on whether to protect the monarch. This makes the need urgent for establishing milkweed and maintaining other pollinator-friendly plants on the landscape and planting days are fast approaching.

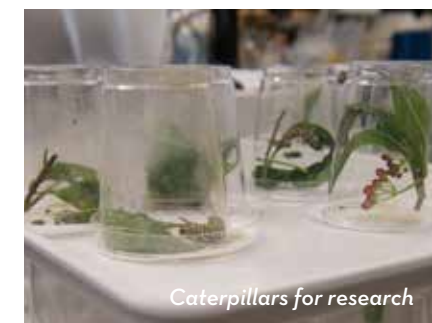
With conscious effort and a community approach involving agriculture, urban and public lands, milkweeds and other pollinator plants can thrive alongside agricultural production.

When Fredericks added his pollinator plant areas, he was doing it for economic reasons. But after seeing the colorful flowers, he has not regretted his decision.

“I usually show these areas first to visitors,” says Fredericks. “The flowering plants are beautiful. I’m proud of the habitat we created for monarchs and other pollinators.”



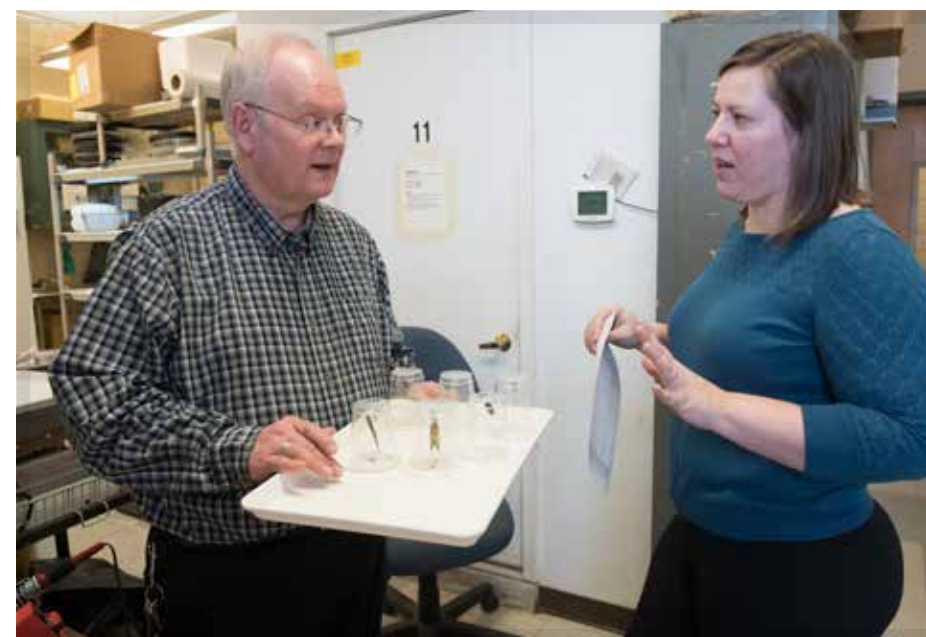
Monarch Butterfly



Caterpillars for research



Milkweed



Keith Bidne, a biological science research tech with USDA agricultural research service, and Dana Schweitzer discuss research projects earlier this year. The Monarch Conservation Consortium at ISU is studying the monarch butterfly and the implications to Iowa farmers.

## How to Help Restore Monarch Populations:

- Take advantage of Farm Bill programs to establish monarch breeding habitat.
- Volunteer to establish monarch habitat on your farm as part of a demonstration project.
- Follow federal pesticide labels and state regulations when applying pesticides labeled as toxic to bees to avoid unnecessary exposure to pollinators and monarchs. Adjust spray equipment to reduce drift by using low pressures, large droplets, and low boom heights.
- Use monarch-friendly weed management recommendations for odd areas, roadsides, and other rights-of-way.
- Establish a Monarch Waystation, a garden with both nectar plants and milkweeds, where monarchs can find food and reproduce.



# BREAKING THE MOLD

By Allison Arp

Seeing a plant covered in white this time of year would be normal and for some even exciting. Seeing a plant covered in white in the middle of July? Not normal, and definitely not a cause for celebration.

Since it was discovered in the Midwest in 1948, white mold, or sclerotinia stem rot, has wreaked havoc for soybean growers across the region. Ranking as the third most devastating disease in soybeans, white mold can reduce yield from 20 to 60 percent depending on the level of infection.

“The last couple years it has been one of the most problematic diseases,” says Daren Mueller, Extension plant pathologist for Iowa State University (ISU). “The only place (in Iowa) where

I don’t see a lot of the disease is in central Iowa.”

While white mold typically prefers cooler temperatures, it has managed to emerge across the state the last few years even with warmer springs and summers. This means there are other factors playing a role in its development.

## Controlling white mold

White mold is harder to control than other pathogens because it develops on the bottom of the canopy and spreads to the stem. The majority of fungicide applications are sprayed on top of the canopy and are unlikely to completely control the pathogen.

“No single practice will provide complete control of white mold,” says Scott Nelson, Iowa Soybean Association (ISA) On-Farm Network® director. “This disease must be managed in an integrated fashion, including genetics, chemical control and cultural practices.”



Research is currently being conducted to help farmers calculate their white mold risk.



## Genetics

In addition to a fungicide application, there are several other options farmers have when it comes to controlling white mold. One of the earliest decisions farmers make could have the biggest impact.

“White mold protection starts with picking a good seed variety that has high levels of resistance,” says Mueller. “Recently, there have been more resistant varieties available, so there are options.”

Some companies will publish resistance scores for certain varieties, showing the potential resistance against white mold. Other factors farmers can look for are short (height) varieties and varieties with a narrower canopy to reduce the humidity among the rows.

## Chemical control

Foliar fungicides cannot offer complete control of white mold, but a well-timed application during early reproductive stages offers the most protection. Some studies have shown post applications of PPO herbicides can increase plant resistance. This past year, the ISA On-Farm Network completed trials looking at the efficacy of a seed treatment against white mold, but the results were inconclusive.

A newer soil-applied biological product is being tested by several farmers across the state. Unlike

other products that work from the top down, this product works to degrade the pathogen within the top two inches of soil. This product is expensive, so again, more research is needed before it can be recommended for farmer use.

“More research needs to be done on the various methods to combat white mold,” Nelson says. “Different combinations of products, practices and varieties need to be looked at to determine the best integrated solution.”

## Cultural practices

To reduce the cool, dark and muggy environment white mold thrives in, farmers with serious white mold issues should consider wider row spacing for their soybeans. Wide rows delay canopy closure resulting in a smaller window for the pathogen to develop and grow.

Rotating infected fields to corn is an option, but like many others on this list, it doesn’t offer complete control.

“Corn isn’t a host pathogen, but the white mold can survive in the soil for a long time,” says Mueller. “It can go through a lot of years planted to corn and the population will continue to drop, but it’s not going to be eliminated entirely.”

As with any disease, keeping notes on white mold is important to future management. Knowing which fields, which parts of fields and the level of disease pressure will indicate how many different strategies might be needed to combat the disease.

## Current research

A practice currently being studied to combat white mold is the use of cover crops. More replications are needed, but early research shows that small grain cover crops could stimulate early white mold mushroom development, reducing the risk of the pathogen infecting the soybeans’ flowers.

One of the biggest developments in managing white mold comes from the University of Wisconsin-Madison. Researchers there have developed a model that predicts the likelihood of white mold being present in a field both while the crop is at a susceptible growth stage and later in

the growing season.

To use the model, farmers input their row spacing information, and based on the weather data collected by the researchers, the model gives farmers their risk level from low (5 to 15 percent chance) to high (30 percent chance or greater). For farmers with a high risk of white mold, the model then offers suggestions on how to manage the disease, taking into account soybean stages and canopy closure.

This model is not yet available for Iowa farmers, but more data is being added every year to fine tune its predictive abilities. The model may expand to other Midwest states in coming years.

Controlling white mold is a complex, multi-step process that needs more research. ISA’s On-Farm Network and ISU researchers are working to improve farmers options against this yield-diminishing pathogen.

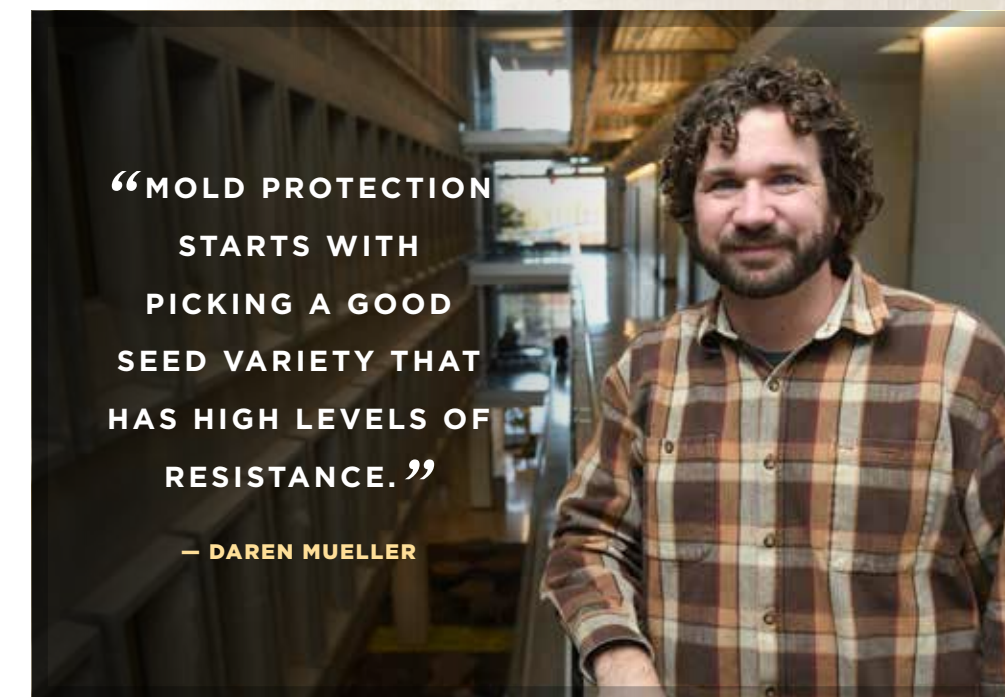
For more information on managing, scouting for and combating white mold, visit [soybeanresearchinfo.com](http://soybeanresearchinfo.com).

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A combination of products and practices is needed to combat white mold.

Disease photos courtesy of Adam Sisson, Iowa State University



“MOLD PROTECTION STARTS WITH PICKING A GOOD SEED VARIETY THAT HAS HIGH LEVELS OF RESISTANCE.”

— DAREN MUELLER



# CHINA TURNS TO FM ON THE SOYBEAN DIAL

By Matthew Wilde



## NEW FOREIGN MATERIAL STANDARDS FOR U.S. SOYBEAN EXPORTS TO CHINA

New rules concerning foreign material (FM) in soybeans have yet to slow U.S. exports to China or negatively affect Iowa farmers, trade and ag experts say.

All U.S. soybean shipments to China exceeding 1 percent FM — weed seed, dirt, stems, etc. — as of Jan. 1 will receive an additional declaration on phytosanitary certificates. Bulk and containerized soybean imports with up to 2 percent FM is allowed, according to a deal struck late last year between the two nations.

Chinese officials in September notified the U.S. Department of Agriculture’s (USDA) Animal and Plant Health Inspection Service (APHIS) of foreign material exceeding their standards — particularly weed seeds of quarantine concern.

“We worked closely with our partners in China ... on a practical solution that addresses their concerns and provides for the uninterrupted flow of U.S. soybeans for our soybean producers and exporters,” says Osama El-Lissy, deputy administrator for APHIS’ Plant Protection and Quarantine Program, in a press release.

The agreement calls for the U.S. to fully implement a series of science-based measures from farms to export terminals, called a systems approach, during the 2018 crop year to reduce the volume of FM and weed seeds in soybean shipments to China. As of mid-January, specific measures haven’t been outlined.

As part of the agreement,

APHIS is required to notify China when a soybean shipment exceeds 1 percent FM.

Some analysts initially speculated the rule could reduce U.S. exports and soybean prices by 15 cents per bushel to compensate for cleaning and blending to meet requirements.

Grant Kimberley, Iowa Soybean Association market development director, says it’s too early to tell how stricter guidelines will affect Iowa farmers.

“Most producers already sell No. 1 soybeans, which contain 1 percent or less foreign material,”

“WE ARE CONFIDENT THAT THIS AGREEMENT WILL ALLOW U.S. SOYBEAN FARMERS AND EXPORTERS TO CONTINUE TO SERVICE THE IMPORTANT CHINESE MARKET WITHOUT INTERRUPTION.”

— JIM SUTTER

he says. “Nothing should dramatically change. It’s more of an issue for exporters to manage. However, farmers should continue to minimize weeds and ensure grain handling equipment is set properly to continue selling high-quality soybeans.”

China is the world’s largest soybean importer. The USDA predicts

overall Chinese purchases will grow by about 110 million bushels to nearly 3.5 billion, possibly more, this marketing year.

The U.S. has little choice but to accommodate its No. 1 soybean export customer, says John Baize, international oilseed consultant from Falls Church, Virginia. More than 1.33 billion bushels were sold to the country in 2016-17 valued at more than \$14 billion, government data shows.

“The trade doesn’t like it, but they will adapt to sell soybeans,” Baize says.

The U.S. Soybean Export Council (USSEC) worked with both governments, exporters and buyers to expedite a workable resolution.

Jim Sutter, USSEC CEO, says the organization will partner with organizations over the coming months and years to promote effective implementation of the systems approach throughout the U.S. soybean supply chain. He believes the changes will improve the quality of U.S. soy exports and build demand.

“We are confident that this agreement will allow U.S. soybean farmers and exporters to continue to service the important Chinese market without interruption,” he says.

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### Special treatment of U.S. soybean shipments over 1 percent FM by Chinese authorities could include:

- Testing FM composition to determine the presence and level of toxic weeds.
- Screening for weeds that will be destroyed by importers/processors, like what the processors are already doing.
- Tracking of the records of U.S. exporters on their performance of weed seed control, which should be done in the U.S. They will send a warning to poor players and even blacklist them if no improvement is made.

Source: USSEC





# CREATING A FUTURE WORTH GROWING

From the first sale of U.S. soy to China to the release of the first soybean oil-based tire, the soy checkoff has been behind the scenes, growing new opportunities and customers for the soybeans you produce. We're looking inside the bean, beyond the bushel and around the world to keep preference for U.S. soy strong. And for U.S. soybean farmers like you, the impact is invaluable.

See more ways the soy checkoff brings value to farmers at [unitedsoybean.org](http://unitedsoybean.org)



## The Last Word

Editor's Notes by Ann Clinton  
[aclinton@iasoybeans.com](mailto:aclinton@iasoybeans.com)



## Soybean Research: Getting into the Weeds

I'm not going to lie. I knew very little about waterhemp back in 1999.

However, when I was tasked with covering my first production research article for the *Iowa Soybean Review*, I was motivated to get it right. I learned all about how checkoff funds were taking a stand against the weed.

Led by Iowa State University (ISU) researcher Dr. Robert Hartzler, the study analyzed the economic impact of waterhemp emerging at different times during the growing season.

At the time, waterhemp was prevalent mostly in southern Iowa but was quickly taking over the state. In fact, one waterhemp plant produces 5 million seeds. Soybean farmers needed to know how to manage it correctly.

That article ended up being one of hundreds of soybean-related research stories I have written over the years. I guess you could say I got into the weeds a little bit . . . not to mention

diseases, viruses and pests . . . as they relate to soybeans.

To date, the Iowa Soybean Association (ISA) has invested nearly \$55 million of soybean checkoff funds in ISU soybean research and Extension and Outreach programs. More times than not, that investment is leveraged with money from industry and other partners.

As an agricultural journalist, that equates into a lot of success stories to write about. To you as a farmer, it means higher-yielding soybean varieties, better plant resistance to diseases and pests and improved management practices.

In this edition of the *Iowa Soybean Review*, we wanted to outline the importance of public sector research. It's an investment you've been making for a long time, but you likely know very little about the specific projects in which your dollars are going. We encourage you to learn more – ask questions.

Check out an awesome website called [SoybeanResearchData.com](http://SoybeanResearchData.com). Farmers can search soybean research projects from all soybean organizations. Read about the scope of the research, how much was invested, objectives of the projects and most importantly, how it benefits you on your operation. You'll be impressed by the amount of comprehensive data that is easily available to you and you'll have a better understanding of how checkoff dollars benefit research projects.

I hope this issue has inspired you to get into the weeds a little bit more yourself. Shoot me a note – let me know what you think about this issue of the *Iowa Soybean Review*. I'd love to hear your thoughts. I'm always interested in the story you have to share.

*Ann Clinton*





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Data from farmer plots, Beck's research, and universities.

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