Successful Succession Strategies
Preparation and Communication Help Reduce the Stress of Passing On the Farm

Today’s Aerial Fungicide Applications Are More Accurate Than Ever

High Fertilizer Costs Make Weed Management That Much More Important
To Spray or Not
To Spray?
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By Vicky Boyd

Up in the Air
Calibration technology improves the performance of aerial fungicide applications, giving growers a viable alternative to ground operations.
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The Hidden Cost of Weeds
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Curt Rincker and grandson, Jace Rincker, stand in harvested corn field on the family farm.
PHOTO: PATRICK PRIEST

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Soybean seedlings on a sunny morning.
PHOTO: GETTY
Turning the Page

During the 16 years since Syngenta launched Thrive magazine, American farmers and their agricultural partners have taken giant steps toward feeding, fueling and clothing an ever-changing world with greater efficiency and success. Many of the people, relationships and technologies that spurred such unprecedented growth have appeared in Thrive.

This issue is no exception. On the pages that follow, you’ll learn about the hidden cost of weeds and the benefits of aerial fungicide applications. You’ll also discover best practices for introducing new products on your farm and gain a better understanding of why succession planning is paramount to safeguarding your family’s future.

As one of the magazine’s founding editors, I can honestly say that sharing these quarterly informational journeys with you — our loyal readers — has been one of the greatest professional honors of my life. Since 2007, you’ve welcomed the stories we thought you’d like to hear into your homes and offices. And, sometimes, when you allowed us to tell your story, you were the featured hero in print whose talents and hard work positively impacted your community and set the stage for a better tomorrow.

But, over the years, like the industry on which it reports, Thrive has advanced technologically and is poised to turn the page to a more robust, easily accessible digital-only format. While this inevitable transformation marks the end of the print magazine, its companion website, SyngentaThrive.com, will build on its success with more breaking news, stories from the farm, videos and interactive content — all readily available to you on your computer, tablet or smartphone.

Admittedly, saying goodbye to Thrive print magazine this quarter is bittersweet for those of us who helped bring its pages to life. But a new day is dawning for SyngentaThrive.com, with an editorial and creative team that is more committed than ever to delivering the information you need to succeed in today’s fast-paced, complex marketplace. After all, Syngenta understands that you deserve nothing less than our best and brightest to help illuminate the exciting road ahead.

SUSAN FISHER
Founding Editor
Syngenta Thrive Magazine

Editorial note: To continue your journey with Thrive and receive the latest agriculture industry news, sign up at SyngentaThrive.com.
Successful Succession Strategies

Open communication and early planning help reduce stress when passing on the farm.

By Amy Campbell

The passing of the head of the family is an emotional event, but when that transition also includes an agricultural business and decades of family tradition, it has even larger implications. By planning in advance for the farm’s future, farmers can protect relationships, finances and the family legacy.

Cari Rincker is an Illinois attorney whose firm, Rincker Law, PLLC, specializes in helping families plan for farm succession. Coming from a farm family herself, Rincker’s experience with farm succession issues is more than professional.

“My father is a farmer, and he’s looking at gradually reducing the time he spends doing physical labor,” she said. “So, as we go through that transition, we’re starting to have more conversations about what’s next.”

It can be difficult to talk to a loved one about the farm’s future, but such conversations lay the groundwork for a smoother transition from the owners to the successors, Rincker says. “The law is one thing, but every family has its own dynamics,” she says. “When you’re talking about money, business and family, a lot of raw emotions can come up, and balancing all that can be quite a dance.”

Having a neutral third party in the room — or on the video conference — can help in those situations, she said, noting that farm succession mediation has become more common over the last 10 years.

Three overlapping components are important in plotting a farm’s future: estate, business and succession planning. Estate planning may include making a will or trust to distribute assets to the intended beneficiaries, whether it’s a farm-specific asset or a more standard personal inheritance.

“I recommend trusts because assets in a trust don’t have to go through probate — they pass to the beneficiaries instantaneously,” Rincker says, noting that a will can take a year to go through probate before the assets are released. “I also recommend a trust because it’s private. It doesn’t ever become public record.”
Business planning includes making the farm a business entity, such as a limited liability company or corporation, to help protect assets.

“A farm or ranch should consider becoming a business entity to reduce personal liability,” Rincker says. “General partnerships and sole proprietorships don’t protect the land or personal assets in a lawsuit.”

Succession planning, on the other hand, spells out who will assume the farm’s operation and in what roles.

“This is the transition of management and knowledge from one generation to the next,” she says. “It’s probably the most delicate aspect, but also the most important. Without that, it doesn’t matter how great your estate plan and your business plan is, you’re not going to succeed in passing the farm business to the next generation.”

Expect the Unexpected

Andrew Branan, an attorney-turned-professor at North Carolina State University who focuses on farm succession planning, says the plan needs to include not just how the farm will pass to the successors, but what happens if, ultimately, it doesn’t.

“One of my successes as a lawyer was a failure of succession,” Branan says.

Branan recounts working with a client who wanted to gift a percentage of his large, profitable operation to his two sons. His client’s plan included a provision for what would happen to those assets if the sons’ plans changed.

“A year or two later the client called and said his sons were leaving,” Branan says. “Fortunately for dad, he was able to hold on to the wealth — his operation wasn’t injured by having two of the principal players pick up their marbles and go.”

Both Rincker and Branan note that the planning components are living documents that should be reviewed and revised as necessary, and that information gathering can be carried out by families while the legal documents are in the works. Basic operation manuals, written procedures and redundancies in access to everything from building keys to account and policy numbers prepare heirs and employees both for the future and for unforeseen events.

“Sometimes I get terrified thinking, ‘If something happened to my father, am I going to be able to find the FSA numbers or get all the details in order to deal with the growing season?’” Rincker says. “I think those are details families need to work on.”

Perhaps most important of all, Rincker says, don’t let perfect get in the way of good.

“Don’t try to have this perfect estate plan right off the bat,” she says. “Just get something in place and then perfect it over time. Because even if you don’t have a will or a trust, there is still a plan — it’s just the plan the law in your state has given you. I think we’d all rather have the autonomy to decide for ourselves how things will pass to the next generation.”

Read articles online at syngentathrive.com
Introducing New Products to the Farm

Introducing new products to your field is intimidating. Our experts share tips to help make sure it’s met with reward.

Q: Why shouldn’t farmers introduce more than 20-30% new products to their farm each year?
A. Michael Moss, head of agronomic technical development at Syngenta: This rationale is based largely on balancing the risk of trying something new versus the potential reward of increased yields from the addition of new technology. Each situation is different. For example, although a particular farmer may not have used a new product themselves, if their neighbor has used it with great success, they may use the new product on a larger proportion of their acreage. Conversely, if a farmer is happy with their current program and has no prior experience with a new product, they may choose to lessen their risk exposure by deploying the product on a smaller percentage of their acreage. To push yield potential and quality of a crop, all farmers would benefit by trying new technologies on their farms each year.

A. Skye Root, founder/CEO at Root Agricultural Advisory and 2022 Syngenta Farm Manager of the Year: Farmers and other decision makers should take calculated risks. Never trying new products is not wise, but constant, broad-scale product changing is far too risky.

Q: What resources should growers turn to when selecting potential new products for their farm?
A. Moss: Many of these products have been tested widely over many years to determine their value to growers. Company product websites, sales brochures, technical bulletins and university and third-party evaluations are useful. Seeking the input from a “trusted advisor/partner” in the farmer’s operation gives a more personal view of the potential fit and utility in the local geography. Advice from company sales and technical teams, retailer agronomists, crop consultants and others are all valuable sources to help understand the local fit of new technologies.

A. Root: Over the last 15 years, the number of new products has increased almost exponentially. That said, those introducing new products today are under unprecedented pressure to immediately “prove” the value proposition with legitimate research, trials and data. Those resources can be useful for farmers to refer to.

Q: How should farmers go about introducing a new product?
A. Moss: Talk with a trusted advisor who has had experience with the product to see what fields, or in what situations, the product is mostly likely to add value on your farm. Choose a field that is large enough to evaluate the product and uniform enough to be able to identify product benefits. For example, if testing a new herbicide product in corn, use a whole field with the same hybrid and other inputs and treat one area with the new herbicide and another area with the grower-standard program for comparison. Once the data is taken, the grower can run return-on-investment calculations to determine the value of the new herbicide versus their standard program.

“Farmers and other decision makers should take calculated risks. Never trying new products is not wise, but constant, broad-scale product changing is far too risky.”
— SKYE ROOT
Founder/CEO at Root Agricultural Advisory and 2022 Syngenta Farm Manager of the Year

“In most cases, a return-on-investment calculation will be needed to determine the level of performance compared to a grower standard program. Yield data is essential to this analysis, as value per bushel rather than cost per acre is the correct way of determining value.”
— MICHAEL MOSS
Head of Agronomic Technical Development at Syngenta
A. Root: Be quantitative and intentional. Don’t just put a new product on the “bad” ground immediately. If possible, compare new products on similar quality ground. Start small but scale up or down over a three- to four-year adoption cycle based on initial results. If the product doesn’t add enough value compared to cost after three or four years, move on.

Q: What should farmers consider when evaluating if a new product works for their farm? What tests should they use and how does data play a role here?

A. Root: Farmers should consider soil tests, production records, aerial imagery and their own records. In-season evaluation, not just at the end of the season, goes a long way. Side-by-side crop comparisons can help show how a product performs against another product or an untreated field.

A. Moss: It comes down to a determination of, “Did the product perform on my farm?” In most cases, a return-on-investment calculation will be needed to determine the level of performance compared to a grower standard program. Yield data is essential to this analysis, as value per bushel rather than cost per acre is the correct way of determining value. Other items of consideration in “did it perform” include speed of harvest, percent of pest control, ease of use and more. Data-based decisions are always preferred when evaluating a new product.

Interviews by Aidan McGreevy

BELOW: Full Trivapro® fungicide bulk tanks await the sprayer in the yard at Haviland, Kansas.
Following Family Footsteps

2022 #RootedinAg contest winner fosters community through agriculture.

*By Olivia Roden*

Lindie Huffman, 2022 winner of the Syngenta #RootedinAg contest, grew up surrounded by tobacco fields and beef cattle while most children were playing with tablets or riding bikes. She moved to the sixth-generation operation when she was just five years old. Her agrarian playhouse, otherwise known as the family farm, sits in northern Kentucky.

“It’s hot, time-consuming and labor-intensive work,” Huffman says. “Our farm was very much about quality over quantity.”

At the center of the operation is the home of Huffman’s grandparents, where she spent countless hours. She worked the land and bonded with her Grandfather Kenny, whom she coined Papaw. He became the most influential person in her life.

An Influential Bond

Huffman, who is passionate about lending a helping hand to all involved in the ag industry, says her desire to serve others is driven by lessons learned from her grandfather. “I realized that I have a servant’s heart and I want to be able to help other farmers,” she says.

Huffman says her grandfather taught her critical ag lessons from a young age that propelled her towards an agricultural career. He taught her about different plants by showing her how to identify blades of grass and picking up leaves around the tobacco fields.

“He was the only person in my family who had gone to university, and he made sure I had that opportunity,” says Huffman. “I went to the University of Kentucky, where he attended.”

Huffman’s story made an impression on both the online voters and the #RootedinAg contest judges, who named her the 2022 grand prizewinner.

“Lindie’s roots in ag run deep,” says Wendell Calhoun, Syngenta strategic marketing and operations manager. “We thank her and everyone who shared their stories. Those stories inspire us to stay innovative for the future generations of the ag community.”

Making an Impact in Ag

Huffman is now an accounting extension agent for agricultural and natural resources at the University of Kentucky. On top of her work in educational programming and community development, she helps local farmers adopt new management practices and find new marketing opportunities.

One of Huffman’s largest projects was growing the Pendleton County Farmers Market from three vendors in 2012 to 34 in 2022. “Farmers markets are a catalyst for community,” says Huffman. The market is now a center where the community connects with food and local growers profit and provide the public with fresh produce.

The farmers market is also home to Sprouts Kids Club, a farmers market-based children’s program that teaches about produce, local food systems and more. Here, children engage directly with farmers by spending tokens as regular market shoppers would.

As part of Huffman’s prize, Syngenta made a $1,000 donation in her grandfather’s name to the Sprouts Kids Club at the Pendleton County Farmers Market. The club educates children about agriculture as Huffman’s grandfather did for her, which is why she

RIGHT: Lindie Huffman, 2022 winner of the Syngenta #RootedinAg contest, stands in her agrarian playhouse, otherwise known as the family farm. OPPOSITE PAGE, CLOCKWISE FROM TOP LEFT: Huffman, as child, poses in tobacco field with Papaw Kenny. Huffman, as child, with Papaw Kenny on tractor. Huffman and Papaw Kenny reminisce about her childhood on the family farm. Gravel path winds through the family farm past shelters and fences to the barn. Papaw Kenny, the inspiration behind Huffman’s career of agricultural service.
chose it as the donation’s recipient. The donation will provide the children with access to more opportunities to learn and connect with agriculture.

“I think that there’s power in storytelling and opportunity in letting people know where their food comes from,” says Huffman. “It builds relationships with the consumer. My mission is to keep farmers farming and to keep families fed through access to local foods.”

—I Lindie Huffman
2022 Winner of the Syngenta #RootedInAg contest
Protecting yield potential and the disease triangle should factor into your foliar corn fungicide decisions.

By Vicky Boyd
BELLOW: Justin Bellcock (left), corn and soybean farmer and Ryan Ploeger (right), Syngenta AgriEdge specialist, use a tablet to access the Cropwise platform. BOTTOM LEFT: Healthy ears of corn await harvest. BOTTOM CENTER: Justin Bellcock (left), corn and soybean farmer and Ryan Ploeger (right), Syngenta AgriEdge specialist, use the Cropwise platform to view crop imagery from Bellcock’s farm. BOTTOM RIGHT: Clean rows of green corn.
Each year, when budgeting for a foliar fungicide application, corn producers weigh fighting disease development with expected returns on investment. But the decision isn’t as simple as it seems, and industry leaders say growers should consider several factors including plant health, hybrid disease susceptibility, weather forecasts, and cropping and disease history.

In addition, AgriEdge® growers may benefit from whole-farm management products available through the Cropwise™ platform for their decision-making around fungicides. The Cropwise platform tracks input costs, provides in-season satellite crop imagery and helps calculate potential ROI, says Ryan Ploeger, Syngenta AgriEdge specialist and certified crop advisor (CCA) in north-central Iowa. “We’re really striving to put a dollar value on the decisions growers make,” he says.

**Beyond Disease Control**

Ploeger says most of his growers apply a foliar fungicide at the VT-R1 growth stage regardless of disease pressure because they’ve seen returns that go beyond disease control.

“What’s driving it is the newer fungicides are more robust and more consistent,” he says. “In a drought year with no disease present, we still see very consistent results because the fungicide is going to help mitigate stress and help the plant use water more efficiently. It’s going to keep the plant cleaner and utilize water more efficiently.”

Mark Baer is a CCA and sales manager for Sun Ag Inc., which has six locations in central Illinois. He says growers in his area typically budget for a foliar fungicide every year. “It’s something they do to protect their investment,” Baer says.

In grower trials, Baer says he’s seen a 5- to 45-bushel-per-acre yield improvement with Miravis® Neo fungicide applied at VT-R1. The wide variation is due to hybrid disease susceptibility, disease pressure, “and everything to do with the environment,” he says.

**A Bird’s-Eye View**

Justin Bellcock, who farms corn and soybeans with his father and brother in northwestern Iowa, says they also typically apply a foliar corn fungicide. He tracks his inputs using Cropwise Financials, an AgriEdge farm management software enabling data-driven decisions.

“We use it in planning so we can figure out how much of everything we need as far as chemicals and seed and other things,” Bellcock says.

A variety of digital tools will be available to growers enrolled in the AgriEdge program with the launch of the Cropwise ecosystem. This season, Bellcock monitored crop progress and plant health three or four times by viewing the platform’s satellite crop imagery. He plans to view it even more frequently in 2023 with the Cropwise Imagery platform. “I’ll look at it more in the future,” Bellcock says of the imagery. “I know the new platform will be a lot better.”

Ploeger agrees, adding it’s another tool AgriEdge growers can use to track fungicide efficacy. “With Cropwise Imagery, it’s showing that the plants are healthier,” he says.
Protect the Plant’s Powerhouse

In Iowa, the foliar corn diseases of concern include gray leaf spot, tar spot and northern corn leaf blight. Alison Robertson, Ph.D., Iowa State University professor and Extension field crop pathologist, says growers need to keep the disease triangle in mind before deciding to apply a fungicide. “To have disease, you need to have the pathogen, a host and the right environment,” she says. “If one is missing, no disease will occur.”

To calculate the risk of disease development, growers should consider the environment, Robertson explains. Fungal diseases need moisture as well as mild temperatures to reproduce.

Leaf moisture, particularly with tar spot, is also a driver for disease development that may come from overhead irrigation, a high dew point or precipitation. “When it’s very dry, we’re not going to see as many of these diseases,” Robertson says. “If the leaves are wet at 8, 9, 10 o’clock in the morning, that’s when you’re going to be at risk for the disease.”

Just before tasseling, Robertson recommends growers and consultants scout the lower canopy for disease. “When you think about diseases, they increase exponentially,” she says. “One spot will grow into ten spots, then 100 spots, then 1,000 spots. Just the presence of a few spots in the field and knowing you have the right conditions for disease puts you at the start of that exponential curve.”

The goal is to protect the ear leaf and those above it since those produce 75% to 90% of the carbohydrates for grain fill. A few spots on the ear leaf likely won’t affect yield, but she says they’re a good indication of conditions conducive for disease development.

“In addition to disease control from fungal pathogens,” says Tyler Harp, Ph.D., technical development lead for Syngenta, “plant health fungicides such as Miravis Neo and Trivapro® can help protect corn plants from abiotic stresses like heat and drought.”

In many cases, Harp recommends a fungicide application at a late vegetative stage (V10 to V12) through vegetative tassel (R1) to avoid potentially limiting yield because of abiotic stress that may occur during grain development.

“On most farms across the corn belt,” Harp says, “we have observed that a plant health fungicide application will provide a yield benefit because it results in a more efficient and productive crop, with proven benefits on longer green-leaf area and improved water/nutrient-use efficiencies. In addition, stalk quality is often improved because diseases and abiotic stresses cause the leaves to drain starches from the stalk, compromise stalk integrity and causing lodging and increased harvest costs.”

Staying Vigilant on Corn Diseases

Fungicides are a critical tool in fighting tar spot and southern rust, each of which can devastate yields. Tar spot, a relatively new disease in Midwestern corn caused by the fungus Phyllachora maydis, typically shows up later in the season.

Because of the potentially devastating effects of this disease, Baer says, “we’re really vigilant watching for that until the corn gets to the maturity level where tar spot won’t be a problem.”

Tar spot’s actual impacts depend on when the crop was planted, hybrid susceptibility, hybrid relative maturity, when tar spot arrives in an area and the environment. “Last year it came in early and was a
“On most farms across the corn belt, we have observed that a plant health fungicide application will provide a yield benefit because it results in a more efficient and productive crop, with proven benefits on longer green-leaf area and improved water/nutrient-use efficiencies.”

— TYLER HARP, PH.D.
Technical Development Lead for Syngenta

real problem,” Baer says. “In 2020, it came in really late, so it had no impact on yield, and this year we hadn’t really seen it.”

And in Arkansas, southern rust — caused by the fungus Puccinia polysora — is the main foliar corn disease, says Travis Faske, Ph.D., University of Arkansas System Division of Agriculture Extension plant pathologist. Fortunately, he says, tar spot has not been confirmed in the state.

Unlike some corn diseases, southern rust doesn’t overwinter in plant residue. Wind currents carry rust spores from tropical areas each year and initially infect corn in the southern United States, Faske says. The spores move north during the cropping season, with environmental conditions playing a large role in potential disease development.

To help growers and consultants stay abreast of spore movement and plan for fungicide applications, the Corn IPM PIPE website (https://corn.ipmpipe.org/southerncornrust/) maps southern rust positive reports.

“If I see Trey Price and Tom Allen in south Louisiana and Mississippi have found it, it will be two weeks before I’ll find it in south Arkansas, then another two weeks before it crosses I-40,” Faske says. “Then it will be another two weeks before it gets to the north parts of the state. This provides a general guide for scouting and so you don’t spray too early.”

Faske emphasizes that the IPM PIPE model is just a tool and doesn’t replace boots on the ground. When southern rust is an immediate threat, he says the best time to make a fungicide application for grain yield protection is VT-R3.

KEY FEATURES

- For disease development, you must have a pathogen, a host and a conducive environment.
- Corn fungicides work best against most foliar diseases applied at late vegetative through VT-R1.
- Scouting and preventive fungicide applications help to ensure maximum value and return on investment (ROI) potential.

RIGHT: Successful harvest underway. LEFT TOP: Justin Bellcock, corn and soybean farmer, studies plant health through crop imagery on Cropwise platform. LEFT CENTER: Proactive applications of certain fungicides can help protect corn from abiotic stressors. LEFT BOTTOM: Ryan Ploeger, Syngenta AgriEdge specialist.

PHOTOS: PATRICK PRIEST & GETTY
Pilot Garrett Lindell, owner of Lindell Aerial Ag Service and executive director of the Illinois Agricultural Aviation Association, ensures his aircrafts make the best possible aerial applications through calibration events.
Calibration technology improves the performance of aerial fungicide applications, giving growers a viable alternative to ground operations.

By Laura Temple
What goes up must come down. Just how aerial fungicide applications come down is essential for efficacy and safety. To help make aerial application viable for growers struggling to make timely fungicide applications, the National Agricultural Aviators Association holds fly-in clinics across the country.

“Every time an aerial applicator makes an application, we want to ensure it is accurate and on-target, while also mitigating risks to the environment and other people,” says Scott Brethauer, Ph.D., NAAA director of education and safety. “This is the goal of Operation S.A.F.E. fly-in clinics, which stands for Self-regulating Application and Flight Efficiency.”

Technology advances continuously improve the quality and reliability of aerial application. Through fly-in clinics, pilots learn how to use that technology.

“We’ve come a long way from dispensing paper out of the plane to determine where the next pass should be,” Brethauer says. “Modern agricultural aircraft use precision equipment, including GPS and automatic flow control systems. S.A.F.E. fly-ins help pilots verify the technology is precisely calibrated so when they go out during the season, they’re giving growers the results they need.”

Garrett Lindell, pilot and executive director of the Illinois Agricultural Aviation Association, also touts the value of calibration events, which he says are held in Illinois twice each year.

“Agricultural aircraft need to be calibrated annually to help us do better,” he says. “For both our retailer and grower customers, calibration gives reassurance that we’re doing a proper job the proper way to serve them well.”

Lindell also owns Lindell Aerial Ag Service Inc., based in Aledo, Illinois. During the winter, he says pilots often adjust nozzles and spray booms on their airplanes. Calibration ensures they’ve improved performance before the busy season.

Demand for services like Lindell’s has grown with the use of in-season fungicides to prevent and control diseases and improve plant health in corn, soybeans, small grains and other crops. He estimates that in-season fungicide treatment makes up about 85% of his business.

“Timely Treatment
The agronomic window for fungicide applications depends on crop maturity, disease pressure and weather conditions. Rain not only can delay application timing, it also can speed up both crop and disease development.

There’s a tight window to apply these products, and we can apply them substantially quicker,” Lindell says. “When it rains, airplanes can get back to work as soon as the weather passes.”

Aerial application often is the better option following rain because running equipment through wet soils causes compaction, and that can lead to long-lasting adverse crop impacts, especially in heavy clay soils, says Blake Miller, agronomic service representative for Syngenta in central Illinois. Plus, growers sometimes struggle to navigate equipment through wet soil and end up rolling over crop rows, reducing yield.

Growers can use aerial and ground applications to capture the value of timely fungicide applications – even when the weather is cooperating.

“Typically, in many corn and soybean production areas, the crop is at the right stage for treatment all at once,” he says. “Aerial applicators can get across many more acres. Ground equipment fits where the topography has trees, river valleys, wind turbines or other features that present greater risks for pilots.”

Applied Technology
Some farmers are uncomfortable with aerial application, which happens at high speeds over their fields.

From those farmers, Miller says, “common questions include, ‘Will applications be accurate?’ and ‘Will the right field be sprayed?’”

Syngenta sponsors calibration events like Operation S.A.F.E. to address accuracy. Miller believes the calibration process ensures growers get the best application possible, especially when coupled with the technology currently available in fungicides.

“Today’s fungicide products work well via aerial application,” he says. “Starting with Trivapro® fungicide, Syngenta reintroduced the SDHI mode of action. We’re able to make that chemistry work well in the field and premix it with two other complementary sites of action for resistance management.”

SDHI fungicides provide residual action that prevent disease and allow most fields to be treated just once, which Miller says is ideal for both farmers and aerial applicators.

“In the face of a disease like tar spot, which now lives permanently in most of the Corn Belt, SDHI chemistry and aerial application work well together,” he says. “Tar spot infects the entire crop in a region within a week. Correctly calibrated airplanes can effectively cover many acres with a residual that can help protect corn from this yield-robbing pathogen.”
Aerial Calibration

Calibration means the right spray volume leaves the aircraft for every acre covered, according to Bretthauer.

“With newer fungicide technology, we know the intended target for the product to land in the crop,” he says. “Calibration tunes the aircraft to apply fungicide in the manner that will get the most out of the product.”

Pilots use speed, airflow, nozzle type and more to push fungicides into the crop canopy, while mitigating drift. For each calibration series, a pilot makes three passes over an established flight line, spraying water containing fluorescent dye. Each series of passes targets a specific spray volume and droplet size goal, Bretthauer says.

Confidence in Coverage

Matt Gill, University of Illinois Extension specialist in application technology, often works calibration events. He helped develop the current software used to analyze data collected from each spray pass.

“This iteration of the software uses new technology to analyze spray patterns,” Gill says. “A digital spectrometer measures the dye captured on the cotton string the planes fly over. It provides a significantly more detailed picture of spray patterns than the previous technology.”

Cotton string and cast-coated paper cards, which are color-sensitive, measure spray deposition during calibration. Using a high-resolution scanner, Gill scans the cast-coated paper cards. The software isolates and measures each droplet stain from the spray, then back-calculates the droplet size that created it. After each stain is measured, the overall droplet spectrum is determined.

During the clinics, pilots receive a report with a pictograph showing their spray pattern and swath width, as well as their droplet size. Using this data, each pilot consults with the Operation S.A.F.E. analyst, addressing areas of concern and other factors to improve application. If warranted, additional calibration passes are made that same day until pilots achieve the desired spray pattern and droplet size.

As a pilot, Lindell uses this information to improve accuracy and show proof of the results.

“I can put my calibration paperwork in front of potential customers to reassure them that we’re doing the best job possible,” he says. “They can see the value of aerial application.”

Typically, in many corn and soybean production areas, the crop is at the right stage for treatment all at once. Aerial applicators can get across many more acres.”

— BLAKE MILLER
Agronomic Service Representative for Syngenta in central Illinois

An Operation S.A.F.E. fly-in clinic addresses three main dynamics:

1. Spray pattern uniformity
Like ground application, aerial application must deposit the same amount of product everywhere. Booms and nozzles are mounted to account for how propellers, wings and helicopter rotors push air around the aircraft and direct liquid flow from each nozzle.

2. Swath width
Aircraft wings create a wake of air that pushes spray down and away, allowing a boom to effectively cover an area wider than its length. Airplanes spray trapezoidal patterns, so each pass partially overlaps to ensure even coverage across the target field. Calibration determines the exact swath width and overlap needed for consistency.

3. Droplet size
Aircraft speed is the dominant factor in determining spray droplet size because the high-speed air around the plane shears the liquid as it leaves nozzles. Droplet size affects plant coverage, so minimizing fine droplets limits drift.
The Sky Is the Limit for Partnership

The partnership between Palmer Flying Service and Syngenta serves retailers and growers.

By Laura Temple

Aerial application of fungicides is a two-step that Suzi Palmer of Palmer Flying Service and Syngenta’s Kelsey Vance perform to the beat of their customers’ farm operations.

Palmer and Vance work together to deliver information on the value of aerial applications, especially for fungicides. For example, they organized a winter meeting for a retailer where Syngenta shared technical expertise, explaining how fungicides applied at early reproductive stages impact yield potential, while Palmer Flying Service explained the technical mechanics behind effective aerial delivery.

“The meeting fostered better understanding of how fungicides and aerial applications may help improve crops,” Vance says. “The retailers’ orders — and their growers’ yields — have increased since then.”

It’s the same each season when aerial agricultural applicators from Palmer Flying Service in Manito, Illinois take to the skies. They apply fungicides and other inputs to thousands of acres of corn, soybeans and specialty crops in central Illinois.

Most of their business comes through ag supply cooperatives and retailers. Aerial applicators quickly and efficiently cover many acres, which is especially valuable when application timing is critical or weather keeps ground rigs out of fields.

Their season starts with aerial dry fertilizer applications in the spring and wraps up with cover crop seeding in the fall. But the bulk of their business is in-season fungicide applications, with insecticides included when needed.

“Complaints are rare because Syngenta products work well. When we do have issues, Kelsey helps us find solutions. In my mind, she is Syngenta. She willingly helps with problems, even when they aren’t product issues.”

— SUZI PALMER
Operations Manager at Palmer Flying Service

Constant Communication

“Communication is key,” says Palmer. “The cooperatives we work with have agronomists who know what their customers need. Our pilots need to know where the field is and what to apply. And the growers need to know when the application will happen.”

Palmer, much like air traffic control, is at the heart of that communication.

Before the season, Palmer and Vance work together, estimating product use for the area Palmer Flying Service covers. They text and talk regularly, ensuring product is where it is needed during the hectic fungicide application window.
Palmer receives orders for aerial applications from local retailers for their customers’ fields. She schedules those jobs and conveys information to the pilots. She calls growers directly letting them know when to expect airplanes to make applications. She even helps load the airplanes.

“I fill gaps between growers and pilots,” Palmer says. “For example, I called a grower to inform him an airplane would soon be on its way to spray. He needed time to move the cows in the pasture next to the field, a detail that hadn’t been included in the information from his retailer. I let the pilot know about the delay and to watch for the cows.”

Technical Education and Support
In May 2022, Palmer and Vance provided technical support to aerial applicators throughout Illinois. Palmer Flying Service hosted a calibration fly-in for pilots, sponsored by Syngenta. Pilots tested their application swath width, evenness of coverage and spray droplet size to prepare their airplanes for the season. This calibration improves the quality of aerial fungicide applications.

To build their knowledge, Palmer and Vance attend regional and national ag aviation conferences together. They also tag team to solve problems that arise.

“Complaints are rare because Syngenta products work well,” Palmer says. “When we do have issues, Kelsey helps us find solutions. In my mind, she is Syngenta. She willingly helps with problems, even when they aren’t product issues.”

“Suzi is a true partner,” Vance says. “We work well together to serve retailers, always in the best interest of growers.”

Relationship Roots
The friendship between Palmer and Vance goes well beyond aerial application. Their fathers attended a rural grade school together in the mid-1960s.

At that time, Kevin Palmer was growing up next to the private airport operation started by his father and a partner in 1957, while Rick Vance was growing up on the farm he eventually took over with his brother.

Kevin was fascinated by airplanes and looked forward to following in his father’s footsteps.

“I was born into aerial application,” he says. “I grew up loading and washing airplanes, doing whatever I could to be around them.”

He began flying at age 15, and he earned certification as an aerial applicator in 1987. He purchased the business in 2005, becoming the owner of Palmer Flying Service. When he needed help about five years later, he asked his daughter Suzi to join the business.

“I’m not a pilot or a mechanic, but I take care of everything else we do, from ordering and billing to unloading product shipments,” she says.

Rick Vance’s love of farming influenced his daughter Kelsey. Her Syngenta territory includes the Vance family farm, where she remains involved, running equipment and providing agronomic support.

Today, Kelsey and Suzi are married and raising their families in their hometowns, though the women are known in ag by their family names. Their teamwork ensures that Palmer Flying Service and local retailers effectively serve farmers like the Vances for generations to come.

• Early-season fungicide application may increase soybean yield potential.
• Syngenta works with Palmer Flying Service to foster understanding of aerial application.
• The partnership ensures aerial applicators provide the service retailers and growers need.

ABOVE: Suzi Palmer (left), Palmer Flying Service manager and Kelsey Vance (right), Syngenta sales representative, work closely together coordinating delivery of fungicides for and aerial applications.
the hidden cost of...
With fertilizer costs on the rise, controlling weeds is more important than ever.

By Cameron Alexander
No grower wants to see their fertilizer investment go to waste, so it’s important to maximize yield potential early in the season by protecting this high input cost. By removing early-season weed competition, growers maximize fertilizer inputs — helping their crops take up essential nutrients. Weeds not only steal water and sunlight from crops, but also take vital nutrients. As fertilizer costs continue to rise, weeds will impact growers’ bottom lines in yet another major way.

What’s Behind Rising Prices?
Many factors contributed to increased fertilizer costs over the past year. “One is increased demand,” says Shawn Hock, U.S. corn herbicide product lead for Syngenta. “There were transportation and distribution challenges as well. It’s a combination of several things.”

Another thing contributing to high prices are the sanctions resulting from the continued conflict between Russia and Ukraine. Belarus is a large producer of potash, and Russia is a large producer of nitrogen and phosphorus. Both countries have struggled to get those products to the world market because of sanctions, and with more trade barriers predicted in the future, the world market may be further disrupted.

Fertilizer prices hit a 13-year high in the spring of 2022 but have slightly decreased since. Regardless, high fertilizer cost remains top of mind for many growers as they head into the next growing season.

The good news: There are ways growers can mitigate high costs and get the most out of their fertilizer investment.

How Can High Fertilizer Costs Be Mitigated?
Growers may be tempted to reduce spending on other inputs, like herbicides, to offset the high cost of fertilizer. But to reach the high yields they’re striving for, a strong weed management program is a necessity.

“In today’s world, farmers are trying to increase yields to achieve record profits,” Hock says. “However, there are a number of rising input costs — not just fertilizer, but also seed, crop protection, land, labor, equipment and machinery. While there’s a chance for record profit, growers are squeezed by rising input costs.”

Hock recommends that growers “leverage investment in variable expenses — like fertilizer, crop protection and seed — to increase yield potential.” An important piece of this puzzle is eliminating weeds before they steal vital nutrients, space, water and sunlight from the crop.

“I would view the control of weeds as a prerequisite to high yield and would argue that the higher the yield, the greater the negative impact of weeds,” says Fred Below, Ph.D., professor and crop physiologist at the University of Illinois. Below points out that weed control starts with a good preemergence herbicide. “If you can stop a weed from germinating in the first place, then it’s not going to compete with the crop for nutrients,” he says.

Weeds reduce the crop’s access to sunlight, water, space and nutrients. A Syngenta study across 20 locations found that weeds as short as two to four inches consumed 13.4 pounds of nitrogen, 0.85 pounds of phosphorus and 16.8 lbs. of potassium. At the time of the study, this equated to roughly $24 per acre in lost fertilizer nutrients alone. The current impact is even greater with increased fertilizer prices.

In addition to using a quality preemergence herbicide, knowing when and where to place fertilizer helps unlock the full potential of the investment. “If you place fertilizer where the crop row is going to be or time it to coincide when the crop roots are available, you can improve its efficiency of uptake,” Below says.

Lastly, know which nutrients already exist in the soil and in what quantities before making decisions on fertilizer investment. A soil test indicates nutrient levels, including those of potassium and phosphorus, and helps growers avoid overspending on fertilizer. That knowledge informs growers on how best to spend their hard-earned dollars.

Should You Invest in a Weed Control Program?
When tackling tough weeds, implementing a full-season approach is important. Starting with a good preemergence herbicide containing multiple sites of action and following up with a post-emergence herbicide with residual control helps ensure weeds don’t get established and rob nutrients from the crop. Growers can
In spring 2022, fertilizer prices hit a 13-year high.
Nutrient-stealing weeds affect profit potential.
A strong weed management program helps crops, not weeds, use expensive fertilizer.

- Carry that momentum into the offseason, keeping the weed seed bank low.
- When it comes to weed control, growers can take a multi-faceted approach,” Below says. “There are preemergent herbicides that prevent the weed from emerging in the first place. And then there are post-emergent herbicides, meaning the weed has emerged and growers are going to make an application in-season to control that weed.”
- Hock reiterates the importance of using multiple active ingredients (AI) in an herbicide program. “Acuron corn herbicide has four AIs, broad-spectrum weed control, long-lasting residual control and excellent crop safety,” he says. “Growers can protect their fertilizer investment by keeping the weeds controlled before they emerge with overlapping applications of this herbicide.”
- Hock recommends growers apply their post-emergence herbicide on their second pass before weeds come up. As an alternate to Acuron®, he recommends using a foundational preemergence herbicide like Lexar® EZ, Lumax® EZ or Calibra™ herbicides, followed by a post-emergence application of Acuron GT or Halex® GT herbicides. When it comes to soybean herbicide programs, growers should consider preemergence herbicides like Boundary® 6.5 EC and Tendovo® herbicides.
- If growers can't control weeds before they emerge, Hock suggests eliminating weeds before they reach one to two inches. However, weeds are already cutting into a growers’ fertilizer investments and stealing vital nutrients by that point. It is also important to check labels for application directions and best practices for herbicide resistance management.
- Making decisions for the new season, high input costs may tempt growers into looking for bundles or “deals.” But reducing upfront costs may also reduce yield potential. Ultimately, the growers who produce higher yields will have the greatest profits, Hock says. That starts with quality weed control and sound agronomic practices.

1 Weed Nutrient Uptake Source: Approximately 20 Syngenta Learning Center Research locations between 2006-2008. Nutrients measured from samples taken from weeds 1-2” and 2-4” in height. Analysis completed by Midwest Labs, Omaha, NE. Period from weed emergence to removal at 1-2” in height was 10 days and 2-4” in height was 20 days. Cost of Weed Uptake Source: https://blogs.worldbank.org/opendata/fertilizer-prices-rise-moderately-2021. Calculations used 28% UAN as the nitrogen source; DAP-(18-46-0) as the phosphorus source and muriate of potash-(0-0-60) as the potash source.
We spend about $50 more per acre on fungicides than some farmers do, but we’re making $250–$300 more per acre by spending that additional $50.”

— TIM MCMILLIAN
Owner, Southern Grace Farms
Control What You Can

Controlling disease at Southern Grace Farms also helps farmer Tim McMillian reduce the yield and quality impact from weather conditions.

By Kaity Lloyd

Tim McMillian, a seventh-generation farmer who operates Southern Grace Farms in southern Georgia, sees two challenges on his farm: one he can't control and one he can.

“We've been blessed to yield well on our farm, and in my experience two things have the biggest impact when it comes to yield,” McMillian says. “The first being water, whether you get too much or too little. The second limiting factor is disease.”

The McMillian family grows cotton, fruit and peanuts. They also own Berrien Peanut Co., which prepares 15,000-20,000 tons of peanuts for shelling each season. Each peanut season, McMillian treats for white mold and early and late leaf spot. “I can remember when white mold was the primary disease that we felt held us and our yields back,” he says.

White mold, a soilborne disease, still is a driving factor, says Wilson Faircloth, Ph.D., a Syngenta agronomic service representative with Syngenta also known as the Peanut Doctor. “The most susceptible parts of the plant are the stems that touch the soil,” Faircloth says. “If fungi colonize a peanut plant, they can destroy plant tissue and kill that part of the plant. Soilborne diseases can take your entire yield if they go unchecked, because they can eventually kill the entire plant.”

In addition to white mold, peanut farmers in the lower Southeast now tackle increasing pressure from a myriad of peanut disease, including early and late leaf spot.

Leaf spot diseases don't necessarily kill the plant, but can cause defoliation severe enough to impair the plant's ability to produce peanuts. “Every leaf is a machine, right? It's a source of energy that sends nutrients down to the developing peanuts,” Faircloth says. “So if you start losing a lot of leaves early in the season, then you just simply don't have enough to feed the developing peanut.”

One of the biggest challenges with late leaf spot, for example, is damage dictating digging decisions. When leaves begin to fall off toward the end of the season and growers must harvest prematurely, it affects marketable yield potential.

Left untreated, these diseases can cause 75% yield loss or more, depending on the level of pressure in a field, Faircloth says. “For white mold, chemistries were introduced that helped boost our yield against that disease,” McMillian says. “And today, although I worry about leaf spot and white mold, they’re less of a yield-robbing issue in our peanut fields because we have strong chemistries to control them.”

Weighing the Options

The question, Faircloth and McMillan note, isn’t whether growers should implement a peanut disease control program, but how aggressive they need to be. Faircloth explains that effective control is achieved before disease appears — think preventive over reactive. A quality disease management program can cost between $85-$150 per acre, depending on products and application rates.

The question for a grower, however, is whether the resulting income justifies the investment.

“We spend about $50 more per acre on fungicides than some farmers do, but we’re making $250-$300 more per acre by spending that additional $50,” McMillian says. “Some farmers try to save that $50 and get by as cheaply as they can, but they’re yielding 1,000 to 1,500 pounds less per acre, which I believe has to do with disease control.”

Faircloth encourages growers to consider three factors when planning their fungicide program:

• Select varieties with higher tolerance of specific diseases
• Rotate crops to cut down on inoculum potential
• Incorporate as many different Fungicide Resistance Action Committee (FRAC) groups as possible
Risk? Or Reward
Low-cost fungicides can be helpful at certain times during the growing season, Faircloth says. However, he sees yield results that show the most effective fungicide programs are built around the newest products and include good resistance management.

Through his research at Virginia Tech, extension pathologist David Langston, Ph.D., sees the economic advantages of using a mix of older and newer chemistries. “It’s good to have something like Bravo brand fungicides that you can rotate and try to preserve these newer, premium chemistries,” Langston says. “But some fungicides are uniquely suited for providing a good return on investment.”

He’s seen those results in multi-product trials that include Miravis® fungicide. “It has shown not just great efficacy on leaf spot, but also excellent residual activity,” he says.

Where some other fungicides need reapplication within a 14-day interval, Langston’s trials show Miravis offers residual activity that extends out 21 to 28 days. Additionally, Langston says, growers who pair Miravis with Elatus® fungicide increase overall disease control.

“You’re picking up great leaf spot control,” he says. “Your white mold control is equivalent to the industry standard, plus it has better residual control, and it manages southern stem rot.”

In a 2020 trial across three locations, Langston found that each of the tested fungicide programs controlled late leaf spot, noting that a Miravis/Elatus combination rotated with Bravo/tebuconazole provided the most significant improvements to late leaf spot control, in addition to showing higher yield compared to other fungicide programs.

Doing More With Less
McMillian grew up watching his father take risks and incorporate progressive farming techniques. This innovative background, and the fact that Miravis was backed by university research, was why McMillian tried the fungicide.

However, telling farmers who have grown peanuts for years they can skip sprays, or extend the application window, goes against patterns that have been ingrained for generations.

“While it can be scary taking that leap, I didn’t mind switching,” McMillian says. “You’re used to putting on an application every two weeks and now you’re saying I can wait up to four weeks? That’s not a small thing. Farming is gambling anyway, but if I’m going to go big with it, I want the data to back me up.”

Many peanut farmers also grow cotton and other crops and may raise cattle, and they want to take advantage of every minute. The expanded residual activity and extended application window gives growers management flexibility they need.

“They’re trying to harvest corn; they need to spray peanuts and cotton,” Faircloth says. “If they can delay the spray on peanuts, they can spend more time on other tasks.” Residual activity also offers peace of mind when a spray is delayed as the result of bad weather, as is common in most peanut seasons in the Southeast.

Langston stresses that any spray program depends on the situation. His advice to growers? Keep it simple: Follow proven advice and don’t try to get cute and cut corners when it comes to using fungicides. “You can’t manage peanut diseases with blinders on,” he says.

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But some fungicides are uniquely suited for providing a good return on investment.”

— DAVID LANGSTON
Extension Pathologist at Virginia Tech

LEFT TO RIGHT: Pulling back the canopy in peanuts to check for signs of disease. Daniel McMillian (left) looks on as father, Tim McMillian (right), discusses peanut fungicide program. Breaking open peanut pods to examine seeds.

PHOTOS: PATRICK PRIEST & DAVID LANGSTON

1 Langston, D. (2020). Fungicide programs to control fungal and soilborne diseases of Virginia-type peanuts. Virginia Tech Tidewater AREC. Suffolk, VA.
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Peanut Rx: Getting the Conversation Started

University researchers developed Peanut Rx, a disease risk index, for growers at a time when tomato spotted wilt virus was ravaging peanut fields, then expanded it to include other diseases. The index helps growers understand disease risk in their fields so they can make customized decisions on their fungicide program.

Plant pathologists from University of Georgia, University of Florida, Auburn University, Mississippi State University and Clemson University annually review disease pressure indices based on different factors, such as:

- variety selection
- planting date
- tillage
- plant population
- field history
- irrigation
- crop rotation

Peanut Rx gives farmers a path to follow to manage their risk and make performance-based decisions.

Brock Ward, a former University of Georgia extension agent who is now an agronomic service representative for Syngenta, says, “Most peanut producers now realize they’re under heavy pressure and need to plan their season with that in mind. The key is if you start clean, it’s easier to stay clean.”

Visit PeanutRX.com to assess your risk and start planning for 2023.

Peanut Rx is a trademark of the University of Georgia.
ECONOMICS OF AGRONOMICS

See the Forest for the Trees

Stay focused with these three strategies as production costs increase.

By David Widmar and Brent Gloy

It’s no secret that production costs will be significantly higher for the 2023 growing season. In the Midwest, the cost of raising a bushel of corn will exceed $5.50 per bushel next year, up from just $3.97 in 2020. Fertilizer remains an enormous source of the upturn, but pressure comes from nearly every budget line item.

Producers usually don’t have much flexibility to offset rising expenses. However, these three strategies help producers progress toward long-term goals despite higher costs.

#1. Be Aware of Availability Bias

Because readily accessible prices have an outsized impact on our thinking, most of us notice rapid cost changes quickly. For example, gasoline prices are posted on signs and updated daily. Prices for other goods and services, such as mowing your lawn or getting a haircut, aren’t nearly as visible. This is known as “availability bias” and occurs when the most readily available data impact perceptions. It’s no surprise managers often focus on categories with readily available prices.

Figure 1 shows the allocation of total production expenses, averaged back to 1991, for a 50:50 corn and soybean rotation in Indiana. Consider the fertilizer, seed and pesticides category which accounted for 27% of total production expenses. The size of this slice undoubtedly varies from year-to-year and looks different in corn than in soybeans, but the idea is that farm managers may spend considerably more than 27% of their attention on these expenses.

#2. Mind Fixed Expenses

The left side of Figure 1 shows the fixed expenses: family labor, land and machinery. Collectively, these expenses account for the majority cost (59%) of raising corn and soybeans and present a few unique management challenges.

First, prices for family labor, land and machinery don’t typically post and update regularly. For instance, a farm’s annual machinery expense is the depreciation, interest, repairs, taxes and insurance expenses of several pieces of equipment utilized over several years.

Second, fixed costs are challenging to calculate, measure accurately and incorporate into budgets. These costs may be predictable two or three years out, but initial measurement is challenging.

Third, fixed expenses can be tough to adjust lower in the short run. For example, a three-year cash rental agreement signed when corn is $7 per bushel will take years to renegotiate if corn prices suddenly change.

#3. Consider a Long-Run Strategy

Producers know that those with the lowest cost accrue significant advantages in the long run. In other words, those with the lowest per-bushel cost are usually the most profitable. So the question is, “How can producers create and maintain a long-run cost advantage?”

It’s important to sharpen the pencil across every category, but in most cases producers find the greatest differentiation and cost advantage within fixed costs. Alternatively, fixed costs tend to create long-term disadvantages.

Availability bias tempts producers to pursue a 5% - 10% advantage on variable expenses, while potentially overlooking more significant opportunities in fixed expenses. In addition to being a large share of total expenses, fixed expenses may offer a greater chance to find a 15% - 20% cost advantage.

Figure 1. Percent of Total Expenses, High-quality Indiana Farmland. 50:50 Corn-Soybean Rotation, 1991-2022

Data Source: Derived from Purdue Crop Budgets, ID-166, Corn-Soybean Rotation.

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ILLUSTRATION: GETTY & AMANDA MORRIS
Wrapping It Up
The allocation of costs looks slightly different for each commodity, but management implications are consistent. First, availability bias is a powerful force often focusing attention on variable expenses. Second, fixed costs are difficult to track but important to monitor in periods of rising prices. It can take several years to lower fixed costs if they get too high. Finally, producers should examine all categories to create and maintain long-term cost advantages. Often, it’s the categories that are hardest to measure and benchmark – such as machinery or family labor – that provide the biggest source of opportunity.

Economics of Agronomics with David Widmar and Brent Gloy

Widmar and Gloy are the co-founders of Ag Economic Insights (AEI.ag). Founded in 2014, AEI.ag helps improve decision making for producers, lenders and agribusiness through: the free Weekly Insights blog, the award-winning AEI.ag Presents podcast featuring Escaping 1980 and Corn Saves America, and the AEI Premium platform, which includes the Ag Forecast Network decision tool. Visit AEI.ag or email Widmar (david@aei.ag) to learn more. Stay curious.
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1 - Acuron yield advantage based on 2016 Syngenta and University trials comparing Acuron to Corvus®, Resicore®, SureStart® II and Verdict® herbicide applied pre-emergence and at full label rates.
2 - Yield results based on 368 non-replicated hybrid/locations in the U.S in 2016-2020.

Performance assessments are based upon results or analysis of public information, field observations and/or internal Syngenta evaluations. Trial(s) reflect(s) treatment rates commonly recommended in the marketplace.

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