

Growing Together

» 2Q | 2019

thrive[®]



**STRATEGIES FOR
COMBATting
CITRUS GREENING**

**COPING WITH
NATURAL
DISASTERS**

No Small Potatoes

**Researcher Makes Major
Contributions to Ag Industry**

syngenta[®]

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Even if you love your print edition of *Thrive*, you'll still want to check out the magazine's website. You'll find more content and links to important resources to help you succeed in today's marketplace. The online version also makes it easy to share specific articles with others.

Scan this QR code to take the fast track to the *Thrive* website, or go to www.syngentathrive.com.



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Kiran Shetty, technical development lead for potatoes, is an enthusiastic supporter of the potato industry.
Photo: Martin Brown

THIS PAGE Brad Kahler, CEO of Fort Transfer, oversees the company's operations from its headquarters in Morton, Illinois. Photo: Seth Lowe

We welcome your story suggestions and comments about *Thrive*.

Please send them to thrive@syngenta.com. For more information, visit the Syngenta U.S. website at www.syngenta-us.com, or call the Syngenta Customer Center at 1-866-SYNGENT(A) (796-4368).

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Thrive is produced quarterly for a nationwide agricultural audience. Its purposes are to update readers on Syngenta products, research, services and solutions, and to provide them with the information they need to succeed in today's complex marketplace.



Working Together

Agriculture is an industry built on relationships. Our need for meaningful human interaction is at the heart of everything we do, everything we are and everything generations yet to come will accomplish. Whether we live in small farming communities or larger cities, we all have a universal understanding that overcoming most challenges is easier with a helping hand or thoughtful advice.

As an industry advocate in our nation's capital, I experience firsthand the power relationships can have in steering key agricultural policies in the right direction. My team at Syngenta is responsible for working with legislators to represent issues important to the future of growers and resellers. But to do our jobs effectively, we can't confine our outlook on these issues to how people inside Washington define them.

As a result, we spend a lot of time outside Capitol Hill, meeting face-to-face with the men and women of rural America, so that we can stay in touch with their reality. Many of us have lifelong connections to these people, because we, too, grew up on family farms that we still visit and help run. In those instances, we not only understand but also live with the impact regulations, commodity prices and trade agreements have on farm income.

The good news is, even in politically divisive times, agriculture can help policymakers find common ground. The passage of the 2018 Farm Bill by more than 85 percent of Congress is proof positive that agriculture is by far the most bipartisan interest in Washington. At Syngenta, we credit this positive anomaly to the industry's strong foundational belief that if we work together, great things can happen.

This issue of *Thrive* shows how strategic coalitions and local partnerships are benefiting our industry. One article looks back at the floods and fires that devastated agriculture in 2018 and the healing power on communities of neighbor helping neighbor. Another article describes how researchers, grove owners and other industry experts are banding together to battle citrus greening, a devastating disease that's changing the landscape of Florida agriculture. Also featured in this issue are the Syngenta Grow More™ Experience sites—living laboratories located throughout the country where Syngenta agronomists work with local growers to help solve crop challenges and maximize productivity.


A common thread in all these stories is the irreplaceable role relationships play in forging goodwill and positive results. As agriculture moves forward, Syngenta welcomes the opportunity to work alongside you, so that together, we can build a better, brighter future. 🌱



MARY KAY THATCHER

“As an industry advocate in our nation's capital, I experience firsthand the power relationships can have in steering key agricultural policies in the right direction.”

MARY KAY THATCHER
Senior Lead
Federal Government Relations
Syngenta

 **WATCH NEW VIDEO** For an in-depth interview with Mary Kay Thatcher, check out the new video posted to the *Thrive* website (www.syngentathrive.com).



What's in Store

Keep current on new products, the latest product updates, news and upcoming events.

NEW PRODUCTS

Epivio Zn Offers Growers Excellent Nutrition in Rice

Zinc deficiency in rice can cost growers up to 40 percent of their yields, due to reduced elongation, resetting and “little leaf,” a disorder that dwarfs leaves often causing chlorosis, necrotic spots or bronzing. To help prevent this deficiency, Epivio® Zn micronutrient seed treatment is now available for use in rice.

Epivio Zn is an EDTA seed-applied micronutrient that is compatible with a number of seed treatments, including CruiserMaxx® Rice and CruiserMaxx® Rice + Vibrance®. Additionally, Epivio Zn features a shelf life of more than three years under correct storage conditions; improved ease of application with less gumming up of equipment, compared with other zinc products on the market; and ready absorption by rice plants.

For more information, visit www.syngenta-us.com/labels/epivio-zn.





A rice paddy flourishes in Texas.

PRODUCT UPDATES

FIRST Trial Results Prove Strength of Golden Harvest Soybeans

According to the 2018 Farmers' Independent Research of Seed Technologies (FIRST) trials, Golden Harvest® soybeans produced 41 Top 3 finishes, beating out both Asgrow® and Pioneer®. While seed company trials are an important data point, third-party data provides an unbiased comparison across seed brands to reveal the top performers.

“The data and insights we gain from third-party trials such as FIRST are extremely valuable,” says Dennis Storm, Golden Harvest soybean product manager. “Year after year, we see superior performance from the Golden Harvest soybean portfolio, which is a result of our advanced genetics combined with the latest traits and technologies to protect against many of today’s toughest threats.”

Nationwide, Golden Harvest had 41 Top 3 finishers and 131 Top 10 finishers in the FIRST trials. Comparatively, Asgrow had 21 Top 3 finishers and 75 Top 10 finishers, while Pioneer only had 19 Top 3 finishers and 62 Top 10 finishers.* Some of the Top 3 varieties from Golden Harvest included soybean brands GH1915X, GH2041X, GH2788X, GH3546X and GH3475X.

Since 1997, FIRST has been providing timely, unbiased comparisons of innovative seed genetics to improve yield and profitability for American corn and soybean farmers. In 2018, FIRST ran tests in 15 states on 686 soybean products from 54 companies.

To find your local, independent Golden Harvest Seed Advisor and learn more about Golden Harvest hybrids and varieties, visit www.goldenharvestseeds.com.

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



Bob Lawless, Golden Harvest agronomist, inspects soybeans at an Agronomy in Action site in Illinois.

Trivapro Proves Its Worth

In the past, fungicides were often the first input corn, soybean and wheat growers cut from their crop-protection lineups. Recently, however, that trend has begun to change. Each year, more growers of these crops are seeing the value that fungicides can bring.

Selected as the 2018 Product of the Year in *Agri Marketing* magazine's annual competition, Trivapro® fungicide is one of the latest innovations changing the game for disease control and plant health in the U.S.

Averaging multiple years of data, Trivapro has helped increase yields an average of:

- 18.5 bu/A in corn¹
- 6.7 bu/A in soybeans²
- 13 bu/A in wheat³

Now entering its fourth year on the market, Trivapro has demonstrated that it is the hardest-working, longest-lasting fungicide available.

1. Based on 138 nonreplicated trials in the U.S. in 2016–2017.
2. Based on 20 nonreplicated trials in the U.S. in 2017.
3. Based on 21 replicated trials in the U.S.



NEWS AND EVENTS

Syngenta Continues to Improve Digital Tools

Syngenta recently launched a new and improved iOS mobile app for Land.db®, the record-keeping software available to AgriEdge® growers. Enrolled growers can download the app from the Apple app store and log in to their accounts. The new app, which seamlessly connects growers to their existing accounts, has four core capabilities: applications, yield, work orders and recommendations. The app also features weather and commodities sections.

Additionally, Syngenta updated Land.db Client to maximize user efficiency.

"We are committed to both improving our current tools and expanding the options available to growers," says

Ron Cowman, head of global farm management systems at Syngenta.

Growers already enrolled in AgriEdge can reach out to their AgriEdge specialists for assistance. If you want to learn more about the AgriEdge program or other digital agriculture tools from Syngenta, talk to your Syngenta rep.



NK Celebrates 135 Years of Excellence

This year marks NK® Seed's 135th anniversary. The Syngenta seed brand is celebrating this milestone with the addition of 17 new corn hybrids and 68 new soybean varieties, which will be available for the 2020 season, as well as a refined farmer-focused brand mission and updated website.

"We know farmers are required to make many important purchase and investment decisions as they try to operate at a profit, and seed is just one of those," says Quinn Showalter, NK head of sales. "For that reason, we continually strive to find new and unique ways to support their bottom lines."

For more information, go to www.nkseeds.com.



Pest Patrol Continues in 2019

Trying to stay a step ahead of pests in the South? While growers know they will encounter insects each season, they don't always know which ones will attack and when. The Syngenta Pest Patrol Program allows users to access online updates from a leading expert in their state about current and anticipated pest pressures, local outbreak predictions and treatment recommendations. And for users who want to be notified as their local pest expert posts updates, they can sign up to receive text message alerts.

Currently, the program is available in Alabama, Arkansas, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee and Texas. For more information, Go to www.syngenta-us.com/pest-patrol.

Syngenta Scholarship Helps Future Leaders in Ag

Syngenta is committed to the future of agriculture and the cultivation of tomorrow's leaders. The Syngenta Agricultural Scholarship annually awards a total of \$20,000 in scholarships to bachelor's and master's students in the agricultural field.

This year, Syngenta is asking applicants to share their aspirations for inspiring the next generation of ag professionals. The 2019 application period runs through May 25. Bachelor's and master's students currently enrolled in an agricultural program at an eligible university are encouraged to apply to compete for scholarship awards.

To learn more about the scholarship program's full terms and conditions or to submit an application, please visit www.syngentaus.com/scholarship.



CELEBRATE THE PERSON WHO MOST INSPIRED YOU



ENTER TO WIN!

At Syngenta, we're grateful to everyone who has helped us firmly establish our agricultural roots. Now, we want to hear your story about who inspired you to be #RootedinAg. In exchange, you could honor that person by being one of three finalists whose stories will be featured in *Thrive*. Each finalist also will receive a mini touch-screen tablet. And if you're our grand prizewinner, we'll send you \$500, plus we'll set up a professional photo shoot with you and the person who has inspired you the most. We'll also give you a chance to pay it forward within your community by donating \$1,000 to a local charity or civic organization of your choice.



Above: Katharine Girone, the 2018 #RootedinAg contest winner, credits her grandfather Kenneth McKee with helping to firmly establish her agricultural roots. They pose for a photo on their farm in Varna, Illinois.

HERE'S HOW TO ENTER:

- 1** Go to www.syngentathrive.com/contest to review eligibility and fill out the easy-to-use #RootedinAg entry form.
- 2** In about 200 words, **describe who inspired you to be #RootedinAg.**
- 3** Using the simple instructions provided, **upload a photograph or video that visually supports your written entry.**

The deadline for entering is May 30, 2019. Shortly after this date, a panel of judges will choose three finalists. Syngenta will then post all finalists' entries on the *Thrive* website and ask visitors to help choose the grand prizewinner by voting for their favorite. These votes along with the judges' scores will determine the winner. Online voting ends Aug. 30, 2019, with Syngenta announcing the grand prizewinner in September.

For more information on the contest and to read stories about others who are #RootedinAg, visit www.syngentathrive.com/community.

Stewardship Strategies

As herbicide resistance spreads, Syngenta offers timely advice and new solutions to help keep tried-and-true tools viable.

Q. Why is stewardship so important when it comes to managing weeds?

A. Bobby Bachman, product marketing lead for soybeans and cotton, Syngenta Crop Protection, LLC: Herbicide-resistant weeds are rampant in agriculture. According to the latest numbers from the International Survey of Herbicide Resistant Weeds, 255 weed species have evolved to resist 23 of the 26 known herbicide sites of action. These weeds are spread across 92 different crops in 70 countries. U.S. growers alone are battling 163 herbicide-resistant weeds—more than any other country currently included in the survey.¹

Even though the numbers are sobering, I'm confident agriculture is up to the challenge of developing strategies that will help lessen the potential impact. By being good stewards of the land and taking proactive approaches to weed management, growers can help defend against resistance so that their access to effective herbicides currently on the market will continue. A focus on stewardship today will lead to a strong, sustainable agriculture industry tomorrow.

Q. What steps should growers take to properly steward their use of herbicides?

A. With any product, the first step to using it properly is to read and follow the manufacturers' specified label requirements and recommendations. When developing an effective weed-management and stewardship plan, growers should use herbicides with multiple effective sites of action and overlapping residuals. Particularly in soybeans, it's important to start clean, using tillage or an effective burndown plus a pre-emergence herbicide application. It's also important to use a post-emergence application to keep weeds at bay, until soybeans are mature enough to reach canopy. At that point, weeds do not have the ability to effectively compete with the crop for water, light and essential nutrients.

In addition to properly using herbicides, growers should diversify their weed-management programs by planting cover crops, using mechanical weed control and rotating crops. Other proven agronomic practices that can help fortify their efforts include narrowing rows, increasing plant populations and employing sound production strategies that promote overall crop growth and competitive ability.

Q. Why is dicamba an important herbicide tool for soybean growers?

A. Soybean growers across the U.S. need tools like dicamba to fight against tough-to-control resistant weeds. Palmer amaranth, marehail, waterhemp and giant ragweed are some of the most resilient and challenging weeds invading growers' soybean fields. Dicamba provides them with an agronomic option to manage these key weeds. For growers who use dicamba, Syngenta strongly recommends combining it with a residual active ingredient like S-metolachlor, the active ingredient in Dual Magnum® herbicide. This combination offers two effective sites of action. That's important because driver weeds are highly adaptive to herbicides, so targeting them with both chemistries can help reduce the selection pressure on these ingredients.

Q. Does Syngenta have any new dicamba tools in the pipeline?

A. A new herbicide from Syngenta is currently under regulatory review.² It will provide contact and residual control of key broadleaf and grass weeds in Roundup Ready 2 Xtend® Soybeans and Bollgard II® XtendFlex® Cotton. This new product—a premix of S-metolachlor and dicamba—will help maintain clean fields by managing major ALS-, PPO- and glyphosate-resistant weeds. Upon registration by the U.S. Environmental Protection Agency, Syngenta will market the new

**“A focus on stewardship today
will lead to a strong, sustainable
agriculture industry tomorrow.”**

—BOBBY BACHMAN

herbicide as Tavium® Plus VaporGrip® Technology. With built-in resistance management and the convenience of a premix, Tavium will offer flexible application—from preplant through early post-emergence—and fit into a variety of tillage systems and geographies.

In soybeans, Tavium will be most effective when used as part of a season-long weed-management program that includes a pre-emergence residual herbicide with multiple effective sites of action, such as Boundary® 6.5 EC, BroadAxe® XC or Prefix® herbicides, followed by an early post-emergence application of Tavium. In cotton, we recommend starting the season with a burndown herbicide, such as Gramoxone® SL 2.0, plus a residual herbicide, such as Caparol® 4L or Cotoran® 4L, followed by Tavium applied early post-emergence. For both crops, Tavium can help reduce the weed seed bank, increase herbicide diversity and fight resistance.

Q. Where can growers and resellers go for more information on Tavium?

- A.** Once Tavium is granted registration, Syngenta will post an online dicamba training presentation, additional information on dicamba stewardship requirements and best-management practices for fighting hard-to-control weeds. In the meantime, growers and resellers can ask their Syngenta sales representative for more information or visit www.syngenta-us.com/p/tavium. 🌱

INTERVIEW BY SUSAN FISHER

1. Heap, I. The International Survey of Herbicide Resistant Weeds. Online/Internet. Wednesday, Feb. 20, 2019. Available at www.weedscience.org.
2. At the time of this writing, Tavium Plus VaporGrip Technology had not received federal registration from the Environmental Protection Agency and was not being offered for sale.

BOBBY BACHMAN
Product Marketing Lead
Soybeans and Cotton, Syngenta
Crop Protection, LLC



Good Neighbors

FieldWatch fosters better communication between pesticide applicators, beekeepers and growers who produce sensitive crops.

Tony Rekeweg, a commercial beekeeper in Decatur, Indiana, recently answered a call from a number he didn't recognize. "It was an aerial applicator who'd been hired to spray a fungicide on the cornfield about 20 feet from some of our hives," Rekeweg says.

The applicator knew about Rekeweg's beehives because he'd seen them on FieldWatch®, an online mapping tool that applicators can reference before spraying chemicals that could potentially harm bees. Equipped with the GPS information of Rekeweg's hives, the applicator was able to make an informed decision on when to apply the fungicide.

"He was kind enough to spray at dusk, when our bees were already back in their hives and didn't have to fly through the spray to return home," Rekeweg says.

In addition to helping to protect bees, FieldWatch also helps protect sensitive crops, ones that are vulnerable to drift from chemicals like fungicides, herbicides or insecticides. For both beekeepers and specialty crop growers, FieldWatch's premise is simple: They can log on to FieldWatch's apps and register the location of their beehives or sensitive crops, respectively.

Meanwhile, anyone planning to spray a field can check for sensitive crops or hives nearby. Many times, applicators can help protect these crops or beehives if they take appropriate precautions, explains Stephanie Regagnon, who has served as FieldWatch CEO since 2016.

"They might choose a different pesticide. Or if it's windy, they might wait a day to spray," she says. "Applicators generally know what their options are, so just realizing the big picture of what's around them helps them to make an informed decision."

For its users, FieldWatch is free and voluntary. "Across all the different pieces of the value chain—whether we're talking about the applicator, the grower or the beekeeper—no one wants a loss of crop or to be faced with a lawsuit," Regagnon says. "When we talk to applicators, they tell us they're excited about a tool that can help them protect themselves and communicate with other people in the ag value chain."

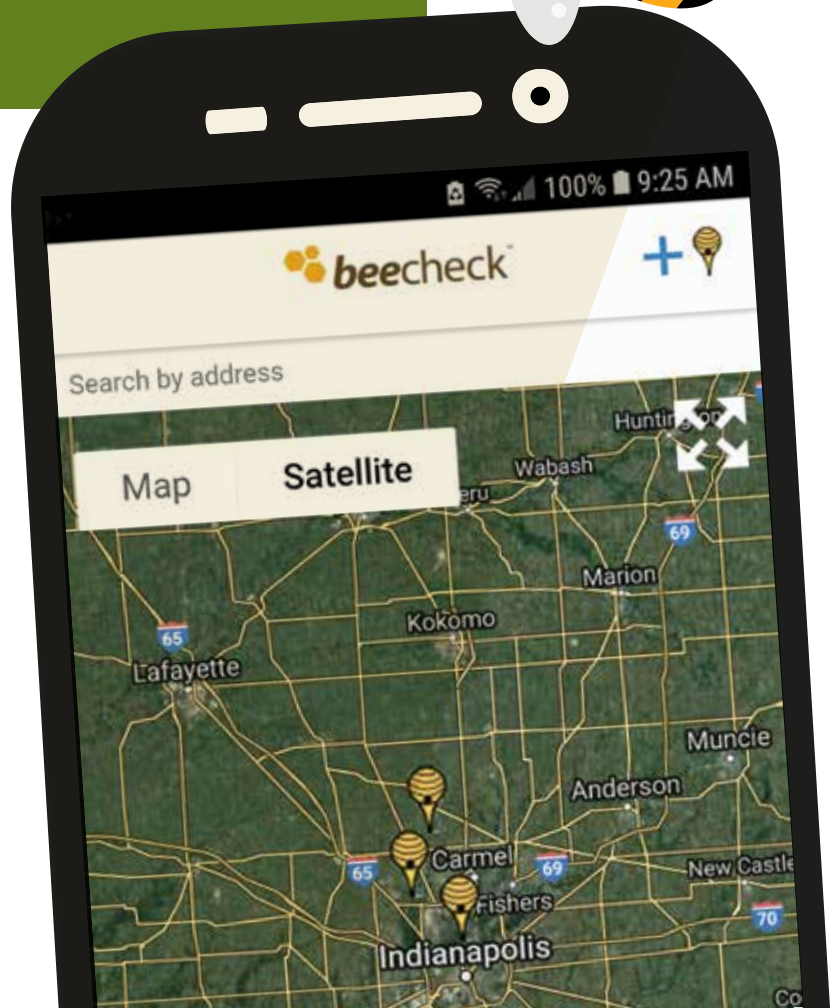
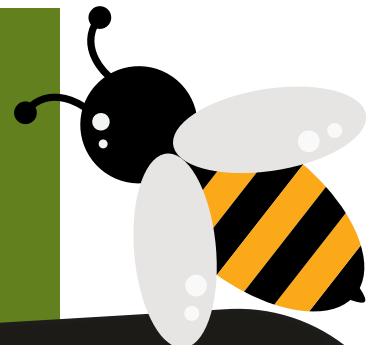
This is one tool in the toolkit to make sure we're being good neighbors."

From the Ground Up

FieldWatch got its start 10 years ago, when an Indiana-based processor of Red Gold Tomatoes had a challenging year with drift. Frustrated with the chemical damage from adjacent farmland, the

"Applicators generally know what their options are, so just realizing the big picture of what's around them helps them to make an informed decision."

—STEPHANIE REGAGNON



processor's director of agriculture operations paid a visit to the agriculture biological engineering department at Purdue University and challenged its staff members to craft a solution. Their answer, an early iteration of today's registry, was immediately popular with local growers. When neighboring states asked to join, FieldWatch spun out as a nonuniversity-affiliated nonprofit.

"That same director is still on our board," Regagnon says. "Over the past 10 years, his drift claims have gone down an average of 80 percent, and the Red Gold company requires all of its contract growers to be in our system. The company takes the issue seriously, and FieldWatch has really helped them out."

FieldWatch has since grown to include 21 participating states and one Canadian province. Today, users and applicators have more functionality than ever. The new FieldCheck® app allows applicators to locate specialty crop and hive locations from their mobile device or tablet.

And beekeepers can more easily update the locations of their hives through the BeeCheck® app. "Beekeepers often move their hives to find new foraging spaces," Regagnon explains. "Once their hives are connected in BeeCheck, the locations are automatically updated on the map when the hives move."

Opening Doors

From the beginning, Syngenta has been a trusted partner and financial supporter of FieldWatch. Caydee Savinelli, Ph.D., Syngenta pollinator and integrated pest management stewardship lead, sits on FieldWatch's board of directors.

"I'm in the stewardship department at Syngenta, which helps inform growers about how to use our products correctly and according to the label," says Savinelli, who adds that part of her job is helping growers understand how to use Syngenta products in a way that doesn't cause harm to pollinators.

"As a board member, I attend meetings and hear the discussions and raise questions," Savinelli says. Because the FieldWatch tools are so popular, the nonprofit regularly gets requests from nonagriculture-based organizations—from parks to endangered species sites—that would also like to register. Syngenta helps FieldWatch hone its scope and stay focused on its ag-based mission.

"When we grow into new states, Syngenta is key in making introductions and vouching for the program upfront to open doors," Regagnon says. "And Caydee's knowledge of the pollinator community helps us to better understand how to serve the honey bee community."

FieldWatch's success hinges on participation from all its stakeholders. "The only way we all play nice in the sandbox is if we're all in the sandbox," Regagnon says. "If we all cooperate, drift claims will go down. Our industry needs to rally around organizations like FieldWatch that are bringing different pieces of the industry together to work on solutions, increase stewardship, encourage communication and be good neighbors." 🌱

STORY BY ROBIN SUTTON ANDERS

Celebrating the People of Ag

At Syngenta, we proudly honor those individuals in agriculture whose hard work and determination are helping to secure a better future. To read their compelling stories, go to www.syngentathrive.com/community.



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FIRE & RAIN

When Mother Nature dealt out natural disasters last year, rural communities responded with resilience. But these events also highlighted the need to help reduce the risk associated with future calamities.

By Darcy Maulsby | Illustrations by Ben Perini

Surreal. That's the first word that sprang to mind as Kyle Koonce surveyed the destruction from Hurricane Florence last September in Jones County, North Carolina, where he was born and raised.

"This was the worst flooding I'd ever seen," says Koonce, a farmer, ag retailer with Meherrin Ag and assistant fire chief of the town of Trenton's volunteer fire department. "More than 95 percent of my farm was flooded, 3.5 feet of water filled the fire station, and we rescued more than 200 people by using boats, tractors and school buses. It was devastating to see my friends and neighbors struggle."

When Hurricane Florence made landfall Sept. 14 as a Category 1 hurricane, it came ashore in North Carolina with 90 mph winds and a punishing storm surge. Governors in North Carolina, South Carolina, Georgia, Virginia, Maryland and other states declared states of emergency. Crop damage and livestock losses to North Carolina's agriculture industry surpassed \$1.1 billion.

"Most hurricanes are 14- to 16-hour events, but this one lasted 4.5 days," says Roy Gorena, a Syngenta sales representative in North Carolina. "While we normally get about 45 inches of rain a year, the hurricane pushed it to 100 inches in 2018."

The hurricane battered crops and saturated soils, delaying or preventing the harvest of soybeans, cotton and high-value crops like sweet potatoes. In early 2019, growers still hadn't harvested some fields. The hurricane's destruction hit especially hard in Duplin County, says Elwood Garner, a North Carolina native and farm manager with Dail Farms, which produces crops, chickens and hogs near Kenansville.

"It looked like a disaster zone here," he says. "People lost everything they had, from homes to crops. It was heartbreaking to see all their damaged personal items piled up by the side of the road like mounds of debris."

California Wildfires Hurt Fruit Harvest

On the other side of the country, ag producers faced much different—but equally devastating—disasters due to the 2018 wildfires. The turmoil started in Northern California near Redding in July, when the Carr Fire blazed a fiery path along Highway 299, turning everything the flames touched into ash, mangled metal and black embers.

Then came the "firenado," a destructive, fire-generated vortex with the power of a tornado. This terrifying phenomenon accelerated the deadly Carr Fire, according to the University of Nevada, Reno.

While the Carr Fire was horrendous, the Mendocino Complex fires were even worse. A pair of wildfires, the Ranch Fire and River Fire, erupted in Mendocino County in late July 2018 and moved through Lake, Colusa and Glenn counties to become the largest-recorded fire complex in California history, burning a combined 459,123 acres, according to the *Sacramento Bee* newspaper.

"The destructive fires have changed many lives in California," says Lindee Jones, a crop consultant with Grow West in Lake County, California, near the Napa Valley wine region. "The Ranch Fire and River Fire occurred right around pear harvest, which complicated everything."

Delivery trucks hauling the ripe pears to packing sheds for cold storage had to find other routes, after roads were closed due to thick wildfire smoke. More complications ensued when



AGRICLIME CREATES CONFIDENCE TO INVEST IN A BETTER CROP

The premise is simple: Give your crop what it needs to outperform and outyield. But if nature doesn't cooperate, Syngenta will share the risk.

That's the power of the AgriClimate™ program, the latest development in the Syngenta Digital Ag Solutions pipeline. "This represents a unique, new risk-management partnership between Syngenta retailers and their growers," says Aaron Deardorff, head of digital agriculture solutions for Syngenta.

communities like Kelseyville were evacuated by early September.

The Mendocino Complex fires' incessant smoke also impacted a portion of the wine-grape crop in the North Coast region. In some instances, growers didn't harvest grapes, or they sold them at a discount.

"It was a really tough year," says Jones, who notes that yet another wildfire, the Camp Fire in Butte County that erupted in November 2018, became the deadliest, most destructive fire in California history. "It seemed like the fires were never-ending."

What's Going On?

The extreme weather that afflicted many parts of North America in 2018 might seem unusual. If past weather patterns are any indication, though, more volatility is likely.

"It's already happening," says Elwynn Taylor, Ph.D., an Iowa State University Extension climatologist. "History shows a trend toward 25 years of volatile weather and yields, followed by 17 to 18 years of fairly consistent yields. We're moving into the 25-year cycle of volatility."

In Iowa, 2018 went down as the second-wettest year in recorded history, behind the great flood year of 1993. Taylor is also paying attention to El Niño and La Niña, complex weather patterns resulting from variations in ocean temperatures in the equatorial Pacific Ocean. In early 2019, the El Niño pattern was weak. "More hurricanes can come ashore along the East Coast and Gulf Coast in these conditions," Taylor says.

Also, the worst weather of the century tends to occur on an 89-year cycle, Taylor says. This is due to a phenomenon known as the Gleissberg Cycle. Sun spots influence this pattern, which

is reflected in more than 700 years of tree rings. This cycle appears to be responsible for the variations in global temperature during 30-year time periods.

"The harshest weather in Iowa during the previous century occurred in 1936 and in 1847 in the 19th century," Taylor says. "Researchers expect the current warming cycle to peak around 2025, which is when the harshest weather is likely to occur."

Responding to Changing Conditions

While farmers can't control the weather, they are adapting to changing conditions. The Lake County Winegrape Commission in California, for example, is undertaking a research project with the University of California, Davis, the Australian Wine Research Institute and other partners to study wildfire smoke effects on grapes and wines.

"We want to support innovative, new findings and set a precedent for future research across Northern California and the West Coast," says Debra Sommerfield, president of the Lake County Winegrape Commission.

Syngenta specialists who live and work in communities impacted by extreme weather are also doing their part to help local growers and ag retailers. Austin Anderson, a Syngenta sales representative from Greenville, North Carolina, delivered meals to people impacted by Hurricane Florence. "It's all about neighbors helping neighbors," he says. "Agriculture is a resilient community."

This focus on community extends to Washington, D.C., where Syngenta works with ag commodity groups and agribusiness colleagues to push disaster-aid packages forward to help farmers affected by hurricanes, fires and other disasters.

"We help educate lawmakers about the real-world impacts of these disasters and show how their proposed policies can provide a lifeline for real people, real farms," says Ariel Wiegard, manager of federal government relations for Syngenta.

Considering the gridlock conditions in Washington, Syngenta has lobbied to mitigate the uncertainty that comes from relying on ad hoc farm-disaster assistance. For example, the Farm Bill signed into law in December 2018 won't retroactively help growers affected by last year's natural disasters, but it does allow for better risk management and more stable and accessible funding going forward.

Garner appreciates the support Syngenta provides legislatively and locally. "The people at Syngenta reach out to do anything they can to help," he says. "While farmers tend to be an independent bunch, it makes you feel good that people still care and want to help their local communities." 🌱

"It's not intended to replace federal crop insurance, but it is designed to bring more value to our clients."

At the field level, AgriClimate technology tracks local temperatures, precipitation and weather triggers, like drought and abnormal rainfall. Participants can receive up to 30 percent cash back on qualifying Syngenta products, if certain weather thresholds are surpassed or not met during the offer period.

AgriClimate can be a stand-alone tool, or it can be added to the AgriEdge® farm-management program from Syngenta. The

company is piloting AgriClimate in select geographies across America.

"We received a very positive response from growers who participated in the 2018 AgriClimate pilot," says Steven Patton, marketing lead for Syngenta Digital Ag Solutions.

While it may not be commercialized in the U.S. until 2020, AgriClimate demonstrates the Syngenta commitment to help growers through unexpected weather events, Deardorff adds. "AgriClimate offers another layer of protection, giving growers confidence to invest in a better crop."

Fighting for

Growers remain resolute, as the search for solutions to citrus greening continues.

By Christina Boodée

Citrus production is James Shinn's life work. Shinn, who owns Tree-O Groves, Inc., in Lake Alfred, Florida, says his family's dedication to citrus stretches back four generations. But he's facing a challenge today his predecessors never encountered.

Huanglongbing (HLB), more commonly known as citrus greening, is a systemic bacterial disease and the greatest current threat to not only Shinn's groves, but also the entire citrus industry.

"We used to have a stable business. In bad times, you could skip a fertilizer or foliar spray and get by," Shinn says. "If you skip anything now, your trees may become more susceptible to citrus greening, which could kill them."

An Unrelenting Threat

The first documented occurrence of citrus greening in the U.S. was in 2005, when a scientist detected the disease in a south Florida nursery. In just three years, HLB spread to every citrus-producing county in the state. As experts searched for solutions and growers fought to stay in business, the incurable disease advanced west. Now, the U.S.'s other two largest citrus-producing states, Texas and California, report an acceleration in the spread of the disease.


The Asian citrus psyllid, an exotic pest responsible for the rapid spread of citrus greening, is the exclusive vector of the pathogen. As this tiny,



CITRUS

A man wearing a camouflage baseball cap and a white long-sleeved shirt is shown in profile, looking down at an orange he is holding in his hands. He is using a small, dark, handheld device to examine the fruit. The background is a lush orange grove with many ripe, yellow-orange fruits hanging from the trees under a clear blue sky.

James Shinn examines oranges at his groves in Polk City, Florida.



“Before greening, caretaking costs were about **\$800 per acre**. We’re now up to **\$2,000 per acre.**”

—JAMES SHINN

winged insect feeds on the leaves and stems of citrus trees, it transmits the bacteria that cause the disease. The bacteria infect the tree’s phloem—vascular tissue that transports sap throughout the tree—triggering root loss and impeding nutrient uptake. The result is loss of tree vigor and resiliency, along with unripe, bitter, green and misshapen fruit that are prone to excessive preharvest drop.

“Citrus greening can cause trees to lose about 40 percent of their root mass, which can drastically and rapidly reduce production,” estimates Mike Irey, director of research at Southern Gardens Citrus in Clewiston, Florida. “The industry has suffered everywhere greening is found; and despite a lot of ongoing research, no one has successfully found a solution to get infected trees back to full production.”

In addition to the absence of a solution, there are other important factors in the steady spread of citrus greening. Citrus trees have zero tolerance to the HLB pathogen, and disease symptoms may not manifest for two or more years after infection. This allows ample time for undetected spread of the disease.

“It only takes one insect to pass the bacteria between trees,” says Elijah Meck, Ph.D., technical product lead for insecticides at Syngenta. “Even with very efficacious products, without 100 percent control, there is potential for an infected insect to spread the bacteria.”

Growers are employing tactics to mitigate the effects of this devastating disease, such as removing infected trees, replanting new trees on high-density blocks, spending more time scouting, and increasing applications of fertilizer and foliar insecticides. Despite the extra work that Shinn

and fellow growers have poured into their groves, impacts on the U.S. citrus industry have been significant.

A Drastic Impact

In 2014, about six years after citrus greening reached epidemic levels in Florida, Shinn managed 1,200 acres of citrus groves. Since then, increasing costs have reduced his acreage to 550 acres.

“Before greening, caretaking costs were about \$800 per acre. We’re now up to \$2,000 per acre,” Shinn says. “We’ve had to back off acreage to cover the cost of caring for the rest of our groves. We’re picking about a quarter of what we were picking five years ago.”

Shinn’s experience is not unique. The University of Florida reports that citrus production in the state decreased by 70 percent from 2004 to 2016. Approximately 34,124 citrus industry jobs have been eliminated, and lost output is estimated at \$4.6 billion.

Thus far, impacts on the Texas and California citrus industries haven’t been quite as drastic. Some experts, however, caution the effects could become worse.

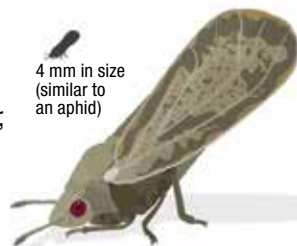
“Florida citrus is used primarily for processing and juice,” says Garrett Gilcrease, agronomy service representative for Syngenta in Southern California. “But California citrus is all fresh market, so market decline for us has the potential to be much quicker than Florida’s.”

Fighting Back

In the meantime, Syngenta is doing its part to support citrus growers.

HOW THE DISEASE SPREADS

Asian citrus psyllid vectors the bacterium, *Candidatus Liberibacter*, which is the source of citrus greening.¹



4 mm in size (similar to an aphid)

Disease spreads when an infected psyllid feeds on a healthy tree and transmits the bacterium.¹



A magnifying glass is needed to detect nymphs and psyllid eggs.¹



1. “Asian Citrus Psyllid and Huanglongbing Disease,” University of California Statewide IPM Program, 2018, ipm.ucanr.edu/PMG/PESTNOTES/pn74155.html.



James Shinn (right) and his Syngenta rep Zach Langford inspect Shinn's orange groves in Lake Alfred, Florida.



SEE MORE PHOTOS.
www.syngentathrive.com/farmproduction

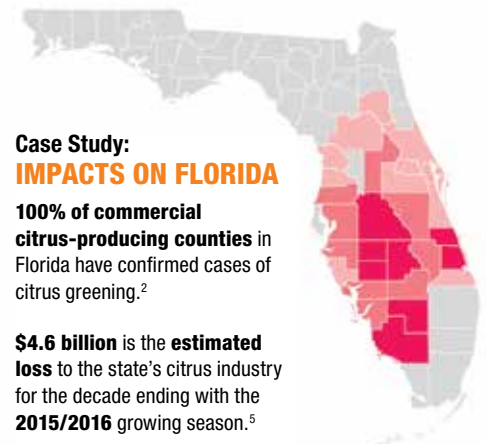
CITRUS GREENING IMPACTS

Citrus greening, also known as Huanglongbing, is a devastating bacterial disease affecting U.S. citrus production. Already prevalent in large parts of Asia and Africa², the disease first arrived in Florida in 2005.³ The vector for the disease is the Asian citrus psyllid, which spreads the disease as it feeds on the leaves and stems of citrus trees, eventually rendering their fruit unsuitable for consumption and then killing the tree. Because symptoms of the disease don't appear for two or more years, the disease often spreads undetected.¹

A GROWING THREAT

8 is the number of U.S. states and territories—including Florida, California and Texas—where citrus greening has been discovered.⁴

15 is the number of U.S. states and territories where Asian citrus psyllids have been found.⁴



Case Study: IMPACTS ON FLORIDA

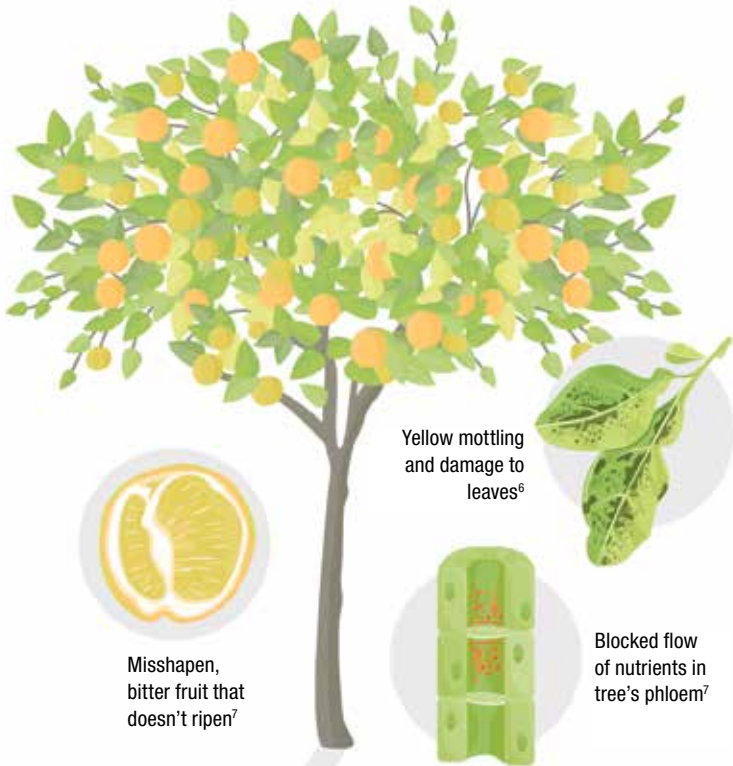
100% of commercial citrus-producing counties in Florida have confirmed cases of citrus greening.²

\$4.6 billion is the **estimated loss** to the state's citrus industry for the decade ending with the **2015/2016** growing season.⁵

Citrus Production by Counties
 ■ High ■ Medium ■ Low

2. "Citrus Greening (Huanglongbing)," University of Florida IFAS Extension, 2018, crec.ifas.ufl.edu/extension/greening.
 3. Singerman, Ariel, and Pilar Useche. "Impact of Citrus Greening on Citrus Operations in Florida," University of Florida IFAS Extension, 2018, edis.ifas.ufl.edu/fe983.
 4. "Citrus Greening," United States Department of Agriculture, www.aphis.usda.gov/aphis/resources/pests-diseases/hungry-pests/the-threat/citrus-greening/citrus-greening-hp.
 5. Bouffard, Kevin. "Citrus industry economic impact drops 31% percent in 4 years," www.heraldtribune.com/news/20170519/citrus-industry-economic-impact-drops-31-percent-in-4-years.

DAMAGE TO CITRUS TREES



3-5 years or less is the average lifespan of trees infected with citrus greening.⁸ But experts recommend prompt removal of all trees infected with citrus greening to reduce its spread.⁹

6. "Asian Citrus Psyllid and Huanglongbing Disease," University of California Statewide IPM Program, 2018, ipm.ucanr.edu/PMG/PESTNOTES/pn74155.html.

7. Miller, Henry I. "Saving the Orange Tree." Los Angeles Times, 2013, articles.latimes.com/2013/aug/30/opinion/la-oe-miller-gmo-citrus-crop-20130830.

8. "Citrus Greening Background," United States Department of Agriculture, 2016, www.aphis.usda.gov/aphis/ourfocus/planthealth/plant-pest-and-disease-programs/pests-and-diseases/citrus-health-response-program/ct_background.

9. "Asian Citrus Psyllid and Huanglongbing," California Pest & Disease Program, californiacitrusthreat.org/pest-disease.

"Our business is to solve problems for farmers," says John Taylor, agronomy service representative for Syngenta in Florida. "We do that through our products, services and expertise."

The Syngenta Citrus Scouting Internship Program, which provides valuable data about pest populations to growers and helps them make informed decisions about application timings, is one demonstration of this commitment.

"We stand beside growers when times are tough, and it makes me proud to work for Syngenta," says Morgan McKenna, sales representative for Syngenta in Fort Myers, Florida, and former intern, whose family produces citrus in the state.

Syngenta also supports growers through research and development. Syngenta introduced Minecto Pro[®] insecticide, a premix of cyantraniliprole and abamectin, to help control the Asian citrus psyllid, along with other key citrus pests like citrus rust mite, citrus leafminer and adult root weevils.

"Cyantraniliprole provides a different mode of action for sucking pests," Meck says. "It will still control lepidopteran pests like citrus leafminer similar to that of the first-generation diamides, but it also has an extended spectrum to give growers more control over thrips, psyllids and adult root weevils."

Meanwhile, abamectin targets citrus rust mite as well as other important mite pests of citrus. "By combining it with cyantraniliprole, we can now offer citrus growers a much-needed tool that protects their trees against multiple overlapping pest populations, including the Asian citrus psyllid," Meck says.

A Look to the Future

Experts remain optimistic about the viability of the industry, as the search for a solution to HLB continues. "Growers have found little things that can help manage the disease, such as optimizing nutrition and soil pH," Irely says. "We hope to have resistant varieties in the future, whether bred through traditional means or via biotechnology."

Superior Pest Control in Specialty Markets

While there's not a lot of common ground when it comes to growing tree nuts and potatoes, there's one production tool that's making a huge difference in both specialty crops. Minecto Pro[®] insecticide, which contains two complementary modes of action, cyantraniliprole and abamectin, provides broad-spectrum control of lepidopteran pests and sucking insects.

In tree nuts, the navel orangeworm is an extremely destructive pest that produces multiple generations in a season. It feeds directly on nuts, rendering them unmarketable. But a May spray application of Minecto Pro can bring growers much-needed relief.

"When an application of Minecto Pro is timed to control

multiple pests, it does its best work," says Meade McDonald, insecticide product lead for Syngenta. "A May spray application will provide growers with a strong foundation for early control of mites and navel orangeworm."

In potatoes, the Colorado potato beetle devours plant foliage, drastically impacting yield and quality. It requires frequent

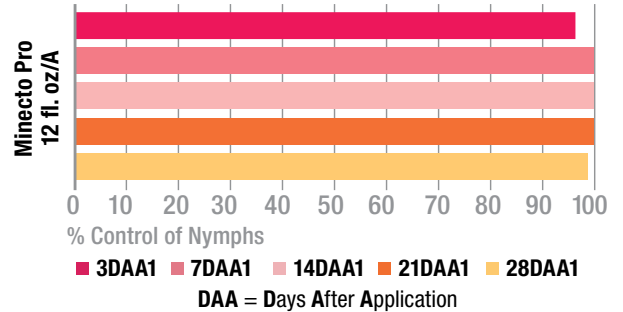
MANAGING CITRUS GREENING

Minecto® Pro insecticide has two complementary active ingredients, cyantranilprole and abamectin, which have proven effective in providing extended residual control of the Asian citrus psyllid and other pests.



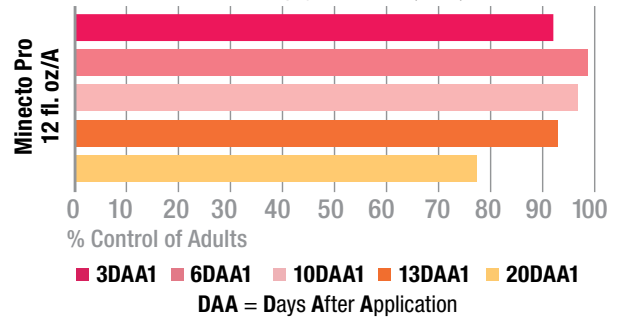
FIELD RESULTS

Asian citrus psyllid control (nymphs)



All treatments included an MSO/NIS blend adjuvant @ 0.25% v/v
Foliar application/One application August 3, 2015
Cooperator trial, Florida

Asian citrus psyllid control (adult)



All treatments included an MSO/NIS blend adjuvant @ 0.25% v/v
Foliar application/One application May 16, 2015
USVL014142015—Internal Syngenta trial, Florida

Shinn, who won the 2018 Agricultural-Environmental Leadership Award from the Florida Department of Agriculture and Consumer Services, has diversified his operation and now grows peaches in addition to citrus. Still, he admits that he has concerns for the future of his groves.

"I'm scared every day. Our profit margin is already so thin," Shinn says, "But this is all I want to do, so I'm going to keep fighting the battle."

Like the generations that came before him, Shinn proves the old Will Rogers' adage, "The farmer has to be an optimist or he wouldn't still be a farmer." This year, Shinn's putting in two new citrus blocks and another next year.

"Despite my fears, I'm hopeful," he says. "I think we're moving in the right direction for the first time in a long time." 🌱

scouting to make sure populations are under control. Minecto Pro can provide growers with up to three weeks of residual activity, reducing the amount of time growers need to spend scouting. Minecto Pro also provides growers with an alternate mode of action to neonicotinoids, which helps expand the available insecticide arsenal.


"There have been some reports of neonicotinoids not controlling the second generation of Colorado potato beetles during the course of a season," says Kiran Shetty, Ph.D., technical product lead at Syngenta. "In those cases, Minecto Pro fits really well, because it's able to clean up that second generation, giving growers the protection their potatoes need."





syngenta™

Outdoor Classrooms



**GROW MORE™ EXPERIENCE SITES
OFFER VISITORS HANDS-ON
LEARNING, LOCALIZED AGRONOMIC
TRAINING AND RELATIONSHIP-
BUILDING OPPORTUNITIES.**

By Alyssa Hillman

From left to right: Syngenta employees Christine May, agronomy service representative; Ben Sacher, state affairs manager; and Mackenzie Ellis, retail sales representative, get ready for visitors to the Hickman, California, Grow More Experience site.

“Unique.” “Educational.” “Relevant.” These are some of the most common words visitors have used to describe Grow More™ Experience sites in recent follow-up surveys. Since 2013, Syngenta has designed the sites to showcase its crop-protection and seed technologies, including NK® corn and soybeans. The sites also provide opportunities for attendees to engage in conversations about local agronomic practices that can help improve crop productivity. This year, Syngenta will continue the momentum by highlighting innovative solutions and practical advice that site visitors can use to secure a more promising future for their farms and businesses.

Local Point of View

With more than 80 locations across the U.S., Syngenta strategically selects the locations for their GME sites based on geographically specific crops, weather, climate and pest patterns.

“We know each customer has a different in-season experience,” says Mike Moss, Ph.D., head of technical development at Syngenta. “Instead of offering one-size-fits-all solutions, our agronomic experts are there to listen and provide the best localized options for our customers.”

The sites’ purpose is to educate visitors on what they can do to continue to help mitigate pest issues and reach maximum yield. This process involves site leads discussing and comparing the top products in the industry, including competitors’.

“I was amazed by the fungicide trials, which compared almost everything on the market,” says Mike Feig, a crop consultant from Illinois, who visited the Grow More Experience site in Rend Lake, Illinois. “When a company normally does something like this, it’s biased. But at Grow More Experience sites, you can see the difference for yourself.”

Syngenta representatives also demonstrate current and new Syngenta products to help increase awareness and comfort levels in the field. “The sites are a good place for us to meet with retailers and growers who are apprehensive about trying a new product,” says Jeff Laufenberg, a Syngenta technical development lead. “Many of them acknowledge that there might be a better product out there but are nervous about trying something new on their dime and in their field. Once they visit and see the product trials, talk to field experts, ask questions and go home with a written plan, they become much more confident in using new products.”

Participants also can engage in conversations about other modern practices geared toward improving productivity and yield. For example, at the Rend Lake site in Illinois, Syngenta agronomist Phil Krieg asked experts at nearby Rend Lake College to share information on using drones on farms.

“Most of the attendees had heard of drone use as a hobby, but hadn’t considered how drones could be used to monitor fields,” Krieg says. “In addition to demos, Rend Lake College reps unpacked the rules and regulations surrounding drones, so

Agronomy in Action

Agronomy in Action sites are a subgroup of the Grow More™ Experience sites that showcase Golden Harvest® corn and soybeans grown in local conditions. In 2019, there will be more than 40 of these locations placed in key geographies across the Midwest.

“Selecting the right seed for your farm is key to a successful season,” says Bruce Battles, head of agronomy for Golden Harvest. “Agronomy in Action sites are here to help this process and provide localized insight and resources to help farmers select the best seed for their operations.”

Here is what visitors can expect at an Agronomy in Action site in 2019:

- > See the latest hybrids and varieties in action by walking through plots, digging up roots and observing side-by-side comparisons.
- > Experience a range of demonstrations based on local needs. Visitors get the chance to evaluate Golden Harvest seeds, alongside competitor trials, to help them make the best decisions for their farms.
- > Walk the fields with area representatives and agronomists. These on-site experts, who are equipped with both in-depth seed and local-environment knowledge, are able to talk through recommended seed-product selection and management practices that fit the local conditions and individual farming operations.

For more information about the Agronomy in Action sites, contact your local Golden Harvest Seed Advisor by visiting www.goldenharvestseeds.com/seed-advisor.



The Agronomy in Action site in Clinton, Illinois, demonstrates what various Golden Harvest soybean varieties look like during different stages of the growth cycle.

“There’s a camaraderie coming from these visits that seeps into the community. ... I strive to replicate the model of relationship-building I’ve learned at Grow More Experience sites in my own interactions with people.” —JASON BAUMBERGER

attendees would be open to using them as a tool to complement their existing practices. I saw visitors walk away with more than excitement about drones. They also walked away with knowledge on how modern technology can complement their operations.”

Hands-On Experience

Grow More Experience sites allow visitors to step into the field to touch, see, tear, dig and gain a deeper understanding of products and agronomics that can enhance their farms and businesses. Brett Craigmyle, a Syngenta agronomy service representative, uses this hands-on model to lead attendees through an active weed demonstration at the Columbia, Missouri, site. Craigmyle takes weed-density data from the University of Missouri and plants similar plots based on that data. He then asks attendees to walk the plots, counting and identifying weeds to become better acquainted with how the data looks in real life.

“Most people in most circumstances can learn best visually versus just seeing data and numbers on paper,” says Matt Prewitt, a central Missouri crop consultant, who has participated

in Craigmyle’s weed-density demonstration. “This demonstration brought the data to life. Brett took the data off the paper and put it into a cornfield.”

Sites are also great places to build relationships. After visiting a Grow More Experience site in Washington state for a few years, Jason Baumberger, a local crop consultant, says, “As a consultant, you think you know a lot about agriculture. But between the agronomists and the growers, you learn to sit back and listen to what they have to say at these events. You listen to their questions, their advice to one another and their issues. I’ve walked away with a greater understanding of the industry and my customers.”

This knowledge and collaboration often spread beyond the borders of the sites, Baumberger adds. “There’s a camaraderie coming from these visits that seeps into the community,” he says. “I’ve been in the business for 20-plus years, and I’ve learned to count on these relationships. In fact, I strive to replicate the model of relationship-building I’ve learned at Grow More Experience sites in my own interactions with people.”

To build on their initial experience, attendees are welcome to return to a site multiple times throughout the year. “Participants often find it beneficial to visit a site more than once, so they can see for themselves various growth stages of crops and the impact weather and pests have had on the trials,” Craigmyle says. “With each visit, they also have the opportunity to interact with different people attending and overseeing the sites.

Local FFA Support

Last year, Syngenta partnered with local chapters of the National FFA Organization (FFA) to help support the next generation of agriculture leaders. For every Grow More Experience site visitor who registered with a valid email address, Syngenta donated \$2 to that site’s local FFA chapter. We doubled this donation for every registered attendee who took the follow-up survey. This effort resulted in a total donation of \$13,950.

“Syngenta has a long and proud history of supporting the local ag community,” says Melissa Lord, Syngenta customer event and trade show lead. “Our Grow More Experience and Agronomy in Action site teams give back to their communities by providing agronomic insights to help site visitors improve their operations. We are looking forward to investing into these communities even more in 2019.” (See “Agronomy in Action,” page 22.)

This year, Syngenta will increase its donation amount to \$5 per valid email address gathered on-site to continue its support of local agricultural education. For more information about the Grow More Experience sites, contact your Syngenta representative by visiting www.syngenta-us.com/rep-finder. 🌱



A Mission in Life

Potato expert at Syngenta makes an indelible mark on the industry he serves.



Kiran Shetty, Syngenta technical development lead for potatoes, has made several major contributions to the potato industry during his long career.

Sometimes, people plant their agricultural roots on the same land they spend their whole lives farming. Others transplant their roots, choosing a path unfamiliar to their families and childhood friends. Kiran Shetty, Ph.D., Syngenta technical development lead for potatoes, definitely has chosen a path less traveled. His agricultural roots extend back to his humble beginnings in southwest India and are now firmly planted in the U.S., where he has become a leading figure in the potato industry.

Over the years, Shetty has stacked up accolades: United Nations Development Program Fellowship, best scientific paper from the Potato Association of America, ambassadorship from Syngenta Technical Services and the inspiration behind the Spud Doctor agronomic video series. (For more information, see “The Doctor’s in the House,” page 25). But

his true legacy is the kindness, expertise and dedication he brings to those around him.

“Dr. Shetty was very supportive last fall at Syngenta grower meetings,” says Kasia Duellman, Ph.D., extension seed potato specialist at University of Idaho (UoI). “It’s important for us newbies to have that support from seasoned professionals.”

Early Roots

Shetty grew up on his grandfather’s farm in southwest India in a house without power or running water. His desire to help kicked in at an early age.

“As a kid, I created little irrigation systems, breaking small pipes and building channels to water my plants,” Shetty says. “Knowing I’d helped the plants produce fruit gave me

a sense of accomplishment. The fruit and the brownie points it earned me at home were nice, too.”

Shetty’s father sold crop-protection equipment and taught Shetty how the machines worked. This experience triggered Shetty’s understanding that technology could improve agriculture.

Expanding Horizons

Shetty attended the University of Agricultural Sciences in Bangalore and received the United Nations Development Program Fellowship to pursue his master’s degree. The demand for potatoes that the fast-food industry spurred caught his attention, and his teachers encouraged him to look at educational opportunities outside India. Shetty applied to UoI because of its excellent reputation for generating potato-production research.

“Pursuing education in the U.S. was like fishing,” Shetty says. “Just cast out the line and see if anything will bite. I got some bites, but funding was a problem.”

Shetty’s father wasn’t prepared to pay for a U.S. education, but Shetty’s mother sold some of her property to help cover the cost. Still, it wasn’t enough for a full semester.

“I came here with the resources she could provide, knowing she’d rolled the dice for me in a big way,” Shetty says.

In greenhouses and wheat fields, Shetty worked his way through the semester. Then Robert Dwelle, Ph.D., division chair for plant science, took Shetty under his wing. Working under Dwelle, Shetty focused on the use of shrink-wraps to extend potato shelf life. The shrink-wrapped potatoes seen in grocery stores today are a direct result of Shetty’s research.

A Professional Success

After two years in post-doctoral studies at UoI, the Overseas Merchandise Inspection Company hired Shetty to build a lab from scratch in Portland, Oregon, which he did. But when a position at UoI became available, he returned to Idaho, where he was stationed in Twin Falls as the area extension specialist for the next five years.

At the time, silver scurf, an important postharvest disease, was causing an estimated \$8.6 million loss in Idaho’s fresh potato market. Learning to manage the disease was priority No. 1. Shetty, located in central Idaho, was able to study the disease on both sides of the state.

For the next three years, he surveyed growers, visited storage facilities, presented at conferences and developed

solutions. As a result of his work, losses declined below \$1.5 million. It was one of the major milestones of Shetty’s career.

“I’ve known Kiran since he was an assistant professor at UoI, and I cherish the relationship,” says Neil Gudmestad, Ph.D., distinguished professor of plant pathology at North Dakota State University. “He genuinely cares about you, your family and this industry that he’s spent so much time serving.”

In 1997, Novartis, a Syngenta legacy company, offered Shetty a position building the research dossiers necessary to register seed treatments for market use. Among his achievements is bringing liquid seed treatments to the potato industry. Liquids distribute active ingredients onto seed pieces more evenly than dusts and are less airborne, reducing potential breathing hazards to applicators. Prior to this development, the potato industry had used dust seed treatments, because applying liquids to seed pieces caused rot and reduced emergence. Shetty’s team broke the mold with post-application procedures and a drying agent that made liquid applications feasible for potatoes.

“I hear Kiran’s name referenced a lot when it comes to driving chemicals forward in a positive way,” says Jim Pitreau, vice president of operations at Green Thumb Farms. “He’s an advocate for potato farmers and treats everyone with respect, whether they’ve been farming for one year or 50.”

The King of Fruits

Every year, Shetty travels back to India, visiting family and friends and checking on the 2.5-acre mango farm he purchased where he grew up.

“It’s a small farm—a garden really,” Shetty says, “But it goes back to my boyhood love of agriculture. I sought out a relationship with farming because it’s where I began and want to continue.”

But he doesn’t market the mangoes. Not surprisingly, he gives them to those in need and saves a few for his family.

“Everyone likes mangoes,” Shetty says. “It’s the king of fruits.”

STORY BY CHRIS HARRELL

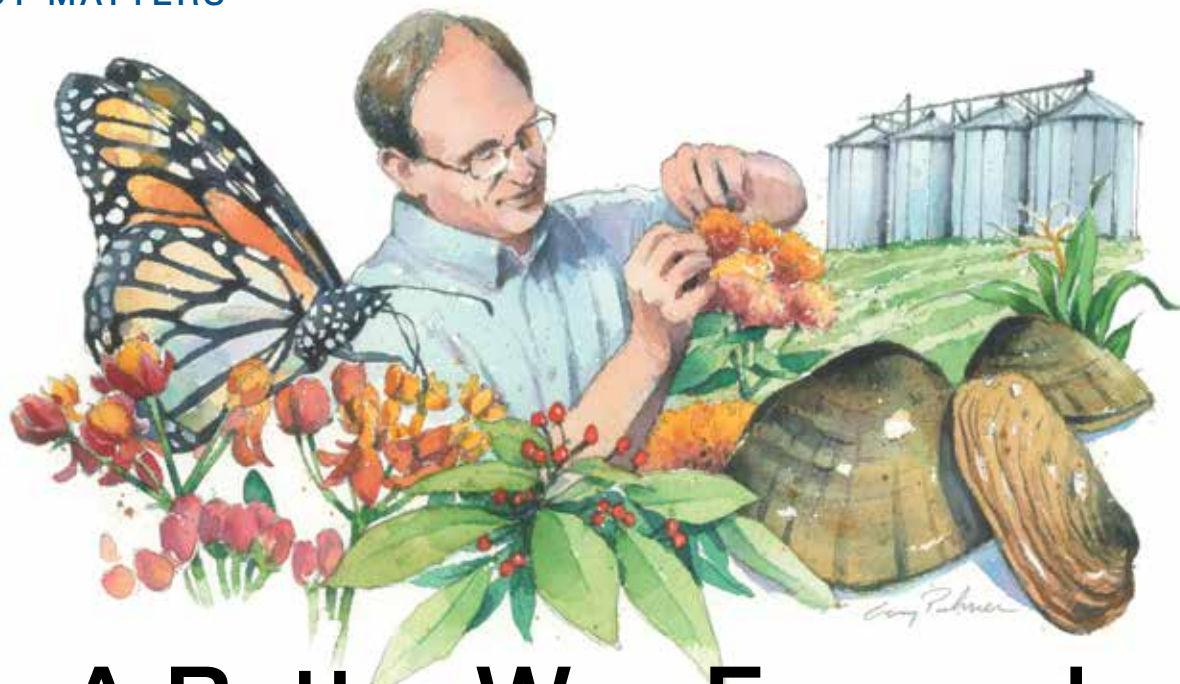
“Dr. Shetty was very supportive last fall at Syngenta grower meetings. It’s important for us newbies to have that support from seasoned professionals.”

—KASIA DUELLMAN



THE DOCTOR’S IN THE HOUSE

Spud Doctor, a video series that provides agronomic tips on potato issues, puts the expertise of Kiran Shetty, Ph.D., Syngenta technical development lead for potatoes, on full display. Providing information on best practices, diseases, insects, potato storage and product updates, Spud Doctor is a great way to learn how Syngenta products can maximize the potential of potatoes. To see more from Shetty and the Spud Doctor, visit www.syngentaus.com/potatoes.



A Better Way Forward

Ongoing conservation projects seek to show that environmental protection and pesticide regulation don't have to conflict.

Uncertainty and litigation—those are among the results of the long history of conflict between the U.S. Environmental Protection Agency, which oversees pesticide regulation, and the U.S. Fish and Wildlife Service and National Marine Fisheries Service, which administer the Endangered Species Act (ESA). This conflict affects the agriculture industry's ability to plan and invest in research and development, and it also threatens growers' access to important tools.

"It's a very complex regulatory matter that has been difficult from a science, legal and administrative viewpoint for many years," says Laura Peterson, head of federal government and industry relations at Syngenta. "Our company is committed to doing what we can to protect the environment and provide cutting-edge tools to farmers. To achieve these mutual goals, we encounter many challenges and opportunities—from developmental to approval processes—that ensure we address all U.S. environmental regulations."

To help find a better way forward with greater regulatory certainty, Syngenta is participating in conservation projects that benefit certain endangered and candidate species.

"These projects focus on identifying ways for landowners to improve habitats for endangered and candidate species and then measuring the benefits for the species," says Ya-Wei Li, director for biodiversity at the Environmental Policy Innovation Center. "Those benefits can

address some of the potential impacts of pesticide use calculated from models, so the species is better off and the process for registering pesticides is more efficient."

The projects are optional for growers and consistent with what they are already doing on their land. "Maybe they're doing X, Y and Z, but there are additional practices they don't have funding for, though they agree those would be good to do," Li says. "Syngenta collaborates with conservation groups and academics in providing resources, guidance and technical support, which enables growers to carry out those practices."

Endangered Species Project: Delta F.A.R.M.

A conservation project that Syngenta supports is with Delta F.A.R.M. (Farmers Advocating Resource Management), an association of Mississippi growers and landowners. The objective is implementation of agricultural practices that will increase habitat

for three endangered species in the Yazoo Mississippi River Delta in northwest Mississippi: two mussels and the pond-lily plant. Implementation began last fall.

Growers haven't felt an impact, says Trey Cooke, the organization's executive director, and he doesn't expect they will. "The conservation measures we're implementing are not taking acres out of production—the farmers are adding conservation measures that they are already accustomed to, but this project's

"In the past, we've regulated threatened or endangered species, and then we've regulated pesticides separately, and the overlap has not been there. We're looking at how to do both without impacting either."

—TREY COOKE

providing them incentives to install them.” These measures include sediment retention structures, cover crops and overseeding of existing buffers with pollinator-friendly plants.

He’s hopeful about both the results and the model this project might offer. “In the past, we’ve regulated threatened or endangered species, and then we’ve regulated pesticides separately, and the overlap has not been there,” he says. “We’re looking at how to do both without impacting either.”

Candidate Species Project: Monarch Butterflies

Another conservation project involves the Iowa Monarch Conservation Consortium, which seeks to establish approximately 480,000 to 830,000 acres of monarch habitat by 2038. The monarch is not listed as endangered, but its population has declined over the last 20 years in North America. The consortium seeks to support species recovery through voluntary efforts and avoid the need to list the monarch under the Endangered Species Act.

The loss of milkweed in Iowa and other Midwest farm states has contributed to the butterflies’ decline. “Everybody has a role to play in helping to increase the amount of monarch-breeding habitat in the state—in a way that is consistent with agricultural production,” says Steve Bradbury, professor of natural resource ecology and management at Iowa State University and a member of the project’s research team leadership. “We’re doing research to better understand how females move across the landscape and how many eggs they produce, and whether a few really big patches of habitat or lots of small habitat patches produce more monarchs in the subsequent generation. Another major theme of our research has to do with the potential risks that pesticide use could have on reproductive performance and population trends, because we’re clearly going to be establishing habitat in close proximity, at least in Iowa, to crop production.”

No land is coming out of production; the conservation efforts focus on spots where farmers aren’t growing corn and soybeans. “With support from the Iowa Pork Producers Association, we’ve also researched habitat establishment around hog production facilities, where people would otherwise be mowing—so that saves time and money, too,” Bradbury says.

A New Approach

In these types of conservation projects, the goal is to develop conservation practices as tools in an improved process that is timelier and more predictable, supports innovation and access to crop-production inputs while protecting farming practices, and ensures protection for endangered species. That would create a true win-win situation—and that’s why Syngenta continues to invest in such conservation programs.

“Syngenta is a leader in looking for solutions to these complicated issues between pesticide regulation and endangered species,” Cooke says. “Syngenta is taking a can-do approach of saying, ‘Let’s work together for an outcome that helps us all.’” 🌱

STORY BY SUZANNE BOPP



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The Right Moves

A crop-protection supplier must have the right transportation plan to ensure the timely delivery of its products.

The freight market is changing, and the agriculture industry is feeling the effects. In recent years, the market has experienced dramatic increases in demand, logistical services and cost.

A nationwide truck and driver shortage has required shippers to pay a premium in bonuses and prioritize shipments, resulting in higher prices and a need for advance planning. Meanwhile, the freshly implemented Electronic Logging Device mandate is increasing transit times by requiring drivers to log all hours they spend behind the wheel, even when loading and unloading. And, despite tough circumstances, shipments could increase across

industries by approximately 36 million tons by 2020, a total that would equate to 1.8 million shipments.

Comprehensive Planning

Under current ag market conditions, growers and resellers face a unique set of

challenges, including low commodity prices, rising operational costs and rampant market uncertainty. Fortunately, they don't need to add the timely delivery of products to their list of concerns, if they partner with the right supplier.

To overcome the logistical challenges presented by the freight market, growers and retailers typically turn to crop-protection suppliers that understand the complexities of the transportation industry. They look for suppliers with a knack for delivering products to the right place at the right time. According to Lisa Sizemore, manager of logistics strategy and support operations at Syngenta, comprehensive planning is the key to meeting these needs. "The minute we finish one season, we start planning for the next," she says.

Syngenta maintains strong communication lines with retail partners throughout the season to inform this planning and be responsive to current market trends. The planning process isn't just reserved for one part of the year; it's a critical part of the company's daily operations.

"We are always aiming for that perfect order; but even more than that, we're looking at future planning and market predictions," says Mandy Johnson, transportation manager with Syngenta. "We're analyzing what we expect to happen in the industry over the coming years—and strategizing about how to mitigate some of the impact that we might incur."

Building a Network

Over the years, Syngenta has built an extensive distribution network that allows the company to adapt to changing market conditions and provide customers with efficient and reliable product delivery. Syngenta uses rail cars and has partnerships with trucking companies. It also makes use of bulk terminals placed throughout the country, enabling Syngenta to move products to carriers with maximum efficiency. In turn, the carriers are able to deliver the products into the hands of customers in a timely manner.

To ensure timely delivery, Syngenta targets partnerships with trucking companies that share its commitment to long-term strategic planning. Fort Transfer, one such partner, has a comprehensive plan in place for growth in the years to come.

"Our plan is strategic growth, focusing on driver retention and shippers who share in those values," says Brad Kahler, CEO of Fort Transfer. "We're not going to overcommit. We're going to do what we're capable of, but we're going to grow as much as we can."

The driver shortage figures into Fort Transfer's planning.

Below: Fort Transfer CEO Brad Kahler looks at inventory spreadsheets with Bill Julius, storage supervisor, as Mike Boylan, storage technician, prepares for the loading procedure.





Above: Fort Transfer Shop Foreman Tim McCoy checks out a truck between its road trips.

Expansion in the middle of a shortage is no simple task, but Kahler and his team take a proactive approach that counteracts the prevailing market conditions. They pour substantial resources into driver satisfaction; they offer health and wellness coaches and a chaplaincy program to drivers. They also emphasize safety as a core value in an effort to protect the drivers and the products they carry.

"We're a small company, and we're trying to invest in those things that may be beyond what a normal large company can offer," Kahler says. "We want to give our drivers a sense that this is the best place to work. That's our ultimate goal—to be the best liquid-bulk chemical company to work for in the industry."

Syngenta recognizes that Fort Transfer's commitment to driver satisfaction and safety aids in retention and recruitment—two factors that exert a positive influence throughout the value chain.

"At Syngenta, we want drivers to enjoy being part of our supply chain," Johnson says. "We try to be easy to do business with, and we listen to what drivers are telling us. We want them to know that we value what they do for us."

Thinking Forward

With an increase in shipments on the horizon, Syngenta is

already developing a strategy to ensure timely deliveries. Understanding the needs of retailers and bulk carriers is essential to the planning process.

"We've been working strategically with our bulk carriers to make sure they're able to deliver what we're planning," Sizemore says. "We're collaborating with them right now on how we can share more in advance, so they can plan accordingly."

This commitment to collaborative planning makes Syngenta especially responsive to the demands of the market. Sizemore believes the company's responsiveness will be crucial to future success, especially in an uncertain market.

"We feel that the tight driver market will continue to stay the same or potentially get a little bit tighter over the next few years," she says. "We're planning and thinking ahead now, so we'll be prepared to handle any scenario that might come along later." 🍀

STORY BY GLENN BERTRAM

"We [Syngenta] are always aiming for that perfect order; but even more than that, we're looking at future planning and market predictions."

—MANDY JOHNSON



Ripple Effect

Syngenta honors the 2018 Golden Harvest Seed Advisor of the Year, a recipient of the Cucurbitaceae Lifetime Achievement Award and FFA members through its Blue Jacket program.

HONORS & RECOGNITIONS

Golden Harvest Names Seed Advisor of the Year

Steve Knorr of Advanced Seed is the 2018 Golden Harvest® National Seed Advisor of the Year. A local, independent Golden Harvest Seed Advisor in Minot, North Dakota, Knorr offers in-depth market and agronomy insights and dedicated customer service to farmers.

“Steve’s ability to connect with customers is second to none,” says Drew Showalter, Golden Harvest district manager. “Advanced Seed knows the markets inside and out and has done more for upper North Dakota farmers in two years than I ever could have imagined. Steve is a big dreamer, but he’s also a big doer, who hosts on-site customer events to demonstrate local seed, crop-protection and field-management trials.”

Knorr received the honor at the 2019 Golden Harvest Seed Advisor Rewards Trip award ceremony, which took place in St. Kitts and celebrated the top-performing Seed Advisors from across the country. Out of the 13 district winners eligible for the national award, Golden Harvest selected Knorr as its top Seed Advisor based on excellence in business performance, dealership growth and customer support.

“The Golden Harvest value I bring to customers is what



Steve Knorr (center) of Advanced Seed and his wife, Margo, (second from left) celebrate his 2018 Golden Harvest National Seed Advisor of the Year award in St. Kitts with Clayton Becker (far left), commercial unit head of Golden Harvest West; David Hollinrake (second from right), president of Syngenta Seeds, LLC; and Chad Stone (far right), commercial unit head of Golden Harvest East.

matters most to me,” Knorr says. “I truly believe in the integrity of this company. The folks behind the scenes aren’t here just to sell a bag of seed to farmers; they are here to bring us true value. After one year of trying Golden Harvest corn and soybeans, my customers are coming back and saying, ‘Wow, we’re happy with the products. We want to increase our order for 2019.’”

Syngenta Scientist Honored With Lifetime Achievement Award

Xingping Zhang, science fellow at Syngenta Biotechnology China, was awarded the Cucurbitaceae Lifetime Achievement Award at the Cucurbitaceae 2018 Conference. The award recognizes outstanding leadership, achievement and contributions to cucurbit science. Held every four years, the conference gives the award to two individuals—one from private industry and one from academia—who have contributed to innovations in cucurbit science and technology.

Zhang has contributed many technological breakthroughs in the watermelon-breeding program during his time at Syngenta and has played an integral role in the development of a number of large-sized seedless, personal-sized seedless, Super Pollenizer™ and seeded watermelon varieties. He is known throughout the industry for his expertise in plant genetics, breeding and teaching.

Crisp Delight, a standout variety Zhang helped develop recently, is a firm-fleshed watermelon variety bred specifically for processing into individually packaged slices that offer excellent eating quality. In response to the market’s demand for smaller portions of watermelon, Syngenta designed the variety to hold up to the rigors of packing and shipping after slicing. Fascination, another variety developed by Zhang, quickly became a top Syngenta seller and set a new standard for seedless watermelon varieties worldwide.

“We are so proud of Xingping and this recognition that he has earned after a lifetime of contributing to watermelon breeding,” says Dean Liere, regional portfolio manager, watermelon. “The industry and consumers alike can literally enjoy the fruits of his labor every day.”





Xingping Zhang, Syngenta science fellow, works with double-haploid cucumbers grown in a greenhouse at Syngenta Biotechnology China.

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A World of Good

The Syngenta Blue Jacket program helps provide recognition and opportunities for National FFA Organization members.

S yngenta has supported FFA for more than 50 years through donations, awards and hands-on learning experiences at national and local levels. As part of that support, Syngenta, along with its retail partners, has made significant contributions to the Syngenta Blue Jacket

Program. The iconic FFA blue jacket symbolizes the organization's commitment to agriculture and its mission of making a positive difference in the lives of young people.

"Since 2008, we've matched every \$2,500 pledged by retailers to benefit the program," says

Michael Boden, head of crop protection sales at Syngenta. "As a result, the Syngenta Blue Jacket Program alone has generated more than \$6.5 million in contributions to local FFA chapters."

On the local level, retailers participating in the Syngenta Blue Jacket Program choose an FFA chapter or chapters to sponsor. Syngenta then awards \$750 in unrestricted

financial assistance to each selected chapter on behalf of the retailer. Each chapter also receives a blue jacket, which can serve as a chapter jacket or go to a deserving student within the chapter. With this help from Syngenta and retailers, FFA provided more than 2,000 jackets in 2018.

"The blue jacket is more than a piece of clothing," says Shea Booster, western region vice president of the National FFA Organization. "It's the thread that ties our organization and our members together."

The effects of the Syngenta Blue Jacket Program are deep and long-lasting. "FFA members are the future of our industry, and it's in our best interest to provide support and help them pursue their dreams and aspirations," says Marshall Dolch, district marketing lead of the West Heartland region at Syngenta. "We work alongside a number of retail accounts throughout West Heartland with this initiative and are always striving to increase the number of participants each year."

Aurora Cooperative, based in Aurora, Nebraska, is one of those retail partners. It has more than 80 locations serving farm owners in several states and has participated in the Syngenta Blue Jacket Program for eight years, supporting about 40 chapters.

"The program is a good way to participate in our local communities and schools," says Kevin Sagehorn, the cooperative's head of marketing.

Aurora Cooperative also donates \$50,000 annually to local and state FFA programs, including the I Believe in the Future of Ag campaign. FFA uses the funds for various activities, such as helping to defray some of the costs of state FFA conventions, leadership programs, livestock shows and more.

Once FFA members themselves, Dolch and Sagehorn appreciate the support from Syngenta and its retailer partners.

"As a student, I always knew that Syngenta supported and cared about FFA," says Dolch, who was an officer in the Iowa FFA in 2012 and 2013.

Sagehorn was president of the Nebraska FFA in 1995 and 1996. "FFA prepared me for college and life," he says. "It helped to make me who I am today."

To these men and the many thousands of other FFA members, continuing support means the world. ■

STORY BY LYNN GROOMS

"FFA prepared me for college and life. It helped to make me who I am today."

—KEVIN SAGEHORN

Michael Boden, head of crop protection sales at Syngenta, shakes hands with an FFA member at a recent National FFA Convention.





FFA members participate in a discussion at a recent National FFA Convention.



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