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3Q | 2020

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20

YEARS OF
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Data-Driven
Research Boosts
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Corn, Soybeans

U.S. AG EXPORTS
SET UP TO ACHIEVE
STRONG FUTURE
GAINS

VEGETABLE VARIETIES
ON FAST TRACK TO
MEET ACCELERATING
CONSUMER DEMAND

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Even though you love your print edition of *Thrive*, please 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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Solid results from innovative research in the lab are leading to higher productivity in the field.
Photo: Tim Pearson

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Collard greens flourish at the agricultural-garden exhibit, sponsored by America's Conservation Ag Movement, on the National Mall in Washington, D.C.
Photo: Lina Walz-Salvador/Farm Journal Foundation

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.



Focus on the Acre

Much has been written about our burgeoning population and the global need for more food by 2050. Farmers read those reports and fully feel the weight of feeding the world. Then they eyeball \$3 corn, \$8 soybeans and 60-cent cotton and wonder just how much the world understands food production. Farmers wonder how they can make a profit at those prices.

Farmers and the retailers who serve them are not alone. We understand that the way forward is stepped off by increasing yield and decreasing the cost to produce the bushel, pound and farmer stock ton per acre. With each profitable acre, a farmer strides toward economic sustainability, and the rest of us are a bit more assured of three squares a day.

Seeds of Innovation

Farmers need to make more than 40 key decisions on their farm each year to bring in a high-yielding, premium-quality crop. Each field on the farm demands a customized solution. And, the viability of the crop hinges on each decision.

Innovative seed, trait and crop protection products help provide flexibility to optimize production and increase economic and agronomic sustainability on each acre. We back those products with strong supply and agronomic support for our retail partners who deliver the on-farm products and support growers with the services they need.

In this issue, take a look at how our seeds of innovation make a difference. Consider the diverse germplasm, solution-focused traits and sound science underpinning seed production, seed treatment and crop protection products. Read about the relationships we have with the capable retailers who deliver these tools to farmers. It's a chain of trust that pulls up all of us.

The end goal, of course, is filling more bellies around the world. It's also higher profit opportunity for the folks with a hunger for feeding the world. When our focus is on helping them do well, we all succeed. 🌱



JUSTIN WOLFE
Regional Director, North America Seeds
Syngenta

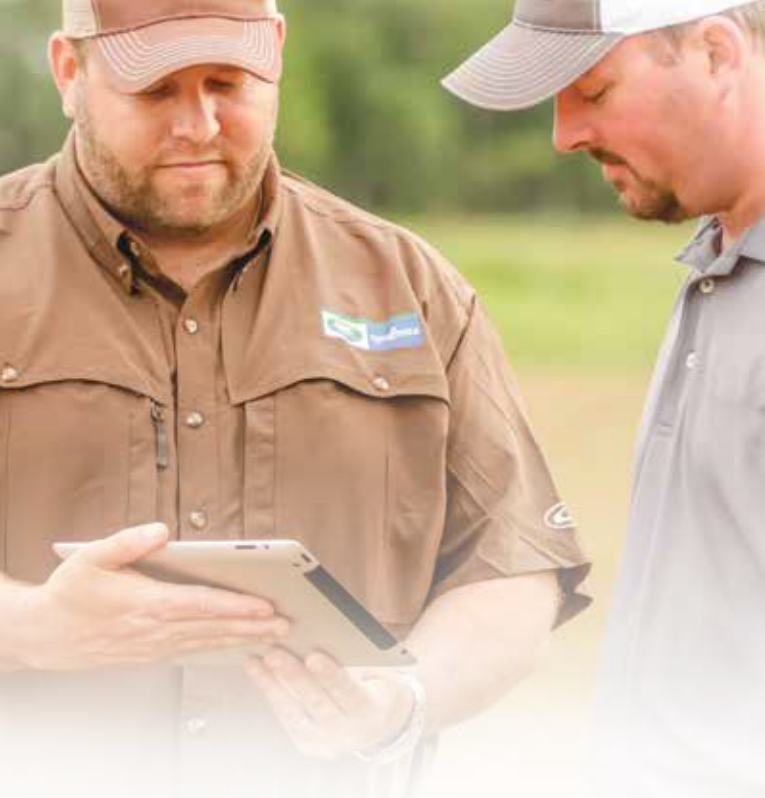


JUSTIN WOLFE

“We understand that the way forward is stepped off by increasing yield and decreasing the cost to produce the bushel, pound and farmer stock ton per acre.”



WATCH NEW VIDEO. For tips on how to increase productivity to drive higher profit potential, check out the new video featuring Allan Gray, Ph.D., executive director for Purdue University's Center for Food and Agricultural Business, posted to the *Thrive* website (www.syngentathrive.com).



What's in Store

Learn about new products, product updates and upcoming events, including a call for votes for this year's #RootedinAg Contest.


NEW PRODUCTS

Newly Expanded NK Corn and Soybean Portfolios

To help farmers minimize risk and maximize potential return on investment (ROI) amid new and emerging challenges, Syngenta released 11 new NK® corn hybrids and 21 new NK Soybean varieties for the 2021 growing season.

The reinvigorated NK corn portfolio offers hybrids with high-yielding performance protected by industry-leading Agrisure® traits, helping farmers meet specific needs and capitalize on whole-farm ROI potential. The new varieties of NK soybeans provide consistently high yield potential and are equipped with the industry's broadest choice of herbicide traits, including Enlist E3® soybeans,





A field of NK soybeans stands strong in Brookings, South Dakota. For the 2021 planting season, soybean growers will have 21 new NK varieties to choose from.

Roundup Ready 2 Xtend® and LibertyLink® GT27™ soybeans, to manage tough-to-control weeds.

For more information, visit www.nkseeds.com.



New AgriPro Brand Wheat Varieties Set Growers Up for Success

Syngenta introduces four AgriPro® brand wheat varieties for this fall to address local growing conditions in the Pacific Northwest (PNW), California and the Central Plains. Two are hard red spring wheat varieties:

- **AP Venom** delivers high yield with very good protein and offers excellent tolerance to stripe rust. It is versatile for fall or spring seeding in the PNW.
- **AP Octane** offers quick emergence and high yield and is versatile for fall or spring seeding in the PNW. For growers in California, AP Octane will be available for winter wheat planting and can be used for either grain or forage.

Two are hard red winter wheat varieties:

- **AP18 AX** provides a new mode of action to control winter annual grasses and has shown good winter hardiness in initial testing and broad adaptation in the Plains.
- **SY Wolverine** has shown outstanding yield performance across the Plains and offers improved wheat streak tolerance.

Visit www.agriproheat.com for additional information.



EVENTS

VOTE!

For Your Favorite #RootedinAg Finalist.

Syngenta thanks everyone who entered the #RootedinAg Contest and shared stories about the people who most nourished their agricultural roots. Although the decision was difficult, a panel of judges narrowed the field of competitors to three finalists.

Now, we need your vote to help us decide who will be the winner of the grand prize — a \$500 gift card and professional photo shoot with his or her mentor. Also at stake is a \$1,000 donation from Syngenta to the winner's favorite local charity or civic group.* Just go to www.syngentathrive.com/contest and vote for the entry you think is most deserving. Online voting ends Sept. 15, 2020, with Syngenta announcing the grand prizewinner in October.

FOR MORE INFORMATION on the #RootedinAg contest and Official Rules, visit www.syngentathrive.com/contest.



*NO PURCHASE NECESSARY. See Official Rules for more details.

UPCOMING TRADE SHOWS AND CONFERENCES

As the weather heats up, so does planning for the late summer/fall trade show season. Please stop by our booth at any of the events below to find out what's new at Syngenta.*

September 2020

1–3 Farm Progress Show
Boone, Iowa

15–17 Husker Harvest Days
Grand Island, Nebraska

October 2020

28–31 National FFA Convention & Expo
Indianapolis, Indiana

*At the time of publication, these events had not been canceled due to COVID-19 restrictions. Check with your Syngenta rep for the latest information.

Enter the Miravis Neo “Seeing Green” Contest

Syngenta invites growers and resellers to share photos of the positive impact Miravis Neo® fungicide is having on corn and soybean crops on their farms or in their areas. In exchange, they will be eligible to win one of eight weekly prizes and a final grand prize.¹ The Miravis Neo Seeing Green Contest, which takes place this summer from July to September, asks participants to post photos of corn or soybean fields treated with Miravis Neo and use the hashtag #SeeingGreen Contest on Twitter or Instagram for a chance to win. Each entry also raises money for the Farmer Relief Fund offered through the American Farmland Trust.² For more information, please visit www.syngentaus.com/miravisneocontest.



1. Void where prohibited by law. Only one prize per person. While supplies last. Manufacturers of prizes are not affiliated with Sponsor and are not sponsors of this Contest. Reference herein to any trademark, proprietary product, organization or company name is intended for explicit description only and does not constitute or imply endorsement.
2. Syngenta will donate \$20 per entry up to \$5,000.00 to the Farmer Relief Fund offered through the American Farmland Trust. The donation will be made at the close of the contest. America Farmland Trust is not affiliated with Syngenta and is not a sponsor of this contest.





Healthy cornfields, like this one in Pontiac, Illinois, will be featured in the Miravis Neo “Seeing Green” Contest, which will give growers a chance to win one of eight weekly prizes and a grand prize.

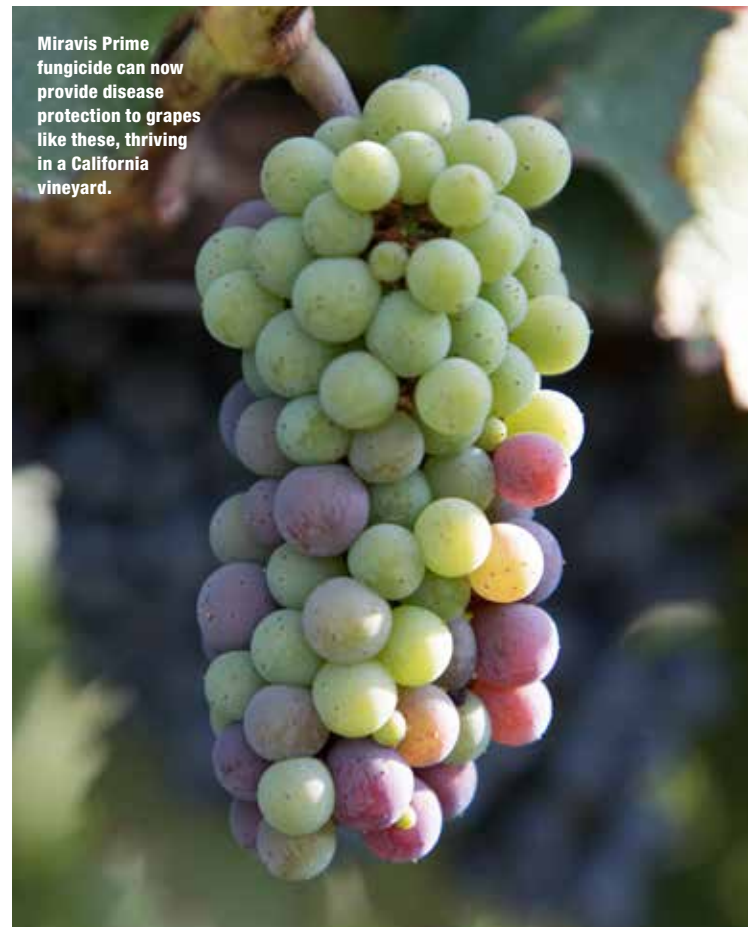
PRODUCT UPDATES

Miravis Prime Is Now Available in California

Growers in California now have access to Miravis[®] Prime fungicide, a combination of fludioxonil and Adepidyn[®] fungicides. Broadly available since gaining federal registration in 2018, Miravis Prime was recently approved for use in California on grapes, fruiting vegetables, cucurbits and other crops.

As a powerful disease management tool for growers, Miravis Prime sets a new standard in its class for spectrum and performance, and provides excellent control against key diseases, such as *Botrytis* and powdery mildew in grapes. Additionally, Miravis Prime complements integrated pest management spray programs. For more information, contact your local Syngenta representative or go to www.syngenta-us.com/fungicides/miravis-prime.

 **Miravis Prime**



Miravis Prime fungicide can now provide disease protection to grapes like these, thriving in a California vineyard.

Three Tips to Drive Production During a Crisis

As the nation's economy slowed down during the COVID-19 crisis, Syngenta powered forward. Here are three tips to help retailers press onward in a crisis.



The COVID-19 crisis caused unprecedented and, in many cases, unpredictable damage to almost every sector of the national and global economies. The agriculture industry, however, is uniquely prepared to deal with uncertainty — from changing weather to evolving pest pressures to fluctuating commodity prices. This industry is built on resiliency and contingencies.

Since the early days of the crisis, Syngenta executed a robust strategy of logistics, communication, education and outreach to help growers and retailers get the products they need on time and without interruption.

“Our procurement team has done a great job in securing supplies, purchasing early and making sure we have everything we need to feed our plants so they can continue producing,” says Kevin Duhé, head of production & supply at Syngenta, North America. “In fact, we have not stopped production at any time during the COVID-19 crisis.”

TIP NO. 1: Communicate Clearly

To stay ahead of issues, Syngenta formed a regional task force composed of stakeholders from every part of the company. This group continues to meet regularly to keep everyone on the same page and employees informed,

which Kathy Eichlin, head of internal communications at Syngenta, North America, says is key for any operation during these times.

“I advise other agribusinesses to rely on those with expertise around you,” Eichlin says. “But also have frequent discussions with your employees, leaders and customers, making adjustments in your communication channels and messaging. Find out what their needs are. You may be able to share learnings and best practices along the way.”

Syngenta did just that with a health and wellness portal that was developed for its customers and employees. Ana Davis, head of health, safety & environment at Syngenta, North America, worked with Syngenta regional directors to build out the public-facing version of the portal found at www.syngentaus.com/wellbeingportal to share with local communities, customers and growers.

“We care deeply about people,” Davis says. “We care about the communities in which we operate, and we want to be part of helping them get through this challenge.”

TIP NO. 2: Serve the Greater Team

Looking out for the well-being of customers, partners and employees has also helped keep the supply and operations

WATCH NEW VIDEO. Kevin Duhé, head of production & supply at Syngenta, North America, explains how Syngenta is taking steps to ensure growers and retailers receive the products they need during the COVID-19 pandemic, posted to the *Thrive* website (www.syngentathrive.com).



teams moving. Duhé says his team worked quickly at the start of the crisis to put safeguards in place at all their shipping sites and warehouses. They focused on protecting not only Syngenta employees, but also the contracted truck drivers who deliver products to customers. “During the peak of the season, we can load 100 to 200 trucks a day,” Duhé says, “so it was important to create safe areas where drivers could wait while their trucks were being loaded.”

The team also built out a private Facebook group for the drivers to communicate with one another along their routes and receive positive messages from Syngenta.

“They share information about where they can find food on the road, because that’s been difficult,” Duhé says. “They talk about how to stay safe and about places that are still open where they can get showers or other amenities.”

TIP NO. 3: Find New Ways to Interact

Unfortunately, the COVID-19 crisis has limited in-person interactions, which are a key part of agriculture. For Syngenta sales reps, maintaining productive relationships with growers and resellers has meant embracing technology and new, innovative strategies.

“Before this crisis, a lot of salespeople would have laughed if you told them they’d need to do most of their business over video chats and text messages,” says Michael Boden, head of U.S. Crop Protection sales at Syngenta. “Instead of walking in with a box of doughnuts, they may meet outside across a truck or set up a FaceTime call. Our team is really good at interacting effectively with customers in different ways now.”

Boden says his team continues to innovate to work around the crisis. From scouting fields in shifts to avoid contact to sharing photos and videos via text message, they’re doing all they can to balance safety and service.

“At a time like this, every decision is extremely important,” Boden says. “Be deliberate and thoughtful, whether you’re considering which input has the best return on investment or what might be the safest way to interact with your neighbors.” ■ STORY BY SHANE NORRIS

From left to right: Production of atrazine herbicide is in full force at the Syngenta St. Gabriel, Louisiana, chemical manufacturing plant; Shop Foreman Tim McCoy with Fort Transfer, one of the largest trucking partners for Syngenta, checks out a vehicle before it transports needed products to retailers; Franz Rowland, a Boston, Georgia, grower, receives sound agronomic recommendations virtually through the AgriEdge® whole-farm management program; AgriEdge Specialist Ashley Green reviews nitrogen-use data on a farm in Mankato, Minnesota, while maintaining physical distancing with the proprietor.

SYNGENTA SUPPORTS LOCAL COMMUNITIES

During the COVID-19 outbreak, Syngenta continues to live out the mission of feeding a hungry world. That has taken on a new meaning as hardworking families around the U.S. are suddenly out of work. When the Syngenta leadership team learned that food banks in the communities surrounding the company’s major operations were serving double or triple their normal meals, the leadership team jumped into action.

“Our mission is around food security, so we see the importance now more than ever to help provide food and meals to those in need,” says Kathy Eichlin, head of internal communications at Syngenta, North America. “There was no hesitancy from our employees and leadership team to help our surrounding community by providing access to food and supplies immediately.”

The company has donated tens of thousands of meals to food banks in Baton Rouge, Louisiana; Omaha, Nebraska; Greensboro and Raleigh, North Carolina; and other locations. “It’s rewarding to give back to the communities that have given us so much over the years,” Eichlin says.

Stand by Your Seed Treatment

Proper stewardship and a science-based regulatory approval process are the best defenses against challenges to the use of seed treatments.

Seed treatments play a critical role in the production of healthy crops, offering a convenient means of fighting early-season insects and diseases and getting plants off to a better start. They also allow growers to avoid applying excessive chemicals to crops. For example, if neonicotinoids — often used in seed treatments — were not available, a pound of neonics would have to be replaced with nearly 5 pounds of older chemicals, AgInformatics research¹ shows.

That's why the use of seed treatments is so widespread. It's estimated that 90% of the corn seed planted in the U.S. is treated.

Every ingredient that goes into a treated seed, including custom treatments, must be tested and approved by the Environmental Protection Agency (EPA). But recently, the safety of treated seed has been challenged. Questions about potential risks to birds and other pollinators — particularly from seeds treated with neonicotinoids — have resulted in attempts to limit or ban their use. Practicing excellent stewardship and making our voices heard can help to preserve agriculture's access to these important tools.

Update on Regulations

At the federal level, the EPA recently assessed the risks and benefits of neonics as seed treatments. In a preliminary interim decision, the agency recognized the benefits of treated seeds in a range of crops, says Jane DeMarchi, vice president of government and regulatory

affairs for the American Seed Trade Association (ASTA). "It also recognized that the risk to the environment from treated seed was very low."

Meanwhile, several organizations challenged EPA in court and through a formal petition, asking for a change in the way treated seed is regulated. "These groups would like EPA to not only regulate the pesticides, but also the seed once it's treated with the pesticide," she says. "We feel like that type of regulation would be duplicative, because when pesticides are approved, they are approved for use as a seed treatment."

The group did not win its court case, but EPA has yet to respond to that petition — a concern for retailers and growers. Right now, a retailer can create a recipe to address a grower's specific needs and apply it to seed. "Since all of those ingredients are approved by EPA, the recipe does not have to go through this long regulatory process itself," DeMarchi says. "But if there's a change in the way treated seed is regulated, it's possible those recipes, and even the process of planting the seed, would also be regulated. This could mean farmers would need a special applicator permit, because you'd be saying that each individual seed is a pesticide."

Dennis Kelly, head of state affairs at Syngenta, adds that currently, "EPA's exemption on treated seeds says, 'No, it's still a seed,' — much the same way that a pressure-treated two-by-four or a boat treated with antifouling paint can move from state to state without being regulated. It's a two-by-four. It's a

"EPA's exemption on treated seeds says, 'No, it's still a seed,' — much the same way that a pressure-treated two-by-four or a boat treated with antifouling paint can move from state to state without being regulated. It's a two-by-four. It's a boat. It's a seed — just because it's treated doesn't mean that it's anything different."

—DENNIS KELLY
Head, State Affairs
Syngenta

Seed treatments, which come in a variety of different colors, protect a broad range of crops from disease and insect damage, while reducing in-season pesticide use.

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Legislation at the State Level

It's important that EPA publishes its final decision soon, DeMarchi says. "EPA has the expertise to make these kinds of decisions. If there's a delay, state legislatures might just make their own decisions." Some states have already introduced bills to regulate treated seeds.

Chuck Spencer, executive director of government relations at GROWMARK Inc., knows his customers rely on seed treatments. "We oppose any initiative, state or federal, that would circumvent a science-based review process of crop protectants," he says. "We believe very strongly in this science-based approach. The process at the EPA level is necessary: one in which nongovernmental organizations, as well as the industry itself, all work together to achieve the most favorable outcome, taking into consideration the control of pests, the health and safety of the humans who are both handling it and ultimately consuming the crops, and also the environment in which growers use the product."

Keeping Treated Seed Available for Growers

To help make sure that agriculture will continue to have access to seed treatments, growers and applicators should use best management practices — following directions on treated seed container labeling for handling, storage, planting and disposal practices and using advanced seed flow lubricants that minimize dust.

Growing Matters' BeSure! campaign, an industrywide collaboration between crop protection providers, trade associations and ag retailers, offers guidance on those practices — such as observing wind speed and direction to avoid dust drift from treated seeds to sensitive areas during planting. You can find more detailed information about seed treatment stewardship at growingmatters.org/besure.

Together with ASTA, Syngenta is also working on education around stewardship of treated seed, DeMarchi says. "Stewardship education is really important, not only because it's crucial that everybody does their part to protect pollinators, but it's very important to EPA."

Kelly agrees. "Syngenta has done a lot of education with farm groups, ag commodity groups and other folks who work at the state level," he says. "We also have a very active state affairs team that works with CropLife America and the other major registrants of insecticides and crop protection."

Of course, Syngenta also continues to focus on making the best products it can, as well as registering its seed treatments in all the states they're used in, so these important tools remain available to growers and retailers nationwide. 🌱

STORY BY SUZANNE BOPP

1. "Facts About Seed Treatments," American Seed Trade Association, www.georgiacrop.com/fullpanel/uploads/files/asta-seed-treatment-overview.pdf

INTRODUCING SALTRO. SDS PROTECTION. UPGRADED.

The best is only the best until something better comes along. And with the arrival of Saltro® fungicide seed treatment, a superior SDS protection has arrived. It delivers powerful control of the disease without the stress shown in plants treated with ILEVO®. Ask your Syngenta retailer about upgrading your SDS protection with Saltro.

SyngentaUS.com/Saltro



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On Guard Against Citrus Greening

Two agronomists offer region-specific insights on a disease that strikes fear in Florida and Western U.S. citrus growers.

Q. How is citrus greening, or Huanglongbing (HLB), impacting growers in your region?

A. John Taylor, CCA, agronomic service representative in Florida, Syngenta: Citrus greening, or HLB, has been the single most devastating challenge to befall the Florida citrus industry. It has reduced yields by 50% or more, doubled production costs, and reduced the overall citrus-bearing

from additional sprays to keep populations of the Asian citrus psyllid (ACP) — a major vector of the disease — low.

Q. What role does scouting play in managing citrus greening in your region?

A. Taylor: We no longer scout for citrus greening in Florida. Early in the disease outbreak, the industry actively scouted and removed infected trees. This entailed robust field scouting efforts coupled with real-time PCR [polymerase chain reaction] testing for positive confirmation. Unfortunately, in Florida, the disease was fairly well distributed when it was initially detected, so scouting and tree removal proved ineffective at preventing spread and establishment. The latency period between infection and symptom expression — combined with the fact that the pathogen is insect-vectored — means field scouting is only a viable strategy early in the disease introduction and establishment.

A. May: Because citrus greening in my region is not well-established, scouting can be a useful tool. I suggest that Western citrus growers go to the following University of Florida IFAS Extension sites for recommendations: edis.ifas.ufl.edu/ch200 and crec.ifas.ufl.edu/extension/greening/management.shtml. Additionally, growers can go to their county's ACP Task

Force meetings, where they can find out about scouting workshops.

Q. Does controlling ACP benefit trees either before or after they're infected with citrus greening?

A. Taylor: That's a question that research has yet to conclusively vet. Early indications seem to show that trees repeatedly infected by hot psyllids see more rapid disease progression and tree decline. Since citrus greening is now endemic in Florida, growers have largely abandoned intensive monthly sprays in mature groves. Where young trees are being established, growers maintain intensive psyllid management practices for the first three years of a tree's life to help delay infection. Since it only takes one hot



acreage in Florida, which at one time was more than 800,000 acres, to around 400,000 acres today. Additional ripple effects include the loss of critical infrastructure, growing reluctance to replace existing trees or plant new ones, and declining consumer demand due to increased commodity prices.

A. Christine May, PCA, agronomic service representative in Southern California and Arizona, Syngenta: California and Arizona do not have citrus greening systemically across all citrus-growing regions. Therefore, a large part of the impact has been from quarantines that restrict movement of fruit between different growing regions, as well as "spray and move" requirements prior to harvest. At this point, citrus greening has not caused commercial losses of fruit in my region. Most of the economic impact has been

psyllid to infect a tree, the action threshold is zero. In our subtropical growing environment, attempting to eradicate psyllids is not biologically or economically feasible. As a result, most growers have evolved into maintaining psyllids at low levels. Minecto® Pro insecticide is one tool that offers growers extended residual control of ACP and other citrus pests.

A. May: Controlling ACP has an important economic impact, regardless of the status of citrus greening infection. The economic threshold for ACP and all insects that vector disease is technically zero. If a block is infected, a single ACP can transmit HLB to another block or another grower's trees. Slowing or stopping this spread within California and Arizona is important for the overall economics of citrus production. While trees can remain in production with HLB, yield and quality are reduced, which over time reduces the production of the entire industry. Systemic infection within the industry would impact growers and fruit packers if the yield decreases enough.

Q. Why is root health important, and what can growers do to improve it?

A. Taylor: Citrus greening infects the root system of trees early in the disease cycle. It causes as much as 30% to 40% loss of the fibrous root mass, which is then reflected in the various above-ground symptoms commonly associated with the disease. This rapid loss of root mass also negatively interacts with other common root issues, such as *Phytophthora*. The interaction of citrus greening with other biological stresses magnifies the impact of each disease and hastens the decline of the trees. As root mass declines, trees become more sensitive to water quality, fertilizer quality and


stress events, such as drought and cold. Without a healthy root system, trees lack the physical ability to efficiently collect water and nutrients as well as store carbohydrates to facilitate normal growth patterns and full crop loads.

Root health is challenging for growers to manage because the root system is out of sight and challenging to monitor. Growers have learned to use soil sampling to monitor pathogens like *Phytophthora* and track root mass trends. Additionally, more attention is being paid to water quality, fertilizer quality and other root health impacts, including nematodes, root weevils and organic soil amendments. Root health is not a single-factor equation. Growers should focus on identifying stressors and opportunities for improvement and then focus their resources on the factors they can effectively manage.

A. May: Root health is an important part of managing HLB and keeping trees in production. HLB infection blocks the phloem of the tree, which transports nutrients. Roots are the basis for nutrient uptake. Keeping them healthy and protected from other diseases can maximize their uptake ability, enabling the tree to get the most nutrients possible. The combination of HLB and root diseases like *Phytophthora* can be very detrimental to nutrient uptake. Syngenta offers two products that help manage *Phytophthora* infections and, therefore, improve root health: Ridomil® Gold SL and Orondis® fungicides. 🌱

INTERVIEWS BY SUSAN FISHER

FOR MORE INFORMATION on managing citrus pests, speak with your Syngenta representative or go to www.syngentaus.com/citrus.



“The economic threshold for ACP and all insects that vector disease is technically zero. ... Slowing or stopping this spread within California and Arizona is important for the overall economics of citrus production.”

—CHRISTINE MAY, PCA
Agronomic Service Representative
in Southern California and Arizona
Syngenta



Despite Pandemic, Ag Export Markets Still Make Major Economic Impact

Because U.S. agricultural production usually outstrips national demand for many goods, U.S. growers and ag companies have traditionally depended on export markets to support their revenues. This year, the COVID-19 pandemic created a hard-to-predict trade situation for these goods. But it's helpful to remember where ag export markets stood before the pandemic to better gauge its effects on trade. This infographic provides an overview of the important role that agricultural exports play in the U.S. economy.





THE BIG PICTURE

\$140 BILLION

is the dollar value of agricultural exports in 2018.²

\$163 BILLION

is the dollar value of additional economic expenditure stimulated by agricultural exports.²

1 MILLION JOBS

were supported by agricultural exports in 2018.²

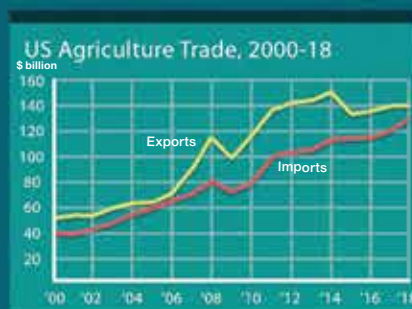
Trading Partners

While exported U.S. agricultural products go to many countries, the U.S. sent 60% of those goods in 2018 to six areas: Canada, Mexico, the EU-28, Japan, China and South Korea.²



Trade Agreements and Trade Surpluses

U.S. agriculture has generally benefited from the more open trade produced by free trade agreements³, resulting in trade surpluses. The trade surplus in 2018 was \$11 billion.¹ The chart below shows the relationship between imports and exports since the year 2000.¹



FOOTNOTES

1. "Agricultural Trade," United States Department of Agriculture, Economic Research Service, www.ers.usda.gov/data-products/ag-and-food-statistics-charting-the-essentials/agricultural-trade
2. "Effects of Trade on the U.S. Economy, 2018 Data Overview," United States Department of Agriculture, Economic Research Service, www.ers.usda.gov/data-products/agricultural-trade-multipliers/effects-of-trade-on-the-us-economy
3. Schulz, Lee and Chad Hart, "Ag Trade and Trade Agreements," *CARD Agricultural Policy Review*, Spring 2017, https://www.card.iastate.edu/ag_policy_review/article/?a=66
4. "U.S. Agricultural Trade Data Update, U.S. agricultural exports, year-to-date and current months," United States Department of Agriculture, Economic Research Service, www.ers.usda.gov/data-products/foreign-agricultural-trade-of-the-united-states-fatus/us-agricultural-trade-data-update

NOTE: First number in the data label is the value in billions of U.S. agricultural exports to the country or region in question in calendar year 2018; second number is the country or region's share of these exports, expressed in percent.





Driving Demand for U.S. Ag Products

Despite the COVID-19 pandemic, U.S. ag export fundamentals are sound and recent trade deals hold promise for future gains.

By Darcy Maulsby | Art by Ryan Etter

It's one thing to say ag exports generate millions of dollars for the U.S. economy. It's another to consider their impact on individual farms.

"When I was growing up near Marengo, Iowa, in the 1970s, the boom in American grain exports drove up grain prices," says Sara Wyant, a veteran farm policy reporter and president of Agri-Pulse Communications, Inc. "That meant my family could afford a few more things like a new car and new farm machinery."

Wyant's family also felt the pain when the 1980 Soviet grain embargo slashed exports and contributed to the worst farm crisis since the Great Depression. Since then, international trade has become increasingly vital to the U.S., which is the world's largest exporter of agricultural products. U.S. ag exports were valued at \$140 billion in 2018, a 1% increase compared to 2017, according to the U.S. Department of Agriculture (USDA).

“Imagine if you woke up tomorrow, and all international trade in ag products had ceased,” says David Widmar, an agricultural economist with Agricultural Economic Insights. “How many acres would we have to idle?”

That would equate to nearly 40 million acres of soybeans alone, he notes, as nearly 50% of soybeans are export bound. It’s hard to imagine this scenario, especially with all the advantages that America has — productive soil, modern infrastructure and advanced technology — to help feed a growing global population.

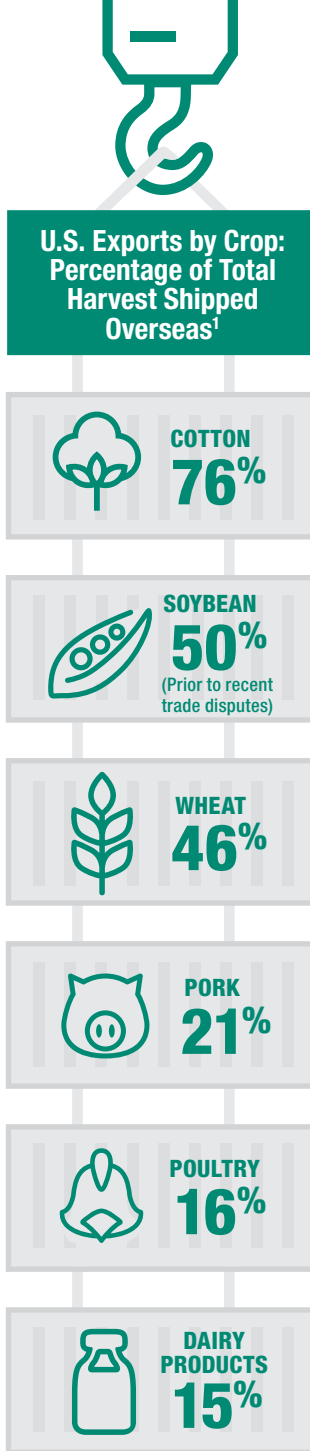
Progress on Trade Pacts

Recent trade deals will create new opportunities for U.S. ag exports, thanks to the United States–Mexico–Canada Agreement and the Phase 1 deal with China, says Arlan Suderman, chief commodities economist with INTL FCStone Financial Inc.

That’s encouraging in times of great uncertainty, like the early days of the recent COVID-19 pandemic, which put many trade negotiations on hold. The U.S. Grains Council (USGC) published an open letter to global customers about America’s COVID-19 response, emphasizing that U.S. grain production and export facilities continued to operate throughout the pandemic. Holding meetings virtually through Zoom videotelephony and online chat services has helped to reignite discussions with trade partners.

“International buyers’ ability to purchase U.S. ag products isn’t what it was before the COVID-19 outbreak, but it appears this situation is just a temporary shock,” says Veronica Nigh, an American Farm Bureau Federation economist. “America is in a strong position when things normalize after COVID-19.”

It’s a matter of finding the new normal, says Ryan Findlay, CEO of the American Soybean Association. “Three years ago, one of every three rows of U.S. soybeans was exported. Then came the trade disputes with overseas buyers, African



1. “Percentage of U.S. Agricultural Products Exported,” United States Department of Agriculture, Foreign Agricultural Service, May 30, 2018. <https://www.fas.usda.gov/data/percentage-us-agricultural-products-exported>

swine fever and now COVID-19. Where is the next China, in terms of demand for U.S. exports?”

The answers will influence the future of U.S. ag. “We are incredibly productive with relatively few farmers,” Suderman says. “Roughly 80% of what’s produced agriculturally in America is grown by approximately 150,000 farmers.”

One in three acres in the U.S. is destined for the export market, according to USDA estimates. “There are 330 million people in the U.S., but American farmers raise enough to feed 2 billion people a year,” says Melissa George Kessler, director of strategic relations for the USGC.

The current world population is 7.8 billion, according to the United Nations. More than 95% of these people live outside the U.S. “We need to keep looking at areas around the globe where demand growth is likely for U.S. ag products,” Wyant says. “The global population is projected to soar to nearly 10 billion people by 2050. Where can we be helpful by providing a safe, nutritious, reliable food supply?”

The U.S. Exports More Than One-Fifth of Its Ag Products

The U.S. is well-positioned to meet this challenge. America began exporting ag products in the post–World War II era, as economies worldwide developed and people wanted higher protein sources. “Today, more than 20% of what U.S. farmers produce is exported,” Nigh says. The growth in soybean exports in the past 20 years, for example, was phenomenal. “In 2000, the U.S. exported under 1 billion bushels of soybeans a year,” Suderman says. “That rose to 2.166 billion bushels a year by 2016, largely due to China.”

Corn is a different story, because despite the current negative effects of low oil prices and complex domestic fuel-blending regulations, the ethanol industry creates a lot of domestic demand. Still, exports of corn grain and corn-based products for animal agriculture and ethanol represent nearly 20% of U.S. corn’s annual

EXPERTS WEIGH IN ON AG EXPORTS

“We need to keep looking at areas around the globe where demand growth is likely for U.S. ag products. ... Where can we be helpful by providing a safe, nutritious, reliable food supply?”

—SARA WYANT
Veteran Farm Policy Reporter and
President of Agri-Pulse Communications, Inc.



“Most of the time, it takes three big things to change food demand and exports: population, income or trade policy.”

—DAVID WIDMAR
Agricultural Economist
Agricultural Economic Insights



demand portfolio, notes Jim Bauman, vice president of market development for the National Corn Growers Association.

All these exports help drive both the U.S. farm economy and the general economy. Roughly 1 million jobs are supported by U.S. agricultural exports, including 764,000 in the nonfarm sector, according to AgExportsCount.com. These include jobs related to supplying seed and crop protection products, transporting ag commodities, and processing and distributing agricultural products for export.

“Years ago, President Franklin D. Roosevelt connected the importance of the farms to the cities, noting that ‘empty pocketbooks on the farm do not turn factory wheels in the city,’” Wyant says.

While exports put money in U.S. farmers’ pocketbooks, growing exports is rarely fast. “Most of the time, it takes three big things to change food demand and exports: population, income or trade policy,” Widmar says.

What Might the Future Hold?

Growing populations in India and Africa bode well for U.S. exports. The key is to avoid focusing on just a few trading partners, Widmar says. “We need to maintain and grow trade with a host of countries.”

That starts by growing the most marketable crops possible, using elite seed genetics and proven crop protection products. “Twenty years ago, hardly any farmers were using fungicides in corn,” notes Lynn Sandlin, business intelligence manager at Syngenta. “Now, growers have Syngenta products like Trivapro® and Miravis® brand fungicides for broad-spectrum disease control and plant-health benefits. We want to help you grow the very best crop possible, in terms of quality and yield potential.”

Maximizing a crop’s potential helps pave the way for more export demand. “We’re on a mission to develop markets, enable trade and improve lives,” Kessler says. “We’ll continue to build long-term relationships abroad as we play the long-term game to benefit U.S. farmers.”

An aerial applicator applies a crop protection product to a field of potatoes.



Managing MRLs to Minimize Trade Troubles

When foreign buyers negotiate trade deals to purchase U.S. commodities, they aren’t just interested in quality and price. They also look at Maximum Residue Levels (MRLs)*, which can disrupt trade when they are out of sync between the country that is importing food products and the country that is exporting those products.

MRLs are the highest levels of pesticide residue legally allowed in or on food or feed. “The U.S. has established MRLs for about 60 years, longer than any other nation,” says Heidi Irrig, North America MRL and senior regulatory manager for Syngenta.

Any time a new pesticide is registered for use on a food or feed crop in America, the U.S. Environmental Protection Agency (EPA) establishes an MRL for that product. As countries modernize their food standards programs, they often establish national MRLs, which may be different from those established by EPA.

“It can be alarming to hear a pesticide might be in your food,” Irrig says. “MRLs aren’t a safety issue, however. They’re a trade issue.” That’s because MRLs are always set at levels far lower than any toxicologically significant levels, which the EPA defines as the level of exposure that could have any adverse effect on animals, humans or plants.

With one out of every three planted U.S. acres bound for export, the lack of global MRL harmonization is a growing concern. Syngenta is working with the U.S. International Trade Commission and CropLife International to address this issue, Irrig says. “We advocate for similar MRLs around the globe so U.S. farmers can provide the best quality, most abundant food supply for consumers worldwide.”

* The potential gap between U.S. approvals and foreign import tolerances or MRLs is a global trade issue that affects all pesticides. Syngenta’s approach with MRLs is all about transparency and engaging proactively with our channel customers, growers and exporters to present current MRL information. Syngenta is engaged in ongoing international efforts to harmonize MRL standards. As MRLs may change from time to time, please check with the Environmental Protection Agency (EPA) and U.S. Department of Agriculture Foreign Ag Service (USDA FAS) Global MRL Database (<https://www.globalmrl.com/db#query>) for a complete list.

“There are 330 million people in the U.S., but American farmers raise enough to feed 2 billion people a year.”

—MELISSA GEORGE KESSLER
Director of Strategic Relations
U.S. Grains Council (USGC)



“We are incredibly productive with relatively few farmers. Roughly 80% of what’s produced agriculturally in America is grown by approximately 150,000 farmers.”

—ARLAN SUDERMAN
Chief Commodities Economist
INTL FCStone Financial Inc.





The Future of Corn Is Data-Driven

SOLID YIELD RESULTS DRIVE GROWERS TO ADOPT TECHNOLOGY.

By Jeff Jones

Whether it's due to unpredictable weather or new crop pests and diseases, farming is an evolving process rife with challenges.

Giving growers the tools they need to overcome these challenges requires large investments of time and resources. But all the investments and scientific expertise in the world mean little without solid results from the field.

From the Lab to the Bushel

For many growers, the genetic enhancements from Syngenta are paying off. By planting NK® corn hybrid NK0624, Louks Farms in Blooming Prairie, Minnesota, persevered despite an extremely difficult 2019 growing season that saw double the annual rainfall.

According to Jason Louks, co-owner of the operation, he produced 250 bushels of corn per acre for the season — 28% above the county average of 180 bushels per acre. Louks cites NK0624's stalk strength and standability as one of the reasons for the farm's success in a difficult year.

"It ended up being a late season for us, with rain, snow and high winds," he says. "By the end, every stalk was still standing. With some other varieties, we saw as much as 50% green snap when winds would hit, but the NK corn kept standing."

A Genetic Growth Spurt

Elite corn hybrids with the latest trait packages can make or break the season for growers like

Amy Kinsler, vice president of sales and marketing for Co-Alliance, and Greg Cannon, district manager for NK Seeds, Great Lakes District, collaborate outside the Co-Alliance facility in Avon, Indiana.

Underwater Discovery

A team of researchers traveled into the depths of the sea to discover a remarkable enzyme that increases the efficiency of ethanol production and feed utilization. Sourced from bacteria that thrive in thermal vents on the ocean floor, Enogen® technology is a genetically modified biotech output trait that converts starch to sugar more efficiently by way of an alpha amylase enzyme produced within the kernel of a corn hybrid.

In addition to determining its usefulness in the ethanol sector in 2011, Syngenta experts evaluated the potential of Enogen corn as animal feed and discovered that the heat-tolerant enzyme found in Enogen corn also makes it ideal for feeding cattle.

According to research at leading universities, Enogen Feed enables a 5% increase in feed efficiency, which helps dairy and beef producers lower feed costs and improve profit potential for their operations.¹

“Prior to Enogen Feed corn hybrids, there were only a few things that could increase feed efficiency by a percentage point or two,” says Duane Martin, Ph.D., head of Enogen marketing and stewardship at Syngenta. “A 5% increase makes Enogen Feed corn hybrids one of the great industry advancements of the last 30 years.”

1. University Research, 2019; University of Nebraska-Lincoln Research Studies, 2013-2017; Kansas State University Research Study, 2017.

Above: Cattle benefit from consumption of Enogen Feed silage at Wellcrest Farms near Mullica Hill, New Jersey.



Louks. A \$30 million investment at the Syngenta research and development (R&D) and seed production site in Nampa, Idaho, helps to deliver more elite hybrids with the right traits to farms faster. The Trait Conversion Accelerator features state-of-the-art greenhouses and laboratories and accommodates a majority of the Syngenta North American corn trait conversion work, which was previously done in open field or semi-controlled environments.

The new facility provides a reliable, controlled growing environment for incorporating desired genes from Syngenta trait donor sources into elite cultivars or breeding lines — a process known as marker-assisted backcrossing. As a result, Syngenta will be able to introduce market-leading traits into the company’s most advanced corn germplasm faster and more efficiently.

Addressing local challenges with more targeted solutions is another priority for Syngenta. “We’ve been able to address yield consistency and standability because of the investments we made in our seeds business,” says Drew Showalter, strategic marketing manager for corn at Syngenta Seeds. “We’ve increased

our trialing by more than 30%, which has helped us better understand how our pipeline performs in more environments and soil types.

A greater understanding of how our pipeline performs in local environments means we can place products on farms with a higher level of confidence because we’ve tested them in R&D trials under a wide variety of environments.”

The Syngenta product launch process is more focused on local needs than ever before. “We started back in August with a collaborative approach that included our sales, agronomy and R&D organizations to build out what we call target product profiles, or TPPs,” Showalter says. “These profiles determined what we should advance in November and brought us a class of products that we have utmost confidence will deliver the results our customers need.”

By testing products in more environments and implementing enhanced data collection, Syngenta can bring to market thoroughly tested, specialized hybrids targeted to meet the agronomic needs of specific local geographies.

The Reality of Retail

Retailers, who work one-on-one with growers in their local communities, are in a prime position to report on which seeds perform best.

Co-Alliance — a farmer-owned cooperative that provides solutions to farmer-members across Indiana, Ohio and Michigan — recognizes the innovation that can help set up growers for success.

“NK seeds stand out to me because they align with a very high-performing chemistry portfolio,” says Amy Kinsler, vice president of sales and marketing for the Indianapolis-based company. “I don’t see the challenges of weeds, insects or diseases lessening over time. We’ve got a lot of R&D investment from Syngenta that’s driving this engine to help growers, and I think that’s really important moving forward.”

And so does Syngenta, as evidenced by its \$1.3 billion annual investment in R&D. It also tests more than 1 million corn genotypes — simply defined as a cell’s genetic makeup that determines one of its characteristics — every year with an end goal of giving growers the best local solutions for any condition.

Trait Expectations

Traits also play a large role in how well a corn hybrid performs. To bring a new biotech seed trait to the marketplace currently takes 10 to 12 years of research, development and regulatory approvals and a financial investment of \$120 million to \$150 million.

For Syngenta, its Agrisure® corn traits portfolio — offering best-in-class insect control, water optimization and herbicide tolerance to protect genetic yield potential — is a sound investment. The portfolio currently includes the following technologies:

- Agrisure Duracade® controls up to 16 key above- and below-ground insect pests, including corn rootworm.
- Agrisure Viptera® offers industry-leading control of ear-, stalk- and leaf-feeding insects.
- Agrisure Artesian® provides market-leading, season-long drought protection.

“We develop products with growers’ production problems first and foremost in mind,” says Tim O’Brien, Ph.D., Agrisure traits manager at Syngenta. “We’re not just developing hybrids, varieties or traits for the sake of building a portfolio — we direct our research to solve the problems that keep farmers up at night.” 🌱

2020 Syngenta Crop Challenge in Analytics Winner

Syngenta and the Analytics Society of the Institute for Operations Research and the Management Sciences (INFORMS) recently recognized a team from Iowa State University as the winner of the 2020 Syngenta Crop Challenge in Analytics. The competition encourages cross-discipline collaboration to discover new ways to use agriculture data to inform seed breeding research and development. This year’s competition invited experts in data analytics, mathematics and statistics to use real-world data to construct a model that can predict the performance of crossing any two inbred corn hybrid lines.

The winning team — which included Javad Ansarifar, Faezeh Akhavadegan and Lizhi Wang — was awarded a \$5,000 prize for its submission, “Yield Performance of Plant Breeding Prediction With Interaction Based Algorithm.”

“The Syngenta Crop Challenge has been a fascinating venue to accelerate innovation

in plant science,” Ansarifar says. “Making the right crosses is crucial in plant breeding to continuously improve crop performance. This work is part of our research effort in designing explainable artificial intelligence in agriculture.”

The advanced analytics that Syngenta honors in this annual competition have the potential to positively impact millions of lives. “The need for continued innovation in agriculture is urgent, and data analytics play an important role in helping us meet the needs of a growing population,” says Gregory Doonan, head of advanced analytics at Syngenta and Crop Challenge judge. “We are committed to bringing innovation to farmers faster to help improve grower profitability and increase the sustainability of agriculture.”

Please visit www.ideaconnection.com/syngenta-crop-challenge for more details about the Syngenta Crop Challenge.

*Syngenta supports but is not a sponsor of the INFORMS challenge. Entrants must read and agree to terms and conditions of the challenge, found with the registration materials.



“The need for continued innovation in agriculture is urgent, and data analytics play an important role in helping us meet the needs of a growing population.”

GREGORY DOONAN
Head of Advanced Analytics
Syngenta

CONSUMERS' TASTES DRIVE INNOVATION

Production challenges and consumer demand fuel fast-paced variety development for fruit and vegetable growers.

By Jacquelyn Stanley

Today's consumer demands fresh produce that offers more flavor, convenience and nutrition than ever before. That's good news for growers who are on the front lines of the \$500 billion vegetable production business. But maintaining a competitive edge when it comes to consumer appeal requires staying ahead of challenges and recognizing opportunities through a steady pipeline of innovation.

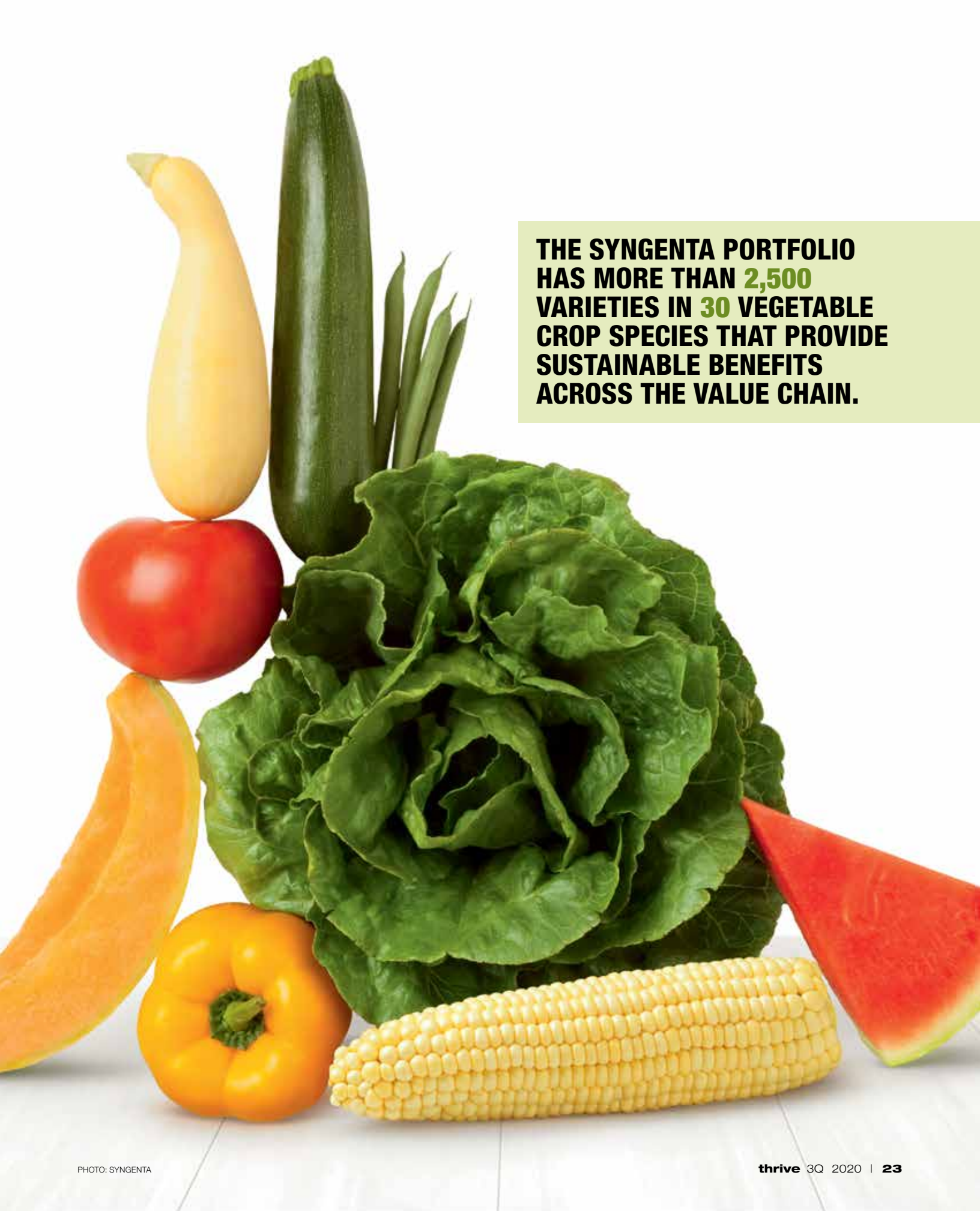
Industry veteran Gene McAvoy from LaBelle, Florida, notes that genetics and advanced breeding capabilities play an increasing role in meeting diverse needs — from vigor and yield potential, which growers demand, to uniformity, appearance, texture and taste, which are key consumer preferences.

"Growers are constantly looking for the next hot crop that appeals to consumers," says McAvoy, associate director of stakeholder relations at the University of Florida Institute of Food and Agricultural Sciences (UF/IFAS) and president of the National Association of County Agricultural Agents. "As a result, the vegetable industry is moving a lot faster. It used to be one variety would be dominant for 10 to 15 years. But now we're knocking out older varieties and bringing in newer ones on a yearly basis."

Fresh Additions

Through advanced breeding and new native traits, Syngenta stays ahead of the curve with these fast-changing market demands by continuously delivering new, sustainable benefits across the value chain. To date, the company has more than 2,500 varieties in 30 vegetable crop species. Here's a snapshot of some of the most exciting developments:





**THE SYNGENTA PORTFOLIO
HAS MORE THAN 2,500
VARIETIES IN 30 VEGETABLE
CROP SPECIES THAT PROVIDE
SUSTAINABLE BENEFITS
ACROSS THE VALUE CHAIN.**

YOOM TOMATOES FROM SYNGENTA HAVE CAPTURED THE WORLD'S ATTENTION BECAUSE OF THEIR UNIQUE COLOR, FLAVOR AND HIGH NUTRITIONAL VALUE.



Won the Fruit Logistica Innovation Award

- **Squashing Disease Resistance**

One key area of innovation is breeding varieties with enhanced disease tolerance, and the patented papaya ringspot virus (PRSV) resistance technology in Syngenta squash varieties is a major development.

PRSV threatens papaya and cucurbit crops in all regions of the world with the same devastating effect — stunted plant growth resulting in limited yields and deformed fruit. To defend against the virus, Syngenta breeds its squash varieties — including Grandprize, Everglade, Spineless Supreme, San Martin, Ebano and Payload — with this groundbreaking resistance technology.

“Our PRSV-resistant commercial squash varieties have the highest resistance package in the market,” says Juan Sabater-Fortea, Syngenta regional portfolio lead for cucurbit vegetable seeds. “Our goal is to give growers greater confidence and success in doing what they do best — supplying the world with better quality food.”

- **Make Room for YOOM**

YOOM® tomatoes, which will soon launch in the U.S. market, have become a sensation in other regions of the world due to their unique appearance and flavor. They also provide essential minerals and vitamins, including vitamin C, potassium and selenium. Earlier this year, YOOM won the Fruit Logistica Innovation Award in Berlin, an annual competition that recognizes innovation in the international fruit and vegetable industry.

“The dark skin color of YOOM attracts attention. What’s even more surprising is its savory, umami flavor,” says Jeroen Ipreburg, Syngenta technical sales representative. “YOOM is packed with nutrients favorable to a healthy diet and offers a high level of anthocyanins linked to its dark purple skin color.” Also found in blueberries, eggplants, cranberries and blackberries, anthocyanins come from a class of compounds believed to have antioxidant effects.

Syngenta breeds YOOM tomatoes with value-added traits that naturally occur in tomatoes, and growers can produce them in local greenhouse environments — year-round or seasonally. Pilot productions to evaluate the release of YOOM for North American growers are underway. YOOM tomatoes are currently grown in Australia, Belgium, Denmark, France, Greece and Spain.

- **Strong Demand for Melons**

Another focus for Syngenta is the melon market, where grower- and consumer-friendly qualities are top priorities. According to Sabater-Fortea, new melon varieties in the pipeline will meet grower, retail and consumer demands — featuring strong plant vigor, comprehensive disease and insect resistance, excellent flavor, uniform fruit shape and size for enhanced carton and bin packing, as well as extended shelf life.

To address consumer preferences, Syngenta also continues to be a leader in the seedless watermelon and snacking segments. Most recently, the company has introduced the

personal-sized seedless watermelon, Sirius, which is recognized for its uniform fruit size and earlier maturity.

“Sweet” Investments

Syngenta produces innovations in vegetables more quickly and frequently due to its continued investment in research and development (R&D). A case in point is the Yield Accelerator, a state-of-the-art yield, recovery and sample processing facility that integrates automation, weighing, husking, cutting and canning/freezing technologies in Stanton, Minnesota. Glenn McKay, regional portfolio manager for large-seeded vegetables at Syngenta, describes this facility as a “game-changing R&D investment” because it benefits the sweet corn grower and processor by maximizing genetic yield and recovery across a wide set of growing conditions.

“The Yield Accelerator allows us to identify key traits for the processing sweet corn industry at a very early stage in the variety development process,” McKay says. “We can incorporate these traits into our genetics quickly, which reduces the time it takes to bring industry-changing genetics to market.”

Other U.S. sites where Syngenta conducts vegetable seeds research and production are Woodland and Gilroy, California; Othello and Pasco, Washington; Nampa, Idaho; Plainfield, Wisconsin; and Naples, Florida.

To strengthen its genetic portfolio in vegetable seeds, Syngenta complements its consistent investment in R&D with strategic acquisitions. Most recently, Syngenta acquired Abbott & Cobb (A&C), a move that provided breeders with the ability to further diversify Syngenta germplasm for new and improved varieties.

McKay pinpoints the improvement of seed quality, shelf life, yield potential, eating quality, kernel color and disease resistance as the overarching goals for developing new hybrids for multiple worldwide markets.

Syngenta has a global leading position in sweet corn genetics,” he says. “The new varieties we’re developing and bringing to market incorporate the best in both grower and consumer traits for the fresh and processing sweet corn industries. For one market segment, we’re incorporating Attribute® II trait stacks into high eating quality corn varieties for strong above-ground lepidopteran control and broad-spectrum herbicide tolerance. This latest breakthrough maximizes yield potential, quality and productivity while lowering overall production costs for growers.”

Across a wide variety of crops, the Syngenta vegetable seeds team is committed to propelling growers — and their industry — forward. “We’re focused on bringing innovation to our customers and to the entire value chain,” says Teresa Mitzel, head of vegetables biological operations at Syngenta in the Americas. “Our goal is to continue introducing vegetable seed offerings that address production challenges while setting a new standard for consumer appeal.” 🍃

VEGETABLE VANGUARDS

Vegetable growers across the country depend on crop protection products to help keep their crops healthy and pest free. But before these tools can reach the farm, extensive testing takes place in the lab, greenhouse and field.

The Syngenta Vero Beach Research Center (VBRC) in Florida is a unique facility with year-round field trials. Scientists at the 240-acre facility generate multiple sets of field data per year.

“We’re constantly working on new technologies and active ingredients to bring to growers,” says Neil Glynn, Ph.D., VBRC’s senior group leader for disease control. “At VBRC, we try out new active ingredients and look at new combinations to better overcome challenges.”

Miravis® Prime fungicide, now a valuable tool in growers’ toolboxes, garnered a lot of excitement at VBRC prior to its 2018 registration, Glynn says. Available for use on grapes, potatoes, leafy vegetables, cucurbits, strawberries and fruiting vegetables, Miravis Prime with Adepidyn® technology offers powerful preventive and curative activity on difficult-to-control diseases.

Today, one of the most interesting challenges for Glynn’s team is finding new uses and combinations of existing products.

“Scientists on our team have been revisiting Actigard® fungicide lately as a product with a strong track record that we think could be revamped in the vegetables marketplace,” Glynn says.

Activating the natural defense systems in several crops, including tomatoes, Actigard helps the plant protect itself against attacks from diseases. It’s highly effective at low-use rates and is an excellent fit in integrated pest management programs. In addition to its activity as a stand-alone compound, Actigard can have synergistic effects when combined with traditional fungicides, such as Miravis Prime and Orondis®. These combinations can lead to enhanced intrinsic activity and longer residual disease control.

“We’re hoping to help growers find new value in an established product,” Glynn says. “Added value for growers means increased economic sustainability; and in our world, that’s very exciting.”



Kim Edlebeck, a Syngenta research technician at the Vero Beach Research Center, inoculates lettuce plants with spores of downy mildew as part of her team’s fungicide testing.

Technology Reduces Farm Labor Needs

As farmers continue to struggle with labor shortages, technology steps in with innovative tools to help bridge the gap.

The United Nations estimates the world's population will expand to nearly 10 billion people by 2050,¹ and agricultural operations must rise to the challenge of feeding this growing global population. However, as the industry gears up to meet demand with higher yields and greater efficiency, growers and resellers are grappling with a challenge that threatens to put these efforts in jeopardy: labor shortages.

"We are blessed in this country to have an abundance of resources," says Bill Brim, co-owner of Lewis Taylor Farms, a diversified transplant and vegetable farming operation in Tifton, Georgia. "We have plenty of land, water and sunshine — all critical ingredients for growing crops. But what we do not have plenty of is labor."

Factors contributing to the escalating agricultural labor shortage crisis include a diminishing domestic workforce and legislation that makes hiring immigrant populations difficult. Unexpected global events, including the coronavirus pandemic, add more complexity to an already inefficient work visa process. Additionally, competition between industries for the same type of worker makes it difficult for farming jobs to stand out.

"The ability to compete with other companies in terms of hours of work, pay and benefits can pose a challenge for employers," says Rob Russell, director of labor and workforce development at the University of Missouri Extension. "Within agriculture, there are times of the year when you have long hours, seven days a week, whereas other types of businesses don't have the same demanding schedule."

Without an influx of new workers, farmers depend on the H-2A program to help close the gap. However, they have long criticized the cumbersome program for its excessive costs, requirements, delays and bureaucracy. Legislation to address some of the program's shortcomings is on the table, but most experts agree these reforms won't be enough to resolve farming's mounting labor shortage.



Bill Brim, co-owner of Lewis Taylor Farms in Tifton, Georgia, uses technology to reduce the labor needs of his transplant and vegetable farming operation, which includes this field of cucumbers.

"We have plenty of land, water and sunshine — all critical ingredients for growing crops. But what we do not have plenty of is labor."

—BILL BRIM
Georgia Grower

Exploring Efficiency

While no machine can replace the human touch needed for crops to flourish, new technologies are available to scale the existing workforce and ease the burden of labor shortages.

Brim, who grows watermelon transplants in more than 80 greenhouses, has embraced technology in certain areas of his operation. For example, he now uses updated machinery to seed his watermelons. "While our old technology required 21 people, we can now run it using six people," he says.

As a result, he estimates his operation has saved about \$700,000 per year in employee wages alone. "If we can implement a technology that requires 10 to 20 fewer employees, we're all for it," Brim says. "We challenge ourselves to make sure we're evaluating powerful technologies coming down the pipeline by asking, 'Is it possible to use for our specific operation, how can we use it, how much is it going to save us, how will we manage it, and what other problems will it alleviate?'"

Technology to the Rescue

The labor challenges that growers like Brim currently face require creative, new solutions, notes Greg Meyers, chief information and digital officer at Syngenta.

“What farmers really want are practical solutions to fit the real-world problems they face on a daily basis,” Meyers says. “Computer and data science have the potential to create the same sort of efficiencies for farmers that tractors did nearly 100 years ago. This time, however, instead of the technology just allowing farmers to plant, spray and harvest fields faster, it now allows them to vary the way they perform these operations to reflect varying conditions — even within the same field — such as soil health and type, moisture, fertility, and pest pressure.

Digital imagery and scouting, for example, have the ability to give farmers high-resolution images of fields every two to three days. By using artificial intelligence, these digital technologies can accurately recognize field issues, including diseases and pests, reducing the need for manual field scouting by as much as 30%.


FarmShots™, part of the Syngenta AgriEdge® whole-farm management program, is a digital tool that uses satellite, aircraft and/or drone imagery to assess crop health, helping growers manage their fields more efficiently. “This imagery can locate crop damage caused by disease, pests and nutritional deficiencies before it’s too late,” says Jacky Davis, digital ag solutions marketing lead at Syngenta.

The recent COVID-19 pandemic amplified the benefits virtual technologies can bring when physical interaction isn’t feasible. “If you’re running a farm, you’ve previously relied on a network of trusted advisers who would come out to your farm and walk it with you to discuss what’s going on,” Meyers says. “If you’re unable to meet with agronomists face to face or they can’t come out as frequently as you’re used to, then the next best thing is a set of virtual eyes via remote technology. Agronomists can get reports delivered directly to their inboxes with insight on drought or climate stress, disease pressure, and more.”

Putting Data to Work

Similarly, data management software, like the technology included in the Syngenta AgriEdge whole-farm management program, enables growers to analyze data of individual fields over time. This digital recordkeeping and analysis allow farmers to fully understand what’s happening on a per-field basis, answer the tough questions and measure overall potential profitability as part of next season’s planning.

Decisions still need to be made by the human workforce, but technology is improving the productivity of farmers and may help mitigate some of the effects of labor shortages nationwide.

“In order to grow, the industry must adapt and move forward under pressure,” Meyers says. “Fortunately, farmers are resilient. With the help of innovative new technology, the industry is primed to not only move forward in the face of labor shortages, but also blaze a trail for future generations.”  STORY BY KAITLY LLOYD

1. According to the United Nations report “World Population Prospects, 2017 Revision.”



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The Difference Is in the Details

NK retailer Mark Boshart knows a good partner pays attention to the little things.

Margins are tight in the agriculture industry. If a grower wants to stay profitable, it's important to take an informed, detail-oriented approach to each season. NK® retailer Mark Boshart is familiar with that reality. As the owner of Boshart Sales, an independent dealership in Mount Pleasant, Iowa, he visits farms all year long. Wherever he goes, he's careful to get the full picture before he makes any recommendations.

"I always do a needs assessment first," Boshart says. "I want to find out what an operation is about and how the grower makes purchasing decisions. It's a more effective approach than just jumping out of the pickup truck and asking how much product he or she wants."

Boshart's process helps him build positive relationships all over southeast Iowa. It's a community he knows well; he grew up there, and he still works each day on his family's third-generation corn and soybean farm. The community knows him, too.

"When people see me — whether it's in a church pew or on Main Street — they know I'm the guy who knows seeds," he says. "It helps that Syngenta gives me what I need."

On the Same Page

Over the course of Boshart's 40-year career in the ag industry, he's seen a lot of change. He says Syngenta has helped him respond to that change with a commitment to consistent innovation. He cites the AgriEdge® whole-farm management platform and the company's deep portfolio as evidence of that commitment.

"Syngenta has steadily brought improvements in genetics and technology to the marketplace," he says. "When you get the opportunity to take off your coat and sit down to have one-on-one conversations with growers, it really shows."

Boshart's partnership with NK sales representative Dale Hewett has been a crucial part of his effort to bring those innovations to the fields of southeast Iowa. Their relationship is built on a shared understanding of how to deliver value to growers. Like Boshart, Hewett doesn't rush in with solutions before a problem is defined.

"It's important to get to know the growers and their operations," Hewett says. "You have to ask them questions to do that. It takes time, but it helps that Mark and I are on the same page. We both believe in paying attention to the details. Our process helps us bring the right recommendations to the table."

"I've had some long-term customers who have stayed with me throughout my career. Those relationships carry over to the next generation of growers. Grandsons and grandfathers can sit across the desk now, as well as fathers and sons."

— MARK BOSHART
Iowa Retailer
Boshart Sales



Dale Hewett (left), NK sales representative, confers with Mark Boshart (right), owner of Boshart Sales, about Boshart's operations in Mount Pleasant, Iowa.



Their approach dates to the early 2000s, when Boshart served as a field sales manager at Syngenta. There, he was part of a three-person team that included Hewett.

"We were learning from each other then, and we're still learning from each other now, even though we're on opposite sides of the desk," Boshart says. "I have the utmost respect for Dale. We work very well together."

The Value of Expertise

When the time comes to provide a solution, both Hewett and Boshart are able to draw on a wealth of agronomic knowledge. Hewett, who has logged more than 30 years in the industry, regularly travels around the community, showing young retailers the ropes. Boshart has served as a Certified Crop Adviser for 25 years.

"I think that certification carries some respect in the countryside," Boshart says. "More than ever, growers are looking for expertise. The seed business has gotten very complex. Traits are coming and going, and combinations are moving fast. I'm finding that growers who don't work with it 365 days out of the year are relying more and more on the retailer to help educate them and help them make the right decisions."

Boshart's customers have come to depend on his knowledgeable, honest advice. As a result, he's earned the trust of multiple generations of farmers.

"I've had some long-term customers who have stayed with me throughout my career," he says. "Those relationships carry over to the next generation of growers. Grandsons and grandfathers can sit across the desk now, as well as fathers and sons."

That kind of transgenerational bond hits close to home for Boshart in ways that go beyond his family farm. Boshart Sales itself is a family business; he ran it in partnership with his brother and father, until his brother died in a tragic farm accident in 1995 and his father retired in 2010. That experience makes him conscious of just how much a family business can mean in the ag world. He works each day to help his customers find the kind of success that can sustain their operations, allowing them to pass on their farms to future generations. Syngenta stands beside him in that goal.

"I like working with a company that knows innovation and has producers' best interests in mind," Boshart says. "I feel good about what I'm doing because of the people I have behind me. I know Dale and Syngenta care about me and my customers." 🌱 STORY BY GLENN BERTRAM

EDITOR'S NOTE: This article is the second in a series celebrating the strong partnerships that help propel agriculture forward. Look for additional stories in upcoming issues of *Thrive* magazine and online at www.syngentathrive.com/community.



Ripple Effect

The 2020 Syngenta Accelerating a Generation Scholarship winners are recognized, *Thrive TV* begins another season and America's Conservation Ag Movement brings diverse partners together to build trust in the food supply chain.

SCHOLARSHIPS

Syngenta Announces the Winners of the 2020 Accelerating a Generation Scholarship

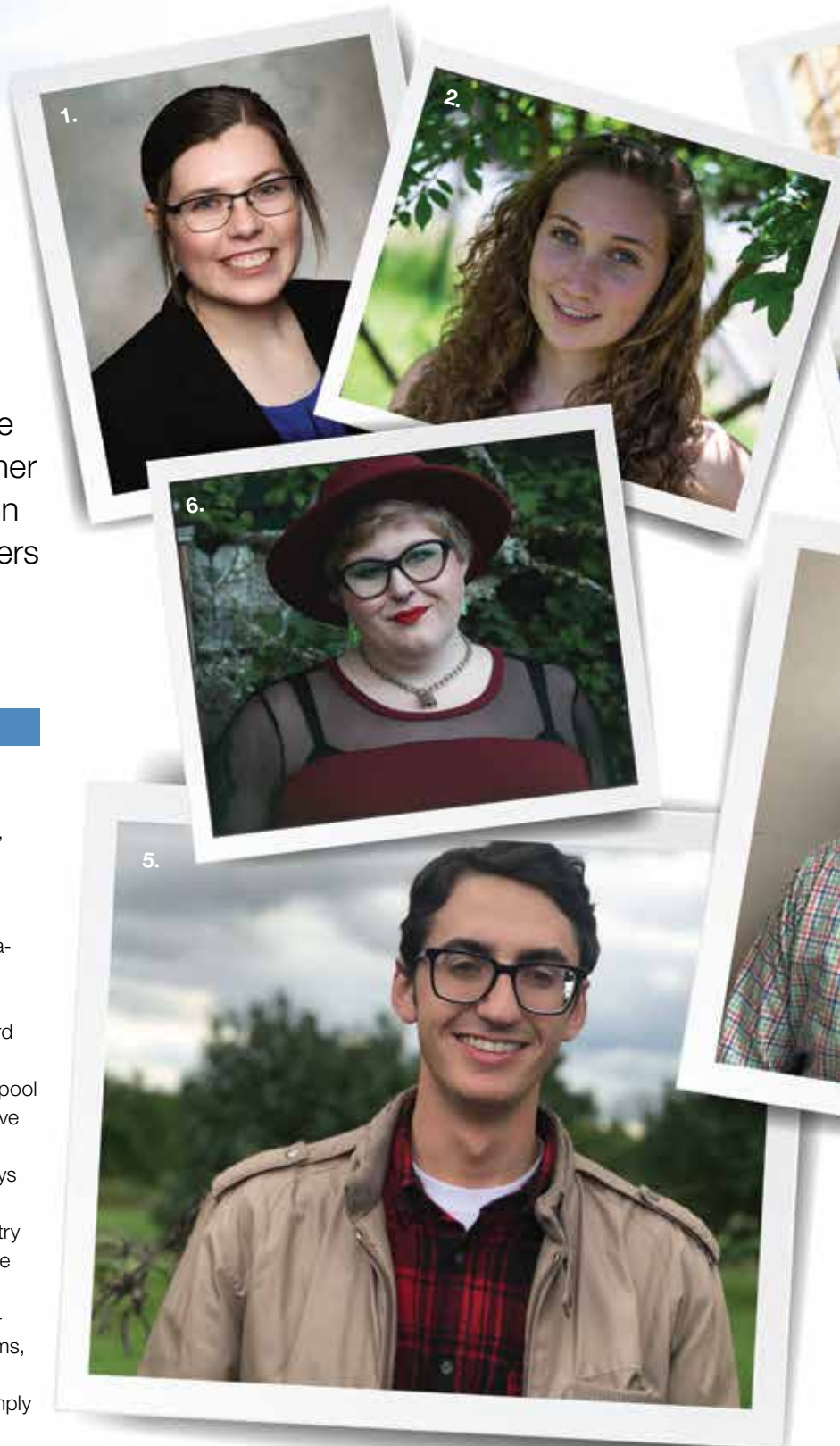
Adam D'Angelo, bachelor's student at Rutgers University, and Rodger Farr, master's student at the University of Arkansas, are the national winners of the 2020 Syngenta Accelerating a Generation Scholarship. Syngenta has awarded both students \$6,000 to help pay college educational expenses.

In addition, six regional winners, including D'Angelo and Farr, have each received a \$1,000 scholarship award to support their education.

Judges selected this year's winners out of a diverse pool of applicants who shared how their agricultural roots have influenced the way they view the future of the industry.

"We received a lot of strong applications this year," says Pam Caraway, communications lead at Syngenta. "This year's applicants have a lot to say about where the industry might be going — and how they will help take it there. The future of our agricultural industry is in good hands."

In his winning video essay, D'Angelo, who's double-majoring in plant biology and agriculture and food systems, emphasizes the importance of enabling sustainable, profitable production. "The future of agriculture is not simply about growing more food," he says. "It's about growing





3.



4.

Clockwise from top left: 1. Leah Mosher
2. Madigan Jean Hawkins 3. Kristen Dunning
4. Rodger Farr 5. Adam D'Angelo 6. Chelsea Newbold

Right: *Thrive* TV reporter Shane Norris (left) speaks on-air with John Jenkinson (right), markets specialist for RFD-TV's "Market Day Report," about upcoming episodes of the Syngenta television series.

food in a safe and sustainable way while preserving the economic viability of the farmer."

Farr, who grew up on a corn, soybean and wheat farm in western Nebraska and is studying weed science, struck a similar note. "I see agriculture moving in a direction that is not only more environmentally conscious and efficient, but also more integrated with an intertwined, sustainable system," he says. "That system will give us the ability to adapt to changing economies and a changing climate."

The other regional winners are undergraduate students Kristen Dunning (University of Georgia), Madigan Jean Hawkins (University of Idaho) and Leah Mosher (Iowa State University), and graduate student Chelsea Newbold (Oregon State University).

For additional information about the winners, please visit www.syngenta-us.com/scholarships.

TELEVISION SERIES

Thrive Returns to the Small Screen

During the new season of *Thrive* TV on RFD-TV, reporter Shane Norris takes viewers inside the stories about how Syngenta has helped keep supplies moving during the current pandemic, what growers can learn from their homes or offices at Grow More™ sites around the country, where innovations in seeds and crop protection begin, and more.

"Because the agricultural community is geographically spaced, projects such as *Thrive* help draw us together," says Pam Caraway, communications lead for Syngenta. "Through the multiplatform *Thrive* communications, which includes *Thrive* TV, we are able to tell ag's story and to share essential information to help our customers — both retailers and farmers — learn about new technologies, share agronomic and economic tips, and catch up on ag news. Response to our reports in the magazine and on the web, radio and TV is overwhelmingly positive. We are here to serve our ag community. Please keep sharing your thoughts and ideas."

Viewers can catch *Thrive* TV during "Market Day Report" on RFD-TV (with simulcasts on Rural Radio 147 SXM) every Monday from July 6 to Sept. 28 at 9:25 a.m. and 1:25 p.m. Eastern. After the stories air, *Thrive* readers can also watch episodes at www.syngentathrive.com.



thrive

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Building Trust in the Food Supply

A partnership is working together to promote conservation practices and share those achievements with the public.

One of the most important lessons the COVID-19 pandemic taught us is that people seek sources they can trust. They want and expect to have confidence in the health care system and their food supply. Another lesson from the pandemic is the importance of coordinated efforts between organizations — and transparency when it comes to sharing those efforts with the public.

Putting such lessons into practice confirms the aim of America's Conservation Ag Movement, a public-private partnership between *Farm Journal's* Trust In Food initiative, the Farm Journal Foundation, agribusinesses, food companies, conservation nonprofits, farmer associations and USDA's Natural Resources Conservation Service. This movement, which officially began in July 2019, helps farmers expand profitable conservation practices across the U.S. and communicates those efforts and successes to the public.

Syngenta joined America's Conservation Ag Movement to further sustainable agriculture and help growers scale up conservation practices.

"The long-term commitment of Syngenta to farmer-led conservation and sustainability efforts is at the core of our company's mission and values," says Vern Hawkins, regional director of Syngenta, North America. "This partnership reinforces and strengthens our commitment to helping farmers deploy new practices that improve our agricultural environment."

Growers participating in the Syngenta Sustainable Solutions program use the same whole-farm management software used in AgriEdge® to monitor and record farm operations and better assess profitability and sustainability. "This computer software enables growers to document their conservation efforts and the positive outcomes that result," says Liz Hunt, account manager for Sustainable Solutions at Syngenta. It's a function particularly important to growers whose downstream food chain partners require documentation that demonstrates sustainable crop production.

As America's Conservation Ag Movement grows, the partners have publicly shared information about efforts to produce food sustainably and conserve natural resources, says Mitch Rouda, president of *Farm Journal's* Trust In Food initiative.

One way the movement is bringing this information to the public is through a new agricultural garden on the National Mall in Washington, D.C. A wide variety of field and specialty crops are on display, and visitors can learn about modern agricultural practices through a guided app-based tour called "U.S. Agriculture Through the Voice of the Farmer" — a series of short videos featuring farmers explaining the conservation practices and precision agriculture tools they use and why.

This summer, when COVID-19 physical-distancing guidelines in our nation's capital permit it, the agricultural-garden exhibit will again open to the public. It will feature Syngenta Seeds technology and plants from Syngenta Flowers. In the meantime, America's Conservation Ag Movement offers a virtual tour of the exhibit at www.fjfgarden.org and plans to post updates about this year's agricultural garden on the site.

"There also will be opportunities to take the curriculum to other locations in Washington and across the U.S. and to provide virtual experiences," Rouda says. "We'll do consumer outreach with educational materials that are short, fun and authentic."

Farm Journal's "AgDay" TV show and "AgriTalk" radio programs will also feature farmers' conservation efforts. Additionally, the movement's partners will share conservation-farming updates on social media. To stay up to date on the latest news from Trust in Food, like and follow it on social media at Facebook, LinkedIn and Twitter.

Hunt adds, "The COVID-19 outbreak has only reinforced what we in agriculture already knew: We must proactively communicate with the public about how farmers and their ag partners are ensuring a safe, sustainable food supply." 🌱 STORY BY LYNN GROOMS



"We must proactively communicate with the public about how farmers and their ag partners are ensuring a safe, sustainable food supply."

—LIZ HUNT
Account Manager
Digital Agriculture
Sustainable Solutions, Syngenta



Syngenta tomato varieties get off to a strong start at the agricultural-garden exhibit on the National Mall in Washington, D.C. See how the garden progresses throughout the summer by checking out the virtual tour at www.ffgarden.org.



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