

Growing Together

>> 2Q | 2016

# thrive<sup>®</sup>

## FUELING CHANGE

Enogen<sup>®</sup> Corn Enzyme Technology Helps Leverage Ethanol's Full Potential



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TEAMWORK,  
TECHNOLOGY  
ANCHOR  
WHOLE-FARM  
SOLUTIONS

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DEMONSTRATION  
SITES SHOWCASE  
NEW APPROACHES

syngenta<sup>®</sup>

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**ON THE COVER** Enogen® Corn Enzyme Technology is a winning formula for corn growers, ethanol plants and rural communities. *Illustration: Ryan Etter*

**THIS PAGE** Syngenta Agricultural Scholarship winner Mitch Roth conducts research in a greenhouse at Michigan State University. *Photo: Scott Stewart*

**thrive**   

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](http://www.syngentathrive.com).

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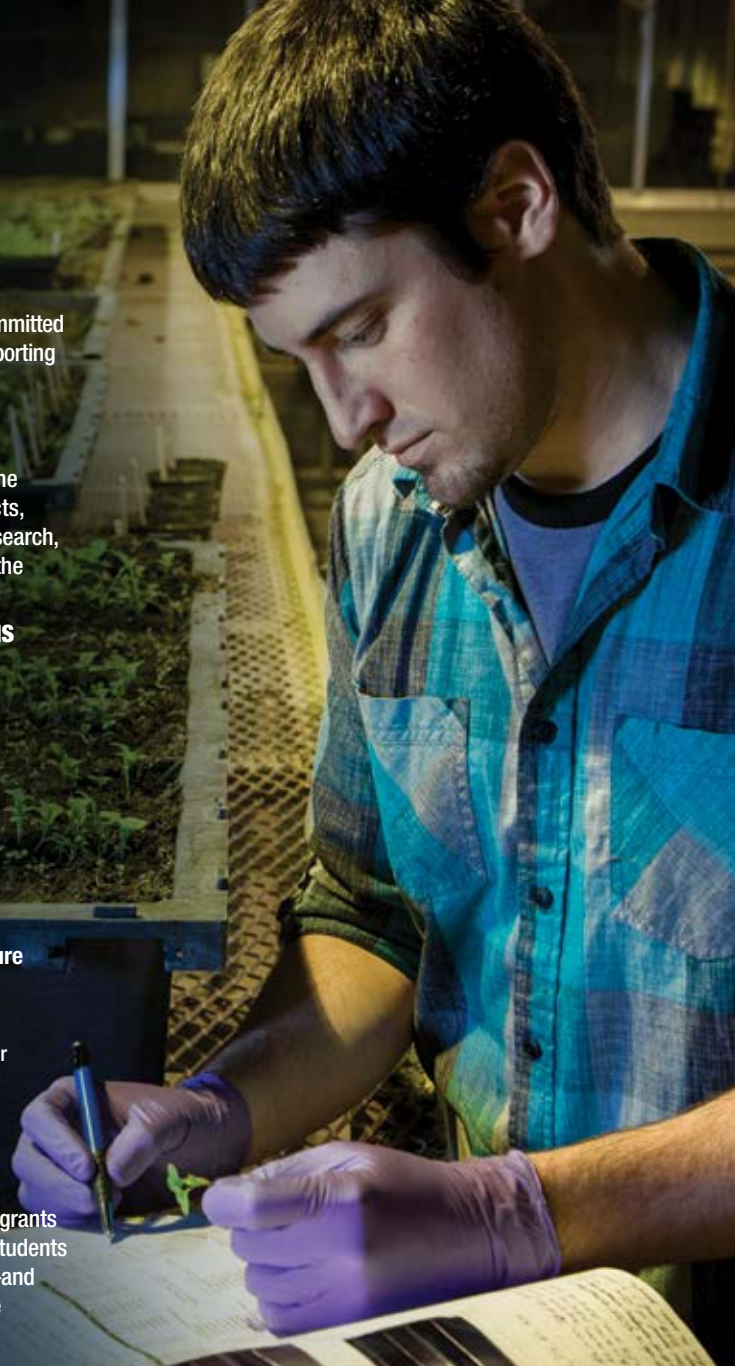
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**We welcome your story suggestions and comments about *Thrive*.**

Please send them to [thrive@syngenta.com](mailto:thrive@syngenta.com). For more information, visit the Syngenta U.S. website at [www.syngenta-us.com](http://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.





# The Power of Choice


As one of the earliest ways to make a living, farming is also one of the most transformational. Almost 12,000 years ago, the advent of agriculture created a more reliable food supply and ignited the flames of innovation from which civilizations grew. Today, those flames are still illuminating the path to a brighter tomorrow. But to keep moving forward, the American farmer needs choice in the marketplace—and so do you.

The proposed acquisition of Syngenta by ChemChina, if approved later this year, will allow you and your customers to continue benefitting from multiple choices and competition in a market where consolidation is considerable. Equally important, Syngenta will continue to be Syngenta in every way that matters to you.

We'll continue to invest in our pipeline of cutting-edge technologies—many of which are featured in this issue of *Thrive*. In 2016 alone, we'll introduce 16 new products that will help growers resolve some of their toughest crop challenges.

We'll also continue to provide service and partnership through the same field force that has earned your trust. From a technical services standpoint, that partnership entails agronomic support, product demonstrations and technical training, so that we can better serve you in your local community. Our series of Grow More Experience sites is one example of how we're putting customers first. As described on the pages that follow, the more than 60 locations across the country will give resellers like you a chance to step into a field and see firsthand the impact Syngenta products can have on area crops.

We're also deeply committed to American agriculture's future generation of leaders. While this issue of *Thrive* celebrates the recipients of our 2015 Syngenta Agriculture Scholarship, we've already begun a new nationwide search to find deserving student candidates this year.

In short, it's business as usual for Syngenta in the U.S. marketplace, but what a business it is! Steeped in history, yet powered by technological advancements, agriculture is an industry that we proudly share with you. We realize you have a choice when it comes to suppliers. Our goal is to continue giving you compelling reasons to choose us—throughout 2016 and beyond. 

**“Steeped in history, yet powered by technological advancements, agriculture is an industry that we proudly share with you.”**



JAMIE EICHORN

**JAMIE EICHORN**  
Head, Technical Services  
Syngenta, North America



**WATCH NEW VIDEO** For an in-depth interview with Jamie Eichorn, check out the new video posted to the *Thrive* website ([www.syngentathrive.com](http://www.syngentathrive.com)).



# What's in Store

Stay up to date on the latest news and events, new products, research and the upcoming #RootedinAg contest.

## NEWS AND EVENTS

### > We're Here for You

By now, you've heard about the possible acquisition of Syngenta by ChemChina. Please be assured that this transaction will not change our structure, strategy, management, people or portfolio in the U.S. marketplace. Syngenta remains Syngenta. From our local teams in the field to our scientists in the lab, we're committed to bringing you innovation, choice and support—today and tomorrow.

For the latest news and information on our plans for growth, go to [www.syngentaus.com/companyupdate](http://www.syngentaus.com/companyupdate).



### >> **Thrive #RootedinAg Contest Now Accepting Entries**

At Syngenta, while our agricultural roots have helped generate a proud history of delivering crop inputs to the farm, they also will provide sustenance for a brighter, more innovative future. We are rooted in ag and know you are too. Please tell us how your agricultural roots are helping you, your family and your community thrive. In exchange, you could win **one of five mini touch-screen tablets**. If you're our grand prizewinner, we'll donate **\$1,000 to a local charity or civic organization of your choice** and send you a **\$500 gift card**. Here's how to enter:

- 1** Go to [www.syngentathrive.com](http://www.syngentathrive.com) to review eligibility and click on the easy-to-use #RootedinAg entry form.
- 2** In about 200 words, describe how your agricultural roots are helping you, your family and your community thrive.
- 3** Using the simple instructions provided, upload a photograph or video that visually supports your written entry.

The deadline for entering is June 30, 2016. Shortly after this date, a panel of judges will choose five finalists, who will each receive a mini touch-screen tablet. 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 Sept. 15, 2016, with Syngenta announcing the grand prizewinner in October.

For more detailed information on the contest and to read compelling stories about others who are rooted in ag, visit [www.syngentathrive.com/community](http://www.syngentathrive.com/community).





### >>> Additional Awareness Needed to Combat SCN

Soybean cyst nematode (SCN) is the most devastating pest in U.S. soybeans, causing up to \$1.5 billion in damages annually. It's a silent yield robber that damages soybeans at the roots. To make matters worse, effects of the nematode often go unnoticed, and symptoms are commonly misdiagnosed as other early-season diseases. That could explain why, according to a recent survey of more than 1,000 growers across the U.S., a majority doesn't consider SCN a serious yield-limiting factor.

Soil sampling is an important tool in helping soybean growers determine the presence and severity of SCN in their fields. But of the growers surveyed, more than half acknowledged they know little about sampling their soil for SCN. Sampling can also serve as

a benchmark to see if current management strategies are working. Research shows SCN-resistant varieties have been losing their efficacy, so adding a nematicide like Clariva® Complete Beans seed treatment, a combination of separately registered products, is recommended.

To increase knowledge about SCN, Syngenta recently sponsored the SCN Awareness and Education Meeting, where a broad group of university nematologists, researchers and representatives from the soybean community discussed the current state of SCN in the U.S., the level of grower awareness and the ongoing research into evolving management strategies. The survey was a focal point.

"The survey confirms that we in the soybean community need to work as a team to combat the growing problem of SCN," says Palle Pedersen, Ph.D., Seedcare product marketing head at Syngenta, who helped lead the discussion at the meeting. "Growers need to be better informed about issues affecting their soybean fields, and we need to provide more tools to counteract those challenges, if soybean will be grown as a profitable crop in the U.S. in the future."

To learn more about Clariva Complete Beans, visit [www.ClarivaCompleteBeans.com](http://www.ClarivaCompleteBeans.com).



**Soil sampling is an important tool in helping soybean growers determine the presence and severity of SCN in their fields.**



NEW PRODUCTS

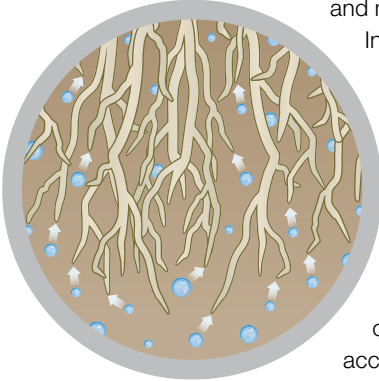
> The Next Wave in Water Optimization

Since its breakthrough commercial introduction in 2011, the elite lineup of water-optimized Agrisure Artesian® hybrids has helped growers across the Corn Belt achieve top-end yields and manage the unpredictability of weather.

In developing Artesian™ hybrids, Syngenta scientists have studied how corn plants respond to water stress at the gene level to identify, validate and deploy multiple genes for water optimization.

The Artesian family is growing. For the 2017 growing season and beyond, growers will have access to Artesian hybrids with additional genes for water optimization. The inclusion of these newly accessed native genes will promote even more consistent performance, regardless of weather

conditions, complementing an already strong genetic foundation. Artesian hybrids stacked with additional traits for insect control and herbicide tolerance are available from Golden Harvest® and NK® Corn. For more information on Artesian corn, visit [www.agrisureartesian.com](http://www.agrisureartesian.com).



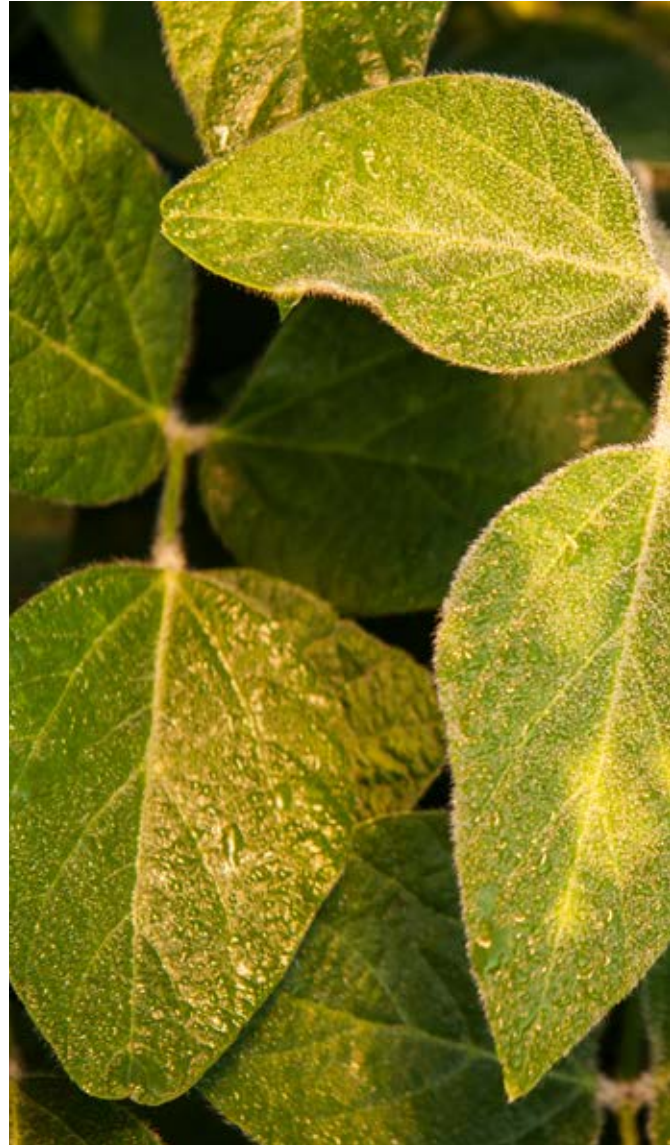
Agrisure Artesian® hybrids promote improved water and nutrient uptake through a robust root system.



>> New Corn Insecticide Is Available

Pest pressure in cornfields varies each year, so growers understand the importance of delivering efficient control against yield-robbing insects. While traits are important, sometimes a trait alone isn't enough to defend corn from pests.

New to growers' toolboxes is Ballista™ LFC insecticide from Syngenta. It offers broad-spectrum performance against



PIPELINE

New Force Formulation Expected

For more than 25 years, Force® corn insecticide has offered growers superior control of corn rootworm and other early-season pests. Now, Syngenta is pleased to announce the coming release of Force Evo, a new liquid corn insecticide formulation. This product is the result of Syngenta homing in on the customer experience to improve upon an already trusted product.

"Syngenta is a company that prides itself on continuous improvement, and this new Force formulation is a reflection of that," says Meade McDonald, Syngenta insecticides product lead. "Growers who have been happy with Force performance in the past will be pleased to experience the improvements that have been made in formulation, handling and storage."

Syngenta expects to receive registration for Force Evo in early 2017. Upon registration, it will deliver easier cleanout, better pumping flowability and more complete emptying of bags. Providing easy-to-load setup, speed and efficiency, Force Evo is well-suited for growers with high-speed planters. (See "The Jet Set," page 6, for more information.) It also will offer the same closed-system packaging as Force CS, will work with existing Force CS equipment and is compatible with most commonly used starter fertilizers. For more information about Force Evo, visit [www.syngentaus.com/forceevo](http://www.syngentaus.com/forceevo).







Soybean leaves in the early-morning light in Gowrie, Iowa.



TREATED WITH CORVUS® AT 5.6 FL OZ/A



TREATED WITH ACURON® FLEXI AT 2.25 QT/A

damaging soil insects, including corn rootworms. Ballista LFC is formulated as a liquid-fertilizer-compatible formulation for added convenience.

“Ballista LFC is applied at a single, robust application rate of 11.5 ounces per acre,” says Brent Lackey, Syngenta insecticides product lead. “It takes the guesswork out of determining the best rate to use on a cornfield, and it can be mixed with several starter fertilizers.”



### >>>> Fungicide Registered for Frogeye Leaf Spot

Four years ago, Syngenta introduced Quadris Top® SB fungicide, a product with two modes of action to help soybean growers control diseases such as powdery mildew and leaf spots. Now Syngenta introduces Quadris Top® SBX fungicide, a formulation that includes more robust rates of azoxystrobin and difenoconazole, offering even greater disease protection.

In addition to exceptional control of strobilurin-resistant frogeye leaf spot, Quadris Top SBX helps increase water-use efficiency, bean size and pod fill, and aids in the production of larger, stronger roots. All of these benefits boost return on investment and profit potential. For more information on Quadris Top SBX, please contact your local Syngenta representative.



### >>> Acuron Flexi Corn Herbicide Registered

Acuron® Flexi corn herbicide is now available for use during the 2016 season. As its name implies, Acuron Flexi offers flexibility to growers in various geographies where weed resistance is spreading and weeds are becoming increasingly difficult to manage.

“With glyphosate weed resistance expanding, growers need a robust product that they can use across different geographies and soil types,” says Gordon Vail, Ph.D., technical product lead at Syngenta. “Acuron Flexi delivers the flexibility growers need by allowing application from 28 days pre-plant up to 30-inch corn.”

Where registered, growers can use Acuron Flexi without geographic or soil-type restrictions and can mix it with atrazine (AAtrex® brands) or glyphosate herbicides, depending on farming practices.

Acuron Flexi features three active ingredients, including bicyclopyrone, and two modes of action to deliver a multitargeted approach to control tough weeds. Bicyclopyrone provides burndown plus residual, delivering improved, more consistent control of large-seeded broadleaf weeds in corn.

State registrations for Acuron Flexi are still pending. For more information, visit [www.syngenta.com/acuronflexi](http://www.syngenta.com/acuronflexi).





# The Jet Set

New planters promise to supercharge the planting process; they also need inputs designed for application at faster rates.

**J**ason Louks vividly remembers the 2013 planting season. That May, the grower from Blooming Prairie, Minnesota, had just a day and a half to plant in his cornfields before the rains came and saturated his fields for several weeks. The unusually long, wet spring kept him out of the fields until June 20. That season, Louks could only plant 15 percent of his acres. He knew something had to change.

“2013 was our driving force,” he says. “We did not have enough time to make a corn crop.”

Like a rising number of growers in the Corn Belt, Louks has invested in a high-speed planter to maximize his time in the field. His goal in 2016 is to reduce his usual 14-day planting season into an eight- or 10-day period.

Standard Planters Travel	High-Speed Planters Travel
<b>4.5–5 MPH</b>	<b>8–10 MPH</b>

## Time Is Money

“Progressive growers know time is money, and efficiency is one way they can increase their profitability, particularly when commodity prices are lower,” says Meade McDonald, Syngenta product lead.

According to McDonald, speed is not the only factor when choosing the right planter. A grower needs a high-speed planter that will enable planting with the same quality, precision and placement, plus handle fertilizers and insecticides as a standard planter does. A standard planter travels 4.5 to 5 mph, while a high-speed model moves across fields at 8 to 10 mph, saving growers both time and money.

“In certain parts of the country, it could dramatically impact harvest,” says McDonald. “For example, growers in southern Minnesota have a compact planting season. If these growers are 10 days or two weeks late planting corn, a freeze in September could prematurely kill the crop.





That's the kind of risk mitigation that high-speed planters can address."

Of course, almost doubling the speed of the planter will make it more prone to repairs and possibly shorten the machine's life span. But growers like Louks who purchase high-speed planters are counting on the profits they make from increased crop yields to outweigh the greater equipment costs.

### What Goes In

Most of the major agriculture equipment manufacturers—including John Deere, Case IH, Kinze and Horsch—are offering higher-speed planting technologies. But manufacturers of the chemicals that go into these planters also must keep up with the accelerating pace of planting.

To meet growers' changing needs, Syngenta scientists and formulation experts are continuously developing new chemistries and refining existing products. One example is its line of Force<sup>®</sup> insecticide brands. For more than 25 years, Force CS liquid insecticide and Force 3G granular insecticide have offered growers outstanding corn rootworm (CRW) and early-season pest control. Even with advanced CRW-treated

hybrids, experts don't see the need for soil-applied insecticides like Force decreasing any time soon.

Kevin Scholl, Syngenta agronomic service representative from Wyoming, Illinois, says Force products are the best options for growers in his area who need to control moderate- to high-infestation levels of CRW. "A large part of Illinois is a high-pressure CRW area, and other liquid products are not able to handle such high pressure consistently," he says.

To continue offering Force to growers who have a stronger need for speed and efficiency at planting, Syngenta is developing Force Evo, an easier-to-load liquid formulation, with registration anticipated in time for the 2017 planting season.

"Growers want a product like Force that is high-performing on CRW," says McDonald. "But they also want a product that is concentrated and easy-to-load for faster planting. This new formulation will offer that."

Force Evo is a back-to-basics product, according to McDonald, and well-suited for high-speed planters because of its easy-to-load setup, speed and efficiency. Upon registration, this new, simpler formulation will provide easier cleanout, better pumping flowability and more complete emptying of bags. It also will offer the same closed-system packaging as Force CS, will work with existing Force CS equipment and will be compatible with most commonly used starter fertilizers.

**"Progressive growers know time is money, and efficiency is one way they can increase their profitability, particularly when commodity prices are lower."**

—MEADE MCDONALD

### Room to Grow

"This new formulation gives us room to grow," says Neill Newton, a Syngenta applications specialist. "It will help us expand and venture into new territory with Force, whether that be through formulation, packaging or the delivery system. With high-speed planters and the Force product, we have the ability to deliver much higher rates, due to the design of the application system and the capacity of the pump."

Field trials also show that Force Evo provides better root protection than its competitors, including Capture<sup>®</sup> LFR<sup>®</sup> insecticide. With better performance and greater convenience, speed and efficiency, Force Evo will be well-suited for unpredictable Midwest springs.

"High-speed planters may be the way of the future," says Newton. "If so, Syngenta and Force will have no problem keeping up." 🍀 STORY BY MATT LAIL

# Good Chemistry

The Syngenta formulation team delivers innovative products to help growers manage their most difficult crop production challenges.

In the world of crop protection, the active ingredients in products are what dominate much of the discussion—and for good reason. At the most basic level, active ingredients are the molecules that effectively control target pests. However, active ingredients are rarely, if ever, applied to crops independently. Doing so would be akin to eating pure sugar

instead of candy, says Andrew Pearson, formulation & analytical development manager at Syngenta. Growers can only fully realize the potency and efficacy of these molecules when scientists deliver active ingredients within carefully designed formulations.

Members of the Syngenta formulation team work in the lab to make sure the products delivered to growers perform exceptionally well in the field. From left to right: Matthew Cottle, Andrew Pearson, Adam Voisard, Katie Oshige, Felisha Vestal and Xinyun Wen.

“Our formulation chemists and engineers focus on delivering an active ingredient—or multiple active ingredients, as is often the case—into a convenient product for the customer,” says Pearson. “Not only does the chemistry need to be effective against the target weed, insect or disease growers are looking to manage, but we need to formulate it in such a way that the product is safe and convenient for the applicator to handle.”

## Formulation 201

It should come as no surprise that formulating crop protection technologies has become increasingly complex in recent years. As certain insects, weeds and pathogens





have adapted to molecules once used to control them, delivering additional modes of action in a single product—via multiple active ingredients—has become imperative.

Adding to this complexity is the fact that the active ingredients within a formulation often differ in form or property. Combining solids and liquids, for example, is a typical challenge chemists and engineers face.

“Any time we are developing a formulation with at least one solid active ingredient and one liquid active ingredient, the process is difficult, because degradation is natural in that state,” says Matthew Cottle, Ph.D., group leader for herbicide formulation development at Syngenta. It is, as he says, a matter of making the incompatible compatible.

“When you really think about it, a lot of what formulation chemists and engineers do is fight gravity, by manipulating how solids and liquids interact,” adds Adam Voisard, a formulation engineer at Syngenta.

### Solving Problems

Syngenta excels at overcoming these challenges. Take Acuron® corn herbicide, for example, a much-anticipated weed-management tool introduced in 2015. Designed to combat grasses and the tough broadleaf weeds that have become increasingly resistant to glyphosate, Acuron herbicide is a premix with four active ingredients.

Deploying new active ingredient bicyclopyrone was just one obstacle in formulating Acuron herbicide, says Xinyun Wen, a formulation chemist at Syngenta. Making this HPPD inhibitor compatible with three other active ingredients—mesotrione, S-metolachlor and atrazine—was also a significant stretch.

“Mesotrione is a solid that doesn’t like to interact with S-metolachlor, which is a liquid, so that combination presented significant challenges from a stability and solubility standpoint,” says Wen. In rounding out the formulation with inert ingredients, chemists relied on an extensive database of information relating to surfactants to ensure compatibility with the active ingredients.

**“The real world has a lot of curve balls, so it’s important to anticipate how those challenges might affect the product’s performance and usability.”**

—ADAM VOISARD

### Engineering Success

Developing a formulation in a beaker is one thing, but producing enough of it to fill large-capacity storage tanks is another. After formulation chemists develop a recipe for a specific chemistry, formulation engineers scale up production.

“It’s the chemists who have the concept,” says Felisha Vestal, manager of the Technology Finished Product Process group at Syngenta. “As formulation engineers, we help realize

that concept.”

To preserve the original formulation’s performance and quality during large-scale production, the formulation engineers may adjust certain operational elements—like mixing speed or the order in which ingredients are added. Rigorous formulation testing efforts also help make sure the product growers receive can stand up to multiple real-world scenarios, such as exposure to hot and cold temperatures, transportation, tank-mixing with other products, and use with various types of bulk and spray equipment.

“The real world has a lot of curve balls, so it’s important to anticipate how those challenges might affect the product’s performance and usability,” says Voisard.

### Staying Relevant

The formulation team’s work doesn’t end after product registration. Syngenta continuously looks for ways to improve existing formulations, as is evident in its growing product pipeline. For example, upon registration, Force® Evo insecticide will be compatible with starter fertilizers. Additionally, it will have excellent cold tolerance and improved flowability and cleanout. This easier-to-load liquid formulation is also well-suited for high-speed planters. (See “The Jet Set,” page 6.)

While the development of a new formulation is nothing short of a scientific triumph, the premise of the formulation team’s work remains simple, says Wen. “Our goal has always been to develop products and new solutions that meet customer needs.”

STORY BY KARYN OSTROM

# Start Smart

Young adults interested in a career in agriculture should prepare themselves by pursuing a broad, skills-based education.

**M**ost people don't realize that agriculture is one of today's high-demand careers. But a look at a popular website for agricultural jobs, AgCareers.com, shows the industry has a wealth of positions available for young people with the right knowledge. The website lists more than 7,000 ag-related jobs daily, and, in 2015, it posted a total of 81,386 jobs in agriculture.

What is driving this demand? The answer is an expanding global population that increases by 83 million people each year, according to United Nations' figures. "In order to live, these people must be fed, and agriculture is responsible for that—while using fewer resources than before," says Ashley Collins, education and marketing manager for AgCareers.com.

The need to farm more efficiently has created stunning technological advancements in agriculture that were only dreamed of 20 years ago. Today's farm machinery is equipped to operate with little driver intervention. Wireless communications allow machinery in the field to record and report information like location, application rates and equipment breakdowns to operators, managers and even equipment dealerships for immediate attention and future analysis. Strides in genetics and agronomics have revolutionized the seed and crop-protection industries by boosting yields with precisely applied crop inputs.

## Education Needed

"Change is happening so fast in agriculture," says Danny Klinefelter, Ph.D., Texas A&M University ag economist. "Part of it is in real-time information and digital communications. It will take a broad education to keep up to speed on these tools. If your farm business is going to succeed, your management must continue to learn, improve and adapt to the leading edge of the competition, or it will fall behind."

Both Klinefelter and Collins encourage all young people who hope to work in agriculture to continue their education after high school, regardless of whether they plan to become growers or enter another sector of the industry.

"The most dangerous thing to say is, 'I'm doing this because this is the way we've always done it.'" Klinefelter says. "Going to college will expose students to different things. They'll have a



chance to work with other people, learn to balance time and develop a broad background of knowledge."

While he's seen English majors go back to farm successfully, Klinefelter says ideally growers should have some combination of business, agriculture and engineering degrees. "This prepares them for another job, which will help them decide if they really want to farm," he says. "Most young people need to work somewhere else for a different perspective, before going back to the farm."

Ag students should also add some diverse course work to their schedules. Klinefelter suggests personnel management, negotiation, interpersonal relations, enterprise risk assessment, managerial/cost accounting, financial analysis or global studies. "They may have to deal with employees, suppliers, buyers and even public relations because of regulations," he says.

## Advanced Degrees Matter

Advanced degrees are high on a priority list for many of the jobs posted on AgCareers.com. About 50 percent require at least a bachelor's degree, and another 25 percent require an associate or certificate level of education.

The competition among applicants for these jobs is strong. "When we look at the education level among applicants,



64 percent have a bachelor's degree or higher, and 14 percent have a master's," Collins says. "So if young people want to compete in the marketplace, they need to consider advanced education." (Read related article, "A Lasting Impact," page 32.)

Advanced training helps students develop employability skills, according to Collins. "These are skills an employer looks for, like

good work ethic, strong communication skills and awareness of how the global market impacts their career."

Work toward an advanced degree also helps students find professional internships. "Advanced education will open the door to internships," Collins says. "Even when

**"Going to college will expose students to different things. They'll have a chance to work with other people, learn to balance time and develop a broad background of knowledge."**

—DANNY KLINEFELTER

planning to go back to the farm, an internship will allow students to learn things outside their comfort zone."

Agricultural internships continue to grow in numbers. AgCareers listed 1,800 internships last year, a 17 percent jump over 2014.

Many companies like Syngenta offer a number of student internships. "The three main skills we look for in a sales intern, for example, are business acumen, knowledge of sales and insight into agronomy," says Jenny Heaton, head of talent development and talent acquisition at Syngenta, North America.

### Diverse Job Market

The jobs available in agriculture are diverse. Collins says she and her AgCareers colleagues have written profiles of more than 200 different careers that are posted on their website. "Right now, we see a number of postings in the biotechnology realm," she says. "There's a big demand in plant pathology and genetics—and the same in animal genetics and sciences."

Research in these areas will lead to new products, which create a need for sales. "Sales is the No. 1 career type we see posted on our website," Collins adds.

The growth of diverse positions in agriculture will continue, especially as farming becomes increasingly complex with more information available for analyzing. "I believe there are high school students today who will likely take agricultural jobs out of college that haven't even been established as careers quite yet," says Heaton. "The industry is moving fast."  STORY BY KAREN MCMAHON

**FOR MORE INFORMATION** on which U.S. universities offer the strongest agricultural education programs, go to "Top 10 Ag Universities" at [www.syngentathrive.com/community](http://www.syngentathrive.com/community).

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This would be the Elatus treated area.

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MW 14145010-HP-TH 12/15



Gilroy,  
California

Growers and resellers who attended the Grow More Experience events in Gilroy, California, in 2015 saw firsthand how Aprovia® Top fungicide helps protect peppers from disease.





# Growth Potential

Syngenta showcases practical, profitable solutions tailored to local growing conditions at locations around the country.

*By Darcy Maulsby*

Scott Heinrich knows his agronomy team isn't looking for another training session with lectures and PowerPoint® slides, especially after visiting the Syngenta Grow More Experience site near York, Nebraska.

"This site brings science to life in a real-world setting," says Heinrich, agronomy sales manager with Farmers Cooperative in Dorchester, Nebraska. "It lets you see the whole system in action in the field and put things into a dollars-and-cents perspective."

Heinrich's team looks forward to summer training sessions at the York site, which demonstrates Syngenta technologies at work in the local geography and the accompanying agronomic practices that can increase corn and soybean yield potential. "By properly managing practices

and products, we've seen a 16.1-bushel yield advantage on corn at York," says Bob Kacvinsky, a Syngenta agronomy service representative who oversees the York site. "That equates to a lot of money."

The York site has served as a model for many Grow More Experience locations that Syngenta has established across the U.S. and Canada.

Each site offers a unique educational resource where retailers and Syngenta Seed Advisors™ can see the company's products in action and learn how to address local production challenges with customers.

While the sites showcase the latest Syngenta technologies, they also spark conversations about cost-efficient agronomic practices that can help improve growers' productivity and maximize yield potential.

"At our Grow More Experience sites, you receive an immersive experience," Kacvinsky says. "This is a tremendous learning opportunity, because you can walk into the field, dig up roots,

gain a deeper understanding of how crops grow, and see which products and agronomic practices can enhance your business."

Syngenta designs each site with local growing conditions and production practices in mind. As a result, attendees have a front-row seat to trials showcasing the best new Syngenta technologies that can bring maximum value to farmers' fields. The sites also demonstrate how growers can use existing Syngenta products more effectively.

Mike Laux, a Syngenta Seed Advisor from New Baden, Illinois, has taken his customers to the local site near Ina, Illinois, for the past two years. "When you see things up close in the field, the information hits home," Laux says. "Everyone who visits the site gets a lot out of the experience and wants to go again next year."

### Individualized Learning Environments

While several thousand people attended training events at Grow More Experience locations in 2015, these weren't huge field days. "Each event creates an individualized learning environment that allows people to see Syngenta technologies in action throughout the growing season," says Chris Clemens, Ph.D., a Syngenta agronomy service manager in Richland, Washington. "The small-group setting encourages interaction with our sales and agronomy representatives."

Syngenta plans to offer more than 60 locations across North America in 2016 to build closer ties with retailers, growers, crop consultants, farm managers, researchers, ag media and university extension specialists, as well as Syngenta Seed Advisors and Syngenta staff.

"Syngenta uses the sites for hands-on training every week of the growing season," says Jim Elliott, technical services sales support lead for Syngenta. "As the

**"Syngenta uses the [Grow More Experience] sites for hands-on training every week of the growing season. As the season progresses, there's a new story to be told."**

—JIM ELLIOTT



The Grow More Experience site in York, Nebraska, features a comparison of corn hybrids on dryland.





season progresses, there's a new story to be told."

Each site focuses on local crops, including corn and soybeans in the Midwest, cotton and rice in the South, vegetables in the East, and specialty crops in the West. The sites reflect the integration of agronomic principles, Syngenta genetics, Seedcare solutions and crop protection products.

"Being able to see how various crop inputs work in the field builds excitement for Syngenta products," says David Shupert, a technical development lead for Syngenta who has helped coordinate Grow More Experience locations in Florida and the western U.S. All across the country, these sites address timely agronomic issues from weed-resistance management to the yield potential of new genetics. In September 2015, the new Grow More Experience plots at the Syngenta vegetable seed research site in Gilroy, California, featured vegetable variety trials and crop protection trials together. Along with a site tour, participants also learned about Syngenta Seedcare options and Operation Pollinator's role in sustainable production. The event came full circle when attendees enjoyed a meal that included one of the top-selling seedless watermelon varieties in the U.S.—Fascination from Syngenta.

"Attendees discovered that Syngenta is much more than a provider of crop protection products," says Jose Cabrera, a Syngenta agronomic service representative for coastal California, Arizona and Hawaii. "They appreciated this 360-degree view of Syngenta that shows how we can fit into their system, from planting to harvest."

### Take a Look at the Future

Grow More Experience events also give resellers and growers a sneak peek at upcoming Syngenta technologies. "We can feature new products that are in our pipeline 18 to 24 months prior to registration," Clemens says.

These innovations will help producers meet the world's growing food security needs and show how Syngenta is contributing to an ample, safe food supply—one of the core commitments of the company's Good Growth Plan. "Each year presents a new opportunity for each site to demonstrate ways to optimize yield," Elliott says.

This includes sharing useful information among the various locations. "When people walk away from a Grow More Experience event, I want them to feel like they've



From left to right: Carol Brooks with KAC Agricultural Research confers with James Hadden and Jonathan Stevenson of Syngenta on next steps at a vegetable Grow More Experience site in Wimauma, Florida.



## What's Ahead in 2016

Excitement for Grow More Experience sites continues to increase, especially as Syngenta builds on the successes of 2015 and expands the program in 2016. With the launch of 16 new crop protection products along with an expansion of its seeds offerings, Syngenta will have a lot to showcase at this year's locations, including trials featuring Orondis® Opti fungicide, Acuron® corn herbicide and Trivapro™ fungicide.

"The positive experiences of the 2015 attendees are a testament to the value of the Grow More Experience sites," says Bob Kacvinsky, a Syngenta agronomy service representative. "We plan on continuing the momentum at this year's locations. Our goal is to energize retailers, Syngenta Seed Advisors™ and growers about how we can help them get more out of the same acres and boost return on investment."

learned a lot and their time was well spent," says Craig Nelson, a Syngenta retail representative who works with the site near York.

The Farmers Cooperative agronomy team in Dorchester looks forward to touring Grow More Experience locations each summer and sharing yield results with its growers during winter meetings, Heinrich says. "We see a lot of value with the concepts showcased at the sites, because they focus on current agronomic issues and return on investment." 🌱



**WATCH NEW VIDEO** Want to learn more about the Syngenta Grow More Experience sites and visit select locations virtually? Check out the new video posted to the *Thrive* website ([www.syngentathrive.com/research](http://www.syngentathrive.com/research)).



# A Perfect Fit

**Ag Connections designed the technology that drives the Syngenta whole-farm management program to meet a wide range of growers' needs. | *By Lauren Mello***

**M**ade up of four synergistic components, the AgriEdge Excelsior® program is like a puzzle. Each of the many pieces—representing risk management, product portfolio, service and technology—is essential to this data-rich Syngenta program, which offers growers whole-farm management solutions.

But like the edges that give a puzzle its strong frame, innovative technology is the cornerstone of AgriEdge Excelsior. After all, it's the program's record-keeping software that helps participating growers operate their farms more efficiently. Driving this technology is the 14-year partnership between Syngenta and farm-management software developer Ag Connections.

## **Where It all Began**

Now a wholly owned subsidiary of Syngenta, Ag Connections is the brainchild of co-founders Rick

Murdock and Pete Clark. People who know them agree that agriculture is in their DNA. Both grew up around family farms. After graduating from college, Murdock spent 15 years farming full time before getting involved in ag retail and eventually ag technology.

It was in the ag retail business that Murdock met Clark. A retail veteran of 18 years, Clark worked his way up to the corporate office of a large wholesaler, where he went on to manage 16 retail stores.

With their deep-rooted knowledge of the agriculture sector, Murdock and Clark saw a need for software tools that would help growers develop yearly input plans and calculate costs.

"As a farmer, I knew the impact of walking into a bank and not having all my numbers ready, and then having that banker push back and say, 'Hey, this isn't going to work,'" says Murdock. "That's where the software comes in.





It helps growers generate the numbers that landowners, FSA [U.S. Department of Agriculture's Farm Service Agency], bankers and all the people they do business with need. We saw a huge place for a technology of this nature, so that's where we planted our seed."

Together, Murdock and Clark decided to quit their jobs and focus their full attention on developing Land.db® software. They also began consulting for Syngenta and learned that the company had an offer—AgriEdge Excelsior as it's known today—that was missing a key piece: a way to help growers keep records. "Land.db and AgriEdge Excelsior fit together," says Clark, "and the program grew from there."

### Putting the Pieces Together

At a glance, Land.db may appear similar to precision ag software technologies, but it's much more. "Land.db is



From top to bottom: Land.db® software helps growers keep track of important farm and crop data; Rick Murdock (left) and Pete Clark, co-founders of Ag Connections, stand in front of the company's headquarters, two converted tobacco barns, near Murray, Kentucky.

**“Between our staff and our leadership, we have a strong handle on where agriculture has been, where it is and where it’s going. Other companies may know technology and analytics, but they don’t have a clue about what growers need and how they need it.”**

—RICK MURDOCK



designed to help growers make a wide variety of decisions concerning their entire operation,” says Clark. “It’s used throughout the year, while growers use precision ag technologies only prior to planting and applications.”

For example, helping growers remain compliant is a huge part of Land.db. Whether to meet restricted-use-pesticide standards, state requirements, or the needs of banks or food processors, documentation is essential. In recent years, sustainability has become an especially hot topic.

“Ultimately, our downstream partners are looking to meet their customer demands,” says Dale Nicol, AgriEdge® manager for the western U.S. “Customers are demanding sustainably produced food products, and it turns out the agricultural production of food is a big place to work on the environmental footprint.”

That’s why Ag Connections has incorporated algorithms from Field to Market®: The Alliance for Sustainable Agriculture into Land.db. These measurement tools help growers create a field print that they can share with food processors, demonstrating the steps growers are taking to minimize their impact on the environment.

Maggie Strickland, business manager of Barnes Farming Corporation in Spring Hope, North Carolina, is responsible for certification, traceability and input purchasing. She uses the AgriEdge Excelsior program to meet FDA Food Safety Modernization Act requirements and GLOBALG.A.P. guidelines for the sweet potatoes Barnes ships to the European Union.

“It’s very helpful for certification,” says Strickland. “Our auditors will say, ‘Wow. Normally, we’ll just have a notepad with some writing on it.’”

### **Making Progress**

While many growers start using AgriEdge Excelsior for the compliance benefits, they quickly see that by having complete, detailed records, they can better manage their operations, drilling down to determine cost per field, crop and farming practice.

“If growers want to know about their no-till, irrigated Syngenta variety, all they have to do is click, and the cost of production for that variety with those farming practices

is available,” says Clark. “When it gets to that level, the program becomes a normal, daily part of growers’ operations, and they start depending on it to make decisions.”

Strickland puts it simply: “You want to know which fields are making you money and which aren’t. The program and its technology help consolidate all our applications and costs per acre into one, centralized database.”

### **A Team Activity**

Led by a team that truly understands agriculture, Ag Connections has designed software that provides growers with a user-friendly experience. Murdock and Clark have daily meetings with their developers to make sure they continue to refine a grower-intuitive interface that can be easily understood and doesn’t add stress to a grower’s already hectic schedule.

“Between our staff and our leadership, we have a strong handle on where agriculture has been, where it is and where it’s going,” says Murdock. “Other companies may know technology and analytics, but they don’t seem to have a clue about what growers need and how they need it.”

If a grower does have questions, support is right around the corner. “Syngenta AgriEdge specialists are like personal trainers for the grower,” says Nicol. “They work with growers to install software, train them on its use and share expertise in what records can be utilized and how reports can be generated to make farming decisions.”

Growers can also pick up the phone and call Ag Connections, whose dedicated team can access the program’s interface and navigate any problems remotely, day or night.

### **Growing Forward**

The recent acquisition of Ag Connections by Syngenta has only helped the AgriEdge Excelsior program grow. Operating as a wholly owned subsidiary, Ag Connections remains the agile, innovative company it has always been.





From left to right: Rick Murdock (left) engages with employees Jeremy York and Kelly Bumpus at Ag Connections; AgriEdge Excelsior has a user-friendly interface; Maggie Strickland reviews data generated by Land.db software with Johnny Barnes (left) and Bryan Salmons (right), all with Barnes Farming Corporation.

“This combination of Syngenta and Ag Connections will enable us to ramp up, quickly moving the program’s tools, service and support forward,” says Clark. “Growers are using AgriEdge Excelsior daily in their operations, and this will allow us to better serve them.”

Strickland, who has used AgriEdge Excelsior for nearly five years, considers it an integral part of Barnes’ operations. “We have a meeting every morning with all our operators, and we say, ‘Where did you go? What did you apply?’” she says. “We put that information into the applications section of Land.db, and at the end

of the year, it shows me every day we touched that field, everything we did to it and how much we spent on it.”

For growers not yet on board, it’s only a matter of time before they put aside their notebooks, says Clark. “We’ve helped so many growers realize the benefits of keeping better records, demonstrating compliance, knowing their costs and having the ability to easily communicate all of that with their business partners,” he says. “I’m excited to continue working with Syngenta and being an integral part of agriculture’s future.”

## Rural Connections

For many Americans, the term “office” conjures up images of a cubicle-laden room complete with harsh overhead lighting and gray, tight-knit carpeting. But for many of Ag Connections’ employees, something different comes to mind.

While a team of seven employees works in the heart of Murray, Kentucky, and several others are sprinkled remotely across the country, the core of Ag Connections is located in rural



Calloway County, Kentucky. Two old tobacco barns on farmland owned by co-founder Rick Murdock provide 23 employees with a completely refurbished space, plus something extra.

“Every employee has a window, allowing them to look out at nature,” says Murdock.

Inside and outside of the office, a sense of community runs strong. The long-standing relationships that Ag Connections has built with other local professionals over the years is something Murdock values.

“West Kentucky Rural Telephone has worked with us to install fiber-optic Internet and an IP phone system,” he says. “In our remote location, we have a 100-megabyte-per-second Internet speed with access to 1 gigabyte. We also work with Murray State University to find qualified graduates in the areas of expertise we need. It’s these close ties to local partners that help make Ag Connections a very special place to work—and this community a place we’re proud to call home.”

# The ENERGY EQUATION

**A unique in-seed technology that enhances ethanol production is quickly gaining widespread acceptance.**

*By Brad Bremer*

**F**ive years ago, a handful of growers in Kansas first planted Enogen® corn. Today, that breakthrough technology is helping to make the ethanol industry more efficient and is enabling an increasing number of ethanol plants to invest in their local communities.

Syngenta is currently contracting Enogen grain with growers to support 18 ethanol plants in seven states—from California to Ohio—representing approximately 1.3 billion gallons of ethanol capacity, with plans to continue expanding the footprint for this game-changing innovation.

## **A Win-Win-Win Scenario**

Enogen corn enzyme technology is available exclusively from Syngenta. It's the industry's first and only corn designed specifically to enhance ethanol production. Using modern biotechnology to deliver robust alpha amylase enzyme directly in the grain, Enogen eliminates the need to add liquid alpha amylase, a key ingredient in ethanol production. Instead, Enogen provides corn growers the opportunity to earn additional income by serving as enzyme suppliers. This in-seed technology helps ethanol plants run more efficiently by significantly reducing the viscosity of corn mash during the production process.

Midwest Renewable Energy, LLC (MRE) will begin using Enogen at its Sutherland, Nebraska, ethanol production facility this season. According to Jim Jandrain, MRE's CEO and chairman of the board, the opportunity to invest locally is a key benefit of using Enogen grain.

"We look forward to purchasing alpha amylase in the form of high-quality grain directly from local corn growers," Jandrain says. "When you think about the value that Enogen will deliver for our growers, our facility and our community, it's a win-win-win scenario."

Enogen growers can earn on average a 40-cents-per-bushel premium. Enogen corn is expected to generate approximately \$25 million of additional revenue in 2016 for local growers through premiums.

"The agreements we have in place with an increasing number of plants will enable them to source alpha amylase directly from growers and keep enzyme dollars in those local communities," says Jack Bernens, head of Enogen at Syngenta. "This is what

**"... with Enogen, ethanol producers can help promote the growth and stability of rural communities through an energy source that is helping to make America more energy independent."**

**— JACK BERNENS**



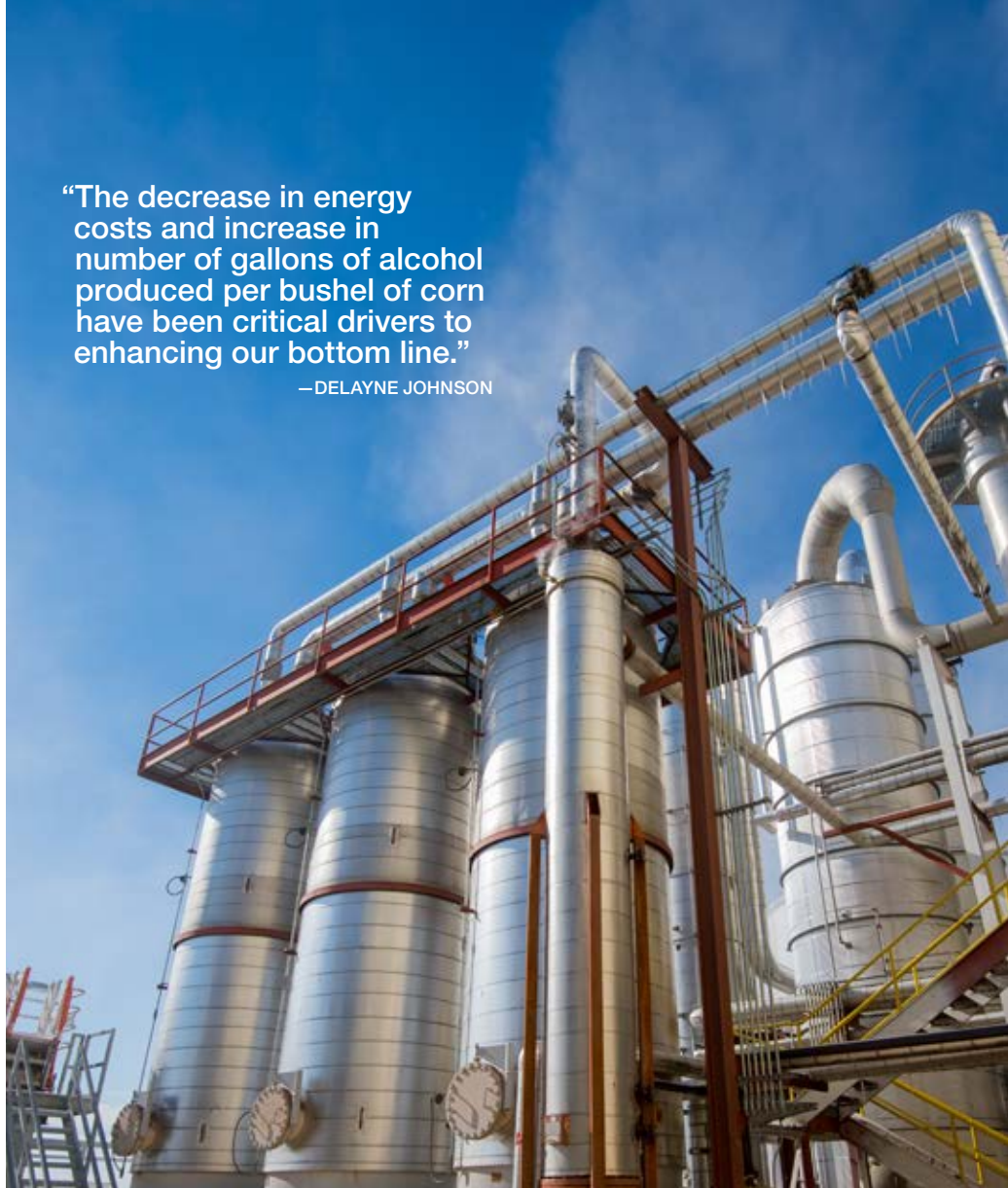


PHOTOS: GREG LATZA



Clockwise from left: Enogen corn enzyme technology reduces the viscosity of corn mash; Enogen corn is the only corn designed to specifically boost ethanol production; corn processed into ethanol produces a superior high-protein livestock feed called dried distiller's grain; Quad County Corn Processors (QCCP) lab manager Nick Ryen works behind the scenes at QCCP.

Clockwise from top left: (from left to right) Syngenta Enogen account lead Todd Axtell, Quad County Corn Processors (QCCP) CEO Delayne Johnson and QCCP plant engineer Travis Brotherson work together to make their partnership a success; the QCCP facility in Galva, Iowa; Terry Evans, who works for Peterson Farm II, one of QCCP's largest Enogen producers, visits QCCP on a cold winter day.



“The decrease in energy costs and increase in number of gallons of alcohol produced per bushel of corn have been critical drivers to enhancing our bottom line.”

—DELAYNE JOHNSON

truly sets Enogen corn apart. It adds significant incremental value at the local level for communities that rely on their ethanol plant’s success.”

**Greater Rewards**

A desire to boost yield and throughput and reduce energy usage led Quad County Corn Processors (QCCP), based in Galva, Iowa, to begin using locally sourced Enogen grain in 2012.

Delayne Johnson, CEO at QCCP, believes that switching to the alpha amylase enzyme in Enogen was a good business move. “Our ethanol plant has had great results,

and the transition was very easy,” he says. “The decrease in energy costs and increase in number of gallons of alcohol produced per bushel of corn have been critical drivers to enhancing our bottom line.”

QCCP is the site of the first commercial cellulosic ethanol production in the state of Iowa, using Cellerate™ process technology. Cellerate is a collaboration between Syngenta and Cellulosic Ethanol Technologies, LLC, a wholly owned subsidiary of QCCP. Cellerate will enable dry-grind ethanol plants to convert corn kernel fiber into cellulosic ethanol, increasing a plant’s ethanol production by up to 6 percent.



**Grain-Bin-Rebate Offer**

To help Enogen corn growers preserve grain quality and further maximize return on investment, Chief Agri/Industrial Division is providing rebates on grain bins and other equipment through an agreement with Syngenta. Stiffened bins from Chief Agri/Industrial Division are available in sizes ideal for on-farm use and offer growers all the features that have created the grain bins’ reputation for superior strength, durability and ease of installation. To learn more about the latest in grain storage and the grain-bin-rebate offer for Enogen growers from Chief Agri/Industrial Division, go to [www.agri.chiefind.com/Enogen](http://www.agri.chiefind.com/Enogen).



Syngenta is also working with QCCP and other ethanol plants to introduce a protocol designed to help growers increase corn yields and drive grain quality through insect control, early-season weed management, glyphosate weed-resistance management and crop enhancement. The Ethanol Grain Quality Solution provides ethanol plants with locally sourced grain while helping to improve grower return on investment (ROI).

"Growers with an Enogen contract can receive an additional 10-cents-per-bushel premium above the current Enogen contract premium, by following protocols outlined in the Ethanol Grain Quality Solution," says Chris Tingle, head of Enogen commercial operations. "Growers without an Enogen contract can receive 10 cents per bushel for any additional corn produced under the Ethanol Grain Quality Solution protocol, provided those bushels are delivered to the ethanol plant."

### Increased ROI Potential

Numerous trials have shown that Enogen hybrids perform equal to or better than other high-performing corn hybrids.<sup>1</sup> Those results were again confirmed by grower experiences last fall.

For Roger Unruh of Holcomb, Kansas, the transition to Enogen was an easy one. As a Golden Harvest® Corn grower, Unruh says that with the premium-per-bushel offer, the decision to plant Enogen hybrids was a no-brainer. "My Enogen hybrid E113N8-3000GT brand yielded up to 270 bushels per acre, while my E116K4-3000GT brand yielded up to 240 bushels per acre this season," he says. "I have been very pleased with both of my Enogen hybrids this year."

Grower Bill Janssen of Wellsburg, Iowa, says yields have been strong and the stewardship protocol straightforward. "We had a nice growing season," he says. "My Enogen hybrid E111B8-3000GT brand yielded up to 238 bushels per acre, and I have found that the Enogen stewardship requirements have not been an issue at all."

Waverly, Iowa, grower Marc Mummelthei agrees: "Enogen stewardship is very simple to follow. It is a very user-friendly, farmer-friendly program. The computer systems are fairly easy to run, so really it's just a small task to grow Enogen."

Bernens says that he and others at Syngenta believe ethanol is an essential part of the energy equation. "Ethanol is good for consumers, good for farmers and good for the environment," he says. "And, with Enogen, ethanol producers can help promote the growth and stability of rural communities through an energy source that is helping to make America more energy independent."

Go to [www.enogen.net](http://www.enogen.net) for more information on Enogen. 🌱

1. Based on Syngenta production data from more than 350,000 contracted acres, 2012-2015.

## Pumping Up Rural America

Last fall, the U.S. Environmental Protection Agency set Renewable Fuel Standard (RFS) targets that are expected to push 14.5 billion gallons of ethanol into gasoline in 2016. This volume could translate into ethanol accounting for more than 10 percent of fuel use in the U.S. and help establish a floor for ethanol production and price.

The RFS is driving billions of dollars of economic activity across America. The results are clear: \$184.5 billion of economic output, 852,056 jobs, \$46.2 billion in wages and \$14.5 billion in taxes each year.<sup>1</sup> "This activity creates a ripple effect as supplier firms and employees re-spend throughout the economy," says Jack Bernens, head of Enogen at Syngenta. "Ethanol is fueling rural America's future—one community at a time."

And biofuels are cleaner than imported fossil fuels. Part of the impetus for the creation of the RFS was not only energy independence, but also the environmental benefit realized from the reduction of greenhouse gas emissions. Over its 10-year lifespan, the RFS has cut U.S. transportation-related carbon emissions by 589.33 million metric tons—equivalent to removing more than 124 million cars from the road over the decade.<sup>2</sup>

"For the ethanol industry to enjoy sustainable success, however, there needs to be an increase in demand," says Bernens. "That's why Syngenta is donating approximately \$600,000 to the Prime the Pump Fund."

This fund is an ethanol-industry initiative created to help the early retail adopters of high-level ethanol blends by awarding grants to reduce their initial investment in infrastructure. The Syngenta donation is part of a commitment begun in 2013 to contribute \$1 to the ethanol industry for every acre planted with Enogen corn enzyme technology.

1. Fuels America, [www.fuelsamerica.org](http://www.fuelsamerica.org).

2. Biotechnology Industry Organization, [www.bio.org](http://www.bio.org).



# Fueling a Better Future

Since 2005, when the Renewable Fuel Standard (RFS) mandated that petroleum-based transportation fuel include targeted volumes of renewable fuels, the results have been very positive. Ethanol has helped America achieve greater energy independence and reduce greenhouse emissions. Syngenta has developed innovative corn seed that takes these gains a step further; its Enogen® corn enzyme technology benefits ethanol plants, corn growers and America's rural communities.

## RFS Contributes to the U.S. Economy<sup>1</sup>



**852,056**

jobs created, directly and indirectly

**\$184.5**

billion in economic output

**\$46.2**

billion in wages

## Byproducts Create Feed and Fuel

**1.5 pounds** of corn oil can be extracted from every bushel, which can be used as a biodiesel feedstock.<sup>2</sup>

**33%** of every bushel of corn processed by an ethanol plant returns to the animal feed market.<sup>3</sup>

**39 million** metric tons of animal feed were produced as a byproduct of the ethanol process in 2014.<sup>4</sup>

## Ethanol Production Expands



**14.3 billion** gallons of ethanol were produced in 2014, more than **3 times** the total in 2005.<sup>5</sup>



### Enogen Benefits Growers

**40¢** average premium per bushel available to growers



Approximately **\$25 million** in added revenue for local growers is expected in 2016 through per-bushel premiums.

### Enogen Boosts Bottom Line<sup>8</sup>

In a 100-million gallon plant, Enogen corn can help save:

**350** billion Btu of natural gas

**106** million pounds of CO<sub>2</sub> emissions

**68** million gallons of water

**10** million kilowatt hours of electricity

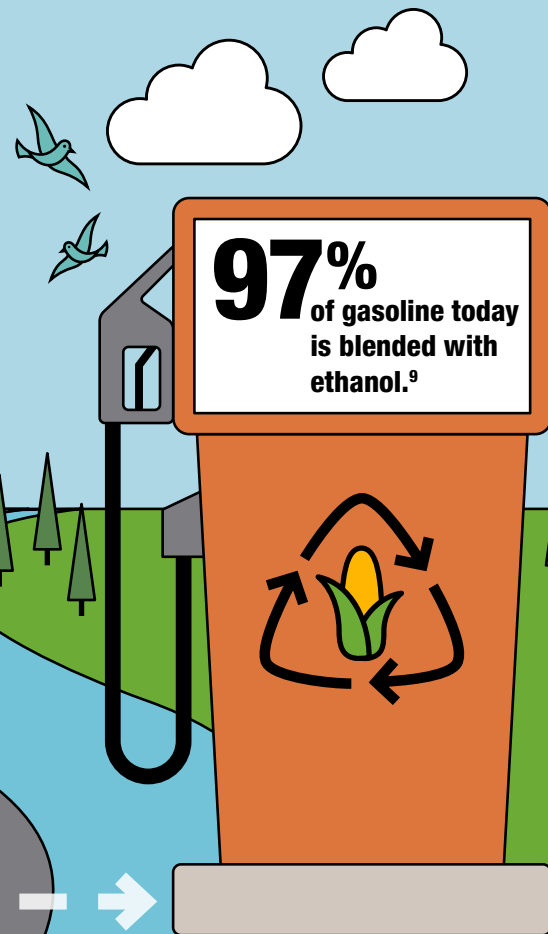
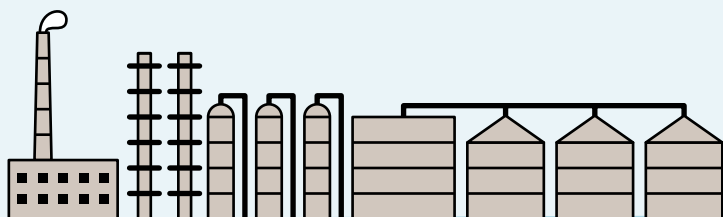
### Enogen Supports Communities, the Environment

**18** U.S. ethanol plants in 7 states using Enogen

**1.3** billion gallon ethanol capacity

#### CELLERATE™ ENHANCES SUSTAINABILITY: Process Converts Corn Kernel Fiber

**6%** more ethanol can be produced from the same bushel of corn using Cellerate process technology, which has the potential to add **2 billion** gallons of cellulosic ethanol across the industry.<sup>6</sup>



### Ethanol Fights Climate Change

**589** million metric tons of carbon emissions eliminated  
**= 124** million cars' worth of emissions removed from the road since 2005<sup>7</sup>



1. Fuels America, [www.fuelsamerica.org](http://www.fuelsamerica.org).  
 2. USDA, [www.usda.gov](http://www.usda.gov).  
 3. "Pocket Guide to Ethanol 2015," Renewable Fuels Association.  
 4. "Pocket Guide to Ethanol 2015," Renewable Fuels Association.  
 5. "Pocket Guide to Ethanol 2015," Renewable Fuels Association.  
 6. Quad County Corn Processors, [www.quad-county.com](http://www.quad-county.com).  
 7. Biotechnology Industry Organization, [www.bio.org](http://www.bio.org).  
 8. Savings calculated based on Enogen trial and commercial results at Midwest ethanol plants.  
 9. "Pocket Guide to Ethanol 2015," Renewable Fuels Association.

# Technologies On Trial

On-farm testing provides useful insights into how new products perform under local conditions.

## Q. Why conduct on-farm trials?

**A. James Hadden, Ph.D., technical development lead, Syngenta, North America:** During the course of registering new products, most field research is done in small-plot settings at universities or on internal research farms. While this research is critical to understanding the products' performance and use patterns, on-farm testing is still needed. Testing on-farm helps build a database of performance for the local market. Weed species, diseases and insect pressure vary by geography. On-farm testing allows growers to see how a product will work on the pests in their areas; it also offers growers an opportunity to compare their current practices with those of the new product.

Often, newly registered products provide an increase in the duration or range of a pest-control technology. For example, Acuron® corn herbicide controls many weeds—such as morningglory, giant ragweed and kochia—that growers are having trouble managing. On-farm testing lets growers gauge for themselves how a product performs and builds their confidence in the product. It also gives Syngenta and our resellers the platform to bring new technology to the early adopters in the area. These growers are typically the ones who drive change.

On-farm testing is a partnership that allows everyone access to view product performance on a larger scale and

under commercial conditions. These trials help us gain additional knowledge around tank-mix compatibilities, product handling and grower programs.

## Q. What are the basic steps in setting up and maintaining a trial?

**A.** Traditionally, our local agronomy and sales teams run our on-farm trialing program. The Syngenta sales and agronomy service representatives, working with a local reseller, will select potential growers who are excited about trying new products or technologies.

Once the growers have committed to work with us, the team will meet to discuss an agronomic protocol. This protocol will outline the treatments we'll test, the product use rates and timings, and any measurements—yield, for example—we'll take during the season. There is an expectation that growers or their farm crews will make the applications at the specified rates and timings. Also, they will need to grant us access to the field so that we can make observations and gather data. The Syngenta rep and reseller may make frequent visits throughout the year to monitor the progress of the trial and record any differences between treatments.

The best growers for on-farm trials are those who have a genuine interest in the outcome of the project. Sometimes

The Syngenta Grow More Experience site in York, Nebraska, features field trials of corn and other crops.





at the end of the season, trials are lost due to a grower's sense of urgency to get his or her crop harvested and in the barn. Our reps make every effort to meet the grower's timeline and expectations. But if a grower harvests a crop before we can capture the data, it can mean the loss of a trial and a year's worth of work. Building strong communications between the grower, the reseller and the Syngenta team may be the most critical element to the success of these trials.

**Q. How do participants make the most of the data collected?**

**A.** Once the data from a test has been captured and summarized, Syngenta shares it with everyone involved. Generally, we set up several on-farm trials of the same protocol across an area. This allows us to observe results on different farms across similar climate and soil types. Combining these trials from the same area gives us the ability to run statistical analysis and build confidence in the performance of a product. Many times, Syngenta uses the results from these trials to prepare local technical sales sheets that resellers can share with growers.

Yield data, disease-control numbers or insect counts are all extremely valuable in telling the story. However, there are times when a photograph can convey the same story in a much more powerful light. Looking at a photo of a clean soybean field that's been treated with a number of overlapping residual herbicides, like Boundary® and Flexstar® GT, next to a field with a program that has allowed numerous escaped pigweeds can be very impactful. That's why we suggest taking pictures throughout the season to document what's seen.

**Q. What resources are available for help?**

**A.** In 2016, Syngenta will launch 16 newly registered crop protection products into the marketplace. We'll also introduce a wide variety of new hybrids and varieties. Our field sales and agronomic service reps have a strong knowledge base around these products and can help provide information on how to use them effectively. We'll also have more than 60 Grow More Experience locations throughout the country, where resellers can see a broad range of our latest seed, seed treatment and crop protection products at work in the field. (See "Growth Potential," page 12.)

With so many new products launching, our need for on-farm trials to supplement the Grow More Experience program is great. If resellers are interested in placing an on-farm trial with a grower, they should contact their local Syngenta sales or agronomy service rep. We can help provide the insight and information needed to make these trials a success. 🍀

INTERVIEW BY SUSAN FISHER

**"On-farm testing allows growers to see how a product will work on the pests in their areas; it also offers growers an opportunity to compare their current practices with those of the new product."**

—JAMES HADDEN



**JAMES HADDEN, PH.D.**  
Technical Development  
Lead, Syngenta,  
North America

# A World of Goods

The Trans-Pacific Partnership offers some major wins for agriculture, but it also raises some concerns.

**T**he Trans-Pacific Partnership (TPP) is a deal truly global in scope. If approved by all of its signatory nations—the U.S., Australia, Brunei, Canada, Chile, Japan, Malaysia, Mexico, New Zealand, Peru, Singapore and Vietnam—the agreement will attempt to standardize trade rules across the 12 countries, representing 40 percent of the world’s economy. “This is a massive trade agreement,” says Ryan Findlay, North America industry relations lead for Syngenta. “It’s worth noting that.”

Ninety-five percent of the world’s customers are outside the U.S., which explains why foreign trading partners are so essential today. “For agriculture, it’s vital to secure access to this growing export market,” says Floyd Gaibler, director of trade policy and biotechnology for the U.S. Grains Council. “This has been termed a 21st-century trade pact because it provides a lot of benefits across the economic sectors.”

## New Market Access

Expanded market access through the reduction or elimination of tariffs is the TPP’s major success. Open markets support the expansion of U.S. food and agricultural exports, help increase farm income and promote job growth. While crops such as corn and other grains haven’t faced many high tariffs in the past, this agreement will basically eliminate the tariffs that do exist, benefitting not only the commodities themselves, but also exports in all forms, says Zach Kinne, director of public policy for the National Corn Growers Association. “Things like meat products and ethanol that use corn for production currently do face high tariffs. Those tariffs will be either eliminated or reduced to provide meaningful commercial access.”

The agreement also whittles away at nontariff barriers such as biotech approval processes and sanitary and phytosanitary barriers, Kinne adds. “The agreement contains language to help reduce these nontariff barriers, which will hopefully reduce trade impediments for growers.”

## Improving Biotech Acceptance

The TPP also includes groundbreaking provisions for biotechnology, implying the recognition that agricultural biotechnology, especially genetic engineering (GE), is and will be an important tool

**“For agriculture, it’s vital to secure access to this growing export market. This has been termed a 21st-century trade pact because it provides a lot of benefits across the economic sectors.”**

—FLOYD GAIBLER



to sustainably feed the world’s growing population. “This was the first time any trade agreement has proposed any language to address that,” Gaibler says. The TPP countries will agree to work together on situations of low-level presence of GE traits and to promote timely authorization of products of modern biotechnology.

The pact also establishes a voluntary working group to discuss and address these issues as they arise. “I think this is very positive, as we have had the increasing challenge of trying to deal with asynchronous biotech trait approval systems,” Gaibler says. “This is foundational language that could be useful in other trade agreements.”

## Data Protection

All TPP members will abide by the same rules of data protection that the U.S. currently follows—a major win, says Doug Nelson, senior adviser for trade, intellectual property and strategic issues for CropLife America. It’s a crucial issue for agricultural advancement. If Syngenta creates a new molecule, he points out, the Environmental Protection Agency requests many tests, which create reams of data—trade-secret data that the U.S. government then possesses.

Federal regulations require the U.S. government to keep that data secret for 10 years, and Nelson is pleased to see the TPP also place that 10-year requirement on all participants. Trade



partners, who need the same data, also will keep it secret for 10 years. That stipulation keeps the incentive in place for companies to continue to create new and better products, Nelson says, which benefits everyone. “Without that R&D, we don’t have innovation.”

### Potential Pitfalls

Not everybody in the industry is a fan of the agreement. Opponents from across the political spectrum worry that TPP will create a larger trade deficit by offering foreign competitors easier access to U.S. markets.

Currency manipulation by trading partners is another concern. The National Farmers Union (NFU) has been in the forefront of agriculture’s opposition to the pact. NFU President Roger Johnson submitted written testimony to the U.S. International Trade Commission to explain why: “TPP contains no enforceable measures to address the persistently increasing U.S. trade deficit or currency manipulation and will likely lead to the same negative overall outcomes of previous trade agreements,” he wrote.


U.S. tobacco groups and their supporters on Capitol Hill also have voiced objections to the exclusion of tobacco products from the TPP’s investor-state protections. Heavy opposition from tobacco-state members of Congress to the carve-out is strong enough that some congressional leaders, including Senate Finance Chairman Orrin Hatch (R-Utah) and House Ways & Means Chairman Kevin Brady (R-Texas), have warned it could imperil the TPP’s approval in Congress, unless the industry’s concern is addressed.

Other farm groups, such as the USA Rice Federation and the U.S. Dairy Export Council (USDEC), have expressed disappointment with the TPP and are still assessing its net benefits before offering their support. In a written statement, Michael Rue, vice chairman of USA Rice’s International Trade Policy Committee, says, the “gains achieved in Japan were, unfortunately, less than our modest objectives.” And USDEC President Tom Suber writes that the agreement “falls short in providing the degree of market access we had been seeking, but it also avoids a disproportionate opening of the U.S. market to [foreign] dairy exporters.”

Proponents, meanwhile, encourage the ag community to be vocal in their support and communicate about the importance of trade. Agricultural trade supports their bottom line and more than a million jobs in the U.S., Kinne says. “In order for us to be competitive in the future with those 95 percent of consumers who are outside the U.S., we need free trade agreements like TPP.”

Regardless of their point of view on the TPP, many in the ag sector believe that a global mindset is increasingly necessary for agriculture in the 21st century. “Farmers in the U.S. today have to think beyond the mailbox like never before. They need to think globally,” Findlay says. “We talk about the U.S. feeding the world—this agreement could be an opportunity to develop a broader marketplace where we can do just that.” 🌱

STORY BY SUZANNE BOPP



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# Ripple Effect

As part of its ongoing support of the ag community, Syngenta awards multiple seed grants and scholarships and sponsors a program to support essential resistance-management practices.

## HONORS AND AWARDS

### > Resistance Fighter Leadership Program Honors New Member

Gene McAvoy, a vegetable extension agent at the University of Florida, is a longtime advocate for promoting improved resistance-management practices in agriculture. Syngenta recognizes McAvoy's efforts and is proud to welcome him to the Resistance Fighter® Leadership Program. Formed to honor advisers who help growers manage resistance, the program provides members with opportunities to expand their resistance knowledge and a platform to share that knowledge with others.

McAvoy is currently responsible for developing and implementing educational programs for vegetable producers in five counties in southwest Florida. "Throughout my career working in vegetable crops in South Florida, I've seen



GENE MCAVOY

diseases, insects and weeds develop resistance to traditional management programs," he says. "It's important to incorporate integrated pest management and other methods to complement chemical





A field of cucumber plants flourishes in Parrish, Florida.

programs, and becoming a member of this program is a good way to get the word out there.”

A few years ago, McAvoy saw western flower thrips populations developing resistance to certain insecticides. Acting quickly and with great success, he helped promote grower cultivation of refugia for beneficial insects. Populations of western flower thrips returned to insecticide-susceptible levels, showing how proactive management helps preserve existing management tools.

“Resistance issues are an ever-increasing challenge in agriculture,” says David Laird, head of product biology at Syngenta, North America. “We are proud to partner with advisers like Gene who meet those challenges head on and help find solutions to preserve the tools we have.”

For more information about the Resistance Fighter Leadership Program and to learn more about past winners, visit [www.resistancefighter.com](http://www.resistancefighter.com).

### ➤➤ Seed Grant Program Winners Announced

Congratulations to the 2015 recipients of the Syngenta Grow More Vegetables Seed Grant Program. Selected from applicants across the U.S., the winners are:

- > Pierz Healy Middle School in Pierz, Minnesota
- > South Winneshiek High School FFA in Calmar, Iowa
- > The Kane Street Community Garden in La Crosse, Wisconsin

The three honorees have received garden grant packages that support their efforts to educate their local communities on the benefits of fresh vegetable production and consumption. For more information on Syngenta vegetables, go to [www.vegetables.syngenta-us.com](http://www.vegetables.syngenta-us.com).



Kane Street Community Garden in La Crosse, Wisconsin, produces between 25,000 and 30,000 pounds of vegetables every year.

# thrive

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# A Lasting Impact

Syngenta Agricultural Scholarship winners contribute ideas for the long-term success of The Good Growth Plan.

The Good Growth Plan is firmly fixed on the future—so it's fitting to hear from agriculture's next generation about this long-term project from Syngenta. The Good Growth Plan has the mission of improving resource efficiencies and ecosystems, and enhancing the well-being of the agricultural community. College students from across the country recently shared their thoughts about The Good Growth Plan in essays that they submitted to the Syngenta 2015 Agricultural Scholarship program.

In the first round of the competition, the company awarded a \$1,000 scholarship to one undergraduate and

one graduate student in each of its four regions, for a total of eight regional winners. From this group, Syngenta awarded two national scholarships of \$6,000 each to a graduate student and an undergraduate student—both from Michigan State University. Mitch Roth, who is working toward a

doctorate in genetics, and Logan Crumbaugh, who is pursuing a bachelor's degree in agribusiness management, represented their school well.

"The Good Growth Plan is a progressive policy and looks to have a lasting impact," wrote Roth in his essay. He also noted that he would like to see it have an educational outreach component. "Not everyone can become an expert in agricultural biotechnology, but I believe more can be done to bridge this gap."

Crumbaugh also appreciates the commitments outlined in The Good Growth Plan and the exposure they give to agriculture's many successes. "Syngenta and farmers alike have already made great strides in recent years toward making crops more efficient, reducing the amount of erosion on viable farmland, helping biodiversity flourish, strengthening small farms, helping people stay safe, and looking after every worker," he wrote in his essay. The Good Growth Plan, Crumbaugh says, is bringing farmers, Syngenta and retailers together to collectively achieve a higher level of success.

"With the 2015 Syngenta Agricultural Scholarship essay topic, we challenged students to contribute ideas for delivering on The Good Growth Plan," says Mary DeMers, senior communications lead for Syngenta. "Mitch and Logan were just two of the many students who took on this challenge, and we're happy to recognize them as the 2015 national winners. We also look forward to what the future holds for them and their careers in agriculture."

Once again, the 2016 competition is open to college undergraduates and graduate students who are enrolled in and are in good standing at a U.S. land grant university as of this spring. They must also be pursuing a degree in a crop-related discipline in an accredited agriculture program.

As part of the application process, eligible students will write a 750- to 1,000-word essay. Please visit [www.syngenta-us.com/scholarships](http://www.syngenta-us.com/scholarships) for updates and more details on the essay theme and application deadlines and requirements. STORY BY LYNN GROOMS

"Not everyone can become an expert in agricultural biotechnology, but I believe more can be done to bridge this gap."

—MITCH ROTH



Michigan State University graduate student Mitch Roth (far left) and undergraduate student Logan Crumbaugh (far right) pose with Erin Koglin (second from left) and Brian Devine (second from right) of Syngenta after being named the national winners of the 2015 Syngenta Agricultural Scholarship.





Syngenta Agricultural Scholarship winners Logan Crumbaugh (back) and Mitch Roth (front) roll up their sleeves to study plant science at Michigan State University.



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