

Growing Together

» 2Q | 2015

thrive[®]

Partner Power

Teamwork, Data-Rich Program
Provide Whole-Farm Solutions

CORN ENZYME
TECHNOLOGY HELPS
BOOST ETHANOL
PRODUCTION

SETTING THE FACTS
STRAIGHT ABOUT
NEONICOTINOIDS

syngenta[®]

contents

8 Untold Benefits
Neonicotinoids have immense social and economic advantages for modern agriculture.
By Darcy Maulsby

14 Field to Fuel
Enogen[®] corn can help improve ethanol production and reward the growers who contract to produce this breakthrough corn enzyme.
By Ken Sanderman

18 The Leading Edge
Syngenta expands the AgriEdge Excelsior[®] program, offering more growers this data-driven resource.
By Courtney Williams

1 WELCOME
Reliable Partners
Syngenta offers total-acre solutions.
By Dan Burdett

2 WHAT'S IN STORE
Learn about the latest news and technologies.

4 ASK THE EXPERTS
Cultivating Leaders
Interview by Susan Fisher

6 KNOW-HOW
Data in Translation
By Suzanne Bopp

22 POLICY MATTERS
Workforce Wanted
By Cindy Snyder

24 BEST PRACTICES
Breaking Down Resistance
By Chris Harrell

26 RIPPLE EFFECT
Syngenta honors leaders in agriculture and supports communities through its Grow More Vegetables Seed Grant Program.

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.



ON THE COVER Laura Martin, Syngenta AgriEdge specialist, and Cathy Hendricks, purchaser and inventory controller at Boseman Farms, located near Rocky Mount, North Carolina, meet to plan for the upcoming year. Photo: Alex Maness

THIS PAGE A grain truck delivers a local grower's grain to Quad County Corn Processors in Galva, Iowa. Photo: Greg Latza



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

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

SYNGENTA NORTH AMERICA REGION

Thrive Communications Manager Wendell Calhoun; **Editorial Board: Senior Manager, External Communications** Ann Bryan, APR; **Head, Customer Marketing** Dan Burdett; **Head, Crop Protection Product Marketing** Jeff Cecil; **Head, Enogen Commercial Operations** David Elser; **Legal Counsel** Jackie Haley; **Head, Sales** Corey Huck; **Head, National Accounts and Customer Service** Scott Langkamp; **Lead, Community Engagement** Shelley Olds; **Head, Marketing Services** Shawn Potter; **Head, Field Force Excellence & Training** Jeff Taber. www.syngenta.com

PACE

Editor Mark Caskie; **Contributing Editor** Matt Harrington; **Art Director** Letizia Albamonte; **Account Supervisor** Rick Kupselaitis; **Senior Production Artist** Vickie McClintock; **Senior Production Director** David Brown; **Production Manager** Sharon Linder; **Editorial Inquiries** 1301 Carolina Street, Greensboro, NC 27401; 336-378-6065, fax: 336-378-8272; tmagazine@paceco.com; **Senior Vice President, Custom Content** Jacqueline Hughes Ponzoni; **President** Craig Waller; **Chief Executive Officer and Chairman** Bonnie McElveen-Hunter. www.paceco.com

GIBBS & SOELL

Managing Supervisor Susan Fisher; **Senior Digital Specialist** Liz Schroyer; **Social Media Specialist** Michele Chandler; **Account Executive** Nicole Luistro; **Digital Programs Supervisor** Tina Allen; **Senior SEO/SEM Specialist** Jeri Moore; **Digital Strategy Director** Mike Samec; **Social Media Supervisor** Zack May. www.gibbs-soell.com

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.



Reliable Partners

The resiliency of American growers is exceptional. Market fluctuations, unpredictable weather and unresolved policy decisions are no match for their grit and determination.

Part of their strength stems from alliances with trusted advisers like you. Understandably, the lower commodity prices of 2015 have elevated the value of these partnerships and are making return on investment a critical component of almost every input growers consider.

We at Syngenta proudly join you in giving growers the tools and advice they need to make informed decisions that will help their farms—and your business—succeed. A unique differentiator that separates Syngenta from other suppliers is our total-acre portfolio. Its breadth and depth enable us to engage in conversations about whole-farm productivity, not just single-product discussions around one pest. Our variety of brand offerings

“Our variety of brand offerings also empowers you to recommend the right Syngenta technology at the right price point for each individual grower.”



DAN BURDETT

also empowers you to recommend the right Syngenta technology at the right price point for each individual grower.

Looking ahead, our robust pipeline will give you even more innovations to prescribe. This issue of *Thrive* previews the promising Solatenol™ fungicides, with registrations pending on a variety of vegetable, specialty and row crops.

Another game-changing solution that is already bringing incremental value to agriculture is Enogen® corn enzyme technology. On the pages that follow, you'll read how Syngenta bioengineered this corn to make the ethanol manufacturing process more effective and efficient with less impact on the environment, which ultimately benefits us all.

Of course, a whole-farm approach encompasses more than just products. It also includes service that binds multipronged solutions into one cohesive program. AgriEdge Excelsior® from Syngenta is such a program. As described in *Thrive*, it combines the strength of our portfolio with data-rich software and on-farm technical advice. Now available nationwide, this powerful program can help growers model their farming operations and understand the triggers that help drive yields and profits.

This season, even though the economic forecast calls for a few clouds, history tells us that swings in the market—up and down—are typical. In the short term, count on reliable partners like Syngenta to help you supply your customers with the solutions they need to manage their farms wisely. And in the long term, look for a silver lining, because the global demand for what American agriculture produces is vast.

Dan Burdett

DAN BURDETT

Head, Customer Marketing
Syngenta, North America

➤ Read article online at www.syngentathrive.com.



What's in Store

Keep in touch with the latest updates for programs, products and events.

NEWS AND EVENTS

> Seeing Is Believing

The number of Syngenta Grow More Experience Sites, which include locations across the U.S. and Canada, will more than double in 2015. These sites are giving growers and the company's channel partners a chance to see—and experience—the latest Syngenta innovations firsthand.

“Our goal for the Grow More Experience Sites is two-fold,” says Mike Moss, Ph.D., head of technical development at Syngenta. “First, we want to highlight innovations that will enhance grower productivity, one of our core commitments in The Good Growth Plan. And second, the experience at the sites, with our technologies and associated agronomic practices, will give growers and our channel partners the understanding of how to use these exciting technologies to maximize yield.”

Syngenta designed each site with the local growing conditions in mind. As a result, visitors will have a front-row seat to trials and discussions that are locally relevant and that showcase how to best use Syngenta products and technologies.

For more information, please contact your Syngenta agronomist or sales representative.

TRADE UPDATE: Syngenta believes anyone who is interested in Agrisure Viptera® and the Viptera China lawsuits deserves accurate information to draw his or her own conclusions about these important issues. We have developed www.VipteraChinaFacts.com as an information resource.



Unblemished apples are a consumer expectation in today's marketplace.

PIPELINE PREVIEW

Solatenol Fungicide Coming Soon

Syngenta hopes to receive registration from the U.S. Environmental Protection Agency (EPA) of Solatenol™-based fungicides for the 2015 growing season. Available in four formulations for use in vegetable, specialty and row crops, products containing Solatenol will result in improved and longer-lasting residual control of diseases, increased yield potential, and maximum return on investment. A preview of each formulation is below:

- > **Trivapro™ fungicide**, which will be a combination of Solatenol, azoxystrobin and propiconazole, will be registered for use in corn, soybeans and wheat. Trivapro will offer outstanding application flexibility and improved disease control. It also will provide excellent crop enhancement benefits, such as stronger stalks, better root systems, and improved straw quality and drought tolerance. There is no cross-resistance among the three active ingredients in the fungicide—strobilurin, triazole and the newest, longest-lasting SDHI—making it an excellent resistance-management tool.
- > **Elatus™ fungicide** is specially formulated for use in peanuts and potatoes. By combining Solatenol fungicide and azoxystrobin technology, Elatus will offer peanut growers excellent control of Southern stem rot and other key diseases, and provide potato growers with a more efficacious dual-mode-of-action, in-furrow product to protect their plants from soilborne diseases in the critical early season.
- > **Aprovia™ fungicide** will be targeted for use in grapes, apples and pears. Trials have shown that Aprovia is highly effective in controlling apple scab and powdery mildew. As a solo product, it offers growers greater flexibility for integrating into existing disease-control programs.
- > **Aprovia Top fungicide** will offer cucurbit and fruiting vegetable growers a powerful, dual-mode-of-action product for improved control of tough diseases. In an environment of emerging disease resistance, Aprovia Top will offer growers a trustworthy new product that combines the proven performance of a triazole with the latest SDHI chemistry.

Check out upcoming issues of *Thrive* or go www.syngentathrive.com for more information on what's next for these Solatenol brands and other innovations in the Syngenta pipeline.

Second Annual Drive to Thrive Contest

Tell us how agriculture drives your community to thrive, and you could win one of 10 mini touch-screen tablets. If you're our grand prizewinner, you'll receive a \$500 gas card, plus we'll donate \$1,000 to a local charity of your choice.

Go to www.syngentathrive.com to enter.



NEW TECHNOLOGIES

> Syngenta Expands Residual Herbicide Portfolio

The new BroadAxe® XC herbicide from Syngenta gives growers more flexibility for soybean, sunflower and dry pea weed-control programs and expands the geography where Syngenta soil-residual herbicides can be applied on these crops. With pre-emergence herbicide activity and multiple modes of action, BroadAxe XC is ideal for weed-resistance management programs.

"BroadAxe XC herbicide has the capability to maximize yield potential through early-season weed management and long-lasting residual control," says Don Porter, herbicide technical lead at Syngenta. "It is a valuable addition to the Syngenta herbicide portfolio."

BroadAxe XC herbicide provides broad-spectrum residual control of key broadleaf weeds, including Palmer amaranth, waterhemp, morningglory, kochia, lambsquarters, Russian thistle (including glyphosate-, ALS- and triazine-resistant populations) and annual grass weeds. For more information, go to www.syngenta-us.com and click on "herbicides."



PRODUCTS UPDATE

> Soybean SDS Solution Arrives

Syngenta has added Mertect® 340-F fungicide seed treatment to its soybean portfolio. Mertect 340-F provides proven, effective sudden death syndrome (SDS) protection and can be applied with a broad-spectrum seed treatment, such as Clariva™ Complete Beans and CruiserMaxx® Beans with Vibrance®, both combinations of separately registered products. During four consecutive years of testing, Mertect 340-F showed consistent performance and yield protection under SDS pressure. It also offers additional activity on seedborne diseases, such as *Phomopsis*, and boasts a first-rate seed-safety profile for germination and stand protection. For more information, go to www.syngenta-us.com and click on "fungicides."



Cultivating Leaders

Leadership at its Best gives growers and retailers the skills they need to advocate for agriculture more effectively.

Q. What is the Syngenta Leadership at its BestSM (LAIB) program?

A. Rex Martin, head of external relations, Syngenta, North America: Leadership at its Best is an advocacy program that we have operated alongside agricultural associations and commodity groups for more than 30 years. (See “Partners in Advocacy,” page 5.) During the sessions, which are held at various times and locations across the country, program participants learn how to refine professional skills, such as public speaking, media outreach, association management, business etiquette and lobbying. They then take these skills back to their state and national organizations to become stronger leaders as well as better advocates for agriculture. Overall, LAIB gives them the quiet confidence to overcome the fears associated with speaking their minds and representing their organizations, even in some environments that may be considered hostile.

Q. Why did Syngenta launch LAIB?

A. We first launched LAIB because we saw a need to help growers and other agricultural professionals more effectively talk to people about agriculture. After all, strong leaders not only benefit their organizations but also all of agriculture, as we tell our stories to legislators on Capitol Hill and to

regulators at the Environmental Protection Agency or U.S. Department of Agriculture.

Q. Can you cite any specific successes?

A. One success story that really stands out for me began at our first National Corn Growers Association (NCGA) Advanced Leadership Conference in 2010. Pam Johnson was part of that inaugural class and credits the experience with giving her the confidence to become the association’s first female president two years later.

Another major milestone in the history of LAIB was the 2012 debut of a program geared specifically to ag retailers. Designed by the Agricultural Retailers Association (ARA) and sponsored by Syngenta, the curriculum, which focuses on sharpening written and oral communications skills, gives participants a clear understanding of government relations, so that they can more effectively lobby policy issues on the industry’s behalf in a live-audience setting. The enthusiasm among our retailer partners and ARA leaders has been tremendous.

Q. Why do you think leadership in agriculture is so important today?

A. The general public is so far removed from the farm, by several generations in many cases, that they don’t know where their



Colt Clemmons (left) with the American Soybean Association receives media training from Steve Powell with Solum Consulting during a Leadership at its Best conference in Greensboro, North Carolina.

food is grown. They don't understand how highly regulated agriculture is and how hard it is to feed the world. If we don't do a better job of explaining what we do and the safety precautions we take doing it, production agriculture, as it exists in the U.S. today, could cease. Those jobs may simply go to other countries. More than ever, it's critical that we tell our own story. And this story is especially credible coming from growers and others who actually make their living on the land.

Q. How will LAIB continue to grow in 2015 and beyond?

A. Throughout 2015, we'll continue developing programs tailored to each participating organization's specific needs. We also will have two new leadership programs in the very near future. Modeled after the NCGA program, we're now co-sponsoring an advanced course with the American Soybean Association (ASA), so graduates of its Leadership Academy can take their skills to the next level and become transformational leaders in their national organizations. The first class in this two-part series already took place in January in San Antonio, Texas, where six ASA directors fine-tuned their skills at developing negotiation strategies, resolving conflict and building consensus. In the second session later this year, the program may cover topics, such as executive media training, issues management, association leadership, advocacy and crisis communications, depending on what ASA's executive leadership determines is needed.

We're also launching All-Star Leadership, another advanced training course in which several different agricultural organizations pick top leaders to go through the course together. This offering helps groups that may not have enough candidates to hold an advanced class on their own. Plus, participants get the added bonus of learning those skills with members of other organizations, which helps build camaraderie and partnerships for life.

Q. How can readers learn more about LAIB?

A. They should contact their association or commodity group to find out more details. Each organization decides who goes to leadership conferences and academies. There's usually a nomination process and an application requirement, but participation in the program is well worth the effort. It certainly

is for Syngenta. We've invested thousands of dollars in LAIB over the past three decades to cover participants' training, travel, lodging and meal expenses. I think it's the best money Syngenta spends on behalf of our customers. Through LAIB, we build stronger advocates for agriculture and help teach critical life skills to men and women who have the experience, the talent and the will to lead our industry to an even brighter tomorrow. 🍃 INTERVIEW BY SUSAN FISHER

"If we don't do a better job of explaining what we do and the safety precautions we take doing it, production agriculture, as it exists in the U.S. today, could cease. ... More than ever, it's critical that we tell our own story."

—REX MARTIN



Partners in Advocacy

Over the past 30 years, Syngenta has partnered with top agricultural organizations to help their members develop better leadership skills and become stronger industry advocates. These organizations include:

Agricultural Retailers Association,
www.aradc.org

American Agri-Women,
www.americanagriwomen.org

American Soybean Association,
www.soygrowers.com

National Agricultural Aviation Association,
www.agaviation.org

National Association of Wheat Growers,
www.wheatworld.org

National Corn Growers Association,
www.ncga.com

National Cotton Council,
www.cotton.org

National Sorghum Producers,
www.sorghumgrowers.com

Potato Leadership Institute,
www.nationalpotatocouncil.org

USA Rice Federation,
www.usarice.com

REX MARTIN
Head of External Relations,
Syngenta, North America

Data in Translation

Syngenta technology professionals are working on an industry collaboration that will power a huge leap forward for agriculture.

Today, nearly every phase of agriculture creates large amounts of data. That abundance of information allows growers to be more efficient than ever before, but translating the reams of data into actionable information can be overwhelming to the grower, especially when the various applications and devices involved don't communicate with each other. As the farming technology landscape becomes more complex, this challenge will only grow. "A lot of data may go unused because it's just too difficult to move around," says Shannon Haringx, data strategy and asset lead for Syngenta.

That concern has inspired a massive project called Standardized Precision Ag Data Exchange (SPADE). "The goal is to streamline data exchange across the ag industry," Haringx says. In addition to helping on-farm systems communicate effectively, SPADE aims to make it easier for growers to share data, if they choose, with their trusted advisers, suppliers and other valued partners, who often all use different systems.

Seamless Communication

SPADE is the creation of AgGateway, a nonprofit consortium of more than 200 ag companies, including Syngenta, as well as suppliers of hardware, software, inputs, services, implements and vehicles. AgGateway members collaborate on enabling and expanding e-business in agriculture.

SPADE's first objective was to create and publish standards and guidelines that could be widely shared throughout the

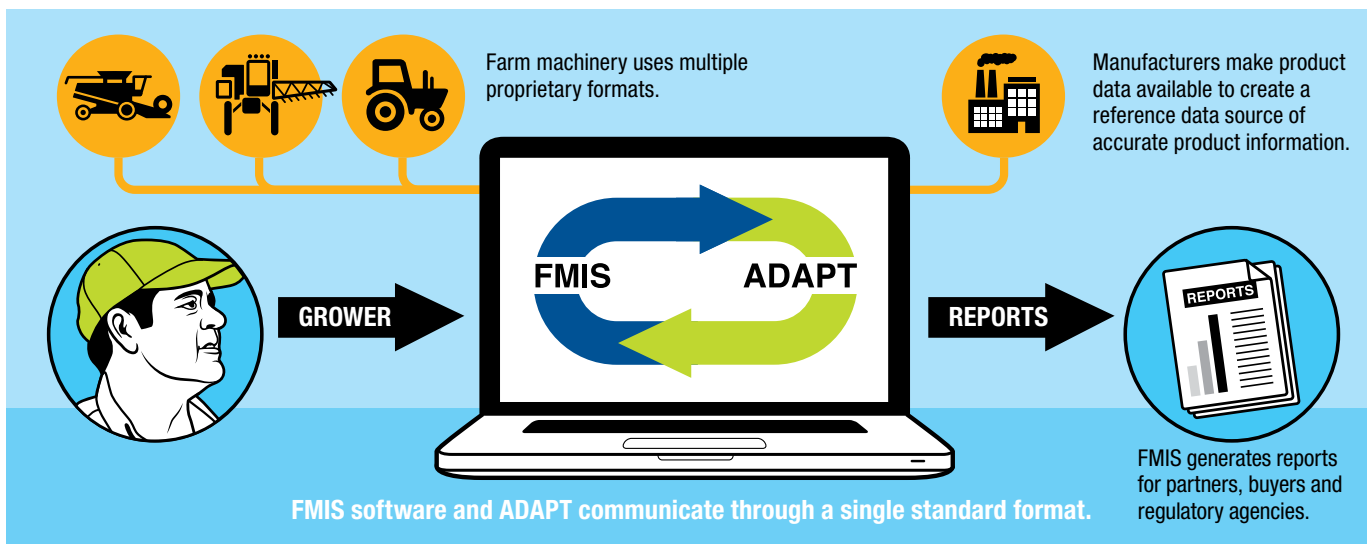
industry and incorporated into future systems. To make this useful on the ground today, an initiative originating out of SPADE, called Ag Data Application Programming Toolkit (ADAPT), offers software and tools to help with current data-exchange challenges.

"We are trying to bring everything together into a common format with SPADE," says Andres Ferreyra, special projects manager for Ag Connections, a software company and SPADE member. "Also, we're making software libraries that will give folks a tool to convert between their own proprietary formats and the common format. ADAPT is that tool."

ADAPT is expected to reach the market this summer, says Jim Wilson, AgGateway standards director and SPADE project manager. "ADAPT is nothing you would see, but something the things you use could leverage," he says. "You have all sorts of equipment, as well as software and information systems that all have proprietary formats. ADAPT is like a universal translator that will be available free to the industry, so all device-makers can use it as a piece of their application."

Grower Benefits

All of these initiatives will help growers directly. "Say a farmer plants Syngenta seed," Wilson says. "As that unfolds, data is collected and records are generated and stored on onboard systems. When a farmer syncs up with a farm-management information system (FMIS), ADAPT can take the data from the



equipment and transform it into a format that the FMIS recognizes. Maybe the source system reports in pounds, and the receiving system requires kilos; or the source system uses local time and the receiving system universal coordinated time. ADAPT will overcome such incompatibilities.”

Another plus: Many growers use equipment from more than one manufacturer, and ADAPT will make it easier for them to manage those mixed fleets. “That’s currently very complicated,” Ferreyra says. “Growers need a plethora of software packages that they need to be proficient in. This is especially true when you get into irrigation.”

That’s why AgGateway also created Precision Ag Irrigation Leadership (PAIL), an irrigation-specific sister project of SPADE. “Different irrigation manufacturers have their own telemetry systems, and you need a proprietary package from each manufacturer,” says Ferreyra. “The results of PAIL enable users to manage these things in a more holistic way.”

ADAPT will not only help compile information from a grower’s existing data, but it also will help a grower’s FMIS talk to new equipment, simplifying onboarding. “All it will take is for that manufacturer to write a plug-in, and it should be able to come right into the farm-management system via ADAPT’s common format,” Ferreyra says.

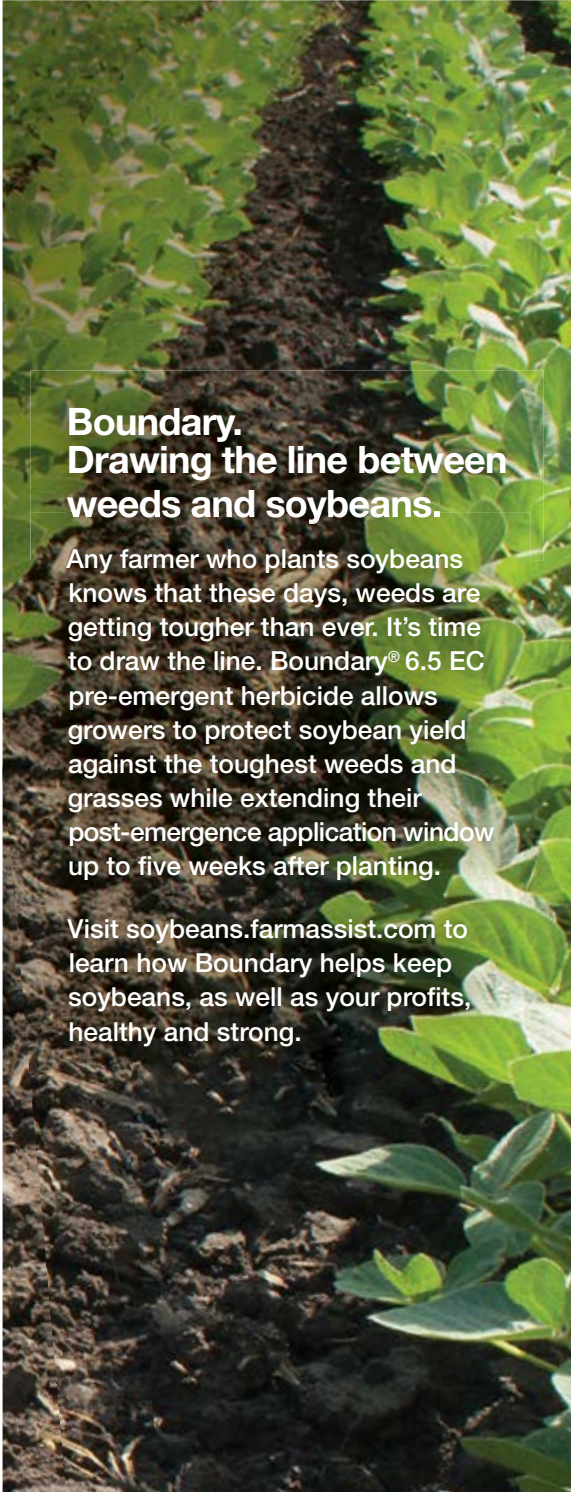
Because SPADE/PAIL-based systems will generate documentation easily, regulatory compliance should be more efficient and accurate. These systems will also simplify crop insurance reporting, traceability and sustainability assessments, because those data requirements have been taken into consideration. “We’re also evaluating future needs of the industry, such as increased food safety, and how all this data will need to be more enabled to meet the demands,” Haringx says.

While SPADE itself doesn’t raise new privacy concerns, the subject of data exchange makes such concerns seem more relevant. SPADE creators are mindful of that. “We’re not getting into who to give the data to; we’re just trying to standardize formats,” says Ferreyra. “Even so, we created a Data Security and Privacy Committee within AgGateway to be in front of the issue and make recommendations to the industry.”

Perhaps SPADE’s most important benefit is the recognition by a variety of industry stakeholders that systems need to interface, while data remains private, Haringx says. “There is no intention to collect or control farm data through these projects. We’re simply establishing industry standards that will make it easier for farmers to utilize and exchange their data across technologies incorporating these standards. It benefits the farmer for us to find this common ground.”

Syngenta is committed to ensuring the protection and confidentiality of grower information. For any Syngenta program in which farm data is collected, the grower, not the company, determines what, when and with whom information about his or her operation is shared. 🌱

STORY BY SUZANNE BOPP



Boundary. Drawing the line between weeds and soybeans.

Any farmer who plants soybeans knows that these days, weeds are getting tougher than ever. It’s time to draw the line. Boundary® 6.5 EC pre-emergent herbicide allows growers to protect soybean yield against the toughest weeds and grasses while extending their post-emergence application window up to five weeks after planting.


Visit soybeans.farmassist.com to learn how Boundary helps keep soybeans, as well as your profits, healthy and strong.



Boundary®



syngenta®



© 2015 Syngenta. Important: Always read and follow label instructions. Some crop protection products may not be registered for sale or use in all states or counties. Please check with your local extension service to ensure registration status. Boundary®, the Alliance Frame, the Purpose Icon and the Syngenta logo are trademarks of a Syngenta Group Company. MW 1SYN4015 SLC 5098A 01-2015

UNTOLD BENEFITS

New research reinforces the value and safety of neonicotinoids, providing a better understanding of their major economic and social impact.

By Darcy Maulsby

LEE TOWNSEND cringes when he hears media reports linking broad bee health maladies to the labeled use of neonicotinoids, especially since there's no scientific research to back up the claims.

"If you're hearing about neonicotinoids and the demise of bees, you're only hearing one side of the story," says Townsend, vice president of TPLR Honey Farms in Stony Plain, Alberta, Canada. "All this doom and gloom is not representative of the beekeeping industry."

While neonicotinoids have been blamed for unpredictable bee deaths, and European commissioners passed a two-year restriction on them, years of independent monitoring show neonicotinoids, when used properly, do not harm the health of bee populations.

"When you really dig into bee health, you'll find it's primarily a management issue," says Townsend, who has kept honey bees for 25 years. "If you keep bees strong and healthy with proper nutrition and disease control, the bees will take care of themselves."

Townsend appreciates new research that's balancing the debate on neonicotinoids, which are currently under review by the U.S. Environmental Protection Agency (EPA), the Pest Management Regulatory Agency (PMRA) and the California Department of Pesticide Regulation (CDPR). Commissioned by Syngenta, Bayer CropScience and Valent U.S.A., with support from Mitsui Agrochemicals, Inc., a series of comprehensive reports from AgInforatics, LLC, an independent agricultural consulting firm, reveals some surprising facts about neonicotinoids in North American agriculture.

"Not only did our reports show the value of neonicotinoids, but they highlighted a number of unintended consequences if neonicotinoids weren't available," says Pete Nowak, Ph.D., principal and co-founder of AgInforatics. He is also the former chair and a professor emeritus at the University of Wisconsin-Madison Institute for Environmental Studies.





Lee Townsend with TPLR Honey Farms uses beehives for pollination and honey production services on canola fields in Stony Plain, Alberta, Canada.



Soybean seed treated with neonicotinoid insecticides bring value to growers.

“Neonicotinoid seed treatments are among the most valued insect control methods in North America. U.S. corn and soybean growers estimate neonicotinoids’ value at \$12 to \$13 an acre on average, while the total value of neonicotinoids in U.S. crop production ranges from \$4 billion to \$4.3 billion annually for the U.S. economy.”

— PAUL MITCHELL

Counting the Cost

Neonicotinoids were introduced in the late 1990s as an alternative to organophosphate and pyrethroid pesticides, and quickly became popular among growers because of their excellent pest control. In the fall of 2013, the AgInformatics team began evaluating neonicotinoid use in the U.S. and Canada on commodity crops (including corn, soybeans, wheat, cotton, sorghum and canola) and specialty crops (including citrus, vegetables and grapes), plus turf, ornamentals and landscapes.

The researchers surveyed more than 22,000 growers, consumers and applicators in the U.S. and Canada, and reviewed in-depth pesticide use information. “Neonicotinoid seed treatments are among the most valued insect control methods in North America,” says Paul Mitchell, Ph.D., a consultant for AgInformatics and associate professor of agricultural economics at the University of Wisconsin-Madison. “U.S. corn and soybean growers estimate neonicotinoids’ value at \$12 to \$13 an acre on average, while the total value of neonicotinoids in U.S. crop production ranges from \$4 billion to \$4.3 billion annually for the U.S. economy.”

Unintended Consequences

AgInformatics also looked at what would happen if neonicotinoids were no longer available. The study revealed many unforeseen effects, including:

- > **Reduced yields.** Without neonicotinoids, growers would be denied a proven, convenient method to

effectively control yield-robbing pests, such as Asian citrus psyllid, aphids, whiteflies, Colorado potato beetle, wireworms, seed maggots and white grubs.

- > **Higher insecticide use.** Without neonicotinoids, acres treated with older, more toxic insecticides would roughly triple. In addition, findings in the reports project that the total number of pounds of active ingredients in insecticides applied to crops would increase from 13 million to 28.2 million pounds—a 116 percent increase, Mitchell notes.
- > **Greater pest control challenges and resistance issues.** Populations of invasive pests, like whiteflies in the southwestern U.S., will likely rise if neonicotinoids aren’t available, Nowak says. Similar trends will also occur with Asian citrus psyllid, a pest that transmits the deadly citrus greening disease, which is threatening productive trees in Florida. If pest outbreaks become more common and there are limited options, then insecticide-resistance issues will also be a greater concern, says Nowak.
- > **Increased operating costs.** If neonicotinoids were unavailable, growers estimate that the average cost per treated acre would increase more than \$8.30 for corn, \$3.30 for soybeans and more than \$2.20 for cotton. For a variety of different crops, this creates a projected total net cost increase of \$848 million per year, captured in everything from increased spending on insecticides to costlier application methods, Mitchell says.
- > **Lower quality agricultural products.** Today’s consumers are used to selecting unblemished fruits and

vegetables. “A major East Coast producer and big-box-store supplier that recently tried to go without neonicotinoids learned the hard way how this can lead to more insect damage and less marketable products,” Nowak says.

- > **Higher food costs.** More insect damage and higher production costs will translate into rising prices at the grocery store, especially for meat, dairy and eggs, because of higher feed costs, Mitchell says.
- > **Harm to beneficial insects and integrated pest management (IPM).** Many growers rely on neonicotinoid seed treatments to provide targeted, systemic control that reduces the risk of insecticide exposure to beneficial insects. “IPM will suffer without the beneficial insects,” Nowak says. (See “Neonicotinoids Are Key to IPM Solutions,” page 12.)

Many of these unintended consequences are reportedly already occurring in the European Union, which started restricting neonicotinoids in December 2013. “There was a tremendous flea beetle outbreak in the canola-growing regions of northern Europe this fall,” says Caydee Savinelli, Ph.D., pollinator and IPM stewardship lead for Syngenta. “Growers had to spray about every week and were still losing about 20 to 30 percent of the crop.”

Banning neonicotinoids is not a science-based decision, because it does not address the complex interplay between crop production and beekeeping, according to a 2011 study. Jerry Bromenshenk, Ph.D., a research director at the University of Montana and CEO of Bee Alert Technology, and his fellow bee investigators fed various levels of neonicotinoids to clusters of honey-bee hives in Montana to study their effect on bee health. While improper use can lead to individual bee losses, the team did not see any effects on the hive as a whole. “It’s clear that neonicotinoids provide a better alternative than any insecticides that have been used before,” says Bromenshenk.

Taking the Next Steps

These facts are useful to the regulatory debate, so Syngenta has submitted AgInfomatics’ socio-economic findings on behalf of the study sponsors to the EPA, the USDA, CDPD and PMRA in Canada. “We need to ensure that the benefits neonicotinoids provide to growers are captured and growers’ voices are heard,” says John Abbott, senior regulatory affairs team lead for Syngenta. “If we don’t speak up, we run the risk of a decision based on politics, not science.”

Abbott encourages retailers and growers to visit the Growing Matters website (growingmatters.org), which provides all 15 study reports, videos, fact sheets and infographics on the benefits of neonicotinoids, as well as tips on how to show support for these valuable crop protection products.

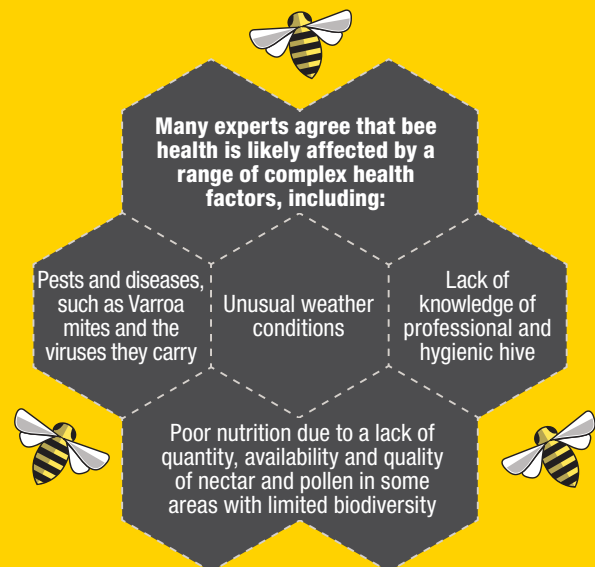
Townsend supports these efforts. “We don’t want to cripple the opportunities to grow safe, bountiful crops. We need to work together to find common solutions to common issues in agriculture.” 🌱

Taking a New Look at Bee Health

Honey bees, like crop production, are vital to farming and food production. While bee health is a concern, multiple sources dispute the claim that honey-bee populations are declining.

The U.S. Department of Agriculture has reported that the overall population has actually increased 10 percent since 2006, and Statistics Canada data show that the honey-bee colony totals for the past two years are the highest since 1987. Global bee populations have been steadily increasing for more than a decade, according to the latest report from the Food and Agricultural Organization of the United Nations.

While beekeepers still face challenges in sustaining healthy hives, the evidence suggests there is no direct correlation between proper neonicotinoid use and poor bee health. “I really don’t see a problem with neonicotinoids,” says Lee Townsend, vice president of TPLR Honey Farms in Stony Plain, Alberta, Canada. “Based on the misinformation in the media, we should be seeing a bee apocalypse, but that’s not happening.”



Syngenta is proud to be part of the Honey Bee Health Coalition, which is focused on hive management, best-management practices for crop protection products and finding ways to provide more forage. The company is also involved in many other stewardship initiatives, including Operation Pollinator, an international biodiversity program that Syngenta launched to boost the number of pollinating insects on commercial farms. “It’s important to work with beekeepers and others in the industry to find solutions to bee health,” says Caydee Savinelli, Ph.D., pollinator and IPM stewardship lead for Syngenta. “The ability of growers to manage their pest populations while maintaining bee health is the ultimate goal and requires commitment of all stakeholders in order to be successful.”

Neonicotinoids Are Key to IPM Solutions

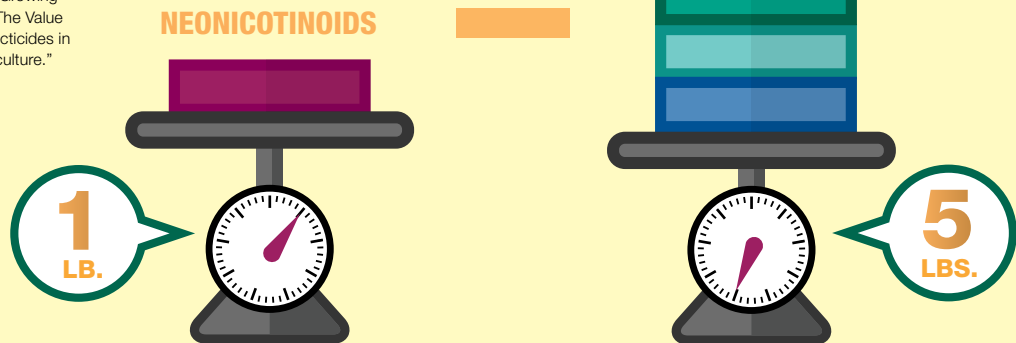
AgInforomatics, an independent agricultural consulting firm, recently completed a comprehensive study to assess the socio-economic benefits of neonicotinoid insecticides in North America. In the multiyear process, the researchers conducted more than 1,700 interviews, evaluated more than 1,500 university field trials and reviewed in-depth pesticide use information.

Neonicotinoid insecticides, with their more targeted application and smaller environmental footprint, have become a vital part of today's Integrated Pest Management (IPM) programs in agriculture, turf and ornamentals. The AgInforomatics study revealed the effectiveness of these neonicotinoids within IPM and the significant implications to these industries if these products were no longer available.

Neonicotinoids Versus Older Chemistries

Across all crops assessed in an AgInforomatics analysis of GfK Kynetec data (U.S. corn, soybean, wheat, cotton and sorghum¹), growers would need 5 pounds of older chemistries to replace 1 pound of neonicotinoid insecticide.

¹ Findings available in Growing Matters fact sheet: "The Value of Neonicotinoid Insecticides in North American Agriculture."



Without Neonicotinoids in Cotton



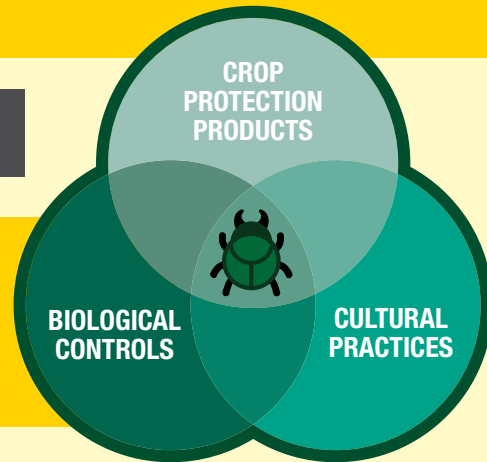
If neonicotinoids were not available to use in cotton, the product acres² of foliar insecticides **would initially increase 30 percent**. Over time, the result of growers using older, broad-spectrum insecticides would be more spraying and more secondary flare-ups of damaging pest activity.

² Product acres are the number of acres treated with insecticides, potentially the same acre more than once. For example, if a farmer treats the same planted acre twice, this acre counts as 2 product acres.

The Integrated Approach

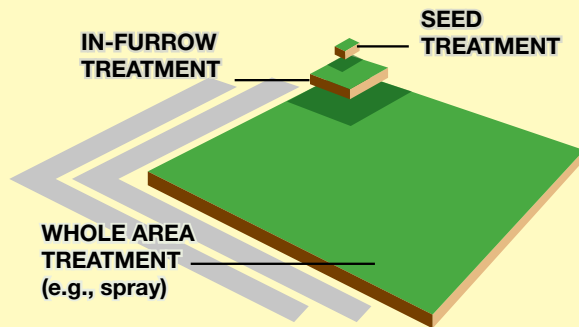
Elements of IPM

IPM combines cultural practices, biological controls, crop protection products and other elements to plan and implement a balanced, practical approach to controlling pests.



Precision in Insecticide Applications

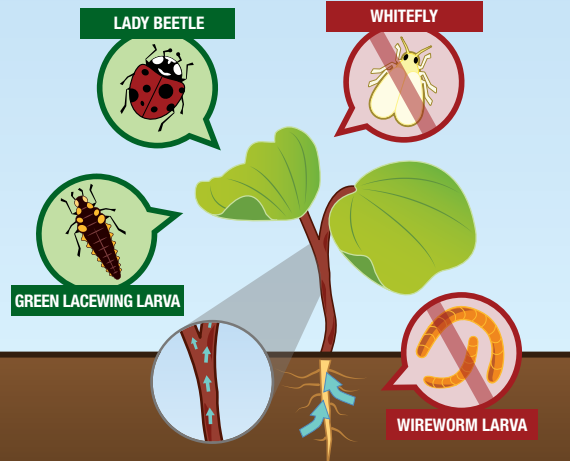
Precision application methods, such as seed treatments, directed soil applications and bark treatments, are the primary delivery systems for neonicotinoids in many crops. They have a much smaller footprint than broadcast foliar sprays.



When used as sprays, neonicotinoids are more selective than many alternative insecticides, leaving more beneficial insects to help keep pests in check.

Harmful Pests Versus Beneficial Insects

Neonicotinoids in general, and especially as seed treatments and soil or bark applications, are softer on beneficial insects while targeting damaging pests.



Via root uptake, plants absorb neonicotinoids, which are systemically distributed throughout the plant. There is little to no residual on the leaf surface to harm beneficial insects.

AgInformatics, LLC, is an agricultural consulting firm established in 1995 by professors from the University of Wisconsin-Madison and Washington State University. The research was jointly commissioned by Bayer CropScience, Syngenta and Valent U.S.A., with additional support from Mitsui on the turf and ornamental studies.

Go to GrowingMatters.org for the latest information, reports, videos and infographics on the benefits of neonicotinoid insecticides. ©2015 Growing Matters.



Field *to* Fuel

A revolutionary corn enzyme simplifies stewardship and delivers quality grain that enhances ethanol production.

By Ken Sanderman





E

thanol is by far the most significant biofuel in America, reports the U.S. Department of Agriculture. Statistics show that ethanol is helping the country reduce its dependence on foreign oil, lowering prices at the pump,

improving the environment through lower emissions and growing the economy by creating new jobs that can't be outsourced. Enogen® corn enzyme technology, the industry's only corn trait bioengineered specifically to enhance ethanol production, is helping to make ethanol more sustainable.

Enogen is rapidly gaining popularity because of the value it delivers and the opportunity it provides corn growers to be enzyme suppliers for their local ethanol plants. "Enogen corn is a win for the farmer, a win for the ethanol plant and, in the end, a win for the consumer," says Enogen grower Marc Mummelthel of Waverly, Iowa. "Anything that increases what corn can do for our country is a good thing."

Gaining Momentum

During the commercial introduction of Enogen four years ago, 19 growers in Kansas signed contracts to plant approximately 5,000 acres of Enogen corn. An estimated 1,000 growers will plant Enogen seed on about 230,000 acres in 2015. Currently, nine production facilities are contracting Enogen corn and either use or plan to use Enogen grain to produce ethanol.

"It is much more than just an enzyme substitute, though," says David Witherspoon, head of Enogen at Syngenta. "Enogen is able to change the viscosity of corn

mash in an ethanol plant, from a consistency resembling a gel into one more like water. When you change that, the facility should run more efficiently, using less energy and achieving higher throughput and ethanol yield per bushel. It works across a broad temperature and pH range, too, so it changes the chemicals the plant can use. It's an efficiency and yield play. That's what makes this enzyme

"Enogen is able to change the viscosity of corn mash in an ethanol plant, from a consistency resembling a gel into one more like water."

—DAVID WITHERSPOON

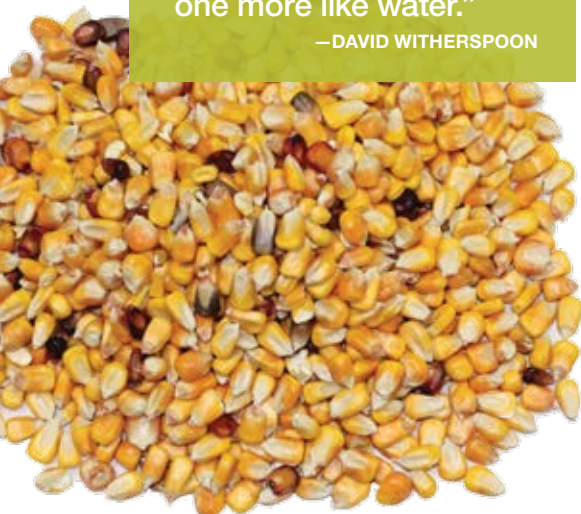


Photo: Enogen® Value Tracker grain, which contains a purple tracer trait, is a visual way to help improve crop stewardship.

unique. Plus, we conveniently deliver it in the corn kernel. That also makes it unique," Witherspoon adds.

Last year brought industry recognition for Enogen corn in the form of *Agri Marketing* magazine's Product of the Year award. "Agri Marketing magazine created the Product of the Year award program in 1997 to recognize one agricultural product each year for its outstanding impact in the marketplace," says Lynn Henderson, publisher of the magazine. "A distinguished panel of judges from across the agriculture industry chose Enogen from a number of exciting new technologies because of the benefits it delivers to farmers, ethanol plants and rural communities."

Stewardship Simplified

On the heels of this success, Enogen corn enzyme technology continues to bring innovations to the ethanol industry. Syngenta has just introduced a new tool for Enogen growers to help streamline stewardship. By including a naturally derived, non-GMO, purple tracer trait, the Enogen Value Tracker offers an easy, visual way to help improve crop stewardship, proper grain segregation, and management in-field and through delivery of grain to the ethanol plant. During 2015, Syngenta will include the Enogen Value Tracker in select bags and Q-Bit® bulk containers of Enogen seed, with the intent to add it to all Enogen seed over time.

"Since its introduction, Syngenta has voluntarily implemented comprehensive stewardship protocols to ease potential commercial concerns about Enogen corn enzyme technology affecting other uses of the corn crop," says Raj Iravarapu, stewardship manager for Enogen at Syngenta. These requirements include border rows around an Enogen cornfield, planter and combine cleanout, and dedicated bin space for all Enogen grain. "The Enogen Value Tracker offers growers a way to make this simple, effective protocol even easier," Iravarapu adds.

It's important to note that Enogen Value Tracker seed does not contain Enogen corn enzyme technology. Enogen seed bags containing the Enogen Value Tracker will include a physical mixture of approximately 95 percent Enogen seed and 5 percent Enogen Value Tracker seed. The Enogen Value Tracker will appear as randomly dispersed purple plants across an Enogen field (inside the border rows) and will represent up to 5 percent of the plants in a given field. Both yellow and purple kernels will appear on the ears of these purple plants.

Making the Most of Every Kernel

Another breakthrough that Enogen has helped make possible is in the area of cellulosic ethanol, a biofuel produced from fiber in the corn plant. In 2014, Galva, Iowa-based Quad County Corn Processors (QCCP) and Syngenta teamed up to produce commercial-scale

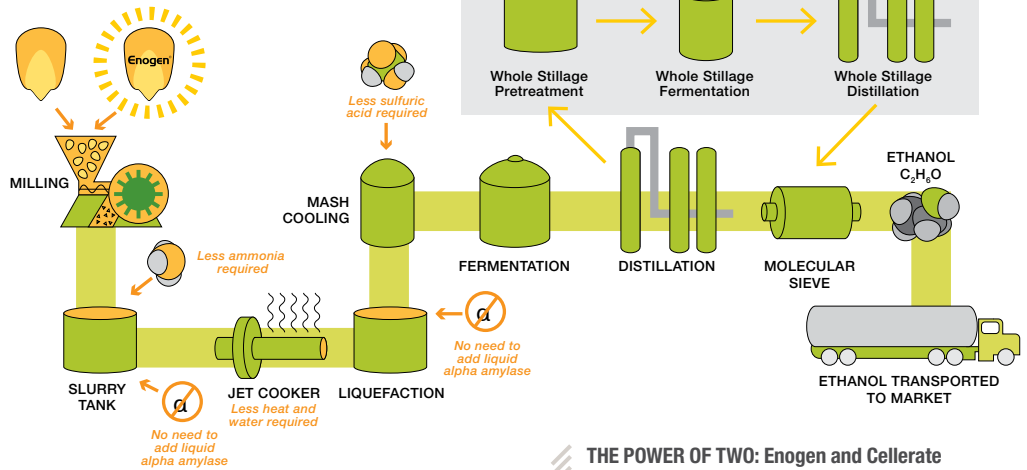
quantities of cellulosic ethanol, the first of its kind in the state. By year-end, QCCP had produced more than 750,000 gallons.

This advancement was made possible through the integration of Cellerate™ process technology. Cellerate is a “bolt-on” process technology that turns corn kernel fiber into cellulosic ethanol. Cellerate will enable QCCP to increase ethanol yield per bushel by an estimated 6 percent. Last year, Syngenta announced an agreement with Cellulosic Ethanol Technologies, a wholly owned subsidiary of QCCP, to license Cellerate to ethanol production facilities.

Tests also show that Cellerate, in conjunction with Enogen corn enzyme technology, will deliver significant benefits to ethanol plants beyond what can be achieved through either technology alone, says Delayne Johnson, QCCP CEO.

“The combination of Cellerate and Enogen corn is expected to generate significant synergies when used together in dry-grind ethanol plants,” he says. “It will produce advanced and cellulosic ethanol while increasing ethanol throughput, decreasing natural gas usage and reducing an ethanol plant’s carbon footprint. These advantages, combined with higher-protein distiller’s dried grains (DDGs) and increased corn oil production, make the

Boosting Ethanol Yields Step by Step



THE POWER OF TWO: Enogen and Cellerate Technologies Deliver Huge Benefits

- > 6 percent increase in ethanol yield (cellulosic)
- > Up to 15 percent increase throughput
- > 20 percent reduction in energy usage
- > Up to 1.6 lbs. of oil per bushel
- > Higher protein, lower fiber DDGs

technology package appealing for ethanol plants looking to improve their bottom lines.”

Syngenta believes ethanol is an essential part of the energy equation, which is why it will continue to invest in solutions that support the renewable fuels industry. “We are proud of the role Enogen is playing in helping to make this biofuel derived from corn a viable energy source,” Witherspoon says. “It’s good for consumers, good for farmers, good for the environment and good for American energy independence.”

Introducing the Ethanol Grain Quality Solution

Corn feedstock is the single biggest input cost for an ethanol plant, and ethanol yield per bushel is one of the biggest drivers of plant profitability. Higher grain quality means higher ethanol yield per bushel.

According to Chris Tingle, head of Enogen and water solutions at Syngenta, ethanol facilities are increasingly seeking not just clean, dry corn with little or no damage or foreign material, but also grain with quality characteristics that can help maximize ethanol production.

“A growing demand for high-quality feedstock is creating opportunities for growers to increase their income per acre,” Tingle says. “By supplying the quality grain that ethanol plants want all yearlong, growers can maximize profitability, while helping fuel the future of rural America.”

Syngenta designed the Ethanol Grain Quality Solution specifically for growers who plant Enogen®, Golden Harvest® and NK® Corn hybrids. Its goals are to raise yields and drive grain quality through effective insect control, early-season weed management, glyphosate weed-resistance management and Crop Enhancement (the Syngenta global business focused on minimizing the effects of nonliving factors, such as heat, wind and rain, on plants). The Ethanol Grain Quality Solution provides the ethanol plant and its growers more high-quality grain, while improving return on investment.

“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,” Tingle says. “Plus, growers who have purchased Golden Harvest or NK Corn can receive 10 cents more per bushel for any additional bushels of corn produced under the Ethanol Grain Quality Solution protocol, provided those bushels are delivered to the ethanol plant.”

The Ethanol Grain Quality Solution is currently being piloted at a growing number of ethanol plants. To learn more, visit www.syngentaus.com/ethanol or call (844) 661-4632.



AgriEdgeExcelsior

Boseman Farms



The Leading Edge

A whole-farm management program that helps participating growers boost their productivity expands nationwide.

By Courtney Williams

Laura Martin (left) with Syngenta and Boseman Farms' Cathy Hendricks review crop data at the farm's sweet potato-packing facility near Rocky Mount, North Carolina.

FOURTEEN YEARS AGO, Syngenta launched a small, regional initiative in the South to provide growers with the tools they needed to meet the challenges of 21st century farming. Today, the AgriEdge Excelsior® program has grown to more than 10.5 million acres across the U.S. Remarkably, more than 95 percent of enrolled growers stay with the whole-farm program because it maximizes their profit potential by combining sustainable agriculture and farm economics with data-capturing technology.

"There are so many holes in a big operation that can get missed if you don't have a way to track them," says Cathy Hendricks, purchaser and inventory controller at Boseman Farms near Rocky Mount, North Carolina. She helps oversee the operation's roughly 14,000 acres, where a broad range of crops, including corn, soybeans, tobacco, peanuts, wheat, clary sage, cucumbers

and more than 1,500 acres of sweet potatoes, are grown. "It's a lot to look after," she says, "but AgriEdge Excelsior technology tracks all our applications and costs. It's a great tool."

Going Nationwide

In 2015, AgriEdge Excelsior will expand to new geographies, including Iowa, Nebraska, South Dakota and Minnesota, marking the first time the program will be available to growers nationwide.

"It's a tremendous story for Syngenta and our partners in the field who work one-on-one with growers," says Steve Gomme, the newly appointed national AgriEdge manager for Syngenta. "I'm excited to not only implement the AgriEdge program nationally, but also to continue seeing it evolve to meet the changing needs of growers."

The program provides outstanding service, actionable data for the grower, and the latest products and technology to help take the guesswork out of improving production, land value, farm stewardship and profitability.

"With the help of our engaged reseller partners, AgriEdge Excelsior enables growers to make informed decisions, gain regulatory compliance and manage the risks associated with production agriculture," says Darren Fehr, AgriEdge manager for the West Heartland region, one of the key geographies for expansion. "Now, growers in every state, along with their preferred supply partners, can take advantage of this program."

Personalized Solutions

With AgriEdge Excelsior, growers have the flexibility to do what makes sense agronomically and economically on their individual farms. The breadth of the Syngenta portfolio, from the latest traits and genetics to seed treatments and crop protection solutions, gives them flexible choices across the whole farm.

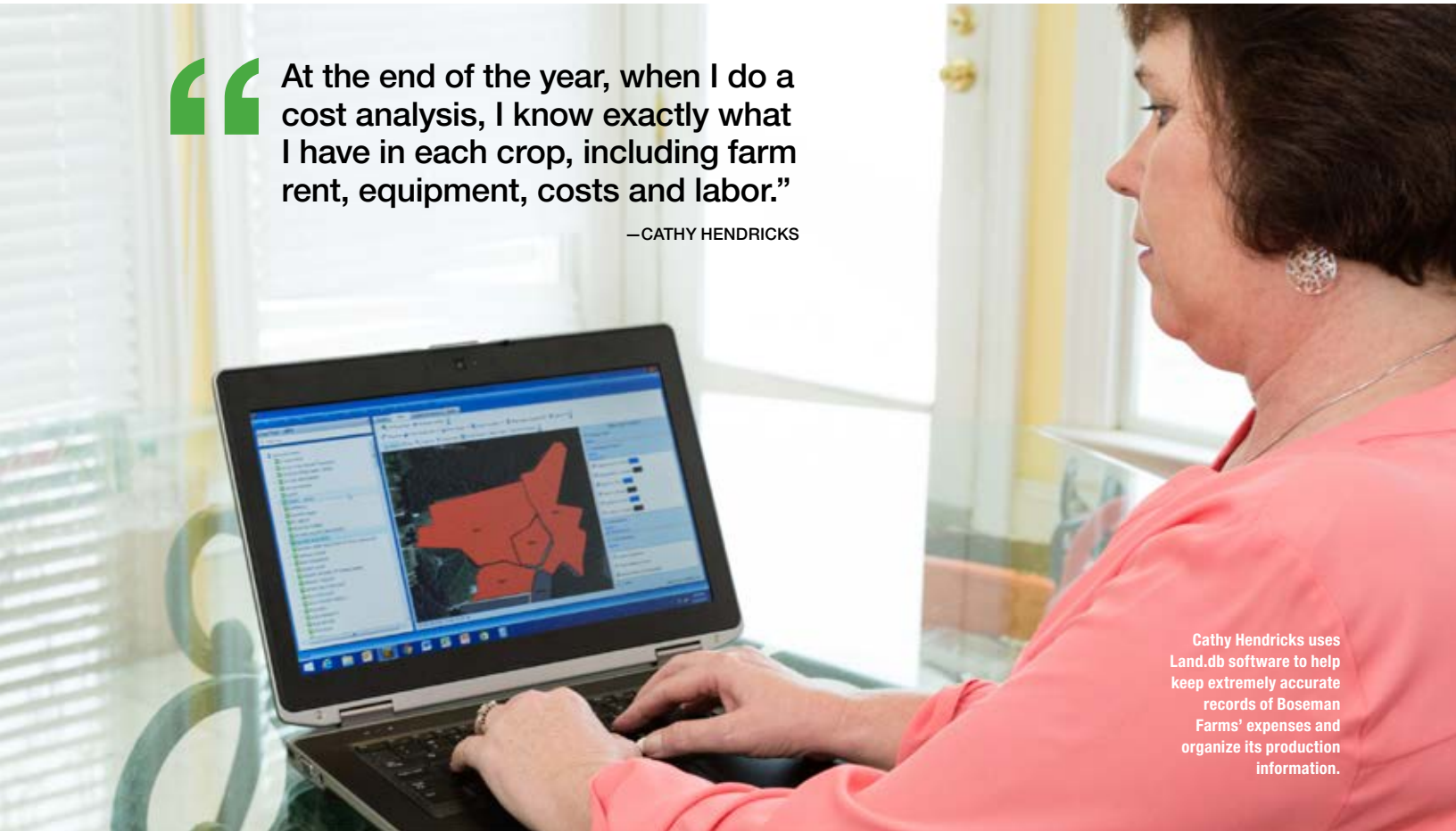
But it's the program's personalized, on-farm support that really sets it apart, according to Reagan DeSpain, AgriEdge Excelsior lead for the Southern and East Coast regions at Syngenta. A local AgriEdge specialist provides on-farm support for each participating grower's portfolio, technology and agronomy.

"By building long-term relationships with growers, we have differentiated ourselves from competitors," says DeSpain. "We knew we had to bring something different to the marketplace; and those relationships with growers, built through our reseller partners, provided us with a differentiated approach to the market."

Technology Advantage

Additionally, growers have access to the industry-leading record-keeping Land.db® software, developed by Ag Connections. The technology is intuitive, powerful and practical.

"The focus of Land.db is to provide software tools that the grower, retailer and consultant can use to organize farm production information each year," says Rick Murdock,



“ At the end of the year, when I do a cost analysis, I know exactly what I have in each crop, including farm rent, equipment, costs and labor.”

—CATHY HENDRICKS

Cathy Hendricks uses Land.db software to help keep extremely accurate records of Boseman Farms' expenses and organize its production information.

co-owner of Ag Connections. “Land.db has the ability to measure grower, farm, field and crop level profitability by taking yield revenue and subtracting crop protection, fertilizer, seed and service costs. ‘Know Your Numbers’ is the foundational design principal of the Land.db system.”

This ability to cater to each farm’s individual needs has been critical for Hendricks. While the rolling Sandhills region of North Carolina boasts some of the state’s best farmland, it takes a lot of small fields to amass acreage. Boseman Farms alone has 1,600 fields, so setting up the system took time. However, Hendricks notes, it was time well spent.

“I use the software to track our farm’s applications and color code them for each field,” she says. “I’m able to enter all my invoicing, which, in turn, keeps track of my applications and costs. At the end of the year, when I do a cost analysis, I know exactly what I have in each crop, including farm rent, equipment, costs and labor.”

Shareable Reporting

The AgriEdge Excelsior program also helps growers prepare professional reports that they can share with landowners, bankers, food processors, the U.S. Department of Agriculture (USDA) Farm Service Agency and other groups. Hendricks uses the program to help Boseman Farms pass its annual GLOBALG.A.P. audit, a vital test for the operation’s sweet potatoes bound for overseas markets. This independent certification system for Good Agricultural Practice sets voluntary standards for agricultural products around the world.

“The GLOBALG.A.P. auditor goes over every single record we have,” she says. “I have close to 10 loose-leaf binders with my AgriEdge Excelsior reports in them, and he looks at every page. In 2014, we scored a 100, and he told me we were the second farm to ever receive a perfect score from him.”

Auditors aren’t the only ones keeping their eyes on the farm’s activities. “Our customers look at our records, too,” Hendricks says. “They look at the comments on our audit, which say, ‘outstanding records’ and ‘excellent.’ We couldn’t do it without the AgriEdge Excelsior program.”

Pioneering the Future of Farming

Looking ahead, AgriEdge Excelsior will continue to help growers keep pace with emerging industry trends and supply-chain requirements, such as providing sustainable sourcing documentation. With the integration of algorithms from Field to Market®: The Alliance for Sustainable Agriculture, the program’s farm-management software enables growers to take the production information already collected and produce “Fieldprints” for each field. Growers can track, manage and record a plethora of inputs against environmental efficiency indicators, including energy consumption, water use, greenhouse-gas emissions and soil conservation. This data gives growers the ability to

Honoring Data Privacy

Like many Americans, growers are concerned about data accuracy, ownership and privacy. The success of the AgriEdge Excelsior® program from Syngenta, which offers data-rich, whole-farm management and solutions, hinges on addressing these concerns and keeping growers at the forefront of all conversations.



“We have safeguards in place to help make sure growers know who has access to their data, where their data is going and how it is being used,” says Aaron Deardorff, head of marketing to settlement at Syngenta.

Since 2002, the Syngenta data-privacy policy has protected and kept confidential any grower information the company obtains. All AgriEdge Excelsior grower data flows through an independent software provider. As governed by its contractual agreement with participating growers, Syngenta only has direct access to AgriEdge Excelsior grower data to pass along financial rewards related to its products used through the program. Growers have the opportunity to provide more detailed information to Syngenta or any third party, but only after they give written consent.

“For almost 15 years, growers have used AgriEdge Excelsior and the data it generates to help manage their farms more efficiently and profitably,” says Deardorff. “Nearly all of them choose to stay enrolled in the program, which indicates its value.”

measure their production practices against their state and national averages provided by Field to Market.

“From a sustainability standpoint, the AgriEdge Excelsior program has really changed the picture for us,” says Agronomist Jason Cook of Moss Farms, a 12,000-acre operation that produces potatoes, wheat and sugarbeets in Rupert, Idaho. “It helps us identify our strengths and weaknesses on an energy-consumption basis and recognize our more profitable areas.”

Syngenta is actively working with industry-leading processors and food companies to better understand sustainable sourcing. These efforts will ultimately help AgriEdge Excelsior growers and their advisers gain a better understanding of a farm’s resource efficiency and discover small management changes that can potentially result in minimizing its environmental impact.

Staying True to its Roots

Even though AgriEdge Excelsior is now a national program, Fehr says its focus on individual growers and farms will continue.

“From a production, sustainability and resourcing standpoint, we understand that a corn grower in Iowa has very different needs from a cotton grower in Texas,” he says. “Our AgriEdge Excelsior specialists, in collaboration with Syngenta reseller partners, will continue to work on programs and offers that meet the needs of growers, as the information age transforms the way they farm.” 🌱

Workforce Wanted

The current immigration system is not working well for American agriculture and is in need of reform.



Immigration reform is a contentious, often emotional, topic for many Americans. But for American agriculture, it's mainly a labor issue.

The idea that grown children will return to their home farms and provide all the needed labor is a wonderful ideal, but “we’re having a hard enough time getting kids to come back and run the farm,” says Kristi Boswell, director of congressional relations for the American Farm Bureau Federation (AFBF). “And besides, that’s a management role.”

As Boswell travels around the U.S. talking with growers about immigration reform, she has been struck by how universal the need is. While the public associates immigrant farm workers with picking fruits or vegetables, they are just as likely to work on dairies or drive custom harvesters.

Hard numbers are difficult to come by, but most agricultural groups estimate 70 percent of farm workers are unauthorized. Boswell draws a difference between unauthorized and undocumented, as the government requires all employers to check documents for new hires; farm audits, however, find much of that paperwork is fraudulent.

Nationwide Reform

While it’s easy for growers with highly mechanized systems to think immigration reform won’t impact their operations, there are

plenty of examples that suggest all of agriculture is suffering from a broken immigration system.

In California, for instance, Boswell says many fruit and vegetable growers who can’t get workers are switching to less labor-intensive row crops. As a result of labor shortages, farmers no longer grow more than 80,000 acres of fresh produce. Instead, that production has moved to other countries.

The issue is also impacting the feed market. Dairies and other livestock operators who can’t hire workers are no longer in the market for feedstuffs or are dumping feed, formerly used to maintain their livestock, onto the market. A 2012 Texas A&M study found that dairy farms using migrant labor supply more than three-fifths of the milk in the country. Without these employees, the study predicts economic output would decline by \$22 billion and 133,000 workers would lose their jobs.

Each farm worker—whether native-born or immigrant—supports between two and three full-time jobs in food processing, transportation, farm equipment and marketing retail. The loss of a substantial number of farm workers could ripple through the entire ag-based economy with potentially long-term negative effects.

Two-Pronged Approach

For immigration reform to work for American agriculture, most believe it must take two approaches.

H-2A Guest Worker Program Survey Results



About **72 percent** of growers reported their workers arrived after the date of need. On average, these workers arrived **22 days late**.



An economic **loss of \$320 million** because farmers could not get the workers they needed through the H-2A program.



Only **5 percent** of the 36,000 native-born workers referred to H-2A employers in 2010 **worked through the entire contract**. Nearly 70 percent did not accept the job offered to them.

Source: National Council of Agricultural Employers, 2010 survey

Photo: A grower and his foreman consult, while field crews transplant processing tomato seedlings in California.

First, protect current workers. Farms are already employing experienced workers they want to keep. AFBF is among the groups advocating for an earned adjustment of status to allow

those experienced immigrant workers to remain. That change would likely include an incentive for the workers to keep working in agriculture for a predetermined period. This is not necessarily a pathway to citizenship.

Second, the government must reinvent the agricultural guest worker program. "To work for agriculture, the guest worker program must be a cost-effective, market-based system," Boswell says. Currently, the guest worker program supplies just 4 percent of the needed agricultural workforce. Without a legal way for workers to enter the country, many cross the border illegally to fill the open jobs.

The Farm Bureau would like to see administration of the guest worker program moved from the U.S. Department of Labor to the U.S. Department of Agriculture, which is more sympathetic to the perishable nature of agricultural produce. Ideally, the program should include both seasonal and year-round components. Other needed changes include issuing visas, good for up to three years, that allow workers to work at one farm or migrate between farms.


Reform Is Needed

"At the end of the day, farmers want a legal, affordable, reliable workforce," says Ryan Findlay, industry relations lead for Syngenta. "The process needs to be simple. It can't be 30 pages of paper that a lawyer checks out and is filed with five different agencies."

Syngenta is joining with other agricultural retailers and organizations to support comprehensive immigration reform.

"The quicker the better," Findlay says. "Agriculture needs this now."

Boswell can't agree more. "Congress must act. We are at the point where we will import labor or food," she says, pointing to a study done by AFBF that showed only enforcing the borders—without immigration reform—will cost \$30 to \$60 billion in agricultural production and increase food prices by 5 to 6 percent.

She encourages all ag professionals to call their legislators and ask for immigration reform. "Allowing legislators to ignore it because of political pressure is not acceptable," she says. "We need to make immigration laws work the way they were intended. Doing nothing—or just enforcement—is not an option for agriculture any longer."  STORY BY CINDY SNYDER

FOR MORE INFORMATION about immigration reform, visit these websites:

- > Agriculture Workforce Coalition, www.agworkforcecoalition.org
- > American Farm Bureau Federation, www.fb.org
- > National Council of Agricultural Employers, www.ncaeonline.org
- > National Council of Farmer Cooperatives, www.ncfc.org

RESISTANCE FIGHTER

— OF THE YEAR —
LEADERSHIP PROGRAM



Are you passionate about helping growers fight resistance?

Do you want an opportunity to learn, travel, interact with industry leaders and enrich your career?

Visit www.resistancefighter.com to learn more about the program and apply. Accepting applications through September 15, 2015.

©2015 Syngenta. Important: Always read and follow label instructions. Some crop protection products may not be registered for sale or use in all states or counties. Please check with your local extension service to ensure registration status. Resistance Fighter®, the Alliance frame and the Syngenta logo are trademarks of a Syngenta Group Company.

syngenta®



SEE MORE EVENT PHOTOS ONLINE
www.syngentathrive.com/farmproduction

Breaking Down Resistance

A select group of agricultural advisers from across the U.S. benefits from participation in the Resistance Fighter of the Year Leadership Program.

Ask most members of the Resistance Fighter® of the Year Leadership Program what they consider the most rewarding part of their role, and each will likely give a similar response. They'll pause for a moment, seem a little surprised to be asked a question with such an obvious answer, and then reply, "Seeing my growers have a successful harvest."

The members of this exclusive program are a diverse group. That diversity—and the breadth of experience behind it—is the backbone of the program. But a shared desire for farmland to reach its maximum potential binds the members together and places them in an elite category of agricultural advisers who are helping growers develop local solutions to one of their most difficult challenges.

Photo, left to right: Joel Spring, Clint Einspahr, Jeremy Kichler, Paul Barchenger, Steve Muhlenbruch and Tim Hambrick in a greenhouse at the Syngenta Vero Beach Research Center in Florida.

"Over the last 10 years, we've seen an increase in resistance to not only weeds, but to insects and diseases as well," says Les Glasgow, Ph.D., technical product

lead for herbicides at Syngenta. "If we do not respond proactively to this serious threat, we will see a rise in management costs coupled with a reduction in productivity and profitability."

Exceptional Leaders

Syngenta founded the Resistance Fighter of the Year Leadership Program in 2009 to recognize third-party agricultural advisers for their foresight about the threat herbicide resistance poses to agriculture and their drive to implement proactive techniques to manage that threat. Since then, the program has expanded and is now also open to advisers fighting resistance in diseases, insects and nematodes. The program currently consists of county extension agents, sales agronomists and other agricultural advisers who have made significant contributions to managing resistance in their areas.

"The Resistance Fighter of the Year Leadership Program honors exceptionally active advisers who help growers in

the fight against resistance,” says David Laird, head of product biology at Syngenta. “It serves as a conduit for knowledge-sharing among members and the agricultural community.”

By connecting real-world experts who are working on the front lines of resistance, the program has become a network of practical knowledge and seasoned experience. Members consult with one another about resistance-management techniques to learn what has worked and what has failed in various geographies. And because the program contains members from Minnesota to Georgia, the odds are good that at least one of the members has insights about a specific resistance issue from personal experience.

“The issues the other guys are facing further south in Tennessee, Kansas and Missouri are the things that we are going to be seeing in our area in the next five to 10 years,” says Joel Spring, a 2013 Resistance Fighter of the Year and crop specialist with AgriLand Farm Services in Centerville, Iowa. “Having a heads-up on the tools they use to fight those battles helps me formulate a game plan for my producers before those problems hit their fields.”

The Benefits of Membership

Through the Resistance Fighter of the Year Leadership Program, Syngenta is able to provide members with resources and opportunities that otherwise may not be available to them. Members receive chances to interact with resistance experts from around the world and get a firsthand look at some of the latest Syngenta resistance-related research. They have a broader platform from which to share their own knowledge with the media and growers through Resistance Roundtable discussions (#ResistanceRT) and are invited to events, including national farm trade shows, media events and research tours.

“This program is a great way to strengthen your leadership skills and get your name out in the industry,” says Clint Einspahr, a 2011 Resistance Fighter of the Year and assistant sales agronomy leader with Cargill, Inc., in Arapahoe, Nebraska. “You get to meet interesting people, expand your knowledge and share what you’ve learned over the years with others.”

This past January, several Resistance Fighters visited the Syngenta Vero Beach Research Center in Florida to tour the facility and get an idea of what new technologies Syngenta may bring to market in the future. During the tour, they interacted with Syngenta researchers, the media and each other. They saw presentations on weed, disease and insect resistance and then visited various laboratories, greenhouses and field trials.

“While these events are beneficial of their own accord, it is the chance for the Resistance Fighters to take part in

them together that allows each member to truly broaden their perspective,” Laird says.

Spring was one of the Resistance Fighters in attendance. “This program has allowed me to meet a lot of great people and see what’s happening in the rest of the country,” says Spring. “I like having the knowledge to go out and say to my growers, ‘This is what we need to do because this is what is already working in other parts of the country.’” As an afterthought, Spring smiles and adds, “It’s also nice to spend a little time down at the Florida beaches during the cold Iowa winter.”

Becoming a Resistance Fighter

If you are interested in becoming a member of the Resistance Fighter of the Year Leadership Program or know an agricultural adviser who deserves to be honored for his or her efforts to manage resistance issues, visit www.resistancefighter.com and select the “Apply/Recommend” tab for further instructions. 🌱 STORY BY CHRIS HARRELL

“The issues the other guys are facing further south in Tennessee, Kansas and Missouri are the things that we are going to be seeing in our area [central Iowa] in the next five to 10 years.”

—JOEL SPRING

The Resistance Fighter Team

Active members of the Resistance Fighter® of the Year Leadership Program come from a variety of backgrounds and geographies. They are:

Josh Bailey

Security Seed & Chemical
Clarksville, Tennessee

Paul Barchenger

Hutchinson Co-op
Hutchinson, Minnesota

Clint Einspahr

Cargill Inc.
Arapahoe, Nebraska

Tim Hambrick

N.C. Cooperative
Extension Service
Winston-Salem, North Carolina

Scott Holder

Helena Chemical Company
Boyle, Mississippi

Jeremy Kichler

University of Georgia
Cooperative Extension
Moultrie, Georgia

Steve Muhlenbruch

NEW Cooperative Inc.
Dows, Iowa

Joel Spring

AgriLand Farm Services
Centerville, Iowa

Scott Stallbaumer

JB Pearl Sales & Service Inc.
Saint Marys, Kansas

Jason Weirich, Ph.D.

MFA Incorporated
Columbia, Missouri



Ripple Effect

Syngenta promotes community gardens through a vegetable seed grant program and supports current and future ag leaders through awards and scholarships.

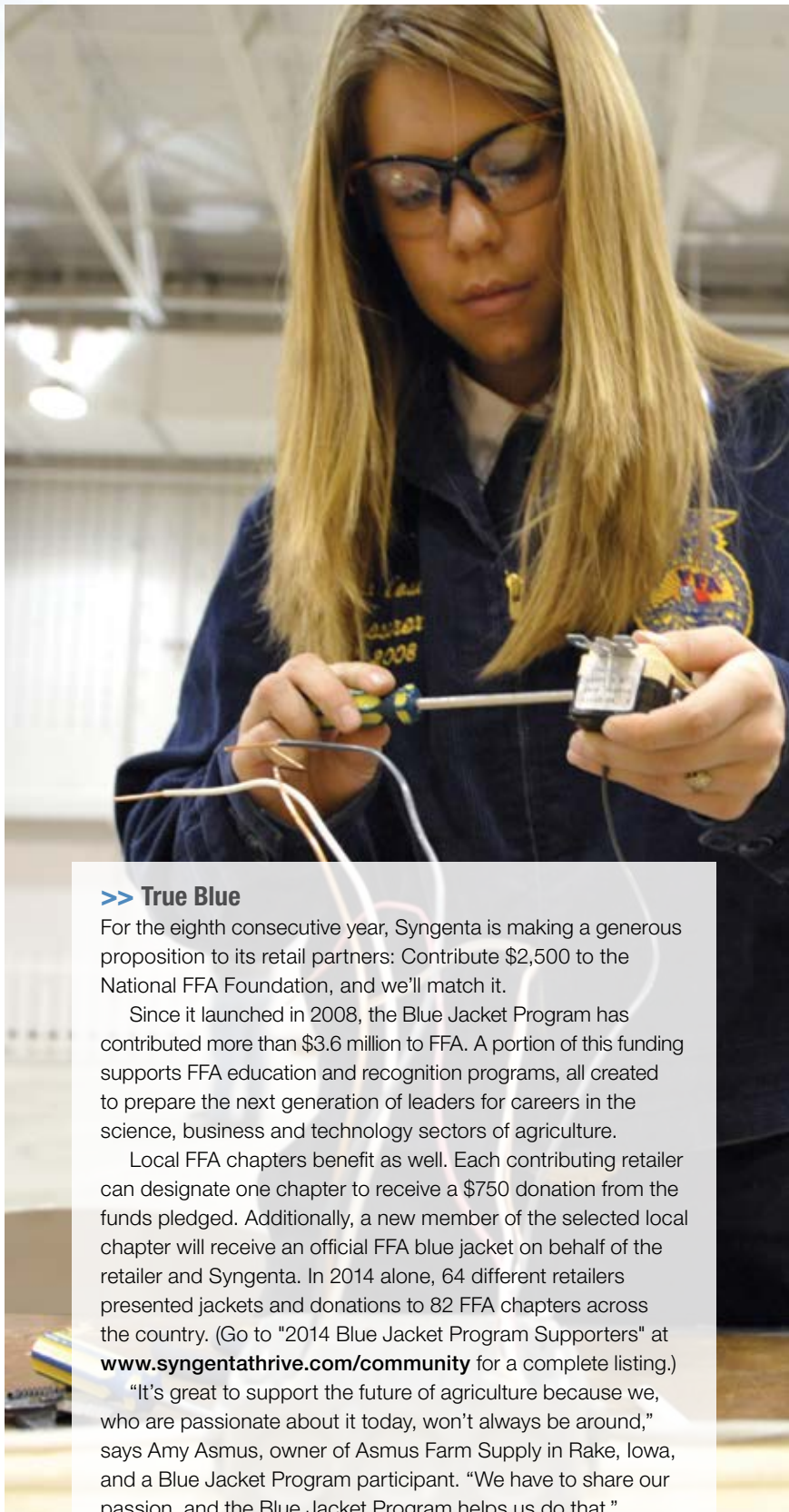
AWARDS AND PROGRAMS

> Scholarship Applications Accepted Through May 15

The application period for the second annual Syngenta Agricultural Scholarship is open until May 15, and Syngenta encourages eligible university students to apply. Drawing upon their education, background, unique skills and goals, applicants must submit an essay that develops an implementation plan for one of the six commitments comprising The Good Growth Plan:

-  **Make crops more efficient**
-  **Rescue more farmland**
-  **Help biodiversity flourish**
-  **Empower smallholders**
-  **Help people stay safe**
-  **Look after every worker**

Undergraduate and graduate university students pursuing degrees in crop-related disciplines are eligible to compete for \$20,000 in scholarship awards. For more information, please visit www.syngenta-us.com/scholarships.



>> True Blue

For the eighth consecutive year, Syngenta is making a generous proposition to its retail partners: Contribute \$2,500 to the National FFA Foundation, and we'll match it.

Since it launched in 2008, the Blue Jacket Program has contributed more than \$3.6 million to FFA. A portion of this funding supports FFA education and recognition programs, all created to prepare the next generation of leaders for careers in the science, business and technology sectors of agriculture.

Local FFA chapters benefit as well. Each contributing retailer can designate one chapter to receive a \$750 donation from the funds pledged. Additionally, a new member of the selected local chapter will receive an official FFA blue jacket on behalf of the retailer and Syngenta. In 2014 alone, 64 different retailers presented jackets and donations to 82 FFA chapters across the country. (Go to "2014 Blue Jacket Program Supporters" at www.syngentathrive.com/community for a complete listing.)

"It's great to support the future of agriculture because we, who are passionate about it today, won't always be around," says Amy Asmus, owner of Asmus Farm Supply in Rake, Iowa, and a Blue Jacket Program participant. "We have to share our passion, and the Blue Jacket Program helps us do that."



Syngenta will once again match retail partners' contributions to the National FFA Foundation.



Corn flourishes in a Mississippi no-till field.

>>> No-Till Innovators Recognized

Syngenta and *No-Till Farmer* magazine honored the 19th class of No-Till Innovator Award winners at a special banquet, held during the annual National No-Tillage Conference in Cincinnati. The 2014 No-Till Innovator Awards were presented to one individual or organization in each of four categories:

- > **Mike Beer**, winner in the Crop Production category, is a veteran grower from Keldron, South Dakota, who plants wheat, corn, sunflowers, yellow/green peas, alfalfa and flax in a no-till rotation.
- > **Ag Spectrum**, Business and Service winner, is a crop-management network based in DeWitt, Iowa, that supports no-till farming by providing products, solutions and leadership to growers across the U.S.
- > **Joel Gruver**, Ph.D., Research and Education winner, is an assistant professor of soil science and sustainable agriculture in the School of Agriculture at Western Illinois University.
- > **The Conservation Tillage Conference**, Organization winner, is a two-day program that aims to educate its more than 900 annual attendees on all aspects of no-till farming, including nutrient management, machinery, precision seeding, cover crops, soil and water quality, and pest management.

A committee of leaders, representing different sectors of the no-till industry, selected these winners based on their commitment to advance no-till farming, regardless of the crop grown or the equipment and products used. The judges included Tom Kelley, a Syngenta agronomic service representative in Illinois; Frank Lessiter, editor of *No-Till Farmer* magazine; Rodney Rulon, co-owner of Rulon Enterprises in Arcadia, Indiana; and Dan Towery, owner of Ag Conservation Solutions in Lafayette, Indiana.

Syngenta is now seeking nominations from individuals and organizations for the 20th class of No-Till Innovators. The deadline for entry is August 1, 2015, and the winners will be announced in January 2016. For more information and to apply online, go to www.syngentacropprotection.com/notill.



© 2015 Syngenta.

Important: Always read and follow all bag tag and label instructions. Some crop protection products may not be registered for sale or use in all states or counties. Please check with your local extension service to ensure registration status.

Cautionary Statement Regarding Forward-Looking Statements

This document contains forward-looking statements, which can be identified by terminology such as 'expect,' 'would,' 'will,' 'potential,' 'plans,' 'prospects,' 'estimated,' 'aiming,' 'on track' and similar expressions. Such statements may be subject to risks and uncertainties that could cause the actual results to differ materially from these statements. We refer you to the publicly available filings of Syngenta with the U.S. Securities and Exchange Commission for information about these and other risks and uncertainties. Syngenta assumes no obligation to update forward-looking statements to reflect actual results, changed assumptions or other factors. This document does not constitute, or form part of, any offer or invitation to sell or issue, or any solicitation of any offer, to purchase or subscribe for any ordinary shares in Syngenta AG, or Syngenta ADSs, nor shall it form the basis of, or be relied on in connection with, any contract therefore.

Aprovia, Aprovia Top, Elatus and Trivapro are not currently registered for sale or use in the United States and are not being offered for sale.

Clariva Complete Beans is an on-seed application of Clariva pn and CruiserMaxx Vibrance. CruiserMaxx Beans with Vibrance is an on-seed application of CruiserMaxx Vibrance alone or with Apron XL.

AgriEdge®, AgriEdge Excelsior®, Agrisure®, Agrisure Viptera®, Apron XL®, Aprovia™, Cellerate™, Clariva™, Cruiser®, Cruiser-Maxx®, Elatus™, Enogen®, Golden Harvest®, Mertect®, NK®, Q-Bit®, Resistance Fighter®, Solatenol™, Thrive®, Trivapro™, Vibrance®, the Alliance Frame, the Purpose Icon and the Syngenta logo are trademarks of a Syngenta Group Company. Leadership at its Best™ is a service mark of a Syngenta Group Company. BroadAxe® is a registered trademark of FMC Corporation. Field to Market® is a registered trademark of Field to Market. Land.db® is a registered trademark of Ag Connections.

GS 405.97001 04/15

SLC 1046L 03-2015

AWARDS AND PROGRAMS

Breaking Ground

The Grow More Vegetables Seed Grant Program helps schools and community programs provide hands-on experiences with gardening.

The love of gardening is taking root in a growing number of communities, thanks to the Syngenta Grow More Vegetables Seed Grant Program. Now in its third year, the program assists schools and community organizations in establishing or enhancing local garden programs that create opportunities to educate their communities on the benefits of fresh vegetable production and consumption.

Each year, Syngenta awards one grant in each of the following categories: elementary and middle schools, high schools and FFA chapters, and community groups and organizations. Grant recipients receive a variety of Syngenta seed, including tomato, pepper, cucumber, lettuce, squash, green bean, sweet corn and watermelon varieties, as well as a flower seed mix from the Flowers, Home & Garden division of Syngenta. The award package also includes a monetary stipend and hand-held camera for capturing the season's progress.

Recipients of 2014 grants were the Harry and Rose Samson Family Jewish Community Center (JCC) in

Milwaukee; the Chemistry Through Agriculture program at Edward Little High School in Auburn, Maine; and Hawthorne Elementary in Mesa, Arizona.

"Our garden benefits the urban Milwaukee community by exposing children of all backgrounds and abilities to gardening," says Lynn Falender, development director of JCC. "It also brings a nutritious food source to more than 8,300 families annually."

Kim Finnerty, a chemistry teacher at Edward Little High School, points to the educational benefits of her school's garden. "With the program, you have the opportunity to watch high school students, who are usually rough-and-tumble, go in and work with more than 500 participating elementary school kids and really make a difference by teaching them about agriculture and food," she says.

Lauren Cluff, a teacher at Mesa's Hawthorne Elementary, notes, "We want the families to be happy that their kids are here and to feel they're getting a special opportunity."

The Grow More Vegetables Seed Grant Program is a collaborative effort spearheaded by two Syngenta employees: Mary Streett DeMers, senior communications lead for vegetables, and Jeannine Bogard, garden vegetables product business manager. Both DeMers and Bogard frequently receive requests for seed from various organizations. They recognize that Syngenta has an opportunity to not just provide packets of seed, but to also make a positive difference in people's lives.

Syngenta selects grant recipients based on various factors, including the positive impact the program is likely to have on its participants and the local community.

The program is just one example of how Syngenta is bringing The Good Growth Plan to life by supporting organizations that share its passion and commitment to sustainable agriculture.

The application period for the 2015 Grow More Vegetables Seed Grant Program is now open. Syngenta welcomes agricultural retailers to spread the word about this important program on their websites, in newsletters and with their sales teams. Interested organizations may complete applications online at www.vegetables.syngenta-us.com. STORY BY LYNN GROOMS



Chemistry Through Agriculture students Makala O'Brien and Owen Voisen harvest broccoli. The program educates students about soil chemistry, pest identification, companion planting and harvesting methods.



On Crazy Hat Day at Growing Partners' Day Camp, second-grade boys rotate through the garden for a lesson on harvesting.



**Herbicide you can
apply at this stage.**



Or this one.

Whether you apply it pre-emergence or post-emergence, Prefix[®] herbicide gives you broadleaf weed and grass control that could pay all the way to harvest. With two active ingredients providing multiple modes of action, it's a powerful option for managing weed resistance to glyphosate or ALS herbicides. And thanks to its long-lasting residual control, you'll have a wide window for follow-up applications.

For more information, visit soybeans.farmassist.com.

 **Prefix[®]**

syngenta[®]