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Innovation is a bit of a mystery—if it was easy, every company would be innovating and no one would be asking questions about the best ways to do so. One of the things we do know, however, is that some ways of working are better for innovation than others. “While remote work clearly improves individual worker productivity by double digits, the more interactive and stimulating face-to-face interaction between employees is the key to dramatically increasing the much higher value (at least five times more) that is added by maximizing collaboration, creativity, and innovation,” says Dr. John Sullivan, a professor of Management at San Francisco State and an expert on human resources metrics.<sup>2</sup>

Evidence supports that working together does lead to innovation; for example, teams of inventors have more patents that are successful than those who work alone,<sup>3</sup> and “extensively collaborative” companies perform better than their peers, according to one study.<sup>4</sup>

However, research also shows that brainstorming, one of the most popular ways of working together towards innovation, often doesn’t work, and people actually come up with more original ideas when they work alone.<sup>5</sup> Steve Wozniak, who invented the Apple I computer by himself, tells people who want to innovate, “Work alone ... Not on a committee. Not on a team.”<sup>6</sup>

So should people who want to innovate work together or alone? The answer is both.

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<sup>1</sup> Using the Nuances of Collaboration to Drive Innovation, <https://www.hermanmiller.com/research/categories/white-papers/using-the-nuances-of-collaboration-to-drive-innovation/>. <sup>2</sup> Dr. John Sullivan, “Innovation Is Now the #1 Business Driver,” <https://www.ereadia.com/ere/innovation-is-now-the-1-business-driver-so-ibm-abruptly-drops-remotework/>, March 20, 2017. <sup>3</sup> Hiroyasu Inoue and Yang-Yu Liu, “Revealing the Intricate Effect of Collaboration on Innovation,” <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4370822/>, March 23, 2015. <sup>4</sup> IBM Global Services, “Using collaboration to enable the innovators in your organization,” [http://www-935.ibm.com/services/in/cio/pdf/empow\\_wp\\_gts\\_usingcollaboration.pdf](http://www-935.ibm.com/services/in/cio/pdf/empow_wp_gts_usingcollaboration.pdf), November, 2006. <sup>5</sup> Thomas Chamorro-Premuzic, “Why Group Brainstorming Is a Waste of Time,” <https://hbr.org/2015/03/why-group-brainstorming-is-a-waste-of-time>, March 25, 2015. <sup>6</sup> Susan Cain, “The Rise of the New Groupthink,” <http://www.nytimes.com/2012/01/15/opinion/sunday/the-rise-of-the-new-groupthink.html>. © 2018 Herman Miller, Inc.

# CONTENTS



## ADVANCED MANUFACTURING

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**23** Eurofins provides testing, training hub for food manufacturers

**28** Advance Iowa cultivates growth of second-stage companies

**32** **Q&A: Ron Cox**  
*CIRAS Director,  
Iowa State University*



## STEM

Sponsored by



**40** **Q&A: Jeff Weld**  
*Senior Policy Adviser on STEM,  
White House*

**44** **Q&A: Pingel**  
*Vice President of Information  
Technology, Kum & Go*

**50** Building up: Des Moines women craft a more diverse workforce



## TECHNOLOGY

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**62** **Q&A: Mark Darrah**  
*CEO, Athena GTX*

**67** UnityPoint Health seeks to build a culture of innovation

**74** **Q&A: Rollenhagen**  
*Founder and CEO,  
Entrepreneurial Technologies*



## BIOSCIENCE & AGRICULTURE

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**98** Q&A: Shanks  
*Engineering Professor,  
Iowa State University*

**105** Iowa AgriTech Accelerator's  
second year

**110** Startup WISRAN tracking  
big steps forward



## ENERGY

Sponsored by



**116** Q&A: Adam Wright  
*President and CEO,  
MidAmerican Energy Co.*

**121** Flood Center works up  
new app



## FINANCE & INSURANCE

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**128** Q&A: Baton Global  
*Kavilash Chawla, Partner,  
and Kelly Dittmann,  
Managing Director*

**136** Insurance of the future

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With its expected spin in June 2019, the Agriculture Division of DowDuPont will become a standalone, pure-play agriculture company dedicated to creating progress for our industry and, more broadly, society. We are excited to announce its name, Corteva Agriscience. “Cor” represents the core or heart, while “teva”, an ancient word befitting our 14,000-year-old agriculture industry, means “nature.” Together, they combine to represent our aspiration to be at the heart of agriculture—and to be the most transparent, innovative and responsible agriculture company on the planet.

Our intent is to transform the role of agriculture in society and to enhance the livelihood of farmers and society – globally. We’re passionate about growing progress. From producers to consumers, Corteva Agriscience will help advance agriculture’s position as an essential industry that fuels human potential. We’ll combine our decades of experience with persistent inventiveness, so that we can help individuals, societies and economies thrive.

Today, innovation is a requirement, not a choice. This mandate is reflected by the significant challenges we aim to solve through our world-class research engine and creating progress in emerging areas such as digital agriculture. With Corteva Agriscience, we are accelerating the pace at which we deliver these advanced solutions to farmers by opening new pathways of progress for the agriculture industry and helping generate progress for our industry and those served by it for generations to come.



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CORTEVA AGRISCIENCE, AGRICULTURE DIVISION OF DOWDUPONT  
**innovationLEADER of the Year**

# SUKUP

BY SUZANNE BEHNKE

As you drive along Iowa's highways in farming communities, the corrugated-metal exteriors of grain bins gleam in the sun or stand as agricultural sentinels amid storms and the state's weather fluctuations.

Many bear the name "Sukup," a three-generation Iowa company that has grown into an international leader in grain bins, grain dryers and steel buildings. Its products are sold in the U.S. and in more than 80 other countries, according to the company website.

Innovation is at the heart of Sukup's business.

In 1962, Eugene Sukup sought to find a way to improve the drying process after he purchased his first drying bin and found the process too lengthy. After some trial and error, he developed a fix. "He patented the idea and the Stirway stirring machine and Sukup Manufacturing Company were born," according to the company's history.

"Innovation is critical to its rapid growth today and into the future," says company spokesperson Rachel Geilenfeld. Sukup has grown 800 percent in the last 15 years.

The success can be attributed to one several factors, says Geilenfeld. "The main one is the company's willingness to expand into new products and new product lines."

Examples include Sukup's steel buildings. The company entered the bin market in 2001.

"If you would ask the typical Iowan, particularly someone in agriculture, what product would you associate with Sukup? The bins," said Geilenfeld.

In addition to bins, Sukup was recently recognized for its QuadraTouch Pro technology that lets farmers remotely check on how their grain is drying.

"They can basically have an app on their phone and they can say 'raise the temperature, shut the machine

off,'" Geilenfeld said.

That shift in technology will affect agriculture in several ways, she explained. For instance, many farm operations will be led by the upcoming younger generation, which is much more comfortable with technology.

"They want to do everything on their phone," she said.

The efficiency of apps such as QuadraTouch Pro requires fewer laborers as well, with workers in short supply these days.

In addition to innovating, the family business leaders have a focus on giving back. The family likes to say that "giving back is in-grain-ed" within the company.

The Sukup Safe T Homes are one example. In 2010, the poor island nation of Haiti was devastated by a hurricane. The news stirred an idea in the company's safety director.

He sent a single email to CEO Steve Sukup on Jan. 14, 2010. It read: "How



Agriculture Division of DowDuPont™



**John Chrosniak**  
Vice President,  
Strategy &  
Planning

## Corteva Agriscience, Agriculture Division of DowDuPont innovationLEADER Award

Corteva Agriscience is currently the agriculture division of DowDuPont and is intended to become an independent, publicly traded company once the previously announced spin-off is complete by June 2019. The division combines the strengths of DuPont Pioneer, DuPont Crop Protection and Dow AgroSciences. Corteva Agriscience provides growers around the world with the most complete portfolio in the industry, including some of the most recognized brands in agriculture: Pioneer, Encirca, and the newly launched Brevant seed brand, as well as award-winning Crop Protection products while bringing new products to market through our solid pipeline of action chemistry and technologies. More information can be found at [www.corteva.com](http://www.corteva.com).

about Bin Houses in Haiti? Hurricane and Earthquake resistant. Perfect!"

The company developed a completely metal Safe T Home that resists termites and moisture. The Safe T Homes, each 18 feet in diameter and offering 250 square feet of living space, are also in Peru and in African nations.

The business began with Eugene Sukup's innovation for drying grain faster but now includes in its product line the following: on-farm and commercial grain bins, portable and tower dryers, centrifugal and axial fans and heaters, stirring machines, bin unloading equipment, and more.

There are three generations, including 10 family members, in the business. Nearly 600 workers from north-central Iowa are employed there. ■



# ROBERT RILEY

BY PERRY BEEMAN

For Robert Riley, innovation is looking at Iowa's lush summertime landscape as a photosynthesis machine feeding the world. It's about creating food additives from corn oils and other materials at his flagship company, Feed Energy, while working day and night to improve the environment that corn is grown in.

Riley knows the glacier-stirred soil needs to be protected. The waterways that have been polluted by runoff need to be cleaned.

At the same time, he knows the economic value of agriculture. His company produces liquid feed additives that help the efficient production of turkeys, chickens, hogs and cattle.

He has a strong environmental ethic, but his language is nuanced. Most notably, he is not big on what has become a confusing word used heavily in some environmental circles: "sustainable."

That word isn't enough for Riley. He prefers "regenerative," or leaving things better than we found them, not the same. "I have thrown the word 'sustainability' out of my vocabulary when it comes to agriculture, and I'm starting to use the word 'regenerative,'" Riley said. "Let's add back more than we take out."

Riley — whose umbrella company, Riley Resource Group, does everything from marketing to technology development — jokes about how he sometimes feels like

a lone environmental voice in some agricultural meetings.

But this philosophy major out of Monmouth College in Illinois (and Dowling High School when it was in Des Moines, before it moved to West Des Moines) looks at the world as a place in which all systems need to work, or the whole thing collapses. He doesn't have a lot of time for those who question the scientific consensus on climate change, or who can't see the wisdom of looking for ways to reduce runoff pollution from Iowa's economically important agriculture operations.

"The earth has been around 4 or 5 billion years," Riley says. "We've been farming for 100 years. Who do we think we are?"

"We have to honor the natural cycle. We get these huge rain events [which he links to climate change], and different weather patterns and we say, 'Well? Who cares?' Well, we have to have some role in that. We are doing a tremendous disservice to our grandchildren. The hubris astounds me."

Riley is equally at home mulling new ways to squeeze nutrition out of corn oils and fats than he is pushing the idea that the Capital Crossroads visioning process for Central Iowa would collapse like Jenga blocks if the natural, social, environmental, cultural, infrastructure, political and human elements aren't all in good health.

In a single day, he might think about how to improve livestock feed but also how to resurrect a respectable operation at the Leopold

Center for Sustainable Agriculture at Iowa State University after the grantmaking fueler of ag research had its budget slashed. He might work with innovative students at Simpson College.

Riley is a giant in the agriculture world but also has had a huge hand in the operation of the Iowa Environmental Council, Nature Conservancy, Whiterock Conservancy and the state park system, proving that farming and environmental protection can go together.

Riley helped create the Iowa Innovation Corp., which promotes entrepreneurship. He's on the Simpson College board of trustees. He's been on the boards of the Iowa Environmental Council, the Nature Conservancy of Iowa, Whiterock Conservancy, the Iowa Department of Economic Development, Des Moines Water Works, Iowa Parks Foundation, and the group that pushed for the constitutionally protected Iowa Natural Resources and Outdoor Recreation Trust Fund. He also founded the Iowa Polarity Thinkers initiative. That one has to do with recognizing natural tensions among views on an issue, and looking to take advantage of the best elements of them while minimizing discord.

Riley spends dozens of hours a week volunteering. "If I'm a lucky guy who somehow fell into this business and have been successful, I think as a CEO I have a responsibility to help be part of the solution," he said.

"If we aren't reinvesting in our leadership programs, or in our youth or our schools or education or health — mental health — if we're not reinvesting in those things, then they are going to begin fraying at the edges and go south. To me, we can't rely on politicians to do it because they seem to be dysfunctional. We need to rely on responsible members of society to do the right thing."

## IOWA STATE UNIVERSITY

Ivy College of Business

### Iowa State University Ivy College of Business innovationENTREPRENEUR Award

When you think of entrepreneurship in Iowa, think of Iowa State University. We've been supporting entrepreneurship at Iowa State for more than 20 years, but the momentum is really picking up. This year, we officially launched two entrepreneurship programs: an undergraduate major, the first at a public school in Iowa, and a PhD program, only the eighth in the country. We received a historic \$50 million naming gift in September from entrepreneurs Debbie and Jerry Ivy ('53 industrial administration). Their gift builds on momentum in several growing areas at the college, including business analytics, supply chain management, which is ranked sixth in the world for research, and entrepreneurship. We are proud to sponsor the first Entrepreneur of the Year Award with Innovation Iowa magazine. I invite you to stay in touch and learn more about the Debbie and Jerry Ivy College of Business: [www.business.iastate.edu](http://www.business.iastate.edu).



**David Spalding**  
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# Eurofins provides testing, training hub for Iowa, U.S. food manufacturers

BY JOE GARDYASZ

When you open your refrigerator, there's a very good chance that every food product you see in it has been tested by a company you may have never heard of — Eurofins.

Eurofins Scientific Inc., one of Europe's fastest-growing companies, has based its North American headquarters in Des Moines since 2006, when it moved its U.S. food testing laboratory operations from Memphis, Tenn. The company has had a presence in Iowa since 2000, when it acquired Woodson-Tenent Laboratories Inc., which had operated a lab in Des Moines since 1955.

The Des Moines operation is the U.S. hub of an international life sciences company that operates more than 400 laboratories in 42 countries, with a worldwide staff of more than 30,000 people.

Food safety often makes headlines when there's a product recall or an outbreak of a foodborne illness; Eurofins is one of the food industry's first lines of defense aimed at keeping the food supply safe.

Over the past 12 years, Eurofins' Des Moines headquarters and labs have grown from about 75 employees to nearly 250 working in four divisions: Microbiology, Chemistry, Grain Inspection and Food Safety Services. Eurofins' customers range from local food retailers to animal feed mills of all sizes as well as pet food

manufacturers and processors of well-known brands of consumer foods.


"We like to think that we're very solution-focused on all things for food safety and quality for the food industry," said Gary Smith, director of Food Safety Systems in Des Moines. "There are a lot of businesses in the food industry that focus on one of these four areas, but very few actually do them all."

Food safety represents a significant public health concern. The U.S. Centers for Disease Control and Prevention estimate that foodborne pathogens cause 48 million Americans, or 1 in 6, to become sick annually, with the most severe cases resulting in about 128,000 hospitalizations and 3,000 deaths.

In 2011, Congress passed the most comprehensive overhaul of food safety regulations in decades. The Food Safety Modernization Act gave the Food and Drug Administration authority to increase risk-based inspections, require mandatory recalls of tainted food and more effectively trace foodborne illness outbreaks to their source.

Under the new rules, processors of food for both human and animal consumption for the first time must develop food safety management plans, which has driven double-digit growth in the education and





training services provided by Eurofins, Smith said. “A lot of our customers here in Des Moines are animal feed producers, so they’re needing a lot of education, a lot of guidance on how to comply with that rule,” he said.

As one of Eurofins’ training hubs, its location in Des Moines provides Iowa-based food processors with tremendous access to the latest training and industry updates, Smith said. “We bring a lot of those innovative activities here first, and we give them first exposure.”

Eurofins’ laboratory services have also expanded significantly in Iowa, said Anders Thomsen, who leads the Chemistry business unit that tests foods for contaminants and authenticity. That unit’s laboratory staff has increased by about 100 people over the past 12 years to approximately 175 currently. Both the Chemistry unit and the 24-person Microbiology unit operate around the clock, seven days a week.

Technology advancements are speeding up the testing processes significantly, Smith said.

“Microbiology testing in general is very time-sensitive,” he said. “Previously, the

old-fashioned cultural methods were very time-intensive and labor-intensive. There’s been a lot of innovation around speed and advancement in rapid methods. Tests that used to take five or six days to conduct, we’re now doing in 24 to 48 hours.”

Increased automation and investments in high-end testing equipment are also paying off in improved levels of quality, Thomsen said. “We are investing a lot in lean technology, in automation, while increasing quality at the same time,” he said.

To increase its laboratory space, the company has plans to move its headquarters offices to a separate location in Greater Des Moines so that it can convert its entire 60,000-square-foot facility in Des Moines into laboratories.

“We have very aggressive growth plans and want to focus on providing solutions to the food industry and our food customers,” Smith said. “So I would say our growth is going to be solutions-focused, with technology, with innovation, with equipment to be able to meet those needs of our customers going forward.

“We’re here to stay; we’re not going anywhere, and we’re going to get bigger.” ■

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# THE DISTRICT

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## PRAIRIE TRAIL

# Advance Iowa cultivates growth of second-stage companies

BY JOE GARDYASZ

Imagine you found out that all of your neighbors, like you, were planning to sell their homes within the next 10 years. Might that ignite a greater sense of urgency about when you get your own house on the market?

The majority of small-business owners in Iowa face a comparable scenario as they and their aging peers approach retirement, says Dan Beenken, program director and lead consultant for Advance Iowa. About 70 percent of all companies with employees in Iowa are owned by baby boomers, and about three-quarters of companies are expected to change hands within the next decade.

Consequently, succession planning and exit strategies have become one of the top assistance priorities for Advance Iowa, a multifaceted small-business assistance program based at the University of Northern Iowa in Cedar Falls.

"That's a huge glut of companies," Beenken said. "We're getting people to think about not only are you trying to sell your company, but three-quarters of the existing companies out there are also."

Now 4 years old, the Advance Iowa program takes a "grow your own" approach to economic development by providing information and tools to existing small and medium-sized businesses.

Services provided by Advance Iowa's six-member team of consultants range from CEO peer roundtables to strategic planning, financial benchmarking and market intelligence. From its base in Cedar Falls, the program strives to serve companies in all 99 counties, with the help of consultants sprinkled throughout the state, Beenken said.

"We live on this mantra that it can be lonely at the top," he said. "That certainly defines a lot of our clients, that they don't have a lot of true peers they interact with enough to be able to learn from. So when they're faced with a fork in the road, oftentimes the founder doesn't have a lot of great VP talent to bounce ideas off of. And they don't want to appear vulnerable."

Advance Iowa is built on the concept of "economic gardening" that was first developed in Littleton, Colo., in the 1980s. In 2010, the Edward Lowe Foundation established the National Center for Economic Gardening, and a number of states, among them Iowa, Florida, Michigan and Missouri, launched statewide programs.

Advance Iowa's "sweet spot" clients are generally locally owned or family-owned businesses with between about 10 and 100 employees. It has worked with companies ranging from high-tech



*Dan Beenken, Program  
Director and Lead  
Consultant for Advance  
Iowa with Jayne Kielman*

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**“We have 100 percent renewal rates from our members, who love to interact with other people who are in their shoes.”**

DAN BEENKEN

manufacturers to assisted living centers and in every type of industry in between. For instance, Advance Iowa provided strategic research for Sterzing's Potato Chips in Burlington that helped the company look into new product lines and territories in the Midwest. Another client, EmbarkIT in West Des Moines, received guidance on rolling out its new help desk feature on its website.

“We don't place a lot of parameters on who we would work with, because we recognize that regardless of business type, a lot of them have the same types of issues,” Beenken said.

The program, which gets half of its funding from state appropriations and half from client fees, has completed 344 client engagements over the last four years, and the companies assisted have added some 275 jobs.

“A lot of the companies we've worked with are launching new products or services as a result of the strategic planning we do with them,” Beenken said. Additionally, “the things they're hearing in their peer groups are helping them ferret out new ideas, new concepts, new growth strategies going forward.”

The CEO roundtables organized by Advance Iowa have proved to be “extremely successful,” he said. “We continue to see

growth in those roundtables. We have 100 percent renewal rates from our members, who love to interact with other people who are in their shoes. This is an opportunity for them to do that confidentially and learn from each other's mistakes instead of always learning the hard way themselves.”

Another key service is strategic planning facilitation, in which an Advance Iowa consultant will come in to meet with the owner and his or her management team.

“It forces them to block out some time and think about ‘Where is my company headed?’ ” Beenken said. “Oftentimes it's very hard to do that on your own, to force yourself to do that. If someone from the outside is coming in, it becomes a lever to make that happen.”

Besides ramping up its succession and exit planning efforts, Advance Iowa will be doing more work with family-owned companies, Beenken said.

“For a lot of communities, (family-owned companies) are the bedrock of the economy locally and across Iowa. They have some unique issues that they face in terms of succession and next-generation development, estate planning. How do we connect them to their peers?” ■

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# Q&A RON COX

*CIRAS Director, Iowa State University*

BY KATE HAYDEN

For more than 50 years, the Center for Industrial Research and Service at Iowa State University has aimed to be a partner for Iowa businesses looking to grow in their communities. We asked Director Ron Cox what is changing for CIRAS in 2018 — and, by extension, what is changing for the businesses it serves.

## How do you personally define innovation?

“Innovation” is a catchall word that can cover a wide variety of activities. To me, it means creating or adopting a better way of adding value to your customers that is new to your industry.

### **What's the most challenging aspect of businesses trying to get an innovative product to market?**

The greatest challenge can vary widely between industries and for different company sizes, but a common theme involves understanding the situation as it really is. Before spending a lot of money, what many companies first need is a better assessment of the true potential of the innovation. What are the potential revenues? What are the likely developmental costs? For small companies, the struggle may be having sufficient funding, gaining access to a large array of developmental

resources, or the ability to penetrate new markets. All of these can limit the degree of innovation possible.

### **What was your first significant innovation, invention or process?**

I had my first marketable innovative idea when I worked as an engineer in the defense industry in my early 20s. I came up with a way to bring two different aerodynamic mechanisms together to enhance the lift and reduce the drag of a maneuvering fighter. The two mechanisms had been around for decades, but they had not been combined in this novel way to address the aerodynamic issues encountered by an aircraft in a dogfight.

The outcome of that effort was a patent and a life lesson. The life lesson was that no matter how great your idea, a newer, more innovative product (in my case, stealth technology) could relegate your innovation to the scrap heap. You have to constantly be innovating to stay ahead of the competition, whether that competition is a new technology or another company.

### **What's the best thing that happened to CIRAS in 2017?**

The Governor's Year of Manufacturing initiative, which began with a call for growing Iowa's manufacturing GDP to \$32 billion by 2022, was a great way to showcase the importance of industry to

this state. The initiative helped CIRAS become more engaged with the Iowa Economic Development Authority, the Association of Business and Industry, Iowa manufacturers and others on the development of a strategic plan for manufacturing in Iowa. We have now moved into the implementation phase, which is the fun part of the effort.

### **Professionally, what's your top goal for 2018?**

We have been developing a great partnership with the Iowa Lean Consortium (ILC), which is maybe one of the best-kept secrets in Iowa. They are an underutilized resource, and I am looking forward to working with their staff and their board to increase the membership, bring more speakers to Iowa, and enhance the interactions between members. I believe the Iowa Lean Consortium will be a critical partner for forward-looking companies that want to continue to grow but are constrained by our nagging workforce issues. I'd love to see the ILC membership double in the next 18 months.

### **What are some of the ways that CIRAS cultivates a culture of innovation among staff?**

My daughter worked at a large, extremely innovative manufacturing company early in her engineering career. I remember the first thing her new boss had her do was read the book on disruptive innovation by [Clayton] Christensen.



The company also had a program where employees could propose to spend a fraction of their time exploring a new idea that was not a part of their job duties. To me, it was sending a clear message right up front: The competition is innovating, we need to innovate, it's the staff that innovate, and staff need time — so we'd better give our staff time to innovate.

At CIRAS I've tried to mimic this approach by providing sufficient professional development time to staff, encouraging new ideas and piloting a fraction of the new ideas. As I said earlier, small organizations rarely have sufficient resources, so we are constantly partnering with other innovative groups across Iowa State University, Iowa, and the country to bring new resources to Iowa businesses.

**What are two or three of the most exciting areas of innovation that CIRAS is working on?**

One of the most important things we are involved with is the digital transformation movement that is upon us. Industry 4.0. This is moving fast, and companies may need to be entering into elements of this arena before all of the answers are completely known. I think it is clear that some companies will be out of business if they do not change.

We will also be rolling out a new workforce initiative to deal with our age-old issue of attracting sufficient workers. This is not a new problem to Iowa. I looked at some old CIRAS surveys from the '70s, and workforce was one of the biggest issues facing industry at the time. Here we are, nearly 50 year later, having the same discussions. Some of what is being proposed today was being proposed then. Is that innovation?

To substantially move the workforce needle, Iowa is going to need a disruptive change in how we think about workforce. We will be rolling out some new activities in this space that we think will spark some improvement for those communities and companies that embrace a holistic approach to the workforce issue. We are not doing this alone; a number of our key partners will be playing leading roles.

**What policy challenges are on the horizon at a state or federal level that could affect your mission?**

CIRAS exists because some wise people 55 years ago decided that Iowa communities are healthiest when they have healthy businesses. We were created to help these businesses — and most of them are small — find new ways to add value to their customers and to stay competitive globally. Any positive change in an economic policy or program that helps small businesses in this way will help our mission.

**What areas of education or expertise are in the shortest supply, where companies can turn to CIRAS for help?**

There are lots of opportunities to help grow Iowa companies and communities in Iowa. Needs vary by company and community, so we have always tried to target our services to the specific company's needs. Depending on the situation, CIRAS staff and partners can help a company develop a STEM pipeline plan, become more efficient in their operations, learn about emerging technologies or access new markets for their products and services.

**What do you see as the most pressing global innovation challenge?**

The "most pressing" depends on the eye of the beholder. If you look at the National Academy of Engineering's 14 Grand Engineering Challenges, you get a good feel for some of the toughest challenges we are facing globally and how we could dramatically improve everyone's quality of life if progress is made on these challenges. A few items might be more urgent in other areas of the globe, such as access to clean water. Other items, such as preventing nuclear terror, likely will need a truly global effort to make headway. However, a few items are important right here at home, and Iowans should get more engaged in the near term. Cybersecurity is clearly one of these. Cyber threats are having a negative impact on some Iowa businesses today, and the issue is only going to get more important. ■

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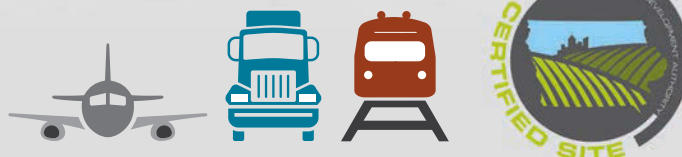
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# STEM

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## IOWA STEM EDUCATORS HELP SHAPE FUTURE OF INNOVATIVE SOLUTIONS

In 1961, R.W. and Mary Nelson started a small family business creating and selling flavors, crop preservatives and antioxidants. The couple used R.W.'s father's wool barn in southeast Des Moines as their company's manufacturing plant, and their family room as an office.

Now, almost 60 years later, Kemin Industries, still a family-owned and operated company headquartered in Des Moines, operates in more than 90 countries, including manufacturing facilities in Belgium, Brazil, China, India, Italy, Russia, Singapore and South Africa.

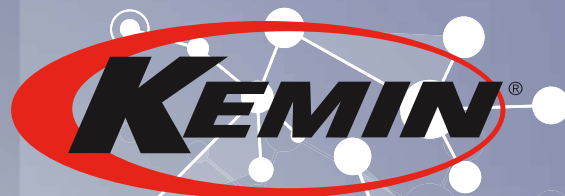
The innovation at Kemin enables its workforce to be originators of countless ingredients that improve the health and lives of humans, their pets and animals. Some of these innovations include new food technologies that keep edibles fresher and more flavorful; and nutraceuticals

that maintain wellness, improve eye and cognitive health, aid weight loss and enhance athletic power. By thinking globally and acting locally, the Kemin global network of specialists and scientists keeps Kemin attuned to the needs of each region and the concerns and needs of citizens. Staying abreast of these developments drives Kemin innovation, directing its efforts to solve the most critical, current and impending problems first. This allows Kemin to introduce timely food production solutions that will have the most benefit for producers and consumers, ultimately helping abate issues such as food insecurity.

Today, Kemin touches 3.8 billion people every day with its products. Kemin is finding scientific solutions that can preserve and improve the quality of life for the growing population. To do so, Kemin needs innovators in STEM fields.

To prepare students to become leaders in finding solutions for the global challenges the world faces, Kemin partners with the Governor's STEM Advisory Council to support and shape the direction of Iowa STEM education. After surveying over 100 of its own scientists to find out what inspired them to start in science, Kemin found that the vast majority were inspired by teachers.

"We wanted to take an opportunity to recognize those outstanding teachers, because not only are they able to convey the knowledge of that particular class in that particular area, but they, in fact, are actually changing the lives of their students, inspiring career decisions," said Dr. Chris Nelson, the president and CEO of Kemin, the eldest of R.W. and Mary's five children and a Ph.D. in biochemistry and biophysics.



In 2014, Kemin created the annual I.O.W.A. STEM Teacher Award to honor those educators who are:

- **Innovative** in their methods;
- **Outstanding** in their passion for education;
- **Worldly** in the way they help students see that STEM is all around them; and
- **Academic** through engaging students in the classroom to prepare them for post-secondary education and high-demand careers.



Eligible recipients are nominated by a school administrator, fellow teacher, student or parent. The nominees are then asked to complete an application, which a panel of external judges reviews. One teacher from each of the state's six STEM regions—Northwest Iowa, North Central Iowa, Northeast Iowa, Southwest Iowa, South Central Iowa and Southwest Iowa—is awarded \$1,500 for the educator's use, plus an additional \$1,500 for his/her classroom.

The 2018 I.O.W.A. STEM Teacher Award winners were recognized during the STEM Day program at the Iowa State Capitol on February 14, as well as during ceremonies at their schools with students, peers, administrators and business partners present. This year's I.O.W.A. STEM Teacher Award winners are:

#### NORTHWEST REGION

**JACQUIE DREY**, 4th grade teacher, Storm Lake Elementary School, Storm Lake

#### NORTH CENTRAL REGION

**TERESA GREEN**, K-5 technology teacher librarian, Edwards Elementary School, Ames

#### SOUTHWEST REGION

**DENISE HOAG**, Computer science/business teacher, Thomas Jefferson High School, Council Bluffs

#### SOUTHEAST REGION

**CASSIDY REINKEN**, Magnet coordinator, Johnson STEAM Academy, Cedar Rapids

#### SOUTH CENTRAL REGION

**DR. HOLLY SHOWALTER**, Medical and bioscience research instructor, Waukee APEX, Waukee

#### NORTHEAST REGION

**STACEY SNYDER**, Expanded Learner Program and Gifted Resource teacher, Orange Elementary School, Waterloo

Since 2014, these awards have attracted more than 600 nominations from across the state. With so many teachers bringing inspiring STEM education to classrooms all over Iowa, Kemin is proud to honor the exceptional work they're doing to foster a passion for STEM subjects now and in the future, provide outstanding curriculum and encourage lifelong learning.



# Q&A JEFF WELD

*Senior Policy Adviser on STEM, White House*

BY PERRY BEEMAN

Jeff Weld has been running the Iowa Governor's STEM Advisory Council since July 2011, but he's on leave to serve as senior policy adviser on STEM education for the White House Office of Science and Technology Policy. He is an associate professor of biology at the University of Northern Iowa.

## How do you personally define innovation?

I tend more toward literal than figurative with words, so I would go with the Latin root, which is "renewal" or "change." Elaborating on that a little bit, to invent or create is to do something truly novel that the world has not seen, but to innovate is to reimagine uses of the familiar, in a novel and more effective way.

### What did you learn about innovating from your parents/mentors?

Well, now that you mention parent, my mother was by necessity wildly innovative, singly raising six children. She could stretch a can of tomato soup with a box of Velveeta and some cabbage into a week's dining. And certainly like anyone who grew up in conditions of meager means, I learned

electronics to keep an old radio working, bicycle repair to keep hand-me-down bikes rolling, later auto mechanics to keep rusty heaps running, and job skills like hustle and problem-solving to stay gainfully employed for the gas money.

Desperation is a parent of innovation. As to mentors, too many to recount here, but just one who exemplified innovation for me was Smitty, who co-owned the Hilltop DX service station on North Dodge Street in Iowa City where I worked through college. From customer service to car repair and even station upkeep, Smitty approached everything with a "how can we do it better?" continuous improvement philosophy ahead of the trend. That has stuck with me through academics and professional (and personal) life ever since — a tribute to Smitty.

### What was your first significant innovation, invention or process?

Doubtlessly I had lots of innovative solutions to all the broken toys in my childhood, such as Frankensteined bikes that merged the tiny wheels of a "stingray" onto the giant frame of a Schwinn 10-speed to make functional transportation. But perhaps one of my proudest innovations was to redesign high school biology, at least for how I

would teach it to my students, by tossing out the textbook and centering the content around community issues.

### What are some of the ways we can cultivate a culture of innovation?

As I alluded to previously, desperation is a parent to innovation, so in that light, we need to allow and permit for more desperation in our culture. By that I mean to introduce more ambiguity, flexibility, risk-taking, meaning and context to schooling and parenting. There's a fable about a science class in which the physics teacher hands out barometers to the students and instructs them to derive the height of their building by the drop in pressure as they ascend the stairway to the rooftop. While most of the class dutifully pulled out the standards table to reference their findings, one kid tossed her barometer off the rooftop and timed its descent to the unforgiving sidewalk below, revealing through gravitational acceleration the building's height. Was she celebrated for thinking innovatively, or sent to the principal's office? Whether we're teaching someone to cook or to solve equations, there are recipes and protocols to box in learners, or they could be handed the tools to

fumble about, question and create. One mode is efficient, the other is meaningful. One fosters conformists, the other spawns innovators.

**What is Iowa's biggest challenge when it comes to innovation?**

Extending my concept previously to a culture of innovation in Iowa, we need to embrace the messy and seemingly inefficient tactic of teaching as more like coaching or facilitation to empowered individuals and teams — whether they be kindergartners or retrained adults on the job. Intellectual risk-taking needs to be celebrated, not penalized. So basically we need to reimagine K-12 and college education, especially how we train and evaluate our teachers. Great models exist, such as Olin College of Engineering in Needham, Mass.

**What are two or three of the most exciting areas of innovation that you are working in?**

Iowa's nationally acclaimed statewide STEM program is definitively innovative in the education space. We have been so very fortunate to have the trust and guidance of visionary leaders, including our governor, our legislators and leaders in business, education and policy. Of the dozen or so educational innovations STEM is bringing to kids, schools and communities across Iowa, these three stand out as particularly transformative (synonym for innovative):

(A) STEM BEST models — Thirty-seven schools and school consortia across the state are now partnering with employers — industry, hospitals, service organizations, etc. — on STEM Businesses Engaging Students and Teachers (BEST). They are redefining curriculum, making school more meaningful, active and collaborative, while serving their communities by contributing to employers' bottom lines.

(B) Scale-Up — Each year Iowa STEM identifies the most effective K-12 programs — kits, curriculum, software,

etc. — to roll out to the most needy of schools and informal educational venues. To empower educators with exemplary materials, all of which foster that collaborative problem-solving environment of the innovator, produces an annual effect of gains across the board on science and mathematics tests and attitudes about learning STEM. Gains are even more pronounced among underrepresented groups. Gains transcend reading as well as STEM. And gains are showing in interest in living in Iowa when youth complete their studies.

(C) Teachers in Industry — Each summer some 60 secondary educators of math, science and technology take the bold step of entering the world of commerce for the summer to update their knowledge and skills while contributing to functions of the plant, the lab or the operations.

Educators are transformed by the experience, changing what and how they teach moving forward. Employer hosts are benefited by the contributions teachers make on the job. And students benefit from revised lessons that incorporate aspects of the work world as opposed to the dry curricular checklist of standards.

**What technology advances will make it easier to innovate new products?**

In the case of education, of course, digital learning platforms hold enormous promise. Take, for example, just one instance of the difference that distance-learning can present. Imagine an algebra teacher in, say, Keokuk who came to teaching after a military career as a nuclear engineer aboard a submarine. Her lessons are riveting as she relates exponents, linear equations and quadratics to phenomena of the sea, or of life support systems on board, or of torpedo trajectory, etc. Everyone ought to have such an impactful algebra experience! And through digital technology they can.

**What areas of education or expertise are in the shortest supply?**

Teachers with the kinds of experiences and training as described previously are in high demand. And most of today's teachers would love to grow their talents in such a direction and be able to provide such rich experiences to their students, so we just need to create more opportunities for educators to experience the work world that awaits their students.

**What do you see as the most pressing global innovation challenge?**

Sorry to sound circular here, but the most pressing global innovation challenge gripping us is the imperative to think and behave more globally. In this era of intertwined geopolitics and economies spanning interstate and international boundaries, if an international employer or trade partner of Iowa sneezes, our state catches pneumonia. That message, clearly conveyed to the citizens of our state, would change how individuals and institutions behave, especially in lean budgetary times when all are asked to innovate toward efficiency and modernization. And most certainly our K-12 and collegiate systems have a profound responsibility to educate to innovate by providing global context (international perspectives and collaborations — a relatively easy thing to do with the advent of Skype and other online platforms).

**What is your top goal in the innovation world this year?**

In my temporary post at the Office of Science and Technology Policy for the White House, my goal is to bring the cutting-edge educational solutions of the Iowa Governor's STEM Advisory Council to bear for federal leaders and the nation. ■

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# Q&A

# JOYCE PINGEL

BY PERRY BEEMAN

*vice president of information technology, Kum & Go*

Joyce Pingel is vice president of information technology at Kum & Go, a company whose very headquarters under construction in downtown Des Moines will stand as a monument to innovation, not to mention the eye-popping architecture of Renzo Piano. Pingel has been heavily involved in STEM (science, technology, engineering and mathematics) efforts in Iowa.

We asked Pingel about her views on encouraging innovation.

## How do you personally define innovation?

I believe innovation is the magic that occurs when creative thought inspires outcomes that change the world.

As I see it, the innovation recipe has five ingredients:

1. Unquenchable curiosity to explore and learn.
2. Self-permission to trust and accept the inputs.
3. A sixth sense of identifying opportunities.
4. Innate ability to pull it all together.
5. Courage, faith and tenacity to execute.

## What did you learn about innovating from your parents/mentors?

I grew up in rural Iowa. My parents were each pulled out of school by their parents at early ages to work on the farm. My parents never had a chance to graduate from high school. As a result, I was blessed to grow up with two parents and seven siblings who used creativity and resourcefulness to make the best of their lives, giving back and lifting up others while on the journey. I carry that lesson with me as an adult. You don't need money to be innovative. You just need ideas, opportunities and a willingness to fight for what you believe in. If done with passion and integrity, the resources will appear as others begin seeing the vision.

## What was your first significant innovation, invention or process?

It is never one person's invention or innovation. In my 25-plus years in IT, there are multiple, game-changing innovative technology solutions that still stand out in my mind that I was proud to lead. Those being: An award-winning PeopleSoft implementation in the late '90s that moved Principal's 16,000 associates to an HR self-service model. Also at Principal in the early 2000s, our implementation of a print-

to-mail facility in West Des Moines that streamlined the bar-coding, tracking, printing and mailing of millions of documents per year. Most memorable at Aviva (now Athene) was our design and implementation of the ATOM system for derivatives' hedging of insurance products, which is still used today. At Kum & Go, I am most proud of our nationally recognized &Rewards Loyalty mobile app, which has attracted over 700,000 active customers in less than two years, providing them discounts and daily value when they shop at Kum & Go.

## What are some of the ways that your company cultivates a culture of innovation?

Innovation and entrepreneurialism are the DNA of Kum & Go. In 1959, Tony Gentle bought a gas station in Hampton, Iowa, and began a partnership with his son-in-law, Bill Krause, to launch what became known as Kum & Go. (The K and G letters in the company name represent Krause & Gentle.) Tony and Bill's entrepreneurial spirit helped shape the direction for the retail convenience stores industry — from introducing bread and milk in a "gas station" to introducing environmentally friendly, ethanol-blended fuels over 20 years ago. Innovation is at the heart of what we do. It is not something we think about; it is just who we are.



**What is Iowa's biggest challenge when it comes to innovation?**

I believe Iowa's biggest challenge to growing innovation is about raising awareness of the talent and gifts that already exist within our beautiful state. Iowa has been an ag innovator for years, from Norman Borlaug to the research labs at ISU, Kemin and DuPont Pioneer. Iowa is a medical innovator, from the birth of chiropractic medicine at Palmer in Davenport to the medical breakthroughs each day at the University of Iowa Children's Hospital. The list could go on for hours. By raising innovation awareness, we will continue to grow and attract economic development to our state. We are off to a great start through the work of the Iowa Governor's STEM Advisory Council, Des Moines Community Partnership and Technology Association of Iowa.

**What are two or three of the most exciting areas of innovation that you are working in?**

Innovation can take many forms, from an inspiring piece of art, to a farm invention designed in your machine shed, to a disruptive technology solution. At Kum & Go, my most innovative project in 2018 is the technology buildout of our amazing new headquarters, Krause Gateway Center, which opens in the fall 2018. Innovation is at the heart of Kum & Go's culture and is at the heart of the Krause Gateway Center's design. Renzo Piano's brilliance comes alive in this architectural and artistic masterpiece. I can't wait to work in it each day. This innovative building is located directly across from the Pappajohn Sculpture Park in downtown Des Moines. Its unique design and location will foster unplanned

"collisions" that I am confident will lead to increased innovation and collaboration for our community as a whole.

**What technology advances will make it easier for software companies to innovate new products?**

I believe mobile and digital apps, artificial intelligence and virtual reality will be true disruptors for the industry.

**What areas of education or expertise are in the shortest supply for your company and others like it?**

We are blessed with a hardworking, talented IT workforce in Iowa. However, tech talent as a whole is in high demand. The greatest shortage seems to be in IT security, IT developers, data professionals and candidates who bring diversity to our workforce (i.e., females, people of color and different cultures).

**What do you see as the most pressing global innovation challenge?**

Global poverty, food insecurities, and social and economic exclusion are huge issues in the world today. To solve these systemic issues, it will take innovation and collaborative partnerships across multiple sectors with a long-term vision to better the world.

**What is your top goal in the innovation world this year?**

Technology can be a powerful force helping innovate and address challenges facing our businesses and our communities. My top goal is to continue making a difference each and every day. To stay curious, to continue dreaming, exploring, observing and activating change for the good of all. ■



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## Building up: Des Moines women craft a more diverse workforce

BY KATE HAYDEN

At the start of 2017, chemical engineer Meredith Smith was frustrated by the statistics of workers in her industry.

Women held 24 percent of all science, technology, engineering and math (STEM) jobs, and only 14 percent of engineers are women, the U.S. Department of Commerce reports.

Looking deeper, the National Science Foundation's annual indicators report found that among 6.4 million workers employed in science and engineering occupations during 2015, 67 percent of those workers were white, 21 percent were Asian, 6 percent were Hispanic and 5 percent were black.

The 2015 "She Matters" study by Iowa Women Lead Change, an organization dedicated to advancing women in leadership, found Iowa women held 48.5 percent of occupations in "science research

and development" and only 26.9 percent of "architectural and engineering" careers.

"At some point you realize, 'Where are they?' " Smith recalled. "I've always been really passionate about that, and my husband said, 'You should do something about that.' "

STEM education efforts have broadened nationwide and in various industries. Des Moines women are part of that, pioneers trying to bring STEM education initiatives to communities that are underserved and under-supported in Iowa.

### **BUILDING A WORKFORCE**

Des Moines is a growing home base for STEM education initiatives — including Pi515, a coding nonprofit serving refugee students in grades 7-12, and Gov. Kim

Reynolds' Future Ready Iowa initiative, aimed at building Iowa's upcoming workforce through technical skills training after high school.

As a sophomore at the University of Georgia, Antoinette Stevens learned that less than 1 percent of the technology workforce was occupied by black women. She's now a cybersecurity analyst with Principal Financial Group in Des Moines.

Stevens took action almost immediately while settling in the state. She founded Reboot Iowa in 2016, initially planning to develop a nonprofit code school. She quickly realized that adults weren't lacking in education opportunities to learn how to code; instead, they were lacking a starting point.

"There's not a lot of places you can go if you have no idea what you're doing, or what any of it means. We want to be that support system for people, so they don't give up just because they can't find the information," Stevens said.

"I want to get to the point where people don't feel so lost when they look at where the technology is going."

She started visiting regional nursing homes to teach the basics of Facebook, Skype and online privacy. She's hosted a daylong Python coding session at the Science Center of Iowa, and has put on events at Gravitare, the downtown Des Moines co-working space.

Meanwhile, Smith turned to her own career experience when designing what would become TigerLily STEM's programs for students in grades K-12.

"I was very thankful to have a great support system. I was also very fortunate

to have access to a lot of leadership development throughout high school and college," Smith said.

With that background in mind, leadership activities are a priority for her students when they attend small-group sessions in TigerLily STEM's new classroom in West Des Moines — a former clothing boutique, with natural light and several study spaces Smith has arranged to accommodate both one-on-one and large-group study sessions.

TigerLily STEM offers a scale of services, depending on what students or families need: private tutoring for students in elementary science to Advanced Placement courses; weekly programs and birthday parties centered on an age-appropriate, science-based activity; and free high school study sessions on Sundays, hosted at TigerLily STEM.

Smith and her husband split the business duties while both keeping their full-time jobs elsewhere: While she runs TigerLily STEM's curriculum development, classes and tutoring, he works on the back-end books and logistics. Smith also employs women part time who are working in STEM fields and can share those experiences with girls.

"Anytime you can see someone who's succeeding in STEM, or a field that you're interested in that looks like you, that can be very encouraging to you," Smith said.

## REACHING OUT

Stevens sees a mix of people turning to her workshops and resources: women interested in entering the field, employees working in nontechnical roles who want to better understand coding, and college students.



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Reboot Iowa is currently building out a resources listing on the website for adults considering going back to school for coding — including free resources and one-off programs in the region.

There's still a population that isn't hearing about Reboot Iowa's services, and Stevens and her volunteer board are exploring what it takes to reach those individuals.

"I really do want to get to the place where we begin targeting lower-income populations, but reaching them is a little more difficult than putting an ad on Facebook," Stevens said. "Finding a way to reach those populations is the challenge we're at right now."

Stevens reached beyond Reboot Iowa quickly, co-founding the Des Moines chapter of Girls Who Code in 2015 and teaching Python programming and web design to member students in grades 8-12.

This year, Stevens took a step back from the club to plan the first Glimpse the Future conference for March 1, 2018, which invited female high school students to explore computer science careers.

Glimpse the Future attracted 70 students, Stevens said, and she learned just as much as they did about what could make upcoming Glimpse the Future events succeed.

"They really hate sitting still," Stevens said. "They really liked the panel, but they also want something more interactive. So I think I'm going to try to do a large-scale, interactive coding workshop and a panel. ... A lot of them said, 'I don't really know what coding is. This is cool, but I wish you had started somewhere here.'"

"It taught me that I had to go even more basic, which is where I thought I had to be, which is good."



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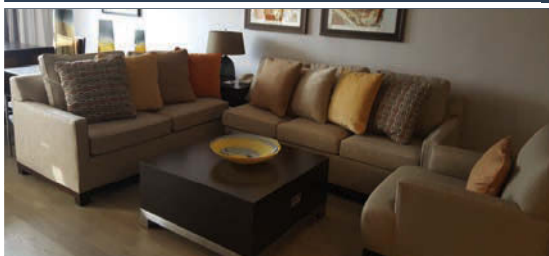
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A year after TigerLily STEM first started activities, Smith estimates the organization reaches about 40 girls each week from Ankeny, Des Moines, Norwalk, Waukee and other area communities.

“I’m super excited to see these communities take shape, even in girls as young as kindergartners,” Smith said. “The more girls that we can get into these classes, changing their perception of STEM, the better. ... Right now we’re really focused on this very local area, but long-term we’d like to expand to other areas.”

## CHALLENGES TO SUCCESS

There are patterns in what factors hinder women and diverse communities from entering STEM fields, Smith and Stevens say.

“There’s a misconception that people have, that STEM isn’t very collaborative and isn’t very creative. ... Part of the goal is to change that perception, because my experience is STEM is inherently creative and collaborative,” Smith said. “Sometimes that misperception is what dissuades girls from getting into it in the first place.”

Of course, there are unique misconceptions held by her young classes.

“One of the biggest ones is often the younger kids think engineers are people who run trains,” Smith said, laughing. “Which is true, but engineers also do a lot more.”

Smith has seen evidence of more substantial misconceptions starting as young as elementary school, when students tell Smith they aren’t interested in a topic like biochemistry.

“When we actually got to the biochemistry stuff, they actually thought it was pretty cool,” Smith said. “We’re changing these statistics one interaction at a time. That’s our whole goal.”

Stevens is attempting to change a different kind of misconception: what experience or level of education is truly needed to have a STEM-based career.

Independently, she founded Black Urban Professionals of Des Moines in 2015, and in 2018 she was named one of the Business Record’s Forty Under 40 honorees for her passion and community involvement.

One of the cross-industry habits Stevens advocates for is rethinking conference panels: focusing less on diverse “diversity panels,” and emphasizing a diverse lineup of expert speakers in their field of work or research.

“I’d rather you had speakers who are women of color, or people of color, or just women — have diverse speakers, don’t just have a panel you focus more on what they are than what they’re doing,” Stevens said. “To be intentional about wanting to have a diverse event means that you don’t just have one diversity panel and call it a day. It means you have people who are knowledgeable about a subject teach other people, and they just look different.”

Working with the statewide Technology Association of Iowa, an organization focused on advancing Iowa as a tech hot spot, Stevens chairs the diversity and inclusion committee and seeks new ways to build a diversity mindset in corporate habits. In 2018, Stevens and other TAI members are reaching out to Iowa companies to set up more full-time apprenticeship opportunities for tech-minded high school students in the state.

As the Reboot Iowa founder, she’s also building the Rebooted Iowans project, which highlights Iowans who switched midcareer to tech-based careers.

“If you already know that college is not for you or you can’t afford it, we want to make it so that you can get an apprenticeship with a company — you’ll be paid a salary, you can get benefits, all of these things and they train you to do a job,” Stevens said. “Those jobs will tend to be help-desk-type work, which is less coding and more understanding of how software works. ... That’s still valuable, and companies still need it. ■

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Q&A

# MARK DARRAH

*CEO, Athena GTX Inc.*

BY JOE GARDYASZ

Entrepreneur Mark Darrah and his wife, Lyn, left Iowa 35 years ago because they were unable to use their degrees in advanced biomedical technology from Iowa State University within the state. In 2007, they returned from Southern California to Des Moines to launch Athena GTX to produce leading-edge medical monitoring devices they initially developed for the U.S. military. Athena GTX's flagship product — a mobile wireless vital signs monitoring unit — was developed for military use and is now also being sold to fire departments and emergency medical services groups across the country. Over the past decade, Athena GTX has won several additional defense contracts for innovative devices used by first responders in combat zones. The company's 25 employees build the devices at its Johnston office. Although Athena GTX has broadened into devices for the civilian emergency responder market in recent years, the bulk of its research and development projects are still in the military market.

## How do you personally define innovation?

True innovation is the creation of and application of significantly improved solutions that meet or resolve customer requirements, unarticulated needs or anticipated market evolutions.

### What's the most challenging aspect of getting an innovative product to market?

This is a dead tie: cost and time. Cost of developing, testing, retesting and evolving through a sometimes very complex regulatory strategy. Time is money. For a small business, both are in low supply to remain competitive.

### What was your first significant innovation, invention or process?

1996. Hands-on, or touch, medical triage. We called it MIDDAS. The ability to put medical sensors in a glove that a first responder would then lay upon a wounded patient to acquire vital signs and transmit to their PDA (before the age of smartphones).

### What's the best thing that happened to Athena GTX in 2017?

We were thrilled to hear that both of our large U.S. Navy research and development projects were picked up by the government for transition to production and tri-service deployment.

### Professionally, what's your top goal for 2018?

Reduce the amount of time I now spend running a business and focus more of my time creating concepts and on innovation of new products for first responders worldwide. As we see increased worldwide disasters and global and domestic terrorism, I have a lot to do.

### What are some of the ways that your company cultivates a culture of innovation?

A culture of innovation begins with the work environment a company creates to attract and retain top people with their own passion for innovation and discovery, the team you construct and then the type of work that your team engages upon. We need all three and continuously work to improve these.

A lifelong dream of ours was to create a company of true innovators and have the courage to encourage and enable them to go beyond what they know to be attainable and reach well beyond their comfort zone as an individual and as a team. It is not so much an age issue as it is an inner drive in our team members that we identify early in any interview process and then our conclusion as to overall fit of the candidate to our culture. We balance that with social time, encouraging this both in and outside of work, in-house and outsourced continuous improvement training, team barbecuing, a pool table in our offices and rich encouragement to explore “outside of their comfort zone” in everything they pursue.

**What are two or three of the most exciting areas of innovation that Athena GTX is working on?**

We are working on smart medical sensors right now across our product line. These sensors are coupled to futuristic decision support algorithms that are anticipative and predictive. Knowing what a patient’s vital signs are “now” is a world apart from prediction of where they will be with the treatments enabled. It is like hurricane predictors: We know precisely where the hurricane will hit land and when it does, but modeling the projected path also saves lives. The better the prediction models, the more reliable the forecast and the better prepared are those in the hurricane’s path. In medicine, the true innovation is knowing where our patient will be at some point in the

future depending on what we are doing to them at any moment in time. The other area of innovation is in the arena of smart-sensing wearables. Sensing platforms that not only monitor you in near real time but also predict your workload, fatigue, dehydration and cognitive sense, or the user’s decision-making ability as they proceed in high-stress environments.

**What technology advances will make it easier for bioscience companies to innovate new products?**

The miniaturization of electronic components is the most exciting area of design and development we have seen in the last decade. Processing power and battery consumption reduction in this technology have been staggering. The path we are on will enable products to be developed very soon that we could only imagine just a few years ago. In addition, significantly upgrading our in-house 3-D printing capability allows us to innovate through concepts faster and put working prototypes in the hands of our customers earlier than ever before at a greatly decreased cost.

**What areas of education or expertise are in the shortest supply for companies like yours?**

First, the areas of computer engineering, electrical and electronics engineering, and biomedical engineering are quickly being overcome by a lack of information technology and wireless communications graduates. Athena needs all of these. However, school expertise, when coupled to what we

see as the “millennial mindset,” often hamper the creativity and innovative spirit we need in our candidates. Truly being able to apply what the student has learned in school, or in their career before applying to Athena and their ability to continue to learn within a team is critical to employment success as much as what school, experience, what degree and what GPA were obtained. A degree and experience to date for us are not the end goal — it is only the beginning.

**What do you see as the most pressing global innovation challenge?**

We believe the major challenge here is the cost of doing business as we go more global. We are a small, customer-focused business. There are three examples. For our team to maintain a robust ongoing connection to our customers in the markets we want to serve globally will take an enormous amount of time and money. The cost increases dramatically as we go from domestic to global. Secondly, in the last five years we have seen an increase in the time it takes to move from a selection decision through the global procurement process to purchase or funding. This is often a limiting factor in the speed of innovation and solving global customers’ problems. Thirdly, at the risk of playing the politics card, a culture of global innovation has to be backed up with solid political policy support, possible supplemental funding sources and potential tax breaks to fuel the ideas that already exist in small business. We are observing that the current Washington culture is more talk and intentions than substance. ■



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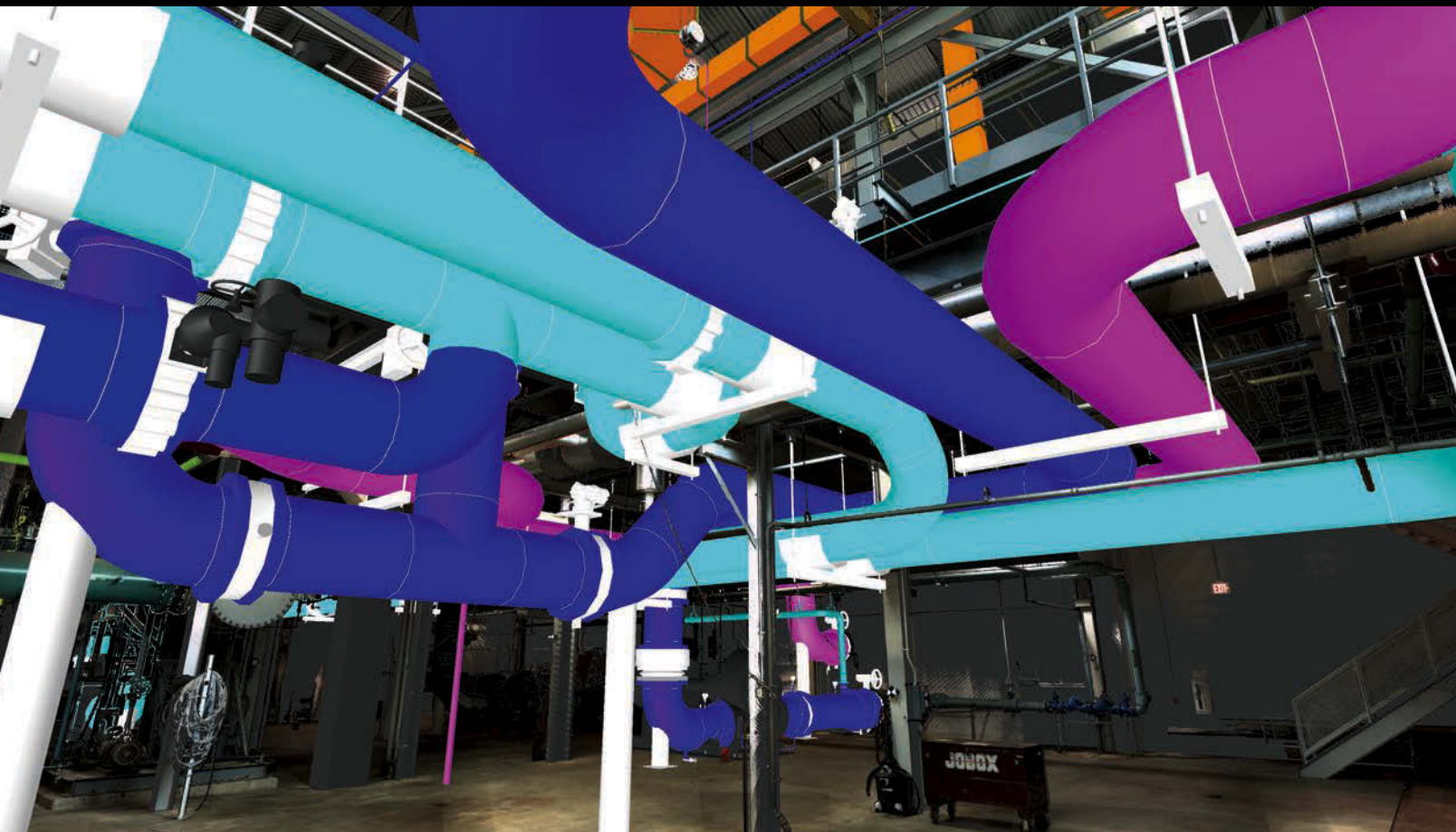


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# UnityPoint Health seeks to build a culture of innovation

West Des Moines-based health care system developing in-house incubator

BY JOE GARDYASZ

How can a regional health care organization with operations in three states and some 32,000 employees become more innovative?

Iowa-based UnityPoint Health — the 13th-largest nonprofit health system in the country — decided it would build a mechanism to empower its employees to think like entrepreneurs, by developing a center to rapidly evaluate ideas submitted by its employees and test new product concepts.

Kent Lehr, vice president of strategy and business development for the West Des Moines-based health system, is leading the effort to launch the UnityPoint Health Innovation Center this year.

“The emphasis behind creating this innovation center is culture, so to me it’s an

investment in our people,” he said. “And we’ve got 32,000 team members across three states — I guarantee you every one of them in their career has had a great idea, and they just don’t quite know where to go with it.”

The innovation center concept is gaining traction nationwide as health care systems recognize that they aren’t keeping up with the pace of innovation, said Lehr, who joined UnityPoint Health through its administrative fellowship program in 2010. “We didn’t have the luxury of operating in the same way if we’re going to try to differentiate ourselves in the marketplace going forward.”

To formulate ideas on how to tap the innovative spirit of a large organization, Lehr spent much of the past year traveling across



“This is a place to sort of break that mold and that cycle. And we’re investing in it, so we’re saying innovation is important.”

**KENT LEHR**

*Vice President of Strategy and Business Development*

the country visiting other health systems to observe mature, well-run innovation programs.

Lehr boiled down the lessons learned from some of the top innovation programs:

They invest in innovation. They make a purposeful effort to invest in people and processes that drive innovation and that ultimately drive the organization forward.

They engage their staff across the organization in being a part of the solution, but they’re also open to outside partnerships to help drive that transformation as well.

“We’re launching it with three criteria: Grow the organization, improve experience or cut waste,” Lehr said. “If your idea relates to any or all of those, we want to hear it. Our thought there is, let’s start small. But those are impactful areas for us.”

The innovation program will use a web-based intake process modeled after successful programs at two separate health systems, along with concepts used by Ford Motor Co. The process — which UnityPoint Health has already tested on a small scale — rapidly runs ideas through a 90-day track in which they’re evaluated by a succession of research “gates” staffed by acceleration teams from within the company. Those teams will hear pitches on each idea and score them to determine which ideas will float to the top and advance.

“We want to provide a pathway for ideas that maybe normally wouldn’t have a typical home with the way the organization operates,” Lehr said. Large organizations tend to be weighed down by inertia in their



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planning and budgeting processes that make it harder for new projects to move forward, he noted. “This is a place to sort of break that mold and that cycle. And we’re investing in it, so we’re saying innovation is important.”

Using the process, three projects with significant organizationwide impact might rise to the top from 100 ideas submitted. But the 97 ideas that are filtered out won’t just disappear, Lehr said. They’ll be shared with UnityPoint Health’s process improvement division, as well as the operational teams in the regions where they originated.

“My thought is, the more we try to centralize innovation, the less innovation we’re going to

get,” he said. “All we’re trying to do is provide a platform and a science to the process and ensure that the ideas get to the place where they can be acted on the quickest.”

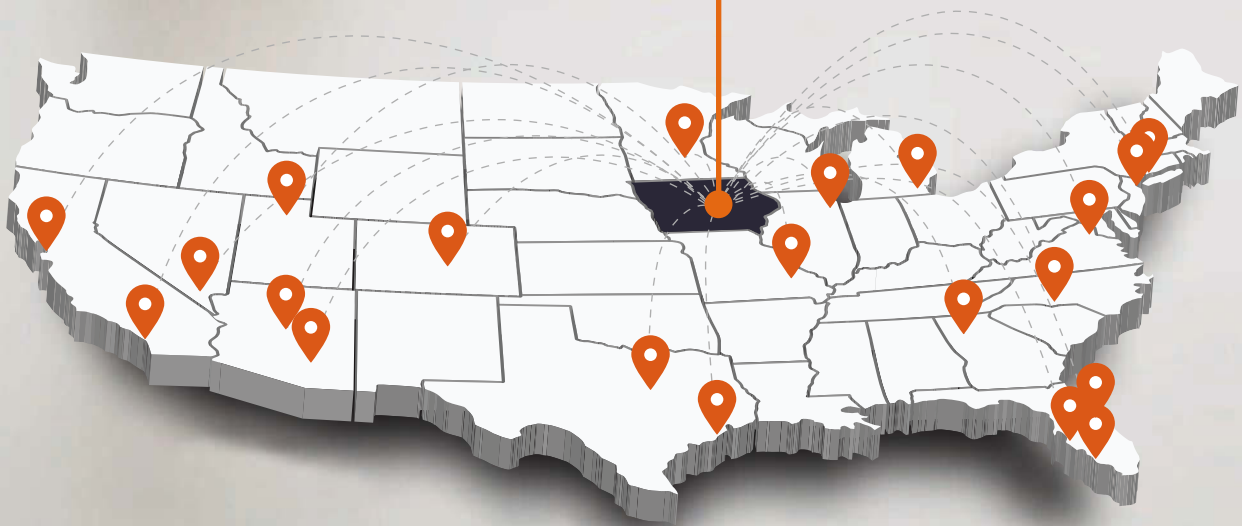
### **A BUSINESS PATH**

Lehr, a doctor’s son who earned a dual undergraduate degree in biochemistry and molecular biology from Cornell College, was on track to enter medical school at the University of Iowa but at the last minute opted for another program he had also been accepted into — UI’s Master of Health Administration/Master of Business Administration program.

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“I decided that business school was the right route for what I ultimately wanted to accomplish and what I thought I'd be good at, and I've never looked back,” he said.

While he was still an administrative fellow with UnityPoint Health, he devised a growth strategy for the health system that he presented to the board of directors, which led to his beginning a full-time role in January 2011 leading that growth effort.

Over the next several years, UnityPoint Health completed affiliations with Methodist Health System in Peoria, Ill., its first major affiliation in a decade. UnityPoint Health subsequently partnered with Quincy Health Group in Quincy, Ill., and then began exploring opportunities in Wisconsin, which led to UnityPoint Health's affiliation with Meriter Health System.

To begin dipping its toe into the innovation pool, UnityPoint Health made a financial investment in the Heritage Innovation Fund in 2015, followed by a subsequent investment last year.

“It's been an outstanding investment for us,” Lehr said. “It's allowed us to invest in companies that are having a big impact in the delivery of health care and help create better

outcomes for the populations we serve.” In addition to helping some companies get off the ground and grow, the investments have provided opportunities to build relationships with those companies, he said.

Ideally, the external partnership with the Heritage fund will provide a platform for identifying potential technology partners who can help implement projects identified through the innovation center process.

“I'm hoping to use that intake process to identify gaps as ideas come in,” Lehr said, “and then the first place we would go to fill those gaps through partnerships would be those funds that we're invested in.”

The launch of an external accelerator program to work with outside organizations will follow closely on the heels of this year's launch of the innovation center, Lehr said.

“Our interest then will be engaging with organizations and consumers in new ways to help advance their ideas,” he said.

“The more effective innovation centers I've seen are those that engage everyone in the ecosystem for solutions.” ■



WHEN IT COMES TO BUSINESS

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Q&A

ERIN

*Founder and CEO, Entrepreneurial Technologies*

ROLLENHAGEN

BY PERRY BEEMAN

Erin Rollenhagen, founder and CEO of the Urbandale-based software company Entrepreneurial Technologies, grew up in Ames and graduated from the University of Iowa with degrees in economics and management information systems. She has been involved in three tech startups. She is chairwoman of the Technology Association of Iowa's board of directors.

## How do you personally define innovation?

There's this phenomenon where certain words just capture the essence of something so perfectly that they gather momentum in our culture for a moment in time and everywhere you turn, there's the word. Then, of course, the paradox is that those words become so overused that your gag reflex triggers a bit when you hear them. It's a shame, in a way, that "innovation" has become one of those words because nothing else so perfectly sums up the idea of finding a new way to solve a problem that has stood the test of time. That's true

innovation to me; many things are just optimizations of previous ideas that advance the ball incrementally, but when someone attacks a problem from a different angle, that's when the breakthroughs and the big leaps forward occur.

### What did you learn about innovating from your parents/mentors?

I learned that innovation is a way of life, a way of looking at the world. My grandfather was a tool and die maker. He worked on all sorts of different projects, from cars to the little spout that pours salt out of a Morton canister. They would bring him a one-of-a-kind product that someone had made by hand, and he'd have to take it apart and figure out how to break it down into steps and make a machine that could produce that product. My parents had the gene also. My dad designed and built one-of-a-kind houses, and my mom grew plants that most people would not think to grow here. They all have a few things in common: First, they see something that hasn't been done before as an opportunity rather than an obstacle. Second, they instinctively recognize how to break a complex problem into smaller pieces while still retaining a vision for the

big picture. And third, they recognize that every problem solved must serve a larger purpose that aligns with your values and what you want to leave behind when your time on this earth ends.

### What was your first significant innovation, invention or process?

I'm not sure if it was the first, but I've always been fascinated by the idea of purposeful visuals. When I was an intern at a software company in about 2001, as part of a training project I created an interface where users could design their own reports and actually see what it would look like live as they checked and unchecked boxes. This seems really elementary now, but it was kind of next-level 17 years ago, and my mentor at the time said, "This is awesome — but don't show it to our clients or they'll all want it." That was the biggest compliment I could have received.

### What are some of the ways that your company cultivates a culture of innovation?

Most innovation doesn't happen in a straight, clean flash of perfection. It's messy and fraught with wrong turns and false starts. What separates those



who succeed is not that they never fall; it's that when they do, they dust themselves off and keep going. They take the failure as a data point, not an end point. To do so requires confidence in the process, the team and ourselves. If people believe they will be ridiculed if their idea doesn't work, that idea will never see the light of day and we all lose something amazing. At the same time, healthy debate is also essential. We have to be able to say to one another, "I see why you're excited about this, but I have concerns on this front." The answer we have found to both of those needs is cultivating a culture of honest feedback, and underlying that honesty is absolute respect and trust. When a person knows that the team holds him or her in unshakeable, fundamental value, they are free to give and receive honest feedback. This might sound like a bunch of vague, hard-to-implement mumbo jumbo, but it was surprisingly easy once we flipped the focus. Trying to build trust and respect by focusing on building trust and respect doesn't work because it lacks authenticity. Sure, the "trust fall" exercise might be fun, but nothing really changes. By focusing instead on the action item of giving and receiving respectful, honest feedback, the trust and respect build organically.

**What is Iowa's biggest challenge when it comes to innovation?**

This is the birthplace of the Atanasoff-Berry computer. A state which has more than quadrupled the yield of corn per acre since 1950. Innovation runs deep here. Our greatest challenge is to embrace the accelerating pace of change, and to adapt our education system to the new face of our technology economy. We have to figure out how to cultivate a greater number of deep thinkers and problem solvers with technology skills, or risk choking ourselves out with our own success. That means we have to make educating our kids and adults a priority.

The technology industry today is in a war for talent, and that means that instead of spending resources on actually building things, companies are spending more and more resources trying to recruit in an ever more crowded field. As individual companies, we do the best we can but until we increase the pool of talent, it's zero sum game. We know that the education works, but today we aren't reaching enough kids, or enough adult learners. We have to ensure equitable access to technology education between urban and rural schools, and also ensure equitable exposure within schools. We have to show kids what they can do with technology, so that they understand that technology is a tool for them to change the world at a much more rapid pace than we could have ever imagined 20 years ago.

**What are two or three of the most exciting areas of innovation that you are working in?**

Firstly, user interface design is extremely exciting right now. Everything we create on a computer is an illusion — just pixels on a screen that have meaning because we choose to suspend disbelief and walk into that dream world with our eyes wide shut. The very best interfaces warp the line between illusion and reality so well that our mind makes the leap before we even know what's happening. An early example of this was Windows making things you click on that look like real-world objects like buttons and tabbed folders. Today is an exciting time to make custom software because clients have bought into the importance of user experience and are ready to invest the time and resources needed. Often that extra 20 percent investment can make a huge impact in the reach of the product. Since we aren't constrained by the physical world, we can make literally anything — and that's very exciting.

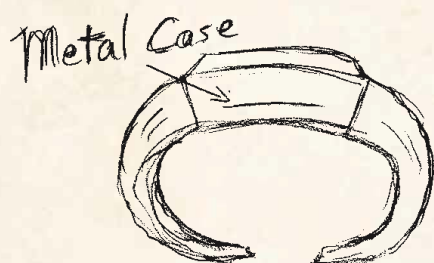
Another thing we have been working with a lot lately is pulling together data from different systems into a centralized hub that

HAVE YOU EVER THOUGHT:

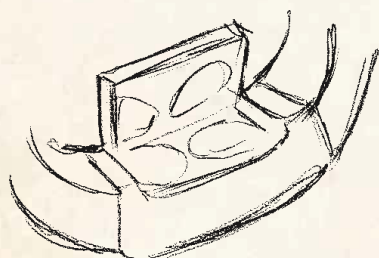
"This tool (or medical device, cookie cutter, mousetrap, etc.) would work so much better if only..."?

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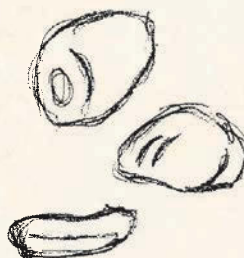
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for Research and Economic  
Development

provides actionable information. This used to be impossible because the old way of thinking for makers of commercial software was to keep information locked up in a proprietary box that no one could access. This came from a fear that if clients could take their data, they'd leave. The last 10 years or so have seen a big pull away from this model. Businesses have recognized that data is most valuable in context, and in most organizations getting that proper context means talking to more than one system. The cloud movement has had a lot to do with this, but installed software providers have done their part, too. As custom software developers, it provides us a great opportunity to make the information businesses need available to them wherever they may be, in whatever format serves them best. Along with this comes being able to develop software for any platform — whether that's web, phone, tablet or whatever's next. In today's landscape the barriers have really decreased, so instead of worrying about what data is available and what code can be written, we can focus on solving the business problem knowing that the technical aspects are very solvable.


Finally, the ability of technology to influence human behavior and solve human problems has been a fascinating area for us. As makers of custom technology products, the things we build can have sweeping implications for how people behave online and in the real world. Think about how in a few short years, social media platforms have changed the ways we interact. We have built tools that reshaped processes and company culture. We have created a virtual marketplace that literally revolutionized an industry. We have created a portal that completely changed the way clients interacted with an organization. It's an awesome responsibility and a huge opportunity to be stewards of behavioral change.

### **What technology advances will make it easier for software companies to innovate new products?**

Technology investment is always a cost/benefit analysis. The return has to have more than equal the resources invested or the project shouldn't move forward. Therefore anything that lets us do more at a lower investment leads to innovation.

The internet and open source movements have been huge because they allow people to build upon each other's advancements. When I first began coding, there was little of this. Information was largely siloed within organizations so a great deal of time was spent solving the same basic problems other organizations were solving and making the same mistakes others had already made, because we didn't share information. There tended to be this belief that these stacks of boilerplate basic code were somehow an asset that must be protected from prying eyes, when in reality probably every organization in town was sitting on a variation of the same code. It also led to a lot of stagnation because once an organization had invested the huge amount of resources to get something that worked, they were loath to change it. It's a little like if scientists discovered a new law of physics but wouldn't tell anyone because they wanted to keep it for themselves. Open source takes a different philosophy and believes that code becomes stronger the more people are questioning it, critiquing it and contributing to its development. It also allows us to build upon each others' successes to advance the industry. There used to be a lot of resistance to open source among clients because some people didn't understand it and thought it meant that their code would be public for anyone to see. The business world is beginning to understand open source better and realize





“Think about how in a few short years, social media platforms have changed the ways we interact. We have built tools that reshaped processes and company culture.”

**ERIN ROLLENHAGEN**

*Founder and CEO, Entrepreneurial Technologies*

that rather than open sourcing a client's entire project, custom developers use open source foundations when appropriate and contribute back select, reusable pieces when appropriate. This is the best of both worlds for business and technology communities.

There's also been increased emphasis on making things that are universal rather than coding to specific devices, formats and platforms. Today's technology landscape involves a dizzying array of scenarios. A few years ago, developers would code to each one individually. This led to a multiplication of resources but without a corresponding uptick in the product itself — it was just a cost of doing business to reach the masses. Recently, the industry has focused on standards and strategies that allow the same code to work everywhere. We fully support this movement because it frees up resources to spend them on the features that will really drive clients' businesses forward.

**What areas of education or expertise are in the shortest supply for your company and others like it?**

We are at an interesting point because today the actual tools and practice of technology are changing so rapidly that by the time someone completed a degree, many of those specific methods would be obsolete. That sounds depressing but what we have learned is that the new techniques are actually very easy for someone to pick up, provided they have the right foundation. That foundation is critical thinking and problem-solving skills. Someone who possesses those can transition quickly from one platform to the next. Another important aspect is communication skills and the ability to be productive in a team. Our work is truly group problem solving, so these skills are essential. Interestingly, when talking to other business owners in our industry and beyond, the same skills continue to come up so I know we are not alone. I think this shift from a reliance on specific applied skills to a need for more advanced, analytical skills reflects the maturation of the industry and our economy as a whole.

**What do you see as the most pressing global innovation challenge?**

Winston Churchill said, "The price of greatness is responsibility." We have created, out of necessity, a thing that has changed our society so much that it now wields a power of its own. It's our responsibility to be thoughtful in the way we shape the technology of tomorrow so that the society it molds is one in which we still want to live. We as a world have lived somewhat naively to this point, creating things haphazardly and without much care to the long-term consequences. We can no longer pretend to be ignorant of the impact of our creations. We have to think not only of solving the immediate problem, but of the goal of engineering a better world. No one organization or company can do this alone, but yet we all must take on the charge individually. It's critical that we do this because changing our own behavior is our best hope for survival. We are constrained to a finite amount of physical resources, and yet our population keeps growing. Social responsibility is not a luxury, it's a requirement in today's world. Through technology we have the challenge to reshape what has often been a drive toward selfish behavior, and channel that toward the higher good.

**What is your top goal in the innovation world this year?**

We always strive to keep getting better. Working on the projects our clients bring to us is a great avenue for this because it pushes real-world problems from a wide variety of industries in front of us. There's also a special joy in solving a problem for its own sake, however. This year we are committed to taking on something just because we want to do it and it sounds interesting. I think the opportunity to be creative for its own sake will be energizing to all of us. Fundamentally, people who get into this business are here because they want to solve problems and make a difference. That's what makes it all worthwhile. ■



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employees  
producing vaccines



### BUILDING ON A LEGACY OF QUALITY

Today, Zoetis – the world's largest animal health company with nearly 10,000 global employees and \$5 billion in annual revenues – maintains 256 acres in Charles City, with nearly 600,000 square feet dedicated to manufacturing. Charles City is the largest of the company's 27 global manufacturing sites. It's here that a team of more than 400 employees produce vaccines for poultry (65% of our production), swine, equine and canine customers.

The roots of the Charles City Vaccines Manufacturing site trace to 1923, when Dr. Joseph Salisbury established a veterinary practice in Charles City, Iowa. In the near century since, the signage has changed – from Salisbury Laboratories to Solvay Animal Health, Fort Dodge Animal Health, Pfizer Animal Health and now Zoetis. But, our commitment to helping protect animal health – and the world's food supply – has never wavered.

### IOWA PROUD

Zoetis is honored to be one of the Charles City area's largest employers. We invest in our community through donation and corporate sponsorships that make the Charles City area a great home for both our colleagues and our neighbors alike.

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"2017 Best Places to  
live in Iowa."

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# IMPROVING IOWA'S WATER QUALITY

5 things  
you need  
to know



IOWA AGRICULTURE  
WATER ALLIANCE

## A collaborative, watershed based approach is being used successfully across the state to address water quality challenges.

The watershed approach enables farmers and other stakeholders to target the best conservation practices where they will be most effective. It makes the best use of taxpayer dollars while meeting local needs and improving water quality in accordance with the goals of the statewide Iowa Nutrient Reduction Strategy (NRS).

Following are examples from two priority watersheds.



The Miller Creek Water Quality Improvement Project (in Black Hawk and Tama counties) had nearly

**6,500** acres of cover crops in 2017, which is estimated to be



**20%** of all the row crop acres in the watershed.

The Headwaters of the North Raccoon River Project (in Buena Vista and Pocahontas Counties), saw a

**400%** increase in cover crop acres from 2016-2017, with

**5,450** acres of cover crops in 2017.

This represents nearly

**10%** of total row crop acres in the watershed.

## The new IAWA Iowa Watershed Awards are designed to further strengthen the momentum that the watershed approach is building across Iowa.

Watershed coordinators, project staff who provide partnership-based management and technical assistance in a watershed, are a key ingredient to the success of locally driven water quality efforts.

IAWA  
IOWA AGRICULTURE  
WATER ALLIANCE

**IOWA  
WATERSHED  
AWARDS**



To honor watershed coordinators for their contributions and dedication to improving water quality, the Iowa Agriculture Water Alliance (IAWA) — in partnership with Iowa State University (ISU), the Iowa Department of Agriculture and Land Stewardship (IDALS), the Iowa Department of Natural Resources (DNR) and Conservation Districts of Iowa (CDI) — launched a new Iowa Watershed Awards program. In its inaugural year, **the 2018 Watershed Coordinator of the Year Award recognizes Lee Gravel, Headwaters of the North Raccoon Water Quality Initiative Project.**

## 3 Addressing water quality provides opportunities to create jobs and economic development.

As an example, the Iowa NRS calls for 12-17M acres of cover crops to reduce nutrient loss and erosion and improve water quality.



**"In a state where agriculture is a leading economic driver, protecting our natural resources is essential to our success."**

Mike Naig,  
Iowa Secretary of Agriculture  
and Co-Chair of the Conservation  
Infrastructure Initiative.

**Currently, there's not enough cover crop seed in the entire nation to meet Iowa's need. This creates the following future opportunities:**

**300,000** acres of seed production  
**300** aerial seed applicators  
**Special planters & Seed cleaners**

Opportunities such as this are attracting more private sector investment.

## 4 Farmer leaders, who are sharing their experiences with others, are helping increase the pace and scale of conservation efforts.

Dean Sponheim, Nora Springs, Iowa, is seeing businesses crop up around conservation practices in his watershed. Through his custom conservation business, Sponheim Sales and Services, he has been coordinating cereal rye seed production to meet growing demand for cover crops and has also been providing custom strip-tilling. He is now seeing some of his customers buy their own machines to start their own businesses. "It makes me feel like a proud father," he says.

In addition to in-field practices such as cover crops, these farmer leaders are implementing new innovative edge-of-field practices such as **denitrifying bioreactors and saturated buffers**.

The Rock Creek Watershed (Mitchell, Floyd, and Worth counties) is on the way to having **the nation's biggest concentration of edge-of-field practices for improving water quality**.



## Public-Private partnerships are key to improving water quality.

While efforts to improve water quality started within the walls of government, increased private sector investment and engagement is accelerating efforts and gaining traction.

After identifying barriers to scaling up conservation efforts to improve water quality, the Conservation Infrastructure Initiative is developing solutions that will increase the likelihood of successfully reaching Iowa NRS goals. The initiative strives to make conservation economical and easier for farmers, while harnessing economic drivers and market-based solutions to improve water quality more effectively.

**The Midwest Agriculture Water Quality Partnership Program is a great example of a public-private partnership to improve water quality.**

### Highlights from the 1st year include:

Partners held over

**190** field days

and conducted over **300**

workshops

With additional outreach efforts, this resulted in an estimated

**1.6** MILLION

contacts with landowners and farmers who are vital to scaling up conservation practices.



**\$1.23** MILLION in federal funds  
**\$13** MILLION and over

in match from partners for cover crops, no-till, strip-till, fertilizer management, bioreactors and saturated buffers. The project has already improved conservation on more than **1.3 million acres**.

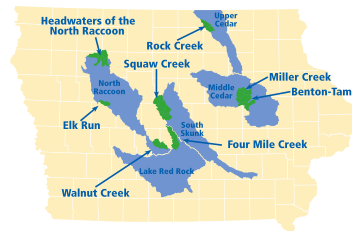


IAWA's Executive Director Sean McMahon and Iowa Governor Kim Reynolds share highlights of the first year of the Midwest Agriculture Water Quality Partnership Program.

This RCPP is co-led by IDALS and IAWA and offered through the Natural Resources Conservation Service (NRCS).

**47** partners have committed **\$48.5** MILLION

in the project, including **\$10M** in USDA funds and **\$38.5M** in non-federal partner match.



The IAWA Business Council brings unique private-sector skills and perspectives together to work on improving water quality. Our Business Council members include representatives from the following companies.

Agri Drain CORPORATION

Agrium

CONTEXT

CORTEVA agriscience

ECO PRACTICES Recognizing Responsibility

EFC SYSTEMS

ESE Ecosystem Services Exchange

Farm Nutrients

HAGIE

Houston Engineering Inc.

LA CROSSE SEED

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PEOPLES COMPANY INNOVATIVE REAL ESTATE SOLUTIONS

syngenta

VERDESAN THE NUTRIENT USE EFFICIENCY PEOPLE

IOWA CORN

IOWA SOYBEAN Association



IOWA PORK PRODUCERS ASSOCIATION

Founded in 2014 by Iowa Corn, the Iowa Soybean Association and the Iowa Pork Producers Association, the Iowa Agriculture Water Alliance is building public-private partnerships focused on implementing water quality solutions. Iowa farmers are actively engaged in various conservation efforts that improve water quality.

IAWA  
IOWA AGRICULTURE  
WATER ALLIANCE

**IAWA's mission** is to increase the pace and scale of farmer-led efforts to improve **water quality**.

For more information see: [www.IowaAgWaterAlliance.com](http://www.IowaAgWaterAlliance.com)

# WATER IN IOWA

IOWA FARM BUREAU // AGRI DRAIN CORPORATION // HOUSTON ENGINEERING // VERDESIAN LIFE SCIENCES  
ISG // HUBBELL REALTY // RDG PLANNING & DESIGN // SNYDER & ASSOCIATES, INC.



Ben Bader, Black Hawk County Farmer

## IOWA FARMERS' COLLABORATION BRINGS WATER QUALITY PROGRESS

Iowa's farmers wear many hats to grow our crops and raise our food. Being an expert at many things is what it takes to keep agriculture in Iowa sustainable. Today's innovative farmers are entrepreneurs, project managers and animal caretakers and that's just for starters. No matter what hat they wear or what job they do, the foundation of it all involves a commitment to taking care of our precious resources—the land and water of Iowa. It matters because, just like you, Iowa farmers eat the food they grow, drink the water that flows through their land, breathe the same air as their neighbors, strive to raise happy and healthy families and they want to protect the way of life that drew their ancestors here more than 150 years ago.

Today, as farmers continue to take on the challenge of improving Iowa's water quality, it is their many roles, their generational experience and their collaborative approach to finding new solutions which sets them apart from nearly any other

industry in Iowa. It is collaboration which keeps farmers on the land, and helps them do more with less. It takes collaboration for Iowa farmers to embrace precision agriculture, so they only fertilize fields that need it, when they need it, in the exact amount they need it. And, it is collaboration that helps farmers design conservation practices that best fit the individual landscapes of their diverse family farms.

Take for example, the Miller Creek Water Quality Improvement Project, a smaller watershed on the Middle Cedar River in north-eastern Iowa. It is here that watershed coordinators have worked with 40 landowners and farmers in Black Hawk County to implement a variety of water quality practices. The project's goal is to be the first watershed in Iowa to reduce nitrogen by 41 percent and phosphorous by 29 percent.

It started modestly in 2014 as farmers in the Miller Creek watershed planted 1,057 acres in cover crops to reduce erosion and keep

**Iowa continues to be home to safe drinking water. In 2015, the Iowa DNR reported 99.9 percent of public water systems had nitrate levels below the standard of 10 parts per million.**

*(State of Iowa Public Drinking Water Program 2015 Annual Compliance Report, June 2016.)*

nitrogen on the fields. But by 2017, Miller Creek saw an increase with 6,300 acres of cover crops planted, closing in on the goal to reduce nutrients from the watershed.

But, it takes more than cover crops. Miller Creek has also installed three bioreactors. This practice involves collaboration with ISU engineers and Black Hawk County Natural Resources Conservation Service who find the best places to put in a system that guides rainfall into a woodchip-filled pit, which naturally filters out nitrogen. Additionally, farmers have installed two saturated buffers to further filter the water and there are plans to put in even more. These saturated buffers also serve as native prairie strips, which serve as habitat for wildlife and pollinators.

**Thanks to practices like planting grassed buffers along streams or by leaving land undisturbed after harvest—often called no-till—Iowa decreased its erosion rate on cropland by 26 percent from 1982 to 2012.**

*(USDA National Resources Inventory Report)*

**A 2014 U.S. Geological survey of several decades of nitrate concentration and flow data from 10 major Iowa rivers indicated concentrations of nitrate decreased from 2000-2012 in all basins.**

*(Decadal surface water quality trends under variable climate, land use, and hydrogeochemical setting in Iowa, USA, 2014)*

The Miller Creek Water Quality Improvement Project is just one of many collaborative projects where farmers, community leaders, scientists and other experts are coming together to protect Iowa's land and water. Why? Because that's what Iowans do best—work together for common solutions. For more information about Iowa's water quality progress, visit [www.conservationcountsiowa.com](http://www.conservationcountsiowa.com).

**Nitrates in the Raccoon River have trended lower in the past 15 years despite a significant increase in corn acres in the watershed during that time.**

*(Agriculture's Clean Water Alliance 2013 Annual Report)*



**For the last ten years, Iowa farmers have invested as much as \$2.2 billion in conservation.**

*(2015 Iowa Farm & Rural Life Poll)*



President Charlie Schafer with Water Level Control Structures ready for shipment from Agri Drain Corporation.

## AGRI DRAIN, PROVIDING COMMON SENSE SOLUTIONS TO COMPLEX AGRICULTURAL AND ENVIRONMENTAL ISSUES

For over 40 years, Agri Drain has provided products and services to increase farm profitability while improving and protecting our valuable natural resources. Our water management products are used for in-field and edge-of-field agronomic and conservation practices such as drainage water management, sub-irrigation, saturated buffers, bio-reactors, tile outlet terraces, ponds and wetlands to conserve and improve water quality, increase yields and reduce soil erosion.

Agri Drain's Smart Drainage System® gives users the ability to manage their drainage system, ensuring the proper moisture level for maximum yield, while reducing nutrient loss and risks associated with drought or excessive moisture.

Agri Drain has teamed up with Ecosystem Services Exchange (ESE), who offers technical assistance for conservation practice planning and system design for in-field and edge-of-field water management practices. ESE works with contractors, private and public landowners, producers, and facility managers to increase farm profitability while providing multiple environmental benefits. ESE is a Technical Service Provider certified through the Natural Resources Conservation Service, United States Department of Agriculture.

Today, Agri Drain's patented water management products are sold to drainage contractors, farmers, and landowners throughout North America. Charlie Schafer continues as President and is the majority

owner of Agri Drain Corporation along with partners Chris Schafer, Kim Wedemeyer, Lisa Newby and Mark Gettler.

Agri Drain partners with local, state, national, and international agriculture, land improvement industry, and conservation organizations to provide common sense solutions to complex agricultural and environmental issues.

Agri Drain is a Proud Member of the Iowa Agriculture Water Alliance Business Council

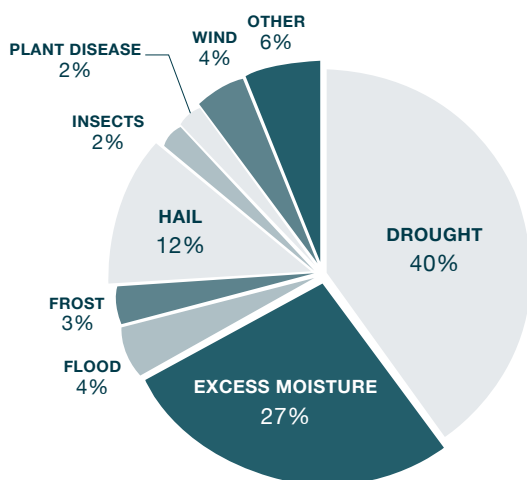


## CAN YOU ADD AND SUBTRACT?

Drought and excess moisture are the leading cause for corn and soybean loss. The practice of drainage water management and sub-irrigation with Agri Drain's Smart Drainage System® offers the solution!

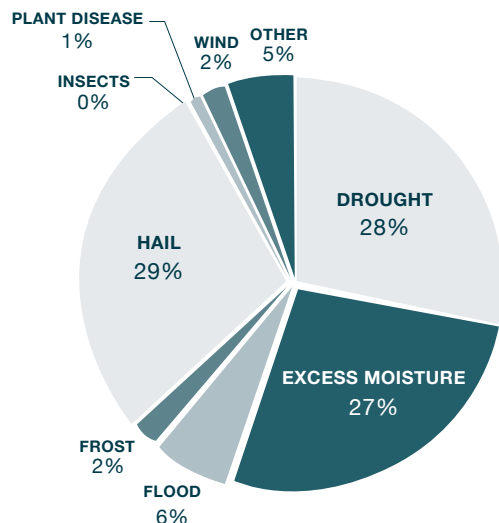
### Causes for Loss of Iowa Corn

1948 - 2010



### Causes for Loss of Iowa Soy

1955 - 2010



Charts courtesy of Chad Hart, Managing Risk in Agriculture, Iowa State University, June 2013.

## INCREASE YIELDS!

Subsurface drainage, drainage water management and sub-irrigation can increase yields by up to 64%.

*M.J. Fisher, N.R. Fausey, S.E. Subler, L.C. Brown and P.M. Bierman (1999) Water table management, nitrogen dynamics, and yields of corn and soybean. Soil Science Society of America 63:1786-1795.*

## IMPROVE WATER QUALITY!

Drainage water management, saturated buffers and bio-reactors reduce nitrogen leaving the field by 32-91%.

*C.A.J. Thompson, Matthew J. Helmers, Thomas M. Isenhardt and John D. Lawrence, "Reducing Nutrient Loss: Science Shows What Works" (2014). Agriculture and Environment Extension Publications. 223. [http://lib.dr.iastate.edu/extension\\_ag\\_pubs/223](http://lib.dr.iastate.edu/extension_ag_pubs/223)*



## CREATIVE SOLUTIONS REQUIRE BOLD NEW IDEAS

It is time for the next generation of watershed planning—bigger, better, and faster data-driven plans that connect the dots and provide accountability through measurable results. Plans optimized to work together, from one watershed to the next, maximizing resources to combine individual practices as part of a larger system, on a local and statewide scale. Houston Engineering, Inc. (HEI) aims to improve water quality across the state of Iowa. Guiding watershed management with innovative solutions is HEI's business. We understand connections across a watershed—rural and urban, farmland and stream—and we are using this understanding to bring Iowa's watershed planning into the next generation.

### **Everything is connected and a one watershed approach is critical.**

Our plans yield more efficient outreach, which is critical to building the public-private partnerships necessary to attract funding to reach the most important goal: increasing the pace and scale of conservation implementation to achieve the goals of the Iowa Nutrient Reduction Strategy and Iowa Watershed Approach.

### **An innovative atmosphere leads to lasting solutions that work.**

HEI has a history of innovative watershed planning with experience that stretches across the nation. Now, we are working with the Iowa Agriculture Water Alliance and others in the Middle Cedar Watershed



*Mario Fenu, Iowa Business Development Manager*

to bring innovative watershed planning to Iowa. We test our assumptions and promote an atmosphere where innovative watershed planning targets specific projects, engages the public, and incorporates soil health.

Iowa, let's rise to the challenge to find new results that inspire and create leadership in sustainable agriculture and conservation for the next generation.



5550 Wild Rose Lane, Suite 400  
West Des Moines, IA 50266  
(515) 401-1471 | [www.houstoneng.com](http://www.houstoneng.com)

Houston Engineering is a Proud Member of the  
Iowa Agriculture Water Alliance Business Council



# HEALTHY SOIL, HAPPY EARTHWORMS

## *The positive by-product of polymer fertilizer additives*

Although fertilizer treatments are fixtures of contemporary agriculture, how much do we know about the polymers they're made up of? Soluble polymers reach the soil anytime fertilizer is applied. So what are the effects of polymers on microorganisms in the soil? A recent study by Verdesian Life Sciences measured the long-term effects of a polymer-based enhanced efficiency fertilizer treatment (AVAIL® Phosphorus Fertilizer Enhancer) on earthworms.

The 12-month study measured effects on three factors of earthworm development: mortality, growth and reproduction rates. Researchers compared three test groups containing earthworms in soil treated with AVAIL at use rate (Group 1), as well as at three times (Group 2) and 10 times

(Group 3) the use rate, with a control group of earthworms and untreated soil.

At the study's conclusion, researchers found a 0% mortality rate across all groups, meaning neither treated nor untreated soil had a negative impact on earthworm survival. Growth rate was measured as an average percentage of inhibition compared to the control group, and earthworms in Group 1 experienced a -9.9% inhibition rate, meaning they had a significantly higher average weight gain than the control. Thus, earthworms exposed to AVAIL experienced more growth on average than those in untreated soil. Finally, reproduction rates in all three test groups remained within natural population variability and were insignificant.

Thus, the application of AVAIL seemed to have a positive effect on earthworm growth when applied at use rate — a surprising finding that may further incentivize fertilizer additive use in the future. After all, because earthworms spend their lives consuming organic matter and recycling their nutrients, their presence doesn't just indicate soil health — it also contributes to it.

This means that for growers who choose to use polymer-based nutrient use efficiency products like AVAIL, benefits are twofold: improved availability of and efficiency of their applied fertilizers and healthy earthworm populations improving soil health and nutrient uptake, leading to healthier plants, a stronger yield potential, and rapid, early growth. To learn more visit [www.vlsci.com/avail](http://www.vlsci.com/avail).



**VERDESIAN**  
THE NUTRIENT USE  
EFFICIENCY PEOPLE

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# HOLISTIC WATER QUALITY LEADERSHIP

*Revitalizing. Guiding. Connecting.*

Statewide water quality leadership starts with a deep connection and commitment to all things water – and ISG is experienced in doing just that. Whether it's working with partners to improve recreational opportunities and revitalize historic riverfronts through projects like the Des Moines Area MPO, to a 40+ year history of agricultural leadership, ISG understands the interconnectivity of our rivers, lakes, and streams and their role in supporting vibrant communities.

Reconnecting Iowans to their water resources and promoting economic potential starts with an integrative approach to planning – one that incorporates public art, green urban stormwater solutions, land and water trails, and business opportunity.

With focused urban connectivity efforts and intricate municipal and water/wastewater solutions to working with rural landowners to restore wetlands, ISG's comprehensive package of water quality expertise is leading efforts to create a sustainable future.

Iowa's outdoor recreation generates over \$8.7 billion in annual consumer spending, highlighting potential ecotourism opportunities and the impact strategic investments in outdoor recreation and water quality can have on local economies and quality of life. Through established and ongoing partnerships with local agencies, chambers of commerce, community leaders and rural landowners, ISG is fully integrated in Iowa's water future. The time is now – and ISG is eager to continue the charge.



## FOCUSED PROFESSIONALS + MULTI-MARKET EXPERTISE

- Water Quality Specialists
- Environmental Scientists
- Civil and Water/Wastewater Engineers
- Landscape Architects
- Planners and Advocates
- Holistic Partner for Success



# INVALUABLE ASSETS CAN BE FOUND IN IOWA WATER

For years, we've been tirelessly working to find a positive solution for our discarded rivers and streams. Now, within the next decade, Des Moines could be a recreation Mecca – 150 miles of water trails with whitewater rafting, kayaking and habitat restoration connected by bike trails and river walks thanks to the Water Trails and Greenways Master Plan.

Places like Columbus, Georgia and Boise, Idaho have attracted national attention – so why not Des Moines?

As one of the fastest-growing cities in the Midwest, we need to compete on a

national level to gain and retain a quality workforce. Activating our waterways into recreational destinations will drive economic development, increase tourism, heighten the quality of our water and land, improve wildlife habitat and most importantly, enhance the quality of life within our communities.

That's why I've spent countless hours in front of those who can make this vision a reality. The Greater Des Moines Water Trails and Greenways Master Plan would not be where it is today without the stewardship of our communities – mayors, city council members, county supervisors,

business leaders, non-profit leaders, park and recreation board members, city and county staff members, and many more.

We have a strong cultural arts scene, hundreds of miles of bike trails and an active, growing population. Recreating our waterways could be the final key to take Des Moines over the top. I can see it now, "Des Moines: Surfing Capitol of the Midwest."

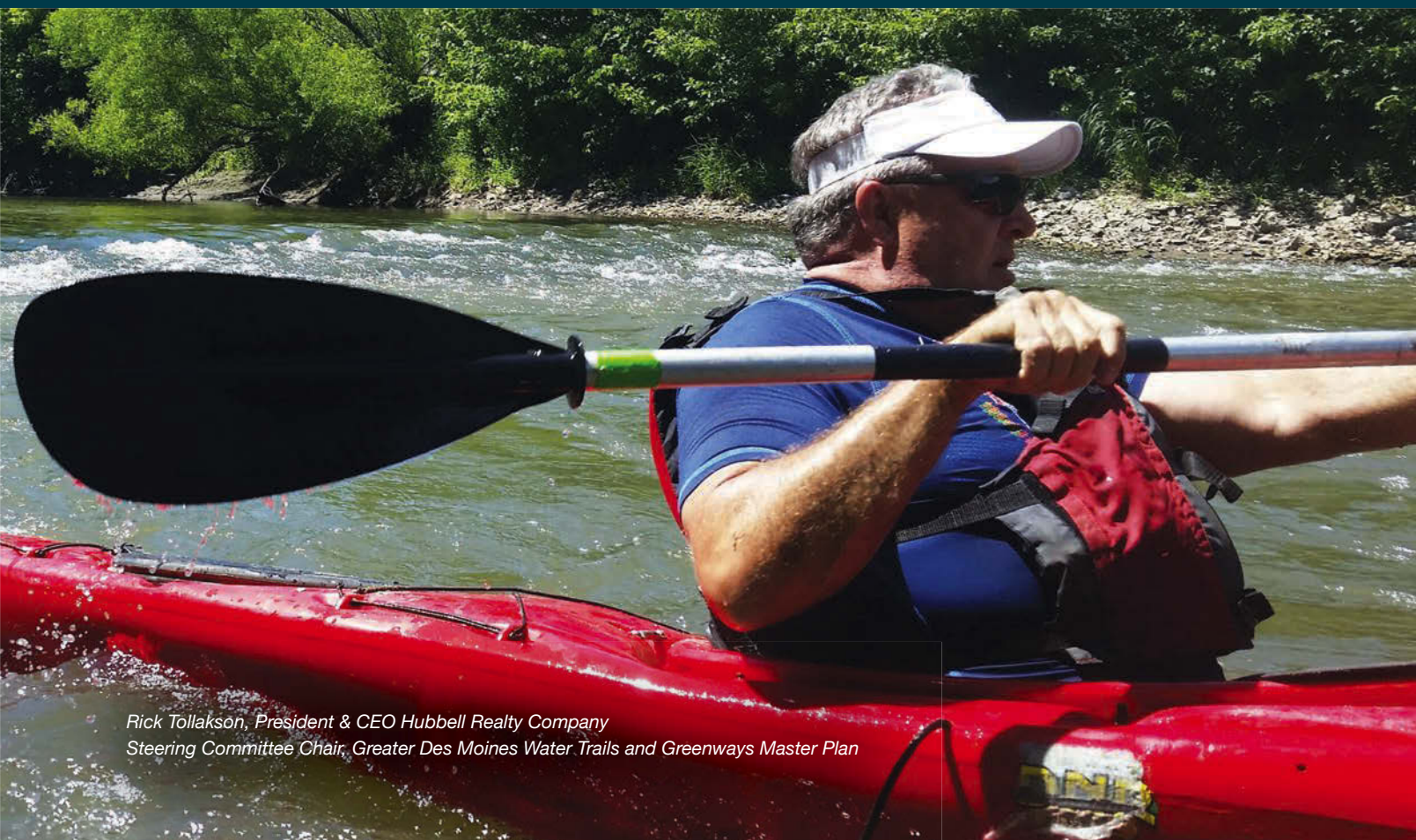
This plan spans far beyond the confluence of our two main rivers and I, personally, can't wait to dive in.



President & CEO  
Hubbell Realty Company



6900 Westown Parkway | West Des Moines, IA 50266  
(515) 243-3228 | [desmoineswatertrails.com](http://desmoineswatertrails.com)



*Rick Tollakson, President & CEO Hubbell Realty Company  
Steering Committee Chair, Greater Des Moines Water Trails and Greenways Master Plan*



# HEALTHY WATER, HEALTHY COMMUNITIES

Whether park, building complex or community, our work mimics and supports the living system of water, air, plants and soils. We create spaces and communities that function in harmony with the landscape. This work yields resilient communities and projects, built for present and future generations.

We make sure your lakes, rivers and streams serve your community as an exceptional asset – promoting public health and attracting businesses, skilled workers, young adults and growing families. This is the path to community health and economic vitality. We do this through partnering with communities, businesses and landowners, providing thoughtful

planning and effective projects. When we restore streams, manage stormwater and develop greenways, we leave landscapes in better condition than we found them. And we leave your community poised for the future. That's our commitment.

RDG Planning & Design brings architects, landscape architects, engineers, artists and planners to your project – as we have since 1965. Diverse in knowledge and experience, we unite in the pursuit of meaning for our clients. Daily, our ability to think, analyze, communicate, draw, conceive, and design connects us to our clients, creating meaningful things and places – together.



## KEY SERVICES PROVIDED:

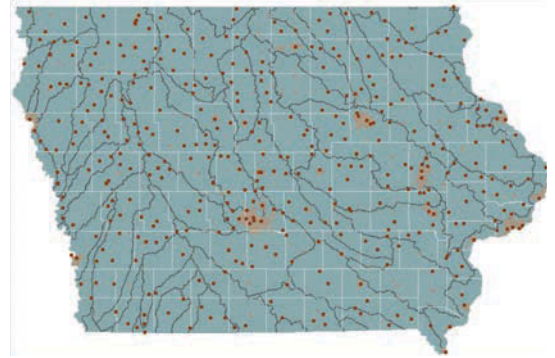
- Landscape Architecture
- Civil Engineering
- Planning
- GIS/Modeling Analysis
- Stormwater Systems Analysis
- Watershed Condition Assessments
- Stream Condition Assessments
- Riverfront Planning & Restoration
- Floodplain Protection/Risk Reduction
- Regional/Campus Stormwater Management
- Community/Stakeholder Engagement

## IMPROVING WATER QUALITY ACROSS IOWA

As Iowa's largest civil engineering firm, we've gained a deep understanding of the water quality challenges facing our public and private clients.

Both rural and urban areas have increasing concern about the destructive power of water such as flooding, erosion, and water quality related issues. But with proper planning, challenges can become opportunities to improve the overall health of the natural environment.

During site reconnaissance and design, careful attention is given to water resources. We assess sites for wetlands and streams to avoid and minimize impacts to natural buffers and waterways. When natural resources are identified, we provide cost-effective, attractive design solutions to improve and protect the environment.



**Our water quality project locations**

### FOURMILE CREEK WATERSHED IMPROVEMENTS

Implementing practices presented in the watershed management plan.

- Stream restoration and wetland enhancements
- Native vegetation re-establishment
- Flood protection



### MCKINLEY LAKE PRESERVATION

Creating a more valuable resource for the community of Creston.

- Hurley Creek and wetland restoration
- Sediment reduction strategies
- Native species re-establishment



### DES MOINES RIVER DAM REMOVAL

The dam removal in Fort Dodge is essential to improve water quality, recreational safety and restoring the river.

- Improving the integrity of the river
- Restoring natural in-stream habitat
- Meeting the designated uses for the river



### RESIDENTIAL WATER QUALITY ENHANCEMENTS

St. James Place in Ankeny included water quality features resulting in stormwater infiltration within the development footprint.

- Floodplain and wetland protection
- Low impact development design
- Reduced right-of-way footprint



DELIVERING  
PROJECTS

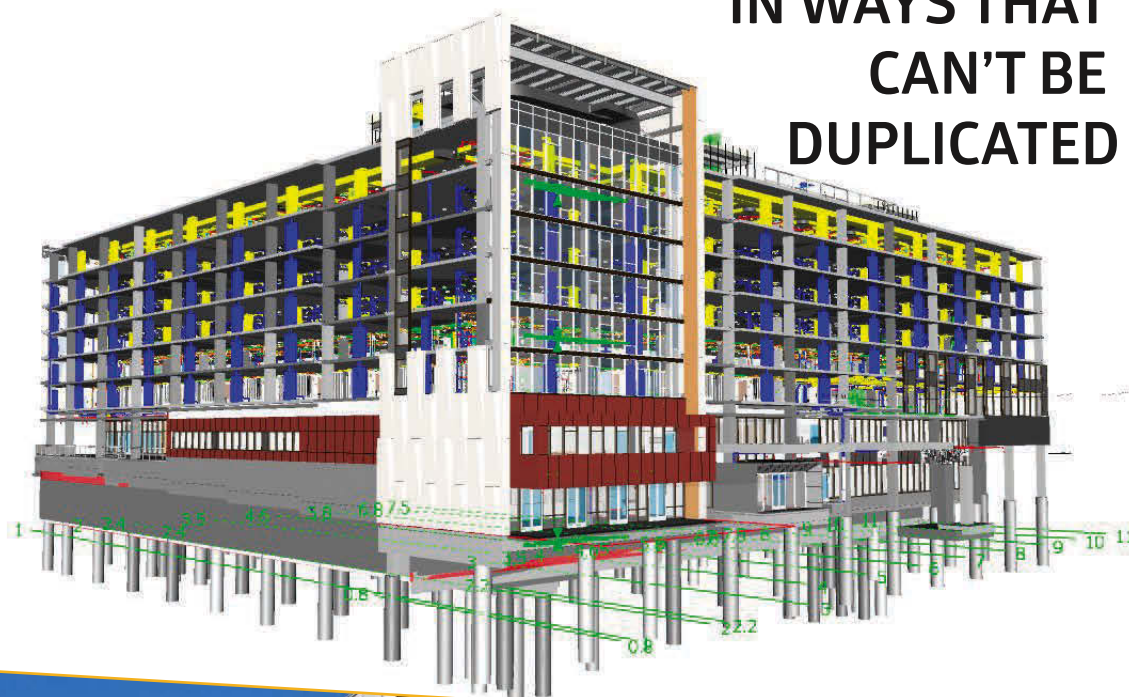


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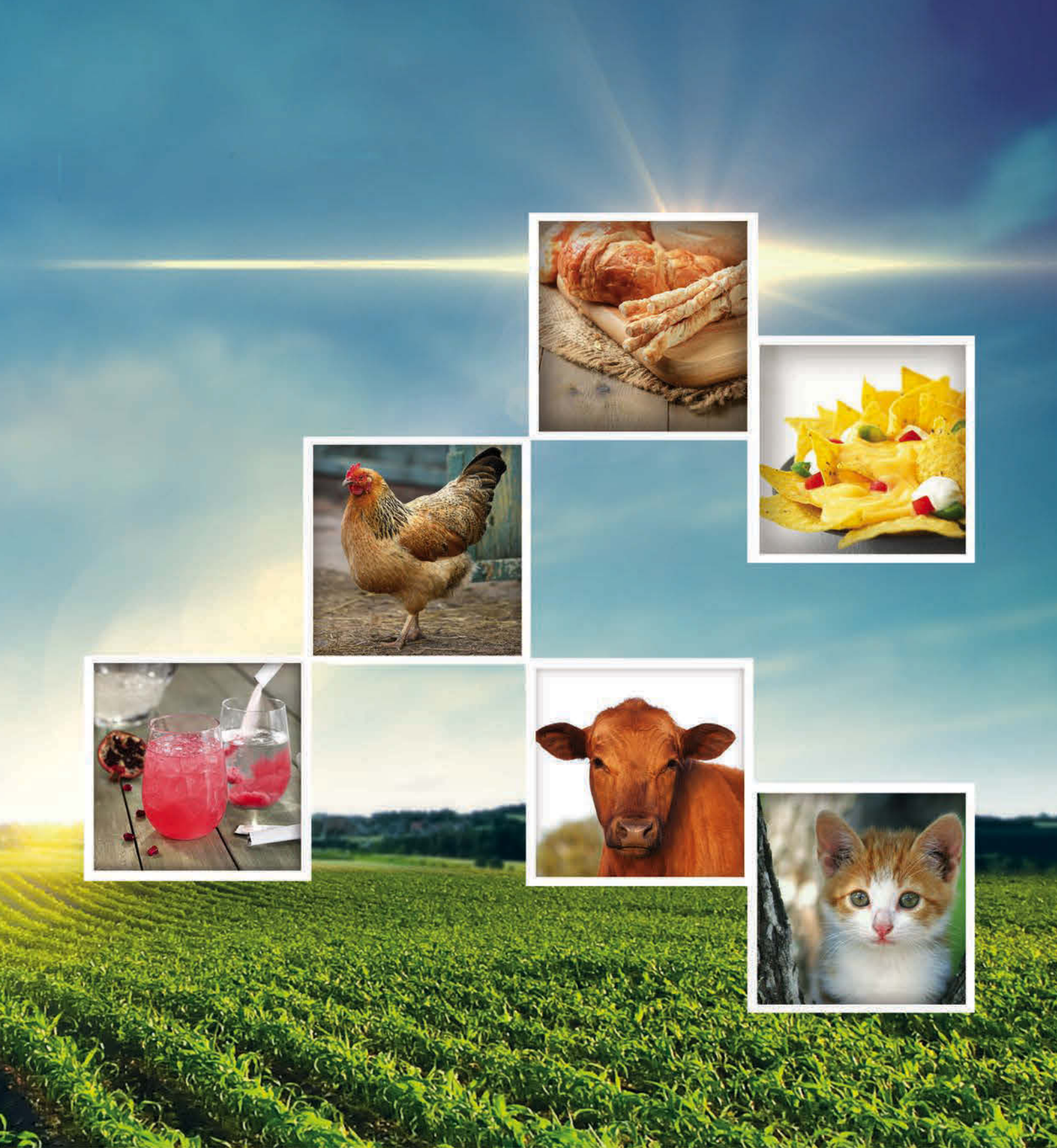


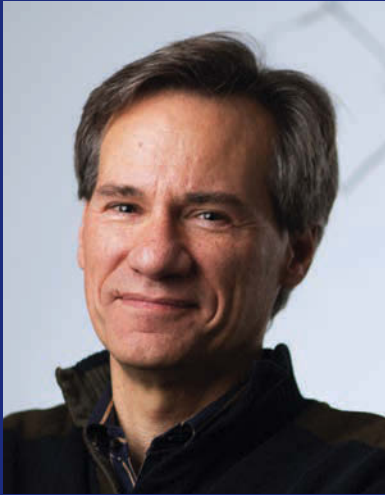
# Supporting a landscape of Innovation

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Q&A

# BRENT H. SHANKS

*Engineering Professor, Iowa State University*

BY KENT DARR

Brent H. Shanks wears a few hats in the world of innovation, including the director for the National Science Foundation's Engineering Research Center for Biorenewable Chemicals, the Anson Marston Distinguished Professor in Engineering at Iowa State University and the Mike and Jean Steffenson Chair, Chemical & Biological Engineering.

## How do you personally define innovation?

Innovation is uniquely integrating knowledge to create something novel that solves a societal challenge/need.

### What did you learn about innovating from your parents/mentors?

My parents were quite broadly curious and valued knowledge. They were both raised on farms, so they had an ethos of making things work.

### What was the first significant innovation, invention or process that you were associated with?

Working in a company after graduate school, we had a team that produced a new product for the petrochemical processing industry with improved performance and lower raw materials costs. The product ended up being sold to companies around the world.

### What are some of the ways that ISU and the National Science Foundation Engineering Research Center for Biorenewable Chemicals (CBiRC) cultivates a culture of innovation?

CBiRC tries to advance innovation using three principles:

- Clear definition of the problem that we are trying to solve.
- Encouraging interactions between multidisciplinary researchers.
- Providing support to nurture and develop innovative ideas.

# GLOBAL SCIENCE. LOCAL SOLUTIONS.



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AROUND THE WORLD.**



“ Innovation is uniquely integrating knowledge to create something novel that solves a societal challenge/need.”

**BRENT SHANKS**

*Engineering Professor, Iowa State University*

**What recent innovation has prompted a “wow” reaction from you?**

There are quite a number that I find remarkable. One such is the ongoing innovation in the automotive industry, but I am also concerned about the concomitant societal dislocations we are headed toward with that emerging technology.

**What are two or three of the most exciting areas of innovation that you are working in?**

In the early 21st century, interest in biobased chemicals was largely driven with an eye toward sustainability. While I believe that remains an important long-term goal, I think an exciting opportunity with biobased chemicals is their potential to provide novel chemical compounds that cannot be viably accessed from crude oil. These novel molecules will lead to the next generation of consumer products, materials, nutraceuticals, antimicrobials, etc. I am particularly enthused about recent work in CBIRC that has identified different novel biobased chemicals that appear to have promising performance as an antimicrobial, insecticide and improved Nylon-type polymer, respectively.

**What technology advances will make it easier for bioscience companies to create new products?**

Biological systems are sufficiently complex that their use and alteration has historically relied on phenomenological behavior. However, we are in the midst of rapid technology development that will allow us to better understand these complex biological systems and as such have more targeted control of them. One such technology receiving significant recent attention is Crispr for more precise gene editing. However, our understanding at the organism level is also rapidly advancing.

**What are the key ingredients of an innovator or the folks you would like to attract to ISU and the National Science Foundation Engineering Research Center for Biorenewable Chemicals?**

I value researchers with deep knowledge in their area of expertise who are looking to creatively apply that knowledge with researchers having complimentary deep knowledge. I find innovation that occurs at the interface between different disciplinary expertise to be particularly exciting, so I hope to find people that have interest in those types of interactions.



**What do you see as the most pressing global innovation challenge?**

I think it is how to sustainably and equitably support the needs of a growing population. This was probably a somewhat unfair answer to the question as it cascades into challenges in a number of realms, e.g., energy, food, health, environment, etc.

**What are the emerging areas of bioscience?**

Better understanding of biological systems has broad implications to almost all aspects of life. For example, materials, crops, animals and medicine are all areas in which bioscience applications are poised for rapid innovations. ■

# The power to **grow.**

Granular, the world's leading supplier of agriculture software and data science, provides farmers with the powerful tools they need to efficiently grow — their crops, acreage, and most importantly, their bottom line. Granular gives growers an intuitive way to improve yields and profit across the entire enterprise and down to the field level.



# Six agritech startups selected for Iowa AgriTech Accelerator's second year

New program tweaks add to accelerator's growing mentorship base

BY KATE HAYDEN

By the end of May, the Iowa AgriTech Accelerator welcomes six new startups fresh on the agriculture field to Des Moines.

Each of those startups selected to participate receives \$40,000 in seed funding, subsidized housing throughout the 94 days, and time to build mentorships, partnerships and a broader agritech network in Iowa, Executive Director Megan Vollstedt said.

"A great example of the dynamic environment that we have, and the collaborative environment, was the variety of technology that we were working with" last year, Vollstedt said. "From the startups that we had, we were working with a software-to-service company, pure machinery-hardware companies, to some in between. That was a great range, and I think also a testament to the amount of innovation that can happen in agriculture technology."

## **Tell us about the first year. What stood out to you out of the five startups represented?**

Being our first year last year, we had a great cohort of startups. We had a great connection between all of the mentors and investors. I think everybody was really involved and engaged and really interested in supporting each other and making the accelerator first cohort a success.

... We were all going into it eyes open and understanding that we have a fantastic group of supporters — the investors, the community support, the mentors, the agtech industry that is here. But I think we were ready to be adaptable, to be flexible with the startups and the needs that we knew we were going to encounter during those days.

## **Tell us about the challenges the accelerator faced during the first year. What were you learning as that was ongoing?**

A good example of being adaptable is continuing to build our network of



“... we are mentor-driven, so it’s essential to have that rich group of individuals.”

**MEGAN VOLLSTEDT**

*Executive Director, Iowa AgriTech Accelerator*

mentors and experts, [which] became a need last year, as we learned what the startups were facing and what their needs and their goals were once they arrived. Whether that was a need for better rapid prototyping, or more connections to farmers with 1,000-plus acres — being able to communicate with them and do customer discovery with them -- that's a couple of examples where we needed to find more resources for the startups. Those were two areas I had to work on developing during the 100 days at that point.

**How did you connect with those mentors and businesses?**

We are supported by seven corporate investors, and their support and involvement in the accelerator are key. A lot of the mentors — we have about 40 percent of the mentors come from those seven investor companies. That's experts and professionals who work in agribusiness and have worked with ag startups, or they're the experts in the industry and they have that fantastic background to support the startups in what they're beginning to work on. ... Since then, I've talked to so many people who attended some of our events last year and wanted to be involved as a mentor and also reached out a little bit more to fill some of those needs that we saw last year, some more rapid prototyping and different focus areas of

agriculture — dairy farming or poultry — I've been working myself to build that network and make sure we have the resources.

I believe we're up to about 117 mentors; we ended the last cohort with about 90-some. They're wonderful people who are able to support us, and we are mentor-driven, so it's essential to have that rich group of individuals.

**Tell us about upcoming plans in Year Two. What is being changed, and what worked really well in the first year?**

Our timeline has changed this next year. Our cohort dates will be May 29 to Aug. 30. That's so we can avoid harvest a little more and not overlap. We did have some teams last year who needed to be out working with customers in that essential time of the year, and our program overlapped with it. We had to be flexible, but we decided this year to fit that time period between planting and harvest.

The startups, pretty much all of them left last year saying that the huge value for them in this accelerator was the people they could meet, the connections that they got, the opening of doors that they had tried to get on their own and weren't successful in getting and didn't know that they could get through our mentor pool and our community of supporters. ...

We also have entrepreneurs-in-residence that are part of our program,

and they come in once a week working with the startups in very specific areas one-on-one. We are incorporating that again this next year because that, again, was another huge piece for the startups to take value from. They cited that as having an extra team member, basically, during their time here, and that focused attention was really huge.

We are going to repeat our demo day format with the World Food Prize in October, and that was a wonderful relationship that we had last year, and a really great event to take advantage of, focused on agriculture sustainability, and the audience that's in Des Moines and the focus that's on Des Moines in that time frame. We're still going to do our formal demo day then, even though the program has ended on Aug. 30.

Demo day is when we have the startups do a pitch presentation — it's a product pitch to the audience, and its intent is so that they can show the progress that they've made, they're able to communicate where they're going next, and in the audience we'd have potential customers, or partners or investors, for their next steps. It helps prepare them for more of those conversations.

New this year, we'll be ending our program on Aug. 30, and that ties into the Farm Progress Show in Boone. So we will have a better presence at the Farm Progress Show in our current cohort. ...

We'll be invited to participate in a little bit different way, so we're going to take advantage of that regional, local event. That's also key in ag tech innovation, to be present there.

**Do you plan to continue to follow up with those startups, six months or a year later? What does that look like?**

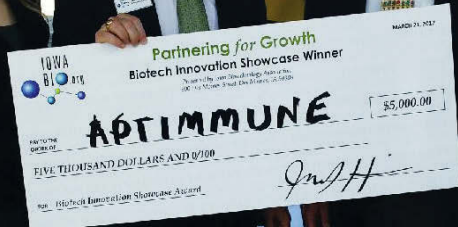
I keep in touch with our startups from last year quite often. I'm still able to connect them to people they're looking for, for help in different areas. When I talk with them and I learn what they need or what they're working on, I can help make connections and support them. They'll often just check in and tell me what they're up to — we work really closely together for those 100 days. ... The seed funding that we provide, we do take an investment in their company, so formally we do keep up with how the company or the startups are doing.

**What does the accelerator look like in the future?**

As long as we have the corporate support and the opportunity to accept startups into our program, we'll still be here helping to innovate. The investor companies that we have are interested in providing value back into the ag ecosystem — part of that comes from new innovations that they can support. Being involved in the accelerator is a great way to do that. ■

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# Wisran tracking big steps forward after Iowa accelerator experience

California software service reaches farmers where they are with data collection

BY KATE HAYDEN

Co-founder and CEO Arsalan Lodhi likes to compare agtech startup Wisran to public utilities metering.

Without water or gas meters, Lodhi said, communities would have no way to track the waste of resources incurred by residents, and costs would look much different.

“The same concept and principles we are bringing to farming operations,” Lodhi said, “right now, people are blindly doing the best they can, with no system or recording of how they are utilizing their people, equipment and fuel while they are out on the field.”

Wisran is a new type of meter for farmers tracking their resources, Lodhi said: a cloud-based software system that picks up tablet sensors on farmers’ equipment, tracking time per task, resources used and other data points for farmers to review.

“We autonomously meter and record the operating time and cost, and tell them where the inefficiencies are happening between what they thought and what’s really going on in the ground, so that they can do something about it,” Lodhi said.

Four years after Lodhi founded the company with partners Justin Durdan and Arsalan Khan, Wisran’s beta software system is working on select fields in California and the Midwest — and the company is developing partnerships with ag giants John Deere and DuPont Pioneer, thanks to a stint in the Iowa AgriTech Accelerator based in Des Moines.

Lodhi represented Wisran in the first cohort hosted by the agtech accelerator in 2017. The accelerator connected startups from across the U.S. with mentors and strategic partners established in the agriculture industry.

“My goal at that time was to build relationships with them, get exposed to both John Deere and DuPont, who are definitely our strategic partners,” Lodhi said.

“Iowa is inherent for us in terms of the market, and that’s another thing I could leverage when I was there.”

Lodhi has more than 17 years of experience in software development, but stumbled into agritech after a chance meeting in California with Durdan, an Illinois-based operator of nearly 30,000 acres. Durdan had just stepped off the stage of a panel discussion in Silicon Valley when Lodhi approached him.

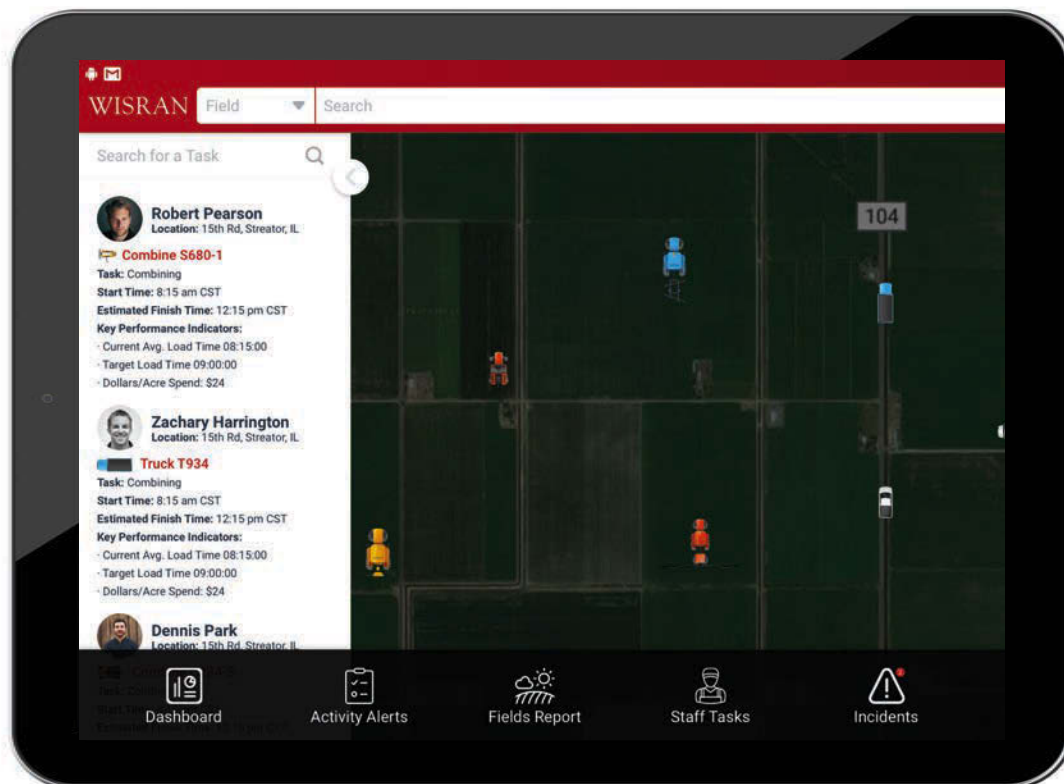
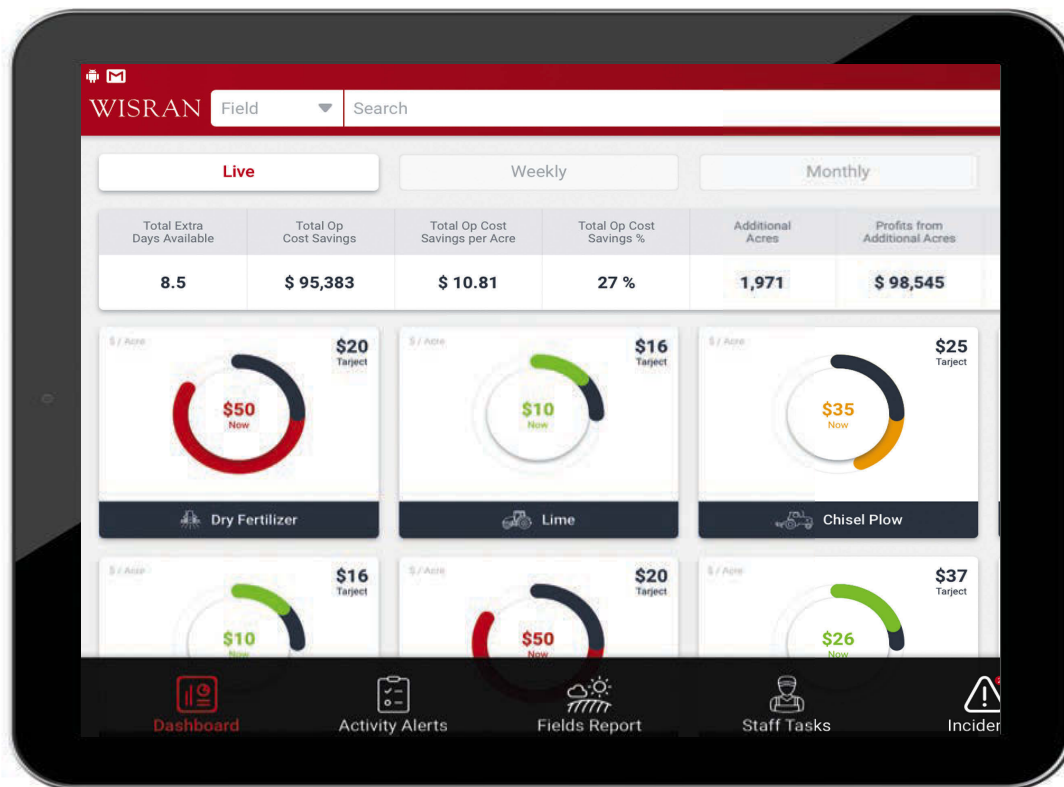
“[I] asked how he thinks he can improve his profit margins. ... He didn’t have a good answer or a clear strategy as we talked about different things,” Lodhi said. “I went to his farm, and there was no clear answer at that time. We were just brainstorming different things. ... After six, seven months we saw a few areas where nobody was paying attention, and we found there were a few opportunities.”

By February, five pilot customers were testing Wisran software in the fields, and the company announced a \$35,000 grant from the Australian Ministry of Science and Technology to expand the company abroad. A potential research partnership with the Department of Agriculture and the University of Southern Queensland is also being discussed.

“Within two weeks we were connected with the biggest corporate farmer over there, and they are very interested in working with us,” Lodhi said. “The Department of Agriculture is very supportive. They are exposing farmers to us, connecting us. So I’m going back there in March, and am very excited and looking for more opportunities there.”

The software service still has work before Wisran can launch a commercial version later in 2018, but early success — and attention — has Lodhi optimistic for the product’s future.

“If I can make some difference in the life of a farmer in terms of becoming sophisticated in how they use or utilize operations — but also in the end to see more margins — that would be a very fulfilling experience,” Lodhi said. ■



CONTRIBUTED IMAGES

TOP: Sensors on farmers' machinery allows the Wisran software to track how much resources are spent on a particular task.  
 BOTTOM: Wisran's dashboard allows farming operations to track where vehicles are and how much time they spend on each task.



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For more information, contact **(888) REG-8686** or visit us at [regi.com](http://regi.com)

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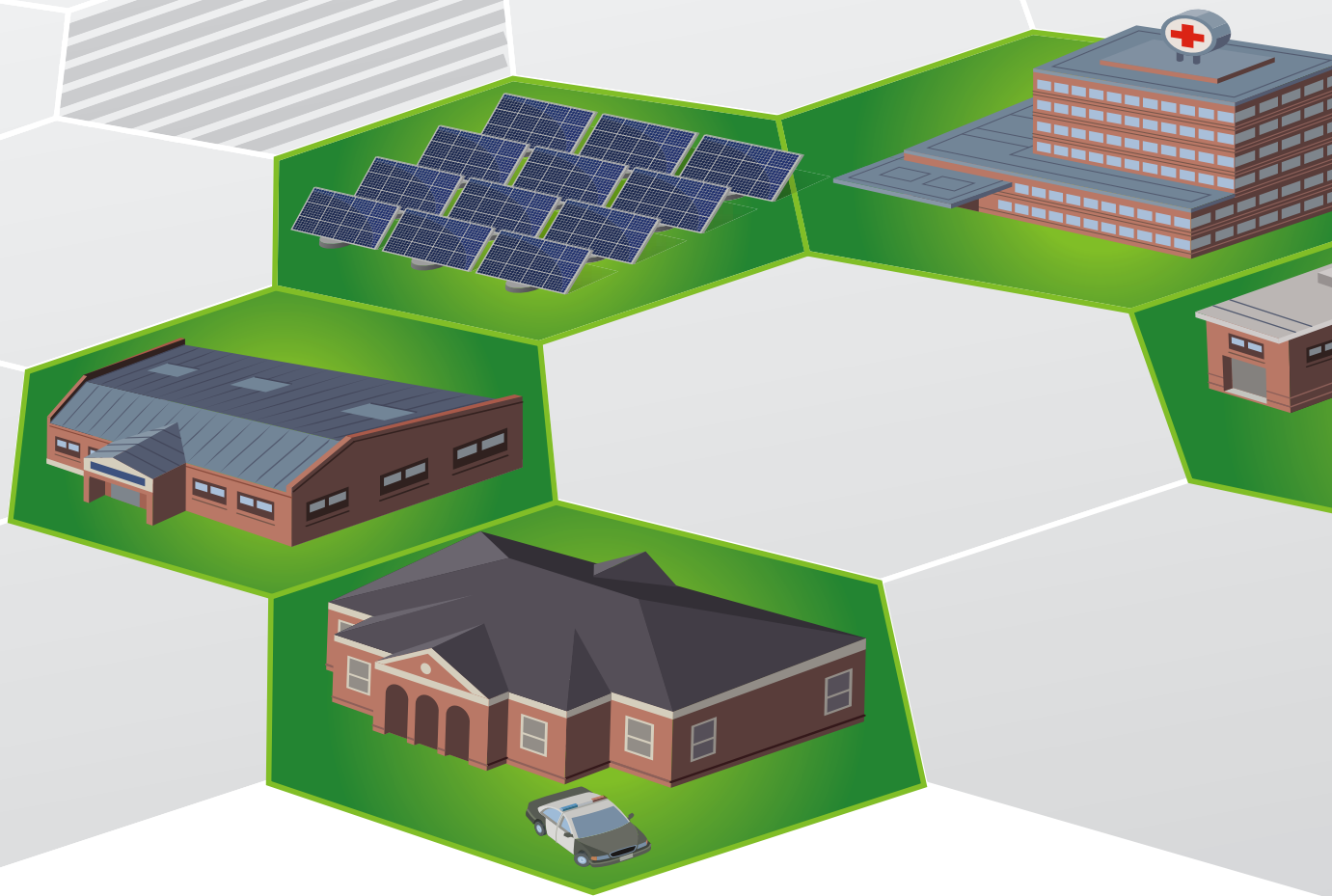


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Q&A

# ADAM WRIGHT

BY KENT DARR

*President and CEO, MidAmerican Energy Co.*

Adam Wright is the president and CEO of MidAmerican Energy Co., which serves 760,000 customers in Iowa, Illinois, South Dakota and Nebraska. In the first part of 2018, the energy company announced it had completed two of its latest Iowa wind farms, adding to Iowa's growing wind energy generation. MidAmerican is on a quest for 100 percent renewable energy.

## How do you define innovation?

To me, innovation is coming up with or doing something new or different to solve a problem, capture an opportunity or make something better. The “innovative solution” usually is a culmination of multiple innovations; for example, the iPad. At MidAmerican Energy, it means constantly looking for ways to improve the way we provide service to our

customers, lower our impact on the environment and make the workplace better for our employees.

### **What did you learn about innovating from your parents/mentors?**

There are answers and solutions all around you and within your reach — now, go figure it out.

### **What was the first significant innovation, invention or process that you were associated with?**

Extracting zinc and other metals from brine during geothermal energy production.

### **What are some of the ways that MidAmerican cultivates a culture of innovation?**

We have an online suggestion box so anyone in the company can present new ideas or ways of doing things. We also are transitioning to an open floor plan concept in our offices and facilities to better allow for the free exchange of ideas.

### **Outside of MidAmerican, what recent innovation has prompted a “wow” reaction from you?**

Virtual personal assistants like Alexa and Siri. These aren't new, but I'm amazed every time I use them.

### **What are two or three of the most exciting areas of innovation that MidAmerican is working in?**


MidAmerican is pursuing use of augmented reality and digital e-books to enhance training of our skilled craftspeople and other technical roles — the technology is mind-blowing, and we can easily see how the quality, depth and pace of learning will improve as a result.

### **What areas of education or expertise are in the shortest supply for companies like MidAmerican?**

Skilled crafts. Parents — and society — tend to push kids toward secondary education rather than the trades, which offer great wages,







benefits and career opportunities. This has historically resulted in a shortage of people with the right aptitude for this work, although we are starting to see some of the interest return through initiatives and partnerships like the Skilled Trades Alliance. Something most people don't realize is that these jobs come with a paid apprenticeship — so you make money while you learn how to do your job — as opposed to secondary education that usually comes with a significant cost burden.

At MidAmerican Energy, we've partnered with the International Brotherhood of Electrical Workers to open the Center for Excellence, a state-of-the-art facility to train future line mechanics.

**What do you see as the most pressing global innovation challenge?**

Climate change. It will take multiple innovations to create the incremental improvements necessary to move toward

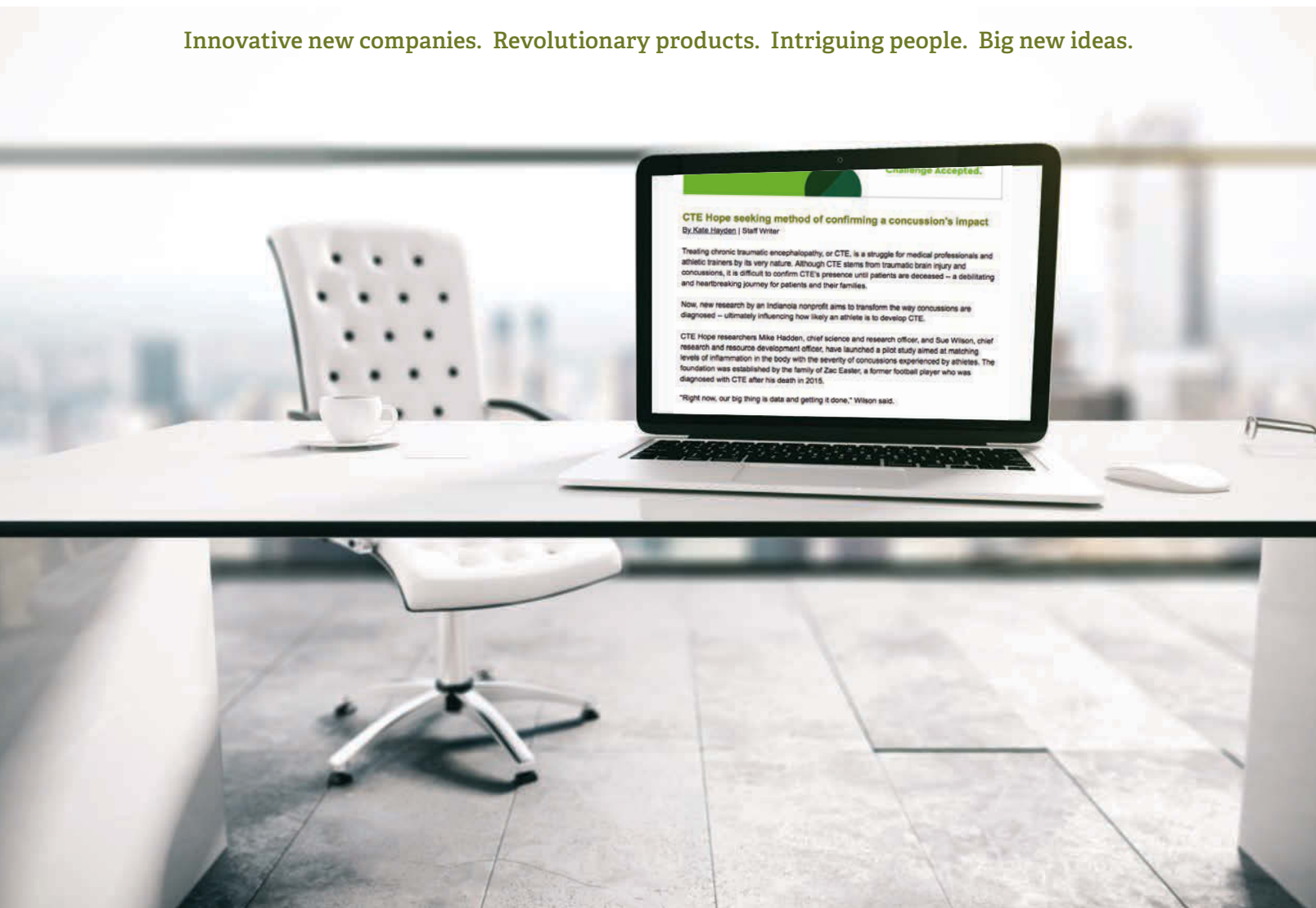
a solution. There are countless benefits to moving the focus to renewable energy, which is a place where MidAmerican Energy can make a difference. We are working to set the standard and demonstrating how the transition can be seamless for our customers.

**What are the most significant challenges MidAmerican confronts as it transitions away from reliance on coal?**

Balancing the outcome. MidAmerican Energy has a goal to provide our customers with 100 percent renewable energy. We've made great strides toward that mark due to our investments in wind energy projects around the state. But those investments must occur in a way that also allows us to prioritize reliability and affordability for our customers. ■

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# Predicting future floods

The Iowa Flood Information System gets a reboot with artificial intelligence

BY KATE HAYDEN

The next time communities are hit by a massive flood, researchers at the University of Iowa's hydroscience and engineering department hope critical information could be reached with a quick ask of Alexa.

That wasn't the case in 2008. June 2018 marks 10 years since floodwaters devastated a number of northeast Iowa communities. At the time, Iowans could barely wait for the water to recede before recovery mode kicked in: Across the state, damage to homes, commercial property, infrastructure and agriculture was estimated at nearly \$10 billion by the U.S. Department of Commerce, the National Weather Service and the National Oceanic and Atmospheric Administration.

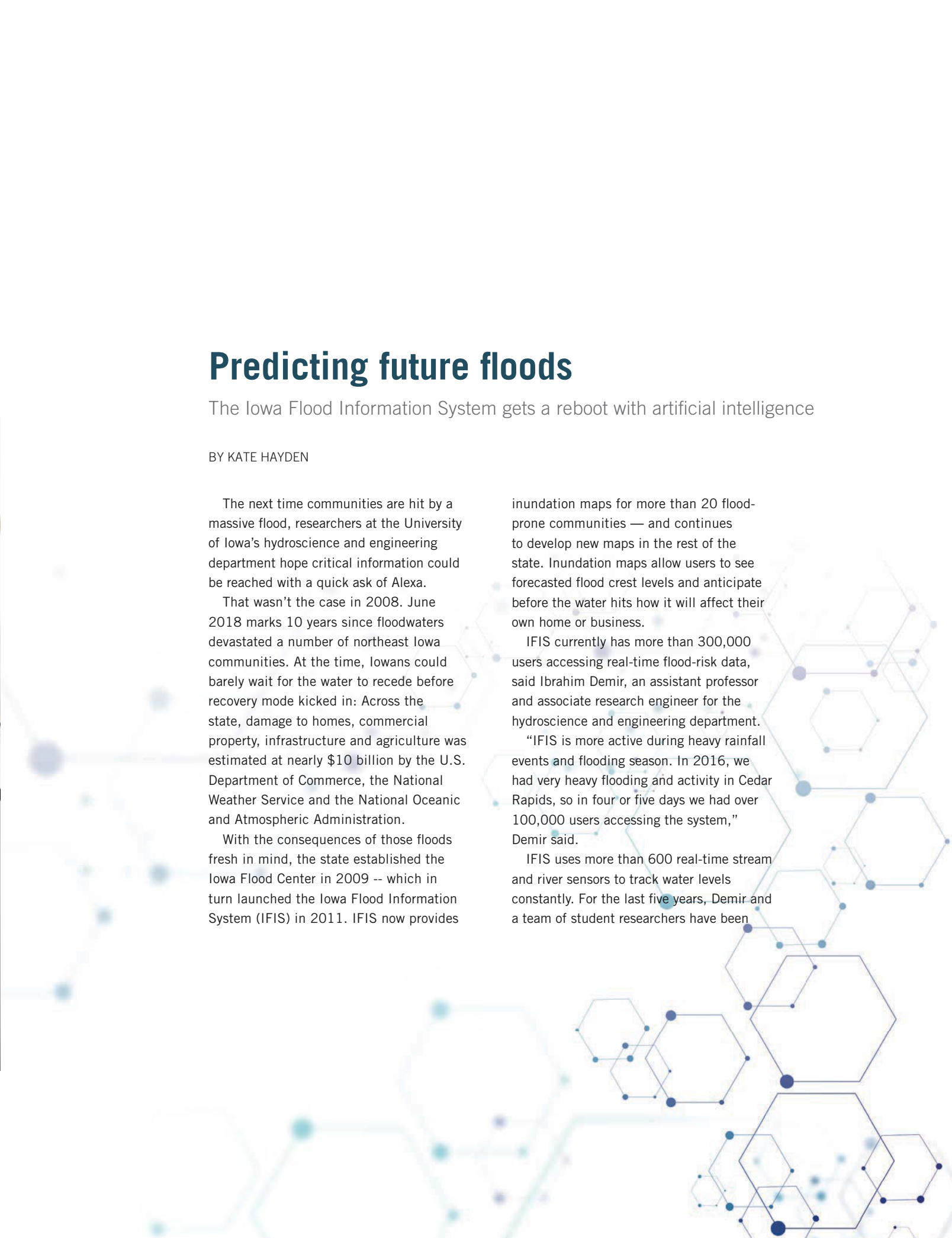
With the consequences of those floods fresh in mind, the state established the Iowa Flood Center in 2009 -- which in turn launched the Iowa Flood Information System (IFIS) in 2011. IFIS now provides

inundation maps for more than 20 flood-prone communities — and continues to develop new maps in the rest of the state. Inundation maps allow users to see forecasted flood crest levels and anticipate before the water hits how it will affect their own home or business.

IFIS currently has more than 300,000 users accessing real-time flood-risk data, said Ibrahim Demir, an assistant professor and associate research engineer for the hydroscience and engineering department.

"IFIS is more active during heavy rainfall events and flooding season. In 2016, we had very heavy flooding and activity in Cedar Rapids, so in four or five days we had over 100,000 users accessing the system," Demir said.

IFIS uses more than 600 real-time stream and river sensors to track water levels constantly. For the last five years, Demir and a team of student researchers have been



studying ways to bring IFIS into daily life for more Iowa residents -- like "Siri for a flood expert," Demir said.

In April, the team launched the first version of Flood Expert.

"The idea is to create an artificial intelligence system for flooding, more like a flood expert that you can talk to 24/7," Demir said. "You can say, 'What is the flood condition for Iowa City at 5 p.m. tomorrow?' or 'What will be the forecast for Iowa City at 5 p.m. two days from now?'"

"Very detailed and data analytic questions could be asked. You could say, 'What is the potential flood damage for Cedar Rapids at a 25-foot flood scenario?' It could give you the number of buildings, number of dollars' damage, structural damage, and all this detailed data, instantly."

Researchers are connecting Flood Expert to the main IFIS infrastructure, so Flood Expert can begin machine-learning concepts based on data already collected by IFIS.

"It's a work in progress," Demir said.

Eventually he thinks Flood Expert's AI technology will expand to other states with a resource such as IFIS. The team expects to make Flood Expert available as a downloadable app, but is striving to make Flood Expert a seamless extension for users of social media platforms and smart assistant devices like Amazon Echo, Demir added.

"We have very strong prototypes and demos for conferences. We are both working on the resource side, but we are trying to

bring our research public and make it more useful and actionable to the public."

Updates to IFIS won't end after Alexa and Echo can take command, however. Demir and other researchers are still looking ahead at how technology like augmented reality can inform disaster relief and citywide evacuation efforts in the future.

The team is working with the Iowa Department of Transportation to create a routing system that can give directions to residents or emergency responders when roads are inaccessible due to flooding.

"We have some applications that use augmented reality and holograms, so if you have these applications, you can bring a 3-D city environment -- more like a hologram -- on your table like in science fiction movies," Demir said. "You can create this holographic environment with cities, with flood maps and demographic information about flood loss and damage."

The Iowa Flood Center funds IFIS and regular maintenance out of the center's \$1.3 million general budget each year. Funding for Demir's research comes from outside agencies including the Department of Homeland Security and NASA, but not from the Iowa Flood Center or directly from the state, he said.

"I'm working with the Flood Center to bring these capabilities to IFIS," Demir said. "I'm trying to make my research benefit IFIS and the general public in Iowa." ■

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*“The DNA of INNOVATION at the Riley Resource Group is strong, the curiosity of all our people is always popping, and the impact of our ideas continues to improve the lives of people in Iowa and throughout the Midwest.”*



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# Q&A

# BATON GLOBAL

BY SUZANNE BEHNKE

*Kavilash Chawla, Partner  
Kelly Dittmann, Managing Director*

Kavilash Chawla and Kelly Dittmann, both leaders at Baton Global, offer their insights on the digital transformation going on in the financial space. Chawla is a partner at Baton, while Dittman helps in business and strategy development and digital transformation.

## How do you personally define innovation?

In business, innovation often results when ideas are generated to further satisfy customer needs. The process of innovating is an iterative/continuous approach focused on transforming or expanding products/services/value into new markets.

Innovation and iteration are oftentimes confused with one another. The iteration journey starts from an existing product, service or known

element, whereas the innovation journey starts with an envisioned outcome. You may end up at the same place, but innovation is about taking the imagined and making it real, whereas iteration is focused on taking the real and improving on it. Both are critically important, but the departure point of an imagined future for innovation empowers innovators to change the future, not just the present.

## What's the most challenging aspect of getting an innovative product to market?

Consumer education, timing, protective leadership and design thinking. Truly innovative products deliver value and services that consumers may not have necessarily appreciated they needed or wanted. Finding the pool of early adopters who can validate a product and provide that initial commercial traction is critical to successfully getting an innovative

product to market, as that early traction enables funding, scalability, etc.

Striking the market at the right time, complemented with the “protective leadership” and “design thinking skills” needed to encourage exploration, development and trust of new ideas to fuel transformational innovation.

## What was your first significant innovation, invention or process?

As an advisory firm, our playground is in the generation, incubation, acceleration and implementation of ideas that change our clients and change the world for the better. Our first significant innovation as a firm was reimagining how clients measure success. By working with our clients to envision a detailed future state of success, we have been able to develop new measurement systems that integrate nontraditional qualitative





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“At 7 billion strong, there is more than enough brainpower in the world to solve even the most daunting challenges we face.”

and quantitative data sources to directly improve both the understanding and pricing of risk and to enable them to achieve their envisioned future.

The innovation journey started by challenging existing assumptions about both definitions of success and the measures of success, and then building systems based on the envisioned future rather than iterating off of existing systems.

**What's the best thing that happened to Baton Global in the last year?**

Bringing on new talent. Last year was a good growth year for us, and the opportunity to bring on new bright, driven and, most importantly, compassionate people to our team has by far and away been the most rewarding aspect of 2017. Our deep expertise and experience create value for our clients by delivering financial, social and organizational impact through insight, innovation and integration solutions. We are thrilled to be serving our Des Moines market.

**Professionally, what's your top goal for 2018?**

Our top goal for 2018 is the same goal we have set every year as a company, to serve our clients so they can serve the world. Running a profitable and efficient business is necessary, but it is not sufficient. By focusing on creating positive value and impact for our clients, we are

not only better able to exceed our operational and profitability targets but we are able to be fulfilled as human beings by being rewarded for doing good that makes our communities more resilient and our world stronger.

**What are some of the ways that your company cultivates a culture of innovation?**

As a research-driven advisory firm, intellectual curiosity is a cornerstone of everything we do, and runs strong through the veins of all of our team members. One of the key ways we foster innovation is by asking all team members to generate thought leadership for the firm. We ask they spend time thinking, reimagining, challenging and wrestling with the status quo to come up with ways to advance the body of knowledge and the application of knowledge. We have found that giving people the freedom to think is necessary to building a culture of innovation. By continuously challenging ourselves to innovate, design and solve problems centered around customers' needs/wants, we continuously improve and deliver value for our clients.

**What are two or three of the most exciting areas of innovation that you are working on?**

One of the most exciting areas of innovation we are working on is using deep learning to enable the collection, conversion

and integration of qualitative data into quantitative outputs that can then inform long-term strategic thinking. This utilization of data will help inform decision-making and improve our customer/user experience.

**What areas of education or expertise are in the shortest supply for companies like yours?**

Critical thinking skills, design thinking skills.

**What do you see as the most pressing global innovation challenge?**

Access. We see the most pressing global innovation challenge is access to the opportunity to participate and innovate. At 7 billion strong, there is more than enough brainpower in the world to solve even the most daunting challenges we face. The innovation challenge is how do we connect all this brainpower together to empower innovation. Until everyone can participate freely, we will never be able to harness all the knowledge and wisdom represented by the 7 billion people on Earth.

Welcoming change. Change occurs in every aspect of our lives, and change will only become more dramatic with the current forms of innovation that are being developed and implemented. We look forward to welcoming change, innovation and improving the lives of others. ■

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**AMY FRIEDRICH**  
*US Insurance Solutions,  
Principal*



**JASON GROSS**  
*Vice President,  
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## Insurance of the future

Changing the industry is about more than automating, leaders say

BY KATE HAYDEN

From self-driving cars to face-scanning phones, technology is encroaching into the most mundane parts of everyday life — and the insurance industry is seeing change arriving.

We asked four leaders in the industry to reflect on their company's role during this transformation, and what customers can expect from the industry in the future. They are: Amy Friedrich, president for U.S. Insurance Solutions with Principal Financial Group; Paul Hlivko, vice president and chief technology officer, Wellmark Blue Cross and Blue Shield; Jason Gross, vice president of strategy and business transformation, EMC Insurance Companies; and Casey Decker, chief information officer, Farm Bureau Financial Services.

### **What's the most significant information technology project your company is working on currently?**

**Amy Friedrich:** We have several information technology initiatives that are designed to drive our top objective — to offer solutions that grow and protect assets of individuals and businesses — and help them live their best lives. The most

“ Artificial Intelligence, specifically machine learning, has the potential to transform our member experience and evolve our business model.”

**PAUL HLIVKO**

*Vice President and Chief Technology Officer, Wellmark Blue Cross and Blue Shield*

significant information technologies that we are working on include customer engagement as well as customer and employee data protection. I am particularly excited about the next-generation customer experience we are creating for our insurance and retirement customers.

**Paul Hlivko:** We have several large-scale transformations underway that will make it easier for our members to interact with us. We're nearing the completion of a modernized core system program that delivers new technology and processes for membership, product and claims operations. We are also well into a multiyear program to modernize our technology organization and adopt forward-leaning, innovative solutions — including cloud adoption. In addition, we continue to invest in our digital business transformation, which includes a revolutionized technology platform, new digital solutions for our customers and open APIs to deliver a more frictionless business.

**Jason Gross:** EMC Insurance Companies, like many carriers, is transitioning from

mainframe legacy systems for our core systems to the latest programming languages, platforms and approaches. We are on a multiyear IT modernization journey to address this transition and bring fresh perspectives to areas like our agent and policyholder experience.

**Casey Decker:** We're a multiline company, so we have significant projects from both a life and a property-casualty insurance standpoint. On the life insurance side, we're in the middle of migrating our policy administration to an all-new, more efficient system called FAST, which will enable us to bring new products more quickly to market. On the property-casualty side, we have Driveology, which is a usage-based insurance program that gives good drivers the discounts they deserve and a better customer experience. We are also partnering with Iowa State University on an intern program. The interns will be paired with some of our employees to form a standing team who will explore and leverage new technologies. This summer the team will be working on a new mobile application.

**What emerging technology on the horizon are you most excited about?**

**AF:** I'm excited about several new technologies on the horizon, one being the migration from simple data analytics to advanced data analytics to artificial intelligence. Data is fueling our digital business strategies. We are building considerable talent focused on data (including hiring our first chief data officer, Tej Dhawan) and are leveraging crowdsourcing to develop data-driven algorithms (e.g., with the University of Iowa Tippie School of Business).

**PH:** Artificial Intelligence, specifically machine learning, has the potential to transform our member experience and evolve our business model. On the horizon, we see the uses of data-driven learning systems to advance our customer experiences, optimize processes and scale the value we can deliver.

**JG:** It is difficult to pick just one. EMC has already invested in drones, the Internet of things, wearables, artificial intelligence, machine learning and even blockchain.

EMC's mission is to partner with our network of independent insurance agents to provide risk protection, improvement and solutions for policyholders. As such, we are excited about any new technology that helps policyholders mitigate risk and avoid losses at an affordable rate.

**CD:** I am excited about the advancements in artificial intelligence, and I believe it has the potential for broad impact on our industry. AI has the potential to generate significant efficiencies that can impact everything from underwriting, customer service, to back-office functions. With all the emerging technology, we are focused on investing in attracting, developing and retaining talent, as people are what ultimately make great things happen.

**What do you believe will be the biggest innovation that will affect the insurance industry in the next few years?**

**AF:** The biggest innovations are not going to be those that make insurance a “robo” process. Making decisions about insurance is inherently a very personal process — and can include emotions like fear, hope, confusion or sadness. The most meaningful innovations will be those that make insurance more human. These could include tools that allow for better online research, processes that acknowledge where insurance language can be confusing or technology that complements human engagement.

Innovations that know when and how to slow processes down when sentiment analysis indicates confusion or providing additional assistance before frustration sets in has the potential to move our industry forward in meaningful ways.

**PH:** The biggest innovation will come from combining emerging technologies to create new frictionless business models. These technologies will be a key driver to connect networks of people, devices and companies in new ways. We believe this will leverage dynamic networks of connections and data and create new opportunities to leverage capital/assets in unique ways to generate value.

**JG:** The biggest innovation for the insurance industry — it's too soon to tell. But I believe it will play out at the intersection of those emerging technologies where AI, analytics and new tools combine to make the biggest impact.

**CD:** From an innovation perspective, there is growing potential for how the insurance industry leverages new data sources in different ways for pricing, underwriting and claims. With the expansion of IoT (internet of things), we will have potential to access data from connected homes, automobiles and many other smart devices that can improve how we calculate potential risks and losses. ■



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- Accumold **36**
- Agri Drain Corporation **86, 87**
- American Enterprise Group **135**
- American Equity Investment Life Insurance Company **141**
- Ames Economic Development Commission **82**
- Baker Group **66**
- Baton Global **57**
- BKD CPA's and Advisors **141**
- Brokers International, Ltd. **126, 127**
- Brown Winick Attorneys at Law **114, 115**
- Central College **48, 49**
- CenturyLink **60, 61**
- Charles City Area Development Corporation **35**
- Cognizant Technology Solutions **58**
- Corteva Agriscience **100, 101, Back Cover**
- Cultivation Corridor **Inside Front Cover Gatefold**
- Des Moines International Airport **71**
- Dickinson Law **69**
- DLL Financial Solutions **109**
- DMACC ciWeek **65**
- DRA Properties, LLC **26, 27**
- Drake University **53**
- Eastern Iowa Airport **35**
- Farmers Mutual Hail **140**
- Feed Energy Company **123**
- Flynn Wright, Inc. **5**
- Granular **104**
- Grinnell College **82**
- Grinnell Mutual Reinsurance Company **134**
- Houston Engineering **88**
- Hubbell Realty **91**
- The IMT Group **139**
- Iowa Agriculture Water Alliance **Special Insert**
- Iowa Biotech Association **109**
- Iowa Farm Bureau **84, 85**
- Iowa State University - College of Engineering **42, 43**
- Iowa State University - Ivy College of Business **130, 131**
- ISG **90**
- JE Dunn Construction **13**
- JLL **11**
- John Deere **22, 47**
- Kemin **38, 39**
- Kent Corporation **96, 97**
- Lincoln Savings Bank **124**
- Mediacom **73**
- Next Level Ventures **3**
- Nyemaster Goode, P.C. **14, 15**
- Pigott **6, 7**
- RDG Planning & Design **92**
- Renewable Energy Group **112**
- Sheraton **55**
- Snyder & Associates, Inc. **93**
- Sukup Manufacturing **31**
- University of Iowa Office of Research & Economic Development **76**
- UTC Aerospace Systems **20**
- Verdesian Life Sciences **89**
- Wartburg College **55**
- Wells Fargo Bank **Inside Back Cover**
- Weitz Co., The **94**
- Workiva Inc. **81**
- Zoetis **81**

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