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For more information about the Technical Systems Management Program at the University of Illinois at Urbana-Champaign, contact us at:
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College of Agricultural, Consumer and Environmental Sciences (ACES)
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Welcome to our fifth issue of Explore.

Perhaps you are entering a new chapter of your life — exciting and, at times, overwhelming. You will soon be deciding a future path ... leaving home, choosing a major, making new friends.

Explore where careers in agricultural technology and systems management can lead is designed to showcase and encourage the opportunities in this growing, thriving field. If you aren’t familiar with an ag systems degree, read on! We think you will be impressed with the diverse and interesting possibilities — from study abroad and hand-on internships to jobs awaiting ag systems graduates. Enjoy as you peruse — take your time. You have big decisions ahead, and you may discover that you like what ag systems has to offer.

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What is an agricultural systems degree?

An agricultural systems degree combines an understanding of the agricultural, biological, and physical sciences with business, managerial, and technical skills. Graduates with this type of degree find careers in the production and processing of agricultural products into food, fiber, feed, and fuel, and the distribution of agricultural products and services. Careers in renewable energy, biofuels, and environmental quality are emerging. Students focus on the application of engineering principles, the study of technology used in agriculture, and the integration of business management concepts in the agricultural and food industries. However, the skills taught in agricultural systems courses are applicable in many fields, and a significant number of students take employment in other industries. This degree is ideal for those interested in technical sales or technical management for an agriculture-related business involved in production, processing, or manufacturing.

Why do the university programs have so many different names?

Prior to the early 1990s, most of the programs were simply called agricultural mechanization. Since then, careers for agricultural systems graduates have expanded far beyond mechanization. Many universities have changed the scope of their programs to focus on emerging technologies as they apply to food, energy, and environmental systems, in addition to traditional agricultural systems. These programs address society’s need to efficiently utilize natural resources and protect the environment. The names reflect the philosophy of the school in responding to these issues. These programs are often quite similar. Consult individual universities regarding the direction and focus of their specific programs:

• Agricultural and Environmental Technology
• Agricultural Engineering Technology
• Agricultural Operations Management
• Agricultural Systems Management
• Agricultural Systems Technology
• Agricultural Technology Management
• Agricultural Technology and Systems Management
• Bioresources Engineering Technology
• Engineering Technology Program
• Mechanized Systems Management
• Technical Systems Management

How does a degree in agricultural systems differ from one in agricultural engineering?

Today, engineers and agricultural systems graduates both work with the same types of buildings and equipment, the same crops and animals, the same sensors and computers, and the global society, yet there is a distinct difference in the work they do. The engineer is trained to analyze and design a process, system, or mechanism, while the agricultural systems graduate is able to identify system problems, formulate possible solutions, analyze the impact of alternatives (including social and economic dimensions), and then implement the best solution. Agricultural systems graduates get a broad and basic background in agriculture and the physical sciences, along with courses in business, economics, and management.

When comparing agricultural systems to engineering, you will find that agricultural systems programs are less theoretical and more practical. Emphasis is on hands-on experiences with equipment, and many courses have laboratory sections.

What do I need to know to get into the program?

An aptitude for science and math, plus an interest in solving problems, is really necessary for this field. You should also have an interest in electronics, computing, and business management. In high school, prepare well in mathematics, physical and biological sciences, English, and agriculture. Take the most advanced high school courses available to you in these areas and, if possible, take courses such as CAD and information systems. You don’t have to be a math wizard to be an agricultural systems student, but mathematics is used a great deal.

Do I need a background in agriculture for this major?

No. This curriculum has the flexibility to allow students from rural, suburban, and urban backgrounds to develop a program to meet their personal career objectives.

Is this a good option for women and minorities?

This field is a great option for women and minorities. The number of women and minorities entering the field continues to rise.
**Are internships available?**

Yes! This curriculum offers many opportunities for internship work experiences in a variety of companies and organizations. Many experiences are paid internships. For some programs, internships are required for graduation.

**How can I find out what schools offer programs in agricultural systems?**

The schools currently offering agricultural systems programs are listed on page 27. Be sure to check with the school in which you are interested regarding its particular program. Begin your search in the agricultural and biological engineering departments, where these programs are typically administered.

**How do I select the school that is a good fit for me?**

The internet is a great place to begin your search. Many universities provide detailed information about their programs, including course requirements, on their websites (again, see page 27 for a list of universities and their websites.) When you have narrowed your choices, visit the top schools on your list. The faculty, staff, and students will be happy to meet with you and show you around. By visiting a school, you will get a better sense of whether its program and setting is right for you.

**What are the course requirements like in these programs?**

There is no single curriculum for ag systems. In fact, the programs vary somewhat among different schools, but the core requirements are similar. These programs integrate a broad education with expertise in the agricultural sciences, applied technology, and business management. Courses are relevant to all phases of the food, agricultural, natural resources, and environmental industries.

Graduates will be able to integrate and apply advanced agricultural technologies and equipment as a result of their student experiences with machine and power systems, computer applications, materials handling, food and materials processing, environmental resources management, electrical and electronic systems, and information and decision support technology. Required coursework balances hands-on knowledge of technology with instruction in agricultural and environmental sciences and agribusiness principles.

Supporting courses provide a foundation of mathematics, chemistry, computer science, economics, and communication skills. Computers are used to collect and analyze data and then act on that information to control machines and processes, in addition to communication and information retrieval. CAD (computer aided design) programs are used to plan equipment and building layouts.

**Will I have time for extracurricular activities? How many hours a day will I need to study?**

Let’s look at the second question first. How much time you devote to your studies depends on you and your expectations. Many colleges say that for every hour you spend in class, typically 15 hours a week, you should spend two to three hours studying outside of class. Tougher courses may require more time, easier courses may require less. Much depends on an individual’s ability, attitude, and motivation. That said, students are not expected to study at the expense of all outside activities. Employers are looking for well-rounded new hires, who have balanced their studies with involvement in student activities. You will also be able to build your leadership, communication, and organizational skills through involvement in clubs or sports. Most schools have an agricultural systems club, and be sure to check out the ASABE student branch on campus (see page 30 for more information about ASABE).

**Can I afford the education?**

Don’t let the cost of higher education prevent you from attending the college of your choice. Most students today need some kind of financial assistance. Many types of financial aid are available, such as grants and scholarships, loans, work-study programs, and part-time employment. They are available from many sources, including the federal government, state agencies, professional organizations (such as ASABE), and universities. When visiting a school, be sure to stop by the financial aid office to find out what programs the school has to offer.

**What is the career outlook? What types of companies will I work for?**

Agricultural systems graduates are in great demand. In fact, many agricultural systems schools have a placement rate approaching 100 percent. The starting salaries are highly competitive and are among the highest of college agriculture majors. Potential employers and career opportunities are vast and varied. You could work for an equipment manufacturer such as Caterpillar or AGCO, a seed and grain company such as Monsanto or ADM, a government agency such as the Natural Resource Conservation Service or the Peace Corps, a food company such as Frito-Lay or ConAgra, or an emerging company in an industry such as biofuels or automation. Agricultural systems students are also hired by smaller businesses such as cooperatives, cotton gins, regional manufacturers, and construction companies, to name a few. Or you could start your own business!

Research and editorial assistance provided by Associate Professor Thomas Brumm, Iowa State University; Professor Joe Harper, University of Illinois; and Professor Stephen W. Searcy, Texas A&M University.
Angling for ASM? Wade on in!

My nickname is Katey the Lady. Wearing pink sweatpants and cowboy boots since the age of two has something to do with acquiring that handle. I’m from a hay and citrus farm in central Florida, where my family also has a small cow/calf beef cattle operation.

The Bartletts highly value education. My 96-year-old grandma holds an MA in education and taught third grade in our hometown for 45 years.

It was no surprise that I ended up at Purdue after my brother enrolled for ag engineering three years before me. The entire family was very impressed with the College of Agriculture at Purdue and even more impressed with the jobs that alumni were able to secure after graduation.

When choosing a major as a freshman, I was drawn to both ag economics and ag systems management. At the time, I opted for ag economics, but I kept an eye on ASM.

Once I joined the Purdue All-American Marching Band and transferred my community college credits, my electives were full, so I graduated in just three years. But I was not ready to leave that old, cold place called Purdue. It wasn’t the snow and ice, but the corn and beans I enjoyed the most!

Inspired by my grandmother, I decided to pursue another degree. One of my mentors, Dan Taylor, who just happens to be a rock star in ag, sent me an e-mail: “How about a master’s in ASM?” I said, “Sure!” Okay, it wasn’t quite that easy, but after much thought, that’s where I’ve ended up. And I like it!

I thoroughly enjoyed the ag economics department, but I wanted to do something that would involve using my hands. I had two internships under my belt with equipment companies, so learning more about machinery was perfect! I jumped right in with two classes: Power Machinery Management and Design of Off-Highway Vehicles. I was soon mixing up silage material as well, with my major professor Dennis Buckmaster. I drove a tractor at one of the research farms for a traction lab, and I continue to be a frequent visitor at the beef and dairy research farms to work on my silage mixing.

If I had known as a freshman that I would want to get an MS degree in ASM, I would have taken more undergraduate ASM classes and a physics class, too. However, ag economics prepared me for my MS project: projecting costs and doing a sensitivity analysis for the cost of my final product, an ensiled mixture of corn stover and the solubles from distiller’s grains. The goal is to cost out the possibilities for ensiling these materials and using them as a cattle feed.

Is the new mixture cheaper than corn silage? Is it a better option for smaller or larger farms? Does it depend on the time of year that the syrup is priced? Does the size of the mixer, and thus the power of the mixer tractor, make a big difference in the cost? These are all questions that I hope to answer by working through the different system approaches and putting dollar values on all the operations.

And that’s why the ASM degree is so valuable: it’s a real-life, detail-oriented program. To complete my project, I have to know how every part of the operation works, and all of the data have to be accurate. If I were in any other program, I would probably not be at a farm, actually measuring operation parameters and fuel consumption.

I’m hoping that my graduate degree will create more opportunities. The jobs that I’m looking at now are more technical than the jobs I looked at two years ago. While jobs in sales and marketing are available, and I would enjoy that, I will be more qualified in parts and service, precision agriculture, and product support. Another benefit to having an MS degree is that my communication skills, both writing and speaking,
have been forced to improve exponentially. I don’t know any employer who is not in favor of that!

**ATM’s a great catch! And the angler’s best tips are ...**

As an undergrad, I was able to obtain two internships. The first was with Bane Equipment Company in Crawfordsville, Ind., and I loved everything about it. My main task was researching the customer base, but Bane also let me explore all aspects of the business, from management to sales and service. I would gladly have gone back for another summer, but my boss at the dealership encouraged me to work at the corporate level.

With his recommendation, I worked in sales support for Case IH in Racine, Wis. My job involved editing and distributing software manuals as the group adjusted to a new program. I job-shadowed a territory sales manager in Canada and visited other facilities as well.

Most undergrads will hear this again and again, and it’s still true: get as many internships as you can. First, internships allow you to get your foot in the door. Some great students sometimes have difficulty finding a job because no one has seen their work before. You have to meet people who can get you jobs, and then you have to do your best so that you can come back after graduation, or get a good recommendation to use elsewhere. Second, internships allow you to see for yourself what you want and do not want. The job that you perform as an intern may not be what full-time employees do, but you will be exposed to many real-world jobs throughout your stint.

And studying abroad is beneficial to everyone. In fact, I’m not sure who benefits more—you or the company that later hires you. I spent spring break in Honduras and Guatemala for an agronomy class, and I took Maymester trips to Brazil and Argentina with a food process engineering study. I saw things that I would never have seen if I had merely vacationed in those countries. We went to farms, processing plants, and peoples’ homes.

There is always time for some touristy activity, but for the most part, studies abroad allow students to grasp the viewpoints of other people around the world—even if it is only a slight grasp. It is good to know how other government systems work, what various countries produce, and what the local people are most proud of.

If I ever go back to Brazil, maybe on a business trip, I will be comfortable with the food, be able converse a bit in Portuguese, and know not to ask about their soccer team if they have recently lost to Argentina!

At first, I thought that ASM meant strictly machinery, but I quickly found that all of the departments in the College of Agriculture seem to revolve around each other. I feel like I am part of ag engineering, ag economics, animal science, and agronomy. Not all projects are as diverse as mine, but most involve intermingling of the departments. It’s also satisfying to know that my work may one day lead to a major development that will help farmers like my dad. I also really like working with feed systems and machinery.

I don’t have a dream job because I am pretty sure that it doesn’t exist! In a presentation by Scott Shearer at ASABE’s 2011 Annual International Meeting, he pointed out that the amount of technical information is doubling every two years. He also quoted Karl Fisch, Scott McLeod, and Jeff Brennan: “For students starting a four-year technical degree, half of what they learn the first year will be obsolete by their third year of study.” He went on to say that “while the quantity of technical information may be doubling every few years, rest assured the fundamentals of math, science, and engineering remain the same.” I am at Purdue to get an update and a preview of the world that I’ll be entering, and most importantly to learn how to think. I am confident that the people at Purdue and in my ASM program have prepared me to adjust to whatever my job will be—a dream or not.
Growing up on a farm, I was always fixing machinery and finding ways to improve it and prevent breakdowns. My parents saw me constantly repairing the farm equipment, and they joked that engineering had to be in my future. This tinkering, combined with a love for math in high school, got me interested in ag engineering tech. The more I researched the field, the more it looked like a go.

Why the University of Wisconsin at River Falls? My parents suggested the school, my grandparents brought it up often enough, and my high school agricultural education teacher praised it—so I checked it out! With a campus visit, I discovered that I loved the “small school” atmosphere, and after touring the engineering department, I knew that UWRF was where I wanted to go. The first week of class confirmed it: UWRF had exactly what I came to learn and accomplish.

Here’s some free advice from a recent grad: pull on your steel-toed boots and work hard from the first day of class to the last. Set the pace and work hard. Believe it or not, every class will become relevant at some point. When you begin as an undergrad, you have no idea what job you will end up in. I landed a job doing something I never dreamed of, and I’m thankful I paid attention in every class. And get involved! It’s a great way to meet people and accomplish your goals. I ended up taking the lead on a large, automated soybean press project. I learned a lot and accomplished some eye-opening things.

Not getting an internship is the biggest regret I have about my college years. It would have helped me in so many ways—to meet people, show off my work ethic, and get my foot in the door to a full-time job after graduation. Instead, I decided that I would rather go home and work on the family farm during the summers. I’m not sorry, because on a farm you learn something new every day, but an internship might have been more useful for pursuing a career.

Thankfully, I was very involved in the ag department, in clubs, and in intramural sports. I studied and worked very hard. I would have been happy to stay longer after graduation and take a few more classes to broaden my knowledge!

I loved the UWRF faculty and class structure, especially the many hands-on labs that enhanced the classroom learning. You picked what projects you wanted to work on. The faculty was always there to give advice and answer questions, and the class sizes were small and conducive to learning. As I mentioned before, I took on the project of building a completely automated soybean pressing operation while in school. It took three years to complete, but it was fully functional before I graduated. It has a seed cleaner to clean out the rocks and pods from the beans before they are augured into the bin. The beans are then pressed and the oil is run through a centrifuge that I designed and built to clean and degum the

Daniel Pusch

Age: 23  
Hometown: Hartford, South Dakota  
Hobbies/interests: Racing, cars, farming, agriculture  
Alma mater: University of Wisconsin-River Falls  
Degree: Agricultural Engineering Technology BS (2010)
oil. The oil is then stored in a bulk tank before it is made into biodiesel. The biodiesel is burned in the tractors at the lab farms and in the lawn mowers on campus. One byproduct of pressing soybeans is soybean meal. This is collected and fed to the cows on the lab farm. It is a continuous process, and that helps make the campus self-sustaining. It was a big success!

Cargill Kitchen Solutions came to UWRF to recruit new engineers. I attended the session that they led, met some of the right people, and it all went on from there. My advisor recommended me for the job that I had my eye on, the company called and set up an interview, and I landed the job before I graduated. I had two other job offers, but I turned them down in the hope of getting employed as a process engineer with Cargill Kitchen Solutions.

Other factors that influenced me as I waited for a callback and considered my options were the opportunity to work for a company as large and successful as Cargill, and the job’s location in Monticello, Minn. I wanted to stay in the Midwest, particularly in the Minneapolis/St. Paul area.

I recently finished the training throughout Cargill’s plants. I spent long hours at every plant, learning how the products are made and how the machines operate. This training will help me to do my job as a project manager for new projects throughout our plants. These projects might involve installing a new production line, adding on to one of the plants, trying to conserve water, or developing our next product.

I love the people I work with. They are all happy to be there and are eager to answer any questions I have. The work is very hands-on, and I am always busy. On any given day, I can see what I’ve worked on—when the day is done, I can look around and see what I’ve accomplished.

Safety is the number one priority throughout Cargill. The concern for every stakeholder’s safety is expressed in the companywide objective to send all employees home from work just the way they came to work: healthy and whole. Hard hats, safety glasses, ear protection, and steel-toed boots are required in every plant. When I kick off my steel-toed boots at night, I feel good about the company, my work environment, and the promise of more fulfillment as I learn more and more.

This job is not what I envisioned doing while I was growing up tinkering, but every day I like it more and more! I hope to continue working for Cargill for many years and move up through the company ranks—boots and all.

“I designed and built this automated soybean pressing system in a UWRF lab. Oil is pressed from the beans and turned into biodiesel for fueling tractors on the farm where the soybeans are grown. This effort helped to make the university self-sustaining and reduce its presence on the grid.”

Clemson School of Agricultural, Forest and Environmental Sciences

AGRICULTURAL MECHANIZATION AND BUSINESS

What future do you see yourself in?

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I’ve always loved all things agricultural, so it was no surprise that, after high school, I wanted to study ag. I especially liked the courses required for the University of Nebraska’s Mechanized Systems Management major, because they were hands-on learning and very practical for real-world situations.

My high school advisor was a major influence in my decision to pursue an MSM degree. My parents also encouraged me to go after an education beyond high school, so that I would have a backup plan if my farming and ranching dreams didn’t come true!

UNL was relatively close to home, and the variety of extracurricular opportunities was amazing. I got involved in the Mechanized Systems Management club and was president my junior year. The MSYM club consists of students interested in the design, manufacture, and use of products in industrial and agricultural fields. The club’s events include industry tours to corporations like John Deere, Altec, Claas, and Valmont Industries, as well as personal résumé critique clinics, and an opportunity to give feedback to the MSM program advisors on the program’s classes and curriculum, and what students would like to learn more about.

In the springtime, the MSYM club organizes and administers the tests given during the Nebraska FFA Mechanized Ag Contest held on the University of Nebraska’s East Campus. Students are challenged to find answers to realistic situations in agriculture. I was also involved with the UNL Quarter-Scale Tractor Team. And to put change in my pocket and gain some work experience, I was employed at the Nebraska Tractor Test Lab for three years. The lab’s purpose is to verify manufacturers’ tractor performance claims through a series of standardized tests, including drawbar performance, PTO, hydraulics, noise level, and three-point hitch testing.

I knew I made the right decision when I was able to apply the knowledge I gained from my core classes while...
working on the family farm and at the Tractor Test Lab. If someone I know is considering an MSM degree, I say, “If you really like working with your hands and understanding how machines interact with each other, then this is the major for you.”

As a summer intern, I was a field test engineer for Case-New Holland. I worked on the hay tools platform, primarily with the 450 Utility Round Baler. I spent about half my summer in the hay fields of Tennessee, Georgia, and Missouri doing product support and working with local farmers. I helped develop the front-mounted net-wrap system along with the baler pickup head. My favorite part of the internship experience was the people—every day I worked with different farmers and the full-time employees at the company headquarters in New Holland, Penn. My co-workers were instrumental to my success during my internship. They were extremely helpful, affirming my skills and knowledge, and building my confidence while working with customers in the field.

One more piece of advice: see the world if you can! As an undergrad, I took a one-week study-abroad trip to Argentina with 20 other UNL students. We traveled across the country, starting in Buenos Aires and ending in Mendoza, primarily focusing on the agricultural sector. We toured an export-loading port on the Parana River in Rosario, a winery, a dairy farm, and Argentina’s Board of Trade. Argentinean agriculture is very similar to ours in its end products, but it can be very different in its processes.

Being my own boss—seeing projects come full circle from planting to harvest, or from calving to selling fat cattle—is a thrill. Most of all, being able to improve our farming methods to overcome new challenges brings me the most satisfaction.

I am passionate about agriculture. I enjoy being presented with challenges and working toward goals. I want to be the best farmer and rancher that I can be, alongside my dad and my older brother Andy—growing food-grade white and yellow corn, soybeans, and alfalfa, and expanding our cow-calf operation, feeding out calves for market. It’s trailblazing work ... and you can do it, too.
From the get-go, I had a strong interest in mechanical systems and a desire to work in the agricultural industry, so I had a general idea of what I wanted to do with my life. The last year of high school and the first year of college are a time for exploring and choosing, and I already had a pretty strong direction.

The decision to attend Clemson University was the easiest part of my college experience. I grew up in South Carolina as an avid Clemson fan. Since Clemson is, to my knowledge, the only university in the state that offers an ASM major, that made it an easy choice for me.

Several of my professors affirmed my decision to pursue ASM. Best of all, they challenged me to go beyond the status quo. The defining moment for me was when I realized as a freshman that I actually enjoyed going to class and learning. School wasn’t a drag—it was something that I was excited about, and that helped me excel in my major.

If I were starting over, I’d recommend declaring a college major based on the career that you want to pursue. And once the decision is made, put your all into it. The more you give to your studies, the more you get out of them.

The summer after my first year at Clemson, I interned with Rogers Brothers Farm in Hartsville, S.C. This was my “aha!” experience, and it really drove home that I chose the right degree for the career that I saw myself pursuing. During that summer, I had my first real taste of cutting-edge agricultural technology, a real-life application of what I was learning in the classroom: field preparation, weed and pest control, irrigation maintenance, planting and harvesting wheat. And the best part? All the machines that I operated were the newest John Deere tractors and sprayers equipped with Green Star II precision agriculture systems.

After graduation, I found my job through the listings on ADM’s career page. I actually applied for a Grain Merchandiser Trainee position, but one of ADM’s human resource people contacted me about the grain terminal operations management trainee program. After the interview process, I was offered a position in St. Louis, Mo.

Kendall Kirk, an instructor at Clemson, had a great influence on me. With his encouragement, I ventured outside my comfort zone and found work far from home. I am glad that I made that decision, and I have enjoyed the adventure of moving away and starting my career.

The people who I supervise now often ask me if my undergraduate work prepared me for employment. The answer is a resounding yes. I use what I learned at the university on an hourly basis!

My work day varies greatly, depending on what is going on. Our facility is a truck-and-rail dumping elevator that loads grain onto barges bound for New Orleans. When I first started, I operated a programmable logic computer (PLC) that controls bucket elevators, belts, and gates to blend the feed of grain. On a regular basis, I was involved with safety meetings and the supervision of hourly employees, maintenance personnel, and contractors. Recently, I received a substantial promotion from supervisor in a trainee program to superintendent of two grain elevators—one in Burlington, Iowa, and the other in Gulfport, Ill. Both receive grain via trucks and load grain barges to the Gulf of Mexico. In this position, I have eight to ten direct reports and am responsible for all operational/environmental policies, employee safety, and much more.

I really enjoy my work, and I’m still amazed that I get paid to do something I enjoy so much. In my book, that’s a dream job! I get great satisfaction knowing that I am a part of a team that moves massive amounts of grain and that, ultimately, has a direct effect in feeding countless people.

And speaking of feeding people, I’m a laid-back kind of guy. After a good day’s work, one thing that fires me up is cooking—grilling to be more specific. My barbeque grill was my first large purchase after starting with ADM. I love to have a few people over and cook up some pulled pork, ribs, or steaks. A good meal after a good day’s labor, then I relax.
Hoofing It in Foreign Climes

Study abroad? You bet you should! I participated in two different study-abroad programs—one to Costa Rica for ten days and one to Brazil for six weeks. I highly recommend the suitcase experience for rounding out your undergraduate years in ASM.

I traveled to Costa Rica during the spring break of my freshman year. Costa Rica borders Nicaragua to the north and Panama to the southeast. To the west, there is the Pacific Ocean and to the east, the Caribbean Sea. Costa Rica has diverse landscapes, flora, and fauna—from rain forests to dry tropical and temperate forests, from active volcanoes to sandy beaches, from high mountains to marshy lowlands. The trip’s focus was on sustainable agriculture. It was a great learning experience to see agriculture in a tropical climate, especially compared to Ohio. We toured a coffee plantation and a small cocoa farm, and we worked with students at EARTH University to build a biodigester on a small family farm to produce cooking gas for the family home.

After Costa Rica, I had the opportunity to study abroad in Piracicaba, Brazil, in the state of São Paulo, through Alpha Zeta Partners—an honorary agricultural fraternity at OSU. Piracicaba is famous for its sugarcane plantations, cane spirits production, and traditional music. The city also houses the oldest agricultural faculty in Brazil, the Escola Superior de Agricultura Luiz de Queiroz (ESALQ), the agriculturally focused branch campus of the University of São Paulo. This faculty is more than 100 years old and is located on a farm with a large collection of trees and plants. It is recognized as a world leader in the field of precision agriculture.

While in Piracicaba, we took classes at ESALQ and spent a weekend with a host family. As a group, we went on cultural and agricultural treks. We toured the local Caterpillar plant, a silkworm farm, cassava and orange juice processing plants, several agricultural co-ops, fish farms, and diversified farm operations that produce commodities such as sugarcane, soybeans, cotton, rice, and beef cattle. We took a ten-day trip to the state of Mato Grosso de Sul to explore a different part of this huge country. This western state is also famous for its natural beauty and is a major destination for domestic and international tourism. The Pantanal lowlands cover 12 municipalities and present an enormous variety of ecosystems, including forests, sand banks, savannahs, and open pastures. After six weeks, we had acclimated to the culture and customs of Brazil and had learned to speak a few words of Portuguese. Portuguese is the official language, but English and Spanish are both part of the national high school curriculum. We got by with a mixture of all three languages!

After my travel experiences, it shouldn’t come as a surprise that I am looking into graduate programs in international agriculture. Following grad school, I’d like to pursue a career within some aspect of the dairy industry.

ASM is a great course of study. I love the idea of a hands-on major, where I can spend time outside of the classroom and learn by doing. For example, at the start of my degree program, I took a course on small air-cooled engines—I knew then that I was in the right spot. In addition, I’m pretty sure I was destined to be a Buckeye since childhood. Ohio State was able to offer me an exceptional agricultural program and great opportunities, including internships, networking, and study-abroad programs. I’m all smiles about Ohio State!

If you’re thinking of ASM, I encourage you to visit the schools, check out the programs, and talk with the students who are pursuing an ASM major in order to gather up different opinions and perspectives. If the shoe fits, wear it!
Like many ASM grads, I grew up surrounded by and working in agriculture. At a young age, I figured out that I was going to continue working in agriculture, but I wasn’t sure how to make a career of it and climb up the ladder.

Fortunately, my family believes in pursuing higher education. Four of my siblings had already attended college. Two of my brothers had attended the University of Minnesota-Crookston, and they reinforced my decision to pursue a degree in agricultural systems management and ag business. In addition, mentors like my high school ag teacher convinced me to look at college opportunities after high school. Ultimately, I chose UM-C because of the school’s small class sizes and the heavy emphasis on agriculture.

I was convinced from day one that going into agriculture was the right thing for me—or for anybody living in my part of the United States. Agriculture is so important in Minnesota, and in the Midwest in general, that well-trained people are in high demand, and jobs opportunities are increasing in precision ag.

Considering the possibilities, I’ll tell anyone who’s thinking about studying for a career in ag to “go for it!” Agriculture technology management has nowhere to go but up. And precision agriculture technology is on a rocket skyward. From auto-guidance to swath control to topography mapping, ag technology is the next big boom that will help farmers become more efficient and profitable.

I have ties to the family farm by owning my own livestock and helping my dad with the crops, so I didn’t study abroad or travel for an internship. My internship was actually done on the family farm. I was focused on taking on more tasks and being more involved in the decision-making. I think it was a good internship experience because I increased my management skills.

Looking back now, I wouldn’t take a different path. My college experience led me right where I want to be, at least for now! The only change I’d make is that I would have studied even harder, possibly taking an independent study in precision agriculture.

It’s amazing what kind of opportunities are out there. Look at my story: I came from a farm where we worked hard just to get by. We didn’t have brand-new machinery. We didn’t even think of auto-steer, automatic shutoffs, and yield monitoring. What we didn’t have brand-new machinery. We didn’t even think of auto-steer, automatic shutoffs, and yield monitoring. What we
had, though, was all of the tools necessary to create a foundation for success—hard work and perseverance. Schools like UM-C, with its great professors, can build on that to create a real success story.

As for the future, I’d like to stay in my current position as a precision agriculture specialist at Titan Machinery in Moorhead, Minn., for at least three to four more years. It will be worth it to stay in this position and learn all I can about precision ag, dealerships, and management. In a few years, I’ll re-evaluate my situation and see if I’d like to climb higher in the precision ag world or go into equipment sales.

Until then, UM-C has given me the background that employers like Titan Machinery are looking for. While still in school, I spoke with the recruiters at on-campus job fairs. The representative from Titan asked questions about my experience and education. He also spoke with my professors, who gave me good references. Before I knew it, I was looking at two different job possibilities that fit my skills and my interests. Shortly after graduation, I was hired.

“Last year I took an elk hunting trip in northwest Colorado. In the photo above, I had just finished packing up the spike camp and meat after a successful hunt. I had spent three days away from the base camp where my companions and I had a large tent set up and the vehicles could go no further. We didn’t have a guide, as we trekked deeper in the mountains than most people want to go.”

On a typical work day, I meet with customers on product configuration, sales, troubleshooting, support, and installation. In addition, I interact with the sales, service, and parts departments every day. I process customer transactions, prepare quotations, and manage the inventory. And I enjoy it! I’m not sitting in the office all day. On the other hand, I don’t have to do physical labor all day. It’s a good balance: I am challenged, but comfortable.
As an undergrad, I knew I wanted to be involved in the implementation of technology in the ag industry. I enjoy being with people out in the field and helping to provide a solution to one of farming’s biggest challenges: combining on hills.

My undergrad work did an excellent job of preparing me, but the internship experiences are what set me apart from other students. The summer after my junior year, I got an internship working for a small company. The owner of the company farmed in California and provided contract employees for John Deere. First, I went to northern California and custom-sprayed rice fields. After that stint was completed, I went to work for John Deere as a contract intern. I was assigned to John Deere’s biomass harvesting team. That was a great experience, as the whole biomass harvesting idea was new, and having the chance to be a part of experimental machinery development and research was fascinating.

The following summer, I worked for John Deere Des Moines Works and followed several limited-production-build 4630 sprayers across the southeastern United States. I tracked these machines, documenting structural issues, getting feedback from farmers, visiting each production site several times as progress was made, and reporting back to the engineers at John Deere.

That fall, I again worked part-time with the John Deere biomass harvesting team. It was during this time that I met people associated with Hilco, which had become involved with John Deere in joint development of a cob collection system.

As you might may have already guessed, I “met my employer” as an intern. I took the Hilco job that I have now because it allows me to work with customers, out in the field, and because it gives me some control over my schedule.

My primary responsibility is to assist our dealers and customers with product education and sales support. During the fall, I get involved with combine clinics at dealers’ locations as well as field test work for new products. During the winter, I work at home and attend farm shows. The summer is spent visiting dealers and maintaining our working relationships.

I enjoy working for a smaller company because individual opinions really matter, and I can make a difference in the direction that we take as the company moves forward. Like any job, it’s sometimes frustrating, primarily because work related to sales does not always provide immediate rewards, and everyone likes a little instant gratification!

Like most people who have grown up around agriculture, my dream job would be to have a large farming operation.

Kevin Cordray

Age: 25
Hometown: Nevada, Iowa
Hobbies/interests: Hunting, camping, restoring antique tractors, building things
Alma mater: Iowa State University
Degree: Agricultural Systems Technology BS (2010)
That dream would be difficult to realize given today’s economy. Nevertheless, at some point, I’d like to be able to farm a little, maybe have a small cattle operation. I enjoy working with livestock. While I was in school, I worked part-time for a farmer who had a small feedlot. I really liked it, and I’d like to have livestock of my own someday.

Both of my internships taught me a lot about working hard and working with people— but my education was also important. AST is a great degree to pursue. It fits in with many areas in the ag industry, and the job market is very good. If you want to farm, work in ag sales, or develop machinery, an AST degree will give you the knowledge base you need to be successful. I would not change much from my undergraduate years, but if I could I would have tried to take more ag business classes.

Overall, Iowa State has an exceptional College of Agriculture. In my opinion, it is the best school in Iowa for education in anything agricultural. The people I met, the friends I made, and the professors who taught me all showed me that I had made the right decision.
When I was looking at colleges, I visited the Kansas State ATM undergraduate program as a prospective student, and I quickly found that it was the right choice for me. I grew up on a diversified farm, and my ATM degree addresses the issues that we face on my family’s farming operation. From the start, the degree’s coursework captured my interest and offered me many different career paths to choose from when I graduated.

KSU is a well-respected agricultural university with a “smaller college” atmosphere. That was important to me—I graduated in a high school class of only 19 students!

In the spring of my freshman year, the KSU Agricultural Career Fair confirmed my decision to enroll in the ATM program at KSU. I discovered that ATM students and alumni are heavily recruited by ag companies. An ATM degree is attractive to a broad range of employers.

An ATM degree is also a strong undergraduate degree because of the flexibility that it offers. There are many hands-on opportunities, including internships, so your educational experience will be top notch and based on the real world.

Speaking of internships, I began to receive internship offers starting in my freshman year. Ultimately, I had three internships—one for each summer of my four-year program. I spent my first internship in sales at Syngenta’s Garst Seed subsidiary, where I assisted in managing a network of seed dealers. Because I really liked that experience, when I returned to school I began to focus on the agronomy and ag business options in the ATM program and easily earned minors in both programs by adding only three additional hours of coursework. That made me more marketable to future employers.

Following my internship with Garst Seed, I interned with Helena Chemical Company and gained additional agronomy and sales experience. Throughout that summer with Helena, I focused on selling foliar fertilizer products as well as developing marketing materials for the various products.

My final internship experience was with Monsanto as a field sales intern with their Channel seed brand. I had spoken with Channel during my junior year at a campus career fair and was offered the internship. That summer, my internship duties involved assisting large customers who were using the newest Channel products. I must have done well because, at the end of the internship, I was offered full-time employment as a district manager.

The deciding factor in accepting the full-time job was my internship mentors—the people I had worked for during my internships. They all told me what they had done to succeed in their current positions. With their advice, my internships became a “fast track” to securing a great career at Channel.

My typical work day involves helping dealers determine how to manage their businesses. I visit farmers and check on their crop production throughout the growing season to ensure customer satisfaction. I evaluate each corn hybrid and soybean variety to determine what biotech trait packages and genetic combinations work best.”

**Ryan Mathewson**

**Age:** 23  
**Hometown:** Axtell, Kansas  
**Hobbies/interests:** Hunting, fishing  
**Alma mater:** Kansas State University  
**Degree:** Agriculture Technology Management BS (2011)
packages and genetic combinations work best, so I can recommend the right product for each of my customer’s fields.

The internships and the ATM program gave me a broad knowledge base, which is important. I work with a variety of farm operators, and they often ask for my opinion on topics that are not related to seed. A broad knowledge base in agriculture allows me to answer those questions, and that enhances my credibility.

As for the future, I’d like to remain as a district sales manager for Channel seed at Monsanto for many years, but someday I’d like to return to the family farm, too. For now, my job satisfaction is very high. I get to work with farmers every day and help them become more successful—so that together we can feed our world’s growing population. I couldn’t imagine having a better career. I work with great people, and I love what I do. I urge prospective ATM students to step out for a career of adventures!

“Here comes the bride” and the groom—flying down the rapids on a Colorado honeymoon. Ryan (on the left) and his wife, Amy Mathewson (hidden behind the guide, right), tackled the white waters after tying the knot last summer. “The rapids come from the melting snow pack, so the water was very cold. It was very fast-paced and a fun way to see a lot of scenery!”
I grew up on a farm, and I’ve always enjoyed working on farm equipment. I knew ASM would be a great fit for me since I love practical applications and learning how agricultural systems work. If you are interested in ag and enjoy hands-on work more than design, then ASM may be the right fit for you, too.

I chose Purdue because it’s only one hour from my hometown, so I could easily travel back home to keep working on the family farm. In addition, Purdue has been a tradition in my family. In fact, we Maples think that Purdue is the finest ag school in the world—so, of course, there was no question where I’d attend.

In the intro-level ASM classes, I learned how to size grain augers, calculate equipment efficiencies, control erosion, and many other practical agricultural applications. I was fascinated, and I was anxious to take the higher-level courses to learn more.

My advice? Be sure to get internships! Industry experience with an ASM degree is the best way to stand out to an employer. And go abroad! It is a great way to diversify yourself and learn more about agriculture in the rest of the world.

My first internship was in grain terminal operations with ADM Grain Company in Brookston, Ind., where I planned and led elevator safety meetings, as well as loaded trains, managed stored grain, and unloaded trucks.

My second internship was “farming abroad” at Robilliard Farms in Leeston, New Zealand. I managed herds of 2,500 breeding ewes and 80 beef cattle. As well, I developed a pasture management plan and a farm loan repayment plan and assisted in many farm management decisions.

And it wasn’t all work. Off the farm, my fiancée and I traveled around the south island of New Zealand. One of our weekend trips included taking a helicopter up to the top of the New Zealand glaciers, where we got engaged. This past summer, Jennifer and I got married—and I started my new job in operations and safety with Kokomo Grain in Edinburgh, Ind. I really enjoy it, and I have applied many facets of my ASM degree to my new employment.

I met many people while at college, and I made good connections for the future, so here’s a little more advice: Network with the guest speakers and industry professionals who come to your classes. Those conversations can lead you to some great places!

Putting up fence in a pasture on the farm in New Zealand.
I always knew that I wanted to pursue a career in agriculture, but I was never sure what direction within that field I wanted to go. After our farm purchased a John Deere GS2 system, I saw first-hand how rapidly ag technology is advancing. I just had to learn more about this technology and find a way to work with it as a career. The AST degree has given me that opportunity.

My parents had a huge impact on my decision, and they reassured me that AST was the right choice. As a woman, I was a little apprehensive about a career in agriculture—ag has the reputation of being a male-dominated field—but I knew I could do it.

There were many factors in my decision to attend South Dakota State University. I had friends close to home in Nebraska who signed on at SDSU to major in AST, and I talked to them about the program and what they were learning. Of course, the out-of-state tuition was a concern. But SDSU was more affordable than I expected!

The deciding factor was the college tour. After walking the campus, meeting with my now-advisor Van Kelley, and finding out more, face-to-face, about the AST program, I was very impressed. And after comparing the SDSU AST program to that of other schools, and what SDSU had to offer to me personally, SDSU out-weighted the other contenders.

I completed my first internship with MaxYield Cooperative and Premier Crop Systems—both Iowa-based companies—the summer after my freshman year. With that experience, I knew that I wanted a career in agriculture, and that my major in AST was the way to go. Not only did I gain firsthand agronomical field experience, but I also was able to work with the latest technology.

My internship projects were focused on assisting farmers with their operations using Ag Leader’s SMS software and other programs. I was amazed at how the integration of technology (in this case, variable-rate planting) improved the farmers’ operations and production over time.

One of my greatest accomplishments that summer was mastering the powerful software and learning how to write the recs that would be used for the next planting season. This first company-shared internship reassured me that I had made the correct choice with an AST major.

This past summer, I was the central South Dakota sales intern for Pioneer Hi-Bred. My projects with Pioneer involved gaining agronomy experience with a primary focus on seed sales. This second internship again was reassurance that I was on the right career path—just where I was supposed to be.

Advancing technology is the future of agriculture, and there are so many directions one can go with an ATM major. It’s pistol hot! And ATM isn’t limited to a career with implement or technology companies. I confidently switched my future career path to sales! In fact, an ATM degree is extremely useful in a sales setting. With my ATM background, I’m more adept at providing assistance, and I don’t have to call someone else to solve problems or answer questions.

I’m a very driven individual, especially when it comes to things that people say cannot be done. I also think of myself as outgoing—especially when one of my favorite hobbies comes up: shooting sports. When I participate in organized shooting events, I get to meet people from all over the nation, and many of them have an ag background. That was especially true when I competed at the Junior Olympics in Colorado Springs, Colo.

There are plenty of opportunities in my field. As I get closer to graduation, I think I’ll know when the right job opportunity is in front of me. In the long run, I’d like to stay in the Midwest in an agricultural/sales career, but I’d love to travel abroad, too, especially in Spanish-speaking countries, where I could use my minors in Spanish and agronomy as well. The world is waiting, and I’m ready!

“Advancing technologies is the future of agriculture, and there are so many directions one can go with an ATM major. It’s pistol hot!”

Mercedes Dittrich

Age: 20
Hometown: Tilden, Nebraska
Hobbies/interests: Shooting sports, golf, farming
Alma mater: South Dakota State University
Degree: Agricultural Systems Technology BS (2011)
I grew up in the foothills of South Carolina and have always enjoyed the great outdoors. I’m sold on hunting and taking in the beauty of nature.

For me, Clemson was a good in-state institution, and close to home, so off I went. I knew I’d made the right decision when I began to meet the people in my classes and in the AGM club. We all had very similar interests, and I knew it was a good fit for me.

The ASM degree is a terrific, diverse technology degree that can get you into just about any field of agriculture. In my case, I have a strong interest in precision agriculture and the advancements it offers for producers worldwide. My undergraduate degree gave me many opportunities and prepared me for my master’s, the current work I’m doing for a PhD, and my job as an extension associate engineer for Oklahoma State University.

Before I graduated with my undergraduate degree, I worked as an agricultural engineering intern at Clemson’s Edisto Research and Education Center. I was able to learn many of the processes and the importance of agricultural research and extension. A good internship is worth its weight in gold!

I found my current job by attending conferences and expressing my interests in extension, research, and continuing my education to whoever I met. My advisor has been my biggest source of encouragement, and I’m currently involved in many mechanical and technology-based agricultural projects. In a typical workday, I set up and implement projects to aid in mechanical and precision farming advancements. I’m also involved in extension activities throughout the state of Oklahoma.

In a few more years, I hope to earn my PhD and then move on to a faculty position, where I can continue to do extension, research, and teaching work.

I get the most satisfaction from seeing work that I have done being implemented by producers—and seeing the producers getting positive results from it. My precision ag background allows me to help producers to better manage their crops, and I love being able to help people.

The only thing that would make my job better is being able to teach. I had opportunities during my master’s program to teach a few ag mech classes, and I enjoyed the interactions with the students—especially when the students realized how important the information that I’m conveying is and how it can be used to benefit them and the work they do. My drive to get out of bed in the morning is the knowledge that the work I do is making a difference in the world—in ways large and small.

“Home on the range—buffalo and all. I live for time outdoors, and one interesting place is the Wichita Wildlife Refuge near Lawton, Oklahoma.”

Wesley Porter

Age: 25
Hometown: Pickens, South Carolina
Hobbies/interests: Hunting and the outdoors
Alma mater: Clemson University Agricultural Mechanization BS (2007), and Biosystems and Agriculture Engineering MS (2010). Currently enrolled in Biosystems and Agricultural Engineering PhD program at Oklahoma State University

“Stepping out and stepping up! I have good memories of undergraduate days. The Annual Clemson Ag Mech Club skeet shoot and cookout are high on the list.”
I’ve been a Penn State fan all my life. During my high school summers, I attended FFA events and sports camps on campus, and I always felt at home. When I was ready for college, Penn State offered the major and the options that met my goals. A Penn State degree is held in high regard. It’s worth the hard work.

I was captain of the Penn State Pullers and active in the ASM and ASABE clubs. I can’t stress enough the importance of student clubs and organizations. Not only will they provide great experiences and practical application of what you learn in the classroom, but you’ll also make good friends, and that will make the adjustment from high school to college easier.

An ATM degree is designed for young people who enjoy hands-on engineering but who also have a knack for business and agricultural sciences. Some call us “educated farmers!” You can get a great job with an ATM degree. More and more companies are hiring ATM grads for a wide range of disciplines.

An internship is an important part of a college education because it’s a low-risk way for companies and potential employees to test-drive each other. Interns get more job offers than applicants without that experience. Best of all, interns perform meaningful tasks—so the learning component is high.

I did an internship with CLAAS, working with the field test team evaluating equipment performance. I worked with CLAAS’s new draper headers and the 700 Series of combines as well as the Orbis 900 non-directional corn header. I was based in Omaha, Neb., but I traveled to California, Missouri, and Minnesota. For the first time in my life, I was really on my own.

After graduation, I got hired at Case New Holland as a product training specialist responsible for training dealer salesman about the CR and CX combines. I found the opportunity by using CNH’s job search tool. My internship was an important accomplishment to include on my application. At the interview, as I learned more about what the job entailed, I knew it was the right position for me. I worked hard to get this position, and the hard work really paid off.

I am enjoying my current position with New Holland and, with time, would like to work my way up the company ladder. But I also dream about owning and operating my own beef cattle operation, and waking up every morning as a husband, a father, and a farmer. Prospects may be slim in today’s economy, but dreams can still come true!
and-grant university students who labor mightily for that perfect 4.0 on their college transcripts might not be doing themselves any favors when it comes to landing that perfect job after graduation, unless they work at least as hard on their communication skills.

So suggests a study of employer attitudes about the importance of land-grant college graduates’ skills, published in the *Journal of Southern Agricultural Education Research* by Dr. Antoine Alston, director of the Agricultural Education Program at North Carolina Agricultural and Technical State University.

Results show that while employers value technical skills very highly indeed, even more important to them are so-called “soft skills,” such as communication and teamwork, as well as character traits such as dependability and honesty.

That comes as little surprise to Brian Dockery, formerly of Rocky Mount, a 2005 A&T graduate with a major in agricultural education, and now territory manager for Dow AgroSciences’ turf chemical division in Plano, Texas. The job often sees him in business attire in the morning for a marketing presentation to CEOs and executives, then in khakis and short sleeves in the afternoon for an instructional presentation to golf course technicians.

“You can’t be effective, unless you can communicate to diverse audiences, with different levels of education,” he said.

If he knew then what he knows now, Dockery says, “I would have done an internship every year.”

“Until you get out there and experience the workplace, and how competitive it is, you don’t realize how important those skills are,” he said.

**Importance of skills**

For Alston’s study, 57 public and private industry employers who typically hire agriculture and environment majors were contacted. Twenty-four responded, ranking the importance of 37 job skills on a scale of 1 to 5, with 1-1.5 considered “unimportant,” and 4.5-5 considered “extremely important.” They were then asked to rank how well prepared land-grant university graduates actually are in those same skills (see table on facing page).

Scoring highest in importance were listening, verbalizing, understanding instruction, and teamwork. Dependability, honesty, and integrity also scored the highest. Slightly lower were those “hard” skills such as math, science, spreadsheets, word processing, Internet use, and accounting systems—all of which employers considered to be “very important” but a little less so than communication skills.

“A lot of people in industry are telling me now that they can find people who have the technical skills, but what they really need are what is now referred to as ‘21st century-ready’ employees. People with a blend of technical and soft skills who can express themselves well both in written and verbal expression,” Alston says.

That’s why he and other professors in the School of Agriculture and Environmental Sciences strongly encourage students to take advantage of many internships and cooperative experiences, and why doing at least one is a requirement for graduation.

Unfortunately, many students don’t adequately appreciate the importance of building those communication, character, and leadership skills until they get a little job experience under their belts, Alston observed.
“Students who take advantage of summer internships appreciate this more. They come back to me and say, ‘Now I understand what you’ve been telling us.’ Or students, who have been in the workforce for some time, come back and say, ‘Now I understand.’”

**How well prepared**

The survey also asked employers to rate how well prepared they felt land-grant institution’s graduates were in the same skill sets that they rated in importance. The results, compiled in a separate article published in “Online Journal of Workforce Education and Development,” revealed that institutions and students are doing well in teaching and learning technical skills, but that they both have room for improvement when it comes to communication and character skills. Employers indicated that graduates’ technical preparedness is higher than its actual importance in the workplace. Meanwhile, they ranked the importance of communication and character skills higher than the students’ actual preparedness, indicating that graduates aren’t as prepared in those areas as their employers would like them to be.

Alston wasn’t surprised at the findings and sees them as further evidence that curriculums need to be revised to reflect a rapidly changing workplace. He applauds the “writing across the curriculum” trend in higher education but believes that more required communication courses would prepare students even better for the workforce. That’s why he incorporated the course “Writing for Science and Technology” into the ag education professional services curriculum and has developed online courses in leadership. But more will be needed, Alston says.

“I believe all land-grant college graduates, particularly in the food and agricultural sciences disciplines, should have at least six credit hours in agricultural communication, three hours written and three hours oral,” he said.

Kurt Peterson of Cargill Ag Horizons in Minneapolis, agrees with Alston that there is “always room for improvement” when it comes to communication education.

“I think it’s always been important, but I think customers’ expectations are higher. If you can’t present your technical knowledge to customers so that they’ll understand, then your technical knowledge almost doesn’t count,” he said.

As if graduates don’t have enough to think about, Peterson points out yet another soft skill challenge that will face them in today’s workforce: Change management. Business keeps changing, he said. Processes keep changing too, and the jobs that recent graduates are hired to do today might not be the same jobs they are expected to do tomorrow.

“We need people with what we call ‘learning agility’—people who have the ability to adapt to change and can handle change,” he said.

Peterson knows of what he speaks. The day he was interviewed for this article, he had just wrapped up a morning meeting and was in his car on the way to the airport, having just received news that his own role at Cargill was changing, from “human resources leader” yesterday to “process improvement leader” tomorrow.

Laurie Gengenbach is staff writer for Research, the magazine of the Agricultural Research Program at North Carolina Agricultural and Technical State University, Greensboro, USA; lagangen@ncat.edu.
Helping students to learn how to solve problems by devising practical, efficient solutions is the task of a joint committee of Midwest educators. Biological and agricultural engineers and agricultural systems management faculty have devised **online undergraduate experiences for students in the areas of renewable energy, food safety, bioprocesses, and more**. The solution involves students from around the world and all walks of life to meet regularly online to interact and learn the latest techniques and science associated with the growing field of agricultural mechanization.

Fully online courses are offered through the **Agricultural Interactive Distance Education Alliance, AG*IDEA**, providing flexibility and enabling students to balance career advancement with professional, social, and family commitments.

Over 115 students have taken advantage of the courses from collaborating institutions, generating 582 credit hours. According to Leon Schumacher, professor and chair of Agricultural Systems Management at the University of Missouri, “Students have the opportunity to learn from a broad base of faculty with expertise in their field.”

AG*IDEA is an inter-institutional academic alliance that allows institutions working together to offer programs that may not be possible at any individual institution. The end result is an enriched learning experience for students and teaching experience for faculty.

The courses are taught by top faculty members at each institution, providing students with a knowledge base and skill set that is applicable to current demands in the field of agricultural mechanization while preparing students for success in future educational or professional pursuits. Schumacher, faculty coordinator for the Ag Mechanization alliance, said “Offering courses between institutions provides the opportunity for a robust curriculum and the sharing of ideas between faculty.”

The agricultural mechanization program is supported by accredited public universities: Iowa State University, Kansas State University, North Dakota State University, South Dakota State University, University of Missouri, and the University of Nebraska. Most of the courses are shared at the undergraduate-level, however, graduate-level courses are also available. Courses include:

- Chemical Application Systems
- Machinery Management Using Precision Agriculture Technology
- Precision Farming Systems—Advanced Concepts and Applications
- Preservation of Grain Quality
- Agriculture Safety and Health
- Biorenewable Systems Technology
- Sensors and Control Systems for Agri-Industries
- Irrigation Systems Management

The objectives of the cooperative effort are to:

- Develop a collaborative, multi-state educational effort to add depth and breadth to each university’s instructional program in mechanized systems management.
- Capitalize on the strengths of individual faculty members between the institutions.
- Reduce overall faculty teaching load.
- Focus teaching talents and efforts in specific areas within each of the institutions.

To learn more about AG*IDEA or the Agricultural Mechanization program check online at **www.agidea.org**.

**A little background**

*First convened in 1994, the Great Plains Interactive Distance Education Alliance (Great Plains IDEA) has evolved from a collegial group of academic administrators who shared a common interest in educating rural professionals through the use of distance technologies and shared courses. It has become a premier post-secondary distance education collaboratory that sponsors inter-institutional undergraduate and graduate degree programs and develops policy and practice models for inter-institutional distance education programs.*

*In 2002, the ten founding universities approved the Alliance bylaws, and a memorandum of agreement for Alliance management. With this step, the Alliance leadership team formalized the working relationship that began in 1994.*

*In 2006, the Great Plains IDEA established a process to expand and include other academic discipline boards. This expansion was initially driven by the interests of the agriculture deans at Iowa State University, Kansas State University, the University of Missouri, and the University of Nebraska to support the Great Plains IDEA programs. AG*IDEA officially joined the Great Plains IDEA organization in 2007. The effort was supported by a $300,000 USDA challenge grant.*

**Billie Strand** is a program specialist, Extended Education and Outreach, University of Nebraska-Lincoln, USA; bstrand2@unl.edu.

**Tom Brumm** is associate professor, Department of Agricultural and Biosystems Engineering; professor-in-charge, Engineering Online Learning and LAS Center for Distance and Online Learning; and director of assessment, College of Engineering, Iowa State University, Ames, USA; tbrumm@iastate.edu.
In Search of

THE PERFECT SCHOOL

Where to begin… The schools listed below list programs in agricultural systems and technology. Contact them directly for more information. Many of these programs are administered by the Agricultural and Biological Engineering Departments.

<table>
<thead>
<tr>
<th>State University/Colleges</th>
<th>Contact Information</th>
</tr>
</thead>
</table>
San Luis Obispo, CA 93407  
Phone: 805-756-2378  
www.bae.calpoly.edu |
| California State Polytech. Univ. | Landscape Irrigation Science  
3801 W Temple Ave  
Pomona, CA 91768  
Phone: 909-869-7659  
www.csupomona.edu/ |
| California State Univ. - Fresno | Plant Science Dept.  
Mail Stop AS-72  
PO Box 9632  
Mississippi State Univ.  
www.abe.msstate.edu/  
Phone: 601-325-3280  
www.csufresno.edu |
| Clemson Univ. | School of Agricultural, Forest, and Environmental Sciences  
261 Lehetsy Hall  
Clemson, SC 29634-0317  
Phone: 864-656-3303  
www.clemson.edu/safes |
Riley Robb Hall  
Ithaca, NY 14853-5701  
Phone: 607-255-2173  
www.engr.cornell.edu/ |
Ellison Bldg.  
Fort Valley, GA 31030-4313  
Phone: 478-825-6275  
www.fvsu.edu |
102 Davidson Hall  
Ames, IA 50011-3080  
Phone: 515-294-1434  
www.abe.iastate.edu |
129 Seaton Hall  
Manhattan, KS 66506-2906  
Phone: 785-532-5580  
www.bae.ksu.edu/ |
PO Box 9632  
Mississippi State, MS 39762  
Phone: 601-325-3280  
www.abe.msstate.edu/ |
Bozeman, MT 59717  
Phone: 406-994-6121  
www.coe.montana.edu/ce/ |
| National Univ. of Ireland, Dublin | (Univ College Dublin, UCD)  
B农Sc  
Belfield, Dublin 4, Ireland  
Phone: 353-1-7167777  
www.ucd.ie/agandvet/bagrs%20programme.htm |
PO Box 7625  
Raleigh, NC 27695-7625  
Phone: 919-515-2694  
www.bae.ncsu.edu/bae |
PO Box 5626  
Fargo, ND 58105-5626  
Phone: 701-231-7261  
www.ageng.ndsu.nodak.edu |
PO Box 550  
Truro NS B2N 5E3, Canada  
Phone: 902-893-6710  
www.nsac.ca/bioenvironmental |
590 Woody Hayes Drive  
Columbus, OH 43210-1057  
Phone: 614-292-6131  
www.fabe.osu.edu |
250 Ag. Eng. Bldg.  
University Park, PA 16802  
Phone: 814-865-7792  
www.abe.psu.edu |
| Purdue Univ. | Agr. Sys. Mgmt.  
225 S. University Street  
West Lafayette, IN 47907  
Phone: 765-494-1172  
joinabe@ecn.purdue.edu  
www.purdue.edu/abe |
PO Box 2120  
Brookings, SD 57007  
Phone: 605-688-5141  
http://abe.sdstate.edu/ |
| University of Iowa | Agr. Sys. Mgmt.  
Arizona Western College - Ag 103  
PO Box 929  
Yuma, Arizona 85366-0929  
Phone: 520-621-6107  
http://ag.arizona.edu/abe/program/s/Agm/ |
2005 Agriculture Bldg  
Fayetteville, AR 72701  
Phone: 479-575-2035  
www.uark.edu/depts/aeddhp |
| University of Delaware | Engineering Tech.  
Bioresources Eng. Dept.  
264 Townsend Hall  
Newark, DE 19716-2140  
Phone: 302-831-2468  
http://ag.udel.edu/departments/bredp/ |
| University of Florida | Agr. Operations Mgmt.  
120 Frazier Rogers Hall  
PO Box 110570  
Gainesville, FL 32608  
Phone: 352-392-1864  
www.agen.ufl.edu |
| University of Idaho | Agr. Sys. Mgmt.  
Moscow, ID 83844-0904  
Phone: 208-885-6182  
www.uidaho.edu/bae/bae.html |
| University of Illinois | Tech. Sys. Mgmt.  
1304 W. Pennsylvania Ave.  
Urbana, IL 61801  
Phone: 217-333-3570  
www.age.uiuc.edu/ |
5710 Bioresource  
Orono, ME 04469-5710  
Phone: 207-581-2709  
www.engineering.umaine.edu |
| University of Minnesota-Crookston | Agr. Sys. Mgmt.  
109 Hill Bldg., 2900 Univ. Ave.  
Crookston, MN 56716  
Phone: 218-281-8101  
www.crk.umn.edu |
| University of Missouri | Agr. Sys. Mgmt.  
Columbia, MO 65211  
Phone: 573-882-2731  
www.fse.missouri.edu/ |
| University of Nebraska | Mech. Sys. Mgmt.  
223 L W Chase Hall  
Lincoln, NE 68583-0726  
Phone: 402-472-1413  
http://bse.unl.edu/ |
PO Box 9030 Mayaguez Campus  
Mayaguez, PR 00681-9030  
Phone: 787-832-4004, 2470  
www.uprm.edu/ |
164 Agr. Eng.  
River Falls, WI 54022  
Phone: 715-425-3985  
www.uwrf.edu/ag-engineering/ |
| Utah State Univ. | Agr. Sys. Tech. & Education  
2300 Old Main Hill  
Logan, UT 84322-2300  
Phone: 435-797-2230  
http://www.aste.usu.edu/ |
213 LJ Smith  
Pullman, WA 99164-6120  
Phone: 509-335-1578  
www.bsys.e.wsu.edu/ |
Ag Systems graduates are in high demand. Depending on qualifications and experience, starting salaries typically range from $35,000-$50,000 annually. For more information, check with individual schools regarding their placement records (see page 27).

So, what would you like to be? Who could you work for? Here are some ATM-degreed ideas!

- Grain Elevator Manager
- Farm Equipment Dealer
- Plant Production Supervisor
- Irrigation Salesperson
- Soil Conservationist
- Precision Agricultural Specialist
- Reclamation Inspector
- International Ag Development
- Vo-Ag Teacher (with certification)
- Irrigation Management
- Territory Service Manager
- Crop Specialist
- Farm Appraiser
- Energy Advisor
- Petroleum Sales
- Water Quality Specialist
- Control Systems Manager
- Farm Facilities Manager
- Safety Specialist
- Product Testing
- Marketing Supervisor
- Veterinary Technician
- Loan Appraiser
- Farm Manager/Operator
- Engineering Technician
- Food Processing Plant Manager
- Biofuels Technician
- Parts Operations Supervisor
- Service Representative
- Ventilation System Designer
- Waste Management Technician
- Golf Course Manager
- Environmental Consultant
- Application Specialist
- Training Manager
- Research Technician
- Integration Manager
- Construction Supervisor
- Facilities Manager
- CAD Programmer
- County Extension Director
- Agricultural Imports Inspector
- Grove Management
- Quality Control Manager
- Cooperative Extension Specialist
- Design Technician
- Bank Field Representative
- Experimental Mechanic
- Dairy Equipment Specialist
- Network Engineer
- Operations Manager
- Program Technician
- Structures Specialist
- Soil Scientist
- Water Management Specialist

Prospective Employers

The following list provides examples of companies that employ ag systems graduates ... a “short list” sampling and by no means complete.

- Aerotech
- AGCO
- Ag-Chem Equipment Co.
- Archer Daniels Midland
- Bobcat
- Cargill
- Case-New Holland
- Cenex-Land-O-Lakes
- Caterpillar
- ConAgra
- Cummins Engine
- Dairyland Seeds
- Deere & Company
- DeKalb-Pfizer Genetics
- Detroit Diesel
- Dole Fresh Vegetables
- Eaton Corp.
- Eli Lilly
- EPA
- FMS
- Farm Credit Service
- Farmland Industries
- FieldStar
- Frito-Lay
- Gehl
- General Electric
- General Mills, Inc.
- Gilardi’s Frozen Foods
- Government agencies
- Growmark, Inc.
- Hershey Foods
- Hog Slat, Inc.
- Hormel Foods Corp.
- IBM
- Ingersoll Rand
- Kifco
- Kinze Mfg. Co.
- Koehler
- Kraft Foods
- Kubota Tractor Corp.
- Landoll Corp.
- Monsanto
- Morton Buildings
- Mustang Tractor
- National Instruments
- Parker Hannifin
- Peace Corps
- Pella Corp.
- Pillsbury
- Pinnacle Food Group
- Pioneer Hi-Bred
- Polaris
- Purina
- Quaker Oats
- Rain Bird
- Raven Industries
- Spreckles Sugar Co., Inc.
- Soil Conservation Service
- Spraying Systems, Inc.
- Sukup Mfg. Co.
- Techmark
- The Dial Corp.
- Toro
- Tyson Foods, Inc.
- USDA
- Valmont Industries
- Vermeer

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**Product Manager**

**Technical Sales**

**Training Coordinator**

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TENURE-TRACK ASSISTANT PROFESSOR POSITION IN POST-HARVEST GRAIN QUALITY AND STORED PRODUCT PROTECTION

RESPONSIBILITIES: Develop an internationally recognized applied research and Extension program in the area of post-harvest technologies, grain quality, and stored product protection engineering. Potential areas of research and Extension include efficient drying of wet grain while maintaining quality, development of systems to prevent and control insect infestations, identity preservation (GMOs, specialty grains), managing grains with mycotoxins, traceability, or food security as it relates to cereal grains and oilseeds. Additional Extension opportunities include development of distance learning and continuing education courses and materials, providing assistance and education in design and layout of grain storage and handling facilities, and addressing safety and health issues related to grain handling and storage. The successful candidate will engage industry, government, and other stakeholders to identify key grain quality and stored product issues; develop a high impact, externally funded applied research and Extension program; and contribute to the Department’s teaching program.

COLLABORATIVE ENVIRONMENT AND FACILITIES: The position, an academic year appointment, will be based in the Department of Agricultural and Biological Engineering, a top-ranked program. The successful candidate is expected to collaborate effectively in a highly interdisciplinary effort to address post-harvest issues, and provide leadership for Purdue University’s Post-Harvest Education & Research Center (www.grainquality.org).

QUALIFICATIONS: Applicants must have a Ph.D. in agricultural or biological engineering, agricultural systems management, or a related discipline. Progress towards a Professional Engineering (PE) license is desirable but not required. Excellent oral and written communication skills are required.

CLOSING DATE: Review of applications will begin December 1, 2011 and continue until the position is filled.

APPLICATION MATERIALS: Applications should include a letter of interest, CV, academic transcripts, statements of approach and vision for research and outreach, and names and contact information for three references. Please email to abegrain@ecn.purdue.edu. Background check is required for employment in this position.

CONTACT: Questions may be addressed to Jane Frankenberger, Search Committee Chair – 765-494-1194 – frankenb@purdue.edu.

For additional information see http://www.purdue.edu/ABE

CALIFORNIA STATE UNIVERSITY, FRESNO
ASSISTANT PROFESSOR IRRIGATION / WATER MANAGEMENT AND ASSISTANT DIRECTOR OF RESEARCH FOR THE CENTER FOR IRRIGATION TECHNOLOGY
DEPARTMENT OF PLANT SCIENCE

Duties include teaching undergraduate and graduate level courses; advising/mentoring students; conducting research in irrigation and water management; administering research program of the Center for Irrigation Technology and participating in university level committees. An earned doctorate (Ph.D.) in irrigation systems and water management, ag biosystems engineering or related field is required prior to appointment (August 17, 2012). Please apply online by November 28, 2011 for full consideration. Visit http://job.csufresno.edu/ for complete position description and on-line application.

ASSISTANT PROFESSOR – MISSISSIPPI STATE UNIV ENVIRONMENTAL QUALITY/WATER RESOURCES

The Department of Agricultural and Biological Engineering at Mississippi State University is seeking a tenure-track Assistant Professor in the environmental quality/water resources area. The position requires a PhD at the time of appointment in Biological, Agricultural, Environmental, or a related engineering discipline. Candidates must be capable of developing and sustaining a strong externally-funded research program in their areas of expertise and should demonstrate a strong interest in teaching undergraduate and graduate courses. Training and/or experience with nutrient and runoff management, eutrophication, and environmental modeling are desirable. The candidate should have good communication skills and be willing to work on interdisciplinary teams. Submit application letter, curriculum vitae, brief statement of teaching philosophy, research plans, and contact information for three references to: Thomas Cathcart, Search Committee Chair, Department of Agricultural and Biological Engineering, Mississippi State University, Mississippi State, MS 39762. Electronic submissions are preferred and should be sent to: tc@abe.msstate.edu. Application review will begin November 1, 2011 and will continue until a suitable candidate is identified. Mississippi State University is an Equal Opportunity Employer. Women and minorities are encouraged to apply.
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For more information about undergraduate and graduate courses contact Agricultural Systems Management http://asm.missouri.edu or 1800.995.8503, Leon Schumacher, schumacherl@missouri.edu

msym.unl.edu

Agricultural Systems Management
University of Nebraska-Lincoln
Biological Systems Engineering
223 Chase Hall
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(402) 472-1413
bse.unl.edu

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- Construction companies
- Grain and seed companies
- Livestock feeding operations
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- Manufacturers