URBAN ROOTS

in Agriculture

Becky Figler

Illinois Bureau of Tourism
The definition of agriculture is getting to be quite a mouthful these days.

“It’s not just farming. It’s not just food. It’s not just science,” says Karl Brandt, Purdue Agriculture’s associate dean and director of academic programs. “It’s many things. Agriculture has a broad meaning to us versus the narrow meaning it may have to others.”

At Purdue Agriculture, the definition encompasses the agriculture, food and natural resource systems, and includes nearly 50 bachelor’s degree programs from biochemistry to food science and landscape architecture to wildlife management.

And with this broad definition come students from increasingly diverse backgrounds with equally diverse interests. Today, 75 percent of Purdue Agriculture students are from non-farm backgrounds. Three of these students—Becky Figler, William Johnson and Chris Davis—describe their experiences putting down urban roots in Purdue Agriculture.
Preparing for a law career from the ground up

Becky Figler had never been on a farm until she came to Purdue University. “I didn’t think of Agriculture as more than farming,” the suburban Chicago native recalls. “I didn’t realize the extent that business, economics and technology were involved.”

That changed with the first time she visited a farm as a freshman at Purdue.

This environmental science major and pre-law student whose first farm visit became an eye-opening experience is now one of the shining stars in Purdue’s School of Agriculture. Not only is Figler an Agricultural Ambassador, a corps of students who meet-and-greet for Purdue Agriculture, she’s been named to Alpha Zeta, the agriculture honor society, and Phi Beta Kappa. Figler also is doing research on the microbial content of forest soils and is a teaching assistant in biology. She topped off her résumé as a legislative intern in Washington, D.C. with the powerful Senate Committee on Food and Agriculture.

While Figler may not have set foot on a farm until arriving at Purdue, she was by no means a science lightweight. Her Schaumburg, Ill., high school has a reputation for its tough college-prep science and math curriculum. And while her goal always has been law school, an interest in environmental issues and science led her to Purdue Agriculture.

“I wanted to have a technical base as a lawyer,” she says.

In an agricultural program, however, Figler found herself in unfamiliar territory. In introductory courses that her classmates found easy, she struggled to understand foreign concepts like yield and bushels per acre.

Culture shock, she says.

“You could have told me anything, and I would have believed it.”

She’s come a long way since then.

Designing a career in landscape architecture

As a child, William Johnson lived in the inner city and played in the streets and along the railroad tracks of Indianapolis. Twice a year, he left his concrete playground for rural Mississippi, where he and his cousins roamed the woods and climbed trees.

As a landscape architect major, Johnson still enjoys both the cityscapes and wide-open spaces. “Planning parks and natural areas are my favorite, but I still enjoy the city plazas, too,” he says.

During Purdue’s recent spring break, Johnson was home again, putting the time to good use networking and shopping his résumé around. He hopes his career will lead him back to Indianapolis, where he can practice his profession and give back to his old neighborhood, extending a hand to the next generation the way the previous one helped him.

“I want to go back to the neighborhood and interact with the kids,” he says. “There are a whole lot of kids there that I can be a role model for.”

At times, not even 65 miles of interstate highway could separate him from his roots. On two occasions, he took a year-long break to work so that he could continue his education. And while college may have been a six-year plan for him, rather than the traditional four years, he has plenty to show for it. Those student sabbaticals were spent in the training grounds of two well-known capital city landscape architecture firms. Add to that a required co-op experience with a third firm, and Johnson has compiled a résumé that reads like that of a seasoned professional.

“The co-op was one of the best aspects of the program,” he says. “Not only do you learn from your professors, you get hands-on experience before you get into the field.”

Figler

Johnson
Today, she talks easily and with confidence about topics like buffer strips and erosion. For her research project with forestry professor Phil Pope, she spent a damp and chilly November in Southern Indiana climbing through brush and using a chain saw to collect samples of deadfall, which she later analyzed in the lab.

Four years of hard work and a wide range of courses in forestry, agronomy, agricultural economics, natural resources and environmental science have made the difference.

“Even my parents are amazed,” she says.

With law school beckoning, Figler turns an optimistic eye to the future. After law school, she would like to go back to The Hill—this time as an environmental lawyer like the ones she shadowed during her internship.

But there will be one key difference.

“What many environmental lawyers have to learn on the job,” Figler says, “I’ll know going in.”

Because of his strong computer background, his employers often picked him to transfer hand drawings to AutoCad, as well as to work with a number of other computer programs. In addition, he honed his skills in design, surveying, and land and urban planning.

It was these two interests—drafting and computers—that led him to Purdue Agriculture in the first place. He had even shuttled between two Indianapolis high schools to take full advantage of courses in both. And when it came time to choose a major at Purdue, Johnson opted for landscape architecture.

“It was still drawing and still using the computer,” he says. Looking back, he has no reason to doubt his intuition. “It was the right major to be in.”

Making a scientific recipe for food

Chris Davis will never look at food the same again.

“I can’t even watch food commercials without analyzing how it was made,” the food science major says.

And even though his major deals with processed food rather than fresh meat and vegetables, when the U.S. Department of Agriculture recalled more than 25 million pounds of red meat last summer, he again was looking below the surface.

“It’s not just that it’s a bad thing to have happened,” Davis says. “I want to know why it happened and how we can stop it from happening again. And every time it happens, I think, ‘Here we go again.'”

Davis wasn’t always so focused on food, though. Drawn to Purdue by its reputation for science education, the Crown Point native enrolled in the agricultural engineering program. But like a large percentage of students, his first choice wasn’t the exact fit he was hoping for. He began shopping around for a major that more closely matched his interests. With his already-strong background in chemistry, academic counselors directed him right back to Purdue Agriculture—this time into the food science program.

As a food science major, Davis has learned how to apply science, mathematics and engineering in converting agricultural commodities into foods and beverages through various processing steps.

And “science” is the operative word. “I enjoy the science part the most, particularly the microbiology,” he says. “It affects so much—shelf life, spoilage, flavor and even the texture of food.”

Food processing involves not only the foods themselves, but also their packaging, storage and distribution. Packaging is designed to do much more than catch a shopper’s eye on a grocery store shelf. For example, different types of packaging may allow for either less light or air—like cardboard and plastic milk cartons.

“Cardboard is more porous than plastic but doesn’t let in light, and plastic containers are more airtight but let the light in,” Davis explains. He learned about processed dairy foods firsthand during an internship with the Kroger dairy system, working in everything from receiving to distribution.

With graduation around the corner, Davis has been interviewing with food processors around the Midwest. His job prospects encompass quality assurance, production management and supervision within the food industry.

“The irony is that people want processed ready-to-eat food, but they want it preservative-free,” Davis says. “That makes it difficult. But it’s one of the reasons that I’ll have a job.”
Purdue agricultural engineer Don Jones wants Hoosiers to decide whether or not they want to allow pork production in the state.

For him, and others in the middle of the animal waste debates, it’s no idle question. Water quality concerns, urban–rural migration and questions of farm size and structure have put pork production under intense scrutiny, both in Indiana and across the country, as producers, environmentalists, legislators, regulators and researchers try to get a handle on how and where pigs will be raised.
Purdue Swine Team members Don Jones (left) and Alan Sutton (center) are researching manure disposal and odor control. They also teach proper manure management to Indiana animal producers.

Chris Sigurdson
Purdue agricultural economist Chris Hurt sees the public voicing concerns about the size of modern hog farms. He’s watched the industry be shaped and molded by economic forces that have cut the numbers of hog operations as the number of marketed pigs increased.

Indiana pork producer Jim Moseley wants pork producers to get out in front of the public debate and address environmental and social concerns. As lead negotiator for the National Pork Producers Council, he took part in an eight-month-long National Environmental Dialogue on Pork Production last year with several federal and state environmental and agricultural officials. The talks yielded a set of environmental recommendations organizers hope will be accepted as a national framework.

The Hoosier Environmental Council wants a moratorium on new hog farm construction and on the expansion of existing ones in Indiana. They cite threats to water quality from mega-farms that collect the waste of 4.85 million pigs. 

Source: Indiana Agricultural Statistics Service, USDA

(Not In My Backyard)—urban-rural migration, water-quality concerns, odor and farm size are at the center of the pork production debate.
thousands of pigs into large lagoons. The prime example is North Carolina, where in June 1995 heavy rains burst a lagoon and sent 25 million gallons of hog waste into the Neuse River, causing a massive fish kill. A disenchanted public there convinced legislators to pass a moratorium on new pork production facilities. In Indiana, 25,000 people signed a petition the council circulated.

The Indiana Pork Producers Association (IPPA) believes pork producers are under siege. The IPPA and the leadership of seven other state agricultural commodity organizations wrote a letter to Gov. Frank O’Bannon, asking for his public support of animal agriculture.

U.S. Senator Tom Harkin (D-Iowa) wants to see national standards for animal waste handling, claiming that “the enormous amount of animal waste produced in America constitutes a growing environmental risk.” The Environmental Protection Agency (EPA) recently announced a plan for regulating the 6,600 largest animal feeding operations across the country, targeting those in the most sensitive environments first. Animal waste rules for pork and poultry producers will be re-written by December 2001.

Purdue University animal scientist Alan Sutton, who literally helped write the book on animal waste management, says well-managed operations would pose little threat to water quality, regardless of size: “Small, poorly managed operations could have significant adverse effects on the environment.” At the same time, he would like to see pork producers get better at storing and using manure. Sutton co-chaired a Council for Agricultural Science and Technology task force which wrote “Integrated Animal Waste Management” in 1996.

To Phil Anderson, executive vice president of the Indiana Beef Cattle Association, the 1997 moratorium movement in Indiana was a direct result of events in North Carolina. Anderson maintains that prudence is called for in all animal operations, but he doesn’t think it’s fair to let North Carolina dictate what should happen in Indiana. Cattle producers aren’t immune either—the EPA wants to revise national guidelines for beef and dairy producers by December 2002.

**A history of hoosier hog production**

Indiana is the fifth-largest hog-producing state in the country, but probably not for long, considering the intense economic pressures, the environmental scrutiny by regulators and others, and the competition from producers in other states. While the number of pigs has remained fairly steady, the number of producers has steadily dropped. Fewer producers are able to raise more pigs, a direct result of advances in production technology and animal health and genetics.

In 1950, 4.4 million pigs were in the fields and pig pens on 108,000 farms in Indiana. By 1980, 24,000 operations were raising 4.85 million pigs. In 1987, there were 4.5 million pigs in Indiana, most still raised in pastures and open buildings on 16,000 farms.

The numbers of pork operations in the state continued to shrink in the ‘90s, from 13,000 in 1990 to 7,000 in 1997. Today, those Indiana hog farms raise 3.8 million hogs, largely in concentrated feeding operations.

Nationally, the number of farms with hogs dropped 11.2 percent in 1997 to 138,700 farms, continuing the same long-term trend from 1996 to 1997. The total drop in farms was 17,560—mostly small ones.

Nearly 10,000 farms leaving the industry had fewer than 100 head in inventory; 6,280 fewer farms were recorded in the 100-to-499 head category; 1,350 fewer in the 500-to-999 head category; and 610 fewer operations in the 1,000-to-1,999 head range.

But the number of large farms grew, with 500 more farms that had 2,000 to 4,999 head and 80 more farms with 5,000 or more head.

It’s an economic dichotomy. Narrow profit margins are pushing smaller operations out of the industry, while the potential for large returns has brought on the mega-farms, Hurt says.

Farms that weren’t big enough to spread costs out over a larger number of animals lost money. Operations that couldn’t afford to adopt the latest technologies lost ground.

On the other hand, when investors saw how much money there was to be made in pork production, mega-farms were born. The industry sprang up in North Carolina almost overnight, pushing that state from a ranking in the twenties to second only to Iowa in
number of pigs produced. Bursting at the seams, those companies now are setting up shop in Utah and Texas, attracted by wide-open spaces and very few people.

Circle 4, a partnership of the three largest North Carolina pork companies and a Virginia firm, already raises 260,000 pigs in Milford Flats, Utah, with plans to market 2 million pigs per year in five years. One operation could raise close to one-third of Indiana’s entire annual output of 6.6 million.

For Indiana, where a commercial operation might have 2,000 head, that size of an operation isn’t even an option. Environmental vulnerabilities, public concern, land use policies and population density would make attempting to site one of those facilities a nightmare.

But the nightmare for many Hoosier pork producers is the inability to grow at all, as their neighbors look suspiciously at any request for permission to expand or modernize production practices.

Moseley says that could become a Catch-22 because pork producers not only need to expand or adjust their operations to stay competitive, they also may have to cover additional costs to comply with new environmental regulations. It’s not a choice, he says, because it’s not up to the farmers. “If you can’t expand or change, you’ll die.

“This isn’t about getting rich. To feed their family, to continue to make the same amount of money, family farmers have got to get sufficiently large to cover the additional costs.”

Purdue’s Hurt, who predicted several years ago that pork operations would gravitate to areas that appreciate them, says many Hoosier family farms are “location locked.”

“The corporate hog farms view hog production as occurring wherever suitable sites can be found,” Hurt says, “whether that’s in West Texas or Latin America.”

Indiana farm families, on the other hand, don’t leave their hometowns behind, he says. They just quit raising hogs.”

Farm families and rural communities would feel that loss. According to Hurt, hogs have generated about 25 percent of farm income as profitability has been good over time. “Think about what it would mean to you to take away one dollar of every four from your paycheck.”

Currently, pork production contributes nearly $2 billion to the Indiana economy with more than 24,000 Indiana residents involved in various aspects of the industry.

And that doesn’t account for the saying that reminds farmers why they grow so much grain in Indiana: “The best way to export corn is to turn it into pork,” Hurt says.

So how does the Indiana pork industry survive? One way is to find new and better ways of raising pigs that don’t harm the environment or bother the neighbors.

Indiana pork production on the cutting edge

It’s become a mission statement for Purdue pork researchers: economically profitable, socially acceptable and environmentally sustainable pork production. They’ve tackled the concerns on a number of fronts.

“For some people, it’s ‘water quality,’ but they also mean odor, property values, NIMBY (Not In My Backyard), farm size and a number of other hot buttons,” Jones says.

To help Indiana pork producers compete, the Purdue Swine Team created *Positioning Your Pork Operation for the 21st Century*, a book of financial and technological recommendations to help smaller producers acquire the economic and technological advantages of the mega-farms. The Swine Team is made up of Jones, Hurt and other experts from agricultural economics, animal sciences, agricultural engineering and veterinary medicine. Team members and Carroll County
Extension educator Steve Nichols, resident of the largest pork-producing county in the state, helps make sure the recommendations will work down on the farm.

Since December, Sutton and Jones have been busy teaching manure management to the state’s 3,800 animal producers who hold confined feeding permits. Helping producers meet state regulations—which include state inspections and on-farm record-keeping of manure disposal—will help keep the industry out of trouble. Producers also fill out a manure management plan for their operations.

“It’s nothing a producer shouldn’t already be doing,” Jones says. “These are good prevention measures that will help producers pay attention. It could even help them save money.” He estimates they talked to 1,300 producers at the “Get Legal” Cooperative Extension Service meetings.

In addition to providing producer education, the Purdue specialists have active research programs looking at manure disposal and odor control. These could also help the producer’s bottom-line.

For example, correctly applying manure to corn fields could save money and boost yields. Substituting swine manure for commercial fertilizer could save producers $25 to $60 per acre and stimulate an increase of 10 to 25 bushels per acre of corn when using nitrification inhibitors, Sutton says.

“That works out to a $2-to-$5 return on each dollar invested in the better manure application practices,” Sutton says. He and Jones have developed computer-based programs that take the guesswork out of manure application.

Sutton also is working on reducing odor at the source. Manipulating the amino acids and crude protein in pig feed, he reduced sulfur odorous compounds in manure—the rotten egg smell—by more than 63 percent. Nitrogen dropped 45 percent in fresh manure and stored manure had 48 percent less ammonia emissions. Addition of 5 percent cellulose to the diet reduced ammonia emission from fresh manure by 49 percent and from stored manure by 73 percent.

Al Heber, an air quality researcher in Purdue’s Department of Agricultural and Biological Engineering, has the best grasp on odor of anyone at Purdue and is working on techniques that help trap volatile compounds, as well as on manure treatments that neutralize them. Along with animal scientist John Patterson, he worked on air scrubbers that filter the smellier compounds out of the barn air. He also has evaluated commercially available manure additives and compounds that either reduce offensive gases or act as a blanket on top of manure and trap the odors beneath it.

Meanwhile, Heber has just equipped a new odor evaluation lab with a $25,000 olfactometer and a gas chromatograph that will help analyze odors both scientifically and subjectively. Using the olfactometer, a panel of trained sniffers will judge the concentration and offensiveness of odors.

But deciding where to put the pigs may be the best bet for odor abatement. Heber is looking for funding to adapt a European-devised computer model that projects the impact of a production facility based on pig population, waste handling systems, predominant wind patterns and other variables. If it is adapted for Indiana, producers could test various options to reduce the area their operations affect.

Land application can be improved, too. Purdue agricultural engineer Dan Ess and agronomist Steve Hawkins have devised a computer-assisted manure spreader that measures the amounts applied and plots it on a geographical information system. Theoretically, the machine could be set to shut off when it runs too close to surface waters or other off-limit areas. The precision manure spreader already has caught the interest of producers who want to do a better job—and be able to prove it.

There are other things that could probably help: emergency spillways for lagoons, secondary containment areas and improved equipment and facility design. Jones and Sutton have worked to help more producers learn and implement the best management practices.

And if producers do all that, Jones says he would like to see something from the public: perspective.

The state’s livestock industry averages only 20 major spills per year, according to the Indiana Department of Environmental Management, Jones says, and most of those do not result in a fish kill.

“There are things that could work for pork facilities are perfect—they’re not,” he says. “But they don’t deserve all the heat. I’m bullish on pork production. We can fix the problems.”
PHOSPHORUS: too much of a good nutrient?

Rebecca Goetz
Crops and fields can never get too much phosphorus—or so farmers and researchers once thought. What plants didn’t use, they believed, the soil lapped up and held.

“Even 10 years ago, the prevailing thought was that phosphorus in fields didn’t move, unless it eroded away with soil,” says Purdue agronomist Brad Joern.

So, when farmers tested soil for phosphorus a decade or two ago, they tested only for what was available to plants. And they didn’t worry if the soil had more than plants needed. It wasn’t going anywhere, anyway.

Or was it?
Uh-oh, it moves!

Phosphorus already has been banned from detergents and laundry soaps, because it causes algal blooms and fish kills and hastens the aging process in lakes.

“Cutting back on phosphorus in detergents cut back phosphorus from sewage treatment plants by half,” says Anne Spacie, Purdue professor of fisheries science. “But streams still were getting way too much phosphorus.”

Enough phosphorus was still making its way into streams this fall to warrant federal attention. An Oct. 18, 1997, a message from the Office of the Vice President of the United States directed the Environmental Protection Agency (EPA) to “identify the major sources of nitrogen and phosphorus in our waters and identify actions to address these sources.”

Even before federal eyes turned to phosphorus, Purdue researchers suspected the old theories about the nutrient’s movement were not accurate. Joern started measuring phosphorus levels in fields and discovered that phosphorus can move down through soils.

“Fields with a long history of phosphorus loading from manure or other fertilizer sources can lose phosphorus in surface water runoff and potentially even through tile drains three feet down,” Joern says.

From there it can be a quick trip to a neighboring river or lake.

Joern and colleagues from Michigan and Ohio are developing a set of environmental guidelines for producers who have more phosphorus than their crops can use. The major focus of these new environmental recommendations is to keep phosphorus out of surface and tile water, while still giving good crop yields.

Farmers who follow the guidelines will save money by applying manure to fields that will benefit from the nutrients, and they will keep phosphorus out of Indiana streams and lakes, too.

The manure dilemma: spreading the P

The guidelines will help, but many livestock farmers still face a phosphorus dilemma. Manure is a resource they can’t afford to waste, but its high phosphorus content can make it problematic to use.

“When manure is applied to meet the nitrogen needs of the crop, it exceeds the phosphorus requirements for the plants,” says Purdue animal scientist Alan Sutton.

Even before federal eyes turned to phosphorus, Purdue researchers suspected the old theories about the nutrient’s movement were not accurate.

“Repeated heavy applications of manure on the same fields can result in a significant buildup of soil phosphorus, which might increase the potential for surface water contamination.”

In part because of phosphorus, the practice of spreading manure on farm land is coming under increasing scrutiny.

At the same time that the vice president sent his message, the EPA drafted a proposed strategy for strengthening nonpoint source management. In the proposal, the agency says it “will expand the scope of regulatory requirements to address application of animal waste.”

Joern anticipates new EPA regulations for manure application on farm fields. Farmers likely will have to keep track of manure nitrogen and phosphorus applications—something they historically didn’t do. Joern thinks they also will apply manure based on phosphorus rather than nitrogen content. If that happens, they’ll annually put on one-quarter to one-half as much manure as they have in past years, or they’ll spread the larger, nitrogen-based amounts on fields only once every three or four years. Either way, they’ll have to find more land on which to spread the excess manure. That will take more time and money as well as increase the chance of compacting soil during manure application.

Phytase in—less P out

Purdue researchers are looking for alternatives. They’re trying to reduce the phosphorus content of manure by changing animals’ diets. Because Indiana producers are high on hogs, the researchers turned their attention to pigs.

Sixty to 80 percent of the phosphorus in most feed grains in hog diets is in a form called phytate phosphorus, according to Purdue animal scientist Layi Adeola. In that form, most of the phosphorus passes right through animals, never getting picked up and used by their bodies.

“Since phosphorus is essential for normal bone development and other metabolic functions in pigs, it is important that enough phosphorus is available to meet the pigs’ needs,” Sutton says. “Inorganic (easily absorbed) forms of phosphorus are commonly added to pigs’ feed to assure efficient, normal growth.”

Joern and Adeola are testing a new type of corn that is naturally higher in easy-to-absorb forms of phosphorus and low in phytate phosphorus. Such corn could reduce levels in manure and decrease the need for supplemental phosphorus in animal diets. Preliminary results look promising.

In separate but related research, Sutton and Adeola found a way to help animals get more out of currently available types of corn so that less inorganic phosphorus must be added to feed. They fed pigs a diet that included phytase, an enzyme that clips the phosphorus out of the naturally occurring phytate-phosphorus molecule. Once clipped out, phosphorus becomes available for pigs to use.
Since the pigs’ systems pick it up, less phosphorus passes into the manure.

Sutton compared hogs on two different diets: low phosphorus with added phytase and normal phosphorus without phytase. He found that hogs on the phytase-added diet gained weight and grew just as well as the pigs on the normal-phosphorus diet but excreted 24 to 41 percent less phosphorus. Manure from those hogs held a balance of nutrients that more nearly matched crop needs—a balance less likely to leach phosphorus into water.

During the study, the researchers noted that hogs fed phytase also were better able to use the nitrogen in their feed. This piqued Adeola’s curiosity, so he investigated further and found an additional benefit. Hogs fed phytase also were better able to use minerals such as magnesium, zinc and copper that were in their feed.

Overall, phytase and the new, high-available-phosphorus corn look like good bets for farmers who have lots of manure to spread and little land to spread it on.

Super alfalfa for P overloads

Revised application rates and livestock diets will help prevent future phosphorus overload, but how can farmers handle the fields Joern has already found that contain 10 to 20 times more phosphorus than they need?

“There’s no way that a farmer can easily take soil with 1,000 pounds of phosphorus per acre down to recommended levels by growing corn on it,” says Purdue agronomist Jeff Volene.

But there might be an alternative.

Brad Joern catches water from a farm drainage tile. Joern found that phosphorus can move into drainage water from fields that have a long history of phosphorus loading from manure or other fertilizers.

Volene studies alfalfa, which naturally pulls more phosphorus from soil than does corn, soybeans, potatoes or wheat. Alalfa planted on a phosphorus-overloaded field can draw the nutrient out of the field and turn it into salable hay.

Current alfalfa varieties already are pretty good at phosphorus mining. However, Volene envisions something even better. He’s teaming up with a colleague from the Department of Horticulture to turn that vision into reality.

Horticulturist K. G. Raghothama started looking at phosphorus because some plants have a hard time getting enough of it out of soil and into their systems. Raghothama and postdoctoral researcher U. Muchhal located the DNA that told cells to produce protein molecules called phosphate transporters, which actively take up phosphate.

Raghothama and Muchhal then starved Arabidopsis plants (plants in the mustard family that often are used for research) for a week, which caused plants to make more phosphate transporters. Then, they isolated and characterized several different genes that code for the transporters.

Now Raghothama has the genes that could turn plants into super-absorbers of phosphate. Volene has plants that need the genes. Jointly, they’re trying to create a super-phosphate-absorbing alfalfa.

“We want to make a plant that really scavenges soil phosphorus in a way that has never been done before.” Volene says. “We want to really crank it up.”

Cranked-up alfalfa might clear soil of excess phosphorus in a few years, rather than decades—at the same time that it produces a crop the farmer can use or sell.

“We’re trying to give the farmer options,” he says. “It’s research Purdue should be doing. The commercial industry isn’t interested, because it’s for a small, niche market that doesn’t exist yet. And it will take several years to come up with a product.”

Joern agrees that Purdue specialists should do what industry can’t, just as it was their job to investigate when they suspected that phosphorus from farms was getting into water.

“As researchers, we all hope that producers can use our information to help them manage their high-testing soils and improve phosphorus management to prevent future problems.”

They hope to keep producers from getting too much of a good nutrient and to keep farming in Indiana sustainable.
Talking Trade

Olivia Maddox

Giving a presentation to a roomful of people may seem like a typical assignment for college students—unless they’re promoting international trade in the former Communist Party Headquarters in Novgorod, Russia, and speaking Russian.

It was a scene that could not have been imagined less than a decade ago. Standing under an inlaid wooden mural with a three-foot-high image of Vladimir Lenin and flanked by Indiana banners, Purdue Agriculture students conducted a workshop to encourage trade with Indiana businesses for a group of Russians.

Developed by Purdue’s International Programs in Agriculture (IPIA), the Russian Corporate Fellows Program turned 10 students into trade ambassadors of sorts last summer when they interned with Russian companies and organizations. During the fall, the students organized the U.S. counterpart

A well-known landmark in Moscow, St. Basil’s is one of the many sites Purdue Agriculture students visited while in Russia. Participating in the Russian Corporate Fellows Program were (front row, from left) Mindy Shroyer, Colleen Milligan, Josh Heiss, Wesley Young, Scott Wiens, (back row, from left) Polly Rhodes, Christopher Starks, Benton Wisehart, Eric Stephenson and Tom Urdal.
Students tout Indiana companies in Russia

to the workshop—this one about Russia and the Russian market for interested Indiana businesses.

It was no random move that sent students to Russia in general and Novgorod in particular. “Russia is the next big emerging market for the United States,” says Michael Stitsworth, IPIA’s associate director, who coordinated the program. “It’s important that our students are in the right places. Small-to-mid-size agribusinesses would like to work in Russia, and they need access to Purdue graduates who have those skills.”

Novgorod was chosen because of its immense trade potential. According to the World Bank, this region has one of the six best investment climates among the emerging markets and, consequently, it has been targeted as a priority area by the U.S. government. Purdue Agriculture hopes to sustain its presence there, sending a second group of students and faculty to Novgorod next year.

Purdue Agriculture teamed up with the Indiana Department of Commerce (IDOC) International Trade Division, the Indiana Commissioner of Agriculture and Novgorod State University to organize this multi-faceted program, which was funded by the U.S. Department of Education’s Business and International Education Program. Selected from more than 100 proposals, it was the only agriculture- and Russia-based program funded.

The program also included the resources of Purdue’s foreign language department. Russian language professor Zina Breschinsky, who has worked with Purdue Agriculture on numerous international study programs, helped make the arrangements in Russia and accompanied the students to Novgorod to get them acclimated.

Built upon the foundation of a traditional study abroad experience, but with a few added twists to more fully integrate it with the rest of their studies, the program required a two-year commitment from students. In preparation for the internship, students spent a year studying the country and its language. Prior to leaving for the nine-week internship, they researched Indiana agribusinesses. Located throughout the state, these small-to-mid-size companies had been identified by the commerce department as interested in breaking into the Russian market.

While in Russia, the students combined work responsibilities and continued language study with excursions into the daily life of the average Russian citizen: shopping for food in open-air markets, navigating overcrowded public transportation, enjoying leisure time throughout the city and experiencing the 20 hours of daylight provided by the “midnight sun.”

“We would go to class and study language, then go out and make use of what we learned that day,” says Tom Urdal, a biochemistry and food process engineering graduate who is employed at Raskas Foods in St. Louis. “We received a good taste of Russian culture.” The students described shopping for food and other items as an “adventure” that often required a pocket dictionary to supplement their emerging Russian language skills.

“I have a new understanding of Russia,” says Polly Rhodes, a forest recreation major from Fort Wayne, whose job was to help map out a nature trail. “My stereotypes were completely destroyed. We often associate the Russian people only with poverty and bread lines,” she says. “But Russians are a very happy and friendly people. They welcome you right into their homes.”

Kristin Jones, European international trade specialist with the IDOC who helped conceptualize the program, accompanied Stitsworth to Russia to attend the trade workshop, check out the market and make some contacts.

“It was a good chance for the students to see the research that goes into making a decision to enter a market,” Jones says. “And for the companies, it provided an opportunity to investigate the Russian market. The students’ work confirmed many of their initial impressions, and they remain encouraged and, in some cases, eager to pursue.”

Upon their return to Purdue at the end of the summer, the students took yet another semester of Russian language and planned the trade seminar for Indiana businesses. This itself was a learning experience as they dealt with the intricacies of putting together a conference—everything from planning seminar topics to arranging international travel and from assessing audio-visual needs to deciding what hors d’oeuvres to serve at the reception.

“This was a remarkable group of students,” Stitsworth says. “They now are part of an elite group of young agriculturists who have the knowledge, skills, attitudes and aspirations needed by U.S. companies and organizations seeking to be part of the global marketplace.”

In the not-too-distant future, these students will be interviewing for their first jobs. The questions are predictable: Have you ever worked as part of a team? What is the most challenging experience you’ve ever had? How well do you face difficult situations? Can you work with people not like yourself? Just imagine the answers they will have.