



“It’s about people.”

**NDSU Extension
Service**

**North Dakota
Agricultural
Experiment Station**

**2001
Annual Highlights**

NDSU

NDSU Extension Service
North Dakota Agricultural Experiment Station

“It’s about people.”

Time and again, NDSU President Joseph A. Chapman has emphasized that NDSU is about people. It’s the people of NDSU who make this institution what it is. And it is those people who will build its future.

The future of the NDSU Extension Service and the North Dakota Agricultural Experiment Station is inextricably intertwined with the people they serve—mostly North Dakotans, but more and more, people all over the world.

Our faculty and staff work closely with people across the state. The Extension Service has 52 county offices in North Dakota. These staff are your neighbors, friends and colleagues. There are eight research extension centers in the state where researchers tackle local problems and demonstrate new ideas under local conditions. A host of advisory boards and panels provide ideas and direction for our research and educational efforts.

Our scientists conduct research on private farms, and entrepreneurs and businesses bring their ideas to test. We’re proud of our ability to respond—to a crop disease like scab or a 500-year flood. Our people are the researchers, developers and life-long educators for North Dakota’s farms, businesses, families and communities.

And technology is playing a role. High-speed Internet access is available at most county extension offices, and two-way video conferencing capabilities are available in a growing number of communities. That means, in many cases, the full complement of NDSU’s research and outreach specialists is just down the road instead of across the state.

The faculty and staff of the Extension Service and the Experiment Station are hard working. They’re innovative. They’re dedicated to the future of this state and this region. In other words, they’re just like you.

No wonder we have such a close working relationship. Because when it gets right down to it, it’s all about people.

This report is a sampling of the efforts of the NDSU Extension Service and the North Dakota Agricultural Experiment Station. We hope it gives you a flavor of our work and a glimpse of how we work with people across the region.

Keeping food safe

As an array of bread dough, pizza crusts and cinnamon rolls streams past on the processing lines, Julie Goplin says her career “is more challenging and exciting than I ever thought it could be.”

Goplin is quality assurance manager at Drayton Enterprises in Fargo, a rapidly growing company marketing preproofed dough products coast to coast. Preproofed means the yeast is activated to start the dough rising, then the products are frozen and shipped to customers — mostly other food sellers like Schwan’s and Happy Joe’s. The company’s bread products are marketed under the Two Sicily’s name in the region’s grocery stores.

Goplin makes sure quality ingredients come in and top-quality products are shipped out. She oversees every quality-related detail in between— from the kinds of smocks workers wear (no buttons to fall off) to equipment maintenance (no broken parts or fragments) to swabbing for bacterial contamination.

With the industry and consumers focusing on food safety and quality, NDSU is gearing up to meet the demand for research, information and graduates like Goplin. She holds bachelor’s and master’s degrees in microbiology and has taken part of the coursework for a first-in-the-nation minor in food safety that NDSU developed. “That coursework prepared me more for this job than anything else I’ve done,” Goplin says.

More than 30 students have completed the minor, first offered in the summer of 2000. It is the centerpiece of NDSU’s Great Plains Institute of Food Safety. Plans are to expand it into bachelor’s, master’s, doctorate and graduate certificate programs. Graduates are already in demand. Drayton found Goplin’s resume on the NDSU Placement Office Web site and called her for an interview.

NDSU’s effort is unique because it pulls expertise from three colleges and seven academic depart-

ments. “NDSU will be the only university in the entire world offering this,” says Patricia Jensen, vice president for agricultural affairs. “We are getting support from every corner.”

“There have been some dramatic, high-profile cases that have made the public doubt the food supply. Anybody in the food industry has to deal with this now,” says Lisa Nolan, director of the institute. “And, in light of current events, our students will have the expertise to ensure that our food supply remains secure.”

The institute is serving as a catalyst for research, bringing faculty from diverse backgrounds together. Economist William Nganje and microbiologist Catherine Logue are developing procedures to assess risks in the food industry from various pathogens. Their goal: to help industry develop strategies to avoid those risks. Work is also under way to assess food safety concerns in bison meat. Agricultural engineer Suranjan Panigrahi is leading efforts to develop sensors to detect spoilage in meat packages.

Outreach efforts are another key. NDSU’s Beef Quality Assurance program helps beef producers make their products safer. Beef specialist Greg Lardy helped develop that program and is an instructor in the food safety curriculum.

Extension food and nutrition specialist Julie Garden-Robinson is another instructor. Last year she coordinated eight workshops across the state for people who cook for senior citizens. Now a lesson plan is available so county extension agents can teach the course. Other programs have been aimed at volunteers who cook for community meals and workers in restaurants and institutional food services.

Last year 200 high school students in LaMoure, Marion and Grand Forks participated in a mini-certification course in food safety that Garden-Robinson developed in collaboration with a program assistant and extension agent. “Follow-up surveys show that students learned the concepts and in some cases are teaching their parents better food safety practices,” she says. “These are the kids who are serving up burgers when we go out to eat, so reaching this group could have significant influence on public food safety.”

For more information: Lisa Nolan, 701-231-8530, lisa.nolan@ndsu.nodak.edu

Food Safety Facts

The U.S. Centers for Disease Control and Prevention estimates that because of foodborne illness:

- 76 million Americans get sick each year.
- 300,000 of those are hospitalized.
- 5,000 die.

The CDC estimates there are 250 foodborne pathogens.

The USDA’s Economic Research Service estimates the human illness costs of foodborne disease caused by just five common foodborne pathogens at \$6.9 billion per year.



**the first
food safety
minor in
the United
States**

Julie Goplin

Saving crops and money

Scab's Threat

Researchers in NDSU's Department of Agribusiness and Applied Economics estimate:

- U.S. grain suffered \$870 million in yield losses and price discounts because of scab.
- When secondary impacts are added in, the total impact to the economy is \$2.7 billion.
- North Dakota suffered 41 percent of that loss, about \$1 billion.

NDSU's response

NDSU's Alsen, the first hard red spring wheat variety which combines high quality and good agronomic characteristics with resistance to scab, was:

- Planted on 452,900 acres in North Dakota in 2001.
- The sixth most-planted variety with 6.7 percent of N.D. wheat acreage.

Plant scientists estimate Alsen's impact on North Dakota could be \$100 million annually in improved yields alone.

Based on work at NDSU and collaborating institutions, the EPA granted an emergency exemption for a fungicide to control scab and the N.D. Department of Agriculture granted a state label for the fungicide. NDSU faculty also developed improved application recommendations. Net return to wheat producers in North Dakota alone has been about \$20 million annually.

A phone call to NDSU's Wheat Disease Forecasting System helped save Alan Lee's crop. "The information the system provided got us out spraying before it may have been too late," says the Berthold-area farmer.

By using the Web or making a phone call, farmers and crop consultants can determine whether spraying for Fusarium head blight (scab), tan spot, stagonospora leaf blotch or wheat leaf rust is warranted.

A computer model uses data from the North Dakota Agricultural Weather Network (NDAWN), a network of 59 sites in North Dakota and western Minnesota, to determine whether the previous 24-hour period was suitable for infection. In addition, machines near selected NDAWN sites collect fungal spores from the air. Samples are collected three times a week and examined for signs of scab. The potential for scab is based on the number of spores and suitability of the weather.

"The forecasting system can save farmers money if spraying isn't necessary, or save a crop if disease problems are imminent," according to Len Francl, the plant pathologist who developed the system.

Over a five-year period, Francl found that producers who had a disease management strategy earned \$11.60 per acre more than those who did not. Those using the system earned \$2.11 more per acre than those who always applied a fungicide.

A tool for the fight against scab is particularly important. A recent study by NDSU agricultural economists revealed that N.D. farmers lost \$356 million to the disease between 1998 and 2000. For every \$1 of scab losses, other areas of rural and state economies lose \$2.

The disease forecast can be accessed at www.ag.ndsu.nodak.edu/cropdisease/ or by calling 1-888-248-7357. "Often I'm out on the tractor and use my cell phone to check the system," Lee says. "I know a lot of farmers in the area who are starting to do the same thing. I think usage will just continue to grow."

Lee became interested in a station at Berthold about five years ago after visiting with John Enz, the state climatologist at NDSU who coordinates the NDAWN system. "I thought if we had a station in the Berthold area it would be a real advantage for local farmers," Lee says.

Lee and others pitched the idea to various groups including the local elevator board of directors and the Berthold Development Corporation. "It's not really economic development but it does have something to do with the economics of the community, so they helped pay for the system," Lee said.

It paid off for Lee this year. "We had been extremely dry and felt we would probably escape any infection this year. I left for Minneapolis but did have my sprayer ready just in case. A friend who also monitors the system called to report that the numbers were going way up so we decided it was time to spray."

Francl and a doctoral student started developing the disease forecasting system in 1992. "In the case of tan spot and stagonospora blotch, infection periods are modeled by a form of artificial intelligence called neural networks. We have been collecting infection data and matching weather patterns here at NDSU since 1993, and our accuracy rate is 85 to 90 percent."

"The disease forecasting system is an important part of NDSU's effort to control crop diseases," says plant pathologist Marcia McMullen. "Researchers develop new varieties that are resistant to disease. They study crop rotations and other management techniques. They cooperate with colleagues across the region to find ways to improve disease control with fungicides. They also look at food safety concerns, analyzing toxins produced by scab to understand impacts on the food supply."

"Researchers, extension specialists and staff at the research extension centers are all working together because no single tool is going to solve the disease problem," McMullen says.

For more information: Len Francl, 701-231-7079, leonard.francl@ndsu.nodak.edu



an important part of NDSU's effort to control crop diseases

Alan Lee



Digging in the dirt

Seven-year-old Brandy says “digging in the dirt” is the best thing about the Youth Garden Project in New Town. “It’s just fun,” she says. Jared, an energetic 13-year-old, agrees, but was frustrated with this year’s infestation of potato bugs. “We had to pluck them and spray them,” he says.

Since 1998, up to 18 youth ages 6 to 14 have worked in the garden and attended garden-related sessions focusing on topics such as insects, nutrition and photography. Polly Cummins-Chase, Extension 4-H youth agent for the Fort Berthold Reservation, coordinates the project.

The program was launched with a grant of garden tools, seeds, seedlings and educational material from the National Gardening Association, one of 300 awarded from more than 1,600 applications. Since then, the garden has grown to a 150-foot by 150-foot plot on loan from Fort Berthold Community College, which also shares expertise and equipment.

Because the land is leased from the Army Corps of Engineers and is a stone’s throw from the Missouri River, no pesticides are allowed. As a result the gardeners must rely on traditional and not-so-traditional methods of pest control. The students used an Internet recipe for an organic potato bug spray. “It didn’t work,” notes Jared of the kitchen-cupboard-based concoction. “It did allow us to integrate the computer and the Internet into our lessons,” Cummins-Chase says.

The region’s Native American tribes, the Mandan and Hidatsa, are agriculture-based societies and have strong gardening traditions. “But that knowledge and those traditions were beginning to disappear,” Cummins-Chase notes.

Thanks to the program, that’s changing. “A number of the kids have gone home and convinced parents, grandparents and other relatives to put in a garden,” Cummins-Chase says.

Dawn Hall has three children in the program, Trent, 10, Billy, 9 and Jess, 7. The family has planted its own garden. “I wanted my kids to know where food comes from and how to grow it themselves,” she says. “The kids have learned so much from this program.”

Tribal elders have gotten involved, teaching lessons on Native American plants, methods and traditions. Early harvests became part of a harvest banquet served in thanks to elders, parents and others who helped. Students learned about planning, food preparation and etiquette. This fall, a produce sale with cooked corn on the cob and baked potatoes taught marketing, food safety and money management. Next spring students will start plants in a new greenhouse.

The program taps the expertise of all the staff at the Fort Berthold Extension office: agriculture agent Paul Gjermundson, food and nutrition agent Anita Rohde, Delores Sand with the Expanded Food and Nutrition Education Program (EFNEP) and Lila Wells of the Family Nutrition Program (FNP). The garden project provided a special opportunity for Sand and Wells to share lessons. EFNEP and FNP are federal programs administered through Extension to teach low-income families about nutrition and how to stretch their food dollars.

The project’s local focus is typical of 4-H. “Extension reaches kids with a variety of programming,” says Karen Zotz, assistant director for NDSU Extension Service programs in nutrition, youth and family science. “But the key element is life skills.”

The youth in the garden project cultivate those skills—decision making, interpersonal skills, public speaking, teamwork, self-confidence, problem solving and responsibility—constantly by working together, deciding what to plant and how to harvest, organizing meetings and produce sales, and making presentations.

“We integrate those life skills into all of 4-H Youth Development programs—special programs like the garden project, traditional 4-H club activities and after-school programming,” Zotz says. “It’s what sets 4-H apart from other youth programs and it’s something that employers tell us they are very interested in.”

That’s fine with Brandy, as long as she can still play in the dirt.

For more information: Polly Cummins-Chase, 701-627-3445, pchase@ndsuxext.nodak.edu

4-H by the Numbers

More than 50,000 youth in North Dakota participate in Extension 4-H programs. About 13% of youth participants belong to 4-H clubs.

- 27% live on farms.
- 31% live in towns under 10,000 people and in non-farm rural locations.
- 23% live in towns with between 10,000 and 50,000 people.
- 19% live in towns of more than 50,000 people.

About 4,700 volunteers work with youth in North Dakota 4-H programs.

The estimated total value of time and expenses of North Dakota 4-H volunteers annually is more than \$1 million.



Youth garden project participant

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The cowboy lifestyle

Steve and Debb Weninger were watching their lifestyle of ranching slowly erode away. "It's gotten so you just can't make a living doing it anymore," Steve says in frustration.

But it's not a cowboy's nature to give up. So they're rebuilding their dream with a twist on 1,000 acres near Sentinel Butte. Instead of cattle, they'll earn their living from tourists who come to North Dakota to experience its solitude, wildlife, wide-open spaces and cowboy lifestyle.

During the week, Steve tests electrical poles for power companies across the western half of the state while Debb tends to the ranch and cattle. On weekends, they've built a picturesque log cabin that will soon be the centerpiece of their guest ranch. Plans call for guest houses, a barn and corrals.

"There are great opportunities here for birding, camping, riding and wildlife photography. It's only limited by your imagination," Steve says.

A growing number of farmers and ranchers are diversifying their farm income by bringing rural and outdoor experiences to an increasingly urban population, says Kathy Tweeten, NDSU community economic development extension specialist. Enterprises include u-pick fruit and vegetable gardens, corn mazes, wildlife and bird watching, guest cabins, trails (hiking, biking and horse), hunting activities, and working farm and ranch experiences. "People want real experiences," she says.

Tweeten launched a series of agritainment workshops beginning in 1999. The Weningers have attended two. "The second time we went we talked some friends into going along," Debb says.

"We help farm and ranch families to see if this type of business could be a good fit for their family before they spend a lot of time and money on it," Tweeten says. "The first question they need to ask themselves is, 'Do we like people?'"

"We realized that this might be an option for us one morning when we went to do our branding and there were 50 people here," Debb says with a laugh. "We've been doing this for years."

During the workshop, Tweeten, other extension faculty, and representatives from the N.D. health, tax and tourism departments share information on health and safety issues, tax regulations, tourism trends, and opportunities and promotion. Legal and insurance experts outline legal and liability issues. Local economic development officials share information on resources, and people already involved in agritainment enterprises share experiences and tips.

A resource guide is available at www.ag.ndsu.nodak.edu/ced/communitypage.htm, and a loose network of entrepreneurs shares ideas and experience through the use of a listserve.

Some decide agritainment isn't for them. Others gain insight on where to start. The workshop encourages people to analyze and build on their interests and assets. "We already have horse packs, tents and camping equipment, so we'll start with that and grow from there," Steve explains.

Steve notes that maintaining grasslands and other natural resources will be a key to sustaining new tourism enterprises. When possible, NDSU researchers include wildlife and aesthetic considerations in their studies. But obtaining funding for such studies is a challenge, notes Lee Manske, a range scientist at NDSU's Dickinson Research Extension Center.

He's accumulated more than two decades of data that indicate it's best to graze cattle in rotations that are consistent with the growth stages of grass. "When we manage rangeland for a specific purpose—for cattle, for wildlife or for an individual species—the ecosystem's health declines. But when our management priority is the biological requirements of all plants and the ecosystem's processes, the rangeland ecosystem's health improves and all components benefit."

At NDSU's Central Grasslands Research Extension Center near Streeter, researchers from South Dakota State University and the U.S. Fish and Wildlife Service are studying how non-game birds fare under various grassland management strategies. Next spring the center will plant trees around a man-made pond to demonstrate how trees can enhance habitat, shelter cattle during winter storms and increase the amount of water available for livestock by catching snow.

"We also look at these activities as a great opportunity to educate people on rangeland and ranching," notes Steve. "The friends we've made and the lifestyle we have are things we don't want to give up. If people come here and understand us and what we do, it will help us preserve them."

For more information: Kathy Tweeten, 701-328-5134, ktweeten@ndsuet.ndak.edu

Tourism Tidbits

Tourism contributed \$2.6 billion to the state's economic output in 1999, according to NDSU agricultural economist Larry Leistritz.

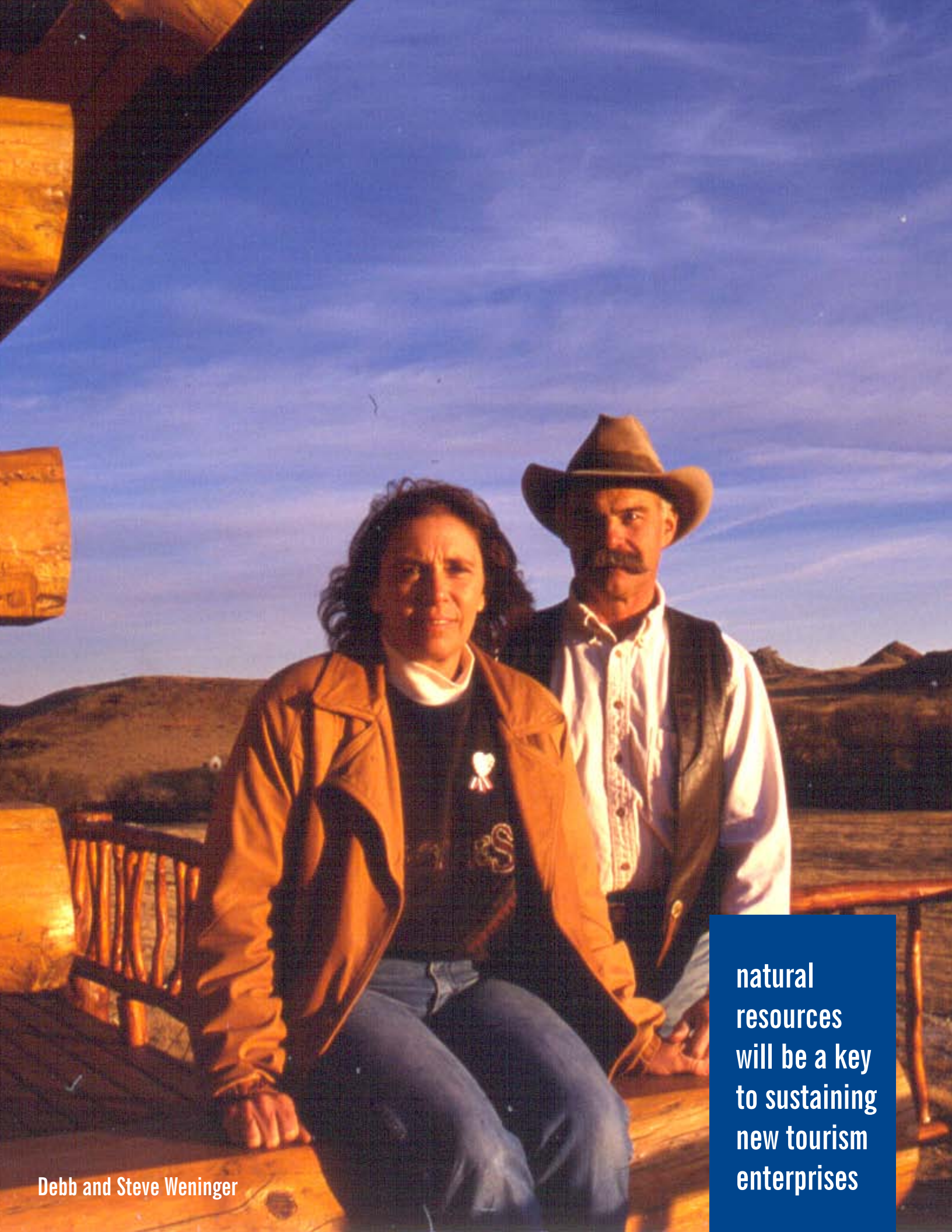
Tourism is North Dakota's second largest industry.

Adventure travel makes up 40 percent of tourism.

A 1996 study by NDSU agricultural economists showed total expenditures on hunting and fishing, including licenses, was \$583 million annually. Almost \$144 million was spent in rural areas.

Nearly a third of Americans are involved in birding activities, a \$5 billion industry.

Tourism revenues increased 517% from 1990 to 1999, making it the fastest growing industry in the state.



Debb and Steve Weninger

natural
resources
will be a key
to sustaining
new tourism
enterprises

Leafy spurge invasion

Amazing Leafy Spurge

The N.D. Department of Agriculture estimates that more than 1.3 million acres in the state are infested with leafy spurge, second only to Canada thistle.

NDSU agricultural economists estimated in the mid-1990s that leafy spurge has a total economic impact in North Dakota of \$86 million annually.

In North Dakota, Montana, Wyoming and South Dakota, the total impact was \$129 million.

A single leafy spurge plant, if left untreated, can infest an entire acre in 10 years.

Leafy spurge seed pods burst explosively and throw seeds up to 15 feet from the parent plant. An average of 140 seeds is produced per stem, and seeds may remain viable in the soil for at least eight years.

Leafy spurge patches may have more than 200 stems per square yard.

Patches of leafy spurge usually spread vegetatively from 1 to 3 feet.

Roots may reach up to 15 feet in depth.

Pieces of roots as small as a half inch long and a tenth of an inch in diameter will produce new roots. Pieces of root also will survive two or three hours of drying in the sun.

Camp Gilbert C. Grafton, the home of the North Dakota Army National Guard's engineers, is regularly invaded by troops with tracked vehicles, bulldozers, graders, scrapers and other heavy equipment. But there's another invader there too: leafy spurge.

This noxious weed is a problem across North Dakota and the camp's nearly 10,000 acres near McHenry. It causes deterioration of native vegetation, wildlife habitat and cattle grazing value.

"Our soil is a very sandy loam, and if we're not good stewards of the land, it could soon look like a desert," says Lt. Col. Rick Moszer, plans and operations officer at the camp. "With NDSU we've been working to find how best to manage the land so that we may continue to have its use."

Collaboration with NDSU on leafy spurge control began in 1985 when the camp was expanded by nearly 8,000 acres. Researchers released about 100 flea beetles at several sites, including Camp Grafton, hoping the insects would kill the leafy spurge.

The beetles multiplied and thrived across the state, and millions of them were captured and moved to other spurge-infested land in North Dakota and surrounding states in cooperation with the N.D. Department of Agriculture, the USDA and county weed boards. In some areas, the beetles nearly eliminated leafy spurge, but not at Camp Grafton.

"We've learned that the beetles don't do very well in sandy soil," says entomologist Denise Olson. The camp is one site where she's testing long-horn beetles, another pest that preys on leafy spurge.

Researchers also used cattle and angora goats to combat leafy spurge at the camp. The latex in leafy spurge irritates the mouths and throats of cattle. Sheep and goats, however, relish the plants.

"Camp Grafton was our first significant opportunity to study this problem," says range scientist Bill Barker. After three years, the researchers achieved 70 percent control. "But we didn't know how to manage the goats and we suffered up to 40 percent mortality."

That prompted a shift to sheep. After three years of grazing with sheep and cattle, control was back to 70 percent. After four years, control was at 80 to 90 percent. The grazing helped bring the weed under control and cut herbicide costs at the camp by \$20,000 or more.

Now the camp hosts training for producers, land managers and Extension staff. NDSU graduate students who worked on Camp Grafton projects now direct control efforts around the region.

One student, Kevin Sedivec, is now NDSU's extension rangeland management specialist. He works with Tim Faller, director of NDSU's Hettinger Research Extension Center, on related projects near Bismarck and Sentinel Butte and cooperates in work at Camp Grafton. Additional work is under way at NDSU's Ekre Ranch near Walcott. Those studies expand on earlier lessons and tailor treatments to local conditions.

Much of the work is part of Team Leafy Spurge, a USDA-funded effort in North and South Dakota, Montana and Wyoming directed by former student Chad Prosser, now with the USDA. As part of that effort, NDSU researchers studied the economics of control methods. Next, they'll look at the impact of research so far. "Where land managers have stopped leafy spurge from spreading and are reclaiming land, we want to assess the economic impact," says economist Dean Bangsund.

Thanks to the efforts of weed scientist Rod Lym, Plateau is the latest herbicide to be labeled for use on leafy spurge. Like most herbicides used on leafy spurge, fall-applied Plateau was tested at Camp Grafton. Traditional treatments of Tordon plus 2,4-D applied in June didn't work at Camp Grafton because that's when most training occurred.

Manufacturers don't test their products on leafy spurge because the market is too small. Plateau was developed for use on peanuts. Lym helps determine the proper rate and timing for applications and must show that no harmful residues remain.

Lym was one of the earliest cooperators at Camp Grafton. He's now studying grasses that compete with leafy spurge. "We try to use everything that's available and find out what combinations work. Herbicides, grazing or insects might not work on their own, but maybe they can weaken leafy spurge so that well-managed grasses can compete or herbicides are more effective."

For more information: Bill Barker, 701-231-7222, william.barker@ndsu.nodak.edu



Lt. Col. Rick Moszer

training for
producers,
land
managers
and Extension
staff

Value-added success

Nine years ago, Central Dakota Cattle Association members asked Karl Hoppe, extension livestock specialist at the NDSU Carrington Research Extension Center, to brainstorm ideas on how to make more money.

The result? Last March the Dakota Halal Processing Company of Harvey began supplying halal foods to the Muslim community. The Arabic word “halal” means “lawful.” In the Quran, Allah commands Muslims and all of mankind to eat of the halal things.

“A few years ago members of the association decided that it didn’t make any sense to send their cattle out of state for slaughter and then have the meat sent back here,” Hoppe says. “They decided to investigate building their own packing plant.”

Just two days later, Adnan Aldayel walked into Hoppe’s office with a business plan for a meat processing facility. Aldayel is Saudi Arabian, but his wife, Merita, is from New Rockford.

He came up with the idea of a halal processing plant while teaching at a college in Louisiana. “I found a fairly large community of Muslims, but I couldn’t find good quality halal meat and products,” Aldayel said.

Why build in North Dakota? “North Dakota has some of the best quality cattle in the world. The people are wonderful and have a great work ethic. Support from the state and university system was also critical,” Aldayel says.

The association moved forward with Aldayel. Currently 60 percent of the plant is owned by producers. Aldayel owns the rest.

Hoppe helped set up an equity drive, investigated product label claims and worked with producers to assure their cattle would meet the plant’s specifications. “Producers have to follow very strict guidelines to be certified halal,” Hoppe

said. Cattle cannot be fed any animal by-products or have any implant or hormone injections. An association employee visits each producer to educate him and to check feed and supplement records.

Maddock-area livestock producer and association member Wendell Grondahl says it’s not that difficult to raise halal animals, but it does cost money. “Taking away the implants has a cost involved,” Grondahl said. “Several feed companies now are making a special blend of supplements so we can comply with the guidelines.”

Selling halal products is not what producers originally had in mind. “But it’s a good niche because the number of potential customers is very high,” Grondahl says. The U.S. Muslim population is estimated at 8 million and may double in the next decade.

The company ships products to California, Seattle, Minneapolis and a wholesaler in Cedar Rapids, Iowa. “Some of our products are shipped to five-star hotels and restaurants overseas where it has been well accepted,” Aldayel said.

The plant employs about 20 people, and expects to double capacity in the next year.

The plant is one success story from efforts to add value to the state’s agricultural production. “Producers lose potential profits when they send their raw products out of the region to be processed,” says Chet Hill, value-added area specialist at NDSU’s Williston Research Extension Center.

Hill and Rudy Radke, value-added area specialist in the eastern part of the state, promote value-added concepts and help producers and entrepreneurs explore potential enterprises from growing onions and carrots to producing halal meat products. The key, according to Hill, is to do your homework and have a good business plan and management strategy.

The Dakota Halal Processing Company now produces 17 products ranging from microwavable products to jerky and summer sausage. Plans are underway for a canning operation and for processing bison, elk, chicken and lamb. As a result, a second plant may be established in Tolna. The company is issuing three million shares of preferred stock for investors.

“I think North Dakota, through agencies and universities such as NDSU, can take the lead in developing a lot of value-added industries,” Aldayel said.

For more information: Chet Hill, 701-774-4315, expwill@ndsuxext.nodak.edu

Value-Added Efforts at NDSU

Economists are identifying market opportunities for new and value-added agricultural products.

Researchers evaluate improved crop varieties and crop production systems that could be the basis for value-added enterprises.

Faculty help enterprises write business plans, analyze markets and develop specifications for their products.

NDSU is helping livestock producers explore the potential for finishing cattle and sheep here instead of shipping them to out-of-state feedlots.

Researchers look for new ways to process products produced in the region and new uses for those products.



Adnan Aldayel and Wendell Grondahl

North Dakota
can take the
lead in
developing
value-added
industries



Managing with precision

Watford City high school senior Nichole Thompson can tell you exactly where she lives—not three miles west and four miles south of Arnegard, but the exact longitude and latitude.

Nichole uses a Global Positioning System (GPS), a navigation system based on satellites 11,000 miles above the earth. Receivers on the ground translate the satellites' signals into precise measures of latitude, longitude and elevation.

The GPS data also can be computerized using geographic information system (GIS) software that allows users to manipulate, analyze and display information. GIS can answer "what if" questions about different scenarios and situations.

Nichole, a member of the Banks Willing Workers 4-H Club, attended a 4-H camp featuring GPS and GIS. The camp was partially financed by a North Dakota 4-H Foundation grant to teach youth the concepts of GPS and GIS.

Nichole particularly enjoyed a scavenger hunt. "At night we were given a GPS system and a flashlight. They gave us longitude and latitude readings which we had to find using a GPS receiver."

Nichole and others used their knowledge to help Carol Thompson, Watford City assistant forester. "She taught us about mosquitos and the students helped her with GPS and GIS," says Marcia Hellandsaas, Extension agent in McKenzie and Dunn counties. "They drove around the city with GPS units and marked mosquito breeding areas. It improved her records and gave her a better handle on the amount of chemical to use."

Nichole joins a growing list of GPS and GIS users. NDSU's agricultural and biosystems engineering department recently received a three-year \$700,000 grant from NASA to encourage the use of NASA products in solving problems in agriculture and natural resources. NDSU extension agents, researchers and others will incorporate remote sensing technology, along with other technology such as GIS and GPS, into management schemes.

"They will then be able to teach others," says John Nowatzki, NDSU extension geospatial specialist who coordinates the grant. "As an example, a producer may be able to determine, by looking at a computer screen, where he may need to apply more or less fertilizer on a field."

In three years, Nowatzki hopes to see the technologies used in at least 50 projects involving precision farming, natural resource management, youth programs, economic development, emergency management and education.

NDSU also offers a class on GIS. "Demand is high because most agriculture students would like to have at least one class to teach them how to use the software," Nowatzki says.

"GIS and GPS skills are one of the top 10 job shortage skills in the country," according to Joe Courneya, NDSU Extension Service 4-H youth educational design specialist. "Whether it be food service, the health industry or agriculture, there's a role for GIS and GPS staff."

Fredonia area farmer Daryl Rott is already sold. "I've got 40 different soil types," Rott says. "Some land may be more suitable for corn or soybeans. I can look at my maps and tell you exactly where those areas are."

He also uses GPS and GIS to vary chemical and fertilizer rates. "In some cases, instead of using a quart, I can use a pint and a half. You're just as effective, and it's more environmentally sound."

Rott found out about GPS and GIS from Nowatzki at an NDSU booth at a convention. "I thought, 'Wow this is fabulous.'"

NDSU researchers also are working with GPS and GIS. "It's especially important as we look at how land use changes from year to year and longer. This gives us a tool to try to interpret why it's happening, come up with some questions and put forth ideas why that movement is occurring," says Dath Mita, a GIS/remote sensing specialist.

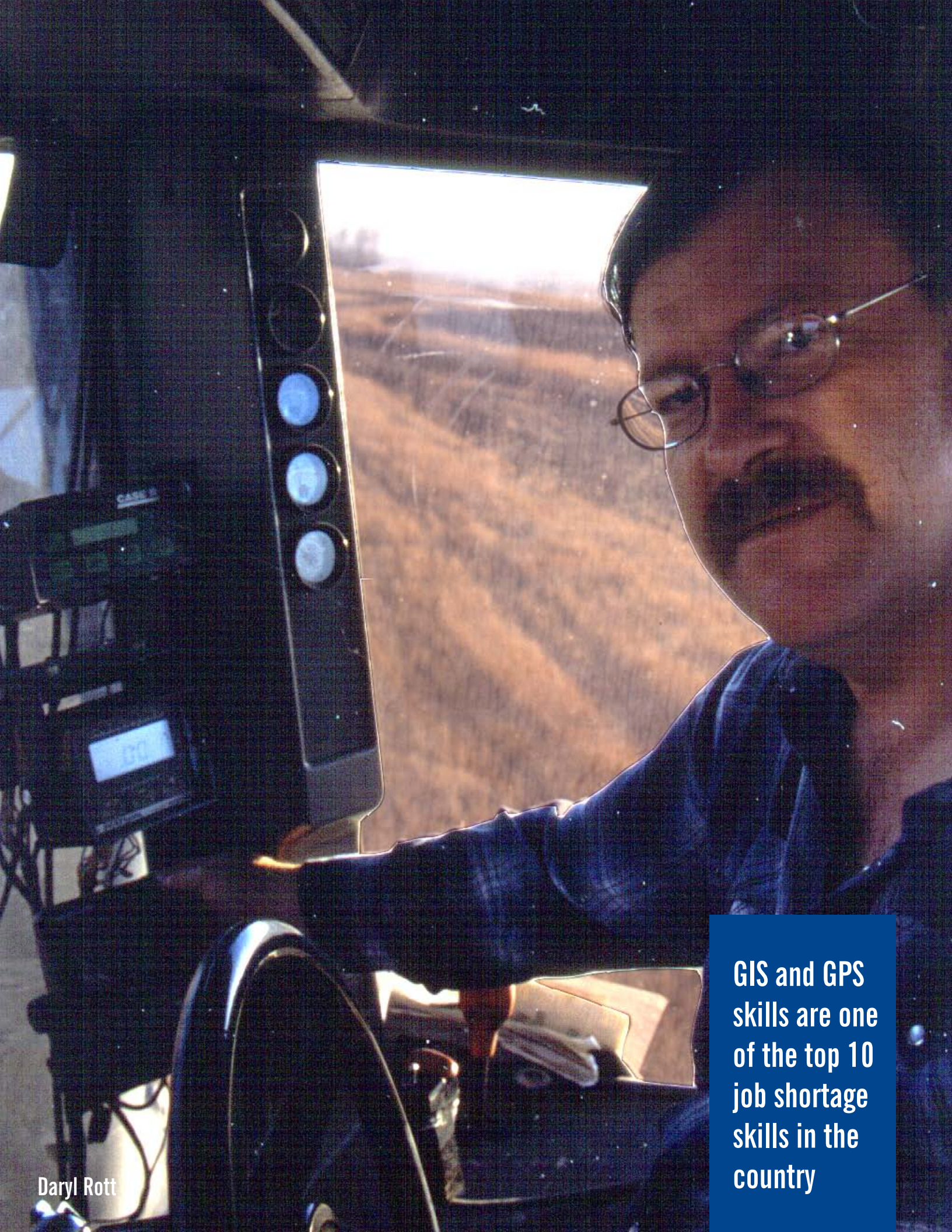
There are also economic development implications. "If you were interested in locating a soybean processing plant, you could determine where most of the soybeans are grown," he explains.

Courneya says NDSU will continue to help North Dakotans use GPS and GIS systems. "In a few years you'll see GPS and GIS as the norm in automobiles," he says.

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GPS-GIS Now and in the Future

- Locating fire hydrants or storm sewers in an emergency
- Determining the exact route to your destination
- Tracking migratory habits of wildlife
- Guiding planes into remote airports
- Determining exact boundary lines, saving time and surveying
- Monitoring regulated water supply wells
- Mapping the location of artifacts at historic sites
- Guiding emergency vehicles
- Tracking crop yields
- Determining soil application rates



Daryl Rott

GIS and GPS skills are one of the top 10 job shortage skills in the country



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Thank you for reading about the work of the faculty and staff of the NDSU Extension Service and the N.D. Agricultural Experiment Station. Many other projects are under way. Often those projects involve cooperation with other universities, agencies, businesses and individuals, but they all have the same focus—improving the lives of North Dakotans and their neighbors throughout the world.

If you would like more information on the programs reported in this publication, please feel free to contact the faculty and staff listed on the corresponding pages. If you would like more information about our other programs or have other questions, comments or suggestions, please contact any one of us.

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