

# GROWING SOUTH DAKOTA



A MAGAZINE BY SOUTH DAKOTA STATE UNIVERSITY

COLLEGE OF AGRICULTURE & BIOLOGICAL SCIENCES / WINTER 2011



Revolutionizing Ag Info Online

## Beef Industry Leaders

Innovative Program For Students

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## Ethanol's Future

Research Paves A New Path

# From the Dean

## Connecting Answer Seekers With Problem Solvers



In 1970, Alvin Toffler published the bestselling book *Future Shock*. In its day, the book was considered an important look into the future, as Toffler predicted the impact of the technological revolution on society – which was at the time in its infancy.

In *Future Shock*, Toffler coined terms like “information overload,” and predicted that

the coming rate of change in society would have a disorienting effect on people, similar to traveling from one culture to another. For some of us, who constantly rely on our children to help us adapt to technology, Toffler hit the nail on the head.

This last October, in recognition of the 40th anniversary of the publishing of *Future Shock*, Toffler and his wife Heidi released a collection of predictions and challenges that they see for the next forty years. One of their main discussion points relates to what the Toffler’s describe as the challenge to connect “answer seekers” with “problem solvers.”

It is abundantly clear that access to information and experts has, and will continue to, increase exponentially. But Toffler’ challenge left me with many questions. What will the new “connections” look like? Will they be like a “Google” search with a resulting 5 million hits for us to sift through? If not, who will choose the answers? Or will the “connection” be an infomercial on a devise yet to be discovered? Will information be for sale? If so, what is the value proposition? What will be the transaction cost? And who will pay? These questions are as provocative as the Toffler’s original challenge for us.

The avenues to connect answer seekers with problem solvers are very pertinent to educators, researchers and the public whom we serve. For nearly 130 years, SDSU has been teaching the young people of South Dakota about the complexities of agriculture and life in a rural society. Since 1887, it has been conducting research in agriculture and related fields. For 96 years it has been operating a Cooperative Extension Service whose mission has been to disseminate unbiased research based information and technology. But it is clear that changing times requires changing services.

When I came back home to South Dakota, I brought with me an idea for a new web-based way of connecting “answer seekers” and “problem solvers.” When I arrived, quite serendipitously, Emery Tschetter, who is a long-time member of the administrative team of the College

of Agriculture and Biological Sciences, told me about his successful efforts to license the name “iGrow” for the College. The College had adopted the tagline “Growing South Dakota,” and with the expanding market for iphones, ipods and ipads, Emery thought “iGrow” may have future value for the College. He was right on target!

We merged his “name” with my “connector” and came up with “iGrow.” This month’s feature story (*Introducing iGrow on pages 2-3*) is about the development and launching of this new service for South Dakotans – iGrow. It is a web based “connector” for answer seekers and the powerhouse problem solvers of SDSU.

Over the decades, the outstanding teachers, researchers, and Extension staff at SDSU have built a rich pedigree of unbiased scientifically based information and technologies. But today, our citizens need, and deserve, something better than a Google search to access that information. I believe iGrow will unleash the collective wisdom of SDSU’s research scientists, Extension specialists, and county educators in a new format that enhances access to that information and those technologies.

I want to thank the administration, faculty and staff of the College and University for their willingness to try something new. Emery has successfully led us down a path that wasn’t always very clear. Lindsey Gerard from our College and Wendy Cradduck and Nikki Youmans from the University’s Office of Information Technology have done an outstanding job of putting a structure around a concept. Drs. Greg Carlson and Cody Wright both deserve special “atta boys” for their willingness to get on board to do the tough work of editing and programming iGrow Corn and iGrow Beef. Many others have volunteered to help enhance iGrow’s structure and develop programs that will be functional in the near future. Thank you all!

I urge you to give iGrow a try. But please understand that by its very nature, iGrow will be different tomorrow than it is today. The services, tools and information on iGrow will be under constant development and improvement. And that is a good thing, because the world around us seems to know no bounds when it comes to rate of change. The intent is for iGrow to be dynamic as well – and constantly provide new ways for the answer seekers of South Dakota to connect with problem solvers of this great University.

Barry H. Dunn, Ph.D.



# GROWING SOUTH DAKOTA

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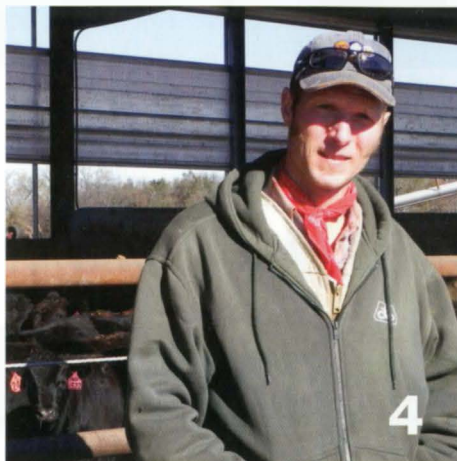
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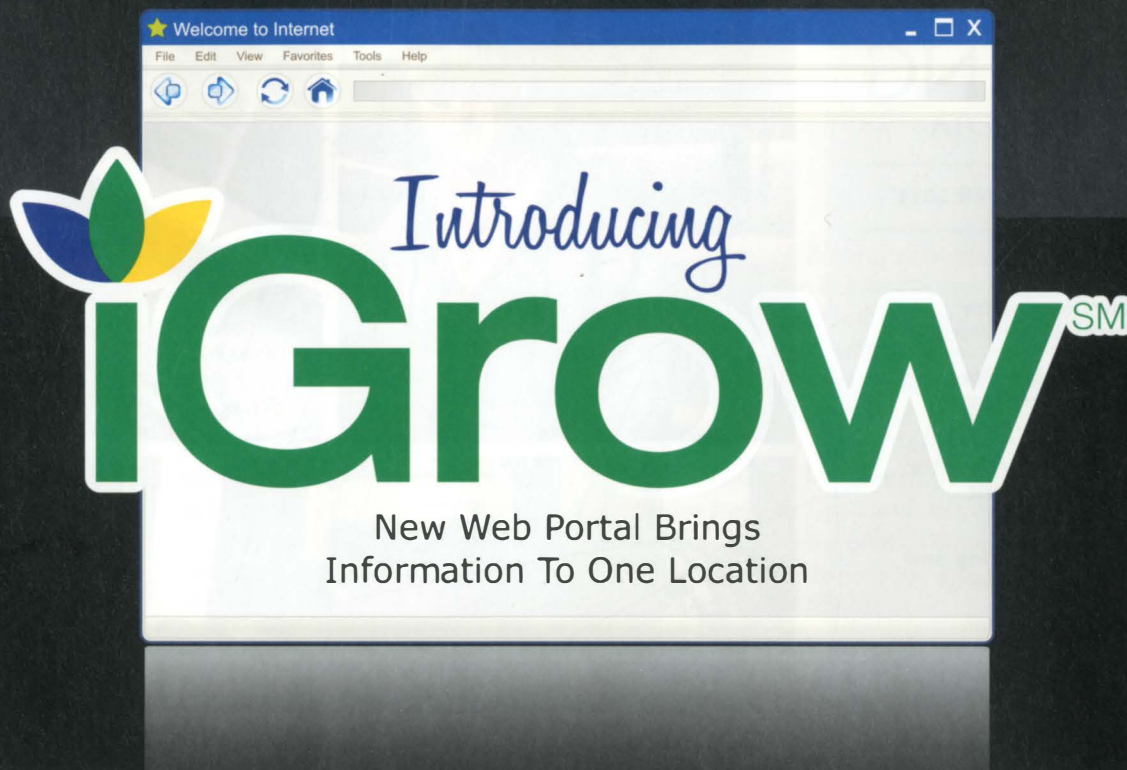
## On the Cover:

A South Dakota sunrise illustrates  
the dawning of a new day and with it  
new opportunities. This image is also  
featured on the newly launched iGrow  
portal. Submit your favorite South  
Dakota sunrise picture for a chance  
to have it displayed on the iGrow site  
as well. Submit your digital photo to:  
[SDSU.iGrow@sdstate.edu](mailto:SDSU.iGrow@sdstate.edu).



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New Program Bolster's Optimism & Opportunities



**F**INDING AG-SPECIFIC INFORMATION on the Internet can often be akin to finding the proverbial needle in a haystack. SDSU's College of Agriculture and Biological Sciences is working to change all that with the launch of iGrow, an innovative web portal that organizes pertinent information in one place on the Web.

The iGrow effort will provide farmers and ranchers easy access to current market reports, profit calculators, zip-code specific weather forecasts, libraries of research and management information, podcasts, and forums moderated by Extension specialists. The site was made public on Jan. 3, and is accessible on computer and mobile Internet devices.

"It's a very sincere effort to serve our farmers and ranchers at a higher and more sophisticated level," explains Barry Dunn, dean of the College of Agriculture and Biological Sciences at SDSU.

He adds that iGrow's mission is to provide "reliable, ethical and unbiased" information online that will help farmers and ranchers with production and marketing decisions. "We see this as a vehicle to take a producer into a series of support and technology in an organized fashion that helps them think through the production process of a commodity," says Dunn.

Dunn and Emery Tschetter, assistant director for marketing and accountability at SDSU, developed the concept for iGrow a year ago, with planning and content development initiated last summer. A few dozen farmers and ranchers were given access to a trial version of iGrow in December, before the site went live in January.

### **Easy, Interactive Access**

The iGrow portal is categorized by topic areas – iGrow Corn and iGrow Beef are currently available. Release of iGrow Beginning Beef Producer will occur Jan. 17, with iGrow 4-H added this spring. Plans call for categories specific to soybeans, wheat, pork, communities, rural health, and food to be added over the course of the next year.

Extension specialists and educators along with agronomists, animal scientists, pathologists, economists, and climatologists are all contributing resources to the iGrow effort.

Each iGrow user can customize their account to feature localized markets offered through DTN, local and national news headlines, and local weather. Additionally, within each iGrow topic area, the site will allow interactive and customizable options – through moderated blog forums and online calculators and management schedules. Individual users can access these tools via their own private password protected account on the site. Dunn explains this will allow information to be localized to each individual producer – making information even more applicable and accurate for their own operation.

For instance, the iGrow Corn profit center features nearly 20 online calculation tools that allow a producer to plug in his own data and evaluate options suited to his individual scenario. Examples of the customizable tools featured include a breakeven calculator; yield response analysis; weed, insect, disease intervention threshold calculator; fertilizer least cost blend calculator; sprayer mix calculator; dryer efficiency calculator and several more.



Automated calendars that pinpoint growing degree days and provide a disease forecaster for crops will also be available in the future.

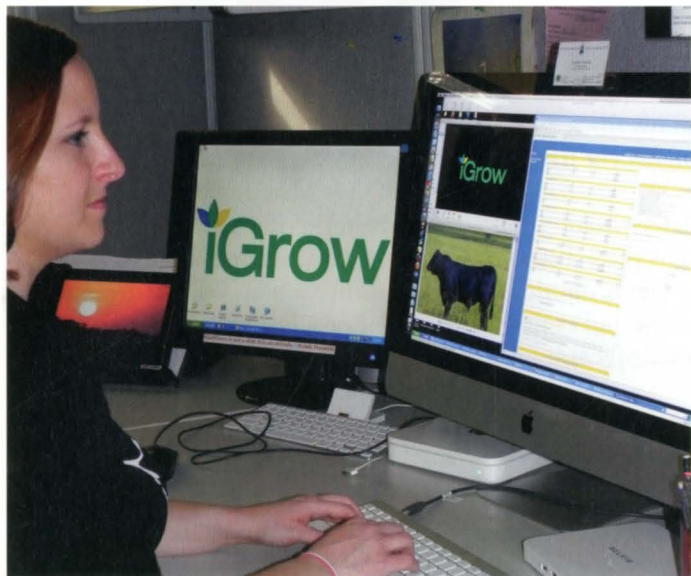
SDSU crop scientist Gregg Carlson points out the value in this format for farmers, saying, "This provides a tremendous ability to take modern computer technology and insert it right at the farm level. We are in the information age. The decisions we make are becoming more and more information intense."

For cattle producers, online decision aids on iGrow Beef currently include a breakeven calculator for calves, trace mineral salt evaluator, price comparison for alternative feeds and a sulfate calculator.

SDSU Extension cow-calf nutrition and management specialist Cody Wright explains that more beef-related features will be added over the next year, including a stocking rate calculator, implanting comparison tool, and a production calendar with reminders for specific production practices and appropriate reference materials related to each practice. Also linked to the calendar will be a synchronization scheduler and vaccination scheduler.

A calculator to evaluate nutritional requirements of different classes of cattle and an online mechanism to enter and store data and receive annual reports on production and profitability for both cow-calf operations and feedlots are also in the works, according to Wright.

Wright is excited about the effort, and says, "Some of the components of iGrowBeef are currently available at various locations online; however, we will be offering all of those components at one location in addition to providing numerous resources and decision aids that are not currently available in this format. Our objective is to provide producers with a one-stop-shop for everything they need to help determine options to maximize profitability."



SDSU iGrow Information Officer Lindsey Gerard is leading technical development efforts of the new iGrow site, which brings together weather, markets, news, and profitability resources on a single menu-driven dashboard.



Send your sunrise photo to iGrow

The iGrow homepage features the image of a rural sunrise – it was also featured on the cover of this issue of *Growing South Dakota*. Not only does this photo illustrate the dawning of a new day and with it new opportunities, but it also symbolizes the new services offered through the iGrow portal. We're inviting people to help us share the beauty of South Dakota and send us their favorite South Dakota sunrise picture. We will select a new sunrise to be featured on iGrow each week. Submit your digital photo to: [SDSU.iGrow@sdstate.edu](mailto:SDSU.iGrow@sdstate.edu)

Carlson adds, "The bottomline is that iGrow puts information and online tools in one place and organizes it much greater than anything that's been done before for farmers and ranchers. It will provide advice in a timely manner so individuals don't have to sort through thousands of search results."

Moreover, Dunn believes the iGrow initiative brings the mission of the land-grant University's service to agricultural producers into a new area of technology that is more efficient and effective at bringing research and technical information to the grass-roots level.

Dunn states, "The iGrow effort is a continuation of Extension's long-standing mission to help citizens convert data to knowledge. We live in an era of massive information overload. This program allows us to bring together and prioritize, in one-easy-to use portal, all of the agricultural production information that producers need to make profit-oriented decisions."

*Editor's Note: Access iGrow at [www.iGrow.sdstate.edu](http://www.iGrow.sdstate.edu). The iGrow format is part of the University's Cooperative Extension Service, and to protect the integrity of the information provided, advertising will not be sold on the site. Development plans for iGrow Meetings, iGrow Media partners, iGrow Membership support, and iGrow Donor support are also underway. The iGrow concept is protected under a federal trademark.*



# Crops, Cattle & Much More

Opportunities Farm  
Cultivates Research,  
Teaching and  
Scholarships

**I**N 2001, A GENEROUS opportunity was extended to the South Dakota State University Foundation when farmer LeRoy Poppens gifted 1,120 acres of land and feedlot facilities – valued at \$1.6 million – to the University.

Located about 30 miles south of Sioux Falls, near Lennox, Poppens envisioned the property continuing as a working farm while providing students, farmers and ranchers the opportunities to experience hands on livestock and agronomy research and benefit from the teaching facility.

Today – a decade later – that vision is being fulfilled as the 1,120 acres, aptly named the Opportunities Farm, are producing cattle and crops along with an abundance of learning opportunities.

Annually, the farm finishes nearly 2,000 fed cattle, and raises 600 acres of corn, 120 acres of winter wheat, 250 acres of soybeans and 30 acres of hay.

Additionally, through revenue generated from those commodities, several scholarships in the College of

Ag and Biological Sciences are funded along with a summer internship on the farm. Moreover, the farm provides a “real-world” setting to enhance SDSU classroom and research activities and generate applicable information for ag producers in the state and region.

## The Real Deal

“From the beginning, the goal has been to keep this an operational and profitable farm so that it would be a scholarship generator for the university. We are a real, profit-driven farm,” says Matt Loewe as he explains how the farm operates. Loewe has been the farm’s manager since 2001, shortly after it was gifted to the SDSU Foundation. Raised on a livestock and grain farm near LeSueur, Minn., he earned a bachelor’s from SDSU in animal science in 1996 and a master’s in plant science in 2001.

Loewe and his wife Paula, who is also an SDSU graduate, live on the farm with their three young daughters. They operate the farm as an independent corporation – he

Matt Loewe, an SDSU alum, has served as manager of the Opportunities Farm since it’s inception in 2001.



is responsible for the day-to-day farm management for the cattle and crops; she works as office manager. The Opportunities Farm corporation then pays rent back to the SDSU Foundation, and scholarship monies, research awards, and funding for the farm's internship result from those proceeds. As one example of the scholarships generated, five \$1,000 Jackrabbit Guarantee Scholarships are funded by the Opportunities Farm each year.

The focus on keeping the farm "real" means crops are planted on a field scale just like any other South Dakota farm. And, much of the grains grown on the farm are then fed to the feeder cattle in the on-site feedlot facility.

**"The Opportunities Farm represents a place where we can practice science at a field scale."**

**TODD TROOIJEN, SDSU PROFESSOR OF AGRICULTURAL & BIOSYSTEMS ENGINEERING**

This allows for practical field- or pen-scale data to be collected from the cropland and feeding facility and shared with other producers. It also allows SDSU classes and a student intern to work with the farm and gain hands-on experience with real scenarios such as nutrient management, carbon credits or drainage issues – and possibly implement real solutions.

But, it also means the Loewe's feel the same stress as any other

farmer. "The bottomline is that how we make decisions impacts how we operate. If I make some bad decisions, I have to scratch to pay bills. It's about as real world as you can get," Loewe says.

### **Outdoor Classroom**

It is that authenticity of the farm – and the information it is yielding – that has earned it respect from students and grain and cattle producers across the region.

One former student summed up his appreciation for the Opportunities Farm this way: "It's a hands-on experience like no other – to be given a real world issue and then to know that our solutions could actually be used someday is pretty amazing."



## **FIRST-RATE FEEDLOT**

One aspect unique to the Opportunities Farm is its feedlot – which features three different housing systems to allow for comparing environmental impacts, livestock performance, physiological stress measurements, and selected nutritional trials among the systems. In turn, that information is being shared with South Dakota and regional cattle producers to enhance their cattle production systems.

The feedlot facility was developed through a grant from the state of South Dakota in 2003 and an investment by the SDSU Foundation. The three feedlot housing systems include a dirt mound open pen, bed-pack confinement and partially covered pens. Each has four 80-head pens.

Three different feedlot housing systems at the Opportunities Farm allow for direct comparisons among the facilities and livestock performance.

This set-up has provided ideas, scientific data and learning opportunities to cattle feeders. Opportunities Farm manager Matt Loewe points out that nowhere else can producers analyze three separate feedlot housing systems under one management and on a farm scale. "There's been a lot of value in this facility; it has helped scores of cattle feeders in the region with determining the type of facility they choose to build," says Loewe.

The feedlot at the Opportunities Farm has also helped make the Steers for State scholarship program a reality. Each year, the farm feeds out 20 steers donated to the fund. The farm contributes all the feed, yardage and pharmaceuticals for the steers, with proceeds from the sale of donated steers going to a scholarship fund for rodeo athletes.

**To contribute to the Steers for State program, contact: Craig Russow, SDSU Foundation, at [craig.russow@sdsufoundation.org](mailto:craig.russow@sdsufoundation.org) or call 605-697-7475.**

Robbi Pritchard, a cattle nutritionist and distinguished professor of Animal Science at SDSU describes it this way, “The Opportunities Farm is a valuable teaching tool because it gets the students out of the classroom to evaluate situations in real time.”

But the farm isn't just a classroom for university students. Loewe reports that the Opportunities Farm hosts a steady stream of curious visitors throughout the year – from local FFA chapters to farmers and ranchers to bus trips from several states away. The farm also hosts field days.

As he looks to the future, Loewe says his goals are to continue to improve the farm's efficiency and expand its reach as opportunities arise. Meanwhile, the farm's focus on providing real-world results – and opportunities – won't waver. Loewe concludes, “We are here to serve the students and people of the region. The information from this farm is an important resource to share.”

For more information, visit [www.opportunitiesfarm.com](http://www.opportunitiesfarm.com)

## Appreciative Remarks about the Farm

“This is a real farm. Whether it's a cattle feeder touring or an SDSU student working on a research project out here, they realize this is the real deal and can relate the information they glean here back to the farms they are connected with.”

**JIM WOSTER**, COLUMNIST AND MEMBER OF THE GOVERNING BOARD FOR OPPORTUNITIES FARM

“This farm follows its mission in providing scholarship dollars, research opportunities and internships to SDSU students, all the while operating a farm and feedlot operation that benefits farmers across South Dakota with the research data it provides.”

**ARLAN HAGENA**, CORN AND SOYBEAN FARMER AND CHAIRMAN OF THE OPPORTUNITIES FARM ADVISORY BOARD



## AN OPPORTUNITY TO GET STARTED

In addition to the cattle, crops, scholarships and research information that the Opportunities Farm is yielding, Barry Dunn, Dean of the College of Agriculture and Biological Sciences, says another important benefit from this farm is the example it displays of how a young family can get a start in production agriculture.

Dunn says, “It's a remarkable story that this farm has enabled the Loewes to rent the property, farm 1,100 acres and feed 2,000 head of cattle.” He adds, “This ownership model illustrates there can be opportunities for young people in agriculture.” Dunn points out the rental arrangement is a concept that could also be used in situations where one generation on the farm or ranch is making the transition to the next generation or for a retiring couple to provide an opportunity for a new farmer or rancher to get started.

Located near Lennox, SD, the Opportunities Farm has provided Matt Loewe (pictured above) and his wife Paula the chance to pursue a career, and raise their young family, in production agriculture.



# College News



## Dairy Products Judging Team Earns Third Straight National Title

South Dakota State University's Dairy Products Judging team placed first in the "all products" category at the 2010 Collegiate Dairy Products Evaluation Contest in Decatur, IL. The 89th annual competition was held at the Archer Daniels Midland Company's James R. Randall Research Center on Nov. 12.

This was the third consecutive year that SDSU's team won the national championship. The team placed first in milk, butter, ice cream, and cheddar cheese. Thirty-eight undergraduate and graduate contestants from 10 universities in the U.S. and Canada participated in the contest.

The SDSU team includes Samantha Erickson, Postville, Iowa; Rebecca Hanson, Brandon, South Dakota; Eric McNeel, Blackfoot, Idaho; and Gagan Deep, Kurukshetra, India. SDSU professor of dairy science Bob Baer served as the team's head coach. Lloyd Metzger, SDSU associate professor of dairy science, served as the team's assistant coach.

Erickson placed first overall, including first in milk, butter, and cheddar cheese. As top judge in the nation, Erickson received the Robert Rosenbaum award and a lifetime membership in the National Dairy Shrine.

In addition to the national championship, the SDSU victory made the team recipients of the Shirley Seas Memorial Scholarship, named in honor of Shirley Seas, who served as coach of the SDSU team for 21 years. Judges and peers also named Baer the winner of the Aurelia and George Weigold Coach of the Year award.

Pictured from left: head coach and SDSU dairy science professor Bob Baer, Gagan Deep, Rebecca Hanson, Sami Erickson, Eric McNeel, and coach and SDSU dairy science professor Lloyd Metzger.

## DeJong Elected to National FFA Office



Photo courtesy of National FFA Organization

Wyatt DeJong, of Kennebec, SD, was elected Central Region Vice President of the National FFA Organization in late October at the 83rd National FFA Convention in Indianapolis. DeJong is an Agricultural Education major at SDSU.

DeJong says his goal is to make an impact, not just an impression, and of his FFA experiences says, "I have come to realize that I can show others they can succeed in a powerful way."

Fulfilling his position will require traveling more than 100,000 miles; meeting top leaders in business, government and education; visiting approximately 40 states; and participating in an international experience tour to Japan. His responsibilities will include providing personal growth and leadership training for students, setting policies that shape the future of the organization and promoting agricultural literacy.

DeJong is a member of the Winner FFA Chapter and in 2009, he served as the South Dakota FFA Association's state secretary. He is among six individuals selected from a field of 36 to hold national office.

## Weaver Receives USDA New Teacher Award



South Dakota State University assistant professor Amanda Weaver received the 2010 New Teacher award at the Association of Public and Land-grant Universities annual meeting in Dallas in November. Weaver is an assistant professor in the SDSU Department of Animal and Range Sciences where she instructs five undergraduate and

graduate courses in meat science and muscle biology. She joined the faculty in 2007.

The Association of Public and Land-grant Universities, or A·P·L·U, and the USDA sponsored the award. It recognizes two outstanding faculty members nationwide on the basis of their ability as classroom teachers, use of innovative teaching methods, service to students and their profession, and scholarship. The award includes a \$2,000 stipend for each recipient.



# FUNDING FUNDAMENTALS

## Budget Cuts Have Far-Reaching Impact

**A**S THE SDSU CAMPUS and the College of Agriculture and Biological Sciences (ABS) embark on a new year, Dean Barry Dunn is steadfast in his priorities for 2011. “We will strive for relevance, quality, responsiveness and the continuation of strong programs,” Dunn emphasizes with regard to the teaching, research and Extension outreach efforts provided by the College.

That said, he recognizes there will be challenges for the ABS College as the year unfolds – specifically due to funding shortfalls. A total of \$1.3 million has been cut in state appropriations to the College over the previous two years. “The budget reductions have eroded base funding for staffing, and our concern is that additional cuts would reduce future opportunity,” says Dunn.

He explains, “This funding is not only about the \$1.3 million in cuts, it’s also about the multiple millions of dollars in impact those cuts have on state programs and communities.”

As one example, Dunn says, “When the base funding for a salaried position is eliminated, it means we can lose an individual – for instance a coordinator for the Horizons program or a county Extension educator – who will write grants that may generate millions of dollars for community programs.”

Specifically, Dunn shares that Extension’s highly successful community development program has received \$3.3 million in grants since the program started in 2004. This includes support from the Northwest Area Foundation, Bush Foundation, and USDA Rural Development, which have helped generate community strategic plans, new business ventures and jobs, as well as community transportation systems, community thrift stores, and child care and youth centers.

“Additional budget cuts to the College’s base funding resulting in the potential loss of staffing to generate and administer the grants behind these types of programs would be a huge loss for South Dakota,” says Dunn.



“This funding is not only about the \$1.3 million in cuts, it’s also about the multiple millions of dollars in impact those cuts have on state programs and communities.”

**ABS DEAN BARRY DUNN**

### **Toll on Research**

Likewise, the budget cuts made over the last two years have meant staffing to conduct research on campus and at the Agricultural Experiment Stations across the state has been trimmed as well. This reduction also takes an economic toll on the state, as a national study conducted in 2009 found that each dollar invested in agricultural research in South Dakota generates a social benefit of \$13.55. Additionally, each dollar South Dakota appropriates for research generates an additional \$3.60 from other sources.

The study concluded that South Dakota has the highest rate of return in the nation on dollars invested in agricultural research over the past 60 years. “This validates that SDSU is a good investment and a good steward of the state’s revenue dollars,” says Dunn.

To put into perspective the impact of this multiplier effect, Dunn cites the work of Jose Gonzalez, an assistant professor in the Plant Science Department who specializes in applied crop genomics and genetics. Gonzalez works with a group of SDSU scientists to develop new wheat varieties for South Dakota growers, and new sources of cellulosic biomass plants for the biofuels industry. Since 2006, he has generated more than \$10 million in grant support for these efforts.

“When we apply the conservative of the two multipliers (\$3.60) to that \$10 million in grant funding, South Dakota has received \$36 million in economic benefit from the hard work of Dr. Gonzalez and his team,” Dunn points out, and adds, “But on top of this, it’s even more important to factor in the additional value of the specific scientific discoveries. It may be a new insect-resistant wheat variety, or a crop

that supports the next generation of cellulosic bioenergy production in the state.”

### **College Concern**

Dunn is also concerned about how the cut in base funding impacts the quality of undergraduates’ educational experiences. He explains, “We’ve got a growing population of students on campus, but reduced resources with which to teach.”

As a result, class section size across the university is going up – meaning a larger student to teacher ratio, which can compromise academic success. Moreover, Dunn says SDSU’s competitive edge over surrounding states used to be the fact that it offered a small student to teacher ratio in the classroom. “We are slowly eroding that advantage,” he points out.

Given the impact to the state and the students, Dunn is hopeful the convening legislative session will be supportive, allowing for the College to address the challenges at hand in the year ahead. “We will continue to be good stewards of the resources we are given and find ways to increase efficiency no matter what that funding level is,” Dunn says.

*Editor’s Note: The ABS College, research programs in the Agricultural Experiment Station and educational programs delivered by the South Dakota Cooperative Extension Service presently operate with a \$63 million budget with funding received from the State General Fund, federal appropriations and special programs, and grants or contracts. Currently, one-third of ABS funding is grant-related.*

## **ABS COLLEGE HIGHLIGHTS**

- ▶ Fall 2010 enrollment in the college was 2,352 undergraduates and nearly 300 graduate students.
- ▶ In 2010, 62% of all South Dakotans used Extension information.
- ▶ 4-H serves 44% of South Dakota youth ages 7-14.
- ▶ A national study in 2009 found that South Dakota has the highest rate of return in the nation on dollars invested in agricultural research for the past 60 years. This generates a social benefit of \$13.55 within the state.
- ▶ Via the Cooperative Extension Service, programs that stimulate economic improvement to people in the state are underway. The Horizons program for rural community development will be continued. Since 2004 grants through the program have resulted in 12 new business ventures – resulting in 6 new jobs; 21 new business plans; 38 community strategic plans, as well as enhanced transportation, childcare and youth centers in several South Dakota communities.
- ▶ A Beginning Farmer and Rancher program funded with a \$750,000 USDA grant will be initiated in 2011. And, iGrow, an innovative online web information portal will be launched to aid crop and livestock producers in profit-related decision-making.



# The Value of Extension

Three Producers Share How They've Benefitted

**A**NYONE WITH A LITTLE EXPERIENCE under their belt will likely agree that education can come in many forms. Sometimes it's a formal classroom setting, and sometimes life's lessons are gleaned through real-world endeavors.

For South Dakota ag producers Laird Larson (left), Myron Williams (center) and Ed Blair (right), their knowledge and success in agriculture has come through diverse experiences, and each of them agrees that SDSU's Cooperative Extension Service (CES) has played an integral role in shaping their crop and cattle operations over the decades.

## Foundation in 4-H

Growing up in the late 50's and early 60's Myron Williams of Wall, S.D., counts 4-H youth programs administered through CES as a valuable opportunity that helped hone his leadership and livestock skills. "If it hadn't been for 4-H, I'd have been lost when I arrived at SDSU in 1966," says Williams, who notes that his 4-H livestock experience was especially beneficial as he pursued his animal science degree.

Williams and his wife Mary both graduated from SDSU in 1971 and began their ranching career by leasing a registered Hereford ranch near Farmingdale, SD. In the late 90's when Williams wanted to build a feedlot for backgrounding calves, he turned to SDSU's ag engineering Extension experts to assist with that effort. "They came out and helped us develop a plan. We built it and are still using the facility today," Williams reports. The facility is built for less than 1,000 head, and they currently background calves from October through May, while also running a cowherd and yearlings on pasture in the summer.

The Williams' son Marty works on the home operation, while son Monty operates his own cowherd nearby –

both are SDSU grads. "We all work together and utilize Extension for nutrition questions, balancing rations, range management or whatever we need input on," says Williams.

Today, Williams remains involved with SDSU by backgrounding calves for the Steers for State program that provides scholarships for the SDSU Rodeo Team and by serving on the Board of Governors for the SDSU Foundation.

He hopes 4-H youth development programs will continue to be offered across the state in the future, to give others the same foundation he – and his own children – had. Williams says, "So many families are several generations removed from agriculture, it's important that Extension's role to educate today's youth about agriculture, leadership and life skills continues."

## Introduction to Technology

After attending SDSU for a year in 1971, Ed Blair of Vale, S.D., returned to the family ranch to pursue his lifelong dream of raising cattle. Over the decades, Ed and his brother Rich have utilized CES to provide relevant beef industry research and marketing information to guide their decisions – and that led to a transition of their entire beef program at Blair Bros. Angus.

Their changeover began in the mid-80s, with the decision to use artificial insemination (AI) in their cowherd. Ed recalls, "We were trying to produce calves for a terminal carcass, but we wanted to keep replacements out of our heifers that would be easy calving. The West River Extension beef specialist at that time helped us realize that with AI we could use sires that had genetics for low birthweight along with growth, and carcass traits."

Through Extension the Blair's also learned of the Calf Value Discovery Program that was being initiated at SDSU



## Survey Reveals South Dakotans Use Extension

As the outreach arm of SDSU, Extension offers educational programs in agriculture and natural resources, youth development/4-H, family and consumer sciences, and community development. And, South Dakotans do use and value that information and assistance.

More than 60% of South Dakotans reported that they utilized Extension information in 2010. Additionally, the 4-H program serves 44% of South Dakota youth ages 7-14.

During Dakotafest held in Mitchell in August 2010, a public survey of 630 adults revealed:

- ▶ 62% said they had used SDSU Extension information in the past 12 months.
- ▶ 66% said Extension helped improve the profitability of their farm or ranch.
- ▶ 75% said Extension helped improve the economic vitality of their community.
- ▶ 80% said Extension helped improve the character and opportunities for young people in their community.
- ▶ 68% said Extension helped improve family skills.

in the late 80's – Ed was asked to serve on the board. The program allowed cattle producers to feed out five steers and get carcass data back. The Blair's were surprised by the results. Ed says, "We had always topped the market with our calves, and figured we were getting as good a price as we could. But from the carcass information, we saw a \$200 price difference between the top and bottom carcass results."

"That information changed our whole operation. We decided to focus on producing high quality cattle and sell them on a grid," says Ed. Shortly thereafter, they partnered with U.S. Premium Beef (USPB) which provided the grid-marketing arrangement they were looking for. A feedlot in Kansas where Blair's sent their cattle wanted to know where they could find more cattle with the same quality.

This prompted the Blair's to transition to producing bulls as a certified seedstock supplier for USPB shareholders and others. Currently the Blair's buy back and feed customer's calves in partnership with Kansas feedyards, and all calves are marketed at USPB. Today, the operation includes Ed his wife Wanda, their son Chad, who is an SDSU graduate and his wife Mary, Rich and his wife Jeanie and their son Britton, who are all SDSU grads.

Ed says over the years SDSU's Extension specialists have been instrumental in helping their operation implement other cutting edge technology– from AI synchronization programs and carcass ultrasounding to computer programs for calculating feed rations.

He hopes that expertise will continue to be available to keep producers informed, and concludes, "We've had a long working relationship with Extension. It's always been a resource where I could get questions answered. I like that they are independent source of information, and I can then determine what would work best for our operation."

### On-Going Education

Laird Larson has relied on information provided by Extension for his diversified farm near Clark, S.D., for more than fifty years. Larson, who applied and was accepted into SDSU's ag engineering program, says his love of farming prevailed over going to college, so instead, he says, "I always viewed my experience with Extension as my advanced schooling."

Larson explains that he didn't go to college because he felt his dad would have had too much to handle on the farm. "I didn't want to lose that opportunity, and I'm proud that the land we farm is still in the family today," says Larson.

But he adds, "I recognized that I needed to continue my education. Extension allowed for that. I've been able to visit with specialists and attend area Extension meetings and gain life-long learning through Extension."

Larson has raised hogs, cattle and crops over the years. Today, he focuses on 2,500 acres of cropland, and has been raising certified seed since 1978. He reports that Extension expertise and research has provided beneficial information to all of his farming entities from record-keeping to engineering advice when remodeling a building. "My stories go on and on. Extension is so broad it is difficult to tell the whole story of the good they are doing," he states.

Larson has been a particularly ardent supporter of agronomy research, including spearheading funding to see the Seed Technology Lab become reality at SDSU.

He believes agronomy, livestock production, research and Extension all go hand in hand. "Producers benefit directly from research, and Extension is key in helping producers interpret and apply that information. It's all a system that is connected," says Larson.

That said, Larson recognizes that funding is a continuing issue – for both research and Extension support. He proposes in the future producers need to step up and better support research through checkoff dollars. Regarding Extension he believes new technology – such as the use of iGrow to disseminate information – can add new efficiencies and create new opportunities.

"I want to keep research and Extension alive because of the benefits I was able to receive. I want that for the next generation too," he concludes.

*Editor's Note: Laird Larson, Myron Williams and Ed Blair have each been recognized as Eminent Farmer's by SDSU. Most recently, the three men are serving on an advisory board to evaluate the Ag Experiment Stations operated by the ABS College.*

# A Vision for Precision

Gregg Carlson Has Helped Guide Agronomy

**I**N THE LATE 1950'S and early 1960's when Gregg Carlson was growing up on a livestock and grain farm in northeast Illinois, personal computers and precision agriculture didn't yet exist. But this youngster's interest in agronomy, math and technology – as well as four years of service in the military – had a big role in changing all of that.

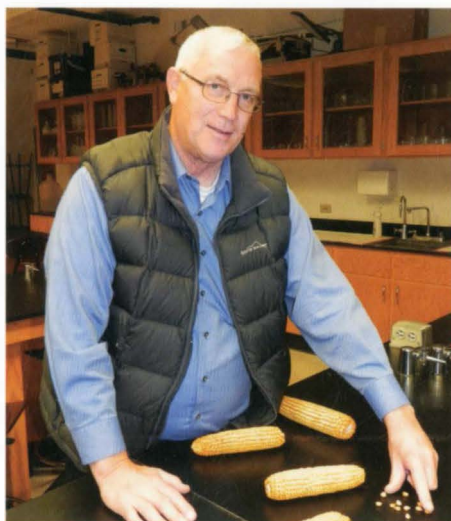
Carlson retells that he was always interested in farming and agronomy; he earned his bachelor's degree in mechanized ag with a minor in agronomy from Western Illinois University. In 1969, he arrived at the South Dakota State University campus to pursue his Master's degree in agronomy.

Carlson's focus on agronomy was then interrupted when he was called to active duty in the Army as an Airborne Ranger from 1971 until 1974. But it was actually that experience that fostered his interest in precision ag.

He recalls, "I saw my first Global Positioning System (GPS) receiver when I was in the Army in about 1972. U. S. Army Rangers were the first to get the Department of Defense's new 'toys.' It was a big black box then with a readout that gave latitude and longitude. After I saw it, all I could think about was how that technology could be used to control inputs in agriculture."

And indeed, he was on to something. Carlson returned to SDSU in 1974, completed his PhD and has been on the faculty – with a three-way appointment of teaching, research and Extension, with much of his focus on precision ag – ever since.

As a visionary leader in his field, Carlson has given hundreds of invited presentations at local, state, national, and international meetings, as well as authored and co-authored numerous reports, Extension fact sheets, and professional papers. He has served as the interim head of the SDSU Plant Science Department and as the



Gregg Carlson's career with the SDSU Plant Science Department has spanned four decades. He says, "I like the students and my advising work. I enjoy interacting with our future – and it keeps you young too I think."

interim director of the South Dakota Cooperative Extension Service.

Much of Carlson's success stems from his enthusiasm and sincerity. Plant Science Department Head Sue Blodgett credits Carlson for his commitment to educating students and growers, and she states, "His positive attitude and willingness to pitch in and help with a variety of projects make him one of Plant Science's and the College's go-to people."

Carlson's early interest in technology has also earned him many unique milestones over the last four decades – one particularly interesting designation is the fact that Carlson had the very first IBM personal computer on the SDSU campus. He even taught Intel assembly language for the Computer Science Department in the late 1970s. Now, that PC is in the Ag Heritage Museum's archives.

Today, Carlson reports that precision ag is becoming the norm in farming. "Precision ag is about doing the mathematics to apply variable rates anywhere in a field. Agriculture has moved from being a biological science to mathematical and biological."

He adds, "Farming used to be about biology and chemistry. Today, it is also about making analytical decisions."

To that end, Carlson recognizes that computers will continue to play an important role in agriculture's future, and he is excited about the iGrow web portal that SDSU is launching to help facilitate those analytical processes for growers.

Likewise, as agriculture evolves, Carlson anticipates a tremendous transition from traditional research to direct on-farm research. He says, "Farmers sometimes question precision ag and research trials. So as we transition to more on-farm research, the results can become more accurate and applicable."

Also important into the future, Carlson hopes the general public will be supportive of agriculture and ag research. He points out, "All of us in South Dakota are dependent on the profitability of production ag. In turn, the profitability of production agriculture is dependent upon farmer/rancher management decisions, and good management decisions are dependent upon the robustness of agriculture's intellectual infrastructure."

As an example, Carlson says, "People may be surprised to learn that crop input costs average \$200/acre – which on 50,000 acres of farmland – adds up to \$10 million dollars that impacts the local economy."

Carlson concludes, "South Dakota's population needs to understand how the economy hinges on agriculture's intellectual infrastructure. And, that's why we need to make certain we are effective on future agronomic production and research."

*Editor's Note: In his spare time, Carlson applies his precision skills to the craft of wood-working, and recently bought his own saw mill. He and his wife Susan have two grown children and two grandchildren.*





# A BOOST FOR BEGINNING BEEF PRODUCERS

Training Program Offered Through USDA Grant

**W**HAT DOES IT TAKE to be a successful beef producer in today's evolving industry?

A new program for beginning beef producers in the state is designed to give them the insight and management skills to answer that question.

Called "beefSD," the three-year program is being launched in early 2011 and will train thirty aspiring South Dakota beef producers in the areas of livestock production, natural resource stewardship, marketing, and business, financial and risk management. Program participants each have less than 10 years of experience during their adult life in beef production.

The program is being administered by the Cooperative Extension Service at SDSU in partnership with the South Dakota Farm Bureau Federation through a \$748,892 grant from the U.S. Department of Agriculture. SDSU Extension beef specialists Kenneth Olson and Julie Walker, who are both based at the West River Ag Center in Rapid City, are serving as project directors for the program, with Stacy Hadrick serving as coordinator. Lowell Mesman with the SD Farm Bureau Federation is also a project partner.

"The beefSD program will focus not only on developing beginning beef producers' management skills but also their leadership skills," says

Hadrick. To do so, numerous Extension specialists and educators, along with experienced South Dakota ranchers and ag professionals, will be involved in sharing their expertise with participants.

Over the course of the three year program, participants will be clustered into two groups – one will meet in western South Dakota, the other in the central part of the state.

The goals of beefSD are to provide participants the opportunity to evaluate alternative beef cattle production systems, learn about the entire U.S. beef cattle industry, and initiate individual cattle enterprise plans to guide decision-making on their own operations in the future, explains Olson.

He adds, "This program is unique because it dissects segments

of the beef industry to give these new producers important insight for their own operations. And, the mentoring provided from experienced beef producers and ag professionals will help create a network that these beginning producers can seek advice from for years to come."

With the average age of beef producers in the U.S. being 58 and with increasing land and production costs making it challenging for beginning producers to pursue farming or ranching, assisting with the generational transition of farms and ranches to younger producers is critical, adds Walker.

"We hope beefSD will help beginning producers develop a plan to achieve their goals in the beef industry. We want to see that the next generation has the opportunity to continue to be on the land and keep ranching and beef production a viable industry within the state," Walker concludes.

*Editor's Note: The grant for the beefSD program will provide a scholarship of \$30,000 to each beefSD participant to defray time and travel costs to participate in the three-year program. Additionally, portions of the program will be made publically available to all beginning ranchers. For more information, contact Stacy Hadrick at 605-347-1195 or Stacy.Hadrick@sdstate.edu.*

The beefSD program format will include:

- ▶ Instructional workshops and case studies to evaluate successful ranches that showcase different production settings such as seedstock, grass-fed, backgrounding, and retained ownership to slaughter.
- ▶ Mentoring by established ranchers and other agriculture professionals to aid program participants in forming their own individual management team.
- ▶ Post-weaning calf performance evaluation following participant's cattle from the ranch, to the feedlot, to the end-product carcass characteristics.
- ▶ Interactive, web-based learning, including webinars and online tools via the iGrow initiative.
- ▶ Travel study trips to expose participants to different aspects and marketing opportunities within the US beef cattle industry. Three trips are planned to coincide with the three year program.





# ETHANOL'S EVOLUTION

Promising New Research Goes Beyond Corn

**F**UELING UP YOUR CAR with ethanol produced from blue-green algae may sound far-fetched. But Bill Gibbons, a professor and researcher in SDSU's Department of Biology and Microbiology, says it is close to reality – with commercial availability of this new generation of ethanol just four or five years away.

Gibbons and his colleagues at SDSU are among the nation's leaders in this innovative algae-to-biofuel concept, which aims to expand the ethanol resource in the U.S. and lessen reliance on foreign petroleum.

"Right now we are using 140 billion gallons of gasoline annually in the United States and spending \$1 billion day to buy oil," Gibbons points out. "Think of the multiplier effect on our country if we could keep that money here," he adds.

Gibbons believes domestically produced biofuels are a key component for that turnaround, but he also knows that it can't all come from corn and soybeans. Presently the U.S. has the capability to produce over 13 billion gallons of "traditional" ethanol – which accounts for 10% of fuel used by American consumers. Revolutionary new research at SDSU focusing on cellulosic biomass and cyanobacteria – also known as blue-green algae – is providing alternatives to broaden the scope of ethanol production and use even further, Gibbons explains.

## Cellulose & Cyanobacteria

SDSU researchers are accustomed to leading the charge on ethanol's development. It all began in the late 1970's when the first farm scale, fuel-ethanol production still in the nation was developed at SDSU.

Gibbons explains that the first generation of biofuels focused on using corn for ethanol and soybeans for biodiesel. "That was the traditional approach," he says.

The second generation of biofuels converts biomass or cellulosic material from grass, corn cobs and stover, trees or waste into ethanol. Researchers at SDSU have had a switchgrass breeding program for this type of bioenergy since the 1980s. A current five-year project at the North Central Sun Grant Center at SDSU has researchers working to optimize another native grass, prairie cordgrass, for ethanol production. This project is also developing biomass fractionation pretreatments, techniques to reuse enzymes, thermotolerant yeast, and a new generation of high solids

Pictured above: Professor Bill Gibbons of SDSU's Department of Biology and Microbiology is one of the South Dakota State University scientists researching new technologies for biorefining renewable materials such as native grasses and algae in order to make fuel and other products.





can be used,” he explains, noting that the military is increasingly interested in using renewable fuels.

As these new production processes emerge, Gibbons foresees ethanol production facilities with greenhouses constructed alongside, using engineered cyanobacteria to produce additional ethanol or drop-in biofuels from the unused carbon dioxide and low grade heat. “There are a lot of synergies between these systems to add value and efficiency to existing plants,” says Gibbons.

The first round of cellulosic ethanol facilities are primarily being constructed as “bolt-ons” to existing corn ethanol biorefineries, to also take advantage of these synergies. Gibbons anticipates that as stand-alone cellulosic facilities are built in the future, they will likely be smaller plants (20 to 30 million gallons), and will be strategically located near the feedstock (grass, cornstover or timber) that they use. He explains this is because transporting these lower density feedstocks over long distances can be challenging and expensive. He adds that these new facilities could easily include secondary biofuel production via a facility for cyanobacteria as well.

Gibbons believes these formats will lead to a total biorefinery concept in the U.S. in the future. “Instead of producing one product, a cluster of facilities could produce ethanol, green gasoline or diesel, jet fuel, and industrial chemicals such as isoprene,” he explains.

On that note, Gibbons believes the sky is the limit for where biofuel research and development is headed – and he says that spells opportunity for young people looking ahead to future careers. “The growth in biomass ethanol and third generation fuels is just beginning. We are going to need many more students in science and engineering to make this a reality. For individuals who want to stay in the Midwest and rural communities this is a great career field,” Gibbons concludes.

*Editor’s Note: Departments on the SDSU Campus involved in biofuels research include: Ag & Biosystems Engineering, Animal Science, Biology & Microbiology, Chemistry, Dairy Science, Economics, Electrical Engineering, Mechanical Engineering, Nutrition & Food Science, Plant Science, Physics, and Wildlife & Fisheries Sciences.*

bioreactors. Additionally, a Department of Defense project at SDSU is working to produce jet fuels from biomass such as prairie cordgrass.

Gibbons anticipates that biomass ethanol will be on the market by 2012. Sioux Falls-based POET, a leading producer of ethanol, has been producing cellulosic ethanol at a pilot plant near Scotland, S.D. since 2008 and is constructing its first commercial scale cellulosic ethanol plant at Emmetsburg, IA, which is scheduled to begin operating in 2012.

While ethanol produced from corn and cellulosic feedstocks offers a viable renewable energy alternative, it also comes with some limitations – primarily the fact that the majority of America’s transportation fuel infrastructure (pipelines and distribution networks, storage facilities, and engines) have been designed for petroleum products, not ethanol.

Because of this, researchers at SDSU and around the country are pushing ahead to develop third generation biofuels that could be used as direct replacements for gasoline, diesel or jet fuel. “Because these third generation biofuels are similar or identical to their petroleum-derived counterparts, they are called direct ‘drop in’ replacements. They will seamlessly fit into the existing fuel transportation, storage, and utilization infrastructure,” explains Gibbons.

Research at SDSU to create these third generation biofuels is focusing on two approaches. One approach uses photosynthetic cyanobacteria – a bacterial version of algae – which can be reengineered to convert sunlight, carbon dioxide and water directly into third generation biofuels. “They are like little factories that spit out biofuel molecules without the need for starch or cellulose,” explains Gibbons.

A second process, called thermochemical pyrolysis, uses high temperatures and pressures to convert cellulosic biomass into long hydrocarbon chains that are similar to gas, diesel or jet fuel.

Gibbons acknowledges that the challenges with these third generation processes is obtaining high yields at fast rates, but the research is promising. He anticipates seeing these third generation fuels in pilot scale, pre-commercial testing by 2015.

### Complimentary Systems

Gibbons sees all three generations of biofuels being utilized in the future. “Our new research is not intended to replace corn-based ethanol. We have the infrastructure for corn-ethanol plants in place, corn ethanol has benefits, and distillers’ grains are a valuable feed coproduct. So, those plants will remain,” he says, and anticipates that as corn yields continue to increase over the next decade there will likely also be similar continuous growth in corn ethanol production.

“The incentive with second and third generation biofuel research is to add to the portfolio and diversity of how liquid transportation fuels can be produced and where they



# New Era for Cereal Grains

Seed Technology Lab Inspires Innovation

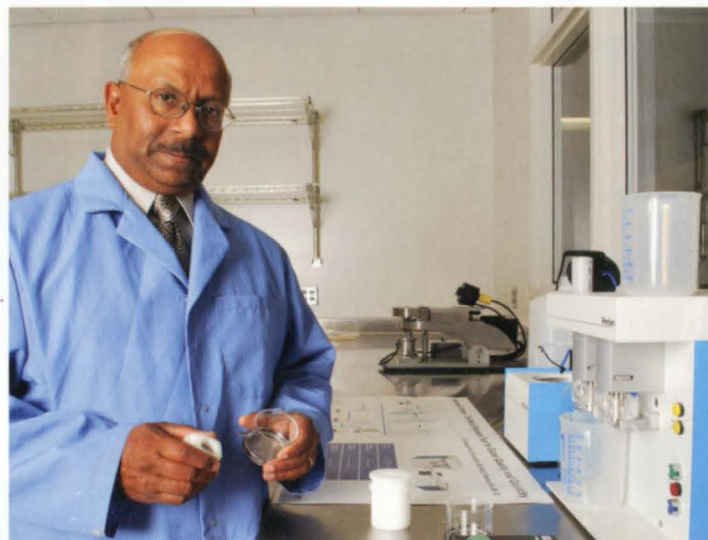
**T**HE STATE-OF-THE-ART Seed Technology Lab opened in September, and with it, the door to innovative seed and crop science efforts by SDSU researchers has also been widened.

The new \$6.5 million facility is the second building on the South Dakota State University Innovation Campus in Brookings, the only university-affiliated research park in South Dakota. It is also unique in that it brings together under one roof the South Dakota Crop Improvement Association, the SDSU Seed Testing Lab, the Seed Certification Service, the Crop Quality Lab, and molecular biology/genomics and biocontainment laboratories – which enhances the opportunity for collaborative work.

“Physically, the facility is amazing, but I think the true payoff will be an increased level of collaboration that will occur as a result of my being in the same building with the SDSU wheat breeders and other scientists,” explains Jeff Stein, SDSU associate professor and small grains pathologist.

Likewise, Tom Cheesbrough, interim director of the South Dakota Agricultural Experiment Station, believes the innovative research generated by the SDSU Seed Technology Center will benefit industry-wide collaborations as well – for other scientists, for plant breeders and their staffs, and for a wide range of stakeholders, including the agricultural producers of South Dakota.

“Much of the fundamental science that our researchers conduct at the SDSU Seed Technology Lab will serve as



South Dakota State University cereal grains food scientist Padu Krishnan examines some of the equipment he uses in the new SDSU Seed Technology Laboratory. The lab opened in September in Brookings.

foundation for applied groups to use as they go forward with myriad projects,” states Cheesbrough.

## Projects Underway

Stein and SDSU Department of Plant Science assistant professor Jose Gonzalez, enthusiastically began work in the new building this fall. Their research focuses on molecular-level science, which provides information to make selection processes more efficient for plant breeders and identifies new genes linked to the biotic stresses of disease and pest resistance.

Stein says the improved greenhouses are an integral part of the SDSU Seed Technology Laboratory that will enhance their research efforts.

“The type of facilities one would need to have a world-class molecular biology program are all here, the chemical



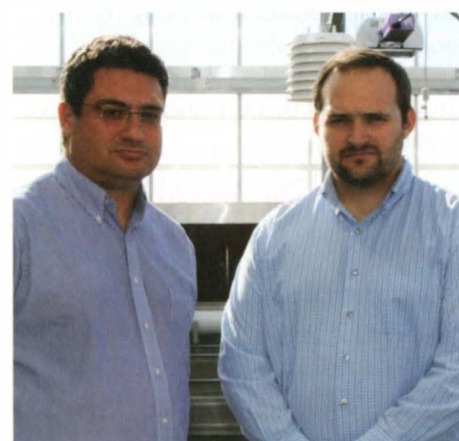


exhaust hoods, the bio-safety hoods, but more pertinent to my work are the state-of-the-art greenhouses,” says Stein. “These greenhouses are even a step above what we have on the main campus, and they will allow for cultivating plants throughout the year with better lighting and temperature control.”

Specifically among his upcoming projects Stein will address defense gene expression in oats against oat crown rust; he will initiate a metagenomics project that will try to identify all the fungal species associated with wheat grown under different conditions, and he will conduct a considerable amount of germplasm evaluation that will ultimately help plant breeders identify and release the best disease resistant varieties possible.

Gonzalez says the new facility will allow him and his colleagues to continue important work on prairie cordgrass genomics. He and a group of scientists recently finished a study that established about 45% of the genome for the grass. Scientists see prairie cordgrass as a potentially valuable biomass energy crop, and South Dakota is seen as place where it could thrive in large quantities.

In time, the genomics work on prairie cordgrass could lead to significant collaboration and consortium efforts on this important bio-fuel crop species. Gonzalez,



Jose Gonzalez, left, and Jeff Stein are among the researchers who will make good use of the SDSU Seed Technology Laboratory where they will both conduct genomic and molecular research to benefit South Dakota.

## FACILITY FUNDING

The Seed Technology Laboratory was built almost entirely through gifts from commodity groups and individuals interested in expanding the university's research capabilities. The facility is one of 10 capital projects already constructed as part of It Starts with STATE: *A Campaign for South Dakota State University*.

In addition to funding for the structure, much of the equipment inside the labs was made possible through generous support. As an example, the South Dakota Wheat Commission, the South Dakota Crop Improvement Association, the South Dakota Oilseeds Council, and various other federal and local agencies provided funding for nearly \$500,000 worth of analytical and processing equipment inside the CQL. Likewise, the South Dakota Corn Utilization Council and the South Dakota Soybean and Research and Promotion Council provided funds for mass spectrometers, protein analyzers, and processing equipment.

In October, university and SDSU Foundation leadership announced a goal to raise \$200 million in the six-year It Starts with STATE campaign, which will conclude December 31, 2012. To date, more than \$137 million in gifts and pledges have been made in the first four years of the campaign period. With the amount raised to date, the campaign is already the largest ever by a South Dakota higher-education institution.

Stein and a SDSU team working to domesticate prairie cordgrass as a crop, submitted a \$45 million proposal to USDA this fall to establish such a consortium of universities and private industry companies in the Midwest and Central Plains. If received, it would be the largest grant ever at SDSU.

### Food Research, Too

On the other end of the seed and grain spectrum, the quality of food crops in relation to health, disease prevention, and economic development will be researched at the new Seed Technology Center as well, via the Crop Quality Laboratory, or CQL.

SDSU cereal grains food scientist Padu Krishnan explains that the improved facilities give him and other plant science researchers an enhanced ability to study the fundamental traits of cereal grains and oilseeds and to exploit these traits to enhance their economic value. The work will help to capture economic returns closer to where the crops are produced. “We torture cheesecakes to reveal their secrets about frozen shelf-life, we pearl wheat to within a few millimeters of the kernel's bran layer to increase milling yield, we stress gluten to its

breaking point to predict bread-loaf volume, and we create healthy pizza crusts using a South Dakota-grown white wheat,” reports Krishnan. “Boiled down, all of our work will help South Dakota-produced cereal grains and oilseeds compete in the global marketplace.”

He adds, “The new CQL lab allows researchers to complete the whole process of testing crops with new equipment and space. We can mill grains to transform raw materials into products that can be tested, and a world-class facility like this will continue to bring more industry projects to help share the cost and resources for finding data as well as maintaining the facility.”

In addition to the research aspects, Krishnan and his SDSU colleagues are equally excited about the teaching opportunities the new facility affords. Krishnan sums up that sentiment saying, “We will have an amazing ability to train graduate students in this site, and they will go into the industry with skills and capabilities that are constantly in demand. Those graduates serve as our ambassadors once they leave SDSU, so in many ways, our investments will return to us.”

# Alumni Accolades

## Four ABS Alums Earn Distinguished Honor

**A**s the roll call for the Class of 2010 Distinguished Alumni honorees was announced this fall, you might say the College of Agriculture and Biological Sciences was beaming like a proud parent.

Four of the seven alumni names on the list were ABS alums – in agricultural terms “it was a bumper crop.” Recognized with the Young Alumni Award were Joel DeRouche and Stacy Holzbauer. Earning the honor for Professional Achievement were Lynn Enquist and Michael MacNeil. Their professional achievements are highlighted on page 20; here they reflect and share words of wisdom:

### STACY HOLZBAUER

SDSU Class of: 2000; Hometown: Wagner, SD  
Current Position: CDC Career Epidemiology Field Officer,  
Minnesota Department of Health



#### During your time at SDSU what contributed to your future success in your career?

SDSU provided me with a high quality, hands-on education that served as a cornerstone for my further studies in veterinary medicine and public health. I was introduced to professors, veterinarians, and researchers who were passionate about what they were doing and it was infectious.

#### What did you enjoy most about your SDSU experience?

The people! Some of my best friends and colleagues are fellow Jackrabbits. SDSU gave me the opportunity to work hard and play hard with these people. Those relationships last a lifetime.

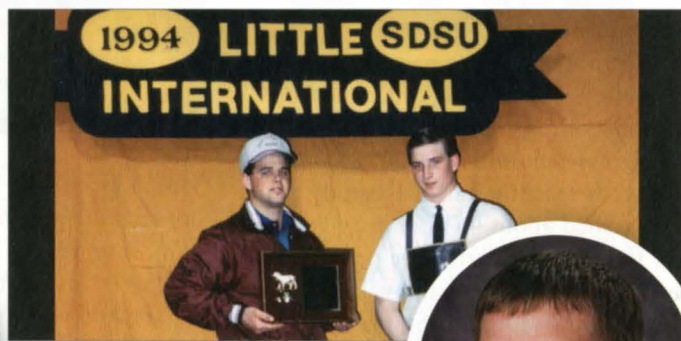
#### What advice would you give SDSU students today?

Don't be afraid to leave your comfort zone. This world is full of fascinating people and experiences just waiting to be discovered and enjoyed. Seek them out. Do what you love. There is a reason work is called work – but if you do not love what you do at least 75% of the time, it's time to re-evaluate.

SDSU is the perfect place to make the transition into adulthood. Study hard, make friends, make mistakes, and take advantage of all SDSU has to offer.

### JOEL DEROCHEY

SDSU Class of: 1997; Hometown: Pukwana, SD  
Current Position: Professor and Swine Extension Specialist,  
Kansas State University



#### During your time at SDSU what contributed to your future success in your career?

SDSU provided me with a foundation of understanding the true meaning of a land-grant University, which shaped my beliefs and how I approach my current position working for the citizens of Kansas. Looking back, I also recognize how personal mentoring by faculty members can truly impact the future careers of students, and this is something I strive to provide to my own students

#### What did you enjoy most about your SDSU experience?

Without question I value the friendships that I developed and still maintain today. The involvement I had with judging teams, Little International, departmental activities and off campus social events are also some of my fondest memories of SDSU.

#### What advice would you give SDSU students today?

Your time at SDSU is special, and you will develop a larger appreciation for SDSU and your experiences after you graduate. Enjoy all aspects of your education, social networking and athletic events while you are there. You will have larger responsibilities soon enough.

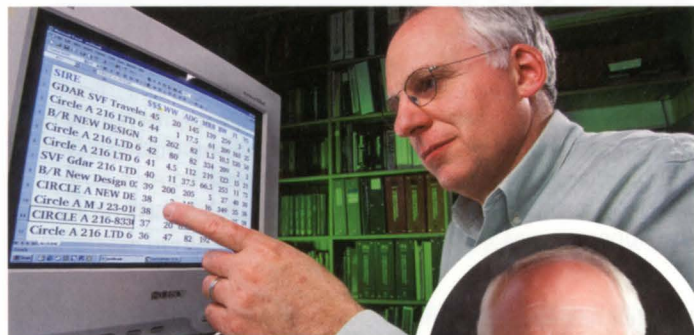


“SDSU gave me the opportunity to work hard and play hard.”

STACY HOLZBAUER, SDSU BRIGGS SCHOLAR AND WOMEN'S RUGBY TEAM CAPTAIN, CLASS OF 2000

### MICHAEL MACNEIL

SDSU Class of: 1982, PhD; Hometown: Ithaca, NY  
Current Position: Research Geneticist,  
USDA Agricultural Research Service



#### During your time at SDSU what contributed to your future success in your career?

I came to SDSU as a graduate student, in pursuit of a PhD. As I reflect on that time, two lessons stand out for me. First, the library is a far greater repository of information than can ever be gained in any classroom. Time spent there continues to inform the quest for new knowledge that has been both my career and passion ever since.

Second, few people can accomplish as much individually as they can with the help of great colleagues. I have certainly benefited from more than my share of them. This is one of the great ironies of PhD training – we seek to establish an independent ability to conduct research, but the best research is often the result of great teams.

#### What did you enjoy most about your SDSU experience?

The camaraderie of working with the my fellow graduate students, and people who frequented the graveyard shift at the computer center, jitterbugging with some wonderful partners and meeting my wife.

#### What advice would you give SDSU students today?

For undergraduate students: Worry less about majors and facts and more about the process of learning. It will serve you well wherever you go – and for most of you it won't be in the field of your major.

To graduate students: Pursue what fascinates you, in that fascination you will find far more than you ever dreamed.

To everyone: Believe in yourself; learn from your defeats and move on, the sting only lasts as long as you let it. Always, always find the time to celebrate the victories (even the small ones) with friends and family.

### LYNN W. ENQUIST

SDSU Class of: 1967; Hometown: Milbank, SD  
Current Position: Chairman & Professor,  
Department of Molecular Biology, Princeton University



#### During your time at SDSU what contributed to your future success in your career?

I started right away as a bacteriology major, at a time when molecular biology was not taught at SDSU. It was a time of major change in biology and my professors made us aware of the excitement. They believed in teaching the fundamentals of practical microbiology and exposing me to a research environment.

#### What did you enjoy most about your SDSU experience?

I loved the combination of hard work and extreme fun. I played in a rock and roll band, often at Hort's on Wednesday nights. I studied like crazy. I met some amazing people including my wife.

#### What advice would you give SDSU students today?

I like to share three lessons: Foremost, try to do what you love or what you think you care deeply about. It isn't about the money; you know it when you see it. Don't be afraid to try new things, and when you are not doing what you love – it's time to move on.

Second, maintain constancy of purpose in your professional life as much as possible. Focus on this purpose, but realize that focus doesn't always mean doing the same little thing over and over. That said, don't forget about family and friends, and find a second passion to cleanse the mind – mine is fly fishing.

Third, follow your gut feeling when you must make a career decision, but don't over-analyze. Most of us can't see further than a year or so down the road, so don't fret. Listen to people you trust, but remember it's your career, not theirs. Remember lesson number one, and don't be afraid to try new things.

# Career Highlights

## STACY HOLZBAUER ► YOUNG ALUMNI

Only eight years out of veterinary school, Holzbauer has distinguished herself in the field of epidemiology, particularly in the research of disease outbreaks. Holzbauer began her career with the Centers for Disease Control and Prevention (CDC) in 2004 as a veterinary medical advisor. In 2006, she became an Epidemic Intelligence Service officer for the CDC, and in this role she had the opportunity to conduct several high profile public health investigations, including an E. coli O157:H7 outbreak associated with lettuce consumption and an outbreak of neurologic illnesses in pork slaughter plant workers.

Presently, she is a CDC Career Epidemiology Field Officer stationed at the Minnesota Department of Health and a Lieutenant Commander in the US Public Health Service. In 2009, she was one of two recipients of the Centers for Disease Control and Prevention award for excellence in veterinary public health.

Holzbauer was a Briggs Scholar while at State as well as a captain on the women's rugby team.

## JOEL DEROUCHÉY ► YOUNG ALUMNI

As an Extension livestock nutrition and environmental management specialist and assistant professor at Kansas State University, DeRouchéy works as a member of an applied swine Extension team and several state and regional animal manure management teams.

He has amassed a lengthy list of awards and publication credits, most notably, twice in the last three years he received an Outstanding Young Scientist Award from the Midwest section of the American Society of Animal Science. He was selected for the Extension award in 2008 and the Research award in 2010.

DeRouchéy's work in swine nutrition has gained the praise of colleagues and corporate heads. He has received as a primary or co-investigator \$1.3 million for applied swine research, \$1.4 million for environmental research and education, and \$2.1 million in gifts and gifts in-kind. In addition to his university appointment, he works as an independent advisor within the swine industry.

## MICHAEL MACNEIL ► PROFESSIONAL ACHIEVEMENT

MacNeil, a research geneticist with the USDA Agricultural Research Service, is considered one of the leading beef geneticists in the world. In his work at the Fort Keogh Livestock Range and Research Laboratory at Miles City, Mont., he is the lead scientist among a group of five scientists developing strategies involving quantitative and molecular genetic aspects of efficient and low-cost beef production to satisfy demands of American consumers. MacNeil's work integrating genetics and economics have become standards in the industry.



Pictured are the eight distinguished people honored by the SDSU Alumni Association this past fall. Back row left to right, Stacy Holzbauer, Steve Hildebrand, Joel DeRouchéy, Michael MacNeil and Lynn Enquist. Front left to right, Jim McKinney, Cheri Kraemer, and Lyle Solem. Kraemer, Solem and Hildebrand were recognized as part of the Distinguished Alumni Class of 2010. McKinney was recognized as a non-alumnus for his Service to South Dakota. A banquet for all of the honorees was held Oct. 22 in Brookings.

MacNeil has earned numerous awards including the ARS Administrator's Postdoctoral Research Awards from the USDA in 1993 and 2004. In 2005, he received the Continuing Service Award from the Beef Improvement Federation, and in 2008, he was recognized by the Western Section American Society of Animal Science with their Distinguished Service Award. In 2010, MacNeil was the recipient of The Federal Laboratory Consortium Mid-Continent Notable Technology Award.

The board-based acceptance of MacNeil's work is evidenced by the fact that breeding objectives he developed are currently being used by the American International Charolais Association, the American Hereford Association, the North American Limousin Foundation, the Circle A Angus Sire Alliance, and the American Simmental Association; and by numerous invitations to collaborate in research both domestically and internationally.

## LYNN ENQUIST ► PROFESSIONAL ACHIEVEMENT

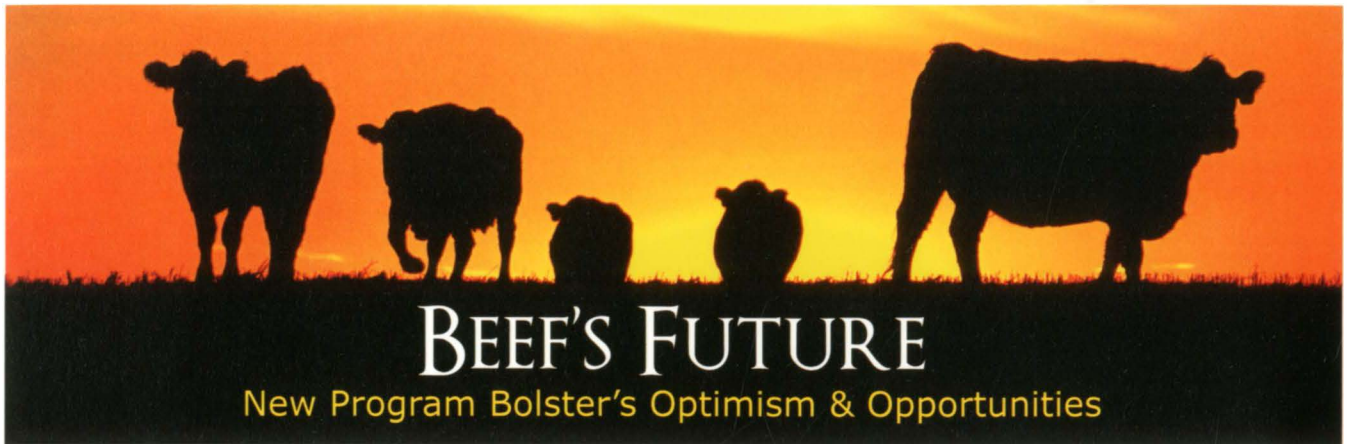
Enquist chairs the molecular biology department at Princeton University and is considered a world-renowned scientist in the field of herpes virology. During his 40-year career, he has done research in the sectors of academia, government, biotech, and large pharmaceutical companies.

A department head since 2004, he oversees 61 faculty members, 64 research staff members and 37 administrative staffers in support of 112 undergraduates, 146 graduate students and 94 postdoctoral students – in five different buildings on the New Jersey campus.

While his administrative skills are significant, "he is first and foremost a terrific scientist who has worked on viruses for his entire career," according to Shirley Tilghman, president of Princeton and a postdoctoral student with Enquist at the National Institutes of Health.

The American Academy of Microbiology, the American Association for the Advancement of Science and the American Academy of Arts and Sciences have elected Enquist as a fellow, which is the highest recognition these societies give.





# BEEF'S FUTURE

New Program Bolster's Optimism & Opportunities

If students on the SDSU campus are optimistic about their future role in the beef industry, it's with good reason. A new program is helping them gain the knowledge and leadership skills to better prepare for a career in the beef industry – and it is generating a wave of enthusiasm.

"I have enjoyed the opportunity to meet many people and experience the different aspects of the beef industry by touring cow-calf operations, feedlots, and a beef processing plant. This has enabled me to appreciate the industry as whole and will allow me to have a better understanding in the future," says Michaela Braesch, a senior animal science major from Herman, Neb.

Braesch is talking about her involvement in the Beef Leaders Program, which she has been participating in for the past two years.

The new program was launched in the fall of 2009 by the SDSU Animal and Range Sciences Department, with animal science professor Kelly Bruns and assistant professor Sara Winterholler overseeing the effort.

They explain that with today's beef industry facing increasing changes in environmental, welfare and global trade issues, along with high production costs and competition for resources, the Beef Leaders Program was developed to complement the conventional classroom curriculum and help students like Braesch and her peers gain a better understanding of the beef industry.

The innovative program offers students the opportunity to participate in:

- ▶ a monthly lectureship series during the school year featuring beef industry speakers addressing current topics – from animal welfare concerns to nutrition and genetics; and
- ▶ group projects addressing industry issues, along with industry tours and participation in state and national beef industry meetings.

"The value of the beef leaders program is industry exposure and the opportunity for students to develop lifelong working relationships with a group of peers that share a passion for the beef industry," explains Winterholler. "We hope this industry network will be

a valuable resource for students to utilize as they work though beef industry challenges once they leave SDSU and pursue personal goals in the beef industry."

Teamwork, critical thinking and communication skills are also developed through the program. As well, Braesch, who intends to be involved with her family's cow-calf operation after she graduates, believes the experience has made her a better spokesperson for the industry. She says, "I believe that by participating in this program, I can help bring awareness to consumers about beef. I can educate consumers about our management practices and assure them that they are consuming a safe, nutritious product."

Likewise, Danielle Schubert, a junior animal science/ag business student from Brainerd, MN, says, "I felt being a part of this group would not only be beneficial to myself, but to the beef industry, as well. The beef industry is the basis for my family's livelihood, and I want to do my part to help strengthen the industry's future."

Schubert adds, "I enjoy being a part of a group where every individual is as passionate about the beef industry and as interested in advocating it as I am."

A third facet of the Beef Leaders Program is the opportunity for one or two students to be selected for a 10-week summer internship that gives insight on the different sectors of the beef industry, producer organizations and governmental policy, including a visit to the nation's capital.

All total, the SDSU Beef Leaders Program is designed to inform, involve and inspire students in their future beef industry endeavors – whether that be carrying on a family legacy of farming or ranching, pursuing a career in a specialized sector of the beef industry, or serving the industry through leadership roles in producer, commodity or legislative entities.

## BECOME A SPONSOR

Industry partners are invited to support SDSU's Beef Leaders Program through sponsorships for the lectureship series, student travel to industry events, and the Beef Leadership Internship. For more information or to contribute, contact: Craig Russow, SDSU Foundation, at [craig.russow@sdsufoundation.org](mailto:craig.russow@sdsufoundation.org) or call 605-697-7475.

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