I recently had the privilege to speak to a large group of community and business leaders in Sioux Falls about the current state, and future opportunities, associated with South Dakota agriculture. I spoke of what I often refer to as the “Grand Challenge of the 21st Century,” to produce enough food, fiber and fuel for more than 9 billion people in the next 50 years using less land, less water and less energy, and to accomplish that in a sustainable manner.

While my talk went well, the audience’s questions were just as challenging. To paraphrase, the questions included:

• As food becomes more scarce, will we be able to use land, and other limited resources, for biofuel production?
• What will happen to the most threatened ecosystem in North America; the prairie?
• Is food from animals raised in large confinement operations with modern production methods safe and healthy? And, are the animals treated well?
• Will my grandchildren, and I, be able to hunt?

My audience weren’t vegan radicals who were opposed to everything about modern agriculture. Rather, many mentioned that they themselves were raised on farms, or had siblings or cousins still farming the family homestead. But their questions go to the heart of concerns of tens of millions of Americans. And farmers and ranchers, and deans of colleges, need to carefully listen, and be ready to answer them.

Answers based on “Trust me, I know what’s best” will not suffice. Nor will unbiased scientific based research findings alone sway their opinions. The consumers who ask these probing questions are sophisticated, well educated, materially well off, and they influence agriculture with both their billfold and their policy.

Charlie Arnot, Director of the Center for Food Integrity says it this way; “Science tells us THAT we can. Society tells us IF we can.” The answers to the questions above, plus a long list of additional questions concerning the use of everything from water to biotechnology, need to be based on a spirit of transparency, responsiveness, and leadership.

Lesson From History
In 1899, a 41 year old Scottish immigrant named James “Scotty” Philip made a personal decision that has become a hallmark for the power of private landowner conservation in our state and nation.

He was a pioneer rancher from the Bad River country of South Dakota. On his own, he made the remarkable decision to buy the last known bison in the Great Plains to save them from extinction. Once rounded up from the Cheyenne River reservation and moved to a fenced pasture north of Ft. Pierre, they numbered eighty-three head. It is estimated that there were less than 1,000 alive at the time, mostly in our first National Park, Yellowstone.

One hundred years earlier, it was estimated that there were 60 million. I am struck not only by the act itself, but mostly by the spirit behind it. His act of stewardship and conservation was not in response to government policy or personal gain. He received no payment or waiver. He did not receive technical advice from government employees or base his actions on lengthy university research findings.

Scotty Philip just did it. He made a decision that changed our world. Today, there are approximately 500,000 bison in the U.S., with South Dakota the leading state in bison production.

In face of the challenges offered up by the audience in Sioux Falls, what might we expect from a modern day Scotty Philip? Leadership!

Farmers and ranchers, and university deans, need to recognize the complexity of our times. There is a long list of success stories associated with modern agriculture. For example, over the last twenty-five years, soil carbon levels in South Dakota’s farm fields have increased, dispelling the myth that modern agriculture mines the soil of its basic nutrients. And no-till production systems and crop rotations reduce erosion and shine in production, even in the drought of 2012.

But challenges remain. While hunting and fishing are part of how South Dakotan’s define quality of life, the impact of changing agriculture practices and some government policies on wildlife populations and fisheries remains of concern to many. De-mystifying modern food animal production is not a choice, but a necessity.

And what is sustainable? As we prepare for the “Grand Challenge,” many debate – and are sometimes annoyed by – the definition of the word. I think it is good to debate and critical to define.

For me, sustainability means that the decisions we make today do not limit the opportunities of the future. Scotty Philip raised thousands of cattle on the rangelands of South Dakota, but he also reached out to help save an entire species for posterity. He intuitively understood the responsibility associated with sustainability.

Wayne C. Lee, from “Scotty Philip, the man who saved the buffalo,” 1975

Barry H. Dunn, Ph.D.
GROWING
SOUTH DAKOTA

VOLUME 3, NO. 1, FALL 2012

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On the Cover:
Modern farming practices like no-till have helped South Dakota farmers better manage the soil, which boosts yields, stores carbon and contributes to a more vibrant environment. Read more about the study findings beginning on page 2.

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South Dakota farmers deserve an A+ for their soil management efforts, according to the findings of a recent SDSU study. By utilizing modern farming practices, farmers have been able to better manage the soil which helps store – or sequester – more carbon. As a result, we all enjoy a cleaner, more economically vibrant environment with cleaner water and resilient soils.

A first-of-its-kind study involved a team of ten scientists at South Dakota State University who looked at data from more than 95,000 soil samples collected from South Dakota farmers’ fields across eastern and central South Dakota between 1985 and 2010.

Their findings? “The soil organic carbon contents in surface soils have increased 24%. These increases directly boost the soil’s yield potential, while reducing agricultural impact on the environment,” reports David Clay, SDSU Professor of Plant Science and one of the lead researchers on the project.

Gregg Carlson, SDSU Professor of Plant Science who was also involved in the study, explains that the findings document that South Dakota fields used to produce corn, wheat and soybeans become carbon sinks as opposed to carbon dioxide sources.

Carbon sinks are natural or artificial reservoirs that accumulate and store some carbon-containing chemical compound for an indefinite period. The process by which carbon sinks remove carbon dioxide from the atmosphere is known as carbon sequestration. Conversely, increasing levels of greenhouse gases such as carbon dioxide are thought to cause global warming.

To illustrate the benefit from the carbon-storing that is occurring, Carlson points out, “The carbon stored in South Dakota’s 12 million acres of cropped land over this 25 year study period is equal to the carbon emitted from 17.8 billion gallons of gasoline.”

Better Farming Practices
Soil carbon sequestration is influenced by many factors, including the amount of carbon contained in the soil, mineralization rates, tillage, and the amount of non-harvested carbon returned to the soil.

SDSU researchers involved with the study attribute the creation of agricultural-based carbon sinks over the last two decades to the adoption by farmers of minimum and no-tillage farming practices that were researched and promoted by the College of Agriculture and Biological Sciences at South Dakota State University, and at the USDA’s Natural Resource and Conservation Service.

Doug Malo, Distinguished Professor of Soil Science at South Dakota State University, says, “The increase in surface soil organic carbon levels is an excellent example of how the land-grant mission in collaboration with federal and private industry partners works together to enhance the economic and environmental well-being of the clientele we serve, which are the people of South Dakota.”

He adds, “Since 1984, more than 6,000 undergraduate students from South Dakota have received basic soil and soil management training from SDSU. Numerous research projects have documented the values and improved yields associated with increased soil organic carbon levels. Countless research field days and Extension meetings have demonstrated the benefits of conservation and no-tillage. Government conservation programs have been implemented, and soil sustaining consulting recommendations have all worked together to create a paradigm shift in South Dakota agriculture. It has resulted in the level of surface soil organic carbon levels increasing.”
The SDSU study also documented that over the 25-year time period no-till adoption by South Dakota farmers has increased substantially. For example, in central South Dakota, no-tillage adoption increased from 5% in 1986 to 73% in 2009. During the same time, clean tillage decreased from 25% in 1985 to 1% in 2008.

Malo also points out that prior to 1984 the state’s average surface soil organic carbon levels had declined about 60% when compared to original values when the land was homesteaded. This study indicates that over the past 25 years that trend is being reversed.

And, as a result of the improved soil management and increased carbon sequestration, crop yields have also been given a boost. A direct comparison between the 5 year yield averages from 1987 to 1991 with yields from 2007 to 2011 showed that corn yields increased 86%, soybean yields increased 40%, and wheat yields increased 65%. These yield increases contributed to improved soil health by producing similar increases in non-harvested biomass returned to the soil, and the yield increases enhanced the state’s economic health by producing more than $2 billion in additional corn, soybean and wheat sales, according to the SDSU researchers.

The study concluded that the partial carbon footprint of corn decreased with increasing sequestered carbon. The study suggests that carbon is being sequestered in many Northern Great Plains surface soils. These results are attributed to: 1) carbon mining that occurred following homesteading, 2) gradual crop yield increases which increased nitrogen holding capacity to the soil; and, 3) wide-scale adoption of reduced tillage and then no-tillage methods.

Changing Perceptions
In total, the SDSU study provides a baseline documentation that surface soils of this region are a carbon sink – results that are drastically different from the general perception that annually cropped soils in the Northern Great Plains are losing carbon.

As further proof, when combined with carbon life-cycle analysis conducted by SDSU’s research team and researchers at the South Dakota School of Mines and Technology, findings from this research shows that South Dakota farmers have some of the lowest energy footprints in the world.

Barry Dunn, Dean of Agriculture and Biological Sciences at South Dakota State University, hopes this first-of-its-kind, unbiased scientific research could change how agriculture is perceived in the world around us.

He says these findings may have important economic impacts as well. As one example, ethanol produced in South Dakota may meet the California advance renewable fuel standard. “Meeting this fuel standard has the potential to dramatically increase the value of South Dakota ethanol in a highly competitive marketplace,” Dunn says.

Looking to the future, public awareness of the significance of carbon sinks has grown since passage of the Kyoto Protocol. It promotes the use of carbon sinks as a form of carbon offset – which may eventually offer new opportunities for South Dakota farmers.

Funding for this research was primarily provided by the South Dakota Corn Utilization Council. Additional support for this project was provided by the South Dakota Soybean Research and Promotion Council, Monsanto, the Agricultural Experiment Station in the College of Agriculture and Biological Sciences at South Dakota State University, the United States Department of Agriculture, and the National Aeronautical Space Administration (NASA).

The findings from the SDSU study were the subject of two international publications. It appeared in the Agronomy Journal and in Better Crops with Plant Food, published by the International Plant Nutrition Institute.

AFIRMATIONS FROM INDUSTRY

“The study’s findings are significant because they confirm what we believed – that our modern farming practices are improving our environment. It’s important for us to be good stewards of the land. We’re doing less tillage, using less fertilizer and pesticides, and we’re reducing erosion. We want to leave this land in great shape for future generations.”

Keith Alverson, farmer, Chester, SD; Vice President, South Dakota Corn Growers Association

“The Wheat Commission feels strongly that applied research of agricultural practices such as no-till and crop rotations have led to greater adaptation of beneficial practices by South Dakota farmers. Sustainable agriculture is increasing agricultural productivity to meet economic and nutritional needs while decreasing impacts on the environment.

All of this is possible through the investment in agriculture research. Everybody benefits from those investments. The challenge is to convey a greater understanding to the general public, policy makers, State and Federal legislators and administrations. This study will help.”

Randy Englund; Executive Director, South Dakota Wheat Commission
WHEAT EDUCATION DAY HELD

Tours of a research lab, hands-on learning stations and tasting food products made with wheat were part of the activities during a Wheat Education Day held for the public on Sept. 15 at the Seed Technology Laboratory on SDSU’s Innovation Campus in Brookings. The event was hosted by SDSU’s Wheat Research Group with sponsorship by the South Dakota Wheat Commission and the SDSU Agricultural Experiment Station.

“More and more people with no connection to farming are becoming interested in where their wheat products come from,” explains Jose Gonzalez, associate professor of Plant Science at SDSU. “We wanted to give a connection and understanding of one of South Dakota’s most important economic commodities.”

Participants had the opportunity to learn about the different wheat classes, tissue culture and molecular biology applications for wheat research and breeding, and to recognize some of the most important diseases in wheat.

This educational and fun event is sponsored by the South Dakota Wheat Commission and the SDSU Agricultural Experimental Station.
FACULTY NEWS

> **DAVID CASPER**, assistant professor of dairy science at South Dakota State University, is the recipient of the 2012 Pioneer Hi-Bred Forage award from the American Dairy Science Association. Casper’s research has focused in the areas of forage digestibility; feed additives to improve forage quality and utilization; and feed efficiency.

> **RICHARD DEMING**, a native of Madison, SD, earned degrees in chemistry and microbiology at State before attending medical school at Creighton University in Omaha. He currently serves as the medical director for the Mercy Cancer Center Radiation Oncology and CyberKnife Radiosurgery Center of Iowa, both in Des Moines.

Deming has also co-founded Above + Beyond Cancer, an organization designed to give cancer survivors and caregivers “experiences that change lives.” Those experiences have included leading cancer survivors to a base camp at Mount Everest and the summit of Mount Kilimanjaro.

**DALLAS TONSAGER** graduated from SDSU with a degree in mechanized agriculture and returned to the family farm near Oldham, SD. In time, he also carved out a career in public service as an advocate for farmers and the rural way of life and has worked with three different presidential administrations.

Tonsager’s involvement with Farmers Union and service as president of the South Dakota Farmers Union, earned him several appointments in Washington, DC. During the Clinton administration he served as state director of U.S. Department of Agriculture’s Farmers Home Administration and USDA’s Rural Development office. During the Bush administration he served on the three-member Farm Credit Administration board responsible for the regulation of the Farm Credit System.

President Obama nominated Tonsager to serve as undersecretary of rural development for USDA. In that role Tonsager oversees a staff of 5,500 in offices nationwide overseeing $37.5 billion in grants and loans administered by agencies charged with improving rural housing, utilities and business.

Noting Tonsager’s service to Presidents Bill Clinton, George W. Bush and Barack Obama, College of Agriculture and Biological Sciences Dean Barry Dunn said, “In these positions he has impacted the lives of countless Americans, both in South Dakota and throughout the country. His thoughtful leadership has lifted up many people, particularly in rural communities.”

This year’s distinguished alumni were honored by the South Dakota State University Alumni Association at a banquet on Friday, Oct. 26, at the Swiftel Center in Brookings. Other individuals recognized include: Larry Bell, ’58, Friendswood, TX; Fred Ellwein, ’83, Gambrills, MD; Jill Franken, ’83, Sioux Falls; Lynn Seppala, ’68, Livermore, CA; Sara Venhuizen, ’07, Pierre; and Steve Imming, non-alumnus award for service; Yankton.

> **JOE CRIBBS** will join the Department of Animal Science at SDSU as livestock judging team coach and instructor. Cribbs will join the faculty in November after completing his master of science degree from Texas Tech University, where he has also served as assistant coach to the livestock judging team.

> **HASNAM KASETHU** and **JILL ANDERSON** have joined the SDSU Dairy Science Department.

> The American Society of Agricultural and Biological Engineers (ASABE) inducted **KASIVISWANATH MUTHUKUMARAPPAN**, a professor of Agricultural and Biosystems Engineering at South Dakota State University, as an ASABE Fellow at a ceremony in Dallas, TX on July 31. Only about 2% of the active members of ASABE have achieved the grade of Fellow. Muthukumarappan joined SDSU in 1997 and has become one of the top faculty members in securing external funding to support his research. He has focused his career on developing new processing techniques that add value to South Dakota agricultural commodities including developing military jet fuel from South Dakota oil seed crops.

> Two new faculty have joined the SDSU Dairy Science Department: **HASMUKH PATEL** as assistant professor in dairy manufacturing and **JILL ANDERSON** as assistant professor in dairy production. Anderson’s work has focused on dairy heifer nutrition; Patel has focused on new product development and processing as well as quality assurance of dairy food products.

> **RICHARD DEMING**, a native of Madison, SD, earned degrees in chemistry and microbiology at State before attending medical school at Creighton University in Omaha. He currently serves as the medical director for the Mercy Cancer Center Radiation Oncology and CyberKnife Radiosurgery Center of Iowa, both in Des Moines.

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> **JOHNS BUTCH** will join the Department of Animal Science at SDSU as livestock judging team coach and instructor. Cribbs will join the faculty in November after completing his master of science degree from Texas Tech University, where he has also served as assistant coach to the livestock judging team.
Additional funding of just under $1 million dollars is being requested for the SDSU Agricultural Experiment Station (AES) for the coming year. The Board of Regents has confirmed that the request will be a priority in their 2013 budget request to the state Legislature when it convenes in January.

If approved, the money — $988,592 — would allow the AES to fund new research positions and would increase the current level of research activity with a focus in three specific areas: animal health and nutrition, next generation biofuels for energy independence, and enhanced profitability and sustainability for grasslands.

The additional funding would pay for salaries at the associate and assistant professor levels for researchers in plant genetics, grassland ecology, molecular plant physiology, biosystems and processing engineering, epigenetics, nutrition of disease resistance and viral and bacterial immunology. (For more about utilization of the funding see sidebar on page 7.)

**Revitalization for Future**

The special funding appropriation would allow SDSU's ag research efforts to regain some of the ground it has lost in budget cuts over the past three years. In that time, more than 30 positions have been trimmed from the ag station payroll and the AES state and federal budget was cut by $2.5 million.

Producers across the state have voiced concern that the experiment station is not able to meet their needs. A Farm Bureau policy statement released in July noted: “State budget cuts over the past four years of nearly 16 percent are affecting the South Dakota State University agricultural research program. Loss of state dollars, compounded by loss of staff, is hampering public research unique to agriculture in this region.”
Created in 1887, SDSU’s Ag Experiment Station has used science to find solutions to pressing agricultural problems, while also identifying new opportunities. As examples, improvements to varieties of forages and crops; no-till farming methods and livestock production have been among the solutions developed by SDSU AES scientists.

A national study published in 2009 found that historically, each dollar invested in agricultural research in South Dakota generates a 22% direct in-state economic benefit and a 35% benefit to the region.

**Optimistic Outlook**

Barry Dunn, dean of the College of Agriculture and Biological Sciences, believes if the AES funding is approved it will provide the means to expand the College’s research mission and restore the ag station’s usefulness to producers.

He explains that the College’s teaching mission is covered by tuition dollars, but the special appropriation for research would be a “tremendous accomplishment.” Dunn credits many friends in the state who have been working to make this happen.

He notes, “We’ve had to absorb $1.8 million in state funding cuts to ag research over three years – as well as eliminating two stations and the campus service labs. This new funding would at least slow the direction in which we’ve been headed.”

Daniel Scholl, who is director of the South Dakota Agricultural Experiment Station and Associate Dean for Research in the College of Agriculture and Biological Sciences, adds, “Our responsibility is to build on this potential budgetary infusion by working hard to use SDSU’s research station facilities optimally and find the best avenues for funding those facilities and for supporting our faculty research fundraising efforts.”

Scholl and Dunn project a potential return on the investment. After a start-up period to get the new research programs up and running, they estimate the eight positions being requested should generate approximately $1.8 million in grants and contracts.

The Agricultural Experiment Station currently receives about $9 million in base funding through the state budget and brought in more than $16 million from outside grants and contracts last year.

Additional funding would allow for research focused in three specific areas: animal health and nutrition, next generation biofuels for energy independence, and enhanced profitability and sustainability for grasslands.

**HOW THE FUNDING WOULD BE USED**

If approved, the AES special funding request for nearly $1 million is for eight full-time equivalents, or FTEs. Barry Dunn, dean of the College of Agriculture and Biological Sciences, explains that FTEs are not people. Thus, funding for these positions would be spread across multiple positions in teaching and research to benefit the entire college.

- Three of the eight FTEs would be assigned to animal production research, joining the 3.5 FTEs currently funded.
- Three new FTEs would be involved in biofuels research, which currently has five FTEs.
- In the third broad research area of grassland studies, two FTEs would be added to the current 2.5 research FTEs.

Dunn explains that the new researchers would focus beyond traditional corn or soybean research in areas where there is less research activity by industry.

Rather, with the changing circumstances in agriculture, Dunn says SDSU and the experiment station must meet producers’ – and society’s – needs.

He cites turning corn stalk into jet fuel as a research example, saying, “More of that is needed; it’s a growth area for the state.”

As another example, Dunn points to the toll from this summer’s historic drought on the state’s farmers and ranchers. He notes, “We’ve done very little risk management for our cattle producers and ranchers. We have disinvested in forage and grassland research, and now we need it.”

He is hopeful that with research, the grassland team will be able to develop new plant varieties that can thrive in droughty conditions.

With regard to livestock production, Dunn also emphasizes the continuing need for research. He concludes, “There’s been a steady erosion of public confidence on production practices, for example, how we meet expectations of the world’s need for food, what we’re doing in disease prevention and nutrition. We’re going back to the drawing board because the world no longer accepts our production practices. We need to be on the cutting edge.”
Better management practices for growing crops; safe and environmental practices for pest management and soil fertility; and a go-to guide for trees of the Northern Plains. These are some of the topics addressed in a line-up of new books being published by faculty in SDSU’s Plant Science Department.

In the last 12 months, Plant Science faculty have been busy writing – and collaborating with co-authors – to bring pertinent guidebooks on a variety of subjects to agricultural producers and interested consumers.

The list of published books – and forthcoming works – includes:

- **Alternative Practices for Agronomic Nutrient and Pest Management for South Dakota** authored by Darrell Deneke and several SDSU co-authors (printed summer 2011).
- **iGrow Wheat: Best Management Practices for Wheat Production** authored by professors David Clay and Gregg Carlson, along with more than 30 additional contributors from the College of Agriculture and Biological Sciences (printed summer 2012).
- **Common arthropods found in homes, schools and other buildings** authored by Extension Pesticide Education and Urban Entomology Coordinator Buyung Hadi and Extension Entomology field specialist Jonathan Nixon (printed August 2012).
- **Trees for the Northern Plains** authored by Extension Forestry Specialist John Ball (scheduled for release winter 2012).
- **Crop Protection Guide for Corn, Soybeans and Wheat** – authored by Extension Pesticide Education and Urban Entomology Coordinator Buyung Hadi, Michael Moechnig (Extension Weed Specialist), Darrell Deneke (Extension IPM Coordinator), Ada Sczzepeaniec (Extension Entomology Specialist), and Kay Ruden from Extension plant pathology program (scheduled for release January 2013).
- **iGrow Soybeans: Best Management Practices for Soybean Production** (scheduled for release spring 2013).*
- **iGrow Corn: Best Management Practices for Corn Production** (release date to be determined).*

*The iGrow Soybeans and iGrow Corn guides will be authored by the same team who collaborated on the iGrow Wheat book.

**Modern Reference Books**

Emery Tschetter credits these authors with their prolific publishing efforts and says, “They are writing the modern reference books for major crop production in South Dakota.” Tschetter is the communications and marketing director for SDSU’s College of Agriculture and Biological Sciences.

As an example of the practical information in these books, SDSU soil science professor David Clay – who served as editor of the iGrow Wheat content, says, “We worked closely with wheat producers to identify the critical topics they wanted included in the book. Each chapter underwent both a scientific review and a farmer review.”

A similar process will be used by the same team of authors in the production of the future iGrow Soybeans and iGrow Corn manuals.

Even if you’re not a farmer, two books in the SDSU Plant Science offering have appeal to the general public. The pocket-size guide book **Common Arthropods found in homes, schools and other buildings** was written to help inform the public about how to identify and properly respond to finding insects, spiders and other ‘creepy crawlies.’

Also greatly anticipated is the publication of **Trees for the Northern Plains: An illustrated field guide** by SDSU professor and Extension Forestry Specialist John Ball. The book – to be published this fall – features more than 200 tree species and information on hardiness zones, soil requirements, growth rates, tree height, and the form of each tree at maturity, as well as valuable information on rootstocks and interesting facts about each species.

A review of the book already gives it high praise, noting that: “…a good tree guide for the region was sorely needed. This book should become a part of every tree enthusiast’s reference collection.”

**BUY THE BOOKS**

For more information about any of these new publications visit www.iGrowMarketplace.org or contact a SDSU Regional Extension Center. Some of the manuals, like iGrow Wheat, are available in an electronic version. This will also allow for chapters to be updated in the future as new research and data is developed.
At A Glance
A Snapshot From SDSU’s
College of Agriculture & Biological Sciences
Fall 2012 Pull-Out Section
Student travel courses abroad; national champion judging teams; student awards at professional meetings – those are just a few of the highlights complementing traditional curriculum coursework within the Office of Academic Programs in SDSU’s College of Agriculture & Biological Sciences. Currently, 18 majors are offered within the College’s eight departments. In 2011, a record 2,222 students were enrolled within the College, a considerable increase from 2003 when 1,507 students were enrolled.

A notable curriculum change for 2012 is the lowering of total credit requirements from 128 to 120 credits for most majors. Three new academic programs are also offered as online certificates through Ag*IDEA, these include Swine Science, Bioenergy and Sustainable Technology (graduate level), and Agricultural and Environmental Law.

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**Examples of Excellence**

- 15 SDSU students accepted into schools of veterinary medicine for Fall 2012
- 15 of 20 applicants placed into MD, DDS or OD programs
- 22 ABS undergraduate research studies funded for 2012-13 at $3000 each from donor support
- SDSU Judging Team successes: national champion dairy products team; national champion wool judging team; crops judging team third in two national competitions
- Student travel courses offered: China, Argentina, Canadian Arctic/Hudson Bay, and New Zealand (proposed for spring 2013)
- Several students were recognized for their research papers, posters and presentations at professional society meetings on the regional and national level.
Agricultural Experiment Station

Agricultural Experiment Station (AES) scientists continue to maintain highly active research programs that are competitive and provide a tremendous service to the South Dakota public. Of note, intellectual property is being generated at a healthy pace. AES scientists released five new plant varieties in FY2012 and nineteen invention disclosures were filed.

As well, funds deployed for research in the form of competitive research awards received by AES faculty and research expenditures on grant funds during FY2012 were also robust. (See chart below.) The impact of agriculture research is embodied in the new practices and new technologies that users put into practice. Often, the impact of this research unfolds over years, even decades.

A more immediate measure of research productivity is often tracked by the amount of new knowledge and technology generated and transferred to the scientific community in the form of peer reviewed publications and transferred to users in the form of intellectual property and Extension and outreach communication channels. In the future, South Dakota AES will implement new approaches to documenting the breadth of those activities.

Manpower remains a serious issue for AES. At the end of FY2012, there were 70.6 active AES faculty scientist FTE with 9.0 FTE vacant. Aggressive fundraising for both base and one-time funds will continue to be pursued along with an effort to cultivate an environment conducive to research.

AES External Research Funds – Fiscal Year 2012

- **Amount Funded**
  - Total $16,823,697
  - UNIVERSITY – BOR
    - $16,455 (4%)
  - PRIVATE
    - $769,730 (5%)
  - NON-PROFIT
    - $3,919,092 (23%)
  - FEDERAL – USDA
    - $6,201,891 (37%)
  - FEDERAL – OTHER
    - $5,396,874 (32%)

- **Actual Expenditures**
  - Total $14,788,635
  - PRIVATE
    - $571,797 (4%)
  - STATE
    - $496,210 (3%)
  - NON-PROFIT
    - $3,295,092 (22%)
  - FEDERAL
    - $10,425,536 (71%)

AES Base Budget – Fiscal Year 2013

**EXPECTED REVENUES**
- State - regular $9,431,146
- State - Oilseeds Research Initiative $450,000
- Federal - formula $3,377,093
- External funding of budgeted positions $361,250
- **TOTAL** $13,619,489

**BUDGETED EXPENSES**

- **Personal Services**
  - Administration $631,904
  - Faculty $6,269,662
  - GRA $1,027,842
  - Staff: NFE, CSA, hourly $2,465,452
  - Provision for salvage of externally funded budgeted positions $361,250
  - **Total** $10,756,110

- **Operating Funds**
  - Distributed to departments $1,501,765
  - Distributed to farms and facilities $189,088
  - Start-up funds $346,250
  - AES fees and operations $387,776
  - Previous years’ commitments $213,500
  - Oilseeds Research Initiative $225,000
  - **Total** $2,863,379

- **TOTAL** $13,619,489
2012 was a year of reorganization and moving forward for SDSU Extension. The eight Regional Extension Centers were established in the communities of Aberdeen, Watertown, Sioux Falls, Mitchell, Winner, Pierre, Lemmon and Rapid City. They are staffed by Extension Field Specialists with expertise in crop and livestock systems; food and families; urban and rural initiatives; and youth and community leadership.

The web portal iGrow (www.igrow.org) has served as a conduit to share news and educational resources with learning communities throughout the state and region. Available products include traditional news releases to podcasts, webinars and online calculators.

Under the umbrella of SDSU Extension, more than 30 4-H Youth Program Advisors were also hired across the state in 2012 with the responsibility of delivering youth programming for the specific counties they serve. Advisors focus 100% on youth activities serving both 4-H and non-4-H interests.
The plans for building a new state-of-the-art Cow/Calf Unit for SDSU’s students, faculty and stakeholders have continued to gain momentum with a summer fundraising auction and the unveiling of the design concepts for the facility earlier this fall.

A successful fundraising auction for the new facility was held for the third straight year at Dakotafest in Mitchell on Aug. 23. (See listing of supporters below.) The first renderings of what the new Cow/Calf Training and Research Center will look like were shared with the public during the Beef Bowl barbecue prior to the SDSU football game on Sept. 29.

The facility (pictured above) will include:
- A main building with offices, conference center, lab space and state-of-the-art, functional working facilities that are also accessible for cattle handling demonstrations
- A multi-purpose building for maternity pens or display pens for livestock evaluation
- A monoslope research building that houses state-of-the-art equipment to apply nutritional treatments and measure individual feed and water intake
- Replicated pastures for grazing management research

Cody Wright, SDSU professor of animal science, says alumni, industry and students have enthusiastically supported plans for the new facility.

SDSU Associate Dean of Agriculture and Director for Agricultural Experiment Station Daniel Scholl says the new facility is integral for the future. Scholl says, “A new facility is a new opportunity to prepare our students to be the next generation of on-the-ground leaders in the beef industry. The new Cow/Calf Unit represents a big step forward in modernizing research.”

For more information about the project contact Cody.Wright@sdstate.edu or call (605)688-5448.


Image courtesy of designArc architecture + design, Brookings, SD.
Horse owners on the Pine Ridge Indian Reservation had a unique opportunity to learn more about equine nutrition, vaccinations and health, as well as farrier training and business skills, during two weeks of educational instruction held on the reservation in June. A session highlighting horse care was also held on the Cheyenne River Indian Reservation.

The effort was initiated by SDSU equine specialist Rebecca Bott, who has a three-way teaching, research and Extension appointment in the Department of Animal Science, and SDSU student Angela Gebhart. Gebhart, a native of Maple Grove, MN, is a 2012 Spanish and Equine Science honors graduate.

Bott and Gebhart had each previously participated in an equitarian program in impoverished areas of Mexico that provided equine care to the animals and training to their owners – and the duo was inspired to bring a similar program to underserved horse populations in South Dakota.

Bott explains that the term “equitarian” has similar principles to humanitarian work. She says, “It’s finding ways to benefit the lives of both equines and their owners through direct care and owner education.”

Outreach Through Horses Initiative Teaches Equine Care On South Dakota Reservations

Working With Communities

In 2011, Bott and Gebhart began assessing the needs – and interest – in an equitarian program by surveying veterinarians and traveling to the Cheyenne River Indian Reservation to visit with tribal leaders and observe equine welfare.

“We learned that there’s not always a veterinarian nearby to offer services for horse care on the reservations,” Bott explains. As well, one of the prominent needs identified was hoof care.

From that information they began developing an educational program to take to the reservation for June 2012. It was decided to offer the instruction on the Pine Ridge Reservation because it already had an established Beginning Farmer and Rancher group – many of whom work with horses.

In addition to Bott and Gebhart, the team that traveled to Pine Ridge in June included two farriers who taught a farrier apprenticeship course during two, one-week sessions. Nine individuals, who were selected from an application process, completed the apprenticeship.

Along with that training, workshops and discussions on equine nutrition and
Young horse lovers can also learn about proper horse care thanks to a special coloring book created by SDSU equine science graduate Angela Gebhart. The coloring book evolved from Gebhart’s trip to Mexico when it became difficult to explain horse care. Working with kids in her local 4-H club, Gebhart had kids develop the themes and pictures explaining how they care for their own horses. From feeding horses to working with veterinarians to get horses vaccinated, the coloring book shares the ins and outs of caring for a horse in a way that’s fun and reader-friendly.

The coloring book is currently printed in both English and Spanish, and addresses horse care needs specific to each region and culture. Gebhart hopes to translate the book to other languages to further spread the message of equine welfare.

In South Dakota the coloring books were given to youth on the Pine Ridge and Cheyenne River Reservations during equine visits this summer.

On the Pine Ridge Indian Reservation, individuals had the opportunity to take a farrier apprenticeship course.

Editor’s Note: Although Angela Gebhart has graduated from SDSU and is now teaching Spanish in Minnesota, she plans to remain involved with equitarian work as well. She traveled to Peru in August to extend equitarian efforts there. Bott will return to Mexico in October to network with horse care leaders and bring new ideas back to South Dakota.
4-H programs recorded a 16% increase at the 2012 State Fair, according to Peter Nielson, SDSU Extension 4-H Youth Program Director. 4-H livestock exhibits jumped to 3,624, up from 3,013 in 2011. 4-H display exhibits were at 11,320, up from 10,079 in 2011. The Youth in Action category, which includes public presentations, special foods, judging contests, skill-a-thons, and fashion revue, increased from 1,227 in 2011 to 2,140 this year.

Nielson explains that State Fair is the equivalent of the state tournament for the nearly 8,500 4-H members across South Dakota. He calls the increased participation “a tribute to the importance that 4-H members put into gauging themselves against the best in the state.”

Additional highlights at the 2012 State Fair included:

• A 37% increase in participation in the Robotics Challenge. The program challenges young people to solve problems by applying logical thought, teamwork and creativity with training provided through the NASA Summer of Innovation grant and a new partnership with the South Dakota Robotics Association.

• More than 100 young people competed in the new State Fair 4-H Beef, Sheep, and Swine Skill-a-thons, which gave 4-H members the opportunity to interact with industry representatives and test their production management skills. Also new this year, youth received points from the skill-a-thon, as well as a production management quiz, industry interview, and showmanship in their respective species to win Premier Exhibitor.

• State Senator Shantel Krebs, (pictured above) Renner, SD, won the 2012 State Fair 4-H Legislative Beef Show, with help from John Roe, a 4-H member from Hamlin County. Earning reserve champion honors was Senator Mark Johnston of Sioux Falls, with help from Alexa Montagne, a 4-H member from Union County. For the event, a 4-H or FFA member is given time to teach a legislator how to show a beef animal before they compete in the show ring for top honors. The annual event is sponsored by SDSU Extension’s 4-H Youth Development Program and the South Dakota Department of Agriculture, South Dakota Cattlemen’s Association and First Dakota National Bank.

• A “Breaking of the Bricks” ceremony was held at the conclusion of the State Fair to kick-off fundraising efforts to build a new 4-H Clover Hall on the fairgrounds. The current structure is no longer a safe area to hold 4-H activities. The new facility will offer 33,000 square feet of space for 4-H exhibits, three large classrooms, a performance stage, a kitchen, restrooms, a large multi-purpose area and office space for Extension and 4-H. The new Clover Hall facility is estimated to cost $3.9 million, and will be funded through donations. It is hoped the facility will be completed for the 2014 State Fair.

A complete listing of State Fair 4-H results is available at iGrow.org.

BEEF COURSE OFFERED IN MITCHELL

Six sessions on the topics of cow-calf records, benchmarking, market outlook, nutrition, reproductive measures, financial analysis, and budgets will be offered in Mitchell, SD, from November through January.

Called the “Beef Production Audit Series,” the program is a collaborative effort between SDSU Extension and the South Dakota Center for Farm/Ranch Management at Mitchell Technical Institute. Participants will have opportunities to discuss and learn about managing production practices to improve profitability. The first session begins Nov. 7, and producers can attend one or all of the sessions.

For more information email jack.davis@sdstate.edu or will.walter@mitchelltech.edu or call (605) 995-7378.
‘WEATHER’ ON DISPLAY AT SD ART MUSEUM

Seventeen paintings by artist Harvey Dunn illustrating his “Depictions of Weather” will be on display until Dec. 2 at the South Dakota Art Museum on campus. The paintings are part of the museum’s collection of more than 100 Dunn paintings. The artist used a distinct color palate and differing cloud formations to depict settler emotions as they encountered weather extremes. As an example, Dunn’s “Just a Few Drops of Rain” (pictured) depicts a familiar early summer storm in eastern South Dakota.

Dennis Todey, state climatologist and associate professor of agriculture and biosystems engineering at South Dakota State University studied each painting and made comments on display cards next to each scene. Todey identified cloud and sky color in association with the season, time of day and region the image represents.

Dunn was native to South Dakota, and was accepted into the South Dakota Agricultural College, which became South Dakota State University. His professor Ada Caldwell encouraged him to enroll in the Chicago Art Institute where his talent was shaped further.

The South Dakota Art Museum is located at the junction of Medary Ave. and Harvey Dunn St. in Brookings. Museum hours are 10 a.m. to 5 p.m. Monday through Friday, 10 a.m. to 4 p.m. Saturday and noon to 4 p.m. Sunday.

SPEAKER ADDRESSES MORALITY OF ANIMAL AG

Wes Jamison, an associate professor of communication at Palm Beach Atlantic University, will be on the SDSU campus in November to address “The Morality of Animal Agriculture.” Jamison has taught agriculture politics, agriculture history, public relations, persuasion and political communication in the U.S. and Europe.

Jamison is one of nine speakers to visit SDSU during the fall semester as part of the free University Speakers series. Additional topics addressed by speakers included “Drought and the Changing Climate” and “Race, Immigration and the Future of Rural America.”

Jamison will speak at 7 p.m. Thursday, Nov. 15, at the Performing Arts Center. His presentation is sponsored by the SDSU Swine and Pre-Vet clubs.

CHINESE ENTREPRENEUR VISITS SDSU TO LEARN HOW TO MANUFACTURE ICE CREAM

SDSU dairy science instructor Howard Bonnemann had the opportunity to teach a unique student this summer. Bonnemann spent two weeks providing Xuiniang Wang, a Chinese businessman and entrepreneur, with one-on-one instruction in the manufacturing process of making ice cream.

Wang hopes to utilize his new knowledge to open an ice cream processing plant and parlor in China. Wang currently owns a 700-cow dairy, egg and vegetable farm in the Shandong Province in China.

Why did an entrepreneur from China contact the SDSU Dairy Science Department for training? Vikram Mistry, Professor and Head of the Dairy Science Department, says although the story is long, the answer is simple. “We are one of only two universities in the nation that has a dairy science program,” Mistry says.

Mistry says word-of-mouth can be attributed to connecting Wang to SDSU. Wang first learned of SDSU from a business development consultant, who asked a South Dakota Senator, who then contacted SDSU President David Chicoine.

“This entire experience has been exciting – the fact that someone from the other side of the world would recognize SDSU as the place to learn about ice cream manufacturing,” Mistry adds.

For more than 100 years SDSU has manufactured ice cream and trained students in all aspects of the dairy industry. SDSU recently completed a new $9.3 million dairy plant with support from dairy processors, producers, suppliers and individuals. For more information about dairy science opportunities contact Mistry at (605) 688-4116 or vikram.mistry@sdstate.edu.
Ever since the Morrill Act was signed into law by President Abraham Lincoln on July 2, 1862, creating land-grant universities, a commitment to agricultural education and research has ensued.

Proudly, South Dakota State University’s College of Agriculture and Biological Sciences has a rich history of research, teaching and outreach accomplishments since its humble beginnings – and has laid the groundwork for continued progress and development integral to the success of all ag-related industries and South Dakota citizens.

Developments have included – and will continue to include – new and improved plant varieties, enhanced livestock production and cropping methods, disease control research, and innovative product creation. Updates to facilities, increases in student enrollments and incorporation of technology are also part of the current and future efforts.

As we mark the 150th anniversary of the historic Morrill Act in 2012, here is a glimpse of some of the inaugural agricultural innovations in the College through the decades:

1887 Dakota Territory’s Agricultural Experiment Station opens at Brookings. It has five scientists, one each in agriculture, botany/horticulture/forestry, entomology, chemistry, and veterinary science. The first bulletin it publishes is “Notes on Growth of Trees on the College Grounds.” The eighth bulletin a year later summarizes the condition of Dakota Territory drinking water.

1898 Horticulturist N.E. Hansen returns from a nine-month assignment as special agent collecting seeds and plants in Russia, Transcaucasia, China, Turkestan, and Siberia. Over 40 years he would make seven more plant collecting trips, and his fame as a plant breeder becomes worldwide. Through his trips, crested wheatgrass, smooth bromegrass, Harbin pear, and Cossack alfalfa are introduced to North America.

1899 The first field station in the Northern Great Plains is South Dakota’s 117-acre Highmore Station. It is the first station in the U.S. to test durum wheat, smooth bromegrass, yellow-blossomed alfalfa, and Russian olive trees.

1909 The very first range research station in the U.S. is established at Cottonwood (near Wall, SD) in the heart of South Dakota rangeland.

1910 The Agricultural Experiment Station becomes the national leader in research on mechanical milkers. SDSU dairy scientists are pioneers in pasteurization and homogenization work.

1915 Glanders, a chronic and highly contagious disease of horses, is eliminated in South Dakota. Although no successful treatment or vaccine is ever discovered, the SDSU Experiment Station veterinarian devises the Mallein test. Early detection and destruction of diseased animals save horses, mules, sheep, goats – and humans, since people were also susceptible to glanders.

1918 Edgar McFadden, while still a student at SDSU, plants different varieties of wheat in his landlady’s Brookings garden and produces a rust-resistant spring wheat using a crossbreeding technique considered impossible at that time. Stem rust epidemics had virtually wiped out wheat production in South Dakota. McFadden’s wheat is appropriately named “Hope.” Nobel Peace Prize winner for 1970 Norman Borlaug would thank SDSU and McFadden for Hope, which became a parent of many wheat varieties used to ease world hunger.

1923 Engineers, working for years to bring electricity to farms and small communities, assist in construction and evaluation of the first rural electric line in South Dakota, the “Renner Farmers’ Test Line.” The engineers spur the development of rural electric cooperatives throughout South Dakota.

1933 Alkali disease has been poisoning South Dakota cattle; SDSU Experiment Station researchers find the culprit – selenium, which occurs in certain soil types. By 1940 scientists can tell farmers where selenium-rich soils are located in the state. In 1978, they identify a substance in linseed meal that prevents chronic selenium poisoning.

1934 SDSU researchers spell out the vitamins A and D requirements on dairy cows, one of the most important contributions to the dairy industry nationwide. Rickets as a major dairy cattle disease is eliminated, and milk production per cow doubles in less than 30 years as a result. This research also paves the way for the eventual elimination of rickets as a human disease.

1945 The Foundation Seed Stocks Division is started after a group of South Dakota seedsmen and farmers see the need to increase and distribute new varieties developed by the plant breeders at SDSU.

1946 Antelope Livestock and Range Research Station is established in Harding County encompassing 8,300 acres for cattle, sheep and range research.

1952 A formula for low-fat dairy spread is released by SDSU scientists, an early step in developing the “light” healthy foods of the 1990s.
1957 A cure for parakeratosis, a nutritional disease of swine, is discovered by SDSU scientists. Adding zinc to the diet significantly increased growth and eliminated skin lesions.

1958 SDSU biologists pioneer plant tissue culture and are now recognized nationally and internationally. Entire plants can be grown from a “starter” mass of undifferentiated callus in a test tube, a pioneering step toward gene manipulation.

1958 Four of every 10 dairy calf deaths are caused by pneumonia. Scientists develop individual outdoor hutches in which to raise the young calves, virtually eliminating death losses from pneumonia. This research brings international recognition to SDSU.

1962 The South Dakota Cooperative Fish and Wildlife Research Unit is established at SDSU. Today, the unit is recognized as the major wetland research group in the prairie pothole region and was among the first to develop economic data on the per-acre value of prairie potholes.

1962 Work begins at SDSU on a rust which destroyed more than $24 million of winter wheat. Four years later the problem is solved and wheat production in South Dakota is ahead of the pre-rust period.

1962 South Dakota is among the very first to achieve 100% bulk-milk handling after research on trends in the state's dairy industry. Combined research and education programs from SDSU help double dairy income, improve butter quality, and expand the state's cheese making plants.

1964 McCrory Gardens, SDSU's 20-acre formal display garden, is established in Brookings. It serves as a year-round public demonstration area and as an outdoor teaching lab for SDSU students in horticulture, forestry, landscape design, and park management.

1969 The West River Agricultural Research and Extension Center is established at Rapid City.

1969 Ag Engineers at SDSU complete research on reducing tractor cab noise. This information is provided to tractor manufacturers who modify muffler design and add the option of insulated cabs to their new tractors.

1969 Southeast South Dakota Extension agents initiate rural water systems to provide an adequate supply of clean water to farms and rural residences. The first system is constructed in Lincoln County in 1972. It becomes the model for development of other rural water systems in the state.

1970 Dairy researchers begin to study whey, a waste byproduct of the industry, as an ingredient in feed and other dairy products. Today SDSU is an acknowledged world leader in whey utilization research.

1980 Animal researchers at SDSU find that prostaglandin F2a (PGF) helps synchronize estrus in the ewe flock, meaning lambs will be within days of each other in age. This boost to sheep producers improves lambing supervision, flock management, and marketing.

1984 The first County Extension Agent for 4-H was hired in South Dakota.

1985 “Guard” wheat is released by SDSU, the first ever spring wheat that is resistant to the Hessian fly. New varieties normally take 12 years to develop; this line is reduced to seven by using a winter nursery in Mexico.

1989 SDSU, with leadership provided by the College of Agriculture and Biological Sciences, was one of the founding partners in the International Arid Lands Consortium, a group which would later be recognized by Congress for playing a vital role in the Middle East peace process.

1990 Dakota Lakes Research Farm was established near Pierre, S.D.

1991 The SDSU Soybean Breeding Program was established.

1993 The Northern Plains Biostress Laboratory was dedicated on campus.

1994 The New Animal Disease Research and Diagnostic Laboratory was dedicated. The $5.6 million project doubled the size of the facility.

1994 The Alfred Endowed Chair in Cheese Chemistry and Technology was filled. It was the first endowed chair at SDSU and the only chair in cheese technology in the nation.

2000 SDSU released and commercialized the first public crop variety with a proprietary transgenic grain. SD1091RR is a Roundup Ready soybean.

2004 Congress authorized the Sun Grant Initiative, with SDSU as one of five national Sun Grant Centers, receiving $8.3 million over five years.

2004 The Veterinary Science Department Center for Infectious Disease Research and Vaccinology was established, with Dr. David Francis serving as the Director.

2004 50th Anniversary of the SDSU Jackrabbit Stampede Rodeo was celebrated.

2005 appropriated $50 million over five years. The nationwide research effort to promote ag-based renewable energy began at SDSU, and it broadens the mission of land-grant universities to include ag-based energy and bio-based produces as a core effort. SDSU is one of five national Sun Grant Centers, receiving $8.3 million.

2011 The Alfred Dairy Science Hall and the Davis Dairy Plant. The project added 10,850 square feet of space, creating a state-of-the-art plant. The SDSU Dairy Science program is one of only two in the United States that effectively combines both dairy production and dairy manufacturing.

SDSU scientists have gone on to be industry leaders in the development of bioplastics, biofuels, no-till farming methods, dairy manufacturing, feedstuffs research, livestock production technology and much more. Extension, research and teaching efforts continue as the land-grant system embarks on its next 150 years.
Master Gardeners
SHARE THEIR BOUNTY

By their very nature, gardeners are a giving group – sharing their knowledge and often their produce with others. Across South Dakota there are countless stories of how Master Gardeners in the state give back to their communities. Throughout late summer and fall, they are frequently donating their homegrown fruits and vegetables to seniors and families in need via churches and local food pantries.

In Aberdeen, the Prairie Partners Master Gardeners are also giving back by working with at-risk youth. A garden has been established at the New Beginnings Center, a Lutheran Social Services group care facility serving boys and girls ages 10-17. Under the supervision of trained South Dakota Master Gardeners, the at-risk youth learn how to plan, plant, tend and harvest a garden, reports former Extension educator and Master Gardener Jerry Mills, who is involved with the project.

The produce from the garden is also utilized in the New Beginnings kitchen and consumed by the youth to improve their nutritional diets and help them learn better nutrition. Any excess produce, over and above what the Center can use, is donated to the local Salvation Army food pantry or to area church programs.

In Yankton, a similar program in Yankton this summer involved eight youngsters in maintaining a garden. Master Gardener Dorothea Blaha coordinated the activity which provided the students with hands on experience of digging in the soil, measuring depth, terminology and experimental planting prior to the actual planting of the garden.

Each child was given their own set of seeds and garden tools and was responsible for the actual planting and care of a single row of produce. That row consisted of beans, peas, squash, cucumbers, beets and lettuce with seeds provided by the SDSU Extension seed bank.

Harvested produce is donated to the local food pantry and churches, as well as sampled by the youth participants so they learn more about nutritional foods.

In Wagner, Master Gardener Alice Koupal is also fostering an interest in gardening among youth. Each spring she visits classrooms in Wagner and at the Marty Indian School and gives a short presentation on flowers and vegetable gardens, then sends home starter plants with the students from her greenhouse. Koupal takes a seed, a plant and the end product and has the students match which seeds and plants go with which vegetable. The kids also sample the different vegetables and make their own planters out of newspapers.

The SDSU Extension Master Gardener Program provides university training to volunteers to prepare them to serve their communities through horticulture extension activities. Over the past ten years, Master Gardener volunteers have contributed over 80,000 hours of service in South Dakota. Learn more at www.sdstate.edu/sdces/resources/lawn/master-gardeners/index.cfm.

SDSU ON NATIONAL TV
An outdoor television show called “Next Generation” hosted by Bass Pro Shops featured a snippet spotlighting research being conducted by SDSU Wildlife and Fisheries PhD student Jason Breeggemann. In a segment called the “Wow Factor,” electrofishing in Texas was profiled. An electrofishing boat owned by Bob Lusk is featured with Breeggemann onboard showing how they sample fish for the study. The announcer credits SDSU for conducting the research. Lusk is editor of Pond Boss magazine, and his organization provides financial support for a research endowment in SDSU’s Department of Natural Resource Management.

In the past 12 months, iGrow has become the “virtual Extension office” envisioned under the SDSU Extension restructuring. From October 1, 2011 to September 30, 2012, there were 96,041 “virtual visitors” to the site. While at iGrow.org, these visitors asked 278,439 questions. Beef, 4-H, Corn and Wheat are the most visited topic pages on iGrow.

The Feedstuff Cost Comparison Spreadsheet is available as an Excel spreadsheet for online iGrow users. It is also available as a Feedstuff Cost Calculator smart phone app and spreadsheet. The mobile app is offered for free download in the iTunes App Store and in Google Play. Developed by SDSU Extension field specialists Warren Rusche and Tracey Renelt, the calculator allows producers to compare feedstuffs as “apples to apples via protein and energy, while taking trucking and purchase price into consideration.” A suite of iGrow Smart Management Apps are being developed for the future.

A link to a YouTube Channel with more than 100 informative videos posted by SDSU Extension, can be found on iGrow.org or visit the video library directly at www.youtube.com/user/SDSUIGrow. Videos are posted in the categories of Drought, Livestock, Agronomy, Native American Programs and GardenLine. A playlist within each category lists video topics and length.

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In my role as Development Director for the College of Agriculture and Biological Sciences, I work with producers and their industry partners on a daily basis. This fall will challenge many of these folks because of this summer's drought. With each passing day without rain, hopes for a year of abundance and profitability transitioned to concerns about the dry conditions and whether there would even be a crop to harvest come September.

While discussions in small-town coffee shops and kitchen tables all across South Dakota may not have been as joyous and upbeat as we would have liked, one thing became crystal clear to me over the course of the summer. The people who produce the food that feed the world understand their way of life is one that comes with inherent risks.

They acknowledge these risks as a part of the burden that comes with their mission. When the rains come and the harvest is plenty, they are rewarded for their hard work and are thankful for the result. However, when the summer leads us down a different path, they are resilient and hopeful for the coming year. That is the nature of their business. Always has been, always will be.

Times like this provide our SDSU faculty with tangible evidence that the work they do is relevant and vital to the people of South Dakota and the region. Whether it’s drought resistant crops, livestock handling during times of stress, or soil moisture management strategies, the urgency to make advances in these areas through teaching and research are never more obvious than when we are confronted with them in a real and immediate way.

To those who are dealing with these challenges, I say “Thank You.” Thank you for being the risk-takers. Thank you for your willingness to work through the tough times. Thank you for being there again next spring to do it all over again. Your trade is a noble one and your strength is at the core of this great nation.

MIKE BARBER ’97
Grassland Plants

JAMES R. JOHNSON & GARY E. LARSON – $17.95

In the grasslands of South Dakota and the northern Great Plains are many hidden treasures. In this guide you will find portrait-quality photos and descriptions of grassland plants and learn of their value to grazing animals and consequently to our nation's food supply. It is the best field guide to learn the role of plants in food and medicine for American Indians and food and habitat for wildlife.

Plants of the Black Hills and Bear Lodge Mountains

GARY E. LARSON & JAMES R. JOHNSON – $34.95

The book describes some 600 plants of the Black Hills and Bear Lodge Mountains of western South Dakota and neighboring Wyoming. This book is the most colorful and most complete plant guide available.

iGrow Wheat: Best Management Practices for Wheat Production

DAVID E. CLAY, C. GREGG CARLSON, KEVIN DALSTED – $59.95

This newly released manual provides guidance for sustainable production of 100 bushel wheat for South Dakota growers. Topics covered include wheat seed testing, fertilizers and nitrogen management, precision farming tools and much more.

Look for the highly anticipated Trees for the Northern Plains: An illustrated field guide by SDSU Forestry professor John Ball. The book will feature information on more than 270 tree species.

Get your copy of these and other great books from SDSU's College of Agriculture and Biological Sciences at

- www.igrow.org
- South Dakota State Agricultural Heritage Museum
  925 11th Street, Brookings, SD 57007