South Dakota State University Combined Research and Extension Plan of Work
2022-2026

Status: Final
Date: 06/24/2021

I. Plan Overview

1. Executive Summary

The College of Agriculture, Food and Environmental Sciences at South Dakota State University is home to both SDSU Extension and the South Dakota Agricultural Experiment Station. One of eight colleges that make up SDSU, our college has an integral role in fulfilling the land grant mission of the university. The solutions for South Dakotans are found through the collaborative partnership of SDSU Extension and SDSU Agricultural Experiment Station.

SDSU Extension and the South Dakota Agricultural Experiment Station achieve their goals with researchers and state specialists located on the SDSU campus in eastern South Dakota, eight Extension regional centers operating across the state, with Extension Field specialists and six research field stations. Outreach is also achieved with four Tribal Extension program offices. 4-H Youth Development begins on campus with the South Dakota State 4-H office and has 4-H Extension field specialists in Extension regional centers and 4-H youth advisors in county-owned offices.

South Dakota's agriculture industry has a $25.6 billion economic impact each year, with agriculture generating 20 percent of the state's economic activity. There are more than 19 million acres of cropland and 23 million acres of pastureland in the state. According to the South Dakota Department of Agriculture, in 2016 the average size farm in South Dakota was 1,397 acres; with 98% of farms in the state being family-owned and operated. There are 46,000 producers in South Dakota on 31,000 farms or ranches. Although the tools have changed through the years, agriculture remains the common thread linking citizens, businesses, and communities within South Dakota.

According to the USDA Economic Research Service (ERS), South Dakota covers 75,885 square miles, with an estimated population of 869,666 people (2017), with 448,693 living in rural South Dakota (51%). It ranks 46th among states in total population size. According to 2017 data from the U.S. Census Bureau, 84.9% of the state's population is white, 2.1% is African-American, 1.5% is Asian, 9.0% is American Indian or Alaska Native, 0.1% is Native Hawaiian or Other Pacific Islander, and 3.8% is of Hispanic or Latino origin. The average per capita income for South Dakotans in 2017 was $48,818. The poverty rate in rural South Dakota is 17.4%, compared with 8.5% in urban areas of the state.

With six field stations and more than 17,000 acres of land across the state devoted to scientific exploration, the SD Agricultural Experiment Station is the largest public and privately funded research organization in the state. In addition to enhancing the quality of life in South Dakota, the SD AES directly supports the teaching programs offered by the College of Agriculture, Food and Environmental Sciences, the College of Education and Human Sciences, and the educational programs delivered by SDSU Extension.

The mission of SDSU Extension provides unbiased, scientific knowledge and innovation to families, communities and industries across the state. SDSU Extension engages citizens in dynamic learning environments, connecting people who share a common interest in order to learn information, interact with technology, and explore innovation.

The combined South Dakota Agricultural Experiment Station and SDSU Extension plan of work will focus on 5 critical issues:

Families, Youth, and Communities
Food Systems, Nutrition, Health, and Well-Being
Regenerative Agronomic Systems
Regenerative Livestock Systems
Natural Resources and Environmental Systems

2. FTE Estimates

Year	1862 Extension	1862 Research
2022	125.0	145.0
2023	125.0	145.0
2024	125.0	145.0
2025	125.0	145.0
2026	125.0	145.0

II. Merit / Peer Review Process

Merit Review:

SDSU department heads and the Agricultural Experiment Station Director serve as merit reviewers. Reviewers evaluate why the proposed research is needed, it's relevance to agriculture, the target audience, and how it compliments other research. Proposals for research grants that are funded by stakeholder groups are subjected to review by the stakeholders themselves and by college administrators. SDSU Extension administrators serve as the merit review team for the Plan of Work. Department heads and program directors conduct peer reviews of programs.

Scientific Peer Review:

SDSU Extension's Program Council, composed of the state Extension director and Extension program directors in Agriculture and Natural Resources, Food and Families, Community Vitality and 4-H Youth Development meet regularly to evaluate the state's programming needs. Ongoing efforts are made to create and update logic models and collect impact indicators. State Extension specialists and field specialists frequently submit grant proposals to regional and federal agencies and commodity groups to fund applied-research and Extension program activities. These proposals are externally reviewed prior to selection for funding. SDSU Extension articles and publications are internally peer reviewed prior to publication.

III. Stakeholder Input

1. Actions to Seek

Use of media to announce public meetings and listening sessions
Targeted invitation to traditional stakeholder groups
Targeted invitation to non-traditional stakeholder groups
Targeted invitation to traditional stakeholder individuals
Targeted invitation to non-traditional stakeholder individuals
Targeted invitation to selected individuals from general public
Survey of traditional stakeholder groups
Survey of traditional stakeholder individuals

Stakeholder participation is solicited from many sources and events, including agricultural check-off groups, commodity groups, funding organizations, governmental agencies, elected officials and boards, public events and meetings, news releases, and industry associations. SDSU Extension seeks and receives stakeholder participation through focused

conversations with representative constituent groups reflective of outreach conducted via our Capstone Program areas.

The capstone groups are:

Agriculture and Natural Resources
Food & Families
4-H Youth Development
Community Vitality

Stakeholders are highly encouraged to participate in and take an active interest in SDSU Extension by providing direction, suggestions, and positive ideas. We ask stakeholders to share visionary strategies that meet the SDSU Extension mission, particularly in the capstone area they are representing. Stakeholders are encouraged to provide feedback and ideas for collaboration and partnership, and to help SDSU Extension reach and serve all demographic populations of the state. At the county level, County Commissioners are asked to maintain a county advisory structure that engages the local 4-H Promotion and Expansion Committee in the advisory role. This advisory structure predominantly gives guidance to county funded budgets and local 4-H expansion efforts.

Other example sources of stakeholder input:

South Dakota Soybean Research and Promotion Council
South Dakota Beef Industry Council
South Dakota Corn Utilization Council
South Dakota Oilseeds Council
South Dakota Pork Producers Council
South Dakota Wheat Commission Council
South Dakota Department of Education and Cultural Affairs
South Dakota Department of Health
South Dakota Department of Social Services
South Dakota Department of Economic Development
South Dakota Department of Energy
Environmental Protection Agency
South Dakota Department of Agriculture
Office of State Veterinarian
South Dakota Game, Fish and Parks
Natural Resources Conservation Service
Bureau of Indian Affairs
South Dakota Weed and Pest Commission
South Dakota 4-H Leaders Association
South Dakota Association of County Commissioners

2. Methods to Identify

Advisory committees
Open listening sessions
Needs assessments
Surveys

Individuals and groups are identified through networking, attending conferences, public meetings, the internet, programming efforts, field tours, emails, and face-to-face arrangements.

3. Methods to Collect

Meeting with traditional stakeholder groups
Survey of traditional stakeholder groups
Meeting with the general public (open meeting advertised to all)
Meeting specifically with non-traditional groups
Survey specifically with non-traditional groups

Open dialogues are held with constituent groups to identify ways in which SDSU Extension can provide/develop outreach programs to meet identified needs to the targeted audience, whether that is a broad scale audience (id. ag producers) or specific sub-audiences (beef producers). Capstone program areas will engage with their constituent groups on a quarterly to semi-annual basis. Written summaries of this feedback are produced and then shared on our web portal so they are accessible to staff and the general public. This feedback is then used to guide strategic program development within that program area.

4. How Considered

In the budget process
To identify emerging issues
Redirect Extension programs
Redirect Research programs
In the staff hiring process
In the action plans
To set priorities

Administrators evaluate all input, requests, and comments from stakeholders. SDSU Extension writes summaries of the discussions held by each capstone program group. Program Directors share the summaries specific to the capstone program area with department heads, faculty, and specialists during program planning meetings. Stakeholder input it reviewed, considered, and used on a basis to create SDSU Extension programs and AES research projects.

Stakeholder input is very important to the Agricultural Experiment Station and to SDSU Extension. By soliciting input, we learn what the challenges are that they are facing and what they would like to see us do to address their challenges. We also learn what they believe the future of South Dakota looks like, what they see as opportunities, and what they think we can do to support these opportunities.

IV. Critical Issues

1 Families, Youth, and Communities

Description:

South Dakota communities need assistance to identify strategies to address the changing social, environmental, human, and economic landscape. According to the US Census Bureau, the U.S. and SD are growing older. Currently, 16.3% of South Dakotans are age 65+. Changes to meet the demands of this aging demographic are expected in health and wellness; home and work relationships; agriculture; community life and the economy. Too many individuals and families are experiencing financial crisis because of inadequate savings and too much

debt. Research and Extension strategies can enhance family life issues such as building financial security, community leadership, youth development, and connect individuals and families to mental and emotional support resources.

Term: Long

Science Emphasis Areas
Family & Consumer Sciences

2 Food Systems, Nutrition, Health, and Well-Being

Description:
Heart disease, cancer, stroke, and diabetes are included in the top leading seven causes of death in South Dakota and stress-related health problems are on the rise. Living a healthy lifestyle greatly reduces a person's risk for developing chronic disease. Local gardens, high-tunnels, and greenhouse facilities help increase fruit and vegetable consumption in the state. Aquaponics, a sustainable food production method that combines advanced aquaculture with hydroponics, is on the rise in SD to meet the need for more fresh produce. Natural fermentation processes replace chemical additives for extending shelf-life of foods and beverages. Research and Extension strategies that promote dietary and lifestyle changes can reduce the incidence of chronic disease across the state's population.

Term: Long

Science Emphasis Areas
Family & Consumer Sciences
Food Safety
Human Nutrition

3 Regenerative Agronomic Systems

Description:
Regenerative agriculture builds the soil through proper management which includes minimizing or eliminating tillage, diversified rotations, and integrating livestock into cropping systems, which results in increased topsoil, soil carbon, and biological activity. Using regenerative methods can allow South Dakota farmers to prioritize caring for the soil in order to put high-quality, nutritious food directly into the hands of the people who lack access. Research and Extension strategies lead to increased agricultural productivity, an increased understanding of plant diseases, pests, and new plant varieties. Farmers rely on the dissemination of science-based knowledge on soil fertility, precision agriculture, genetics, genomics, horticulture, environmental preservation, weed science, and preserving water quality.

Term: Long

Science Emphasis Areas
Sustainable Agricultural Production Systems

4 Regenerative Livestock Systems

Description:
Due to shifting population demographics, and changing cultural and societal standards, the perceptions of livestock utilization and husbandry continue to be under scrutiny. In addition, the demand to produce more food with fewer resources continues to be a challenge to livestock health and productivity. According to the USDA Census of Agriculture, the average age of U.S. producers is 58.3. Producers want to learn more about crop and livestock reintegration, precision livestock production in confined and range settings, as well as factors that impact effectiveness of their feeding programs. Research and Extension strategies can increase profitability, optimize resource management, enhance learning communities, and increase awareness of the consumer and

food service side of the beef industry.

Term: Long

Science Emphasis Areas
Sustainable Agricultural Production Systems

5 Natural Resources and Environmental Systems

Description:
There are approximately 19 million acres of cropland and 23 million acres of permanent pasture and rangeland in South Dakota. Rangeland is the lifeline of streams, ponds, and lakes, and it is a source of wildlife habitat, recreation, and scenic beauty. As an agricultural resource, cropland has a significant impact on the economic, as well as the environmental well-being of the state. Healthy soil contributes to a healthy ecosystem, which in turn impacts society. Research and Extension continue to develop programs that improve the understanding of natural resources, environmental, economic, and social impact of changing climate and energy needs. Protecting soil and water quality in agricultural, rural, and urban landscapes and watersheds is essential.

Term: Long

Science Emphasis Areas
Environmental Systems