

2011 SOUTHEAST SOUTH DAKOTA RESEARCH FARM HIGHLIGHTS

Southeast Research Farm; 29974 University Road, Beresford, SD 57004

Phone: 605.563.2989

Authors: Robert Berg and Ruth Stevens

Crop Research

- Our Directors set goals of producing dryland yields of 300 bu/ac corn and 100 bu/ac soybean.
- Soil fertility projects evaluated sulfur for no-till corn; N, P, micronutrients, and livestock manures for corn, soybean, small grain, &/or cover crops; and crop residue management for corn-soybean rotations with and without tillage.
- Crop breeding and variety performance trials evaluated alfalfa, corn, oat, soybean, and winter wheat.
- Plant pathologists studied corn diseases, foliar fungicide and seed treatments for soybean, and soybean cyst nematodes.
- Weed control options for corn and soybean were carefully evaluated.
- Entomologists examined the role of insects in producing mycotoxins and screened varieties for soybean aphid tolerance.
- Role of cover crops was evaluated including after no-till winter wheat.
- A rotation was established for organic crop production.
- Tillage and crop rotation systems were modified to include early season soybean before winter wheat.



Flame thrower for weed control in organic plots demonstrated August 23, 2011 during Northern Plains Sustainable Ag Tour

Nearly 50 research and demonstration projects (Table 1) associated with four departments in the College of Ag and Biological Sciences (Plant Science, Animal Science, Ag and Biosystems Engineering, and Veterinary and Biomedical Services) were conducted at the farm during 2011 which was the 50th Anniversary of the Southeast South Dakota Experiment Farm.

Weather and Climate Summary

Weather is monitored here for both the State Climatologist and the National Weather Service. Annual and growing season precipitation was below normal for 2011. We received 22.17 inches of annual precipitation (87% of normal). Growing season precipitation from April through September was 18.33 inches (97% of normal). Annual snowfall was 27.2 inches, with 25.8 inches in the first half of the year and 1.4 inches during the last half.

The growing season accumulation of heat units was 3,104 units, which is only slightly below normal (97% of normal). The coldest temperature of the year was recorded on January 23 at -19°F and the hottest temperature was 100°F on August 1, giving a 119-degree temperature range. Our first frost of the season occurred on September 15, for a frost-free season of 105 and 139 days on a 32°F and 28°F basis, respectively.

Livestock Odor and Runoff Control

Unique ways to address environmental issues for livestock grow/finish operations are actively pursued at SE Farm.

Both vertical and horizontal biofilters remove 95% of the odor from our swine confinement barn and can help reduce the spread of diseases. We also use a low input bedded system to feed pigs in our hoop barn.

Construction began on an Animal Waste Management System for our cattle feedlot and swine facilities. Runoff diverted to a sediment basin will be applied to a vegetative treatment area intensively managed and monitored so state and federal agencies can determine if this technology can be classified as an approved practice for large and small operators. A mortality compost unit is planned to be built in 2012.



Constructed first phase of an Animal Waste Management System designed by USDA/NRCS

Livestock Research

Cattle trials focused on protein recommendations for rations with distillers grains and monitored calf health when exposed to calves persistently infected with bovine virus diarrhea (BVD) in the feedlot.

Corn silage and three types of forage sorghum silages harvested from fields too wet to plant early last spring are being evaluated as growing rations for calves in our feedlot as an integrated crop and livestock project.

Swine trials evaluated reducing temperatures at night to help reduce utility bills when raising nursery pigs, looked at how antibiotics affect intestinal microbial populations, and measured whether feeding rations with small particle size affected pig performance.



Feedlot Expansion and Renovation Completed in 2011

At least 500 people attended more than 20 events (Table 3) here for extension programs; professional training; and various regional, township, and local meetings, including:

- Stewards of Progress reorganization local community meeting
- National Crop Insurance Service field school
- 4-H youth field day & local club meetings
- Northern Plains Sustainable Ag Society organic plot tour

Beef Research

By Ben Holland, Extension Feedlot Specialist, SDSU

The Southeast Farm Feedlot experienced quite a bit of change in 2011, with much of the emphasis placed on the runoff control measures and feedlot expansion that began this last summer. These projects were funded in part by the USDA-NRCS Environmental Quality Incentives Program (EQIP), the Vermillion River Basin Watershed Project, and the Southeast SD Experiment Farm Corporation. Because of the wet spring and early summer, construction was delayed. Pen surface shaping and the construction of sediment basins to collect all runoff from the feedlot was completed in late summer, and a solid-set irrigation system for applying liquid runoff to a vegetative treatment area (VTA) was almost finished before winter began. In conjunction with the project, pen surfaces were graded, and construction was completed on 8 additional research pens in the outdoor lots just in time to receive calves in late October.



In 2011, all or parts of four feeding experiments were completed with 698 head of cattle being preconditioned, backgrounded, or finished. Calves were sourced from the SDSU Research Stations at Cottonwood and Miller, as well as from location auction markets and South Dakota ranches. Research demonstrated that grazing cover crops could be an economically competitive option to drylot-based backgrounding programs. A finishing experiment showed that cattle fed greater than 25%

modified distillers grains in diets with dry rolled and high moisture corn do not benefit from additional degradable intake protein supplementation. Analysis is continuing in an experiment investigating the genetics of vaccine response, and a backgrounding experiment comparing corn silage to three varieties of sorghum silage is ongoing. With increased capacity, better facilities, and the ability to integrate with cropping systems, beef cattle research at the Southeast Farm is set to increase and continue to impact South Dakota Cattle Feeders in 2012 and beyond.

APPENDIX

Table 1. Research & Demonstration Projects

Table 2. Project Leaders

Table 3. Events

Table 1. 2011 RESEARCH & DEMONSTRATION PROJECTS; SE RESEARCH FARM, BERESFORD, SD

PROJECT TITLE	PROJECT LEADERS (Contact information in Appendix Table 2)
PLANT SCIENCE DEPARTMENT	
Cropping Systems	
Tillage and Crop Rotations for Eastern SD (Phase 5, Year 1)	Robert Berg
Alternative Crop Rotations (Phase 2, Year 3)	Robert Berg
Aerway Tillage Timing; (Monitor Corn & Soybean)	Robert Berg
Soil Fertility	
Phosphorus Placement and Rate (Soybean)	Ron Gelderman
Fertilizer Demo on Corn	
Nitrogen Management for Corn-Soybean Rotation	
Manure on Corn	
Sulfur on No-Till Corn	
Swine Manure and Cover Crop Effects on Performance and Quality of No-till Corn, Soybean and Wheat. (Phase 1, Year 3)	Ron Gelderman, Peter Sexton, Robert Berg, Bradley Rops
Crop Performance Variety Trials & Demos	
Precision-Planted Corn Hybrid Performance Trials	Bob Hall, Kevin Kirby
• Early & Late Maturity Glyphosate Resistant Corn	
Soybean Variety Performance Trials	
• Non Glyphosate Resistant Soybean Variety Trials, Groups I & II	
• Glyphosate Resistant Soybean Variety Trials, Groups I & II	
Soybean Row Spacing	Vance Owens
Alfalfa Variety Performance Nursery Trials	
Annual Warm-Season Grass Biomass	
Cool-Season Perennial Grass Forage (2 trials)	
Perennial Grass Forage Trial	
Date of Plant Soybean (year 2)	Dave Clay, Gregg Reicks, Robert Berg
Winter Wheat Variety Performance Trial (Intense Management)	Bill Berzonsky, Steve Kalsbeck
Prairie Cordgrass and Cup Plant Demo (saline site)	Arvid Boe
Crop Breeding	
Non Roundup Soybean Nurseries and Cyst Nematode Evaluations	Guo-Liang Jiang
Oat Breeding and Seed Increase Projects	Lon Hall
Entomology	
Soybean Aphid Variety Trial	Kelley Tilmon, Peter Sexton
Corn Insect Impacts on Mycotoxin	Billy Fuller, Rosemary Gutierrez, Robert Berg
Black Light Trap Insect Station	Billy Fuller, Rosemary Gutierrez
Plant Pathology	
Corn Diseases	Kay Ruden
Soybean Foliar Fungicide and Seed Treatment Trials	
Soybean Cyst Nematode Studies	

Table 1. 2011 RESEARCH & DEMONSTRATION PROJECTS; SE RESEARCH FARM, BERESFORD, SD

PROJECT TITLE	PROJECT LEADERS (Contact information in Appendix Table 2)
Weed Control Demonstrations and Evaluation	
<p>Corn: Corn Herbicide Demonstration; Warrant Crop Response on Corn; Anthem in Corn; Verdict in Corn; 2,4-D Formulation Study; One Pass Corn Programs, Two Pass Corn Programs, Fierce Early Preplant Burndown; Pre Rimsulfuron & Mesotrione Mixes; Impact Programs; Laudis + Oil Adjuvants; White Clover Cover Crop in Corn</p> <p>Soybean: Soybean Herbicide Demonstration; Duration of Residual Activity in Soybeans; Warrant in RR Soybeans; Zidua Two-Pass Soybean Programs; Warrant Crop Response on Soybean at Two Planting Times; Anthem in Soybean; Burndown with Sharpen, Optill, or Verdict in Soybeans; Autum Super & Tank Mixes; Cadet in Soybeans; Herbicides and Fungicides in Soybeans; Ignite Weed Control programs in Liberty Link Soybean; 2-4-D Droplet Size Study; Adjuvants with Sharpen Burndown; Spring Dandelion Control; Horseweed Late Applications in Soybeans; White Clover Cover Crop In Soybeans</p> <p>Other Research: Fall Forb Planting after Milestone Application; Spring Forb Planting after Milestone Application; Fall Grass Seeding after Milestone Application; Spring Grass Seeding after Milestone Application; Aminocyclopyrachlor on Common Sunflower; White Clover Tolerance to Pasture Herbicides</p>	<p>Michael Moechnig, Darrell Deneke, Dave Vos, Jill Alms</p>
Other General Rotations & Miscellaneous	
Maximum Yield Corn and Soybean Trial	BOD*, Robert Berg, Robert Hall
No-Till Crop Performance After Cover Crop	Robert Berg, Dwayne Beck, Peter Sexton
Organic Production	Peter Sexton
Cover Crop Demos	Peter Sexton
Crop Growth on Ridges in Saline Soils	Peter Sexton
Crop Residue Management	Howard Woodard
ANIMAL & RANGE SCIENCES DEPARTMENT	
Beef	
Beef Cattle Feedlot Renovation	Ben Holland, Brad Rops, BOD*
Protein Recommendations for Beef Feedlot Rations with Distillers Grains	Ben Holland, Levi Garbel, Brad Rops
Evaluating the Risk of BVD Persistently Infected Calves in Feedlot	Ben Holland, Brad Rops
Sorghum and Corn Silage Comparisons	Ben Holland, Brad Rops, Robert Berg
Swine	
Reduced Nocturnal Temperatures for Nursery Pigs (2X)	Robert Thaler, Steve Pohl, Brad Rops
The Effect of Bacitracin on Antibiotic Resistant Bacteria (2X)	Nuria Garcia, David Francis, Robert Thaler, Brad Rops
The Effect of Water Treatment on Pig Performance	Robert Thaler, Brad Rops
AG & BIOSYSTEMS ENGINEERING DEPARTMENT	
SDSU State Climatology Data (automated station)	Dennis Todey
Biofilters for Confined Grow/Finish Swine Production	Dick Nicolai, Robert Thaler, Steve Pohl, Brad Rops
Animal Waste Management System / VTA Project (Phase 1 Construction)	Robert Berg, Brad Rops, Todd Trooien, Erin Cortus, Steve Pohl, Chris Hay, BOD*, NRCS, SD Association of Conservation Districts
GENERAL	
National Weather Service Station (Centerville 6SE)	Ruth Stevens, Doug Johnson, Garold Williamson, Brad Rops, Bob Berg, Don Morin
Precision Ag (Yield Monitor & Auto-steer Guidance)	Garold Williamson, Doug Johnson, Brad Rops, Ruth Stevens, Robert Berg, Joe Schumacher

*BOD / Southeast Farm Board of Directors; office phone number 605-563-2989

Table 2. 2011 PROJECT LEADERS; SE RESEARCH FARM, BERESFORD, SD

Jill Alms; Senior Ag Research Technician; jill.als@sdstate.edu; phone 605-688-5100
Dwayne Beck, Professor / Farm Manager; dwayne.beck@sdstate.edu; phone 605-224-6357
Robert Berg, Professor/Farm Manager; robert.berg@sdstate.edu; phone 605-563-2989
Bill Berzonsky, Professor; william.berzonsky@sdstate.edu; phone 605-688-
Arvid Boe, Professor; arvid.boe@sdstate.edu; phone 605-688-4759
Justin Bonnema, PE USDA-NRCS; justin.bonnema@sd.usda.gov; phone 605-692-2344 ext 101
David Clay, Professor; david.clay@sdstate.edu; phone 605-688-5081
Erin Cortus, Assistant Professor; erin.cortus@sdstate.edu; phone 5605-66-5144
Darrell Deneke; IPM Coordinator; darrell.deneke@sdstate.edu; phone 605-688-4595
David Francis; Professor; david.francis@sdstate.edu; phone 605-688-5680
Billy Fuller, Professor; billy.fully@sdstate.edu; phone 605-688-4593
Levi Garbel, Graduate Research Assistant; levi.garbel@sdstate.edu; phone 605-688-5441
Nuria Garcia Fernandez; Graduate Research Assistant; nuria.garciafernandez@sdstate.edu; phone 605-688-5481
Ron Gelderman, Professor; ronald.gelderman@sdstate.edu; phone 605-688-4770
Rosemary Gutierrez, Graduate Research Assistant; rosemary.gutierrez@sdstate.edu; phone 605-688-4593
Bob Hall, Professor; robert.hall@sdstate.edu; phone 605-688-4760 (retired)
Lon Hall, Research Associate; lon.hall@sdstate.edu; phone 605-688-4758
Chris Hay, Assistant Professor/Agriculture Engineer; christopher.hay@sdstate.edu; phone 605-688-5610
Ben Holland, Assistant Professor/Extension Feedlot Specialist; ben.holland@sdstate.edu; phone 605-688-5460
Guo-Liang Jiang, Assistant Professor; guo-liang.jiang@sdstate.edu; phone 605-688-4749
Doug Johnson; Ag Research Technician; douglas.johnson@sdstate.edu; phone 605-563-2989
Steve Kalsbeck; Research Associate II; steve.kalsbeck@sdstate.edu; phone 605-688-6047
Kevin Kirby, Ag Research Manager; kevin.kirby@sdstate.edu; phone 605-688-4250
Mike Moechnig, Assistant Professor/Extension Weed Specialist; michael.moechnig@sdstate.edu; phone 605-688-4591
Don Morin; National Weather Service; donald.morin@noaa.gov
Dick Nicolai, Farm Machinery & Safety Specialist; dick.nicolai@sdstate.edu, phone 605-688-5663 (retired)
Vance Owens, Professor; vance.owens@sdstate.edu, phone 605-688-6088
Steve Pohl, Professor/Extension Specialist; steve.pohl@sdstate.edu; phone 605-688-5662
Gregg Reicks, Research Associate; gregg.reicks@sdstate.edu; phone 605-688-
Deron Ruesch; District Conservationist; USDA-NRCS; deron.ruesch@sd.usda.gov
Brad Rops; Research Assistant; bradley.rops@sdstate.edu; phone 605-563-2989
Kay Ruden, Research Associate; key.ruden@sdstate.edu; phone 605-688-6246
Joe Schumacher; Research Engineer; schumaj@sdstate.edu; phone 605-688-4502
Peter Sexton, Associate Professor; peter.sexton@sdstate.edu; phone 605-688-6179
Ruth Stevens; Statistical Assistant; ruth.stevens@sdstate.edu; phone 605-563-2989
Robert Thaler, Professor/Extension Swine Specialist; robert.thaler@sdstate.edu; phone 605-688-5435
Kelley Tilmon; Associate Professor; kelly.tilmon@sdstate.edu; phone 605-688-4601
Dennis Todey, Associate Professor/State Climatologist; dennis.todey@sdstate.edu; phone 605-688-5678
Todd Trooien, Professor, todd.trooien@sdstate.edu; phone 605-6988-5677
Dave Vos; Senior Ag Research Technician; dave.vos@sdstate.edu; phone 688-5100
Garold Williamson; Ag Research Technician; garold.williamson@sdstate.edu; phone 605-563-2989
Howard Woodard; Professor; howard.woodard@sdstate.edu; phone 605-688-4774

Table 3: Programs / Training and Community Meetings at Southeast Farm; 2011

Meeting	Project Leader	Date
Southeast Farm Annual Meeting, Research Planning Session	Berg, et al	Jan 25
Southeast Farm Annual Meeting, Public Meeting	Berg, et al	Jan 25
CES Educator Meeting; "Eating off Land"	Lounsbery	Feb 3
CES Educator Private Applicator Training	Wagner	Feb 10
4-H Meeting	Christensen	Feb 13
Township Annual Meetings (Glenwood and Riverside)		Mar 1
Southeast Farm Board of Directors Spring Business Meeting	Berg, et al	Mar 8
4-H meeting	Christensen	Mar 20
Township Tax Evaluations (Glenwood and Riverside)		Mar 21
Southeast Farm Board Committee Meeting; Corn/Soybean	Novak, et al	Mar 22
Southeast Farm Board Committee Meeting; Outreach	Merrill, et al	Apr 7
Southeast Farm Board of Directors Special Meeting; CES Reorganization	Berg, et al	Apr 26
4-H Meeting	Christensen	May 9
Southeast Farm Board and NRCS Meeting; AWMS Project	Berg, et al	Jun 2
Southeast Farm Board Committee Meeting; Scholarship	A. Novak, et al	Jul 6
CES 4-H Livestock Judging	Lounsbery, et al	Jun 9
Southeast Farm Summer Tour	Berg, et al	Jul 12
Southeast Farm Board of Directors Special Meeting; Scholarship Project	Novak, et al	Jul 12
National Crop Insurance Services field adjuster training school	NCIS	Jul 14
CES 4-H Project Day	Strunk	Jul 28
Northern Plains Sustainable Ag; Organic Plot Tour	Sexton, et al	Aug 23
Southeast Farm Fall Tour	Berg, et al	Sep 8
4-H Meeting	Christensen	Oct 16
Southeast Farm Board of Directors Fall Business Meeting	Berg, et al	Dec 8

2011 events / meetings 23
Attendance at events / meetings 534