

Project Proposal

2000 Producer Grant Program

Please type or print legibly in dark ink. If space does not permit adequate explanation, you may use page 5 (blank page) for overflow. If your proposed project requires assistance from a financial institution, please enclose a letter from them indicating their commitment.

Project Title: Introducing Cover Crops in Eastern South Dakota Cropping Systems

Project Leader: Craig Stehly

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Is the applicant a producer? Yes No

Is this an Individual or Group Project?

Is this a Marketing Project? Yes No

Grant Funds Requested: \$ 9,861.15 **Other Contributions:** \$ 37,605.50

Are you requesting a continuation of a previous SARE Producer Grant?

Yes No

(If yes, include a progress or final report.)

1) What is the objective of this project? Describe the problem your project will address.

The objective of this project is to successfully introduce cover crops into eastern South Dakota no-till cropping systems.

Producers in eastern South Dakota are beginning to understand the importance of diverse crop rotations in no-till systems. While practicing a diverse crop rotation of wheat – corn – soybean, it is difficult to timely plant and achieve a desirable stand of corn following the cereal crop. This is due to insufficient cropping intensity of the rotation. Producers who utilize tillage in their cropping systems waste the water that would be saved in low disturbance no-till systems. Cover crops would utilize this “saved” moisture to provide the trafficability and improved soil structure needed to timely plant the subsequent crops. Other benefits provided by cover crops include: increasing soil fauna, provide nitrogen for the next crop, aid in nutrient cycling, control erosion, sequester carbon, reduce soil compaction, reduce soil crusting, prevent nitrogen leaching, suppress weed seed germination, “false-out” some disease organisms, change the previous crop residue’s color, and provide forage for fall livestock grazing.

2) Describe in detail how you would use this grant to address the problem.

The grant funds will be used to evaluate cover crop types, stand establishment procedures, and impacts on current and subsequent crop yields.

(1) Craig Stehly, Davison County, South Dakota.

(A) A randomized, complete-block design experiment consisting of 100 acres will evaluate red clover in wheat stubble prior to planting corn the following year. Treatments will include: (1) check, (2) red clover drilled at approximately Feekes 2-3 wheat stage, and (3) red clover drilled into wheat stubble after harvest. Seeding rate is 10 pounds/acre.

The data that will be gathered includes: (1) soil moisture in the top 12 inches – sampled 2-4 times during the cover crop year, (2) soil surface bulk density, (3) soil temperature, (4) soil surface bearing strength using a soil penetrometer, (5) current crop year yield and quality, (6) subsequent crop yield and quality, and (7) evaluating insect pest populations and species.

(B) A randomized, complete-block design experiment consisting of 100 acres will evaluate rye into corn prior to planting soybean the following year. Treatments will include: (1) check, (2) airily broadcasting rye at approximately V6 corn stage, and (3) drill rye into corn stalks after harvest. Seeding rate is 90 pounds/acre.

The data that will be gathered includes: (1) soil moisture in the top 12 inches – sampled 2-4 times during the cover crop year, (2) soil surface bulk density, (3) soil temperature, (4) soil surface bearing strength using a soil penetrometer, (5) current crop year yield and quality, (6) subsequent crop yield and quality, (7) evaluating insect pest populations and species, and (8) weed species and density in the soybean crop.

(2) Paul Leiseth, Hamlin County, South Dakota.

(A) A randomized, complete-block design experiment consisting of 160 acres will evaluate red clover in wheat stubble prior to planting corn the following year. Treatments will include: (1) check, (2) red clover broadcasted at approximately Feekes 10-11 wheat stage, and (3) red clover drilled into wheat stubble after harvest. Seeding rate is 10 pounds/acre.

The data that will be gathered includes the same as described in 1 A. Continued on page 5.

3) How will you know if you have achieved what you wanted to do with this grant? How do you propose to evaluate the economic, environmental and social impacts of your project? *

If we can identify a cover crop that meets our needs and is economically feasible while providing positive environmental benefits on area soil, water, plants, air and animal resources then we have achieved our grant's objective.

The economics will be evaluated at the end of the project. All records of inputs and field operations will be analyzed (with assistance from Jason Miller, NRCS) to determine if the cover crops implemented were economically feasible.

The environmental impacts will be evaluated throughout the project period described in step 2. This data will be analyzed (with assistance from USDA-ARS and SDSU staff) to determine the impacts of cover crops on the immediate area's environment.

The social impacts of this project will be evaluated by the number of people who attend the research sites' field days/tours. Once the research site's economics and environmental effects have been evaluated, then detailed information can be disseminated via workshops, publications, and the World Wide Web. This project will aid in promoting cover crops in annual cropping systems as being more socially acceptable; therefore, more producers will implement this best management practice. The social impacts of the project will also be evaluated in the future via the Conservation Technology Information Center's crop residue management survey. This survey will indicate if conservation tillage acres increase or decrease over time.

4) Why is the problem you are addressing in your project important to your farm and to other producers in your area and the North Central Region?

The implementation of no-till systems in tall-grass prairie regions in north central United States has stagnated due to mainly insufficient cropping intensity and inadequate crop diversity. If this project successfully demonstrates the value of cover crops in no-till systems, the number of acres of this soil conserving, environmentally friendly practice should increase.

* Economic, environmental and social impacts can be evaluated in a variety of ways, depending on your personal goals and farming/ranching operation. Impacts could be evaluated, for example, by anticipated effect on cash flow, water resources, soil erosion, wildlife, community and quality of life. Call the NCR SARE Office if you have any questions about these indicators, which are an important part of this application.

5) How will you share information from your project with other producers? (Each project must include an outreach component.)

Field days/tours will be held at each of the project's sites during a time of the year that demonstrates one of the following activities: (1) growing cover crop, (2) planting into the cover crop and/or (3) during harvest of the cash crop.

Once the project's sites economic and environmental effects have been evaluated, then detailed information can be disseminated via workshops, publications, radio spots (Dakota Farm Talk), news articles, and at the South Dakota No-Till Association web site (www.sdnottill.com).

6) Describe your farm or ranch operation if you are submitting an individual proposal. If you are submitting a group proposal, describe your operation and provide a brief description of the operations of the other producer members of the group.

Craig Stehly (applicant). Stehly farms is a diversified cropland operation located in Davison County, South Dakota. Major crops are corn, soybeans, winter and spring wheat, grain sorghum, and sunflowers. All crops are no-tilled and a diversified crop rotation is practiced. We use an integrated pest management system and are trying to use cover crops in our rotations.
Continued on page 5.

7) List the names, addresses, and phone numbers of any cooperators. Include how they will participate or what they will contribute.

Representing USDA-ARS in Brookings are Dr. Walt Riedell, Dr. Shannon Osborne, and Dr. Louis Hesler. Representing South Dakota State University (SDSU) is Dr. Tom Schumacher.

Drs. Riedell, Osborne, and Hesler can be contacted at:

USDA-ARS
2923 Medary Avenue
Brookings, SD 57006
Phone: (605) 693-5207

Dr. Tom Schumacher can be contacted at SDSU, 247A NPB Box 2140C, Brookings, SD, 57007.
Phone is (605) 688-4762.

Drs. Riedell, Osborne, and Schumacher will provide information to producers involved in the grant on how portable soil moisture probes, temperature probes, and soil penetrometers work, and will conduct training sessions that demonstrate the proper use of these probes. Dr. Schumacher will also demonstrate the procedure for collecting and calculating soil bulk density. Dr. Hesler will demonstrate sampling procedures for cutworms in row crops following a cover crop. Two training sessions will be held for the producers involved in the grant (one in the Watertown SD area and another in the Mitchell SD area). Drs. Riedell, Osborne, Hesler, and Schumacher will also be available to the producers involved in the grant for guidance in setting up plot designs and helping tabulate and review gathered data.

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Signature of Applicant (**must** be a Producer)

2) Describe in detail how you would use this grant to address the problem.

Continued from page 2.

(3) David Gillen, Aurora County, South Dakota.

(A) A randomized, complete-block design experiment consisting of 160 acres will evaluate Roundup Ready canola, hairy vetch, and red clover in wheat stubble prior to planting corn the following year. Treatments will include: (1) check, (2) Roundup Ready canola drilled into wheat stubble (at 6 pounds/acre) after harvest, (3) hairy vetch drilled into wheat stubble (at 20 pounds/acre) after harvest, (4) red clover drilled into wheat stubble (at 10 pounds/acre) after harvest.

The data that will be gathered includes the same as described in 1 A on page 2.

(4) Lewis Bainbridge, Davison County, South Dakota.

(A) A randomized, complete-block design experiment consisting of 100 acres will evaluate rye into corn prior to planting soybean the following year. Treatments will include: (1) check, (2) airily broadcasting rye (at 45 pounds/acre) at approximately V6 corn stage, and (3) airily broadcasting rye (at 90 pounds/acre) at approximately V6 corn stage.

The data that will be gathered includes the same as described in 1 B on page 2.

6) Describe your farm or ranch operation if you are submitting an individual proposal. If you are submitting a group proposal, describe your operation and provide a brief description of the operations of the other producer members of the group.

Continued from page 4.

Paul Leiseth, Hamlin County, South Dakota. Leiseth Farms, Inc. is a cash grain farm that grows corn, soybeans, spring and winter wheat. The farm practices no-till and minimum till farming.

David Gillen and family operate 3,300 acres in Aurora County, South Dakota. They raise wheat, corn, and soybeans and have practiced no-till for the last 8 years.

Lewis Bainbridge and family operate a diverse crop and livestock operation in Davison County, South Dakota. Their livestock consists of both cattle and hogs. Their major crops include corn, soybeans, wheat, and alfalfa. They have practiced no-till for the last 7 years and are wanting to introduce cover crops into their cropping practice as a means of integrating livestock grazing without damaging soil structure.

7) List the names, addresses, and phone numbers of any cooperators. Include how they will participate or what they will contribute.

SDSU-Cooperative Extension Service. Ray Gosmire, CES, 3200 W Havens St., Mitchell, SD, 57301. Phone is (605) 995-8620. Chuck Langner, CES, PO Box 996, Watertown, SD, 57201. Phone is (605) 882-6300.

Extension educators Gosmire and Langner will assist the producers with establishing the plots and with technical assistance at field days/tours.

USDA-NRCS. Bill Anderson, NRCS, 1820 N Kimball Suite B, Mitchell, SD, 57301. Phone is (605) 996-7140. Jason Miller, NRCS, Dakota Lakes Research Farm, PO Box 2, Pierre, SD, 57501. Phone is (605) 224-6357.

NRCS agronomists will assist the producers with overall economic analysis of the various treatments and assist with the field days/tours.

Budget

PERSONAL SERVICES		
	<i>Grant Funds Request</i>	<i>Other Contributions</i>
<i>Major Participants (individuals and their role)</i>		
Craig Stehly, farmer: conduct trials, take samples, scout, Record findings, donate 200 acres for trials @ \$50/acre Write and submit progress reports	\$400	\$10,000
Paul Leiseth, farmer: conduct trials, take samples, scout, Record findings, donate 160 acres for trials @ \$55/acre	\$200	\$8,800
David Gillen, farmer: conduct trials, take samples, scout, Record findings, donate 160 acres for trials @ \$35/acre	\$200	\$5,600
Lewis Bainbridge, farmer: conduct trials, take samples, scout, record findings, donate 100 acres for trials @ \$45/acre	\$200	\$4,500
<i>Salaried Personnel (individuals and their role)</i>		
USDA-ARS and SDSU personnel: Drs. Walt Riedell, Shannon Osborne, Louis Hesler, and Tom Schumacher will provide training/demonstration of data gathering equipment and procedures. Assist with data analysis.	0	\$720
SDSU-CES Ray Gosmire and Chuck Langner will provide assistance to producers described on page 5.	0	\$800
USDA-NRCS Bill Anderson and Jason Miller will provide assistance to producers described on page 5.	0	\$800
<i>Hourly Personnel (individuals and their role)</i>		
NA		
<i>SUBTOTAL</i>	\$1,000	\$31,220

Major Expenditures: Gathering and recording data.

NON-PERSONAL SERVICES		
	<i>Grant Funds Request</i>	<i>Other Contributions</i>
<i>Travel</i>		
USDA-ARS & SDSU personnel travel to plots for training/demonstration of equipment & procedures.	\$0	\$120
<i>Operating and Supplies</i>		
Craig Stehly: 66.4 ac of red clover X 10 lbs/ac X \$2/lb	\$1,328	\$664
Craig Stehly: 66.4 ac of rye X 90 lbs/ac X \$0.10/lb	\$597.60	\$498
Paul Leiseth: 106.6 ac of red clover X 10 lbs/ac X \$2/lb	\$2,132	\$799.50
David Gillen: 120 acres of the following cover crops: RR canola, hairy vetch, red clover.	\$2,840	\$1,200
Lewis Bainbridge: 66.6 ac of rye X 45&90 lbs/ac X \$0.10/lb	\$449.55	\$333
<i>Lease of land and equipment</i>		
Weigh Wagon rental to measure crop yields	\$400	\$1,200
<i>Equipment purchases</i>		
2 Aquaterr Soil Moisture Probes (\$1,170 X 0.4)	\$468	\$702
2 JMC slotted 1.25 inch (core) soil probes (\$380 X 0.4)	\$152	\$228
1 Soil Compaction Tester (\$225 X 0.4)	\$94	\$141
<i>Outreach</i>		
Film and Developing	\$100	
Writing, editing, printing, & mailing field day flyers	\$300	\$500
<i>Miscellaneous</i>		
<i>SUBTOTAL (from above)</i>	\$8,861.15	\$6,385.50
<i>SUBTOTAL (from page 6)</i>	\$1,000.00	\$31,220.00
<i>TOTAL</i>	\$9,861.15	\$37,605.50

Major Expenditures: Cover crop seed and sampling equipment.

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Signature of Applicant (**must** be a Producer)