

**Environment and Natural Resources Trust Fund
2018 Request for Proposals (RFP)**

Project Title:

ENRTF ID: 129-C

Managing Soil Quality for Ecosystem Services & Productivity

Category: C. Environmental Education

Total Project Budget: \$ 1,451,404

Proposed Project Time Period for the Funding Requested: 5 years, July 2018 to June 2023

Summary:

Developing an innovative approach to reduce water quality impacts from agricultural landscapes by focusing on soil health management, rather than yield, resulting in increased ecosystem services and crop quality.

Name: Linda Meschke

Sponsoring Organization: Rural Advantage

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Location

Region: Statewide

County Name: Statewide

City / Township:

Alternate Text for Visual:

South Central MN

| | | | |
|--------------------------|-------------------------|-----------------------------|----------------------|
| _____ Funding Priorities | _____ Multiple Benefits | _____ Outcomes | _____ Knowledge Base |
| _____ Extent of Impact | _____ Innovation | _____ Scientific/Tech Basis | _____ Urgency |
| _____ Capacity Readiness | _____ Leverage | _____ TOTAL | _____ % |



PROJECT TITLE: Managing Soil Quality for Ecosystem Services and Productivity

I. PROJECT STATEMENT

Since commercial fertilizers came to agricultural production in the 1950’s, farmers have been focused on increasing crop *yield* by fertilizing with primary nutrients nitrogen, phosphorous and potassium. In southern MN periodically sulfur and/or zinc is added, but few other nutrients have been consciously added over the last 70 years. The system has become so refined that our focus has narrowed to primarily two crops- corn and soybeans and over time, we have mined the secondary and micronutrients from the soil. With few exceptions, we have not replaced important secondary and micro-nutrients critical to soil biological functions.

Many soil properties impact soil health, but soil organic matter [SOM] deserves special attention. SOM affects several critical soil functions and can be manipulated by land management practices. We propose to develop an approach to train farm operators on how to **manage their farmland to increase SOM** as a tool to reduce water quality impacts in agricultural systems while maintaining or increasing yield. Benefits to increased SOM include: recycle nutrients/ minimizing nutrient leaching- especially nitrogen; increase water holding capacity/ less runoff; improved soil structure aggregation/improved ability to take up and hold water; and erosion prevention due to increased water infiltration and stable soil aggregate formation.

Our approach will use a small pool of local agronomists who have experience in advising farmers on sustainable farming practices. Agronomist will work with up to 48 willing farm operators to learn, develop and apply methods to increase SOM in each field, measured by an upward trend from the Soil Health Calculation included in a Haney Soil Test. In addition, working with the Conservation Marketplace Midwest [CMM] we will develop a protocol to track the ecosystem services gained from this activity and quantify the benefits.

II. PROJECT ACTIVITIES AND OUTCOMES

Working with the agronomists we will develop a training module so we have continuity on methods and outcomes desired. Agronomists will identify participating farmers and complete a soil test in the fall following harvest each year in each field. Data will be tracked and compared to document an upward trend in soil health condition. Over winter, a management plan will be developed that documents the management strategies to be applied on each field with the goal of increasing soil quality over time. It takes three years to begin to see and measure the soil quality improvements, so we are asking for this project to be five years long. Key methods applied will include cover crops, less tillage, improved nutrient management, perennial crops for harvest or grazing, and water storage. Many options can be applied to a field depending on soil type, current cropping system and weather events and only a few have been listed. The overall outcome will show an upward trend in the Soil Health Calibration over time resulting in improved ecosystem services and reduced nonpoint pollution loading.

Activity 1: Consulting with Farmers to Improve Soil Quality

Budget: \$ 876,404

| Outcome | Completion Date |
|--|-------------------------------------|
| 1. Develop Training Module | December 31, 2018 |
| 2. Soil Testing & Data Tracking | Oct/Nov each year |
| 3. Develop/ Review Field Management Plan | Winter each year |
| 4. Outreach Meetings and Field Days | Winter and Summer Seasons each year |

Activity 2: Identify, Quantify and Track Ecosystem Services

Budget: \$ 75,000

| Outcome | Completion Date |
|---|-----------------|
| 1. Identify Trackable & Quantifiable Ecosystem Services | December 2018 |



Environment and Natural Resources Trust Fund (ENRTF)

2018 Main Proposal

Project Title: Managing Soil Quality for Ecosystem Services and Productivity

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|--|----------------|
| 2. Develop Web Based Tracking Matrix | June 30, 2018 |
| 3. Quantify Ecosystem Services Gained on Each Field and Record | Fall each Year |
| 4. Present Methods at One Event Each Year – Local, Regional, State | Varies - 2023 |

Activity 3: Targeted Implementation of Soil Quality Improving Practices

Budget: \$500,000

| Outcome | Completion Date |
|---|---|
| 1. Participating Farmer Application for Cost Sharing/ Decision Made | March/April First Year; July 1 - 2 nd to 4 th Year |
| 2. Farmer Applies Practices, Requests Reimbursement | December 31 each Year |
| 3. Results Documented | December 31 each Year |

III. PROJECT STRATEGY

A. Project Team/Partners

This project will be led by Rural Advantage and their partners that they have worked with over a number of years. Linda Meschke, President of Rural Advantage will be the Project Director. One FTE staff will be hired by rural Advantage will be hired to work with the agronomists, assist in developing training and field days/meetings and track data. Agronomist will include John Oolman, Clark’s Grove; Joe Mutschler, Wells and International Ag Labs [Jon Frank and Wendell Owens], Fairmont. Conservation Marketplace Midwest [Charlene Brooks] will lead the “Identify, Quantify and Tracking of Ecosystem Services” component.

B. Project Impact and Long-Term Strategy

The long term strategy of this project is to demonstrate that managing for soil quality in agricultural landscapes can reduce nonpoint pollution impacts while maintaining crop yields. Currently farmers manage for yield, not soil quality. Improving the soil biological functions will increase nutrient cycling in the soil [versus leaching]; increase water holding capacity; improve soil structure and the ability to take up and hold water and reduce soil erosion across the field[s]. In addition we will identify and quantify ecosystems services, such as nitrogen loss reductions, water storage, sediment reductions and carbon storage.

C. Timeline Requirements

We are requesting a five year project timeline from July 1, 2018 to June 30, 2023. The primary reason for this is because when you are applying practices to change the management of the land, expecting long term benefits, experts in soil science indicate that once practices are applied, it will take three years for the farmer to notice results with their crops, even though biological changes are occurring in the soil. On the trend line, we expect to see a slight decline in years two and three and then a steady incline in years four and five from the baseline in year one. Being able to extend our project to five years allows enough growing seasons to document the real benefits.

2018 Detailed Project Budget

Project Title: *Managing Soil Quality for Ecosystem Services and Productivity*

IV. TOTAL ENRTF REQUEST BUDGET Five years

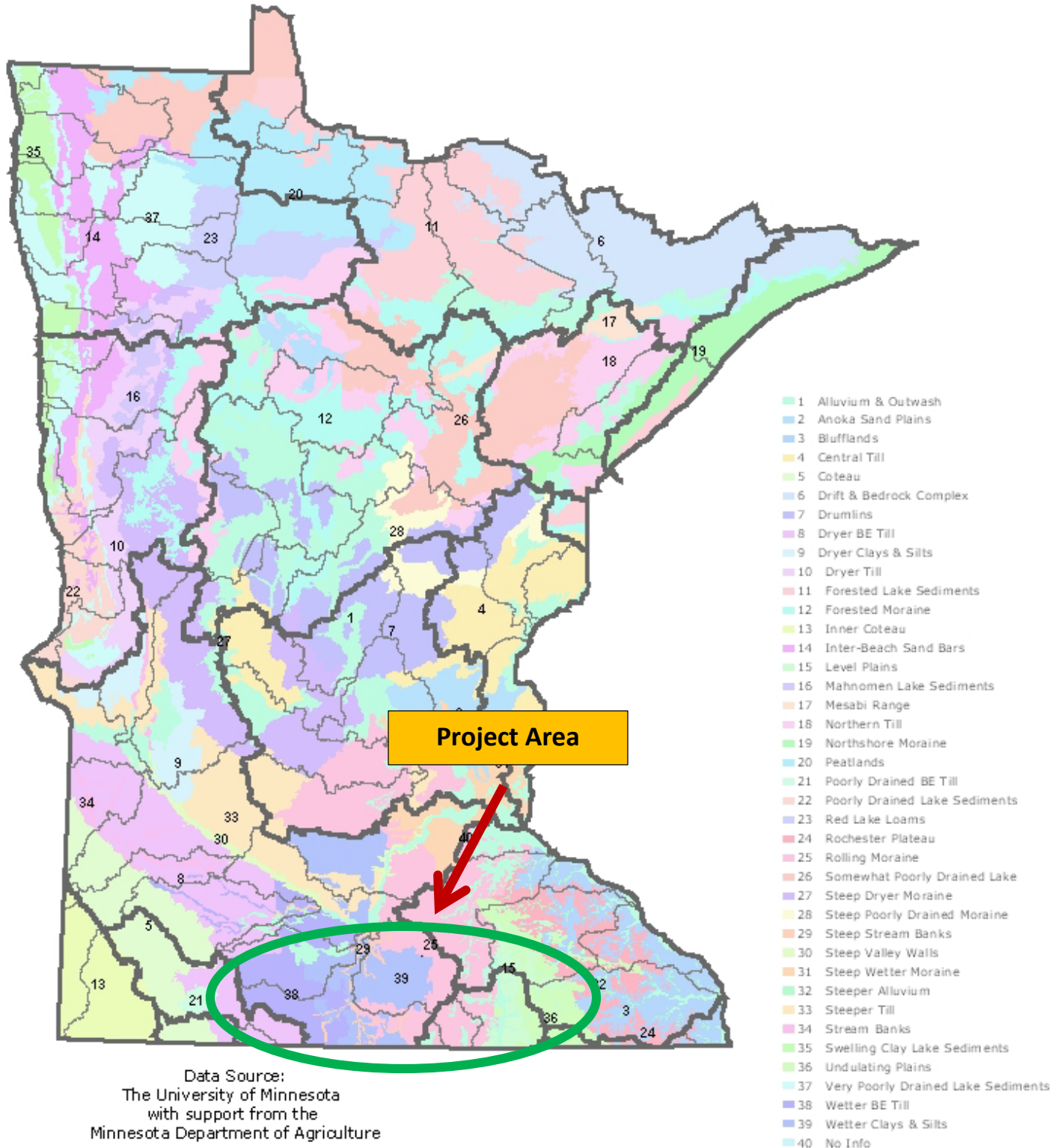
| BUDGET ITEM | AMOUNT |
|---|---------------------|
| Personnel: Meschke, Project Director, Rural Advantage[RA] .10 FTE \$39.78/hr + \$4.21 Fringe TBD, 1 FTE Project Manager, RA \$20/hr + \$3.10/hr Fringe | \$286,389 |
| Professional/Technical/ Service Contracts: 3 Agronomists [Oolman, Mutschler, Owens] at \$10,000 per year each plus \$15/A Farm Management Cost [not to exceed 27,870 acres] Conservation Marketplace Midwest- Brooks \$15,000/ year [\$40/hr x 375 hr x 5 yr] | \$642,600 |
| Equipment/Tools/Supplies: soil probes, survey flags, signage for field days, consumable supplies for infield soil tests, soil test infield analysis monitoring equipment. Soil Testing - Hainey Soil Test/ each field/yr \$49.50 each plus shipping [\$5.00] = \$54.50 each x 120 samples] | \$9,040 |
| Acquisition (Fee Title or Permanent Easements): <i>In this column, indicate proposed number of acres and name of organization or entity who will hold title.</i> | \$ - |
| Travel: In-state travel for staff to farms, field days, meetings [5,000 miles/yr x \$53.5/mile] | \$13,375 |
| Additional Budget Items: In-field implementation of cost shared practices for participants in project only. Cost share varies by practice. Practices cost shared includes only perennial planting, reduced tillage, nutrient management, water storage and cover crops. | \$500,000 |
| TOTAL ENVIRONMENT AND NATURAL RESOURCES TRUST FUND \$ REQUEST = | \$ 1,451,404 |

V. OTHER FUNDS *(This entire section must be filled out. Do not delete rows. Indicate "N/A" if row is not applicable.)*

| SOURCE OF FUNDS | AMOUNT | Status |
|--|---------------|---|
| Other Non-State \$ To Be Applied To Project During Project Period: <i>Indicate any additional non-state cash dollars secured or applied for to be spent on the project during the funding period. For each individual sum, list out the source of the funds, the amount, and indicate whether the funds are secured or pending approval.</i> | N/A | <i>Indicate: Secured or Pending</i> |
| Other State \$ To Be Applied To Project During Project Period: <i>Indicate any additional state cash dollars (e.g., bonding, other grants) secured or applied for to be spent on the project during the funding period. For each individual sum, list out the source of the funds, the amount, and indicate whether the funds are secured or pending approval.</i> | N/A | <i>Indicate: Secured or Pending</i> |
| In-kind Services To Be Applied To Project During Project Period: <i>Indicate any additional in-kind service(s) secured or applied for to be spent on the project during the funding period. For each type of service, list type of service(s), estimated value, and indicate whether it is secured or pending. In-kind services listed must be specific to the project.</i> | N/A | <i>Indicate: Secured or Pending</i> |
| Past and Current ENRTF Appropriation: <i>Specify dollar amount and year of appropriation from any current ENRTF appropriation for any directly related project of the project manager or organization that remains unspent or not yet legally obligated at the time of proposal submission. Be as specific as possible. Indicate the status of the funds.</i> | N/A | <i>Indicate: Unspent? Legally Obligated? Other?</i> |
| Other Funding History: <i>Indicate funding secured but to be expended prior to July 1, 2018, for activities directly relevant to this specific funding request. State specific source(s) of funds and dollar amount.</i> | N/A | |

Project Title: Managing Soil Quality for Ecosystem Services and Productivity

Minnesota's Agroecoregions with Watershed Boundaries



Project Managers Qualifications and Organization Description

Linda Meschke, President, Rural Advantage

Ms. Meschke has over 38 years of experience in working on water resource issues in south central Minnesota. Her work has been focused on the implementation of innovative conservation practices to address agricultural non point source pollution. She currently is working on landscape diversification that includes targeting of perennials or 3rd Crops throughout the intense corn and soybean region of southern Minnesota.

For this proposal her role will be to coordinate the project between various partners, farmers and Conservation Marketplace Midwest. Ms. Meschke will also be responsible for project administration and reporting.

Ms. Meschke has extensive experience in working with producers/ landowners; local governments; non profits; University of Minnesota researchers and educators and private industry to bring them together and work toward common goals. In collaboration with multiple partners she has developed and successfully lead over \$10 million dollars in projects in the Greater Blue Earth River watershed area that have resulted in an estimated reduction of at least 9 percent of the pollution loading going to the Minnesota River from the Blue Earth River system.

She is currently an elected SWCD Supervisor for Martin County and was recently awarded the Distinguished Service in Sustainable Agriculture Award from the Minnesota Sustainable Farming Association. Ms Meschke serves on the Boards of the University of Minnesota Southwest Regional Sustainable Development Partnership, I-90 Restorative Farmers and the Green Lands, Blue Waters. She has additional experience working as the Water Planner, Wetland Administrator and Agricultural Inspector for Martin County, Minnesota; farm partner; doing loan servicing for Farmers Home Administration during the farm crisis of the mid 1980's; and as a Vocational Agricultural Instructor and FFA Advisor.

Rural Advantage

Linda Meschke, with other partners, established on November 13, 2003 a 501[c][3] non profit called Rural Advantage under MN Statutes Chapter 317A to provide a vehicle to continue to advance the 3rd crop work in Minnesota and the Midwest. Linda Meschke is President of Rural Advantage. Rural Advantage's mission is to promote the connections between agriculture, the environment and rural communities in order to improve ecological health, economic viability and rural vitality. Objectives include:

- Advance landscape diversification to improve ecological health, rural vitality and farm profitability.
- Cultivate a more sustainable approach to agriculture that is diverse, resilient and responsible; and supports natural and agricultural 'systems' thinking.
- Foster rural economic development that supports rural families and local communities.
- Promote increased stewardship through education, demonstration and implementation.