The Nebraska Healthy Soils Task Force Report

Findings, Recommendations and Action Plan

For Governor Pete Ricketts and the Agriculture Committee of the Nebraska Legislature

In compliance with the requirements of Legislative Bill 243, introduced by Gragert, 40; Brandt, 32; Dorn, 30; McCollister, 20; Pansing Brooks, 28; Walz, 15, and approved by the Governor April 17, 2019. One Hundred Sixth Legislature, First Session

Passed on Final Reading with Emergency Clause 43 Aye; 0 Nay; 6 Not Voting

December 2020
With special thanks to Alex Brechbill, Heidi Borg, Jared Koelzer, Alan Moeller, Aaron Hird, Bijesh Maharjan, and thirty groups and organizations for their participation in the “input-listening sessions” (refer to Appendix B).

The Task Force is grateful to the University of Nebraska Institute of Agriculture and Natural Resources, the USDA Natural Resource Conservation Service, and the Nebraska Natural Resources Districts for their expertise and guidance.

By a vote of 11-2, the Task Force voted to approve this report with Bolze, Shapiro, Berns, Birge, Pflueger McDonald, Steffen, Allemann, Bettger, Tucker, and Whitmore voting “YES” and Wellman and Lunz voting “NO”. Absent were Bartek and Ward. Senators Gragert and Slama are non-voting members.
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This report may be downloaded in its entirety at: https://nda.nebraska.gov/healthysoils/index.html
Executive Overview

This Soil Health Task Force Report is about the future hope we have for Nebraska while leveraging and maintaining its strengths. It is about dreaming bigger together than each of us can dream alone. It is about encouraging communication, cooperation, and learning in a world that wants to isolate us. It is about bringing experts and persons from all walks of life together around the table to discuss our land, water, and environment. Together, we can envision and grow Soil Health for Nebraska Wealth!

Legislation
LB 243 passed by the 106th Legislature recognized the need to achieve more rapid and widespread adoption of soil health practices, and the private and public benefits that follow. It created a 17-member Healthy Soils Task Force (HSTF) to develop a Nebraska Healthy Soils Initiative. The Task Force work began in June 2019 and continued through December 2020.

Process
The HSTF reviewed soil health work being done in Nebraska and other states. A common theme was the need for a mechanism to bring about formalized collaboration, coordination, and communication to soil health work. The HSTF subdivided into four subcommittees, taking a detailed look at Education, Economics, Ecosystem Services, and the Initiative. A series of 25 input sessions were held with 31 stakeholder groups across Nebraska in October and November 2020 and the resulting feedback has been analyzed and incorporated into this final report.

Definitions, Fundamentals, and Principles
In order to frame the issues and address the HSTF’s charge, it was necessary to define and develop the following sections which are abbreviated here:

Definition of Soil Health
Soil health is the capacity of the soil to function as a dynamic living ecosystem that nourishes plants, sustains animals and people, and improves the environment. A soil becomes healthier when organic matter levels are increasing (carbon sequestration), water infiltration rates are improving (reducing erosion, runoff, and flooding), and the soil’s biological life is diverse and abundant.

Fundamentals of Soil Health
Soil health is an important component of food production and security, weather resiliency, improved water quality, reduced erosion, human health, farm economics, wildlife, and quality of life for producers. The importance of soil health is summed up by Dr. Rattan Lal of The Ohio State University: “Soil health determines the productive capacity of any agricultural practice… By improving soil health, we can produce more from less: less land, less water, less fertilizer, less pesticides, less environmental damage, less emission of greenhouse gases.”

Barriers and Constraints
We recognize that the transition to these practices has challenges. We discuss them at the beginning of the main report.

The Soil Health Movement
The movement is worldwide and those associated with the soil health movement are finding that healthier soil leads to improved yield stability, greater net financial returns over time, and ecosystem benefits. In applying the soil health principles to Nebraska, it is important to develop appropriate practices that best fit the state’s diversity of conditions.

The Soil Health for Nebraska Wealth Initiative:
The HSTF proposes a visible, coordinated, highly publicized statewide campaign throughout Nebraska promoting the theme, “Soil Health for Nebraska Wealth”. This name highlights the value of soil and water resources to all Nebraskans and the connection between soil health and the economic future of its farmers and ranchers. This Soil Health Initiative is intended to increase producer profitability while improving the soil and protecting the environment through voluntary non-mandated means. We propose five goals that will focus on implementing the Soil Wealth theme, with increased soil health and benefits to water quality/quantity, conservation, and erosion reduction. We offer this plan as a road map to a “win-win-win” opportunity for producers, landowners, the general public, and the environment.
**Soil Health for Nebraska Wealth Initiative Goals**

1. **Establish the Nebraska State Soil Health Hub with Regional Proving Grounds**
   The Soil Health Hub facilitates coordination, collaboration, and communication among existing soil health efforts in partnership with producers and non-operating landowners. The Soil Health Hub will be a mechanism to bring all soil health stakeholders together, build upon and enhance existing efforts, and create a strategic vision for shared implementation. Initially, the Soil Health Hub will bring UNL, NRCS, NRDs, NDA, and other agencies, organizations, producers, and landowners together into a formal partnership, developing a common blueprint to address the Initiative’s soil health goals and timelines. Six Regional Proving Grounds across the state are proposed to facilitate more localized soil health education, demonstration, and research.

   The Soil Health Hub would be governed by a Board of Directors that includes representation from the principal soil health partners as well as strong producer representation. An Advisory Committee made up of additional representatives from the soil health community would be formed to offer additional input and guidance. Full-time staff would be required to carry out the directives of the Board of Directors.

2. **Form a Nebraska Producer Learning Community**
   The Learning Community will complement the Soil Health Hub by being an organized community of progressive soil health producers. Peer-to-peer relationships will aid in improving and advancing farm economics, resource stewardship, and the management of environmental issues on working farms and ranches. The Learning Community would participate in the Soil Health Hub and provide input into the needs and challenges of producers and non-operating landowners.

3. **Develop the Next Generation of Soil Health Practitioners**
   It is imperative to build the systems and the frameworks to encourage, recruit, and train young people who are interested in careers in soil health. We need to facilitate the development of the next generation of farmers, ranchers, technicians, conservationists, educators, entrepreneurs, agronomists, agribusiness workers, and leaders to ensure a productive and sustainable future for Nebraska.

4. **Recruit $50,000,000 in Additional Soil Health Funding and Incentives Over the Next 10 Years**
   Corporate, public, and private groups are committed to helping implement soil health practices. Our objective is to recruit these funds to be used by producers to learn and implement soil health practices. The Nebraska Soil Health Hub will act as an economic development engine to recruit funding sources to promote soil health adoption in the state. Grants, industry partnerships, carbon and environmental incentive programs, and other funding sources will be sought. The Soil Health Hub can also assist and support other entities across the state in submitting soil health grant and program applications.

5. **Establish Nebraska Soil Health Measurements and Benchmarks**
   Appropriate criteria or metrics need to be established that reflect the soil health status of a field. There is a current lack of metrics used by all to measure and manage soils to improve soil health. The HSTF is recommending the formation of a Soil Health Measurements and Benchmarks committee that will be tasked with establishing a standard set of soil health measurements for Nebraska, determining the current benchmark levels of soil health in our state, and develop a suite of tools that bring together the best and most practical key performance indicators of soil to measure the effectiveness of the management system being used.
Outcomes and Evaluation
If the preceding five goals are accomplished, the HSTF believes that Nebraska will be the national leader in soil health awareness and adoption and we will become a model for other states to follow. It is beyond the scope of the HSTF to establish specific metric goals since one of our recommendations is to establish the appropriate benchmarks and indicators. Our long term goals are to decrease the ‘soil health gap’ in soils that have a significant separation between the achievable soil condition and the present condition. All Nebraska soil resources will be managed and maintained to be at the highest level, for their resource, as reasonably possible. An indirect result will be reduced leaking of contaminants to the groundwater and improved surface water quality.

Soil Health for Nebraska Wealth Implementation Plan
The Soil Health Task Force will disband at the end of 2020. People who are passionate, dedicated, and invested in achieving healthy soils for a wealthy Nebraska will be needed to drive this Initiative forward to fruition. Former Task Force members are encouraged to lead, participate, and share from their 18 months of work.

The following are recommended next steps:
Goal #1 “Establishing the Nebraska State Soil Health Hub with Regional Proving Grounds” is the most critical step in accomplishing the Initiative. A Soil Health Hub Formation Summit meeting for all interested parties should be scheduled, advertised, and held to form a team to begin the process of creating a Hub.

Goal #2 “Producer Learning Community” working groups focused on precision agriculture, economics, and natural resource conservation should be launched by UNL, NRCS, NRDs, and other interested and qualified parties.

Goal #3 “Developing the Next Generation of Soil Health Practitioners” can be launched by a group led by UNL and other educational representatives along with individuals who have a passion for education and development.

Goal #4 “Additional Soil Health Funding” will need to be driven by the Soil Health Hub. This goal will likely not be worked on until the Hub is formed and active.

Goal #5 “Establish Nebraska Soil Health Measurements and Benchmarks” should be initiated by a technical committee composed of representatives from NRCS, UNL, and the NRDs with other interested and qualified parties invited to participate in the process.

This graphic shows the correlation between the Initiative outcomes and the positive benefits for the entire state of Nebraska.
Introduction

This Task Force Report is about the future hope we have for Nebraska while leveraging and maintaining its strengths. It is about dreaming bigger together than each of us can dream alone. It is about encouraging communication, cooperation, and learning in a world that wants to isolate us. It is about bringing experts and persons from all walks of life together around the table to discuss our land, water, and environment. Together, we can dream and grow Soil Health for Nebraska Wealth!

The 106th Nebraska Legislature recognized the need to protect and improve our soil resources for generations to come and to ensure our ability to grow quality food and fiber through the passage of LB243. This bill created the Healthy Soils Task Force (HSTF) and directed it to do the following:

1. Develop a comprehensive healthy soils initiative for the State of Nebraska (covered in The Initiative section).
2. Develop a comprehensive action plan to carry out the initiative (covered in The Initiative and Implementation sections).
3. Examine issues related to providing farmers and ranchers with research, education, technical assistance, and demonstration projects (covered in Why Is Soil Health Important and Barriers and Constraints section).
4. Examine options for financial incentives to improve soil health (covered in Why Is Soil Healthy Important and Goal #4 sections).
5. Examine the contribution of livestock to soil health (covered in Livestock Impact On Soil Health section).
6. Identify realistic goals and timelines for improvement of soil health in Nebraska through voluntary partnerships (covered in Outcomes and Evaluation and The Initiative sections).
7. Review the Farm Bill and identify opportunities to leverage state, local, or private funds (covered in Goal #4 and Appendix F).

Early on in the process, the HSTF adopted the following Mission Statement: To develop a positive, proactive plan for soil health to ensure an enriched, resilient, and sustainable future for the state of Nebraska. To this end, the HSTF, along with many key stakeholders from across Nebraska, has researched soil health programs and activities in other states, assessed current soil health work being done in Nebraska (see Appendix A), and examined the issues as directed by LB243. While the emphasis of LB 243 is improving soil health, two major resulting benefits are improved water quality/quantity and reduced erosion. Therefore, in addressing soil health the HSTF report and recommendations will naturally address these two critical factors.

The HSTF initially divided into teams to research the soil health steps taken by other states. After assessing the findings, a more in-depth review was conducted on three state programs. In New York, the state’s Land Grant Institution, Cornell University, had a significant influence on its program. In Indiana, the greatest influence came from the state’s Natural Resources Conservation Service, and in South Dakota, it came from its producers. A common theme through all was the need for a mechanism to bring about formalized collaboration, coordination, and communication - the 3 C’s.
The HSTF next subdivided into four subcommittees and added external stakeholders to take a detailed look at Education, Economics, Ecosystem Services, and the Initiative. Drawing upon the other states’ best practices, subcommittee findings, assessing current soil health work being done in Nebraska, and the examination of issues as directed by LB243, the HSTF fashioned their recommendations. Prior to finalizing the report, a series of 25 listening sessions involving 31 groups were held with key stakeholders/partners in soil health. This feedback was analyzed and incorporated into the final report. A list of feedback participants is included in Appendix B. The image at the bottom of this page is a graphical representation of the process of gathering all the input and running it through filters to distill it down to a Soil Health Initiative.

The following report, findings, and recommendations are the culmination of these efforts. It is not intended to suggest nor create mandates or regulations. By being proactive in addressing key agronomic and environmental issues, the aim is to avoid what has happened in other states where lack of voluntary action brought about public pressure resulting in strict mandates and regulations. A 2019 resolution passed by the Nebraska Farm Bureau may sum it up best: “Nebraska agriculture needs to be proactive in addressing natural resources challenges in the state. We support initiatives, research and education that promote soil health, water quality, and soil/water conservation, to be implemented on a voluntary basis.”

Producers and non-operator landowners are necessary partners in this effort. Agriculture is always changing and we want them to understand the numerous benefits associated with the soil health practices recommended as they evaluate management options. Foremost on the minds of the HSTF in the development of the Nebraska Initiative and Action Plans was increasing bottom lines for producers and non-operators while protecting the environment for future generations.

Before outlining the key components of this Initiative, we will define and describe soil health, discuss soil health principles, and explain why soil health is important and how to achieve it. We will also discuss some of the challenges and barriers to the adoption of these practices. We will look at economic examples to support soil health. This background is important since it provides a rationale for the goals that we present as part of the Initiative.
What Is Soil Health?

Soil is much more than “dirt” and goes far beyond being a medium in which to grow plants. Healthy soil is a dynamic, living, symbiotic ecosystem composed of the physical minerals (sand, silt, clay, etc.), the chemical interactions between elements, and the biological organisms (bacteria, fungi, worms, plants) that live in the soil.

The term “soil health” implies that soil is alive, as the terms “healthy” or “unhealthy” describe the living and not the dead. Viewing the soil as a living ecosystem fundamentally changes the way soils are managed and valued. Understanding the many benefits that accrue from healthy soils encourages the public to support programs that encourage these practices.

There are many definitions of soil health but for the purposes of this report and this Initiative, soil health is defined as follows.

Soil health is the capacity of the soil to function as a dynamic living ecosystem that nourishes plants, sustains animals and people, and improves the environment.¹ A soil becomes healthier when organic matter levels are increasing (carbon sequestration), water infiltration rates are improving (reducing erosion, runoff, and flooding), and the soil’s biological life is diverse and abundant.

Soil health is perhaps summed up best by Dr. Rattan Lal, Professor of Soil Science and founding Director of the Carbon Management & Sequestration Center at The Ohio State University:

I believe soil is a living thing. That’s what soil health means, soil is life... As long as you are consuming the natural resources—food, water, elements—coming from the soil, you owe it to soil to put something back, to give something back, whatever you can.²
Why Is Soil Health Important?

Soil is one of the most essential natural resources. It affects the food we eat, the water we drink, and the air we breathe. Soil is essential for life and is the foundation for plant growth and healthy food production. Nebraska ranks fourth nationally in total agricultural receipts and fourth in land in farms and ranches with 45 million acres (92%) of the state’s total land area dedicated to farming, ranching, and livestock enterprises. This land base along with a bountiful supply of groundwater has resulted in a system of natural resources that are the lifeblood of Nebraska’s way of life and agricultural economy. It is vital that we protect our state’s soils in order to keep them healthy and productive for Nebraskans now and in the future.

Soil health is the capacity of the soil to function as a dynamic living ecosystem that nourishes plants, sustains animals and people, and improves the environment. In large part, this definition is also a description of the native prairie ecosystem that covered Nebraska soils generations ago and built the productive carbon-rich soils that bless the state. However, there is consensus among soil scientists that our soil has lost organic carbon since the advent of the plow. Experts tell us that American soils have already lost about half of their organic matter, and Nebraska is no exception. Water and wind erosion have been significant factors in organic carbon loss and disturbing the soil through tillage has oxidized soil organic matter. In general, these losses have not resulted in lower productivity because yields have been increased through the use of improved crop genetics, inorganic fertilizers, irrigation, precision agriculture, and other agricultural advancements. However, the overuse of synthetic inputs can be detrimental to the soil biology and microbial life that are critical for the natural cycling of soil nutrients and the natural defense and health of growing plants.

Some modern farming practices have slowed down the organic matter losses and are working to restore soil carbon, improve water retention, and reduce nutrient loss. No-till farming (Nebraska leads the nation in no-till acres) reduces erosion, and precision agriculture can tailor nutrient applications to reduce the possible loss and increase net profits. While these practices have been positive, more needs to be done to possibly rebuild what has been lost.

Off-Farm Benefits of Soil Health

Environmental and other off-farm benefits of soil health are becoming more widely recognized. The off-farm benefits of soil health include increased food production, weather resilience, wildlife abundance, pollinator habitats, clean water, and carbon storage. Wildlife and pollinators benefit from increased food resources, improved water quality, less toxic chemical exposure, and development of cover. By combining precision conservation such as prairie strips and buffer strips to reduce nutrient loss, producers can maximize farm profitability and natural resource conservation. Conservation trees and shrubs can be incorporated as well. These unique approaches also improve landscape diversity, which builds greater agroecosystem resilience. For example, Schulte et al. (2017) illustrated that integration of prairie strips (i.e., 10% of croplands in perennial vegetation) into corn-soybean rotations led to a 3.5-fold increase in pollinator abundance, 2.1-fold increase in native bird species richness, 37% reduction in total water runoff, retention of 20 times more soil, and 4.3 times more retention of phosphorus. These results demonstrate the impact that strategically diversifying agricultural production can have on biodiversity and ecosystem services.

Agriculture and society overall are increasingly sensitive to extreme weather events. Martha Shulski, Nebraska State Climatologist, stated that “antecedent conditions when combined with floods, droughts or extreme heat can influence the severity of impact for these weather extremes. Conservation practices, such as those that improve soil health, can lead to risk reduction and improved weather resiliency. The use of meta-data for “big-picture” decisions is needed.”
Improved Water Quality and Reduced Erosion-Sedimentation

Approximately 88% of Nebraskans depend on groundwater as their drinking water source. Healthy soil and a healthy soil microbiome provide natural filtration for precipitation that enters groundwater sources that are then utilized for drinking water. Perennial prairie soils are highly effective in water filtration. However, with many of these acres now converted to row crop agriculture, the decreased soil capacity to filter water has had a negative impact on groundwater quality.

The implementation of soil health practices will reduce sedimentation and nutrient and chemical losses into our lakes, streams, and groundwater. Nebraska as a state averages under the 5 ton per acre erosion maximum loss ceiling (RUSLE by the NRCS) but modeling has shown that within the state many watersheds are over 10 ton per acre losses. Runoff water causes erosion which leads to nutrient loading of surface water and contributes to sedimentation of reservoirs and prematurely ends the lifespan and capacity of dams. Soil that is protected with a cover crop or with the residue from a past crop has much higher water infiltration rates and far lower rates of runoff. Soils higher in organic matter also use and hold nutrients more efficiently which increases productivity and profitability while decreasing the risk of nutrient loss.

The map on the right shows the most recent nitrate-N concentrations for 18,754 Nebraska wells.

Producer-implemented soil health practices can and are making a difference! A specific example of how soil health management techniques can improve and protect water is the Shell Creek Project in eastern Nebraska. Shell Creek runs from Newman Grove to Columbus and drains more than 300,000 acres. In 2006, the Environmental Protection Agency designated the waters as impaired due to the high concentration of atrazine. Thanks to a comprehensive watershed management plan that employed soil saving and building techniques, Shell Creek’s water and aquatic life are now the healthiest they’ve been in decades.

In 2018, the watershed made national history as the first stream to be delisted for atrazine from the EPA’s ‘Impaired Waters’ list as a result of implementing a comprehensive watershed management plan. This accomplishment took more than 12 years to accomplish and was a collaborative effort between local producers, the NRD, UNL, NRCS, and other agencies. More than 240 landowners participated in the program, putting more than 340 conservation practices on the land, including no-till farming, filter and buffer strips, and cover crops. Governor Pete Ricketts summed it up perfectly at the delisting ceremony held near Schuyler, NE on June 15, 2018:

This is the perfect example of how Nebraskans pull together to solve our common challenges. Working together, local community leaders collaborated with state and federal agencies, and together they are accomplishing their goals of cleaning up the watershed and being good stewards of our natural resources.
Healthy Soils and Healthy People

Healthy soils are critical to human health as they are the foundation of the food system and nearly all food-producing plants grow in soil. Simply stated, without soil we have very little food to eat. Healthier soils produce healthier, more nutrient dense crops that in turn nourish people and animals. Indeed, soil quality is directly linked to food quality and quantity. Experts believe soil microbes could have a big impact on the nutritional content of our food. Moreover, the plants we eat and the dirt we come in contact with may also directly fortify our own gut microbiomes. The discovery of this link between soil health and human health has commanded the attention of big food companies, farmers, scientists, and environmental organizations, and it has sparked a research boom. In 2018, the Soil Health Institute gathered nearly 200 scientists and organization leaders for the first Conference on Connections Between Soil Health and Human Health. One result of the conference was defining the direct connection between soil health and human health. Assessing an economic value to the environmental and human health benefits provided by soil health is challenging and more research is needed to fully evaluate the connections.

Healthy Soils and Healthy Economics

Farming and ranching are complex businesses and staying in business requires making a profit. Like any business, owner/operators make management decisions based on whether the change will pay for itself and improve the producer’s bottom line. While producers are engaged in environmental stewardship, they must balance that objective with making sure they can pay the bills. Innovators in the healthy soil movement are showing that adopting healthy soil management practices can assist them in meeting both objectives. A positive return on investment (ROI) can come from an increase in yield and/or a reduction in input costs. Soil health management practices must be economically viable; however, the key is to measure economic success in terms of net profit per acre over time and not yield per acre.

To build or restore the soil takes time, and sometimes short-term financial decisions conflict with long-term sustainability goals. Healthy soil management practices have a front-end cost in seed, equipment, and management and benefits cannot always be measured in the first year or two of implementation. The amount of time needed to produce a ROI depends on many factors, but because the benefits are cumulative, the returns continue to grow for many years. Evidence of this comes from a Cover Crop Economics study published by SARE that showed cover crop benefits to yield increasing with each year of use (see Table 1 below). In another example, a 2019 paper published in the journal “SOIL” confirms that crop yields of corn and wheat improved over time by 20% when soil organic matter increased from 0.5% to 1%, and when soil organic matter reached 2% additional significant improvements were achieved.

<table>
<thead>
<tr>
<th>Crop</th>
<th>ONE YEAR</th>
<th>THREE YEARS</th>
<th>FIVE YEARS</th>
</tr>
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<tbody>
<tr>
<td>Corn</td>
<td>0.52%</td>
<td>1.76%</td>
<td>3%</td>
</tr>
<tr>
<td>Soybeans</td>
<td>2.12%</td>
<td>3.54%</td>
<td>4.96%</td>
</tr>
</tbody>
</table>

Table 1 - Percent increase in corn and soybean yields after one, three, and five years of consecutive cover crop use on a field. SARE, “Cover Crop Economics”
Because there may be a time gap between implementation of healthy soil practices and positive ROI, some form of additional sources of revenue would help encourage adoption of these practices. This can come in the form of per acre incentive payments such as the Environmental Quality Incentives Program (EQIP) and the Conservation Stewardship Program (CSP) through NRCS, or discounts to an operating cost like crop insurance. Some states already have local programs in place to encourage farmers to use practices that promote soil health.

Soil health economic benefits are varied and can be challenging to measure and understand. Increased crop yields and decreased input expense are fairly straightforward. Missing from the balance sheet are the economic impact gained from higher organic matter, conserved nutrients, reduced erosion, and increased resilience to weather extremes (droughts and floods). Avoiding potential losses and building future wealth through appreciated land value are also valuable but will not appear on an income statement.

The lack of economic data/ROI is one of the main reasons that the agricultural community shares for not adopting soil health practices. While some economic data exists, more case studies, testimonials, and especially long-term, peer-reviewed research are needed to inform Nebraska producers when evaluating risk in trying something new and substantiating the business case. This is particularly critical considering the thin profit margins that exist in agriculture today. UNL’s Department of Agricultural Economics is proposing a new unit with the mission to support informed economic decision-making in agriculture through applied research and education. As a source of agricultural business management research and education, the unit could play a vital role in analyzing and interpreting data and conducting research in support of soil health economics.

While a number of producers are showing these practices do pay for themselves, it continues to be an area that needs advancement. Jeff Steffen, an HSTF member who farms near Crofton, maintains detailed production records showing the economic benefits of using healthy soil management practices. In a 2019 interview with the Nebraska Farmer, Steffen stated that adding cover crops to his system partially helped him exceed county corn yield averages with only 6 inches of irrigation water and 0.59 lb. of applied nitrogen per bushel produced versus many producers utilizing over 1 lb. of nitrogen per bushel. Steffen also said:

You need a living root in the soil in order to reduce applied nitrogen...and I cut back on my nitrogen slowly over time. I’ve been able to go with all conventional soybeans now, saving on seed cost.

I don’t have any insecticide or fungicide treatment costs, and I’m no-till so I don’t have extra fuel expenses. By keeping things covered, we are able to reduce inputs, get as good or better yields and improve water infiltration and water-holding capacity in the soils. To truly build organic matter with cover crops, you really need to add that small grain to the rotation.11

<table>
<thead>
<tr>
<th>Jeff Steffen Crop Expenses vs. University of Nebraska 2019 Crop Budget</th>
<th>Cost to Produce Bushel of Grain</th>
<th>Jeff Steffen’s Farm</th>
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<tbody>
<tr>
<td>Crop</td>
<td>Lowest Cost UNL Budget</td>
<td>$2.91</td>
</tr>
<tr>
<td>Irrigated Corn (Pivot)</td>
<td>$2.91</td>
<td>$2.79</td>
</tr>
<tr>
<td>Dryland Corn</td>
<td>$3.24</td>
<td>$2.83</td>
</tr>
<tr>
<td>Irrigated Soybeans</td>
<td>$7.45</td>
<td>$6.52</td>
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<tr>
<td>Dryland Soybeans</td>
<td>$7.48</td>
<td>$6.38</td>
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<tr>
<td>Winter Wheat</td>
<td>78 Bu/A</td>
<td>$5.04</td>
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<tr>
<td>Oats</td>
<td>120 Bu/A</td>
<td>$2.90</td>
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Corn and Soybean Yields in Trendline with County Averages

Source: UNL 2019 Crop Budget, Jeff Steffen Farm Data 2016-2018

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<thead>
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<th>Source: UNL 2019 Crop Budget, Jeff Steffen Farm Data 2016-2018</th>
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<tr>
<td>Utilizing cover crops and other soil health management practices allows Jeff Steffen to be a low-cost producer of his crops which leads to profitability.</td>
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<tr>
<td>This table shows Steffen’s cost of production significantly lower than the bottom end of UNL crop budgets.</td>
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Table 2

Additional Economic Studies

- A Datu Research case study analyzing the Willis farm12 from Northwest Missouri showed that cover crops had a positive impact on profit in three out of four years with an average gain in net income of $17 per acre. The adoption of cover crops over the four years of this study produced benefits including yield increases, reduction of fertilizers, herbicides, and erosion-related repairs, and savings of hay by using cover crops for cattle grazing.
Why Is Soil Health Important?

- A Cover Crop Economics study published by SARE\textsuperscript{13} showed cover crop use having positive impacts to both corn and soybean yields in five consecutive years and showed the most benefits in the drought year of 2012 (see Table 3). This study goes on to evaluate the special situations (compaction issues, grazing, conversion to no-till, a drought year, etc.) where cover crops and other soil health practices pay off faster and show impressive net returns - especially the longer the practices are used. See Appendix C for the full analysis tables.

- An American Farmland Trust case study of the Thorndike Farm in Illinois\textsuperscript{14} analyzed the benefits and costs of adopting conservation tillage, nutrient management, and cover crops. Results showed their bottom line improved by $34 per acre across 1,400 acres by adopting the soil health practices. In addition, they have seen an increase in the water holding capacity, organic matter content, aggregate stability, and earthworm activity of their soil resources.

- In addition to increases in productivity and profitability, investments in soil health adds long term value to the land as well. For each 1% of soil organic matter, the value of the nutrients alone is $465 per acre, and the extra water holding capacity of better soils may contribute to higher yields (see Tables 4 and 5). Consider the accumulation of wealth to the state as we build the organic matter levels back in Nebraska soils. To increase soil organic matter, some of the nutrients may be indigenous to the soil, others may have to be inputs.

<table>
<thead>
<tr>
<th>Value of Soil Organic Matter</th>
<th>Water Holding Capacity Value of Extra 1% SOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nutrients</td>
<td></td>
</tr>
<tr>
<td>1% organic matter = 20,000 pounds*, 50% carbon, C:N ratio = 10:1**</td>
<td></td>
</tr>
<tr>
<td>Nitrogen</td>
<td></td>
</tr>
<tr>
<td>1000 pounds @ $0.40 per pound = $400.00</td>
<td></td>
</tr>
<tr>
<td>Phosphorus</td>
<td></td>
</tr>
<tr>
<td>100 pounds @ $0.40 per pound = $40.00</td>
<td></td>
</tr>
<tr>
<td>Potassium</td>
<td></td>
</tr>
<tr>
<td>100 pounds @ $0.20 per pound = $20.00</td>
<td></td>
</tr>
<tr>
<td>Sulfur</td>
<td></td>
</tr>
<tr>
<td>100 pounds @ $0.08 per pound = $8.00</td>
<td></td>
</tr>
<tr>
<td>Carbon</td>
<td></td>
</tr>
<tr>
<td>10,000 pounds (5 tons) @ $4/ton = $20.00</td>
<td></td>
</tr>
<tr>
<td>Total Value of 1% SOM per acre</td>
<td>$465.00</td>
</tr>
</tbody>
</table>

\*Assumptions: 2,000,000 pounds of soil in top 6 inches
\*Relative ratio of nutrients: 100 Carbon/10 Nitrogen/1 Phosphorus/1 Potassium/1 Sulfur
Source: Understanding Soil Microbes and Nutrient Recycling, Hoorman and Islam, Ohio State University, SAG-16-10

- The recent reThink Soil: A Roadmap to U.S. Soil Health study\textsuperscript{15} organized by The Nature Conservancy gathered soil health economic information from a wide variety of sources for three important field crops: corn, soybeans, and wheat. The study estimated that for each 1% of these crop acres that adopted soil health practices, the annual economic benefits would amount to $226 million of societal value through increased water holding capacity, reduced erosion and nutrient loss, and reduced greenhouse gas emissions. The study concludes that soil health could ultimately deliver $50 billion of social and environmental benefits every year. The large economic benefits that accrue to the non-farming public are evidence that tax revenue should be used to assist producers and landowners making the challenging transition to soil health practices.

While more academic economic studies will be important, case studies and testimonials such as these can inform and influence the emotions, trust and motivation of other producers deciding whether to try something new.

**Soil Health and Organic Farming**

An increasing number of Nebraska farmers are transitioning to certified organic production to meet a growing demand and to increase profitability. Certified organic operations in Nebraska sold $185 million in products in 2019, an increase of 92% from 2016. The number of operations increased 47% during the same time period. In January
2020, 110 farmers responsible for over 1.83 million acres attended a UNL Organic Transition Workshop in Mead, NE. Traditional organic practices are heavily reliant on tillage which can be detrimental to soil health; however, a growing subset of organic producers are implementing soil health management strategies such as cover crops, roller crimpers, weed flamers, diverse rotations, and livestock integration which are reducing the amount of tillage required and enhancing the health of their soils. Application of livestock manure in conjunction with proper use of cover crops can also improve soil health while providing for fertility needs in organic systems. As interest in organic production grows, it is important that organic producers understand and implement as many soil health management practices as possible.

**Improved Quality of Life**

A 2019 poll conducted by South Dakota State University in partnership with the South Dakota Soil Health Coalition queried both conventional-practice producers and soil health producers to assess their stress levels on a range of issues from market price volatility to extreme weather events. They were also asked to assess current and future operation profitability, input cost pressure, and natural resource conditions for generational succession. Results indicate that a significantly higher percentage of farmers implementing soil health-improving practices in their operations experience less stress, are more satisfied with farming, and are more optimistic about their futures than their conventional farming peers. Producers using a greater number of soil health practices reported less stress, greater farmer satisfaction, and greater optimism. The soil health producers were also almost twice as confident that their operation is well positioned for generational succession. The importance of this was underscored in the HSTF 2020 Statewide Producer Survey. More than 80% of 267 producers gave a High or Very High rating for “I want to leave my land better for the next generation” as an incentive to make changes that improve soil health (see Appendix D).

**Summary**

Perhaps the best summation of why soil health is important is another quote from Dr. Rattan Lal:

Soil health determines the productive capacity of any agricultural practice… By improving soil health, we can produce more from less: less land, less water, less fertilizer, less pesticides, less environmental damage, less emission of greenhouse gases.
**The Principles of Soil Health**

While the art and science of implementing soil health practices will be unique to each producer, the basic principles of soil health are universal. There are five widely recognized Soil Health Principles which are summarized by the NRCS North Dakota Soil Health Specialist Jay Fuhrer. These soil health principles do not replace but rather complement and strengthen structural conservation practices such as terraces, grassed waterways, riparian buffers, and windbreaks. These more permanent conservation practices can further protect soil and water resources and ensure the effectiveness of individual farm production systems based on the site’s specific needs.

**Keep the Soil Covered**

Soils need to be covered (armored) with residue from previous crops, or from the living canopy of a growing crop or cover crop. This armor protects the soil from the sun and weather, reduces or eliminates wind and water erosion, increases water infiltration, reduces evaporation, moderates soil temperatures, reduces compaction, suppresses weed growth, and provides a habitat for soil biology.

**Minimize Soil Disturbance**

Any productive ecosystem must have limited disturbance or disruptions in order to thrive. Minimizing soil disturbance can help restore soil organic matter. Soil disturbances can be physical (tillage, erosion, compaction), chemical (over-application of nutrients and pesticides) or biological (overgrazing and monocultures). While it is impractical to eliminate all disturbance from a production agriculture system, the amounts and the effects should be minimized whenever possible.

**Maximize Diversity**

Our soils were built over time, as diverse plant communities grew in harmony with diverse soil microbial populations to create a symbiotic ecosystem that provided forage for an abundance of wildlife. Production agriculture has replaced polyculture perennial landscapes with monoculture annual landscapes, leading to a less diverse soil microbiome. Diverse crop rotations and diverse cover crop mixes are needed to broaden the biological community of our soils. More diverse rotations also allow for easier livestock integration, manure applications, and timely cover crop plantings.

**Maximize Life and Growth of Plants**

A healthy soil ecosystem requires plants to be continually living and growing, capturing sunlight, carbon dioxide, and water, and turning it into carbohydrate sugars and oxygen (photosynthesis). Much of this sugar is released into the soil to support the microbiome which in turn nourishes and protects the plant community. Most Nebraska farms grow cool or warm season annual crops, which have a dormant period before planting and/or after harvest. Cover crops can fill that dormant period and maximize both photosynthesis and the biological life of the soil.

*Photo shows plant root exudates leaking out to feed soil biology.*
Integration of Livestock

Animals have long played a collaborative role with plants and biology to develop our soils over time. Livestock’s impact on soil health is the cumulative effect of plant biting, saliva, urination, defecation, trampling, and all the other ways that grazing animals impact plants and soil. Using livestock manure to fertilize fields can substantially increase the soil’s organic matter with improved water-holding capacity.

A sixth principle of context integrates the five agronomic principles and the diversity of individual operations and regions. It is not an agronomic principle but it is necessary to fully understand and effectively apply the Five Principles of Soil Health.18

Know The Context

The agricultural, economic, and social context that each producer operates within must be considered when implementing soil health principles. Nebraska resources are very diverse and differences in climate, topography, and soil types matter when it comes to soil health management. The five preceding principles will successfully work in every county in Nebraska, but they need to be skillfully applied within the local context to target the specific goals and objectives of each producer.

6 Core Principles of Soil Health and Regenerative Agriculture

These principles of soil health are often practiced in a system of agriculture referred to as Regenerative Agriculture, which is a system of farming principles and practices that increase biodiversity, enriches soils, improve watersheds, and enhance ecosystem services. Conservation tillage, cropping system diversity, minimized field traffic, or any practice that increases the resiliency of the soil to drought or other extreme weather events are considered regenerative practices. Large food companies such as General Mills, Cargill, Walmart, Unilever, Dannon, and Nestle are encouraging and subsidizing regenerative agriculture practices for producers in their supply chains.
Livestock Impact on Soil Health

Livestock have always been part of the ecosystem that has produced food for humans and developed the deep, productive soils found in the Great Plains. However, because of economies of scale, specialization, and policies, fewer Nebraska farming operations now include livestock as part of the overall enterprise. Without integrating livestock in some way into a farming system, implementing a successful and profitable soil health improvement plan is more difficult.

There is no substitute for the positive effects of animals grazing growing plants; their hooves break up the soil crust, crushing plant matter and creating mulch, cycling nutrients and allowing sunlight to reach new plants. Livestock saliva, urine, and dung add valuable biology to the soil and provide for natural fertility. Livestock integration can be very profitable as animals perform very well and the cost per ton of feed from a grazed cover crop is usually far less than the cost of harvested hay or silage. Including livestock in a statewide soil health initiative is critical since close to half our land resource is devoted to the feeding of animals through forages or grazing.

Practice and research is showing that, when managed with the other principles, adding livestock to a system can enable a more self-reliant farming system. Ron Bolze, HSTF member, Chadron State College professor, and the Nebraska Grazing Lands Coalition Coordinator stated:

The reintegration of livestock has management challenges but the potential benefits to soil and profitability are significant. Using proven grazing principles, soil health can be increased on pastures, native range and grazed crop acres. With 22 million of Nebraska’s 45 million farm and ranch acres in rangeland and pastureland, half in the sandhills, the potential impact is significant. Incorporating the grazing ruminant has the potential for the greatest enhancement in soil health over time.

Grazing management of perennial plants is continually improving. Managed rotational grazing techniques benefit both the land and the animals. It results in increased native grass production and restoration of vegetation on degraded land, thereby increasing soil organic matter. Dr. Richard Teague from Texas A&M AgriLife Research has shown that ranchers practicing proper grazing principles have been able to increase organic matter levels by 50% in a 10-year period compared with conventional grazing practices, while at the same time greatly improving profitability. Results from studies conducted by Arizona State University School of Sustainability show that with just 5 years of managed grazing, significant improvements are achieved with increases in soil organic matter, soil carbon, root structure, depth and mass, soil structure, aggregation, and apparent soil life.

<table>
<thead>
<tr>
<th>Texas study - soil, carbon, nutrients and water</th>
<th>Heavy continuous</th>
<th>Light continuous</th>
<th>Multi-paddock</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil organic matter</td>
<td>3.1</td>
<td>4.4</td>
<td>4.86</td>
</tr>
<tr>
<td>Fertility CEC</td>
<td>24.6</td>
<td>23.7</td>
<td>27.4</td>
</tr>
<tr>
<td>Water-holding (gal./ac.)</td>
<td>55,700</td>
<td>79,059</td>
<td>87,324</td>
</tr>
</tbody>
</table>

Source: Richard Teague, Texas AgriLife Extension

Table 6
Another opportunity for many farms in Nebraska is to utilize the manure produced from the many livestock (cattle, swine, and poultry) facilities across our state. The application of manure to cropland can improve the soil’s physical, biological, and chemical properties. The high concentration of organic carbon and nutrients in manure make them a soil amendment that can’t be duplicated by commercial fertilizers. The nitrogen and phosphorus supplied are typically in a slow release organic form that is less susceptible to environmental losses than most commercial fertilizers. When manure applications are combined with proper use of cover crops, nutrients can be sequestered and cycled very safely and effectively. As with any fertilizer, application rates must be matched to crop nutrient requirements. Distance to fields is a challenge since raw manure is expensive to haul and apply. Developing inexpensive composting and dewatering systems or ways to decentralize some feeding operations will be crucial to getting the manure benefits on more farms.

In early 2020, a faculty team from University of Nebraska, University of Minnesota, and Iowa State University surveyed 957 farmers and their advisors on the benefits and barriers to manure use. 70% responded that “Fertilizer and manure regularly complement each other in crop fertility programs.

Producer Profile

Logan Pribbeno (@Nebraskero on Twitter and Instagram) and his family operate the Wine Glass Ranch in Chase County, north of Imperial, NE. Their family farms 5,000 dryland acres, rents irrigated corn, and manages 1,200 cows and 4,500 steers/heifers on 18,000 acres, plus hunting/outfitting opportunities. Logan believes that cattle integration is the “magic” that turns soil health into profit. Wine Glass no longer applies phosphorus or potassium to its fields, and has also reduced nitrogen. Additionally, Logan has opted not to apply nitrogen to his fields in the fall. Fifty years ago, farmers integrated cows in their operation through farmer-to-farmer partnerships and he’d like to see that popularized today.
The Soil Health Movement

Farmers and ranchers around the world are experiencing a number of challenges. These range from shrinking profit margins to increased public scrutiny concerning the impact current agricultural practices have on the environment. It is a huge task and a delicate balancing act for Nebraska’s farmers and ranchers to produce food and fiber for a growing world population, while maintaining profitability and protecting natural resources and health. Soil quality, erosion, water quality, and net income are all issues that are inextricably linked to the soil. Increased knowledge through educational programs on the value of healthy soils and the restoration of carbon has led to a growing soil health movement.

This movement is worldwide; in applying these soil health principles to Nebraska, it is important to develop a mix of principles that best fit the state’s diversity of conditions. In Nebraska, innovative farmers, ranchers, researchers, government agencies, non-government organizations, and agribusinesses are taking the lead at developing and promoting a widespread focus on soil health.

Those associated with the soil health movement are finding that healthier soils lead to improved yield stability and greater net financial returns over time. Healthy soils improve soil structure, resulting in increased infiltration rates and water storage capacity in the soil profile. This makes the soil more resilient to drought, flooding, and erosion, thereby reducing runoff of sediment and chemicals into surface water which protects the public investment made in flood control structures and dams by keeping the sediment and other contaminants out of the reservoirs. These producers are building wealth in their land through enriched soil and protecting both the economic engine and the environment for future generations.

Recently, increased interest in rewarding producers for implementing soil health practices has led to the creation of several programs in the private sector. In early 2020, the USDA announced a new Innovation Initiative that includes enhancing carbon sequestration through soil health and forestry, using innovative technologies and practices to achieve net reduction of the agricultural sector’s current carbon footprint by 2050 without regulatory overreach and reducing nutrient loss to improve water quality. Additionally, multiple carbon sequestration programs are being launched where farmers will be able to generate additional income by selling carbon credits.
Barriers and Constraints

With the many demonstrated benefits of implementing soil health practices, one might ask why the adoption and application rate of these principles is not higher. The 2017 Census of Agriculture reports the overall national use of cover crops at 15.4 million acres of cover crops grown on acres of harvested cropland, which is about a 5% adoption rate. While Nebraska has led the nation in no-till adoption, less than 5% of cropland acres across the state utilize cover crops. While soil health practices have many positive benefits, there are many barriers and constraints that are keeping Nebraska farmers from more broadly implementing cover crops and other soil health practices.

Education and Information Availability vs. Producer Awareness

Nebraska key stakeholders (UNL, NRCS, NRDs, nonprofits, agribusinesses) provide data and informational resources and conduct soil health education events. However, a relatively small percentage of producers take advantage of these opportunities. Additionally, very few outreach and education efforts have been directed toward crop advisors, co-op agronomists, farm managers, lenders, and non-farming landowners. More education opportunities are needed for all groups but to maximize this investment, greater coordination and awareness between key stakeholders is needed.

Understanding the Economic Impact of Soil Health Practices

Producers see the immediate expenses involved in implementing soil health practices, but the return on that investment (ROI) is not always observed immediately and is not as easily measured or understood (as compared with conventional crops). Return on physical investments such as equipment, terraces, or tiling are easier to see but many soil health benefits are compounding and cascading and can not be measured in the first year or two of implementation. More data is needed to impart that knowledge to producers.
Non-operating Landlords
40% of Nebraska’s agricultural land is tenant farmed. Economically it is often difficult for the tenant to invest in soil health practices that will improve long-term productivity and value of the land when their farming tenure may be short. Landlords need to understand the value of soil health and encourage longer-term leases to facilitate the adoption of practices.

Lack of Adequate Incentives and Discounts for Adoption
Implementation of soil health practices may require initial investments of equipment and education. These investments need to be encouraged and partially offset with incentive programs that encourage ongoing use of soil health management even after the incentive program has expired.

Universal Soil Health Measurement Standards
Much like assessing human health through various medical tests, having an appropriate, well defined, and well-understood set of soil health measurement tests will allow better monitoring and evaluation of soil health needs and on-farm progress in Nebraska fields and rangeland. Soil health measurement standards need to be widely agreed upon, adopted, and promoted within Nebraska by all soil health stakeholders.

Corn-Soybean Rotation and Cover Crop Implementation
The dominant crop rotation on the majority of Nebraska crop acres is corn and soybeans. When the fall harvest is late, the time needed to establish a successful cover crop is limited. This reason was identified as the top barrier to overcome in the response of over 120 farmers from surveys conducted by the HSTF and UNL Extension events. (see Appendix D for full survey results.) Some innovative producers are experimenting with interseeding cover crops in corn prior to harvest, and while this sometimes works, much more research on this practice is needed. Cereal rye is very cold-hardy and can be planted later in the season or frost seeded and is often successfully used as a cover crop prior to soybeans. Cereal rye before corn can also work well but is much more challenging. In arid environments, there are legitimate concerns that cover crops may compete for limited moisture.

Increased Management Requirements for Soil Health Practices
The increased management and labor required to implement soil health practices can be a barrier. Cover crops typically require an additional equipment pass after harvest for seeding, which is often difficult when labor and appropriate seeding time is limited. Maintaining existing no-till acres is also challenging as herbicide-resistant weeds have become a major issue and decreased effectiveness and increased cost of herbicides have driven some producers back to tillage. Management considerations and training are also needed to expand crop rotations, improve nutrient and manure management, irrigation efficiency, and cover crop termination.

Integration of Crops and Livestock
Lack of infrastructure (fences and water) and the lack of time and management capacity have kept many Nebraska producers from integrating livestock into their systems. When farm incomes are down overall, the extra risk of beginning these practices becomes a barrier to implementation. There is a pressing need for assistance in integrating livestock on row-crop land, and an opportunity to educate land-owners about potential benefits.

Soil Health Education for Pasture and Range Management
Soil health research and education have focused largely on cropland acres, but our grassland resources are just as important to protect and improve. More educational resources need to be developed towards soil health in pasture and range. The expanded use of portable fencing and water systems on row-crop lands are being developed which would provide another manner to support producers.
THE INITIATIVE - SOIL HEALTH FOR NEBRASKA WEALTH

Considerable efforts are being made to restore Nebraska soils to a healthier state; however, the scope and rate needs to increase. A multitude of entities are currently involved in providing education, technical assistance, research, and demonstration on various aspects of healthy soil principles and practices (see Appendix A). Some excellent programs have been created and made available but adoption is still limited. More communication and awareness is needed as research findings show that positive predictors of conservation practice adoption included positive attitudes and awareness of conservation practices and programs. The HSTF concluded that the following factors need to be addressed in order to bring about rapid, widespread adoption of soil health practices.

1. Develop better methods to measure and quantify soil health.
2. Improve coordination, collaboration, communication (the 3 C’s) between existing programs.
3. Be more tactical in determining who the audience is, what programs are offered, and how.
4. Increase producer, non-operating landlord, and public soil health awareness and knowledge.
5. Demonstrate best soil health practices and benefits in real-life situations on a regional basis.
6. Focus on the economic benefits of soil health through research, case studies, and testimonials.
7. Enhance learning through peer-to-peer, mentoring, and train the trainer methods using the latest technology.
8. Increase research around soil health.
9. Actively pursue multiple sources of funding for new programs and incentives.

Addressing these factors is the basis for a Healthy Soils Initiative to remove adoption barriers and constraints and accelerate the adoption of soil health awareness and adoption. Asking, “How can we do better?”, is the essence of the Initiative's goals and corresponding action plan to make it happen.

Thirty-five states have or are developing Statewide Soil Health Initiatives. Our approach is based upon best practices but particularly one key mantra: the direct, consistent, and foundational involvement of producers in the system's change process. Farmers, ranchers, and non-operating landowners are the ones who have the final say on their management practices. This was stressed in a recent research project led by Andrea Basche, UNL Assistant Professor of Agronomy, where staff and board members of Nebraska NRDs were interviewed. A majority of respondents felt that soil health would best be impacted by “more interest from farmers” but, surprisingly, did not see increased funding or personnel as the top influence. Several comments stressed that investing in relationships with producers would result in immeasurable benefits.

The HSTF proposes an Initiative that is a visible, coordinated, highly publicized statewide campaign throughout Nebraska to protect and enhance the health of its soils by increasing awareness and adoption of soil health principles. With input from the feedback sessions, the theme selected by the HSTF to promote the Initiative is “Soil Health for Nebraska Wealth.” This theme stresses the value of soil and water resources to Nebraska and the importance of soil health to the economic future of its farmers and ranchers.
In compliance with Legislative intent and to meet “best practice” from across the nation, participation in the proposed Initiative will not be achieved through mandates or regulations but rather through voluntary partnerships and participation with producers, key stakeholders, and the public. While there will be many complexities to the adoption of soil health management principles and practices, the Initiative considers all farmers, ranchers, and landowners as potential participants, and all other interested and concerned parties as potential stakeholders. The Initiative goals are designed to build capacity and collaboration without adding unnecessary bureaucratic layers.

**Initiative Goals**

1. Establish the Nebraska State Soil Health Hub with Regional Proving Grounds
2. Form a Nebraska Statewide Producer Learning Community
3. Develop the Next Generation of Soil Health Practitioners
4. Recruit $50,000,000 in Additional Soil Health Funding and Incentives Over the Next 10 Years
5. Create Nebraska Soil Health Benchmarks and Measurements of Success

This graphic shows the correlation between the Initiative outcomes and the positive benefits for the entire state of Nebraska.
**Goal 1: Establish the Nebraska State Soil Health Hub with Regional Proving Grounds**

**Rationale**

After analyzing existing efforts (see Appendix A), the HSTF sees potential for these groups to have greater impact by working more cooperatively with a common plan of action. By working collectively, the resources of NRDs, UNL, NRCS, and other stakeholders in soil health would be better utilized. These factors were repeatedly stressed during conversations with national leaders and the review of other states’ Soil Health Initiatives. A general theme that emerged from the research confirmed that coordination of soil health efforts is often lacking but will be needed to ensure Nebraska’s status as a powerhouse agricultural state and be the leader in natural resource conservation.

The HSTF recommends the formation of a Nebraska State Soil Health Hub within the overall Initiative. The Hub would create a centralized means to facilitate enhanced coordination, collaboration, and communication among existing entities in partnership with producers and non-operating landowners to carry out the goals of the comprehensive Initiative. The Hub should not be another layer of bureaucracy or duplicate what is already going on, but a mechanism to bring all soil health stakeholders together, building upon and enhancing existing efforts with the addition of new, voluntary approaches to fill gaps.

**Soil Health Hub Purposes and Structure**

- The purpose of the Hub is to bring UNL, NRCS, NRDs, NDA, and other agencies, organizations, producers, and landowners together into a formal partnership, utilizing a common blueprint to address the Initiative’s soil health goals and timelines.
- Promoting the Initiative as a statewide campaign to enhance efforts to protect and improve soil health.
- Working in partnership will reduce duplicated efforts and disconnected programming, ensure the delivery of a consistent message, and reduce chances for programmatic gaps.
- Including producer input and involvement in the process will enhance and strengthen the effectiveness of education, technical assistance, in-field demonstrations, and applied research programs.
- The creation of this Hub would increase the competitive position of Nebraska in obtaining funds from grants, corporate partnerships, and ecosystem service programs (Goal #4) as it creates a point of contact for those wanting to connect to Nebraska’s soil health programs. These funds would focus on incentives and markets to help producers in their soil health journey.
- The Hub would be governed by a Board of Directors that includes representation from the principal soil health partners as well as strong producer representation.
- An Advisory Committee made up of additional representatives from the soil health community would be formed to offer additional input and guidance.
- Full-time staff would be required to carry out the directives of the Board of Directors. Potential staff could include an Executive Director along with staff having expertise in economics, fundraising, communications, and administrative support.
- A 501(c)(3) organization would likely need to be formed to ensure the staff is independent and equally responsible to each of the partners with direction given and performance evaluated jointly by the Board.

**Soil Health Hub Activities**

The activities of the Soil Health Hub will be set by the Board of Directors and may include but not be limited to:

- Coordinate, collaborate, and communicate planned soil health activities across Nebraska.
- Promote soil health benefits, principles, and practices to producers, landowners, and consumers.
- Document the economic viability of adopting healthy soil management practices.
- Identify and initiate projects where more research is needed to remove adoption barriers.
- Create and facilitate the Producer Learning Community (Goal #2).
• Recruit soil health market incentives and investments for producers and landowners (Goal #4).
• Seek and acquire the financial resources needed to carry out the Initiative.
• Develop and maintain a centralized website for Nebraska soil health information.
• Facilitate, coordinate, and communicate the six regional soil health proving grounds.

Soil Health Regional Proving Grounds
Nebraska has a unique diversity of soils, topography, rainfall, cropping systems, and other environmental factors. While soil health principles apply statewide, one set of practices will not fit the entire state and can differ by region, farm, and ranch depending on what is needed to reach the desired healthy soil standards. The HSTF recommends the creation of Regional Proving Grounds (RPGs) to provide ground-truthing of soil health practices. A proving ground is a term used throughout industry and the military as a “place for scientific experimentation or testing or a place where something is developed and tried out.”

The HSTF suggests dividing the state into six regions: Panhandle, Southwest, North Central, South Central, Northeast, and Southeast. These six regions correspond to Nebraska’s six distinct agro-environmental regions, NRCS land management areas, Natural Resource District boundaries, and the Nebraska Extension Engagement Zones. These RPGs will allow for region-specific experimentation, testing, and demonstration to “prove” and analyze the agronomic, economic, and environmental viability of soil health practices.

Characteristics and Functions of Regional Proving Grounds
• Study how livestock can best be integrated into farming systems.
• Develop, demonstrate, and educate best practices for managed grazing.
• Address areas of greatest need within each region.
• Show how soil health management systems can be beneficial to wildlife populations.
• Operate living classrooms to educate producers, landowners, and consumers.
• Utilize existing infrastructure of NRDs, UNL Research, and NRCS research and demonstration farms.
• Direction and coordination of the RPGs would fall under the Soil Health Hub with extensive use made of appropriate existing personnel, including UNL Extension Engagement Zone Coordinators and Agents, NRCS field personnel, and NRD staff.
• The UNL On-Farm Research Network should also be utilized. This network works with 60 producers each year to conduct 80-100 on-farm research studies and has gained a reputation as a reliable and unbiased source of information.
• The Rogers Memorial Farm, a long term no-till research farm owned and operated by UNL, should be used as a model of how effective these RPGs could be.
• NRCS and UNL have partnered since 2017 to establish 17 soil health demonstration farms and 9 research ranching sites (designated by stars on the map above). The successes and experiences of this partnership should be utilized as well to develop unique long-term sites on producers’ fields and grassland.
• Increase support for producers to offset the risks involved in implementing soil health management systems.
Goal 2: Form a Nebraska Producer Learning Community

Rationale

Concern for agricultural productivity and profitability, food quality and security, environmental resilience, ecosystem sustainability, and increasing weather variability has resulted in soil health moving to the forefront of many producer conversations. One outcome is that producers in several states have formed producer-led organizations to address soil health. 37 states, including Colorado, South Dakota, and Kansas, have formed such organizations and can serve as models. Most of these producer organizations were formed because the members wanted to learn and enhance their working knowledge and promote soil health practices to others.

The HSTF recommends the creation of a statewide Producer Learning Community (PLC). The PLC would bring together like-minded people to foster learning, capacity building, and knowledge gathering, and generate information to guide informed decisions. A formal organization of progressive producers in soil health will provide leadership in addressing farm economics, resource stewardship, and the management of environmental issues on working farms and ranches. Working together, producers will be more empowered and can have a greater influence than working alone.

The Nebraska approach will be somewhat different from other states’ producer groups in that the PLC would not be a stand-alone organization. It is a key component of a three-pronged approach, along with the Soil Health Hub and Regional Proving Grounds, to increase the pace of healthy soil management practice adoption. The producers themselves will be integral to the educational and change process. Farmers and ranchers talk to one another and trust what other farmers and ranchers tell them. Modern technology allows interaction with producers utilizing best soil health practices wherever they reside. Although this would be a statewide organization, it might be useful to subdivide the Producer Learning Community along the RPG lines for more locally targeted meetings and learning.

Like many producer groups, a small fee ($50 or less) from members to show commitment to the organization and provide some operating capital for programs and services is recommended. The majority of the operating and administrative costs of the PLC would be funded by the Hub, and administrative and coordinator duties would fall to Hub personnel as well. Potential members would include farmers and ranchers who are using healthy soil management practices in their operations as well as those who are interested in learning more. Landowners, agriculture support workers, agribusinesses, and consumers would also be welcomed as members in the PLC.

The PLC would work closely with the Hub to communicate the needs and challenges of producers and non-operating landowners. Their involvement as a formal component of the Soil Health for Nebraska Wealth Initiative may be the most important factor leading to success. One Producer Learning Community member from each of the six Regional Proving Grounds could serve as a representative on the Hub Board of Directors.

Outcomes

A successful Producer Learning Community would have the following outcomes:

- Sponsor formal workshops, courses, field days, educational programs, mentoring, informal networking events, online groups, etc., to provide members with the latest soil health information and developments (with the assistance of the Hub).
- Allow members to serve as mentors, providing tours, and sponsoring education and training events on their farms.
- Provide practical and local resources for producers who are interested in beginning to implement soil health practices.
- Leverage and extend the influence and the work of UNL, NRCS, and NRD education programs.
- Participate and inform the Nebraska NRCS Soil Health Producer Advisory Board and the Local Working Groups of the NRD/NRCS regions to collaborate and deepen soil health understanding with technical service providers.
- Explore precision technology and the role in natural resource conservation and economics.
Goal 3: Develop the Next Generation of Soil Health Practitioners

Rationale
While the first two Initiative goals focus on existing soil health producers and technicians, the HSTF also wanted to look to the next generation of soil health practitioners. We feel that it is imperative to build training systems and educational frameworks to encourage, recruit, and train young people who are interested in soil health careers. Additionally, we want to expose all young people to the benefits of soil health so that the next generation of consumers will be soil health savvy. We need to facilitate the development of the next generation of farmers, ranchers, technicians, conservationists, educators, entrepreneurs, agronomists, agribusiness workers, and leaders to ensure a productive and sustainable future for Nebraska.

Throughout our input-listening sessions, the entities and organizations (i.e., Nebraska Cooperative Council and NRDs) indicated it was extremely difficult to find qualified employees with backgrounds and/or experience with soil health. This shortage of workers is magnified by the increased need to find qualified people for open positions. Couple this with the increasing average age of the Nebraskan farmer/rancher (56.4 years old) and there is a looming workforce crisis that needs to be addressed.

Activities and Outcomes
- Develop programs with FFA, 4-H, and other K-12 programs to nurture relationships with Producer Learning Community members to teach soil health principles and share agricultural experiences.
- Collaborate with UNL, community colleges, and other post-secondary educational systems to establish soil health scholarships, internships, and job placement to support students as they progress through high school and post-secondary education.
- Facilitate post-high school soil health internships between graduates and agribusinesses, NRCS, UNL, NRDs, Vocational Agriculture instructors, and other organizational stakeholders within the soil health realm.
- Support young producers through Beginning Farmer-Rancher soil health incentive programs and mentoring programs.
- Assist in the transition of land stewardship for retiring farmers to young soil health producers.
- Develop capacity with UNL Extension, NRCS Support, NRD staff, and other core agricultural community networks to support rural communities in building leadership and resiliency.
- Develop annual “Soil Health Educator Boot Camps” for all interested K-12 educators and trainers.
- Develop training sessions for ag bankers, ag insurance, farm management companies, etc., on soil health and involve the RPGs as a lab-based approach over multiple years.
- Utilize digital and social media platforms to share positive soil health experiences to all audiences but specifically young people.
- Encourage programs like UNL’s Engler Agribusiness Entrepreneurship Program to spend sufficient time focusing on soil health-related facets of agriculture.

An example of what we need more of is a project recently completed at the Lewis and Clark NRD. It is a pilot project with UNL, NE Game and Parks, NRCS, Bazille Water Management Project, local co-ops, and agronomists, producers, and students from Dr. Andrea Basche’s Ag Business 405, the senior capstone course on integrated farm management. Over the course of the semester, students met and interviewed five producers. They analyzed soil tests, yield maps, marketing, and livestock. Their challenge was to make three recommendations for areas that the producer wanted to address as well as challenges that were identified by the students. By establishing real-world soil health experiences for future producers, agronomists, teachers, and conservationists, we can give them a head start into their careers.
Goal 4: Recruit $50,000,000 in Additional Soil Health Funding and Incentives Over the Next 10 Years

**Rationale**

The HSTF believes it is far better to incentivize farmers and ranchers to adopt healthy soil management practices rather than to regulate them into it. Incentives can be an effective way to encourage producers to try new things, but widespread incentive programs require large scale funding. NRCS programs like EQIP and CSP are effective but limited, with less than 8% of all cover crop plantings in Nebraska being program funded. Additional incentives beyond these existing programs are needed to advance soil health in Nebraska. One of the priorities of the newly established Soil Health Hub will be to research and recruit additional incentive funding sources for producers.

The Hub can also assist and support other entities across the state in submitting soil health grant and program applications. The objective is to get the vast majority of the money to producers to encourage soil health practice adoption. The goal of recruiting $50,000,000 of soil health incentive money and getting 90% of it directly to the producers is big but doable, as there are a number of sources to draw from. The remaining 10% would be needed for program administration for various grants and programs across all entities who are working in the soil health space.

**Grants**

There are many soil health grant opportunities worth hundreds of millions of dollars available today. The Hub will be a coordinating body and will both write grants and coordinate and assist in writing with other entities. Some of the larger possibilities are:

- Conservation Innovation Grants (CIG) are a USDA Farm Bill provision that directs $25 million for on-farm trials, including soil health demonstration trials.
- Regional Conservation Partnership Program (RCPP) promotes coordination of NRCS conservation activities with partners that offer value-added contributions to expand the collective ability to address on-farm, watershed, and regional natural resource concerns.
- 319 Grants are federal grants for nonpoint source water pollution mitigation projects. More than $150 million per year have been awarded over the last 30 years.
- Nebraska Environmental Trust (NET) was established in 1992 to conserve, enhance, and restore the natural environments of Nebraska and has awarded more than $300 million in grants. Soil health practices directly address three of the five funding categories, and well-written and coordinated grants administered by the Hub should have an excellent chance of being funded.
- Sustainable Agriculture Research and Education (SARE) grants. Since 1988, SARE has invested $6.1 million and funded 1,670 projects in Nebraska to advance agricultural innovation promoting profitability, stewardship of the land, air, and water, and quality of life for farmers, ranchers, and their communities. We believe that with assistance and encouragement from the Hub, Nebraska farmers and ranchers could get even more projects funded.
- Private foundations supportive of conservation projects.
- The Water Sustainability Fund is a source of financial support to help local project sponsors achieve the goals set out in Neb. Rev. Stat. § 2-1506 and is administered by the Nebraska Natural Resources Commission.

**Environmental Incentive Programs**

Trillions of dollars have been pledged by corporations who are serious about reducing their carbon footprint (see Appendix E). One of the most effective ways for a company to reduce its carbon footprint is to work with farmers to sequester carbon into their soils and thus offset their own emissions. Soil health practices have the potential to return the carbon dioxide in our atmosphere to the “magic number” of 350 parts per million, while feeding people, building more fertile soils, and contributing to ecosystem health.30

While carbon markets have been explored in the past, new concerns have driven interest to new heights over the last five years. In response to growing public awareness of the value of soil carbon and its impact on the environ-
ment, various market-based incentive structures, or ecosystem services carbon markets are emerging to pay farmers, ranchers, and landowners for adopting soil health practices. Producers get paid when they manage their systems in a way that allows plants to capture and store more atmospheric carbon than what the system uses and generates.

There are currently 19 multinational, national, regional, and local emissions trading systems that are operating or being considered around the world. Four of them have the most promise for Nebraska producers:

1. **Nori**: Launched in 2019, Nori’s goal is to create a new way for anyone in the world to pay to remove excess carbon dioxide from the atmosphere. The company does so by connecting buyers and suppliers in the world’s first carbon removal marketplace. The first methodology on Nori’s platform is regenerative agriculture and soil health. Nori has teamed up with Granular, a Coreteva Agriscience Company to reach deep into the production agriculture sector.

2. **Indigo Carbon**: Indigo Ag launched The Terraton Initiative in 2019. This is an effort to use agricultural soil to sequester 1 trillion tons (1 terraton) of carbon dioxide. The plan aims to pay farmers in this program $15 to $20 per ton of carbon that they sequester using practices like diverse crop rotation, input reduction, no-till, cover crops, and managed grazing. Payments could tally an estimated $15 to $45 per acre. Initial interest in this program has exceeded 17 million acres in the first 6 months.

3. **Bayer Carbon Initiative**: In 2020, Bayer started rewarding farmers in Brazil and the U.S. for generating carbon credits by adopting climate-smart practices—such as no-till farming and the use of cover crops—designed to help agriculture reduce its carbon footprint. Bayer recognizes the pivotal role growers and their land can play in helping to create lasting, positive environmental impacts. Incentivizing farmers to embrace no-till, precision nitrogen use, or cover crops helps sequester carbon into the soil, reduce fossil fuel usage, and reduce greenhouse gases. Farmers participating in the Bayer Carbon Initiative will have the opportunity to be rewarded for their best farm management practices and other sustainability efforts.

4. **Nutrien**: Nutrien, the world’s largest provider of crop inputs and services, is also entering the carbon market. The ag retail king is rolling out a pilot program targeting 100,000 acres in 2021 to encourage growers to sell environmental credits they accumulate through using “climate-friendly” products and services. Nutrien expects the program could boost a farmer’s income by $50 per acre. That pencils out to $20 coming from carbon credits while $30 stems from productivity and yield gains.

5. **Ecosystem Service Market Consortium (ESMC)**: The consortium is made up of more than 40 major agribusinesses and agricultural trade associations and the Foundation for Food and Agriculture Research (FFAR). $20.6 million is being invested for both research and development of environmental markets for farmers, and the ESMC should be on-line for farmer participation sometime in 2022.

**Corporate Partnerships**

In addition to large corporations investing in soil health through Environmental Incentive Programs, there are additional opportunities for direct funding to producers through corporate partnerships. Examples of programs that are currently underway include:

- In October 2020, the Upper Big Blue and Central Platte NRDs announced that they were partnering with Nebraska NRCS and The Nature Conservancy on a soil health initiative called Resilient Futures for Nebraska Soil. The goal of the program is to improve soil health in the Central Platte Valley on 100,000 acres of...
Nebraska cropland over the next five years. The funding will provide $4.4 million for technical and financial assistance for producers who have the option of receiving assistance to implement cover cropping, reduced tillage, and diversified crop rotations. Payments will vary from $15 to $40 per acre depending on the type of soil health practice implemented. An exciting component of this partnership is the access it will provide to the newly created Ecosystem Services Market Consortium. This carbon marketplace will connect companies looking to shrink their carbon footprint with producers who are implementing soil health practices that capture carbon. Payments in this project will not be tied to carbon storage measurement but will be guaranteed by acre. This will give producers a low-risk way to explore carbon marketplaces. Participating companies will include Cargill, Target, and McDonald’s.

- In 2020, Practical Farmers of Iowa partnered with Cargill and Pepsico to pay Iowa farmers $40 per acre to give low carbon corn farming a try.
- A similar program with ADM and Unilever will pay qualified Iowa farmers $40 per acre to implement a sustainable soybean program.
- No-till on the Plains and Country Crock® launched a three-year program to support farmers with soil health education and cost-share to plant cover crops to improve soil health on fields covering 13,000 acres in the first year alone in eastern Kansas and western Missouri on soybean fields that have not been previously planted with a cover crop.
- The Midwest Row Crop Collaborative consists of companies such as Kellogg’s, Walmart, McDonalds, PepsiCo, The Nature Conservancy, and others. Their mission is to test and demonstrate solutions for removing barriers to the adoption of good farming practices that can viably benefit the environment, using science-based approaches for system change. HSTF members have met with Collaborative representatives, and they would be very interested in working with and funding projects for Nebraska producers who want to increase their soil health practices. The Collaborative also indicated that having a statewide coordinating body like the Nebraska State Soil Health Hub would be a great benefit to attracting corporate investment into soil health programs in the state.

- The Soil Health Partnership is a joint effort of National Corn Growers, Bayer, The Nature Conservancy, National Wheat Foundation, and the Environmental Defense Fund. This partnership funds and supports soil health at the field level by providing education, testing, and financial support directly to farmers in the program. A number of Nebraska farmers are already a part of this program and that number could be expanded.

- General Mills has publicly committed to advancing regenerative agriculture practices on 1,000,000 acres by 2030. To that end, they have invested $5.5 million and launched pilot programs in North Dakota, Kansas, and Michigan to provide farmers with tools, training, and testing to advance soil health practices on their farms.

The HSTF believes that these corporately funded partnerships will continue to grow and will provide significant amounts of funding for Nebraska producers to adopt and implement soil health practices.

**Programs and Provisions from the 2018 Farm Bill**

Title II of the 2018 Farm Bill provides assistance to agricultural producers and landowners to adopt conservation activities on agricultural and forest lands to protect and improve water quality and quantity, soil health, wildlife habitat, and air quality. A number of programs exist to incentivize soil health for Nebraska producers including CRP, CSP, and EQIP. While there will be billions of dollars invested in these programs, applying for them and implementing them can sometimes be difficult. The Hub and the PLC can assist producers to navigate these programs and make the best decisions for their operations. (See Appendix F for additional Provisions of the Federal Agriculture Improvement Act of 2018.)
Goal 5: Establish Nebraska Soil Health Measurements and Benchmarks

Rationale

From the inception of the Healthy Soils Task Force, we identified a lack of widely accepted and consistent soil health measurements. Consequently, there is no benchmark for the current state of soil health in Nebraska. In order to communicate the status of our soil health and the actions we are taking to improve it, we need to measure the continuous improvement of a soil’s health by tracking change and documenting the management system at the field level.

The HSTF is recommending the formation of a Soil Health Measurements and Benchmarks (SHMB) committee that will be tasked with establishing a standard set of soil health measurements for Nebraska and determining the current benchmark levels of soil health in our state.

Prescribing specific remedies and tracking success is difficult due to the different natural conditions and the levels of adoption and intensity of current management. It is also often difficult how to determine the most effective management changes. The HSTF supports further efforts to calibrate soil health monitoring allowing the documentation of change to be publicized and recognizing how changes in management improve soil health.

Objectives

There are three major objectives for this goal:

1. **To establish standardized soil health measurements and protocols for Nebraska.** To accomplish this objective, the SHMB committee will evaluate existing tools and protocols in use or in development and determine which ones are most effective and appropriate for Nebraska. These examples include but are not limited to:
   a. Current soil health measurement standards that are currently being used by NRCS, UNL, and the NRDs.
   b. The Soil Health Gap theory, as developed by Bijesh Maharjan, UNL Soil Scientist. The Soil Health Gap is defined as the difference between soil health in an undisturbed native soil and current soil health in a crop-land in a given agroecosystem. This system allows for each field to be compared to its natural best and not the best soils in other geographic or ecological regions.

The Soil Health Gap Theory of Measurement

![Image of the Soil Health Gap Theory](image)

Undisturbed native soil health condition  
Current field soil health conditions

Dr. Bijesh Maharjan, UNL Panhandle Research and Extension Center, is the author of the Soil Health Gap Theory.
c. The North American Project to Evaluate Soil Health Measurements, which is the result of a $9.4 million grant from the Foundation for Food and Agriculture Research to the Soil Health Institute, the Soil Health Partnership, and The Nature Conservancy. The project convened a “blue ribbon panel” of experts from the USDA, several universities, and the private sector to develop consensus on how 30 different soil health indicators should be measured.31

d. Resources and standards developed and used by the NRCS National Soil Survey Center.

e. Tests and measurements being used by soil labs in Nebraska, including the Haney test and the PLFA test.

f. Soil health evaluation tools like Land O’Lakes Truterra, COMET Farm, Cornell CASH test, and the Indigo Ag Insight Tool.

2. Establish a soil health benchmark for Nebraska.

   a. Quantify the acres of adoption and resultant successful improvement in natural resources.

   b. Develop a benchmark map of soil health in Nebraska with maps of the critical soil properties.

   c. Conduct county-level Natural Resources Management Surveys which involve remote sensing tools. A timeline will be developed for periodic assessments by region.

3. Develop a suite of Nebraska Soil Health Management Monitoring Tools that bring together the best and most practical key performance indicators of a soil to measure the effectiveness of the management system being used.

   a. Identify ways to develop and implement rapid assessment tools for land managers to use to identify and monitor their soil’s health.

   b. Develop a protocol to monitor the adoption of management techniques that improve the health of Nebraska’s Soils.

   c. Evaluate and adopt a land management assessment tool for Nebraska that incorporates public and private sector efforts, such as the Saving Tomorrow’s Agriculture Resources (S.T.A.R.) assessment tool32 that is being used by other nearby states. Using a tool like S.T.A.R. as a starting point is effective and reduces reinventing procedures.

   d. Utilize the Regional Proving Grounds to develop Ecological Site Description Reference Sites that will function as “field validation” to determine what changes are possible and how to achieve them. These will allow site-specific soil health gaps to be determined.

   e. Develop a Nebraska Rapid Assessment of Soil Health digital tool that will supplement a management questionnaire. Visual sensing of soil color has shown promise as a rapid assessment tool elsewhere in the US.
Outcomes and Evaluation

If the preceding five goals are accomplished, the HSTF believes that Nebraska will be the national leader in soil health awareness and adoption, and we will become a model for other states to follow. To judge the effectiveness and success of this Initiative, we suggest the following outcomes as a way to evaluate success. It is beyond the scope of the HSTF to establish specific metric goals since one of our recommendations is to establish the appropriate benchmarks and indicators. Our long term goal is to decrease the soil health gap in soils with significant separation between the reasonably achievable soil condition and the present condition. We want all Nebraska soil resources to be managed and maintained at the highest level. An indirect result will be reduced leaking of contaminants to the groundwater and improved surface water quality.

Measurable outcomes are defined by the five specific goals outlined in the Initiative. Our vision is that by 2025, the Nebraska State Soil Health Hub should be functioning and working with an active network of Regional Proving Grounds and the Producer Learning Community. One or more Nebraska higher education entities should take on the challenge to create an academic path to producing future leaders and practitioners in soil health areas. Metrics and benchmarks will be developed and agreed upon by the agricultural community, and periodic statewide reports on the current status of Nebraska soils will be published.

Implementation Plan

Unfortunately, action plans can be developed, placed on a shelf, and never acted upon. We feel the best approach is to have the implementation process be driven by those who are passionate, dedicated, and invested to see healthy soil management practices adopted throughout the state. Former Task Force members are encouraged to lead, participate, and share from their 18 months of work.

We recommend the following implementation plan:

Goal #1 “Establish the Nebraska State Soil Health Hub with Regional Proving Grounds” is a critical step in driving this initiative forward.

The following have been identified as potentially needed steps to form the Hub but they can be modified as deemed necessary and to best meet the goal:

- A Nebraska Soil Health Hub Formation Summit meeting for all interested parties should be scheduled, advertised, and held in the first quarter of 2021.
- At the Summit meeting, a Hub Implementation Team will be formed that includes an emphasis on producers and representation from NRCS, UNL, NRDs, former Task Force members as well as representation from a cross-section of other soil health stakeholders. Ex officio representatives could be invited from the NDA, and the Chair of the Agricultural Committee or their designee, and the Chair of the Natural Resources Committee or their designee. The team can solicit input and expertise from other individuals and resources as needed.
- Identify an existing legal entity to serve as a pass-through administrator for the Nebraska Healthy Soils Initiative until a Hub legal entity can be formed. This entity would receive and disburse funds as directed by the implementation team.
- Initial funding partners will be sought to launch the Hub implementation process.
- Hire a Temporary Implementation Director for a term of no more than 12 months.
- Implementation team begins initial planning for the Hub.
- Fundraising campaign led by Implementation Director to permanently fund the Hub.
- Implementation team appoints willing stakeholders to serve on the initial Hub Board of Directors that would include producers as well as NRCS, UNL, and NRDs.
- An organizational meeting of the Board of Directors is held and officers are selected. The Implementation Team is phased out.
• Board finalizes by-laws and files for 501(c)(3) tax-exempt status
• Staff positions are identified, job descriptions are written, and advertising/recruitment begins for inaugural Executive Director/Initiative Coordinator.
• Advisory Committee is identified and meets with the Board.
• Hire Executive Director/Initiative Coordinator.

**Goal #2 “Producer Learning Communities”** working group focused on precision agriculture, economics, and natural resource conservation should be launched by UNL, NRCS, NRDs, and other interested and qualified parties.

**Goal #3 “Developing the Next Generation of Soil Health Practitioners”** working group should be launched by a group led by UNL, NRCS, NRDS, other educational representatives along with interested and qualified individuals who have a passion for education and development.

**Goal #4 “Additional Soil Health Funding”** needs to be driven by the Hub so likely will not be worked on until the Hub is formed and active.

**Goal #5 “Establish Nebraska Soil Health Measurements and Benchmarks”** should be initiated by a technical committee composed of representatives from NRCS, UNL, NRDs. Other interested and qualified parties are invited to participate in the process.
Appendix A: Existing Soil Health Work in Nebraska

University of Nebraska Institute of Agriculture and Natural Resources

- The Daugherty Water for Food Global Institute programs
- Nebraska Extension programs
- Agricultural Research Division research
- CASNR academic programs
  - Center for Resilience in Working Agricultural Landscapes
  - Agronomy/Horticulture research into cover crops and soil health
  - The School of Natural Resources
  - Biological Systems Engineering
  - Agricultural Economics
  - Animal Science
  - Center for Grasslands Study
- Specific Activities and Events
  - ENREC Midwest Soil Health Clinic
  - ENREC Soil Health-Cover Crop Conference
  - Cover crop tailgates
  - Cattle and cover crops research by Mary Drewnoski
  - Paul Jasa and the Rogers Farm - no-till and cover crop research
  - Water & Soil Resource Management Team
  - The Soil Health Nexus – North Central Region
  - Various webinars, videos, conferences, workshops, clinics, and field days
  - Cropwatch Website - soil health information depository
  - Nebraska On-Farm Research Network
  - Cornhusker Economics - soil health-related articles
  - Soil Health Demonstration Farms and Ranch Initiatives
  - NebGuides
  - USDA/NIFA Grants on biochar and alternative management strategies on cover crops

Natural Resources Conservation Service

- National and State Soil Health Divisions and Staff
- 17 Soil Health Demonstration Projects located across the state
- Rainfall simulators, soil tunnels, and earthworm tunnel kits
- Soil Profile Cards for outreach to kids
- Soil monoliths of working lands
- Soil Health Test Bucket for educators
- Nebraska NRCS Soil Health Assessment Protocol
- Unlock the Secrets in the Soil campaign and infographics
- The Science of Soil Health video series
- Profiles in Soil Health video series
- Mighty Mini Microbe educational campaign
- “Keep the Stubble” – No Tillage November campaign
- NRCS Plant Materials Program
- Soil Health Fact Sheets
Appendix A: Existing Soil Health Work in Nebraska

Nebraska Natural Resources Districts
- Soil health programs and projects such as Project GROW, Project SENSE, etc.
- Groundwater quality and quantity projects
- Cover crop cost share in some areas
- Resilient Futures for Nebraska soil health initiative

Non Governmental Organizations
- Soil Health Partnership
- Nebraska Corn Board
- National Association of Conservation Districts Soil Health Champions Network
- The Nature Conservancy soil health projects
- Pheasants Forever and Ducks Unlimited soil health programs
- Soil and Water Conservation Society chapter and programs
- Midwest Cover Crop Council
- Howard G. Buffett Foundation soil health promotions
- Nebraska Environmental Trust soil health projects
- Sustainable Agriculture Research and Education (SARE) grants for farmers working in soil health

Agribusiness
- Soil health related programs from companies such as Ward Labs, Arrow Seed, Green Cover Seed
- Soil health programs and education from various cooperatives across the state
- Truterra by Land O’Lakes and various Nebraska co-ops
Throughout October-November 2020, 25 Input-Listening Sessions involving 31 groups were completed. (Note, some sessions included overlapping groups.) The COVID-19 pandemic restricted us to holding virtual sessions.

The participants were identified as organizations that directly tied to the areas of LB 243 and who had an interest in the work of the HSTF. The groups were asked to provide feedback on four areas: the goals, the action steps, any gaps, and the slogan.

Their feedback and themes guided many areas of the Task Force Report including: economics (mentioned as a priority in every session), impact of livestock, coordination of state soil health activities, identifying the key soil health indicators, having a “go-to” site for soil health and leveraging funding private and grant money on a bigger-scale, and adapting incentives to support the heightened risk in the change of production systems, among other invaluable points.

<table>
<thead>
<tr>
<th>Cargill</th>
<th>Center for Rural Affairs</th>
<th>Farm Credit Services</th>
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<tbody>
<tr>
<td>General Mills</td>
<td>Midwest Row Crop</td>
<td>Nebraska and National Izaak Walton League</td>
</tr>
<tr>
<td>Nebraska Bankers Association</td>
<td>Nebraska Cattlemen Association</td>
<td>Nebraska Corn Board</td>
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<td>Nebraska EPA</td>
<td>Nebraska Farm Bureau</td>
<td>Nebraska Farmers Union</td>
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<td>Nebraska Game and Parks Commission</td>
<td>Nebraska Grazing Land Coalition</td>
<td>Nebraska NRCS</td>
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<td>Nebraska Association of Resources Districts</td>
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<td>Nebraska Regenerative and Common Ground</td>
<td>Nebraska Soybean Board</td>
<td>Nebraska Sustainable Agriculture Society</td>
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<td>The Nature’s Conservancy</td>
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<td>UNL Water and the Daugherty Institute</td>
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<td>Nebraska Cooperative Council</td>
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Appendix C: Cover Crop Economics: Opportunities to Improve Your Bottom Line in Row Crops


### TABLE 4. Impact of cover crops on costs, returns and net profit for corn following one, three and five years of cover crop use and with various management scenarios

<table>
<thead>
<tr>
<th>BUDGET ITEM</th>
<th>YEARS OF COVER CROPPING</th>
<th></th>
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<tr>
<td></td>
<td>All figures are per acre</td>
<td>One</td>
<td>Three</td>
<td>Five</td>
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<tr>
<td>Estimated input savings when using cover crops</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Fertilizer(^1)</td>
<td>$0</td>
<td>$14.10</td>
<td>$21.90</td>
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<tr>
<td>Weed control(^2)</td>
<td>$0–$15</td>
<td>$10–$25</td>
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<tr>
<td>Erosion repair(^3)</td>
<td>$2–$54</td>
<td>$2–$54</td>
<td>$2–$54</td>
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<tr>
<td>Subtotal</td>
<td>$2–$19</td>
<td>$26.10–$43.10</td>
<td>$33.90–$50.90</td>
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<tr>
<td>a. Savings on inputs (the low end of the subtotal range from above)</td>
<td>$2</td>
<td>$26.10</td>
<td>$33.90</td>
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<tr>
<td>b. Income from extra yield in normal weather year (survey data)(^4)</td>
<td>$3.64</td>
<td>$12.32</td>
<td>$21</td>
<td></td>
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<tr>
<td>c. Cost of seed and seeding (survey data)(^5)</td>
<td>$37</td>
<td>$37</td>
<td>$37</td>
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<tr>
<td>Net return in a normal weather year (a + b - c)</td>
<td>-$31.36</td>
<td>$1.42</td>
<td>$17.90</td>
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</table>

**Special situations where cover crops can pay off faster**

|                                                        |                |                |                |
| I. When facing severe herbicide-resistant weeds\(^6\)  | $27           | $27            | $27            |
| Adjusted net return                                   | -$4.36        | $28.42         | $44.90         |
| II. Potential grazing income\(^7\)                    | $49.23        | $49.23         | $49.23         |
| Adjusted net return                                    | $17.87        | $50.65         | $67.13         |
| III. Compaction addressed by cover crops\(^8\)        | $15.30        | $15.30         | $15.30         |
| Adjusted net return                                    | -$16.06       | $16.72         | $33.20         |
| IV. Assisting the conversion to no-till from conventional\(^9\) | $23.96        | $23.96         | $23.96         |
| Adjusted net return                                    | -$7.40        | $25.38         | $41.86         |
| V. Income from extra yield in a drought year (survey data)\(^10\) | $58.70        | $75.73         | $92.55         |
| Adjusted net return                                    | $27.34        | $77.15         | $110.45        |
| VI. Extra fertilizer savings from improved fertility\(^11\) | $15.20        | $15.20         | $15.20         |
| Adjusted net return                                    | -$16.16       | $16.62         | $33.10         |
| VII. Federal or state incentive payments received\(^12\) | $50           | $50            | $50            |
| Adjusted net return                                    | $18.64        | $51.42         | $67.90         |

\(^1\) Assumes no fertilizer savings in year one, then a savings of 15 pounds of nitrogen per acre in year three and 30 pounds per acre in year five, at $0.38 per pound. Also assumes a phosphorus saving of 20 pounds per acre in year three and 75 points per acre in year five, at $0.42 per pound.

\(^2\) The first year assumes a reduction of one herbicide pass if sufficient cover crop biomass is achieved. Savings are higher in later years due to reducing by two passes or by using less-expensive herbicide products.

\(^3\) Based on the cost of machinery operations and labor to repair gullies and clean ditches (assumes average cost, but fields will vary).

\(^4\) Assumes a corn price of $3.50 per bushel and a 200-bushel yield times the percent yield increase shown in Table 2.

\(^5\) Costs for seed, seeding and termination can vary from a low of about $10 to over $50 per acre. Most farms estimated to be $25–$40 per acre.

\(^6\) In a field with a severe herbicide-resistant weed infestation, this figure assumes that a thick-biomass cover crop will reduce herbicide and labor costs and will reduce dockage for weed seed at harvest.

\(^7\) Assumes that grazing a cover crop (cereal rye in this example) results in a reduction of 1,093 pounds of hay fed per acre of cover crops. This is based on 1,500 pounds per acre of dry matter generated by rye, then reduced effective use of the rye by 50% due to hoof action and selective grazing. Assumes average feedlot waste of 22% for hay fed (68% dry matter). The hay is valued at $80 per ton. Additional savings of approximately $5.50 per acre generated due to lower labor, fuel and machinery depreciation from reduced hay fed. Assumes grazer already has water access for their grazing area and an electric fencing system.

\(^8\) This is based on a University of Minnesota machinery cost estimate for subsoiling at $15.30 per acre (2017 data used for machinery costs).

\(^9\) No-till savings versus conventional: No fall chisel plow ($112.22 per acre) and savings on two field cultivator passes in the spring ($1 x $6.37 per acre).

\(^10\) Assumes a corn price in drought of $6.89 per bushel and reduced base yield of 142 bushels per acre x percent yield increase for drought. Numbers are based on actual national average corn yield for 2012 and national average corn price in the 2012–2013 marketing year (USDA-NASS).

\(^11\) Assumes using legumes as a cover crop and that overall improved soil health allow nitrogen to be cut by an extra 40 pounds per acre over basic fertilizer savings.

\(^12\) The basic NRCs EQIP rate in the majority of Corn Belt states starts at $50 per acre or higher; some states have lower rates.
TABLE 5. Impact of cover crops on costs, returns and net profit for soybeans following one, three, and five years of cover crop use and with various management scenarios

<table>
<thead>
<tr>
<th>BUDGET ITEM</th>
<th>YEARS OF COVER CROPPING</th>
</tr>
</thead>
<tbody>
<tr>
<td>All figures are per acre</td>
<td>One</td>
</tr>
<tr>
<td></td>
<td>Three</td>
</tr>
<tr>
<td></td>
<td>Five</td>
</tr>
<tr>
<td>Estimated input savings when using cover crops</td>
<td></td>
</tr>
<tr>
<td>Fertilizer†</td>
<td>$0</td>
</tr>
<tr>
<td></td>
<td>$6.30</td>
</tr>
<tr>
<td></td>
<td>$8.40</td>
</tr>
<tr>
<td>Weed control‡</td>
<td>$0–$15</td>
</tr>
<tr>
<td></td>
<td>$10–$25</td>
</tr>
<tr>
<td></td>
<td>$10–$25</td>
</tr>
<tr>
<td>Erosion repair§</td>
<td>$2–$4</td>
</tr>
<tr>
<td></td>
<td>$2–$4</td>
</tr>
<tr>
<td></td>
<td>$2–$4</td>
</tr>
<tr>
<td>Subtotal</td>
<td>$2–$19</td>
</tr>
<tr>
<td></td>
<td>$18.30–$35.30</td>
</tr>
<tr>
<td></td>
<td>$20.40–$37.40</td>
</tr>
</tbody>
</table>

a. Savings on inputs (the low end of the range from above) $2 $18.30 $20.40
b. Income from extra yield in normal weather year (survey data)$  $11.45  $19.12  $26.78
c. Cost of seed and seeding (survey data)$  $37  $37  $37

Net return in a normal weather year (a + b - c) $-23.55  $0.42  $10.18

Special situations where cover crops can pay off faster

I. When facing severe herbicide-resistant weeds§ $27 $27 $27

Adjusted net return $3.45 $27.42 $37.18

II. Potential grazing income§ $49.23 $49.23 $49.23

Adjusted net return $25.68 $49.65 $59.41

III. Compaction addressed by cover crops§ $15.30 $15.30 $15.30

Adjusted net return $-8.25 $15.72 $25.48

IV. Assisting the conversion to no-till from conventional§ $23.96 $23.96 $23.96

Adjusted net return $40.41 $24.38 $34.14

V. Income from extra yield in a drought year (survey data)$  $66.24  $69.80  $74.36

Adjusted net return $41.69 $70.22 $84.54

VI. Extra fertilizer savings from improved fertility§ $7 $7 $7

Adjusted net return $-16.55 $7.42 $17.18

VII. Federal or state incentive payments received§ $50 $50 $50

Adjusted net return $26.45 $50.42 $60.18

---

1 Assumes no fertilizer savings in year one, then a savings of 15 pounds of phosphorus per acre in year three and 20 pounds per acre in year five, at $0.42 per pound.
2 The first year assumes either no herbicide savings or a possible saving of $15 per acre by avoiding a full herbicide pass ($75 per acre for the chemical and $75 per acre for application). The third and fifth years assume using a less expensive residual chemistry that costs $30 per acre, with the possibility of saving $15 per acre in the fall.
3 Based on the cost of machinery operations and labor to repair gullies and clean ditches (assumes average cost, but fields will vary).
4 Assumes a soybean price of $9 per bushel and a 60-bushel yield times the percent yield increases shown in Table 2.
5 Costs for seed, seeding and termination can vary from a low of about $10 to over $50 per acre; most farms estimated to be $25–340 per acre.
6 In a field with a severe herbicide-resistant weed infestation, this figure assumes that a thick-biomass cover crop will reduce herbicide and labor costs and will reduce dodging for weed seed at harvest.
7 Assumes that grazing a cover crop (cereal rye in this example) results in a reduction of 10,093 pounds of hay fed per acre of cover crops. This is based on 1,500 pounds per acre of dry matter generated by rye, then reduced effective use of the rye by 50% due to hoef action and selective grazing. Assumes average feedlot waste of 22% for hay fed (66% dry matter). The hay is valued at $80 per ton. Additional savings of approximately $5.50 per acre generated due to lower labor, fuel and machinery depreciation from reduced hay fed. Assumes grazier already has water access for their grazing area and an electric fencing system.
8 This is based on a University of Minnesota machinery cost estimate for subsoiling at $15.30 per acre (2017 data used for machinery costs).
9 No-till savings versus conventional. No fall chisel plow ($11.22 per acre) and savings on two field cultivator passes in the spring (2 x $6.37 per acre).
10 Assumes a soybean price in drought of $44.40 per bushel and reduced yield of 39.6 bushels per acre x percent yield increase for drought. Numbers are based on actual national average soybean yield for 2002 and national average price in the 2012-13 marketing year (USDA-NASS).
11 Assumes that overall improved soil health allows an additional reduction in phosphorus of 10 pounds per acre ($0.42 per pound) and 10 pounds per acre of potassium ($0.28 per pound) over basic fertilizer savings.
12 The basic NRCS EQIP rate in the majority of Corn Belt states starts at $50 per acre or higher; some states have lower rates.
Appendix D- Survey and Poll of NE Producers at State Soil Health Workshops, Spring 2020

Slido Poll and Survey Results of Producers and Agriculture-related roles (127) at State Soil Health Conferences—Mead, Hickman and Broken Bow, March 2020.

The producers identified soil erosion and increasing water infiltration as the top priorities/incentives (4.7 average). The top challenges were the lack of window to plant cover crops after harvest and the ability to integrate livestock (4.2 and 3.7 average, respectively). The top factor to reduce the rate of N, P and K was the soil test and previous "N" credits (4.5 average). Note, the high average was listed.

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Hickman (n=70)</th>
<th>Broken Bow (n=14)</th>
<th>Mead (n=43)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farmer/Producer</td>
<td>79%</td>
<td>71%</td>
<td>58%</td>
</tr>
<tr>
<td>Landowner (Not a Farmer)</td>
<td>9%</td>
<td>0%</td>
<td>7%</td>
</tr>
<tr>
<td>Crop Consultant/Adviser</td>
<td>7%</td>
<td>0%</td>
<td>19%</td>
</tr>
<tr>
<td>NRCS/UNL/Government</td>
<td>3%</td>
<td>21%</td>
<td>9%</td>
</tr>
<tr>
<td>Other</td>
<td>3%</td>
<td>7%</td>
<td>7%</td>
</tr>
</tbody>
</table>

Number of crop acres that you directly manage or influence-- PRODUCERS ONLY

<table>
<thead>
<tr>
<th></th>
<th>Hickman (n=69)</th>
<th>Broken Bow (n=13)</th>
<th>Mead (n=37)</th>
</tr>
</thead>
<tbody>
<tr>
<td>zero acres</td>
<td>4%</td>
<td>23%</td>
<td>14%</td>
</tr>
<tr>
<td>1 - 199 acres</td>
<td>14%</td>
<td>15%</td>
<td>24%</td>
</tr>
<tr>
<td>200 - 999 acres</td>
<td>32%</td>
<td>15%</td>
<td>27%</td>
</tr>
<tr>
<td>1000 - 3,999 acres</td>
<td>41%</td>
<td>31%</td>
<td>19%</td>
</tr>
<tr>
<td>4,000 &amp; greater total crop acres</td>
<td>9%</td>
<td>15%</td>
<td>16%</td>
</tr>
</tbody>
</table>

List the number of total acres that you advise.--- ADVISOR ONLY

<table>
<thead>
<tr>
<th></th>
<th>Hickman (n=30)</th>
<th>Broken Bow (n=8)</th>
<th>Mead (n=22)</th>
</tr>
</thead>
<tbody>
<tr>
<td>zero acres</td>
<td>27%</td>
<td>38%</td>
<td>14%</td>
</tr>
<tr>
<td>1 - 9,999 crop acres</td>
<td>60%</td>
<td>50%</td>
<td>36%</td>
</tr>
<tr>
<td>10,000 - 99,999 crop acres</td>
<td>13%</td>
<td>13%</td>
<td>32%</td>
</tr>
<tr>
<td>100,000 - 999,999 total crop acres</td>
<td>0%</td>
<td>0%</td>
<td>14%</td>
</tr>
<tr>
<td>1,000,000 total crop acres or more</td>
<td>0%</td>
<td>0%</td>
<td>5%</td>
</tr>
</tbody>
</table>

Utilize livestock in their operation

<table>
<thead>
<tr>
<th></th>
<th>Hickman (n=70)</th>
<th>Broken Bow (n=13)</th>
<th>Mead (n=40)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avg. Per Advisor (n=18)</td>
<td>59% (n=70)</td>
<td>83% (n=13)</td>
<td>45% (n=40)</td>
</tr>
<tr>
<td>950</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avg. Per Advisor (n=5)</td>
<td>750</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1333</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total acres that you advise that are seeding cover crops for soil health and/or livestock-- ADVISOR ONLY

<table>
<thead>
<tr>
<th></th>
<th>Hickman (n=58)</th>
<th>Broken Bow (n=11)</th>
<th>Mead (n=29)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avg. per producer (n=58)</td>
<td>209</td>
<td></td>
<td></td>
</tr>
<tr>
<td>950</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avg. Per Advisor (n=5)</td>
<td>54</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1333</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The number of cover crop acres that I routinely plant is ____? -- PRODUCER ONLY

<table>
<thead>
<tr>
<th></th>
<th>Hickman (n=29)</th>
<th>Broken Bow (n=29)</th>
<th>Mead (n=29)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avg. per producer (n=29)</td>
<td>231</td>
<td></td>
<td></td>
</tr>
<tr>
<td>950</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
What incentives most drive you in making changes to improve soil health?

(1: No value as incentive; 5: High value as incentive) | Hickman (n=69), Broken Bow (n=13), Mead (n=41)

As a Tenant or Landowner, rate the most pressing obstacles to increase cover crop use in your farming operation?

(1 = no obstacle and 5 = major obstacle) | Hickman (n=69), Broken Bow (n=13), Mead (n=41)

What present factors most impact the rates of Nitrogen, P & K that you apply and/or manage?

[1 = no impact to 5 = most impact] | Hickman (n=69), Broken Bow (n=13), Mead (n=41)
Appendix E: Corporate Pledge List Towards Carbon Offsets

These are just a few examples of corporations who have made Carbon Pledges:

- Microsoft: Be carbon negative by 2030; by 2050, remove all the carbon the company has ever emitted.
- Amazon: Reach net carbon neutrality by 2040. Jeff Bezos commits $10 billion to a climate change fund.
- Apple: Committed to making its products and supply chain carbon neutral by 2030.
- Delta: Commits $1 billion to become the first carbon neutral airline.
- Jet Blue: Offset all carbon dioxide emissions from all domestic flights starting July 2020.
- Lyft: Make all rides carbon neutral.
- Lundin Petroleum: Be carbon neutral by 2030.
- British Petroleum: Zero out all its carbon emissions by 2050.
- Shell Oil: reduce the Net Carbon Footprint of its energy products by 20% by 2035 and 50% by 2050.
- Verizon: Pledged to be carbon neutral by 2035.
- Walmart: Zero emissions by 2040 and protect, manage or restore at least 50 million acres of land and one million square miles of ocean by 2030.
- Best Buy: Reduce carbon emissions in our operations by 75% (over 2009 baseline); carbon neutral by 2050.

Image credit: Indigo Ag

Title II of the 2018 Farm Bill provides assistance to agricultural producers and landowners to adopt conservation activities on agricultural and forest lands to protect and improve water quality and quantity, soil health, wildlife habitat, and air quality. Funding may be increased roughly 2% per year through 2023 and a number of programs exist to incentivize soil health for Nebraska producers. CRP, CSP, and EQUIP are all potential programs that Nebraska producers could qualify for.

Conservation Reserve Program (CRP)—Continues funding for payments to producers who maintain cropland, marginal pasture, or grassland in grass or tree cover for 10-15 years. The overall acreage cap is gradually increased from 24 million acres to 27 million acres in FY2023. Within the overall cap for FY2023, goals are established of 8.6 million acres for continuous signup and 2 million acres for grasslands. Land that was in CRP under a 15-year contract that expired in 2017 or 2018 is eligible for enrollment. A general signup is required each year. After each general signup, a ranking of grassland contract offers for enrollment is also required (grassland contract offers are accepted continuously).

The 2018 Act requires, to the maximum extent practicable, that 60 percent of acres available for CRP enrollment each year be allocated across States based on historical State enrollment rates. At least 40 percent of continuous enrollment is to be in water quality practices under the Clean Lakes, Estuaries, and Rivers (CLEAR) initiative to the maximum extent practicable. Expiring CRP contracts enrolled under CLEAR or other related water quality practices may also be enrolled in contracts of up to 30 years under a new CLEAR 30 Pilot Program. The Conservation Reserve Enhancement Program (CREP), which has been implemented administratively by USDA, is required by statute under the 2018 Act, which also includes a definition of eligible partner to include both state and nongovernmental partners.

The 2018 Act also sets upper limits on the county average soil rental rates used to set field-specific maximum annual payment rates and sets even tighter restrictions on maximum payment rates for re-enrollments. Incentive payments for continuous signup contracts continue; a payment of 32.5 percent of the first annual payment is required. $12 million is provided for a forest management incentive. Opportunities for routine harvesting, grazing, and other commercial activities on CRP land are expanded (with a reduction in annual payment).

The Soil Health and Income Protection Pilot Program (SHIPP) provides payments for farmers who establish grass cover on less productive cropland for a period of 3-5 years. The CRP Farmable Wetlands Program (FWP) is extended through 2023. The Transition Incentives Program (TIP), which supports the transition of land under expiring CRP contracts from contract holders to beginning or socially disadvantaged farmers, is continued with $50 million in funding. Under the 2018 Act, land can be transitioned from any contract holder (not just retired or retiring farmers).

Conservation Stewardship Program (CSP)—Continues financial assistance to producers who meet stewardship requirements on agricultural and forest lands. Under the 2014 Farm Act, CSP could enroll as many as 10 million new acres each year, at an average cost of $18 per acre. The 2018 Farm Act replaces the acreage cap with a funding cap and provides mandatory funding of $700 million for FY2019, $725 million for FY2020, $750 million for FY2021, $800 million for FY2022, and $1 billion for FY2023. CSP funding was $1.32 billion in FY2018 (estimated) and, had the 2014 Act provision been extended, was projected to be roughly $1.75 billion per year, on average, for FY2019-FY2023 according to the Congressional Budget Office (CBO). CSP contracts will no longer be eligible for a one-time automatic renewal. Producers seeking contract renewals will be required to compete with others seeking new or renewed contracts. Cover crop payments are increased, and supplemental payments are authorized for advanced grazing management, as are payments for the development of comprehensive conservation plans. A new Grassland Conservation Initiative is established within the CSP to assist producers in protecting grasslands for grazing and wildlife.

Environmental Quality Incentives Program (EQIP)—Continues financial assistance to producers to install and maintain conservation practices on eligible agricultural and forest land. The 2018 Act mandates funding of $1.75
billion in FY2019, $1.75 billion in FY2020, $1.8 billion in FY2021, $1.85 billion in FY2022, and $2.025 billion in FY2023. EQIP funding was $1.76 billion in FY2018 (estimated) and, had the 2014 Act provision been extended, was projected to be roughly $1.75 billion per year for FY2019-FY2023, according to the CBO. The share of funding set-aside for livestock-related practices is reduced from 60 percent to 50 percent while the set-aside for wildlife habitat practices is increased from 5 percent to 10 percent.

The new legislation also: (1) provides for higher incentive payment rates (up to 90 percent of costs) for highly beneficial practices; (2) establishes Conservation Incentive Contracts that provide both annual and cost-sharing payment for 5-10 years to encourage adoption of practices with broad resource benefits (e.g., cover crops, transition to resource conserving crop rotations); (3) allows irrigation districts, irrigation association drainage districts, and acequias (a political subdivision of a State organized to manage irrigation ditches; acequias cannot impose taxes or levies) to participate in EQIP for water conservation or irrigation efficiency practices; and (4) requires $25 million in Conservation Innovation Grant funding to be used for on-farm trials, including a soil health demonstration trial.
Based on the current NRCS definition of soil health: “The continued capacity of soil to function as a vital living ecosystem that sustains plants, animals, and humans.”

2. Dr. Lal is the 2020 World Food Prize awardee for developing and mainstreaming a soil-centric approach to increasing food production that restores and conserves natural resources and mitigates climate change. https://www.worldfoodprize.org/en/laureates/2020_lal/


18. https://understandingag.com/


21. https://lib.dr.iastate.edu/cgi/viewcontent.cgi?article=1602&amp;context=abe_eng_conf


25. Steven Keleti, www.soil4climate.org, 2019


27. https://www.merriam-webster.com/dictionary/proving%20ground

28. https://cropwatch.unl.edu/on-farm-research

29. The USDA National Agricultural Statistics Service 2017 Census of Agriculture reports the average age of farmers has increased from 58.3 in 2012 to 59.4 in 2017. In Nebraska, it was 55.7 in 2012 vs. 56.4 in 2017. https://www.nass.usda.gov/Publications/Highlights/2019/2017Census_Farm_Producers.pdf


Letters of Feedback and Support

The following section contains letters that were submitted by stakeholders of soil health work in Nebraska. They are from entities, organizations, companies and individuals who have had a role in the development of this report and have generously given of their time, effort, and input to make this report a reality.

These letters are not a part of the official document as they had not been written when the Healthy Soils Task Force voted to approve this document. The inclusion of these letters into the printed report was discussed at the final Task Force meeting.

Letters were solicited from all participating stakeholders—even those who were not 100% in support of this Soil Health Initiative—and all letters that were submitted by the deadline given for publishing are contained in the following section.

It is likely that additional feedback and support letters will be submitted after the deadline. Those will be made available upon request by emailing the Healthy Soils Task Force chairman, Keith Berns: keith@greencoverseed.com
Governor Pete Ricketts and members of the Agriculture Committee:

In 2019, I introduced and prioritized LB 243, which created the Healthy Soils Task Force. The Healthy Soils Task Force has been meeting for a year and a half, working on their mission to develop a comprehensive healthy soils initiative for the State of Nebraska and an action plan to coordinate its efforts. I am writing to express my support for the Healthy Soils Task Force’s report titled, “Soil Health for Nebraska Wealth”. I applaud all of the members for their hard work and dedication.

The Task Force was comprised of some of the most experienced soil conservationists in Nebraska, bringing their expertise from production agriculture, agribusiness, academia, Natural Resources Districts (NRDs), and environmental organizations. Additionally, there was representation on the Task Force from all corners of the state.

After personally spending 31 years at the Natural Resources Conservation Services (NRCS), I know that the degradation of soil health is a complex issue that takes patience, trust, and compromise to address. The Task Force has laid out a plan to address this issue in a holistic and timely manner. Stakeholders from all over the State of Nebraska were met with, one-on-one, to gather their input with the report and the goals outlined. With feedback from over thirty organizations, the Healthy Soils Task Force crafted a final report to address how Nebraska can become the nation’s leader in healthy, productive, and sustainable soils.

The Task Force has made recommendations by identifying five goals. The main goal is to establish a clearinghouse, referred to as the “Hub” in the report, to coordinate, communicate, and collaborate with the various conservation organizations in Nebraska, most notably, the NRDs, NRCS, and UNL. Although Nebraska offers many noteworthy programs for conservation practices, the main concern that rose to the top is the lack of synergy between entities. The Hub will be the catalyst for that synergy. The Hub will be a nongovernmental, one-stop shop for information on conservation practices. Furthermore, it will be a vehicle for grants and funds from private companies and large food producers. The Healthy Soils Task Force does not request any funds from the State of Nebraska nor does it seek the power to mandate; rather, it confidently puts forth the Task Force’s goals and recommendations as the best path forward to restore the health of our soils in Nebraska.

I humbly ask for your support in the recognition of this initiative and action plan. With the guidance of the Healthy Soils Task Force, Nebraska is poised to be the leader in healthy soils in the nation.

Sincerely,

Tim Gragert
District 40
To Whom It May Concern,

I am writing this letter to thank the members of the Healthy Soils Task Force for their work over the past several months. They worked diligently to create a thorough report detailing the issues related to providing farmers and ranchers with the research, education, technical assistance, and demonstration projects they need to promote soil health. They also reported on the options for financial incentives to improve soil health, and the contribution of livestock to soil health, as outlined by Senator Gragert's LB 243.

Promoting healthy soils should be a priority of our state's policymakers, as agriculture and livestock production are Nebraska's major economic drivers. There is a significant opportunity for Nebraska farmers and ranchers to capitalize on the economic and production benefits of improved soil health, while simultaneously improving surface and ground water quality.

I look forward to supporting policies to improve Nebraska's soil health in upcoming legislative sessions.

Sincerely,

Julie Slama
State Senator, District 1
December 17, 2020

Nebraska Healthy Soils Task Force
c/o Keith Berns, Chairman
918 Road X
Bladen, NE 68928

Dear Mr. Berns and committee members,

On behalf of the USDA Natural Resources Conservation Service (NRCS) in Nebraska, I want to offer our congratulations to the Task Force on your efforts to compile the Nebraska Healthy Soils Task Force Report. Many of the soil health implementation activities and initiatives described in the report align well with the mission and priorities of the NRCS, and therefore we are supportive of the strategy.

Nebraska NRCS has been working vigorously to promote soil health concepts to our employees, partners, and producer groups for the past decade. We will continue to lend our support and cooperation to other groups working to promote natural resource conservation and the adoption of soil health management systems to landowners and producer groups.

Over the past year, the NRCS Soil Health Specialist has assisted the Soil Health Task Force with technical discussions of several soil health parameters, including identification of the Benchmarks and Measurements in Goal #5 of the report. Additionally, NRCS provided input on the map resources and data contained in the report. I have noted the benefit of a statewide soil health coordinating body to help guide the outreach efforts of many separate organizations working to carry out soil health promotion and field events.

Efforts to achieve large scale improvements in soil health in Nebraska will require multiple partners bringing resources and technical capacity to the table. As such, Nebraska NRCS is in support of a statewide effort to deliver information and education to producers on the benefits of implementing soil health management systems.

Sincerely,

CRAIG DERICKSON
State Conservationist

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January 4, 2021

Keith Berns, Chair
Nebraska Healthy Soils Task Force
918 Road X
Bladen, NE 68928

Subject: Institute of Agriculture and Natural Resources Collaborations for Healthy Soils

The faculty and staff of the Institute of Agriculture and Natural Resources (IANR) are committed to conducting research and delivering educational programming that enhance the stewardship and good management of the bountiful natural resources of Nebraska. Recently we have formed the Water and Integrated Cropping Systems (WICS) team within IANR to further enhance our systems approach to managing our soil and water resources, and to increase internal connections, communications, and collaborations in this important area.

We welcome and are supportive of increased communications and collaborations with our external partners in local, state, and federal agencies that are working to improve and sustain soil health. Our WICS team members working with partners in these agencies will continue to serve Nebraska to ensure our soil and water resources are well managed.

Sincerely,

Michael J. Boehm
NU Vice President and
IANR Harlan Vice Chancellor

cc: Ronald E. Yoder
December 28, 2020

Keith Berns
Nebraska Healthy Soils Task Force
Chair 918 Road X
Bladen, NE 68928

RE: Nebraska Healthy Soils Task Force Report

Dear Keith,

The Lewis and Clark Natural Resources District (LCNRD) has closely followed the process of the Healthy Soils Task Force and development of the Nebraska Healthy Soils Initiative since testifying in support of LB243 at the Agriculture Committee hearing in January 2019. LCNRD supports the Healthy Soils Task Force, the completed Report and, most importantly, development of the comprehensive action plan to carry out the Initiative.

LCNRD sees statewide benefit in building awareness, determining collaborative possibilities and determining viable action steps relating to soil health in Nebraska. LCNRD has two conservation areas with direct focus on soil health as a means to positively impact ground and surface water quality and offers conservation cost-share programs that relate to soil health. Land treatment practices, and cover crop programs are widely used by producers to directly benefit soil health in the district. We work effectively with NRCS county offices in preparing and administering these programs, which is a testament to the benefits of working together.

On behalf of LCNRD, I would like to thank the Healthy Soils Task Force for all their work in preparing and submitting the Healthy Soils Task Force report. The report and initiative will further Nebraska’s role as a leader in agriculture and conservation.

Sincerely,

Annette Sudbeck
General Manager

cc: Jeff Steffen, LCNRD Board Chair
December 21, 2020

Keith Berns
Nebraska Healthy Soils Task Force Chair
918 Road X
Bladen, NE 68928

RE: Nebraska Healthy Soils Task Force Report

Dear Keith:

On behalf of the Lower Platte South Natural Resources District (LPSNRD), I would like to thank the Healthy Soils Task Force for all their work in preparing and submitting the Report. Since LB243 was proposed and approved, LPSNRD has been following the process of the Task Force to develop a Nebraska Healthy Soils Initiative and a comprehensive action plan to carry out the Initiative. LPSNRD testified in support of LB243 at the Agriculture Committee hearing in January 2019 and we support the Healthy Soils Task Force and the completed Report.

Furthermore, LPSNRD supports building awareness, determining collaborative possibilities and determining viable action steps relating to soil health in Nebraska. LPSNRD offers many conservation cost-share programs that relate to soil health. Our land treatment practices and cover crop programs are widely used by producers in our District and directly benefit soil health. We work closely and successfully with our NRCS county offices in preparing and administering these programs, which is a testament to the benefits of working together.

Again, thank you and the Task Force for the important work completed thus far, which could certainly place Nebraska agriculture in the forefront of soil health activity moving forward.

Sincerely,

Larry Ruth
Lower Platte South NRD Board Chair

Cc: Paul Zillig, LPSNRD General Manager

Protecting our natural resources for future generations
December 23, 2020

Keith Berns
Nebraska Healthy Soils Task Force
918 Road X
Bladen, Nebraska 68928

Dear Mr. Berns,

On behalf of the Nemaha Natural Resources District, I would like to thank the Healthy Soils Task Force for their time and dedication in preparing the Healthy Soils Task Force Report. Thru the process it was obvious that the members of the task force were very passionate about developing a report that provided a comprehensive and realistic plan to promote the awareness and improvement of soil health in Nebraska.

Our NRD’s located in far southeast Nebraska and our crop production is largely dryland. Soil health is important to all Nebraska; however, dryland agriculture benefits greatly from improved soils and the increased water infiltration capacity. Our hope is that this report will result in more awareness in the benefits of soil health that help provide tools we can use to help local producers implement best management practices that will directly benefit our soils. We feel that producers in our area are some of the most conservation minded in Nebraska and will be willing to work with the NRD to take the next step forward protecting and improving our soil resources.

Again, we appreciate the important work that the task force has done and are exited to see the results of your effort in the upcoming years.

Sincerely,

Robert F. Hilske, General Manager
December 22, 2020

Keith Berns
NE Healthy Soils Task Force

Dear Mr. Berns:

The purpose of this correspondence is to express the Papio-Missouri River Natural Resources District’s support for the formation of the Nebraska Soil Hub to coordinate present and future efforts to improve soil health in Nebraska.

The NRO has a long-standing commitment to conserving and protecting the natural resources within the geographical boundaries of the District. The formation of the Nebraska Soil Hub will enhance the NRD’s commitment to this effort, the health of the soils in the District.

The P-MRNRD strongly supports the NE Healthy Soils Task Force and their effort to create the Nebraska Soil Hub to bring all soil health stake holders together into a formal partnership, utilizing a common blueprint to address the Initiative’s soil health goals and timelines.

Highest Personal Regards,

John Winkler
General Manager
12/21/2020

Keith Berns
Nebraska Healthy Soils Task Force – Chair

Dear Keith,

This letter is provided to show support from the Central Platte Natural Resources District for the voluntary implementation of the Nebraska Healthy Soils Task Force proposal. The voluntary implementation of a statewide healthy soils initiative will begin the process of establishing a statewide soil hub and form a Nebraska producer learning community that will be an integral part of a successful long term soil health program in the state.

This program will bring together the many entities and projects that are being implemented and make them available to the entire state while leveraging funds to grow the program and lessen the risk for producers wanting to implement soil health practices in their operations.

Sincerely,

Lyndon Vogt

Lyndon Vogt
General Manager
Central Platte Natural Resources District
December 28, 2020

Keith Berns
Nebraska Healthy Soils Task Force
918 Road X
Bladen NE 68928

The Lower Big Blue Natural Resources District would like to thank the Healthy Soils Task Force for the work they put into the Healthy Soils Report. Soil Health has been important topic in our area of Nebraska and this effort highlights its growing importance and acceptance by producers. It provides a great framework to further promote these activities across our State.

The report clearly defines the needed steps to accomplish the important goals to make Nebraska the leader in soils health. This vital resource needs to be protected and enhanced for the benefit of our citizens.

I am sure your report will be well received by the Governor and the Legislatures Agricultural Committee.

Let me know if you have questions or need additional information.

Sincerely,

David S. Clabaugh, Manager
Lower Big Blue NRD
December 28, 2020

Keith Berns, Chair
Nebraska Healthy Soils Task Force
Created by Nebraska Legislative Bill 243,

Dear Task Force Members:

As the UNL Extension Engineer working with no-till educational programs and conducting applied research on no-till practices, I recognize the value of a healthy soil when it comes to having a productive and resilient soil system. Unfortunately, too many producers are destroying soil structure and burying crop residues with tillage, resulting in erosion, runoff, and declines in soil health. Nebraska’s progress in implementing continuous no-till systems, helping producers conserve soil and water while improving profitability and reducing risks to the environment, has been fairly regional depending on needs and locally available information. The goals set forth by the Task Force will help producers realize the value having a healthy soil and help spread the adoption of practices to improve soil health state-wide.

I have been with the University of Nebraska since 1978, working with various soil, water, and energy conservation programs and, more recently, cover crops and soil health. Most of my emphasis has been on no-till equipment and system management, stressing the systems approach and the long-term benefits of continuous no-till and improving soil health. I have had the opportunity to conduct applied research, both on University farms and on those of cooperating producers, to learn more about soil health practices and strengthen my educational programs with valuable hands-on experiences. As such, I would be glad to assist the proposed Learning Communities by sharing some of the knowledge and experiences that I have accumulated over the years of helping the early adopters. Producers learn a lot from fellow producers in their own area and the proposed Soil Health Hub and Learning Communities will greatly facilitate this learning. Likewise, I can help demonstrate the long-term soil health improvements from the use of continuous no-till cropping systems by using the University of Nebraska’s Rogers Memorial Farm.

I thank the Healthy Soils Task Force for their work and strongly support the implementation of the recommendations in their report. By doing so, Nebraskans will be able improve profitability, build soil health, and reduce risks to the environment. Healthy soils will be more resilient and help make Nebraska wealthy.

Sincerely,

[Signature]

Paul J. Jasa
Extension Engineer
December 23, 2020

Dear Keith,

I am pleased to offer this letter of support to you in regards to the final Healthy Soils Task Force Report. For the last three years, I have been the primary instructor of two crop management courses within the College of Agricultural Sciences and Natural Resources. During this time I have taught over four hundred undergraduates who are soon to be, or have already become, the agricultural workforce of our state, country and world. I speak for their enthusiasm and interest in improving soil health and supporting natural resources stewardship. I can attest firsthand to their eagerness to gain from the classroom an understanding of the crop production approaches that support these critical goals for the future of our state.

As I read the report, I see the fundamental groundwork that will help my teaching better support students who are eager not only for classroom learning, but more importantly, for seeing in action how we maintain soil resources and profitable farms. I see the report as foundational to supporting my teaching and in developing the next generation of human capital and creativity. The ideas proposed in the report – namely the formation of a state soil hub and producer learning communities – will offer countless out of classroom learning opportunities for my students. The report includes ambitious ideas that I am not aware of ongoing at such a scale in any other state. Therefore we have an opportunity to lead the country in demonstrating collaboration that truly achieves resource stewardship as well as prosperity for both our rural and urban communities.

I truly appreciate the work of the Task Force in outlining such an ambitious and important plan.

Best Regards,

[Signature]

Andrea Basche, Ph.D.
Assistant Professor in Cropping Systems
Department of Agronomy and Horticulture
University of Nebraska-Lincoln
30 December 2020

Keith Berns, Chair
Nebraska Healthy Soils Task Force
C/O GreenCover Seed
Bladen, Nebraska

Dear Mr. Berns,

I am writing to express my support for the Nebraska Healthy Soils Task Force Report. The report provides a strong case for increasing adoption of soil health practices in Nebraska. The report also provides a strategic framework for adoption of soil conservation practices through education, research, and financial investments.

As a University faculty member, my extension and research efforts focus on developing innovative solutions to the growing wildlife conservation and management needs in multi-functional landscapes where there are competing interests for agricultural production, wildlife conservation, and ecosystem services. One approach that my lab focuses on is precision conservation, which aims to create ‘win-win’ solutions for agricultural producers by maximizing whole-field profitability while reducing the impacts on the environment (e.g., reduced soil erosion, water runoff, etc.). The Healthy Soils Task Force Report aligns well with this precision conservation initiative by providing a strategic framework to adoption of soil conservation practices in Nebraska with the goal of creating resilient agricultural systems for future generations.

The elements outlined in the report are important to developing an effective healthy soils conservation strategy across Nebraska, including three key areas:

- **Establish the Nebraska State Soil Hub with Regional Proving Grounds.** This Hub will address a critical need by providing a centralized location to improve communications and coordination with partner agencies and landowners. This Hub will also help landowners share information amongst each other and work together to improve soil conservation in Nebraska.

- **Develop Producer Learning Communities (PLCs) focused on precision agriculture, economics and natural resource conservation led by interested and qualified parties such as UNL, NRCS, NRDs, and others.** PLCs will help strengthen current efforts to improve adoption of alternative agricultural practices to maximize whole field profitability and natural resource conservation in Nebraska.

- **Recruit at least $50 million in new outside funding to help farmers and ranchers make investments.** Funding will be critical to improving adoption of soil conservation practices in Nebraska.
I look forward to working with the Healthy Soils Task Force members, Nebraska agriculture and conservation organizations, and Nebraska landowners to improve education and research efforts on alternative agricultural practices aimed at maximizing whole field profitability and natural resource conservation.

Sincerely,

Andrew Little, Ph.D.
Assistant Professor of Landscape and Habitat Management
School of Natural Resources
(402) 219-1913
alittle6@unl.edu
December 28, 2020

Keith Berns
Chair of NE Healthy Soils Task Force

Dear Keith,

This is a letter of support for the Nebraska Healthy Soils Task Force's Action Plan and the five goals you have developed. As an Extension Educator located in Nemaha County, I have been working in the area of Soil Health for the past 10 years primarily in southeast Nebraska. I have also been involved in Soil Health Programming through Extension statewide and as the state coordinator of the SARE (Sustainable Agriculture Research and Education) Program in Nebraska.

I believe your first goal of establishing a Nebraska Soil Hub with regional proving grounds is an excellent strategy for the development of healthy soils in Nebraska. There are several excellent soil health projects that are currently being conducted cooperatively between the University of Nebraska, NRCS, different NRDs and farmers. Having worked with several of these projects with Nebraska Extension, coordination is sometimes lacking and resources of these different stakeholders would be better utilized if this goal is accomplished. The regional proving ground is key to moving soil health management systems forward through research and demonstration sites across the state. The regional proving grounds (RPG) will be able to build on the infrastructure that is already in place across the state under the direction of the statewide soil hub. These regional proving grounds are extremely important for developing the best soil management systems for the different climates and agriculture production systems across Nebraska. This concept to "prove" and analyze the agronomic, economic, and environmental viability of soil health practices regional is vital to the success of this action plan.

The second goal of forming a Nebraska Producer Learning Community (PLC) is a very important component of the action plan. Producer lead groups in several states have formed organizations to address soil health and your plan to use the neighboring states of South Dakota and Colorado as models makes good sense. The plan to have the PLC work with the Nebraska Soil Hub and RPG is important to increase the adoption of soil health management practices. Having a small membership fee of $50 shows a commitment to the organization and will provide some funding for programs. Opening up membership in the PLC to landowners, agriculture support workers, agribusinesses, and consumers is also important. Similar to other farm organizations, producers are key to a successful program. Nebraska Extension currently works hand in hand with different farm organizations, commodity boards, NRCS, NRDs and the farmers in the on-farm research network. The PLC would be a key group for us to work together on soil health programs and projects.
The third goal to develop the next generation of soil health practitioners is extremely important. Nebraska Extension through 4-H Programs, FFA and partnerships with other organizations knows the importance of education and training. Your plan to first expose all young people to the benefits of soil health to prepare the next generation of consumers to be soil health savvy is key. I see Nebraska Extension Educators working with PLC to provide education and training to youth and young adults about soil health. Through the partnerships with PLC, NRCS and other organizations, we will facilitate the development of the next generation of farmers, ranchers, technicians, conservationists, educators, entrepreneurs, agronomists, agribusiness workers, and leaders to ensure a productive and sustainable future for Nebraska. Your detailed plans to accomplish this goal are achievable with cooperation and collaboration of the previously mentioned organizations.

The fourth goal to recruit $50,000,000 in Additional Soil Health Funding and incentives over the next ten years is an aggressive goal, but the potential is there. I agree with your logic that soil health management practices need to be incentivized to increase adoption by farmers. I believe as the benefits of soil health practices, such as cover crops are realized, both environmentally and economically; funds will become more available through government programs, grants from governmental agencies and grants from private organizations and corporations like you describe in your action plan. A major source of funding to farmers can definitely come from corporations that are incentivizing farmers to sequester carbon through soil health practices to reduce their carbon footprint. The potential for this program are unlimited.

The fifth goal of establishing Nebraska Soil Health Measurements and Benchmarks needs to be completed. This is crucial in determining the progress producers are making through the soil health management practices they are following. Your plans for accomplishing this goal are doable as well and very important if the Nebraska Healthy Soils Action Plan is to be completed. I know Nebraska Extension Educators can be a valuable partner in soil health evaluation in the RPGs across Nebraska.

As an Extension Educator currently working in the area of soil health, I am very excited on the potential to work with the Nebraska Soil Health Task Force to improve soil health and make Nebraska a more sustainable agriculture system.

Sincerely,

Gary Lecoing, Ph.D.
Extension: Educator
Nebraska Extension
December 29, 2020
Letter of Support for the Nebraska Health Soils Initiative

To the Nebraska Health Soils Taskforce,

Having read the Taskforce Report and taken opportunity to participate in the UNL Agronomy and Horticulture listening sessions I would like to voice my support of the five goals outlined in the report. The need to value soil health for the state of Nebraska is clear. As an extension professional with Nebraska Extension, I consider it a privilege to have worked and interacted with many of the innovative and forward-thinking farmers in our state. These hard-working men and women view themselves as stewards of the land and I have learned much from them. Many of my own goals in research and extension have focused on developing and communicating ideas that will help farmers steward their land well both now and for future generations. One of the important issues addressed by the Taskforce is the farmer-led and farmer-focused approach proposed in the initiative recognizing the important role farmers play in building soil health. Furthermore, the State Soil Health Hub and Regional Proving grounds represents an innovative approach to extension and research with great potential to help improve understanding and adoption soil health concepts. Another critical need the Soil Wealth initiative addresses is the need for greater sharing and collaboration across the various soil health stakeholders in Nebraska. With the increased attention on soil health, having consistent metrics for evaluating soil health is absolutely critical if we are to improve our understanding and ability to communicate these concepts. I also appreciate the ambitious goal of recruiting $50,000,000 in funds for soil health in Nebraska and I look forward to collaborating with these efforts. While I look forward to continuing work with farmers in our state helping them produce the resources our world needs in an economically and environmentally sustainable way, I believe this can be more effectively accomplished within the framework outlined in the report. These goals address critical issues for our state, are both achievable and ambitious and I look forward to opportunities to work with the Soil Wealth initiative.

Regards,

Chris Proctor, PhD, CCA
Weed Management Extension Educator
University of Nebraska – Lincoln
174 Keim Hall
Lincoln, NE 68583
(402)472-5411
caproctor@unl.edu
December 26, 2020

To Whom it May Concern:

This letter is in support of the Soil Health for Nebraska Wealth initiative. My perspective is from the lens of working as a Nebraska Extension Educator for nearly 17 years in the areas of crops and water.

In their report, the Healthy Soils Task Force outlined five goals for consideration, and I support each of them. Many entities within Nebraska work in the soil health arena. While there has been increased effort to partner in recent years, coming together to create a Soil Health Hub would heighten awareness, increase collaboration, and reduce duplication of efforts amongst government and private entities. For example, in 2020, a partnership was formed locally with The Nature Conservancy, Upper Big Blue Natural Resources District, Nebraska Extension (and Nebraska On-Farm Research Network), Natural Resources Conservation Service, Kellogg’s, and 11 farmers to interseed cover crops into four-leaf stage corn for improved soil health. The partnership has benefited all of us in ways that could not have been achieved by any individual party. This is just one example of what could be achieved exponentially with the creation of a Soil Health Hub. It also shows the potential of entities coming together to recruit the $50 million outlined in the fourth goal. These entities can also play a role in developing the next generation of soil health practitioners as outlined in the third goal.

Working closely with farmers and livestock producers, the ones thinking outside of the box and on the cutting edge are often trying things without feeling the freedom to talk with neighbors working in more traditional ways. Connecting like-minded farmers around topics for ‘support systems’ is something I’ve often done in my Extension career. Many individuals and some groups exist but aren’t connected. Listening to farmers share ideas and their desire to share with other like-minded farmers resulted in the recent formation of a small, local soil health group. Farmers having the opportunity to share, try things, fail, and learn with others shortens the learning curve and propels agriculture forward. Thus, the importance of a state-wide Nebraska producer learning community as outlined in the second goal.

Perhaps the greatest challenge regarding soil health is understanding what it is, how to measure it, and how to put economics to it. Consistency and consensus do not currently exist and (I feel) are necessary amongst entities regarding what should be measured, what tests should be used, and what the results/analysis mean. I appreciate the recommendation of creating a committee from various entities to define these. A large barrier to soil health practice implementation is understanding economics of practices that take years to measure and place a financial value upon. Having a clear, consistent way to associate economics to practices and measurements for communication with landlords, tenants, and bankers is critical to future soil health practice adoption as outlined in the fifth goal.

This letter of support outlined a few of the reasons I support all five goals proposed by the Healthy Soils Task Force. Please feel free to contact me with any questions regarding this letter.

Sincerely,

Jenny Rees

Jenny Rees, Nebraska Extension Educator, York and Seward Counties
jrees2@unl.edu, (402) 362-5508, 2345 Nebraska Ave., York, NE 68467
December 30, 2020

Keith Burns  
Chair, Nebraska Healthy Soil Task Force

Dear Keith,

I am pleased to write this letter in support of the final report prepared by Healthy Soils Task Force (HSTF). I am writing in a capacity of Assistant Professor and Extension Specialist in Soil Science and Agronomy at the Dept. of Agronomy and Horticulture in the University of Nebraska-Lincoln.

First and foremost, HSTF deserves congratulations for such a comprehensive document on Soil Health with a well-thought plan of actions for Soil Health for Nebraska Wealth Initiative. This is a very timely and potential document that many of us will take advantage of in guiding our soil health efforts in the state individually or collectively.

Soil as a finite yet a most important resource has finally gained a long overdue attention. Some may say Nebraska is behind other states on initiatives around soil health. But the topic is so consequential and perennial that today is also the best time to set out on this journey of soil stewardship. The HSTF tirelessly conducted surveys among producers, documented challenges and opportunities around this issue and formulated 5-prong action plans. I can speak for researchers that HSTF’s suggestion to identify metrics and benchmarks of soil health management is spot on. Nebraska can take a national lead on benchmarking soil health management and many other as suggested in the report. As an extension specialist, I admire the smart idea of the Hub, Proving Grounds, Professional Learning Communities, and the development of Practitioners that will help achieve desired soil health goal in the state and are needed particularly in western NE and beyond to explore and build capacity. In addition to stewardship and capacity building, this initiative can potentially open us to a new economic growth.

I am impressed with the HSTF reaching out to all possible stakeholders and institutions in preparing this report staying true to their 3Cs (communication, coordination, and collaboration) approach. Such extensive communication and collaboration among all the state agencies and stakeholders are what it would take to move this Soil Health for Nebraska Wealth Initiative forward. I commend HSTF for putting this important foundation to all the good initiatives around soil health that are soon to sprout in the state.

Yours sincerely,

Bijesh Maharjan  
Assistant Professor | Extension Specialist  
University of Nebraska–Lincoln  
Panhandle Research, Extension and Education Center  
1-308 632 1372 | bmaharjan@unl.edu
December 27, 2020

Keith Berns
918 Road X
Bladen, NE 68928

Keith,

On behalf of the Nebraska Wheat Board (NWB), we are writing to express our support for the Healthy Soils Task Force - Soil Health Initiative Report. The task force has taken the first step in creating meaningful change in soil health.

Crop production has become much more intense and producers planting decisions change based on a number of factors. Improving our ability to manage and produce profitably will help prevent catastrophic losses, allow more effective management options, protect natural resources and help to stabilize crop and livestock production across the state. Managing nutrient inputs, crop quality, farm profitability and soil health are paramount, as we expect world populations to grow exponentially by 2050 and the burden of feeding the world falls upon Nebraska agricultural producers.

The Nebraska Soil Health Initiative links farmers, agronomists and ag professionals to conduct practical research and answer questions, develop a learning community, and recruit investment into soil health. Producers will benefit with this type of hands on research and allow them to make more informed management decisions. The cooperation between farmers, public researchers and private industry agronomists, demonstrates a commitment to the entire agriculture community. The willingness to share findings speaks volumes of the importance of the project for the benefit of all producers.

Projects like this will allow for great food stability and food security for a countless number of people worldwide, while providing practical research to farmers that produce our food. The Nebraska Wheat Board supports the continuation of research, investment, and out-reach of healthy soils.

Respectfully,

Royce Schaneman, Executive Director
Nebraska Wheat Board
December 27, 2020

To Whom it May Concern,

The Nature Conservancy is excited to the see the development and delivery of the report: Soil Health for Nebraska Wealth. The report is well documented and has been informed by experts across the food and agriculture spectrum. We have been grateful for the opportunity to provide ideas and input as this report was developed.

The report documents the significant economic and environmental benefits that can flow from widespread adoption of soil health management practices across the State of Nebraska. In 2016, The Nature Conservancy issued a report finding, on average, each one percent of U.S. cropland moving to a soil health management system would improve farmer returns by $37 million, while increasing the value for society at large by $226 million. The benefits on farm result from the opportunity to reduce input costs while keeping yields stable or seeing modest increases. The benefits to society arise from lower greenhouse gas emissions, improvements in water management and water quality.

The goals and recommendations provided in the report reinforce the need to provide timely and accessible information to farmers and ranchers across the state. Our positive experience with peer learning networks in other geographies reinforces our belief that investing in this approach will greatly accelerate the adaptive learning process across diverse areas and increase the rate of successful adoption of these practices in Nebraska. New market incentives are starting to take shape as companies and governments look to agriculture as a solution provider on environmental challenges such as climate change or water quality. Positioning Nebraska agriculture as a leader in the testing and development of new market incentives will ensure Nebraska producers are prepared to take advantage of these opportunities as they emerge.

We look forward to staying engaged with this initiative as it continues to take shape and we will look for ways we can contribute our expertise and resources to the benefit of the farmers, ranchers and citizens of Nebraska.

Sincerely,

Michael Doane
Global Managing Director
Food and Freshwater Systems
The Nature Conservancy

December 10, 2020

Nebraska Healthy Soils Task Force,

The Nebraska Grazing Lands Coalition (NGLC) Board of Directors wholeheartedly supports the Soil Health for Nebraska Wealth report. With 22 million of Nebraska’s 45 million farm and ranch acres in rangeland and pastureland, half in the Nebraska Sandhills, the potential impact for improved soil health is significant. This vast land area represents, perhaps, the largest carbon sink in the state and, hence, can play an immeasurable role in carbon sequestration. The properly grazed ruminant has the potential for the greatest enhancement in soil health over time. In addition, getting the grazing ruminant back onto row crop acres remains as an untapped management practice to greatly enhance soil health on Nebraska’s row crop acres.

NGLC Executive Board members participated in a stakeholder’s session resulting in exchange of knowledge about how effective grazing management can result in improved range conditions and enhanced soil health over time. The NGLC Coordinator served on the HSTF.

The NGLC Board of Directors stands ready to support the HSTF Initiatives as follows:

1) Collaborate with UNL, NRCS, NRDs, NDA and other natural resource conservation entities in formation of the State Soil Hub and Regional Proving Grounds
2) Contribute to the Producer Learning Community through the NGLC Stewardship Program wherein experienced grazers mentor less experienced grazers
3) Help develop the Next Generation of Soil Health Practitioners by including soil health discussion into our Generational Transition sessions
4) Participate in helping to develop soil health measurements and benchmarks that are informative for range application

Through Nebraska Environmental Trust (NET) funding, NGLC recently wrapped up a three-year land owner demonstration wherein eight private land owners grazed diverse mixtures of cover crops on row crop acres. Changes in soil health were part of the data analyzed. The longer term objective is to encourage the conversion of marginally productive row crop acres back to perennial grasslands with grazing cover crops as an intermediate step.

The NGLC Board of Directors applauds the HSTF for their tireless efforts resulting in this report which paves the way for enhanced soil health across Nebraska for future generations.

Ron Bolze, Coordinator, NGLC
December 28, 2020

Chairman Keith Berns  
Nebraska Healthy Soils Task Force  
932 Road X  
Bladen, NE  68928

Dear Chairman Berns and members of the Task Force,

Thank you for the opportunity to comment on the final draft of “The Nebraska Healthy Soils Task Force Report. Also, thank you for providing Nebraska Farmers Union (NeFU) the opportunity to comment on the draft. Finally, we thank you and everyone involved with the Task Force for their hard work.

While NeFU has reservations about portions of the report, opportunities missed, and the logistics tied to goals, all things considered, we are in general support of the goals of the report. We appreciate the effort that was made to pull together the many diverse factions in agriculture and natural resources to focus on ways Nebraska can accelerate healthy soil building activities.

As we consider future potential carbon sequestration efforts in Nebraska, it is helpful to review the carbon sequestration efforts in the 2006-2010 years. The Chicago Climate Exchange had 3,064,918 acres of Nebraska farm and range land under contract with one of three primary aggregators in the state tied to the Chicago Climate Exchange as of March 1, 2010. At that time, carbon values fell to 15 cents per metric ton as the result of the failure of the U.S. Senate to approve the Cap and Trade program already passed by the House of Representatives. 1,604 Nebraska farmers and ranchers were credited with sequestering 3,937,232 metric tons of carbon, making Nebraska the top carbon sequestering state in the nation. If the Cap and Trade legislation would have passed in the Senate, most carbon experts were forecasting carbon values to increase over a period of several years to $12 to $15 per metric ton. National Farmers Union was the largest carbon aggregator in the nation by a good margin.

NeFU was the largest aggregator of carbon in Nebraska measured by acres with 1.2 million acres of land signed up from 2006 to 2009 in anticipation of the Senate approval of Cap and Trade legislation. The Farm Bureau’s AgraGate carbon sequestration program had more producers but not as many acres as did the NeFU program. The high water mark for carbon values sold on the Chicago Climate Exchange under contract with Nebraska Farmers Union was $4.72 per metric ton. NeFU sent out checks amounting to $484,485.66 for 2006-2007 carbon credits to 221 Ag producers for an average of $2,192.24 per payment. Carbon sequestration was well received by farmers and ranchers, and just getting a good start when the U.S. Senate failed to pass the Cap and Trade legislation, which did collapse the value of carbon offsets. .

Unfortunately, when the Senate did not pass Cap and Trade legislation and support a version of the market based system being used by Europe and most of the industrialized nations of the world, it tragically failed to develop a coherent alternative climate change policy, forfeiting the U.S.’s leadership role in the world on climate change issues.

If there is to be a viable and stable carbon offset market that rewards farmers and ranchers for sequestering carbon and reaping all the soil building and water holding benefits that come with storing more carbon in our soils, the ag carbon market must be tied to a coherent national climate change strategy with goals to reduce carbon emissions and the amount of carbon dioxide in the air.

It is a fundamental mistake to not understand the linkage between healthy soils, carbon sequestration, and reducing the amount of carbon dioxide in our atmosphere. Corporate America understands that reality, and is looking for ways to partner with Ag, but national Congressional leadership in needed.


Relative to changing the cultural practices of Ag producers in order to create more healthy soils, NeFU has always supported state and federal cost share programs to incent farmers and ranchers to adopt soil and water conservation practices on their land. Experience has taught us that the most effective way to garner the necessary voluntary participation and support of landowners is to educate them on the benefits of practicing good conservation and then incent those practices. The support of landowners is essential to the success of soil building activities. Experience has also shown us that when federal, state, and local policies are aligned, progress happens, especially when educational, private sector, and land grant colleges and NGO organizations work together.

NeFU’s support for focusing on healthy soil building practices including compensating farmers and ranchers for adopting agricultural practices that sequester carbon is based on our understanding of the benefits of increasing our soils ability to absorb and store more moisture. As a result of climate change, Nebraska is experiencing changes in weather patterns. Precipitation patterns exhibit more high intensity rainfall events and longer periods between precipitation events. Soils with higher water absorption rates allows more moisture to be absorbed during high volume rainfall events, and provides more moisture for plants to draw from during longer gaps between rainfall events. Farmers and ranchers are always well served when they increase the productive capacity of the soils they depend on.

NeFU supports the establishment of Nebraska State Soil Health Hubs with Regional Proving Grounds, and forming Nebraska Producer Leaning Communities, and developing the next generation of soil health practitioners as part of a broad based educational effort needed to lay the groundwork for the adoptions of healthy soil building efforts. Education is at the base of the NeFU Triangle because all useful cooperative efforts begin with education.

We believe there are benefits in aligning the State Soil Hub and Educational and Demonstration regions with NRCS Major Land Resource Areas (MLRAs). We want to do support efforts that increase the adoption of regenerative agricultural practices and the utilization of cover crops.

We support creating a Producer Learning Community. When farmers can learn from the experience of other farmers and ranchers, we know that farmer and rancher acceptance increases.

We find the funding section to be problematic. While we need private sector partners, we know that their financial support will come with company interests that may or may not be consistent with the Task Force goals. We think the structure of future Farm Bills to support soil building is likely to happen.

Production agriculture must be open to new ideas and realities. We need to work together to pursue any and all viable options to increase healthy soils, and regenerative agricultural practices. We thank the Task Force again for their considerable amount of time, effort, and willingness to think outside of the box.

Sincerely yours,

John K. Hansen
President, Nebraska Farmers Union

Fighting for Nebraska’s family farmers and ranchers since 1913.
Dear Keith,

We are writing to express our support for the Nebraska Healthy Soils Task Force Report.

We appreciate all the work that went into the Nebraska Healthy Soils Task Force Report. The Report makes a strong case for state policies that promote the widespread adoption of soil health practices in Nebraska. It also provides a strategy for achieving more widespread adoption of those practices and the many public and private benefits that would follow. We agree that the elements outlined in the Report are important pieces of a state soil health strategy, including:

* **Organize Nebraska soil health efforts along regional lines**, using a Soil Health Hub and regional proving grounds to recognize the differences in soils, climate, and agricultural systems across the state and deliver region-specific research and information that will serve Nebraska farmers and ranchers.

* **Support a statewide Nebraska Producer Learning Community** to help farmers test soil health practices and share results and other information, which should be done in coordination with existing organizations already working to support soil health practices.

* **Put in place a state framework to support soil health education for a new generation of producers**, which will also require that the University of Nebraska and other post-secondary institutions overhaul the way they teach agronomy, livestock management, and ag economics to catch up with recent advances in soil health science.

* **Recruit at least $50 million in new outside funding to help farmers and ranchers make investments** needed to make the transition to farm and ranch systems that will rebuild healthy soils.

* **Establish benchmarks and measurements of success**, which includes identifying appropriate soil health tests for Nebraska farmland; establishing a system to track data on soil health and the adoption of soil health practices; and setting goals for the adoption of farm and ranch systems that rebuild soil health. We would like to see the state establish goals for the adoption of soil health practices by 2030 that include at least 75% no till/25% conservation tillage; cover crops used on 50% of cropland; managed rotational grazing systems on 50% of Nebraska pasture and range; and doubling the use of diverse crop rotations and the implementation of Integrated Pest Management on Nebraska farmland.

We believe the elements outlined in the Task Force Report are important, but believe several additional steps will greatly help Nebraska attain widespread adoption of soil health systems:

* **Dedicated state funding is very important.** Many of the opportunities to acquire outside funding identified in the report require a substantial match from state or local sponsors, and having a dedicated
source of state funding would greatly aid efforts to attract outside funds. That investment is very justified by the many public benefits healthy soils provide for Nebraska including water quality, soil conservation, flood mitigation, carbon storage, and fish and wildlife habitat.

* Support for soil health planning will be critical. Farmers and ranchers will need technical assistance to develop and implement soil health plans at the farm and ranch level. The U.S. Department of Agriculture has been developing soil health planning protocols but does not have the capacity to deliver soil health planning and other technical assistance to all 45,000 farms and ranches in Nebraska. Nebraska’s Natural Resource Districts (NRDs) are one logical provider of the technical assistance required, but NRD staff will need additional training in soil health principles, practices, and planning, and NRDs will need additional resources to employ soil health planners.

* Nebraska should work with USDA to identify opportunities to better use the more than $200 million in USDA conservation dollars coming into the state each year. Focusing more of those funds on soil health testing, planning, practices and systems could help Nebraska farmers and ranchers reap the economic and resiliency benefits of healthier soils while also delivering the many natural resource benefits for all Nebraskans.

* Grassland restoration and preservation should be part of Nebraska’s soil health strategy. Considerable grassland remains in the Sandhills and some parts of Nebraska, but in many counties grassland has been largely eliminated. To economically obtain the soil health and economic benefits of integrating livestock back into cropland production, Nebraska needs to promote the restoration and protection of grassland, especially in counties where it has been largely removed from the landscape.

We look forward to working with the Task Force members, the Nebraska Legislature, and Nebraska agriculture, conservation, education, and other organizations towards adoption of these recommendations.

Mike Gaghagen, Nebraska Division
Izaak Walton League of America
mikegaghagen@gmail.com

Duane Hovorka, Agriculture Program Director
Izaak Walton League of America
dhovorka@iwla.org
Central Valley Ag Cooperative letter of support for the Nebraska Healthy Soil Task Force Soil Health for Nebraska Wealth Initiative

Central Valley Ag Cooperative (CVA) wants to express our support for the work done by the Nebraska Healthy Soils Task Force developing their “Soil Health for Nebraska Wealth” Initiative. CVA works with Nebraska crop and livestock producers across the eastern half of our state. We see the need for a better understanding of soil health and how to improve the health of our soils.

The Nebraska Healthy Soils Task Force report completed in the fall of 2020 addresses many issues and concerns common to our members: Consumer interest in sustainable agricultural practices, the growing interest in agriculture’s role in climate change, agriculture’s impact on water quality, and the interest our members have in passing productive and sustainable operations to future generations.

We have recently created a position of Conservation Agronomist at CVA. Our Conservation Agronomist helps our producer members understand opportunities to add beneficial conservation practices, take advantage of cost share programs, understand opportunities for trading carbon credits, and seeks premiums for grains and proteins produced using sustainable practices. All these opportunities take good record keeping and additional planning to reap their benefits. We will assist our producers with these tasks.

We intend to work with the Nebraska Healthy Soils Task Force and the entities they create such as the Nebraska Producer Learning Community in educating agricultural producers in our trade territory. We will assist in providing speakers, distributing educational resources, and hosting grower and livestock producer meetings.

Tim Mundorf
Nutrient Management Lead
Central Valley Ag Cooperative
Timothy.mundorf@cvacoop.com
Dear Mr. Keith Berns,

Thank you for your leadership of the Nebraska Soil Health Task Force. Cargill appreciates the effort that every member of the Task Force contributed to the final report which is now on its way to Governor Rickett’s and the legislature for consideration. We applaud the broad make-up of the Task Force which consisted of agricultural producers, educators, industry, policy makers, and environmental groups.

As you know, Cargill provides food, agriculture, financial and industrial products to the world. With deep roots in Nebraska, we operate 15 facilities and employ over 3,800 people. The health of Nebraska’s environment is imperative, and Cargill is working to improve soil health in Nebraska by working hand-in-hand with farmers, ranchers, and innovators through implementation of on-the-ground projects, some of which are referenced in the report. Specifically:

- Cargill’s “BeefUp Sustainability” is an initiative committed to achieving a 30% greenhouse gas (GHG) intensity reduction across its North American beef supply chain by 2030. The 30% reduction builds on the industry’s existing GHG efficiency efforts and will equate to removing 2 million cars from U.S. highways for a year. In order to reach the goal, Cargill will work across the beef supply chain to accelerate adoption of practices known to improve sustainability outcomes, like soil health and carbon storage.

- In August 2020, Cargill, The Nature Conservancy, Target and McDonald’s launched a new five-year project aimed at working with Nebraska farmers to advance proven soil health practices to help mitigate greenhouse gas emissions and help farmers adapt to climate change. Overall, this effort has the potential to sequester 150,000 metric tons of carbon dioxide over the course of the project – equivalent to removing over 32,000 cars from the road in one year.

- In addition, Cargill previously teamed up with Nestlé Purina and The Nature Conservancy to implement innovative irrigation technology in the beef feed supply chain in Nebraska, which could save up to 2.4 billion gallons of irrigation water over the life of the project.

Again, Cargill wishes to thank the entire Task Force for their work toward assembling the final report. We share your objectives of promoting soil health practices, forging partnerships and coordination between farmers, industry, and government, and focus on setting and achieving measurable soil health outcomes. Cargill looks forward to being a partner in helping make Nebraska a leader of soil health awareness and adoption.

Sincerely,

Ryan Sirolli
Sustainability Director
Cargill, Incorporated
952-984-7626
Ryan_Sirolli@cargill.com
12-30-2020

To: Keith Berns
   Chairperson, Nebraska Healthy Soils Task Force

From: Raymond Ward, Agri-Business member of Task Force

RE: Support of the Task Force Report

I realize the importance of Nebraska’s great Natural Resource – SOIL on a daily basis. Plant life as well all life is dependent on our soil resource. This says we have to educate the population on the importance of soil in our daily lives. Erosion of soil by water and wind has reduced the potential productivity of a large percentage of our soils. This report is a road map of how to reduce soil degradation and to improve the health and productivity of our soil natural resource. A very strong side-benefit of healthy soil is improved water quality and quantity.

Our farm in Saline County has benefited from healthy soil practices. Soil erosion and water loss is much less while crop productivity has increased. In our business, farmers contact me daily asking how to improve their soils. Education, by demonstration, as outlined in the Report is the answer producers need to improve the soil and water natural resources.

I support the Task Force Report to help improve our soil resource for the betterment of Nebraska farmers and all Nebraskans.

Raymond C. Ward
Chair, PhD, CPSS, CCA
Nebraska Healthy Soils Task Force  
December 23, 2020

NHSTF Members,

I am a 25-year member of the American Society of Agronomy and the Certified Crop Advisor Program, I have logged over 500 credit hours of continued education, as well as over 30 years of working consulting with farmers and ranchers in their respective cropping and grazing systems.

After being invited to sit in on a Zoom conference call and reading the report and talking with some key members. I would like to endorse and support this effort and see it continue. I complement the task force members on the work they accomplished of laying out the needs and goals, as well as laying out the next step for the future of agriculture and potential enhancement of our precious soils.

In agriculture there are many sources of education from universities, government organizations and private industry. I see the future in a different light than one that is heavily influenced by either commodity organizations, government programs, and or federal crop insurance. The Farmer and Rancher of Nebraska and the surrounding region has an opportunity to learn, find economic opportunity and become an excited practitioner of soil health through the action plan. However currently I feel is held back from one of the core soil health principles, due to the lack of cropping choices and one of the 5 soil health principle is a diverse crop rotation and diverse species. The task for has laid out a plan for the most often the most underutilized part of the core soil principles in diverse crop rotations, which can include grazing.

My support also is area of the task for on increasing emphasis on the measurables. We often hear about the benefits of the tangibles in soil health but there are several ways of helping producers and the ag industry gain excitement as we look at the list below. These will be developed through the recommendations committee and the design of the key regions of the state referred to as the Hub.

Let me put emphasis on some of what I would hope to see developed in the Hub system.

1. Water Holding capacity is one of the most exciting things to me as I see not only benefits in infiltration but WHC increasing with good management practices. This has great economic implications to the state. My example is a producer who has soil considered by soil type to hold in the surface foot 2.5 inches of soil water. However, when measuring after 20 plus years of not till and over 10 years of cover cropping that his soil could hold 4.2 inches of soil water. More needs to be learned about how much the total soil profile can hold.

2. Carbon, I am wondering if we would be underselling the value of the carbon cycling without better measurements of total plant, root, and soil contributions from crops, covers and livestock. If this is not a net gain to the soil, we would not have the ability to increase SOM. Thus, removal from the atmosphere. Whenever I see news or comments on climate change or carbon, I think that only the emissions (carbon footprint) are discussed and rarely the sequestration side (carbon sink) unless it is from a tree in the rain forest and USA agriculture (thus NE ag) is greatly overlooked in the calculations.

3. Nutrient cycling and nutrients stored in the biomass and the soil It is easy to measure the biomass of crop residue and cover crop biomass and add that nutrient measured into fertility programs. And learn more about how much nitrate and phosphate we are retaining in the field.

Sincerely,

Rich Russell   CCA
Holdrege, NE  308-991-6442
December 23, 2020

Keith,

I am writing this letter of support for the Healthy Soils Task Force Soil Health Initiative. As a No-till Specialist working for USDA-NRCS, I have worked personally in the field with many members of the Task Force promoting soil health and water and soil conservation for sixteen years.

I will submit that the goals set forth by the highly qualified members of the Task Force are realistic and achievable and will integrate well with existing groups that we will look to align with in the future.

The establishment of a State Soil Hub that aligns Educational and Demonstration regions with NRCS Major Land Resource Areas (MLRAs) will allow for information sharing that will be invaluable in the development of economic databases that will increase awareness and encourage adoption of regenerative ag and cover crops across all of the variable soil types and various agronomic systems in our state.

The concept of creating a Producer Learning Community is an excellent approach. Having coordinated a No-till Incentive Program for the Lower Elkhorn NRD for some twenty years, I believe that the process of bringing farmers together to share ideas, approaches and successes is a sound path toward success.

Education is the foundation of change, and the Healthy Soils Task Force Soil Health Initiative approach is a good base to begin with in our journey to address climate change and regenerate our soil resources.

Thank you,

Dan Gillespie

NRCS No-till Specialist
December 23, 2020

TO: Members of the Nebraska Healthy Soils Task Force

FROM: Nebraska Elder Climate Legacy Initiative


As members of the Nebraska Elder Climate Legacy (ECL) Initiative, we enthusiastically support the work of the Nebraska Healthy Soils Task Force which has culminated in this final report to Governor Ricketts and the Agriculture Committee of the Nebraska Legislature.

We see the effort as being a very comprehensive process of assessing Nebraska’s abundant and diverse soil resources. The process was also transparent, involving all stakeholders. And it comes at a critical point in the evolution of agricultural management practices needed to adjust to the multiple challenges facing agriculture and society today. But rather than just another report to gather dust on administrative book shelves, the Task Force members have developed a sound set of recommendations and a bold, but certainly doable, action plan. In short, the Task Force efforts over these many months serve as a solid foundation for Nebraskans and their elected officials to move forward in establishing the state as a national leader in building soil health for the future. And doing so through voluntary programs and additional support offered our agricultural producers — the true stewards of the land!

Early on in its inception, founding members of ECL realized that Nebraska has a particularly unique and profound role to play in humanity’s dual challenges of long-term food security and climate adaptation/mitigation; a role coming through our productive agricultural sector and the land and water resources from which it thrives. Consequently, ECL was instrumental in the passage of LB243.

Over the past 12 to 18 months, much has transpired at the national level which amplifies soil health and this work of the Healthy Soils Task Force. Within the private sector, businesses are increasingly seeing the value of eco-services that agricultural producers can provide—including carbon sequestration in the nation’s working agricultural lands. In turn, markets are developing for carbon credits, whereby producers are financially reimbursed for their stewardship practices. In Congress, Nebraska’s own congressional delegation have signed on in support of the Green Climate Solutions Act, a plan to help farmers and ranchers access carbon credit markets. As NE Senator Deb Fischer noted, “--reducing barriers (to these markets) will enable more ag producers to be part of the climate solution and it will help them expand on existing practices (of good stewardship).”

Looking ahead, we regard the implementation of the recommendations of this report as being a most critical policy action step. It is policy that can offer better risk management and expanded economic opportunities for our agricultural producers; while at the same time yielding greater environmental sustainability and more equitable societal sharing of those responsibilities and benefits. It’s just good Down-to-Earth policy!

Bruce Johnson, on behalf of the Nebraska Elder Climate Legacy Initiative