

## 2019 Annual Report of Accomplishments and Results

North Dakota
North Dakota State University

### I. Report Overview

The NIFA reviewer will refer to the executive summary submitted in your Plan of Work. Use this space to provide updates to your state or institutions as needed.

<b>1. Executive Summary</b> (Optional)
See Plan of Work

## II. Merit and Scientific Peer Review Processes

The NIFA reviewer will refer to your Plan of Work. Use this space to provide updates as needed or activities that you would like to bring to NIFA's attention.

Process	Updates
1. The <u>Merit Review Process</u>	No updates
2. The <u>Scientific Peer Review Process</u>	No updates

### III. Stakeholder Input

The NIFA reviewer will refer to your Plan of Work. Use this space to provide updates as needed or activities that you would like to bring to NIFA's attention.

Stakeholder Input Aspects	Updates
1. Actions taken to seek stakeholder input that encouraged their participation with a brief explanation	No Updates
2. Methods to identify individuals and groups and brief explanation.	No Updates
3. Methods for collecting stakeholder input and brief explanation.	No Updates
4. A Statement of how the input will be considered and brief explanation of what you learned from your stakeholders.	No Updates

#### IV. Planned Program Table of Contents

No.	Program Name in order of appearance
1.	Cropping Systems
2.	Natural Resources
3.	Livestock Systems
4.	Economic and Community Vitality
5.	4-H Youth Development
6.	Human Development and Education
7.	

## V. Planned Program Activities and Accomplishments

Please provide information for activities that represent the best work of your institution(s). See Section V of the Guidance for information on what to include in the qualitative outcomes or impact statements. Add additional rows to convey additional accomplishments. You may expand each row as needed.

No.	Title or Activity Description	Outcome/Impact Statement	Planned Program Name/No.
1.	<b>Increasing Access to Organic Support</b>	Transitioning to certified organic production increases the value of grain and allows farmers to access rapidly growing, high-value organic markets. See below.	1 Cropping Systems
2.	<b>Soil Sense Podcast Shares Soil Health Collaborations</b>	The Soil Sense podcast highlights the unique way farmers, consultants, researchers and Extension are working together to advance soil health in North Dakota.	1 Cropping Systems
3.	<b>Leading a Public-Private Partnership to fight SCN</b>	Protecting soybeans from new and emerging diseases helps protect the nation's food supply, keeps more money in hands of North Dakota growers and strengthens our local economy.	1 Cropping Systems
4.	<b>Brine Spill Remediation</b>	Returning brine spill lands to production will ensure the long-term sustainability of North Dakota's agriculture operations and rural communities, while enhancing food security.	2 Natural Resources
5.	<b>Emerald Ash Borer</b>	Diversification of tree species, along with planning and preparation, makes urban forests more resilient.	2 Natural Resources
6.	<b>Reclaiming Pipeline Disturbed Soils</b>	When pipeline-disturbed soil is properly vegetated, landowners are spared the losses associated with poor grain production and soil erosion.	2 Natural Resources
7.	<b>Nutrient Management Education</b>	Educating and assisting crop and livestock producers in adopting nutrient management practices specific to manure will reduce adverse impacts on water quality leading to increased confidence and acceptance of agricultural practices by the public.	3 Livestock Systems
8.	<b>Bovine Emergency Response Team</b>	Public safety is always a concern when dealing with accidents involving animals. The first step in assuring public and human safety is training first responders on the correct procedures for addressing incidents involving the transportation of livestock.	3 Livestock Systems
9.	<b>Energizing Entrepreneurs</b>	Resources on entrepreneurship and firsthand connections with successful entrepreneurs can help develop business ideas and expand the workforce	4 Economic and Community Vitality

<b>10.</b>	<b>Lamb Value Discovery</b>	Sheep producers can learn more about the end product of lamb, and consequently, identify production management targets that result in a high quality product, increased dollar value, and operation sustainability.	4 Economic and Community Vitality
<b>11.</b>	<b>Creating Impact with Technology</b>	Enhancing youth's skills in technology can help communities change for the better.	5 4-H Youth Development
<b>12.</b>	<b>Youth Gardens Lead to Healthy Kids</b>	Youth garden programs provide hands-on activities that lead to healthy kids and strong communities.	5 4-H Youth Development
<b>13.</b>	<b>The Family Table: Eat, Connect, Savor</b>	Improving health behaviors can increase quality of life and save millions of dollars in collective health-care costs for North Dakotans throughout their lifetime.	6 Human Development
<b>14.</b>	<b>Childhood Obesity Efforts</b>	Improving health behaviors for youth can increase quality of life and save millions of dollars spent on collective healthcare costs for North Dakotans through their lifetime.	6 Human Development

## Increasing Access to Organic Support

### Providing science-based information on organic crop production

#### Public Value Statement

Depressed commodity prices are hurting farm income and the volatility of conventional grain markets is taking a toll on the financial and mental health of farmers. Transitioning to certified organic production increases the value of grain and allows farmers to access rapidly growing, high-value organic markets. Currently, it is difficult for North Dakota farmers to access experienced organic advisors. This programming is growing the network of agronomists and ag service providers who can advise farmers on best practices for organic transition, certification, and management

#### The Situation

Certified organic grains are in high demand and supply chains are struggling to find sufficient domestic supplies of organic wheat, corn, and soybean. Organic certification offers farmers strong price premiums over conventional markets and can improve farm profitability. However, transition to and management of organic crops is challenging and involves a steep learning curve for producers. Not only is transition challenging, but farmers lack access to a robust network of agronomists trained in organic production to turn to for advice.

#### Extension Response

To address the lack of ag service providers knowledgeable about organic certification and management, an Extension Specialist started an organic training program. Workshops for NDSU Extension staff were held in 2017 and 2018 training 11 county agents and 1 specialist. In 2019, the specialist partnered with a regional group to offer a two-day training for agronomists and farmers focused on the basics of organic certification, inspection, record-keeping, and management. This training was the first in a series that have become the Organic Agronomy Training Service (OATS). In late 2019, OATS became an independent non-profit entity dedicated to increasing farmer access to science-based organic technical support.

#### Impacts

The first-ever OATS training was held in Bismarck in March 2019. Thirty people attended and participants were evenly split among producers and agronomists or other ag service providers. A highlight of the program was small group discussions working through case studies of farmers transitioning to organic production in different parts of the Northern Great Plains. Participants reported that talking through realistic scenarios with experienced organic farmers and agronomists helped them think holistically about organic transition and management. Two farmers reported they would begin transitioning a portion of their land to organic production in 2019 as a result of attending OATS.

#### Participant Feedback

"OATS had a great mix of people from all aspects of the organic industry...I especially liked hearing what practices are working on organic farms from the farmer-presenters...It was an excellent training!"

-ND farmer who began transition in 2019



Attendees discuss organic transition scenarios in small groups.

## Soil Sense Podcast Shares Soil Health Collaborations

### Public Value Statement

The Soil Sense podcast highlights the unique way farmers, consultants, researchers and Extension are working together to advance soil health in North Dakota.

### The Situation

Farmers are searching for science-based alongside experiential information about soil health. They want the low risk associated with the university studied approaches, but they also want the innovation and guidance from other farmers using soil health building practices. This has led to a significant and unique collaboration amongst farmers, consultants, researchers and Extension in North Dakota where soil health isn't about the prescription, but rather the pursuit. Getting this information from multiple sources in the hands of those who need it is where the Soil Sense Podcast is highly effective.

### Extension Response

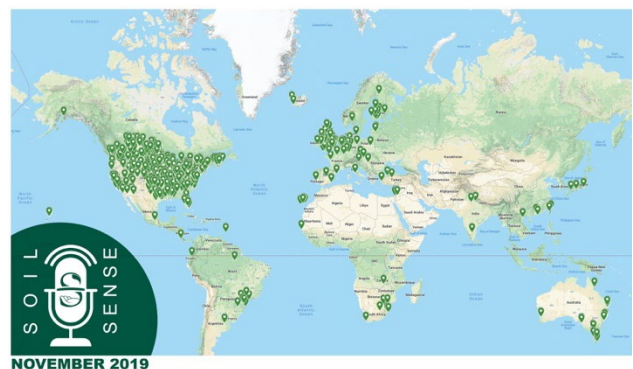
Let's paint a picture of how the Soil Sense Podcast was developed. Imagine riding around in a tractor with a farmer, talking about what they do during countless hours in equipment planting, protecting and harvesting crops. What do they listen to, is it music, talk radio or podcasts? Well, for many, it's podcasts. Add another piece to the puzzle – a nationally recognized podcast host, Tim Hammerich from the Future of Agriculture, develops and interest in the soil health approaches being used in North Dakota. And thus, the 16 episode Soil Sense Podcast was born!

Doing a podcast alone still presents several missed opportunities. Linking additional resources, like NDSU YouTube videos sharing research and on-farm examples, on-line web calculators and follow-up websites through a highly interactive webpage (NDsoilsense.com) is how we continue to expand upon information availability. We then promote that

information using high quality graphics shared using social media and listservs.

### Impacts

Since the release of the podcast on August 1, 2019, there have been over 11,000 plays from across the world. There has also been significant interaction via social media and increased viewing of NDSU soil health videos. This has led to the recording of a second series to be released in 2020.



### Feedback

"Sitting in the packing tractor may not be the most exciting job but I've had two days to catch up on the #soilsense podcast. It's a great series, and been fun to listen to. It has my 5 stars on the podcast app!" – *Twitter post, Extension professional*

"I have loved learning about #soilhealth & how it is affected by tilling, herbicides, weather and #covercrops on the Soil Sense podcast through @NDSU and @NDSUsoilhealth" – *Twitter, social media influencer with over 21,000 followers*



## Leading A Public-Private Partnership to Fight Soybean Cyst Nematode

### Public Value Statement

Protecting soybeans from new and emerging diseases helps protect the nation's food supply, keeps more money in hands of North Dakota growers and strengthens the local economy.

### The Situation

Soybean Cyst Nematode (SCN) causes more yield loss to soybeans than any other disease in the United States. SCN continues to spread in North Dakota, and is slowly adapting to the genetic resistance used in approximately 95% of the soybean in the US. Simultaneously, the majority of growers are unaware of the erosion of this critical disease management tool. The situation is too large and complex for one organization to address alone. Without intervention, yield losses to SCN will continue to increase.

### Extension Response

*NDSU Extension leads a national public-private partnership* whose mission is to address the SCN crisis, known as '**The SCN Coalition**'. Launched in 2018, the SCN Coalition includes dozens of Universities, companies, and soybean checkoff organizations. To date, over **\$2.5M** has been committed by soybean checkoff and private industry partners and an additional **\$2.5M** (est.) in in-kind support has been garnered to fund the SCN Coalition.

### Impacts

Since the 2018 (February) launch and January, 2020, the SCN Coalition has:

- 429 national article mentions
- 16.4% share of the national 'SCN' discussion
- 18.2 M potential impressions
- Embedded itself in the nation's largest outdoor and indoor farm shows.
- Worked with media partners to deliver a special edition 32-page insert in the Corn+Soybean Digest to 113,000 growers mailboxes.

- Been awarded the Best of NAMA Award for Overall Public Relations Program. NAMA is the largest agri-marketing organization in the US.

## The Public-Private Partnership

### A Model Public-Private Partnership in Extension



The SCN Coalition is recognized as a model for the synergistic impact that public-private partnerships have when all parties have '*skin in the game*'.

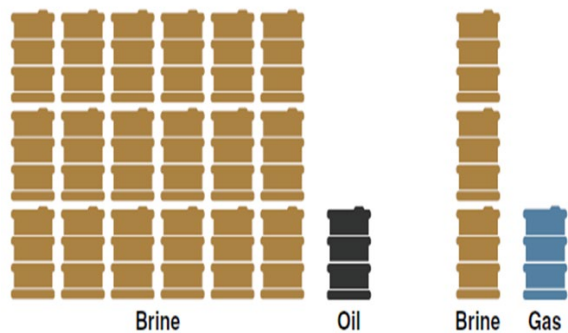
Brine Spill Remediation

Public Value Statement

Brine spills result in agricultural lands that have reduced productivity or, in some cases, removed from production. Returning these lands to production will ensure the long-term sustainability of North Dakota’s agriculture operations and rural communities, while enhancing food security. In addition, reclamation of these lands will improve ecological functions leading to enhanced biodiversity, wildlife habitat, air quality and water quality.

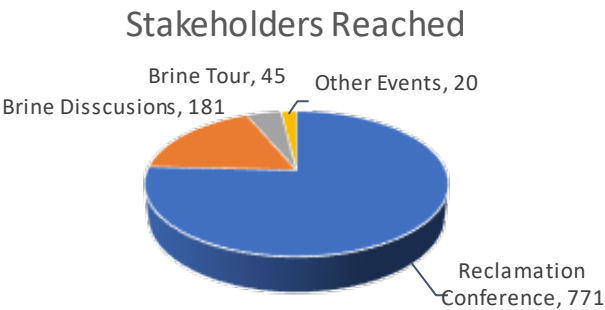
The Situation

Global population growth and industrialization have greatly increased the demand for both food and energy. This increasing demand for both agricultural products and energy has led to unprecedented economic growth and development in the state of North Dakota. While proving to be economically beneficial, oil and gas production poses significant risks to agriculturally dominated regions in the form of produced water or “brine” spills. Brine is a solution consisting of high levels of dissolved salts, primarily NaCl, and is the primary byproduct of oil production. On average in North Dakota, as many as 18 barrels of brine are produced for every barrel of crude oil. Brine-contaminated soils often exhibit structural and edaphic properties that severely inhibit the growth of vegetation. In the period between 2001 and 2015, over 6,000 brine spills with an average volume of 3,400 gallons occurred in North Dakota. Without active remediation, the effect of salts on soil and vegetation can last many years.



Extension Response

NDSU Extension initiated a program to educate industry and landowners about the impacts of brine spill, strategies for remediation, and awareness about their consequences if left untreated in 2017. A multifaceted approach that included eight brine discussions, three conferences and 12 presentations, and one tour was utilized to disseminate program curriculum to landowners, industry and other stakeholders. These efforts reached 1,044 people, including 81 private landowners, 129 industry representatives, 146 government officials.



Impacts

The brine discussions were informal events that brought together landowners, industry and government representatives to discuss brine spills and directed programming efforts. Topics discussed at these events included the impacts of brine spills, spill reporting, spill response, technologies used to prevent and mitigate spills, and updates on spill remediation research. The insights gained from these events resulted in the creation of an Extension publication and the organization of a tour.

The North Dakota Reclamation Conference is an annual event hosted by NDSU Extension in conjunction with BKS Environmental, Dickinson State University, Society for Range Management and the North Dakota Department of Environmental Quality. Surveys of participants reported increased knowledge of spill reporting, soil remediation techniques and vegetation establish. In addition, 72% of survey respondents intended to modify their current reclamation practices as a result of the knowledge gained at the 2019 conference.

NDSU Extension hosted a Brine Spill Remediation Tour in 2019 in response to input received during the Brine Discussions. Post tour surveys of participants revealed:

- 95% increased their knowledge of the impacts of brine.
- 95% increased their knowledge of methods that can be used to evaluate a brine spill.
- 100% increased their knowledge of soil remediation practices.
- 100% increased their knowledge of bioremediation practices.

## Feedback

"There is a need for education for landowners, oil industry, our legislators and government officials. NDSU has made a huge effort to pull us all together with their round table discussions, I can't express how important I feel it has been to be able to sit at a table with all groups involved and to be able to have a frank discussion on our concerns and to try to understand where the other parties stand on issues. I find that when there is no communication you have a tendency to think the worse. NDSU needs a big "Thank You" for initiating a lot of communication. Going on that tour has reinforced the need for continued education, we all need to understand what is happening around us. We need to keep the lines of communication open between all parties. "Thank You" NDSU."  
– Patty Jensen, landowner, Tioga, ND

"The Brine Extension program has done an excellent job connecting technical information with concerned landowners. This benefits both parties, providing sound technical information and updates on recent research to ag producers, and giving feedback to NDSU educators and researchers on the real world concerns." – Karl Rockeman, Director, Division of Water Quality, North Dakota Dept. of Environmental Quality

"The Northwest Landowners Association seeks to educate the public about surface rights by organizing public information meetings while continuing to work with state agencies in developing new guidelines and policies for bonding, pipeline technologies, and reclamation and remediation. Our partnership with the NDSU Extension in hosting brine spill discussions and a tour is beneficial for the NWLA board of directors to be a part of and properly gauge the needs and concerns of landowners. NDSU Extension's efforts to educate the public on reclamation have been fruitful; landowners are more proactive and better educated on what to do when a spill is discovered." - Troy Coons, Chairman, Northwest Landowners Association

"We feel the reclamation conference is critical in our ability to state our best practices with state and industry leads, as well as learn from everyone else. It's a critical component to continuing to improve what we do.

" - Anonymous Industry Representative



## **Emerald Ash Borer**

### **Training Continues and Preparations Intensify**

#### **Public Value Statement**

People love trees, but our urban forest is vulnerable to invasive pests! Diversification of tree species, along with planning and preparation, makes urban forests more resilient.

#### **The Situation**

Emerald Ash Borer (EAB) is a highly destructive insect pest of ash trees, killing >99% of the trees it attacks. Though the insect has not been found in North Dakota yet, we still have the opportunity to plan and prepare. It will likely be devastating to forest resources in North Dakota as green ash makes up the majority of trees. On average, more than 40% of the urban forest trees in North Dakota are green ash; in some communities that number is as high as 80%.

#### **Extension Response**

Preparations for EAB have been steadily ongoing for many years but were intensified in 2019. In cooperation with the ND Forest Service and the ND Department of Agriculture, several training events were held. We taught three face-to-face training sessions for Natural Resources Conservation Service (NRCS) personnel in March, followed by an on-site visit to an EAB-infested area near the Twin Cities in April. Participants were trained on EAB biology, potential treatments, likely regulatory response, and ash-replacement species. A hands-on exercise focusing on searching for insects beneath the bark was especially useful. In October, two additional workshops were held for municipal forestry personnel from throughout the state.

#### **Impacts**

Together, these events trained 130 natural resources professionals. More than 90% of respondents listed the training sessions 'Good' or 'Very Good'. When asked how they planned to use the knowledge gained from the

training, participants most-often listed identifying the signs and symptoms of EAB while in the field. However, several people discussed creating or adjusting an EAB management plan, or working with Tree Boards and other stakeholders to build support for EAB preparations. Three months later, several participants were already putting those plans into action, as seen below.

#### **Feedback**

"Educating public and Towner, Granville, Velva, and Drake communities on where EAB is now. Promoting diversity!"

-EAB workshop participant, Bismarck

"Started a tree inventory within the school district. Coming up with a plan to replace ash trees within the district over time."

-EAB workshop participant from West Fargo

"I'm hoping to take a proactive approach to EAB vs. reactive."

-Mandan City Forester



Participants team up in the hands-on log peeling exercise during an Emerald Ash Borer detection workshop in Bismarck, ND.



# Reclaiming Pipeline Disturbed Soils

## Improving profitability with perennials

### Public Value Statement

Hundreds of miles of pipelines crisscross western North Dakota and more are installed every month as the oil and gas industry expands. When pipeline-disturbed soil is properly vegetated, landowners are spared the losses associated with poor grain production and soil erosion. Perennials reduce production costs, spread risk, and help soils recover after pipeline installation.

### The Situation

Pipeline development in western North Dakota is increasing as companies seek to capture natural gas and reduce transportation costs of the oil and produced water being hauled by truck and rail. Most pipelines are installed via trenching and these disturbed sites too often become unproductive areas that are susceptible to soil erosion and weed infestation. When farmers plant annual crops on compacted or compromised soils, they incur production costs and get little yield in return.

### Extension Response

A farmer near Ray, ND reached out to an Extension Specialist at the Williston REC in early 2018 to discuss options for managing a pipeline that crosses his property. He grew annual crops for three years after pipeline installation but lost money every year when those crops yielded little or nothing at all. The specialist developed combinations of different alfalfa and grass varieties to plant in a demonstration trial and helped Shane secure seed. The mixes were seeded in June 2018. In 2019, the farmer and specialist hosted an on-farm field day to highlight the progress the perennials are making.

### Impacts

The farmer estimates he lost over \$200 an acre on the approximately 40 acres of the pipeline in the years he planted soybean and durum. He was also losing soil to erosion where there was bare ground and getting frustrated by weeds. A rough estimate of seed and seeding costs for the site is \$2,833 and in 2019, Shane earned \$4,500 from his portion of the hay after an agreement to split the bales with a neighbor who cut and baled it. This comes out to a net return of \$1,667 over 2 years, or about \$20 per acre per year. This is a tremendous improvement in profitability in just 2 years! Future returns are predicted to be even better because no more inputs are needed and thus establishment costs are spread out over more years.

### Participant Feedback

The farmer said the pipeline may be his most profitable acres in 2019. The record-breaking September rains prevented him from harvesting many of his annual crops and he saw the benefit of spreading risk to a forage cutting taken earlier in the summer. There would have been even more bales to sell had the hay cut in southern-most quarter not been rained on and abandoned.



View of the site looking south on May 29, 2019. Pipeline is on the left, undisturbed soil is on the right.

## Nutrient Management Educational Support Program...A five-year review

### Public Value Statement

Educating and assisting crop and livestock producers in adopting nutrient management practices specific to manure will reduce adverse impacts on water quality leading to increased confidence and acceptance of agricultural practices by the public.

### The Situation

Livestock production is a major industry in North Dakota with approximately 1,690,000 cattle, 151,000 hogs, and 73,000 sheep being inventoried annually on over 31,900 farms. The manure produced by these livestock is identified as a major source of surface water contamination in many watersheds across the state. According to the North Dakota 2018 Integrated Water Quality Assessment Report, 26,439 acres of lakes and reservoirs are impaired by nutrient loading of which animal feeding operations (concentrated livestock feeding and wintering operations) are a source.

Geographically, North Dakota has two distinct livestock production areas. The eastern portion of the state has a more rolling topography and receives higher rainfall giving rise to potholes and more year-round flowing streams with an increased risk of frequent water runoff events in the watersheds. The western portion of the state has a steeper topography and receives significantly less rainfall but is prone to higher intensity of runoff during the less frequent events. The precipitation and topography split also dictates two different cultures of livestock production.

The NDSU Nutrient Management Educational Support Program, under the direction of the current

Livestock Environmental Management (LEM) Specialist, has evolved since its inception 22 years ago. The focus has shifted from regulatory compliance issues and proper manure application to alternative livestock feeding options and the characteristics of handling livestock manure once it is contained in North Dakota's climate. Along with numerous invited talks, the specialist

coordinates annual events such as the North Dakota Custom Manure Hauler Training and Composting

Demonstration Days. These events target not only producers, but also 319 Watershed Coordinators, NRCS and NDSU Extension personnel. For the past five years the program has had a consistent FTE. This report will show the reach and impact having a focused manure management Extension specialist can have on stakeholders of North Dakota.

### Extension Response



**768** One-on-one Consultations



**10** Publications

- Manure Spreader Calibration for Nutrient Management Planning
- N.D. CAFO Operators Record Book
- Animal Carcass Disposal Options
- Environmental Implications of Excess Fertilizer and Manure on Water Quality
- Nitrogen Behavior in the Environment
- North Dakota Manure Fertilizer use Recommendations
- Phosphorus Behavior in the Environment
- Alternative Winter Feeding Strategies for Beef Cattle Management
- Containment Pond Management
- 5 Easy Steps for Composting Dead Livestock



**2** Packaged Programs

- Mortality Management
- Kids, Compost, Crops and Consumption: Introducing the Whole Food Cycle to Urban Youth



**120** Presentations



**16** Nutrient Management Demonstrations/Tours



Other activities included updating the LEM website, preparing LEM News for 300 recipients, timely press releases and radio interviews.

## Impacts and Feedback

The following are impacts and feedback from three selected programs (youth program, in-service format and general manure management) from 2015 through 2019.

Eighty third- and fourth-grade students at a low-income school in the Fargo School District participated in the pilot program **Kids, Compost, Crops and Consumption**. This program consisted of 6 lessons: livestock production, compost and manure, soils, plant growth and human nutrition with a review at the end to complete the cycle. Follow-up evaluations were completed by 63 students 3 months after the last lesson and indicated students applied the knowledge they gained:

- 73% planted the square-foot garden that was provided by the program.
- 37% harvested the plant and the majority ate it as a salad.
- 57% planted another garden besides the one the program provided.
- 62% had a parent participate in the garden activity.
- 29% consumed 2 serving of vegetables per day during the summer break months.

### Teacher feedback

- “The most valuable part of the program was exposing the students to agriculture in ways they have not experienced. Very hands-on and having something to take home to try was excellent. As one student said, ‘Showing us real life.’”
- “I noticed the kids were attentive and really participated in discussions.”

After the pilot, Kids, Compost, Crops and Consumption was turned into a packaged program and has been used in 9 counties in North Dakota and by 1 educator in Minnesota and is available to NDSU Extension agents, educators and Soil Conservation Districts for the 2020 programming year.



When the 2012 equine inventory for ND was compiled by the National Agricultural Statistics Service, 5 counties were home to 25% of the total inventory for the state. In 2015, the LEM program along with NSDU Extension agents hosted **Equine Encounters** in three of those counties. These workshops were geared toward small-scale, urban equine owners who have lesser manure management experience. Fifty-seven percent of the attendees increased their knowledge of proper manure management techniques and 98% of 46 respondents said they would attend another meeting if offered the following year. In 2016 a fourth county was added and the workshops were hosted again. This time we added in-field activities (pasture walk, weed ID, compost bin how-to) to go along with the education. When asked to list one behavior they intended to change within 3, 6 or 12 months as a result of the workshop, 35% of participants responded they were going to compost their equine manure.

Most of these small-scale equine owners are also found near urban areas and are at risk for stockpiling excess livestock manure because of minimal land for application and limited space for winter feeding. For the next 3 years, starting in 2020, the Equine Encounter workshops will be hosted in 5 ND counties in the spring and fall. The overall goal will be to improve manure and land management techniques to help sustain a small but growing sector of the livestock industry.



**Composting manure** has been a major focus for the past 5 years. The LEM program hosts at least one hands-on composting workshop each year where participants can view compost at various stages, sample for moisture, monitor temperatures and see how a compost turner operates. These workshops are typically hosted at the NDSU Carrington Research Extension Center. Because of these workshops the LEM program has connected with producers in the state and aided in decisions as they purchased compost turners or spreaders, started using compost as a soil amendment, attended national composting workshops, and started compost businesses. The format of the workshops has evolved to include producers as the host-sites. In 2019, two producers hosted workshops in the northeast and northwest regions of ND. Because of the continued interest in composting manure in ND, a \$50,000 North Central Region Sustainable Agriculture Research and Education grant was awarded to NDSU LEM and University of Minnesota Manure Management Extension programs for workshops in 2020 and 2021 which will include the help of 4 producer-composters.

The following is feedback from a composting business:

- “The most useful part of working with NDSU Extension and CREC has been the wealth of resources and depth of knowledge that the professional staff provided to us through the service. Through printed materials, we could dive deeply into programs, grant opportunities and educational offerings, then follow internet links to even more information. During in-person meetings, we were able to ask specific questions and trust that the advice and guidance provided to us by the specialist and other staff members, was based on current, top of the line research directly related to our business. Mary's availability to meet and willingness to share her fund of knowledge - and passion about manure management - on multiple occasions has been greatly appreciated by us all!”





## Bovine Emergency Response Program

### Public Value Statement

Public safety is always a concern when dealing with accidents involving animals. The first step in assuring public and human safety is training first responders on the correct procedures for addressing incidents involving the transportation of livestock.

### The Situation

Daily there are several hundred thousand head of cattle on the roadways in the United States. University and Extension faculty from across the country developed the Bovine Emergency Response Plan (BERP) and teaching curriculum as a framework for emergency responders to more appropriately address accidents involving cattle transport vehicles. The Plan includes standardized recommendations, suggestions and materials for emergency personnel in call taking, scene arrival and assessment, containment and security, extraction of cattle, relocation of cattle, mortality disposal, securing the wrecked transport vehicle, euthanasia, and debriefing.

### Extension Response

At educational programs conducted in North Dakota, South Dakota, Nebraska, Georgia, and West Virginia, participants participated in: classroom training, table top exercises, demonstrations and practicums on the subjects of in call taking, scene arrival and assessment, containment and security, extraction of cattle, relocation of cattle, mortality disposal, securing the wrecked transport vehicle, euthanasia, and debriefing. The training is targeted toward first responders and others

interested in responder safety, public safety and animal care and well being.

### Impacts

The attendees of the BERP training sessions included farmers, ranchers, veterinarians, fire department staff, county emergency managers, law enforcement, ambulance, tow truck drivers, and extension agents.

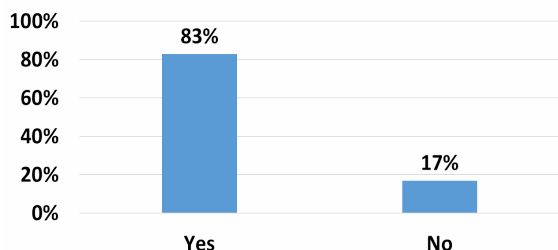
Participants took a pre and post test to compare knowledge before and after the training. Overall, attendees post test scores improved 22% over their pre test scores.

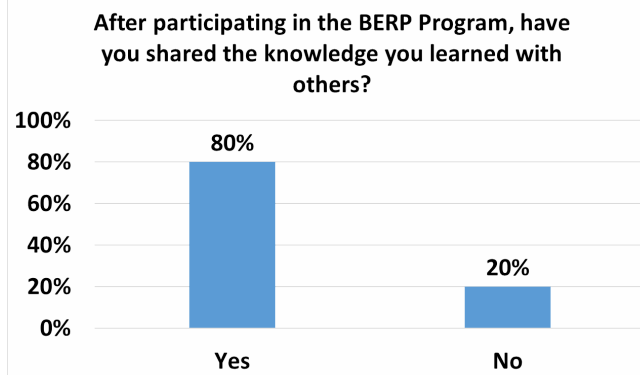
Participants also completed a course survey to determine participant knowledge before and after the program in the following areas: Introduction and Local Emergency Planning, Transportation Hazards, Biosecurity, Euthanasia and Mortality Issues, Debriefing and Safety, and Animal Care and Handling. Attendees were asked if they learned what they expected, and if the program was worth the cost to attend.

Follow up surveys indicate participants implement practices taught in the BERP trainings.

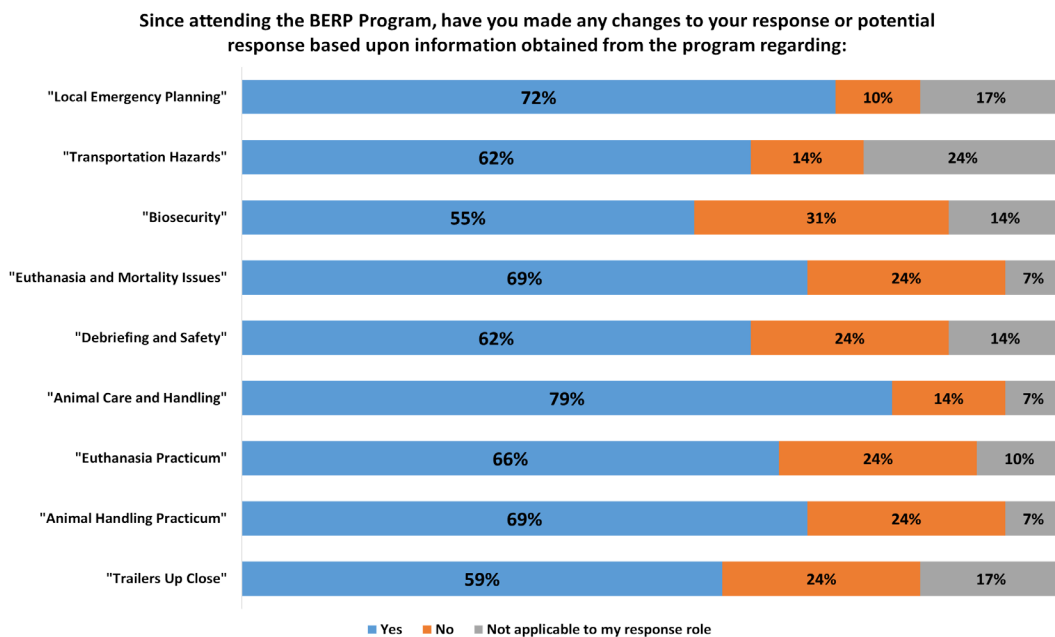


If you have responded to an emergency incident involving cattle, did the training you received at the BERP Program help you to mitigate the event?





- “This training also applies to all live animal incidents, not just bovine transport incident response. The biggest improvement I have seen so far has been the animal handling recommendations, thinking like an animal, and pen setup recommendations directly from the class to create a successful outcome.”
- “As a veterinarian it’s crucial for us to know how to proceed when these emergencies occur and much of what was covered is not emphasized in vet school”
- “We used some of the information learned to capture a horse that was loose on the highway.”
- “I shared some of the information with other officers at the state police academy. I believe it should be taught to all basic and cadets.”



## Feedback

- “Every time the livestock panels go out it’s a learning experience for the fire departments and law enforcement. They are gaining a lot of confidence in working with animals properly now - confidence they didn’t have before the BERP class or interaction with BERP trained responders.”



## Energizing Entrepreneurs

### An Entrepreneurship conference for rural entrepreneurs

#### Public Value Statement

Resources on entrepreneurship and firsthand connections with successful entrepreneurs can help develop business ideas and expand the workforce.

#### The Situation

Rural communities across North Dakota are faced with the closing of many main street businesses. The retail sector looks different than it ever has. When local businesses close, it affects not only the tax base but the social fabric of a community that leaves empty store fronts on main street.

#### Extension Response

This effort brought two-day conferences and resources in Oakes and Garrison, ND to rural residents with the goal to educate and inspire individuals to start their own business in the community where they reside. Successful entrepreneurs served as keynote speakers and breakout sessions were held in local main street businesses. Participants could see a main street business firsthand, while hearing the unique real-life challenges on how to make a business successful in a rural community.

#### Impacts

This conference connected individuals who are interested in starting a business with successful entrepreneurs as well and state agencies with resources to help them get started. The conference also showcased an entrepreneur friendly rural community while exposing “outsiders” to the many successful businesses the town had to offer.

The results of the evaluation included:

- 42% of participants had high optimism regarding possibilities for entrepreneurship in rural ND AFTER attending the conference.
- 80% of participants reported a high level of optimism regarding possibilities for entrepreneurship in rural ND after attending the conference.

#### Feedback

“I came away with so many ideas and things that I should be thinking about going forward. I was overwhelmed (in a good way) with the information and programs that are available to small business within ND.”

“Networking with entrepreneurs and partners. Learning about creative ways communities approach entrepreneurship. Holding the sessions in businesses/community facilities was a unique way to explore Garrison.”

“Keep doing this conference - what a positive way to promote rural ND and the pride people have in their communities and businesses.”



## Lamb Value Discovery

### Public Value Statement

Sheep producers can learn more about the end product of lamb, and consequently, identify production management targets that result in a high quality product, increased dollar value, and operation sustainability.



### The Situation

Sheep producers often sell a commodity based lamb product, yet sheep enthusiasts can be rewarded by creating lambs that excel with lean, muscular, high quality carcasses of a desired weight. The opportunity for value discovery and importance of production management decisions can be realized through enhanced value-based marketing options in the future & connect the supply chain on true market value of sheep/lamb produced in the U.S. Knowledge is Power!



### Extension Response

NDSU Extension hosted the MN/ND Lamb & Wool Producers Spring Workshop on May 23, 2019. A total of 52 participants attended the one-day event. Participants had real-world application of livestock evaluation, ultrasound technology, slaughter and fabrication process, and various cuts of lamb.

Northern Plains Lamb Value Discovery Program resulted in lamb carcass data collection of 1,180 head from producers in Minnesota, North Dakota, and South Dakota. This “gate-to-rail” focus for Northern Plains sheep producers provided practical production and carcass data that will be utilized for directing goals and management decisions.



### Impacts

According to workshop survey, knowledge about sheep & lamb value (1-9 Likert scale) increased their knowledge about sheep and lamb value from prior to (5.0) compared to after (6.7) the workshop.

Continuous improvement exists in the potential to make sustainable societal, environmental, and/or economic change in animal agriculture.

### Feedback

“I most thoroughly enjoyed the lamb fabrication and carcass grading.”

“The workshop was well put on, and the sheep unit tour was my favorite.”



## Creating Impact with Technology

### Public Value Statement

Utilizing 4-H teen leaders (Tech Changemaker) to teach digital skills to New American and underprivileged youth will increase the economic opportunities for youth across the nation.

### The Situation

More than 24 million people living in the U.S., including 19 million living in rural communities, do not have access to broadband internet, an essential service in today's economy (FCC 2018 report). Limited access to broadband internet combined with the growing need for digital skills is impacting access to economic opportunities for youth across the nation.

### Extension Response

National 4-H Council and Microsoft are working together through the 4-H Tech Changemakers program to empower 4-H teens to lead digital skills trainings, teach the value of digital tools and find technological solutions to real world problems. These teens are called tech changemakers.

In North Dakota, tech changemakers have been making an impact on New Americans and underprivileged youth in Cass County.

### Impacts

Over 200 youth in Cass County, ages 10-16 were reached through afterschool programs, classroom sessions, and day camps. In addition, six youth leaders helped facilitate educational programming across the state.

64% of surveyed youth participants reported that the STEM day camps made them want to learn more about technology. 70% of surveyed youth reported that they can see how technology can help change my community for the better.

100% of tech changemakers reported that they felt they were helping their community through grant activities.

### Youth Comments

"It was fun to learn about robotics from the tech changemakers."

"I got to learn how to code drones, not just fly them!"

"I made my own video game in STEM club and won an award for my game. I didn't think I could code."



\*Federal Communications Commission (2018). *2018 Broadband Deployment Report*. Washington D.C. Retrieved from: <https://www.fcc.gov/reports-research/reports/broadband-progress-reports/2018-broadband-deployment-report>

## Youth Gardens Lead to Healthy Kids

### Public Value Statement

Youth garden programs provide hands-on activities that lead to healthy kids and strong communities.

### The Situation

The children of North Dakota are its most precious resource, but they are undernourished and inactive. Surveys of high school children in North Dakota indicate 99% do not eat the recommended amount of vegetables daily, 31% are overweight or obese, and 74% are not physically active on a daily basis.

### Extension Response

The NDSU Junior Master Gardener Program was established to address these concerns. In 2019, the program awarded \$22,500 to 50 garden projects that educated 3,320 children across the state.

The projects were designed by educators to address their local priorities (for example, promote health and wellness, develop skills in gardening, beautify towns or enhance food security). NDSU educators provided support to all projects and led 30 of them.

Partner organizations included schools, youth clubs, childcare centers, museums, zoos, senior centers, churches and youth-at-risk programs. Over 280 local businesses and organizations supported the projects with human resources, access to land and water, plants, tools, classroom space and food.

### Impacts

A survey was completed by all project leaders. They reported their projects fostered:

- Enhanced skills in gardening (100% of projects).

- Increased physical activity (100%).
- Stronger community partnerships (100%).
- Healthier diets for youth (90%).
- Opportunities for community service (88%).
- Beautification of the community (76%).
- Increased food security in the community (60%).

Other impacts were mentioned by leaders. They reported their children:

- Donated 18,200 pounds of produce to needy families.



- Developed self-esteem in their service to their communities.
- Learned where their food comes from.
- Learned the value of teamwork.
- Made new friendships with the elderly.

### Feedback

"Thank you for helping to give our youth a skill they can use and share throughout their lives."

"This project was fabulous and such a win-win for kids and community members."

## The Family Table: Eat, Connect, Savor

### Public Value Statement

Improving health behaviors can increase quality of life and save millions of dollars in collective health-care costs for North Dakotans throughout their lifetime.

### The Situation

According to North Dakota statistics, only 3% of children meet the daily recommendation for fruits and vegetables. Adequate fruit and vegetable consumption is linked with preventing chronic diseases, including heart disease, cancer and diabetes. In recent years, substance abuse among North Dakotans of all ages also has become an issue.

Meals eaten as a family tend to be more healthful. These meals include less fat, less pop and more fruits and vegetables, and they tend to be higher in calcium, fiber and other essential nutrients. Eating meals as a family at home also can save money. Teens who eat with their family regularly are less likely to get involved in risky behaviors such as smoking, drinking and taking drugs. Children who eat regular meals with family members are better able to pay attention in school and learn. By the time they are teens, children who eat regularly with their families do better academically than their peers who do not.

### Extension Response

Years of published research by nutrition and youth development faculty at several universities inspired The Family Table project. The purpose of this interdisciplinary effort is to introduce new, younger audiences to Extension and to increase family mealtimes among participating families to at least three times per week using a variety of traditional

and technology-based approaches, including Facebook, e-newsletters and classroom lessons.

### Impacts

Since the launch of the program in January 2017, 3,673 users of the program's website have made 47,636 page views, with an average viewing session of more than seven minutes. Of those, 69% were new to our page. On the Facebook page, the total reach has been 176,261 users; of those, 8,486 are considered "engaged users" because they have "liked" or "commented" on the Facebook post.

According to post-surveys with parents or caregivers participating in the newsletter/family meals goal-setting activities:



85% reported eating together as a family the recommended three or more times per week



About 82% reported reading the newsletters, with about 33% creating a weekly goal



About 29% reported an increase in vegetable consumption, 17% reported an increase in calcium-rich food consumption and 13% reported an increase in whole-grain consumption

## Childhood Obesity Efforts

### Public Value Statement

Improving health behaviors for youth can increase quality of life and save millions of dollars spent on collective healthcare costs for North Dakotans through their lifetime.

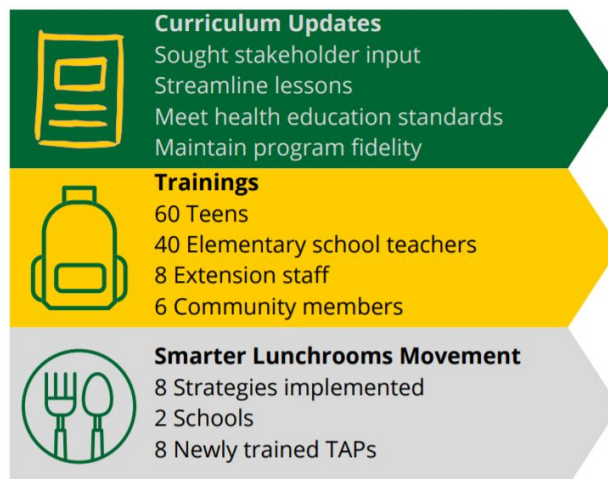
### The Situation

Youth in North Dakota experience a 13.4% obesity rate. National childhood obesity rates have more than tripled in the past 30 years. The national average for childhood obesity is 15.3% (ranges from 8.7% to 25.4%) for 10 – 17 year olds (2018, NSCH). Furthermore, in North Dakota, 4 in 10 middle school students and 1 in 2 high school students do not get at least 60 minutes of physical activity 5 days per week. Children with obesity have greater risk of developing Type 2 Diabetes, high blood pressure, and depression during childhood. Childhood obesity prevalence can lead to adult obesity, in turn, increasing the risk of chronic diseases and associated healthcare costs.

### Extension Response

NDSU Extension seeks to improve the environment and processes that promote optimal health and nutrition of youth and families while working toward reducing childhood obesity and chronic disease prevalence. In collaboration, grant funding from the ND Department of Health via the Maternal and Child Health grant program provided opportunity to address capacity gaps in Western ND in regards to nutrition education, physical activity opportunities, and systems and/or environmental change to promote health. Six contractual workers facilitated nutrition education programming in McKenzie, Morton, Stark and Williams counties, reaching nearly 587 youth that would have otherwise gone unreached. The curricula reach 2<sup>nd</sup> – 5<sup>th</sup> graders with the intention of providing multiple education opportunities to deepen and broaden learning. In addition, eight Technical Assistance Providers (TAP's) were trained.

## Impacts



## Feedback

From an 'On the Move Cooking School' participant: *"At first, I was really nervous and I thought I wouldn't like it, but it was actually really fun."*