Development of a Soil Health Demonstration Network in North Dakota.

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ABSTRACT

Producers in North Dakota are facing many soil health related issues in their agronomic systems; including but not limited to salinity, sodicity, and generally reduced soil function. Thus, management options to improve soil health are of interest. To better answer the question of “how to improve soil health?” a network of demonstrations have been set up across the eastern part of the state. The long-term goal is to use large, replicated, in-field plots to evaluate management options of local interest. This provides the opportunity for growers to have input on management practices that will be utilized, and have access to the progress of a treatment, all with limited personal risk. The primary goal of this demonstration network is to provide technical support to producers on practices, which build soil health, so that they can take the information and apply it on-farm.

SITE DEVELOPMENT

Locating Demonstration Sites

Ideal site locations include:

1. Problem acres: saline, sodic or overall poor productivity/poor soil health
2. Innovative and interested landowners
3. Easy access/public plot locations.

Building Local Soil Health Network

Establishing local connections is critical for each demonstration site. Partnering NDSU Extension with local Soil Conservation Districts, Natural Resource Conservation Service Centers, and local equipment and seed dealers has been a main asset to establishment and longevity.

Fig. 1 Demonstration sign highlighting local cooperation Sargent Co., ND

SITE DEVELOPMENT

Initial Soil Sampling

To determine plot placement an EM-38 (Geonics Limited Ontario, Canada) or Veris Cart (Veris Technologies Salina, KS) is used to map the area of interest. Based on the salinity map (Fig. 2) plots are set up. Number of treatments and type of treatment varies from site to site, based on local interests. Each treatment is replicated three times on all demonstrations. Soil samples were taken, three points within each plot at two depths 0-15 cm and 15-30 cm. These samples were analyzed for Electrical Conductivity (1:1 method) and pH.

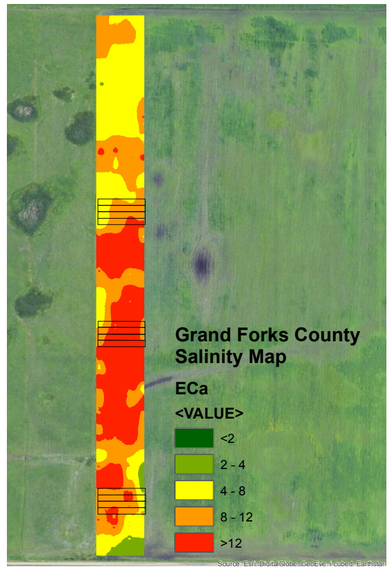

Fig. 2 EM-38 map of demonstration site Grand Forks Co., ND

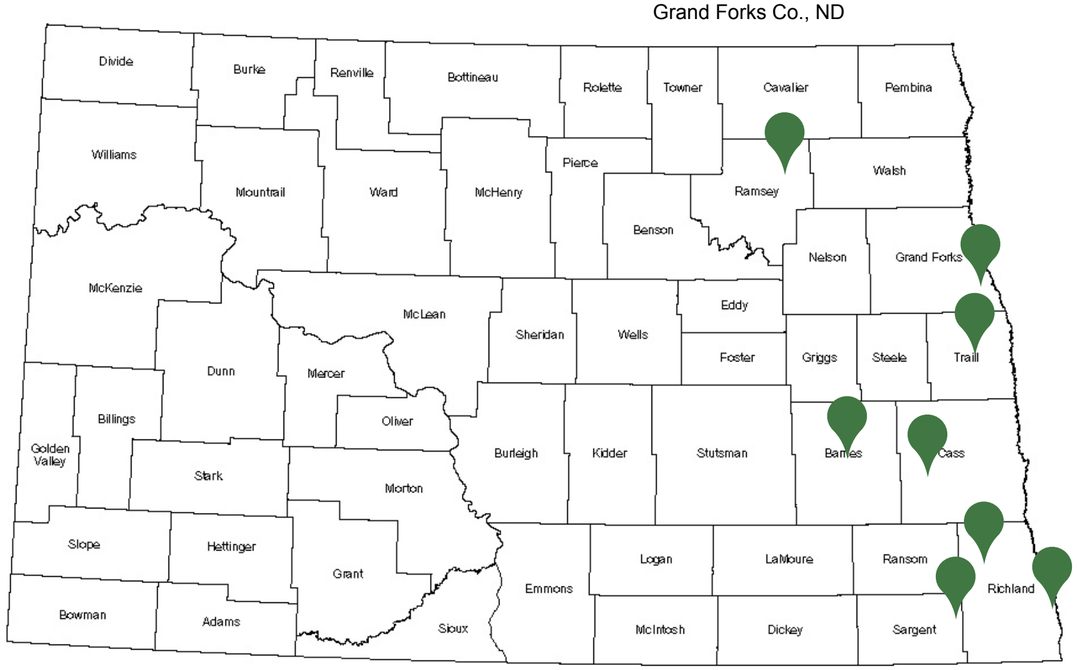

Fig. 3 Soil Health demonstration site locations in eastern North Dakota, site development began in 2013

Demo Treatments
Control
Full Season Cover Crop
Wheat
Wheat with Cover Crop
Alfalfa
Rye
Mulching with Straw Bales

Determination & Set-Up of Treatments

Treatment types differ across the different demonstration sites in the state. This variation is intentional; the goal is to develop treatments based on local interest and opportunities. Each site includes a normal/control treatment, i.e. what crop/rotation the landowner has historically planted on the field. Treatments were installed with the help of the landowner and/or cooperator groups.

EXTENSION EFFORTS

The summer of 2014, field days were hosted at many of the demonstration sites, over 430 producers we introduced to this project and general soil health concepts.

Fig. 4 Successful field day with over 100 participants Sargent Co., ND

As shown in Fig. 4, soil pits were used as an educational tool to show producers what is going on belowground, under the different treatment types.

Surveys were conducted at each event to gauge learning and develop future programs. The surveys showed increased knowledge based on presented topics, Fig. 5.

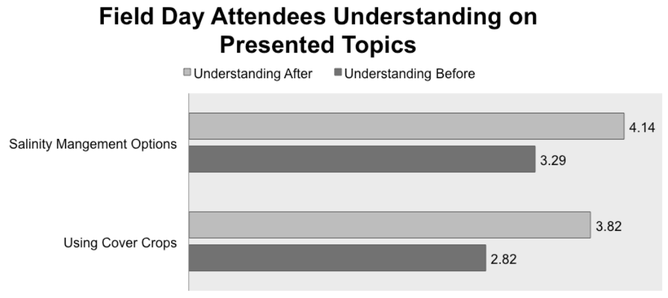

Fig. 5 Survey results from a field day in Richland Co., displaying increased understanding of both salinity management and cover crops options.

Extension Efforts will continue throughout the winter. Informal meetings or *Café Talks* were held at local cafés in two counties in the winter 0f 2014, Fig. 6. Café Talks will be expanded to two additional counties in the winter of 2015 to reach more producers.

Fig. 6 Local producers, NDSU extension, and NRCS Soil Survey personal at a Café Talk in Sargent Co., ND