

# New Mexico

## 2021 Ogallala Aquifer Virtual Summit White Paper

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### New Collaborations & Activities

New Mexico State University (NMSU) and USDA-NRCS have been working with producers for years to improve soil health and promote conservation practices in New Mexico. As part of an increased effort to synergize the activities of the two institutions and thereby expand overall reach and impact, new collaborations have begun which will focus on increasing the sustainability of agriculture in the state, specifically the High Plains and Middle Rio Grande regions. These new collaborations involve NMSU researchers at the NMSU Clovis and Los Lunas Agricultural Science Centers and NRCS staff at the state office.

These efforts were inspired by ongoing Ogallala Water CAP activities at the Clovis Hub location as well as discussions during and after the initial Ogallala Summit in 2018. The primary focus of activities of New Mexico through Ogallala Water CAP has been on soil health/tillage and alternative crops. The **two new projects** described below expand upon those focus areas.

#### Strategic Tillage Management in Dryland Cropping Systems of New Mexico: Demonstration and Evaluation of Agronomic and Soil Health Benefits

This five-year study begun in 2018 will evaluate soil health and nutrient cycling changes with strategic tillage management practices in long-term no-till agroecosystems. No-till farming typically offers many benefits, such as reducing soil erosion and increasing infiltration, soil organic matter storage, and soil water conservation. It also reduces labor and machinery, increasing the economic efficiency of farming.

But no-till farming also has its challenges. Dryland farmers in semiarid regions question the long-term sustainability of such a system because of the potential long lag time to realize benefits, increased dependence on herbicides for weed control and build-up of herbicide-resistant



weed populations, and potential stratification of nutrients and organic matter in the topsoil. Therefore, we specifically aimed to:

- 1) Demonstrate changes in soil organic matter and nutrient cycling under diverse tillage (conventional tillage [CT], strip-tillage [ST], no-till [NT], and strategic reduced-tillage [SRT]) systems.
- 2) Determine the lasting impacts of SRT on soil health, soil structure, erosion potential, and crop production under diverse tillage systems.
- 3) Provide agronomic, soil health, and soil erosion information to growers, agricultural professionals, and other stakeholders.
- 4) This research will quantify changes in soil health, water conservation, and crop yield and quality. The outcomes of this study will help farmers by providing management recommendations on improved water use efficiency, soil health, and erosion control.

#### Alternative Forage and Grain Cropping: Demonstration of Regenerative Solutions for Semiarid Regions

In 2020, a second new collaborative research and demonstration project was begun in collaboration with NRCS. This project focuses on growing non-traditional forage and row crops to provide not only agricultural sustainability but also economic viability in the southern Ogallala Aquifer region in the face of changing climate and increasing water limitation for crop production.

As water quantities in the Ogallala aquifer region of New Mexico continue to diminish, innovative farmers have begun incorporating perennial crops and pastures into their cropping systems in order to make them more resilient to water shortages and drought, as well as soil degradation.

Also, alternative forage cropping and marketing strategies are necessary throughout the state that gives primarily forage producers options during times of low commodity prices and/or rotational periods between forage crops, while improving soil health and combating weeds. High-value grain and oilseed commodities, combined with forage crops may provide such an avenue through smother crop utilization.

Specific objectives of this project include:

- 1) Evaluate the potential to grow several alternative crops under different irrigation schemes.
  - a. Clovis Perennial Forages (Center Pivot): perennial wheat, bluestems, blue grama, and sideoats grama
  - b. Los Lunas Grain/Oilseed (Flood): various combination of legumes (cowpea), corn, sunflower, sorghum x sundan, millets, teff, and barley
- 2) Evaluate soil water and chemical/physical property dynamics with and without perennial cropping/pastures and annual, alternative grain and oilseed crops.
- 3) Explore alternative crop marketing opportunities and economic stability. Provide agronomic, soil benefit, economic stability, and marketing potential information to growers, agricultural professionals, and other stakeholders.

and cattle grazing on soil health and silage corn production. Another farmer east of Clovis is testing summer cover crop mixtures in winter wheat-based crop rotation begun in summer 2020.



Steve Kadas (NRCS) and Rajan Ghimire (NMSU) discuss soil properties in an ongoing cover crop study plot at the NMSU Agricultural Science Center at Clovis.

Both of these demonstrations will be highlighted at field days, workshops, and seminars and will target a diverse group of stakeholders, including farmers, dairymen, crop consultants, NRCS staff, water managers, and policymakers.

Farmers in eastern New Mexico have started projects on conservation practices, along with ongoing on-farm demonstration/collaboration projects in this region. A farmer west of Clovis started a cover crops project in the fall of 2019. He is testing the efficacy of various cover crops