

# Carbon storage potential in Texas' High Plains

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## CURRENT RESEARCH IN SOIL CARBON

Since 2015, we have been assessing soil carbon (C) stocks in Texas High Plains semi-arid cotton and corn production. With limited rainfall, increases in soil C are slow to observe following the adoption of conservation management practices. However, once improvements in soil C are observed, we also see improvements in ecosystem services.

Systems currently being evaluated include:

- Three years post-cover crop adoption in corn monocultures (Randall and Dallam Counties)
- Seven years post-cover crop and no-tillage adoption in cotton monocultures (Dawson and Hale Counties)
- Twenty years post-cover crop and no-tillage adoption in Dawson County



## Increasing Soil Carbon

Conservation management practices like cover cropping and no-tillage can sequester atmospheric carbon dioxide (CO<sub>2</sub>) and store it as organic carbon in the soil which can increase water storage, reduce drought stress, and improve soil quality/health.

The effect of conservation management practices on soil carbon in semi-arid climates like the Texas High Plains is poorly understood.

## What We Can Measure

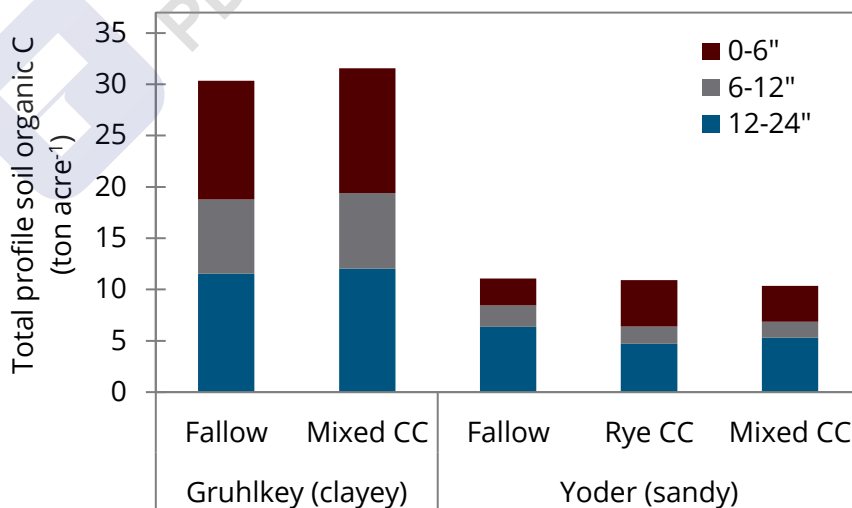
Our lab is fully equipped to measure soil carbon and track improvements in soil health from conservation management practices.

Assessment opportunities:

- Soil carbon pools & stocks
- Greenhouse gas emissions
- Soil microbial communities
- Nutrient cycling
- Soil quality/health

## Funding Sources

- Texas Corn Producers Board
- Texas State Support
- Cotton Research and Promotion Program
- Lamesa Cotton Growers
- Natural Resources Conservation Service



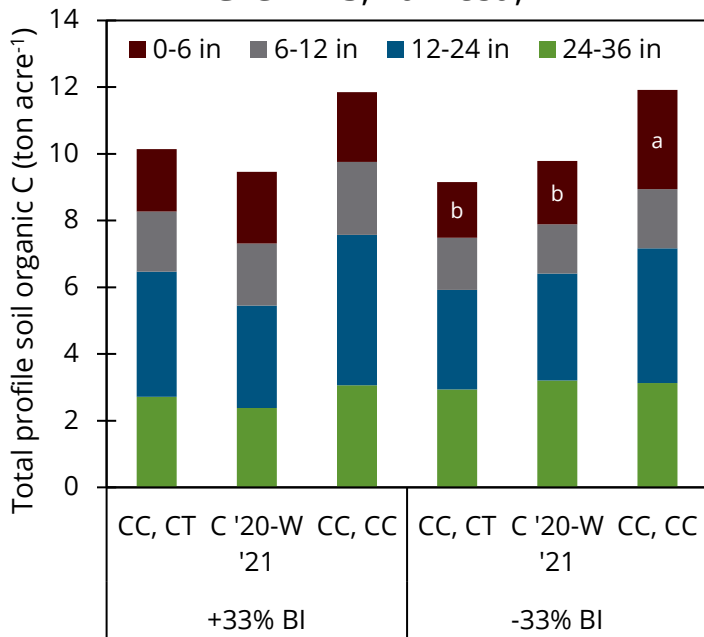
- Samples collected after three years of cover crop adoption in corn monocultures
- Gruhlkey Farm located in Randall County (Pantex silty clay loam)
- Yoder Farm located in Dallam County (Dallam loamy fine sand)

*Soil organic carbon stocks increase with long-term (18+ years) adoption of conservation management*

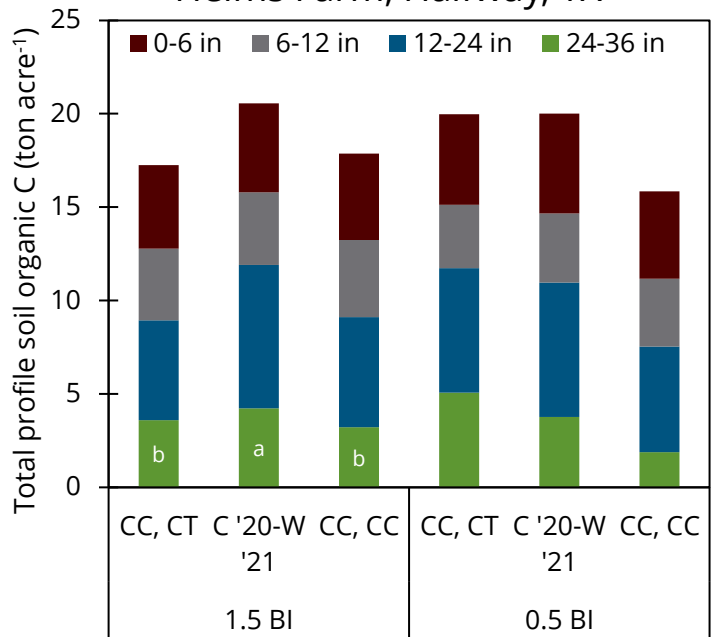
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### AG-CARES, Lamesa, TX

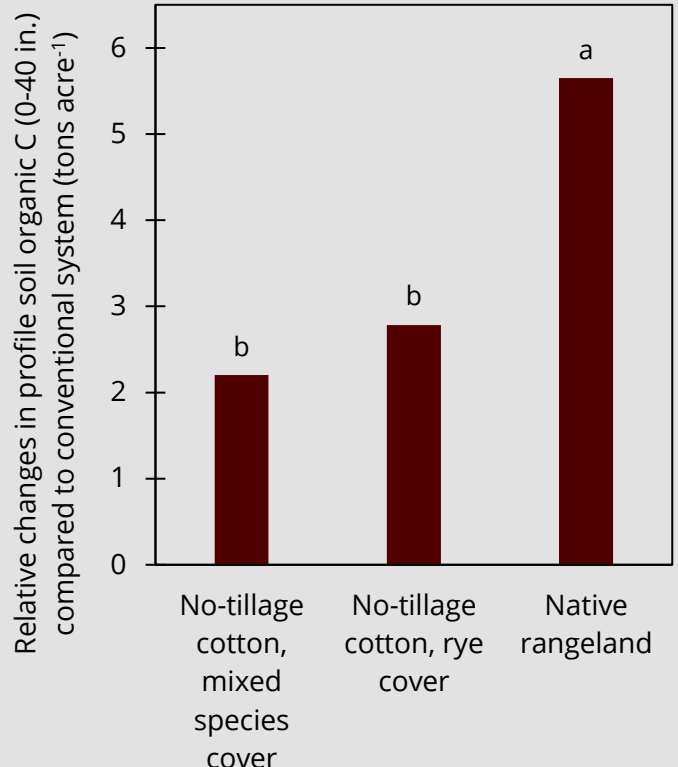
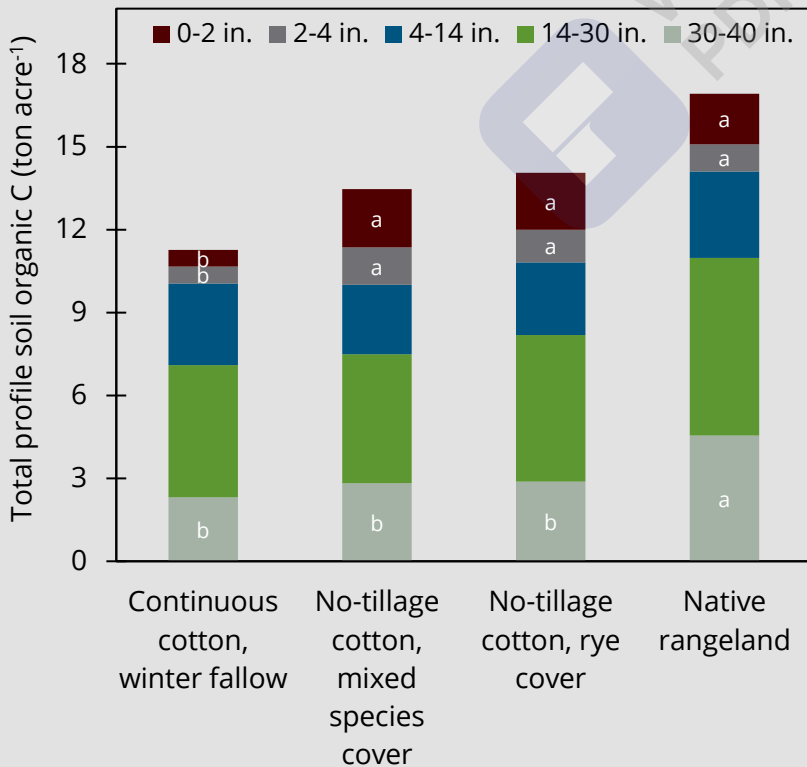


### Helms Farm, Halfway, TX



- Samples collected after seven years of conservation management in cotton monocultures
- Soil series: Amarillo fine sandy loam
- Treatments: (1) CC,CT, continuous cotton, conventional tillage; (2) C'20-W'21, cotton-wheat-fallow; (3) CC,CC, continuous cotton, cover crop
- BI: base irrigation of approximately 7.6 inches

- Samples collected after seven years of conservation management in cotton monocultures
- Soil series: Pullman clay loam
- Treatments: (1) CC,CT, continuous cotton, conventional tillage; (2) C'20-W'21, cotton-wheat-fallow; (3) CC,CC, continuous cotton, cover crop
- BI: base irrigation of approximately 10.0 inches



- Samples collected at AG-CARES in Lamesa, TX after twenty years of conservation management
- Native rangeland located near Wellman, TX, unplowed at least 80 years
- Soil series: Amarillo fine sandy loam