

Documenting the Effects of Management on a Benchmark Soil Results from the Texas Southern High Plains DSP Comparison Study

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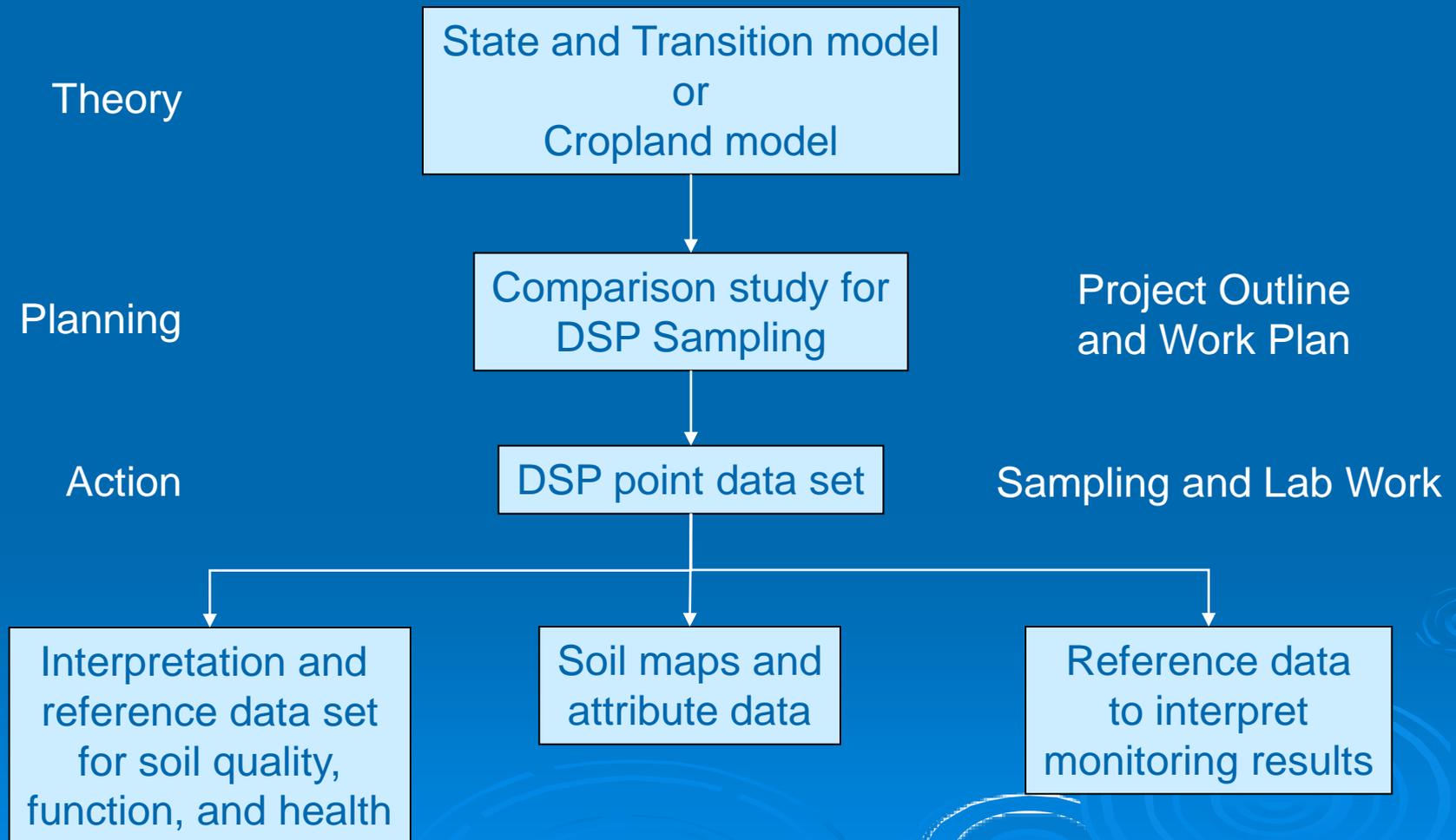
National Soil Survey Center, Lincoln NE



Overview

- Objectives of the Southern High Plains (SHP) DSP project
- Training / Sampling effort
- Project results and issues
- Future plans

Comparison studies to assess the effects of long-term management



Adapted from Soil Change Guide, 2008

Project Objectives

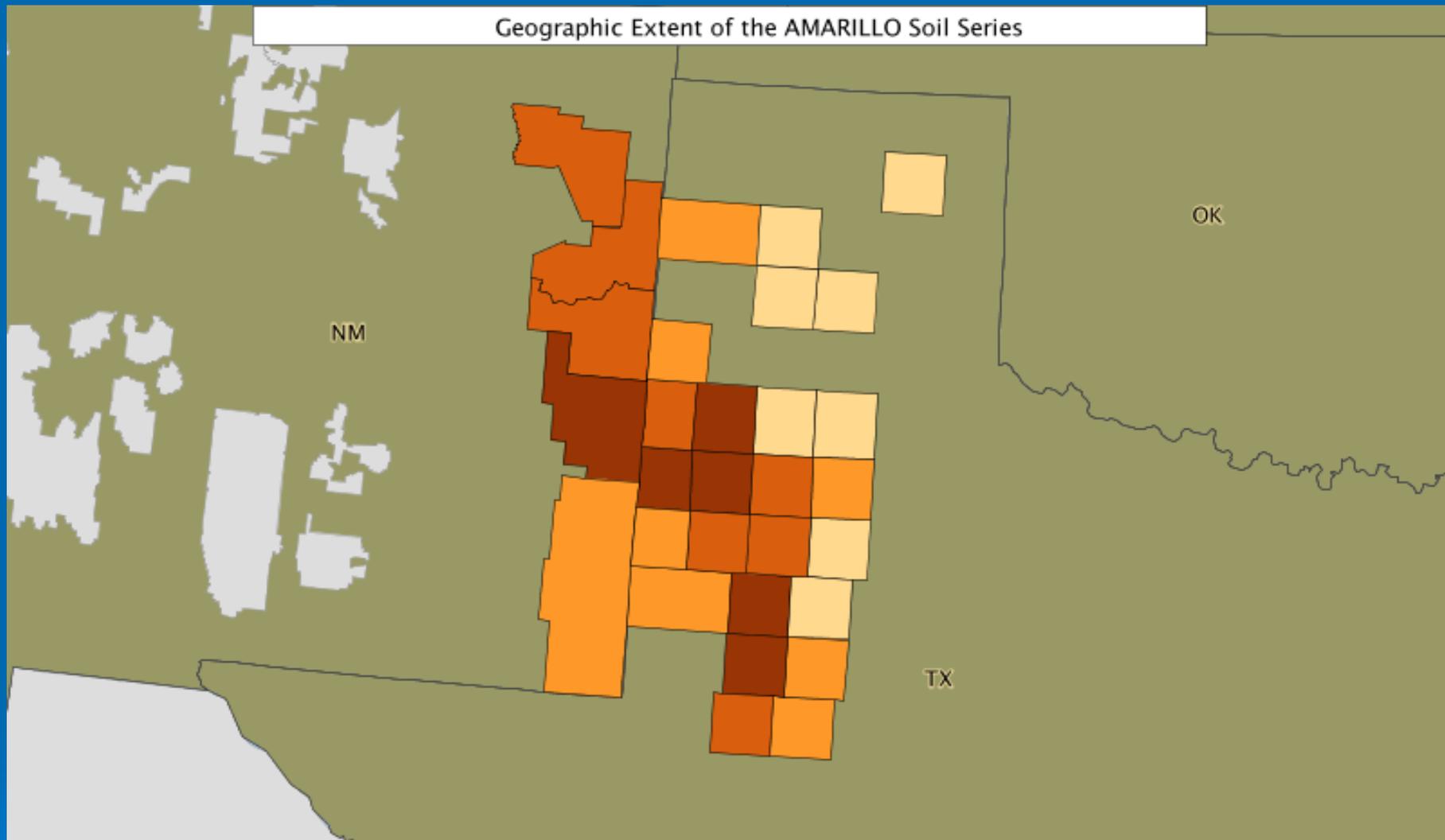
- Train MO and Zone Office personnel in DSP sampling techniques, as described in the Soil Change Guide
- Gather soil data that shows the effects of conventional management on soils in cotton compared to those in range and CRP
- Illustrate the effects of intense tillage and irrigation on carbon dynamics in a major benchmark soil

Southern High Plains DSP Project

- Comparison Study Setting -

- Amarillo FSL soils
- Fine-loamy, mixed, superactive, thermic Aridic Paleustalfs
- Range, CRP and irrigated conventionally managed cotton
- Five sites per management practice
- Additional sampling for surface aggregate stability and stable isotopes

Geographic Extent of the AMARILLO Soil Series



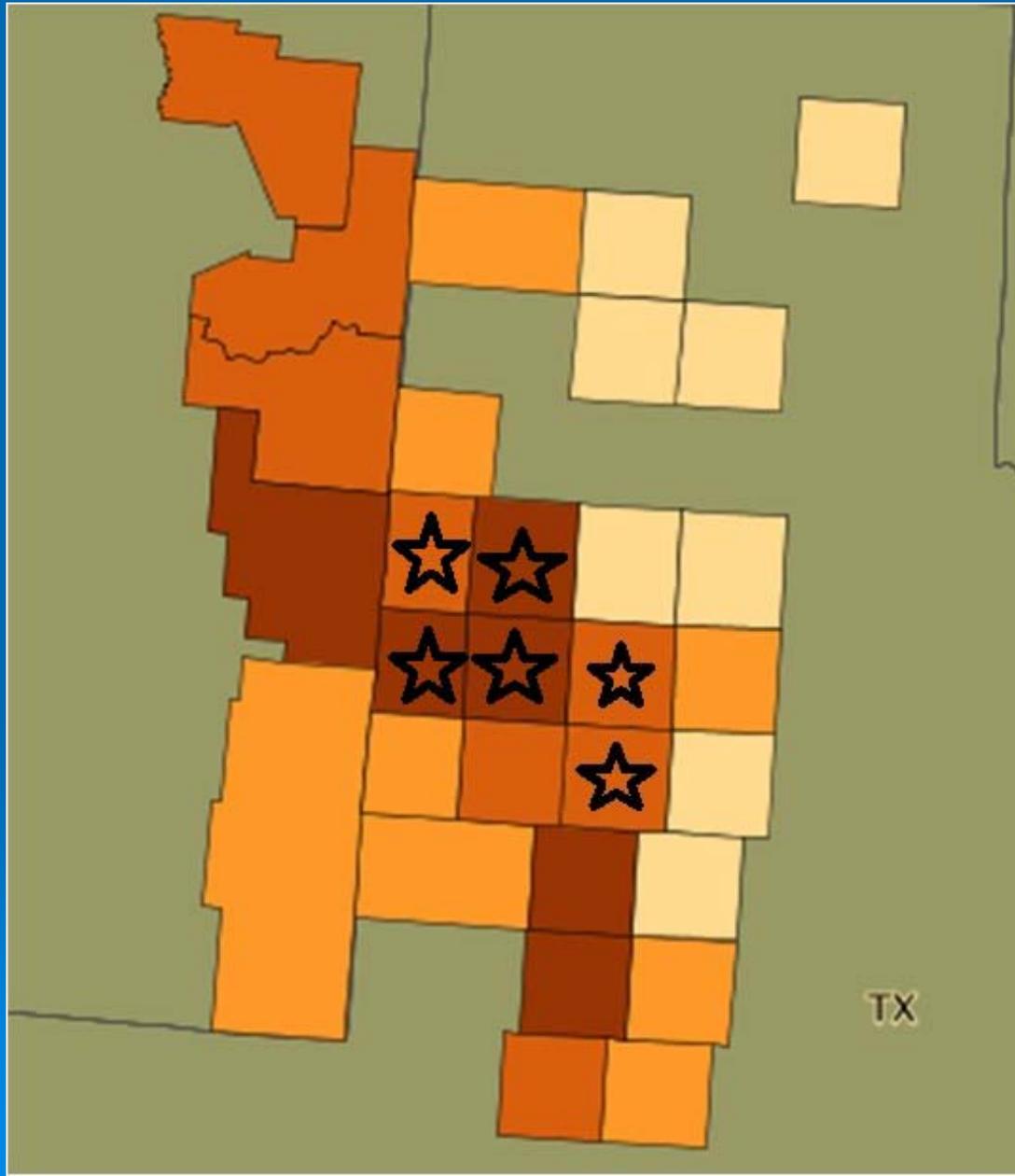
acres per soil survey area

-  Data available
-  Data not available
-  No acres reported
-  21096 or less
-  33221 to 95152
-  98003 to 220489
-  237632 to 299397

Map created 11:59 AM 6/25/2010 http://www.cei.psu.edu/soiltool/semtool_phase3.html

This application is a product of the National Cooperative Soil Survey partnership of The Pennsylvania State University (Center for Environmental Informatics), West Virginia University, and the USDA-Natural Resources Conservation Service (National Geospatial Development Center and National Soil Survey Center).
Cooperative Ecological Studies Unit (CESU) Cooperative Agreement # 68-3A75-4-104

SHP DSP Project Sampling Locations



Amarillo FSL Range Landscape



Amarillo FSL CRP Landscape



Amarillo FSL Cropped Landscape



SHP DSP Project Training Participants







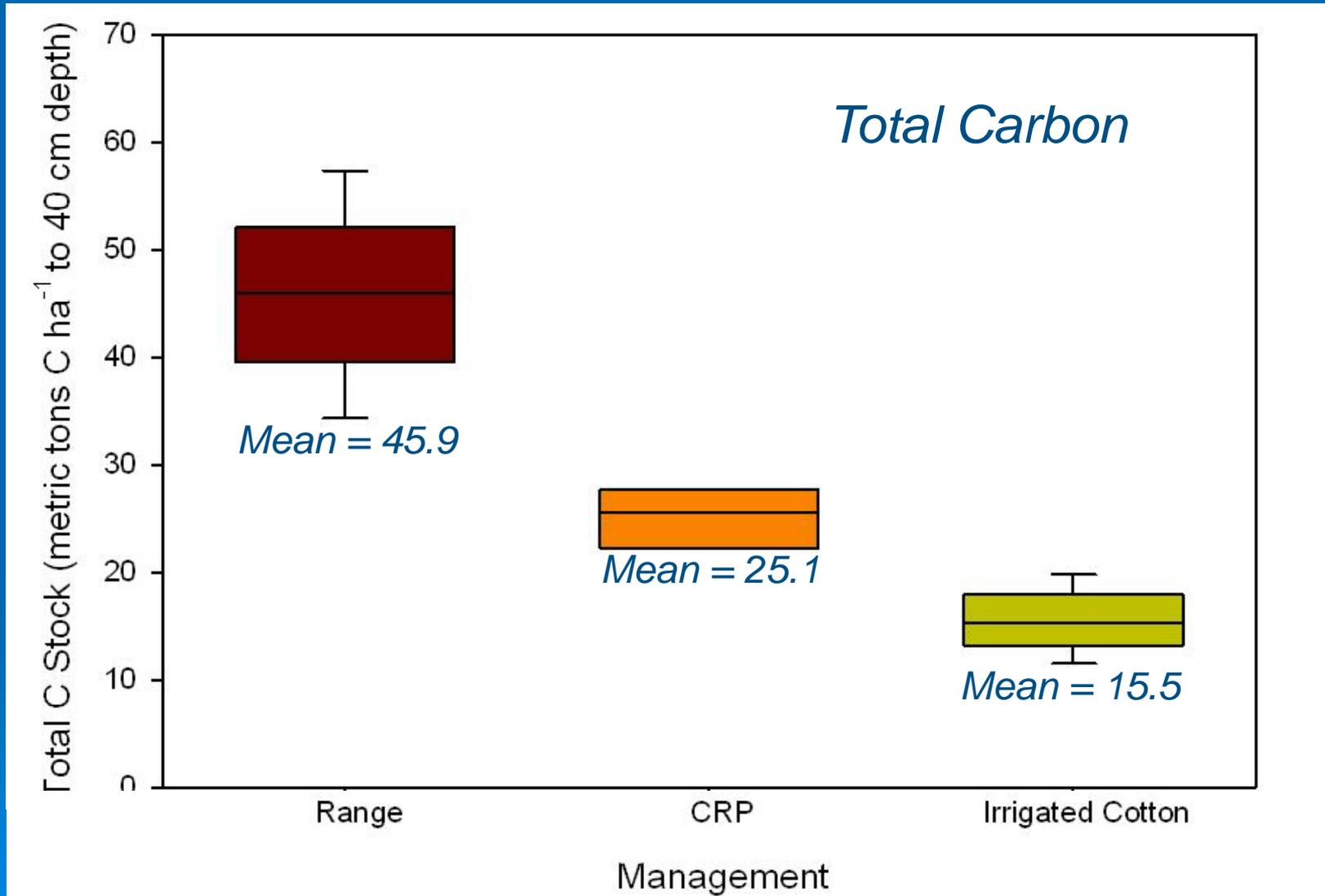
SHP - DSP sampling effort

- Comparisons between prevalent management practices will help build data-based projections of future impacts
- Provides additional measures of soil change parameters
- “A lot of data real quick” helps agency stay up on significant land use issues, e.g., carbon inventory

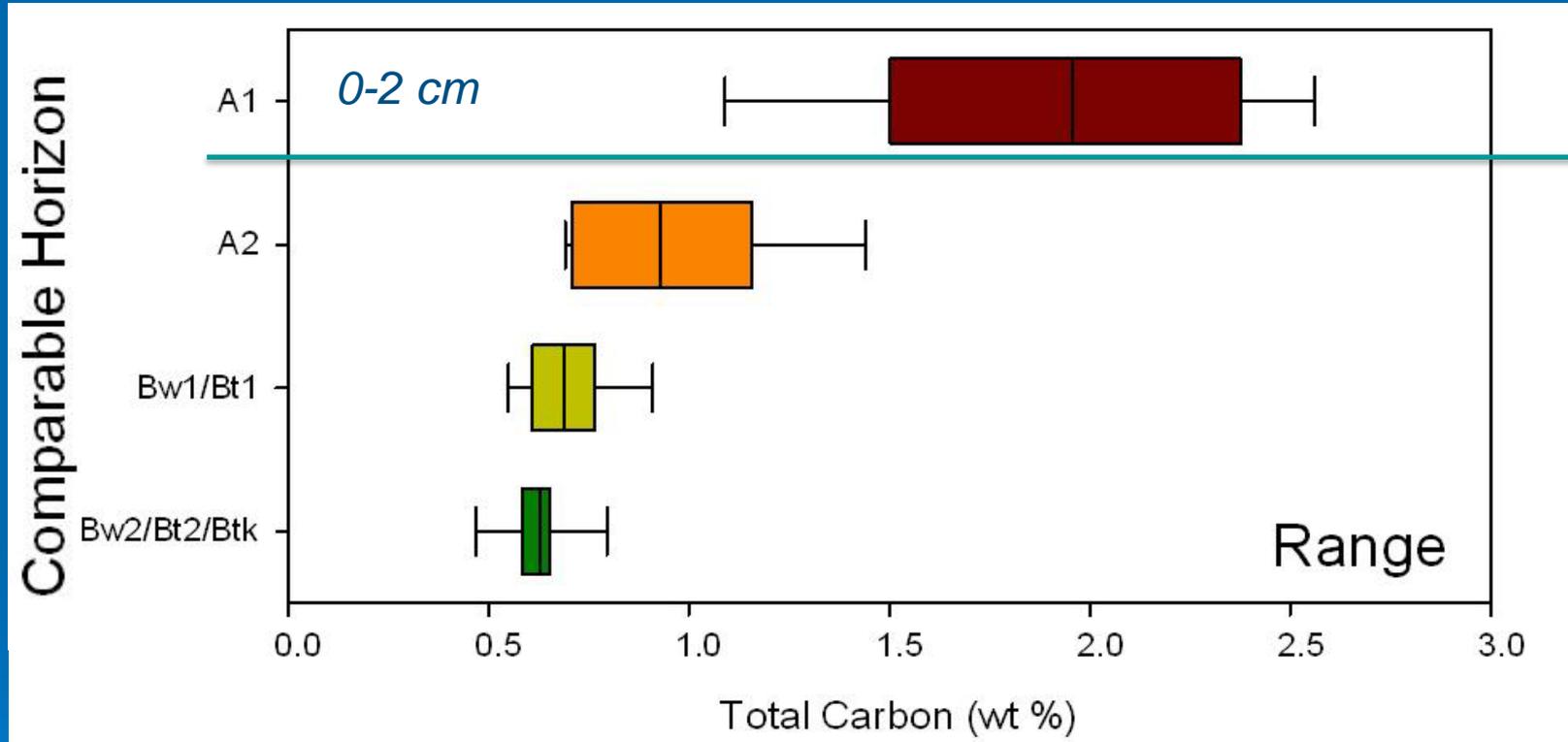
Early Results from the SHP-DSP Project



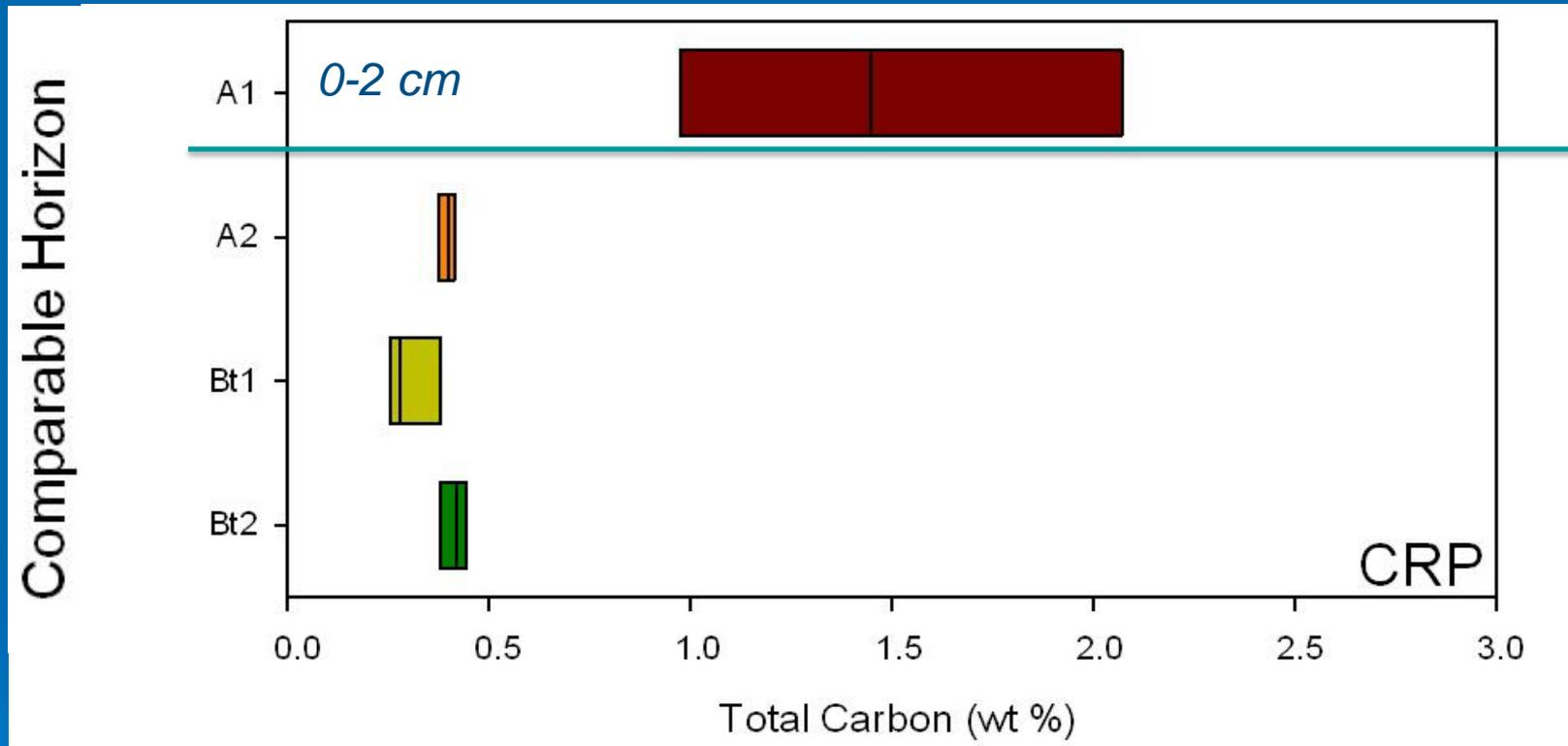
Management impact on soil properties



Distribution of soil carbon with depth Rangeland

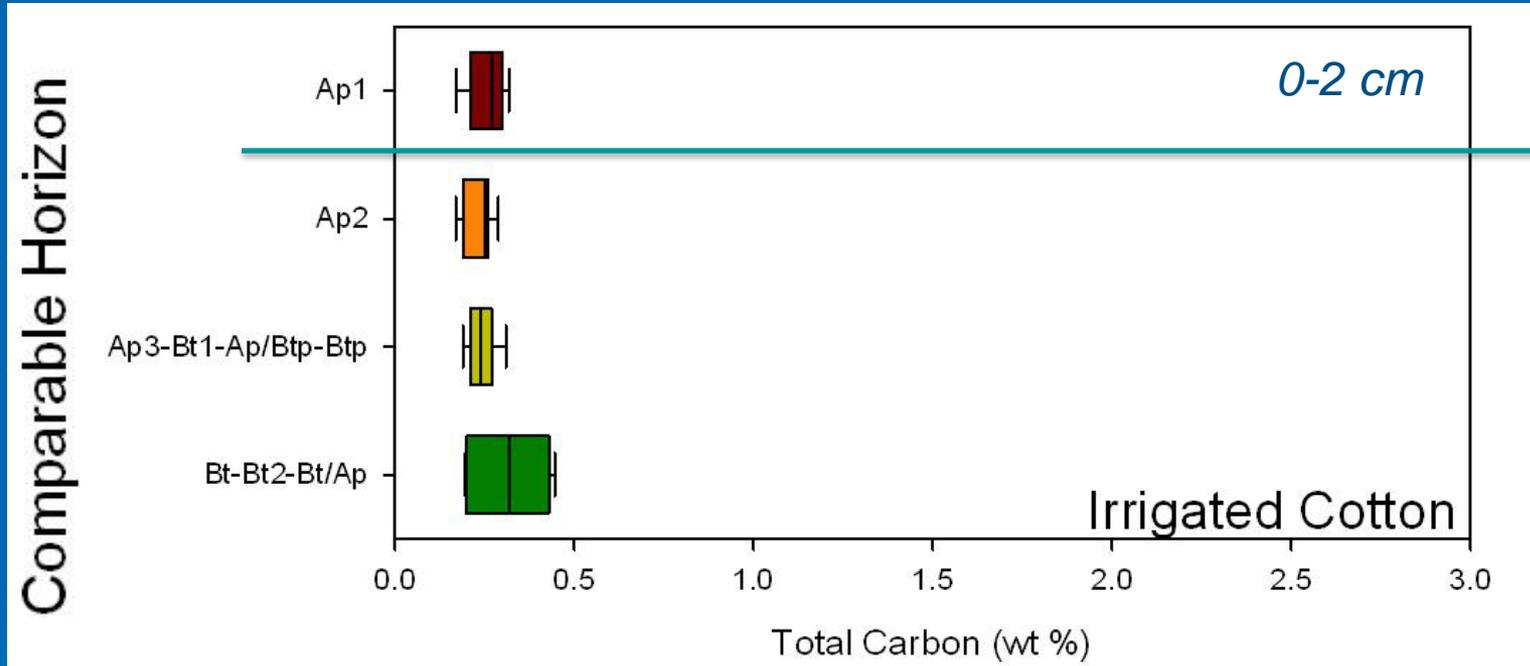


Distribution of soil carbon with depth CRP

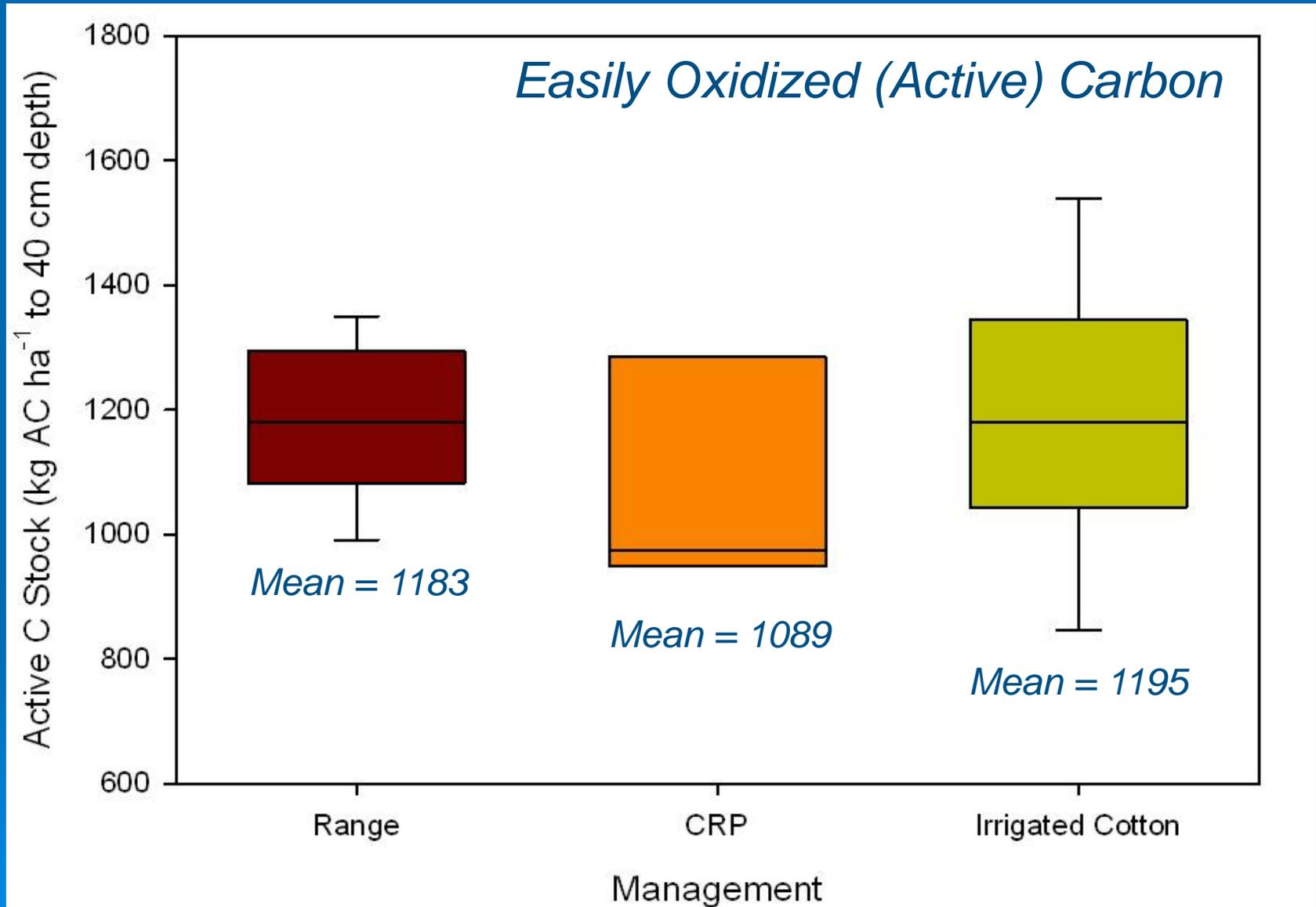


Distribution of soil carbon with depth

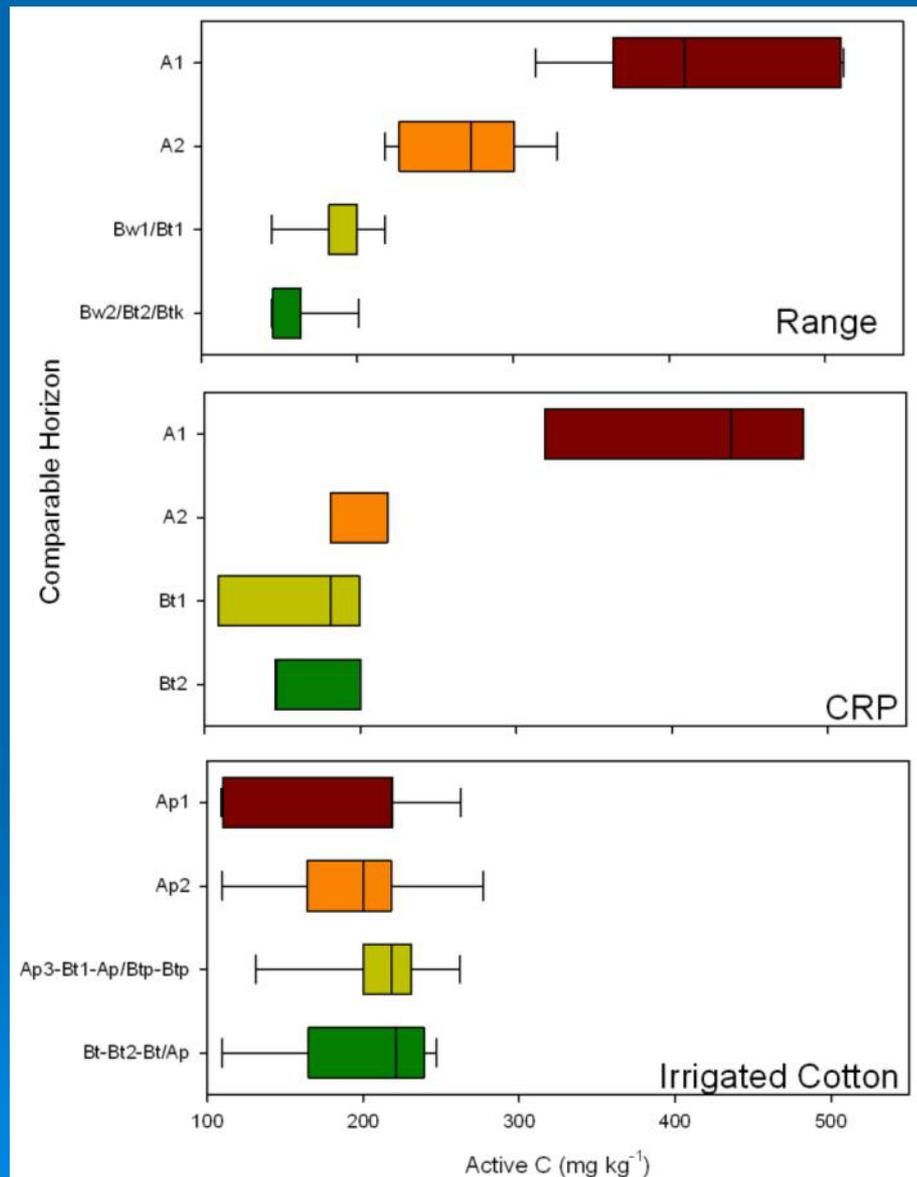
Irrigated Cotton



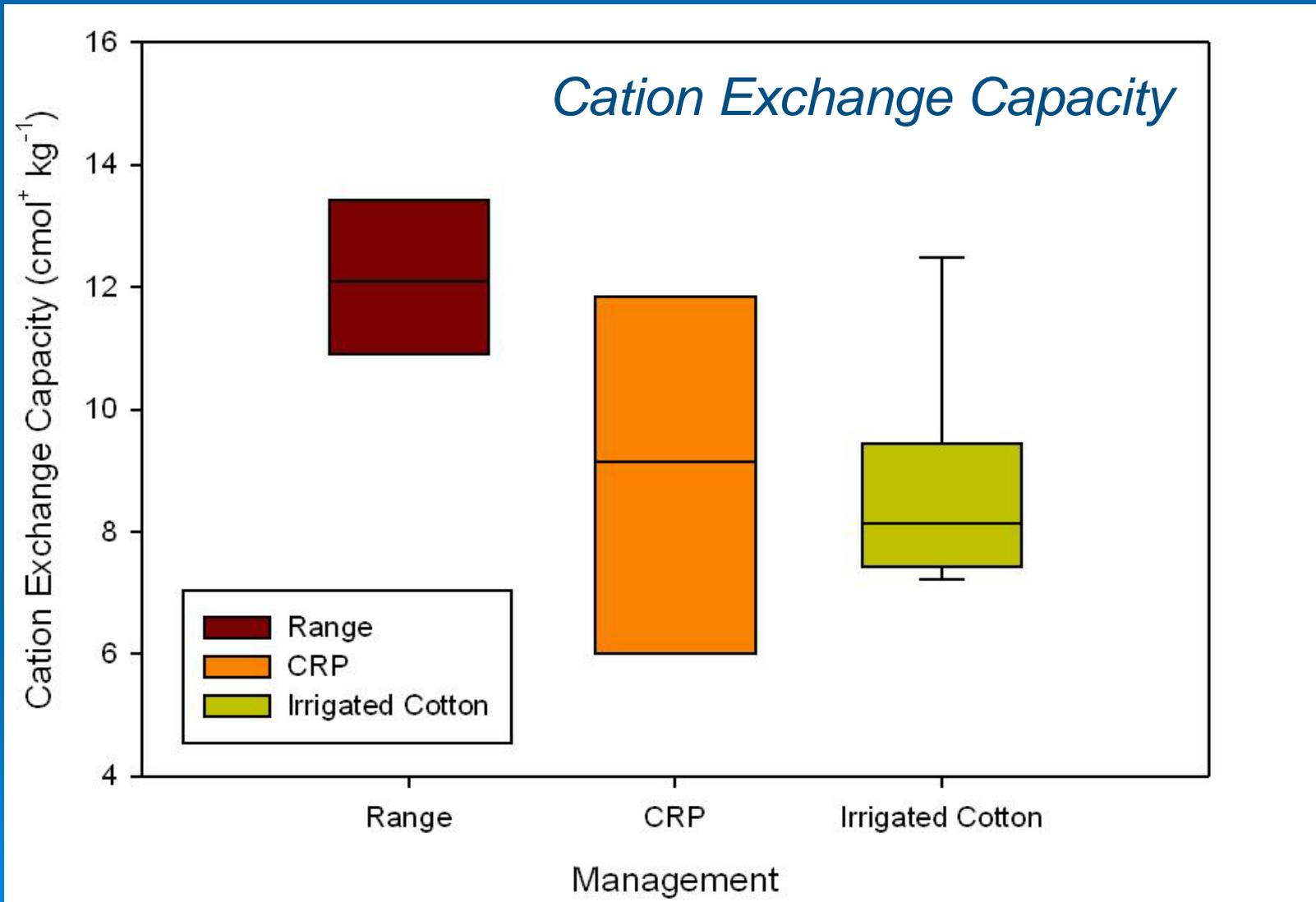
Management impact on soil properties



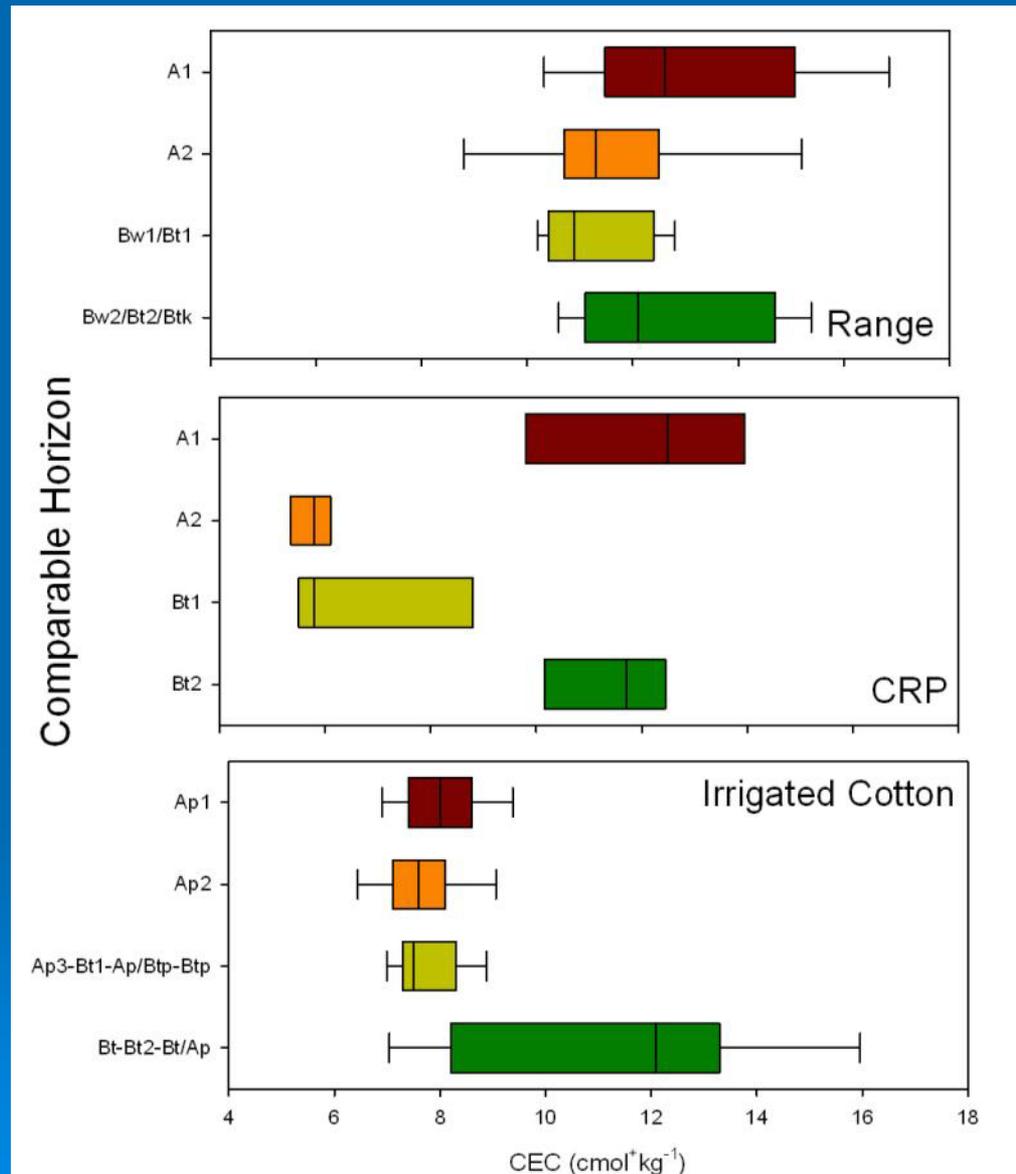
Management impact on soil properties



Management impact on soil properties

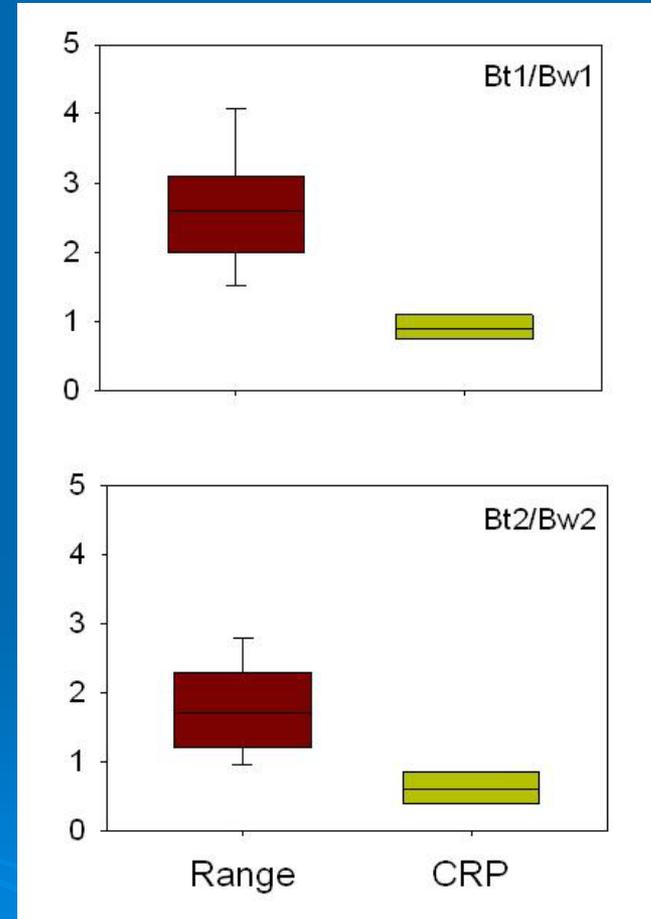
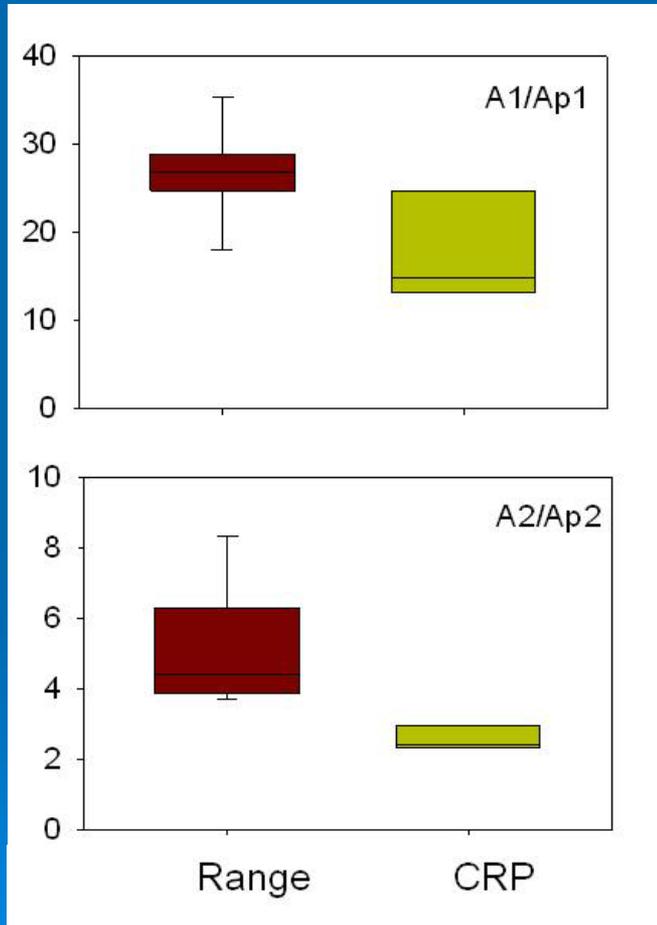


Management impact on soil properties



Management impact on soil properties

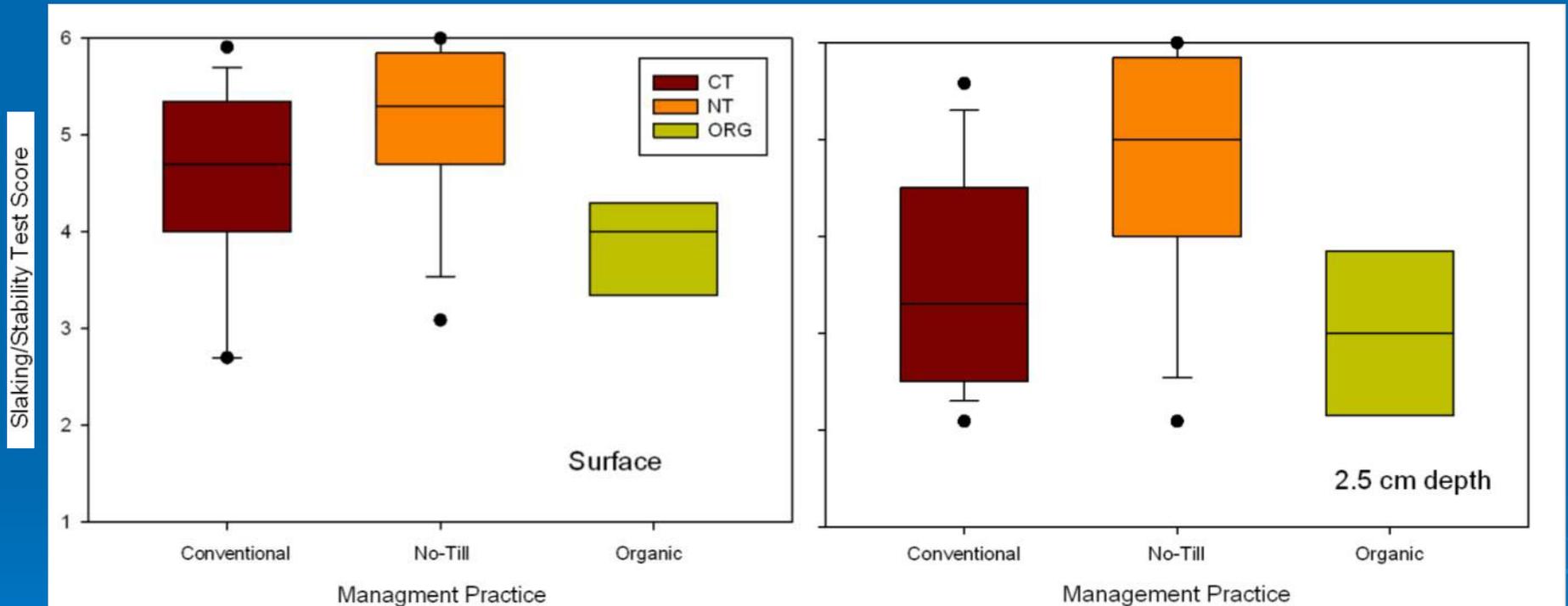
Mehlich P (mg kg^{-1})



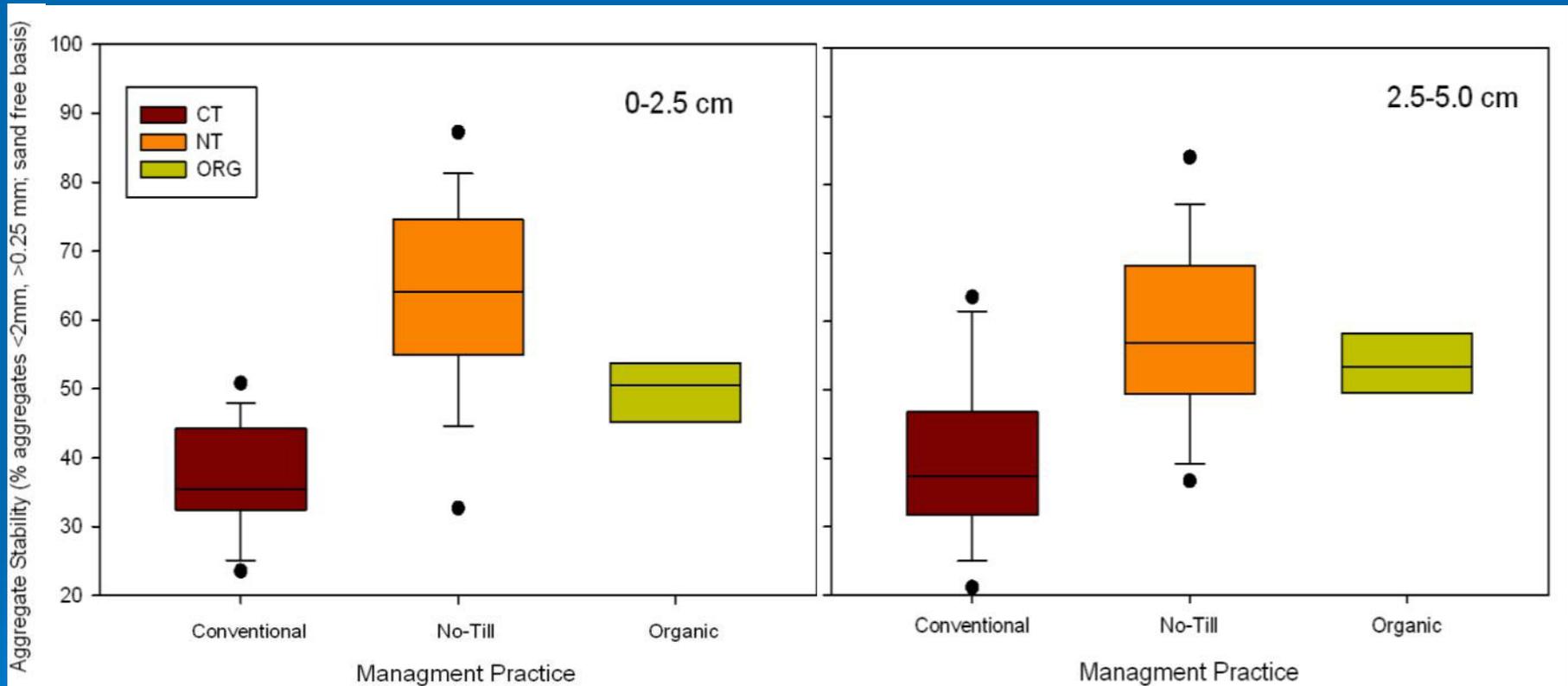
Slaking/stability test



Suitability of Measurement Technique

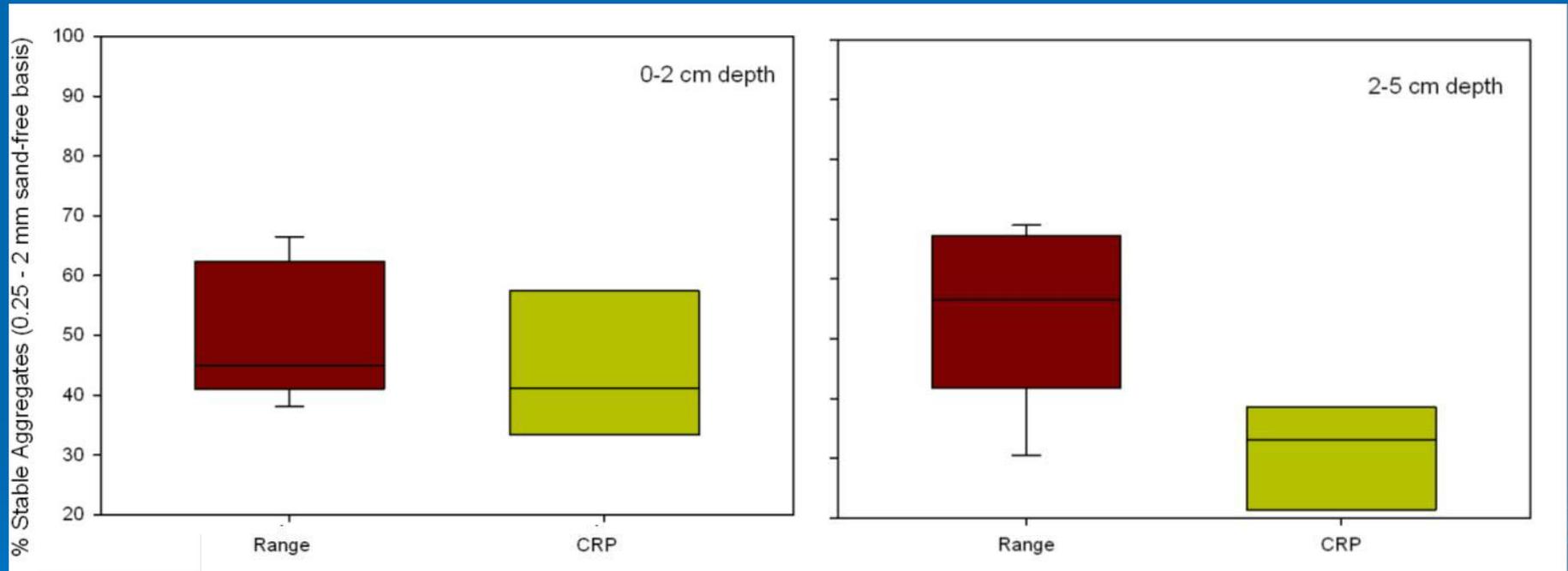


Suitability of Measurement Technique



Wet aggregate stability (field kit)

Management impact on soil properties



Wet aggregate stability (field kit)

Southern High Plains DSP Project

- Future objectives -

- Complete sampling
- Collect field and lab data for reports
- Management impact report
- Additional sites (?)
- Another project on benchmark soil (?)

Amarillo DSP Project Cooperators

- Dr. Wayne Hudnall, Texas Tech University, Lubbock
 - Dr. Ted Zobeck, USDA-ARS, Lubbock
 - NRCS, National Soil Survey Center, Lincoln
 - NRCS Texas, MLRA 77 Soil Survey Office and Zone 1, Lubbock
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Thanks for your attention!