Soil Water in Oklahoma No-Till

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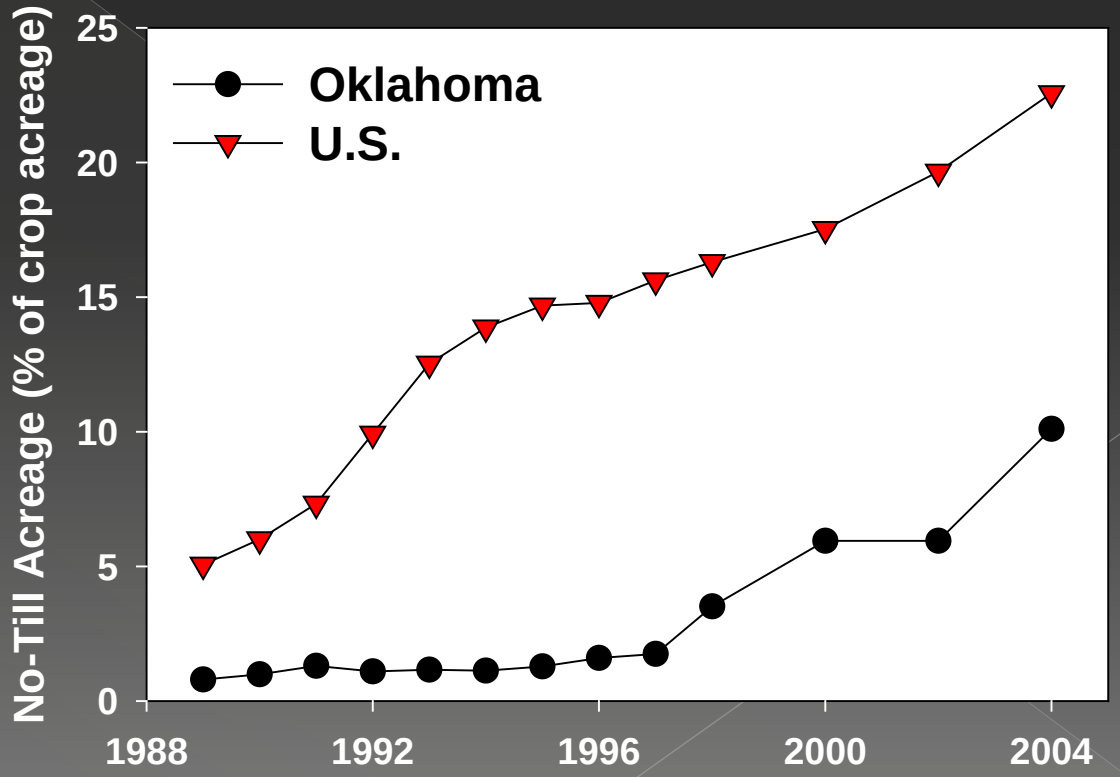
No-till Adoption

- Oklahoma has lagged behind
- 2008 OK Survey
  - 30%



No-till Adoption

- No-till is Increasing Because:
  - Elevated Fuel Prices
  - Improved No-till Technology
  - Cost-share Programs
  - Reduced Labor Costs
  - Improved Soil Quality

What is No-Till

Lack of Full Width Inversion Tillage

Impact of No-Till on Soil Condition

- Crop Residue is Maintained on Surface
- Soil Organic Matter Increases.
- Soil Structure is Improved

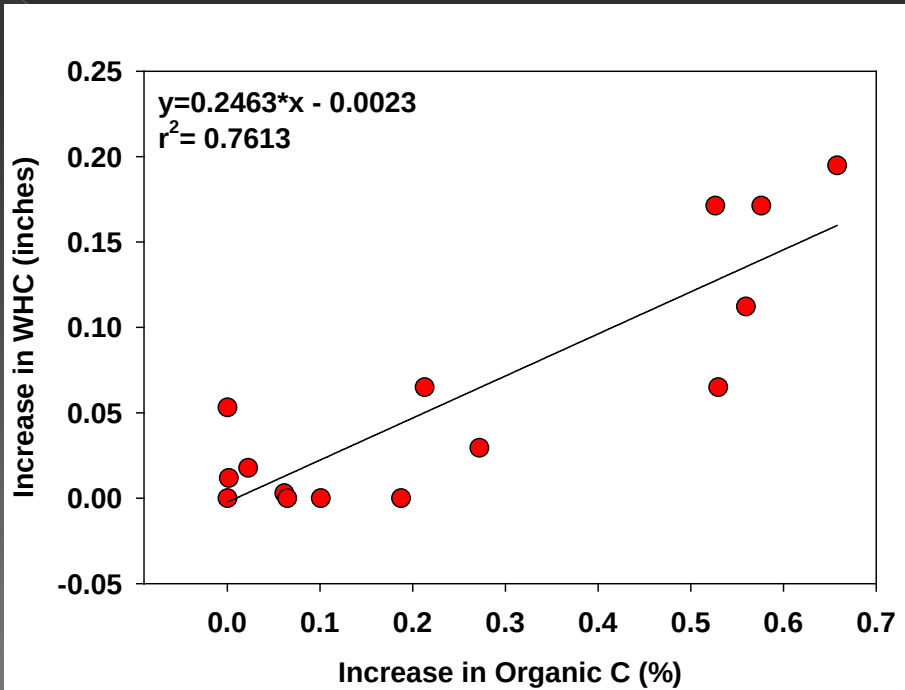
- Each are interrelated and Influence Soil Water Flow.

Crop Residue

- Residue Protects the Soil Surface from Crusting
- Increased Biological Activity at soil surface.

Soil Organic Matter

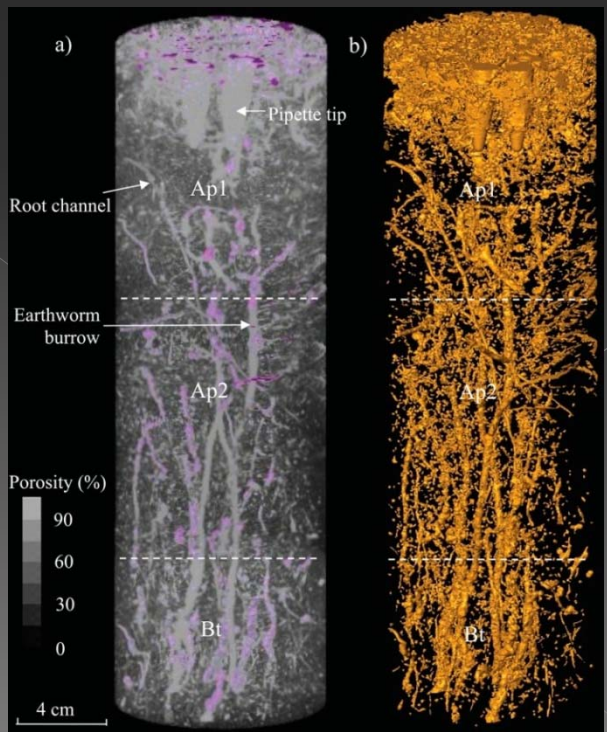
- Increased Biological Activity
- Increases Aggregate Stability
- Increases Soil Water Holding Capacity



McVay, 2006

Soil Structure

- Increased Macroporosity
- Reduced compaction
- Increased Water Infiltration



Luo et al. (2007)

Current Research Efforts

- Determine if no-till management influences soil water flow dynamics in North Central OK
- Experiment Located near Lahoma
- Pond Creek Silt loam
- 5 rotational treatments
- Measure soil moisture

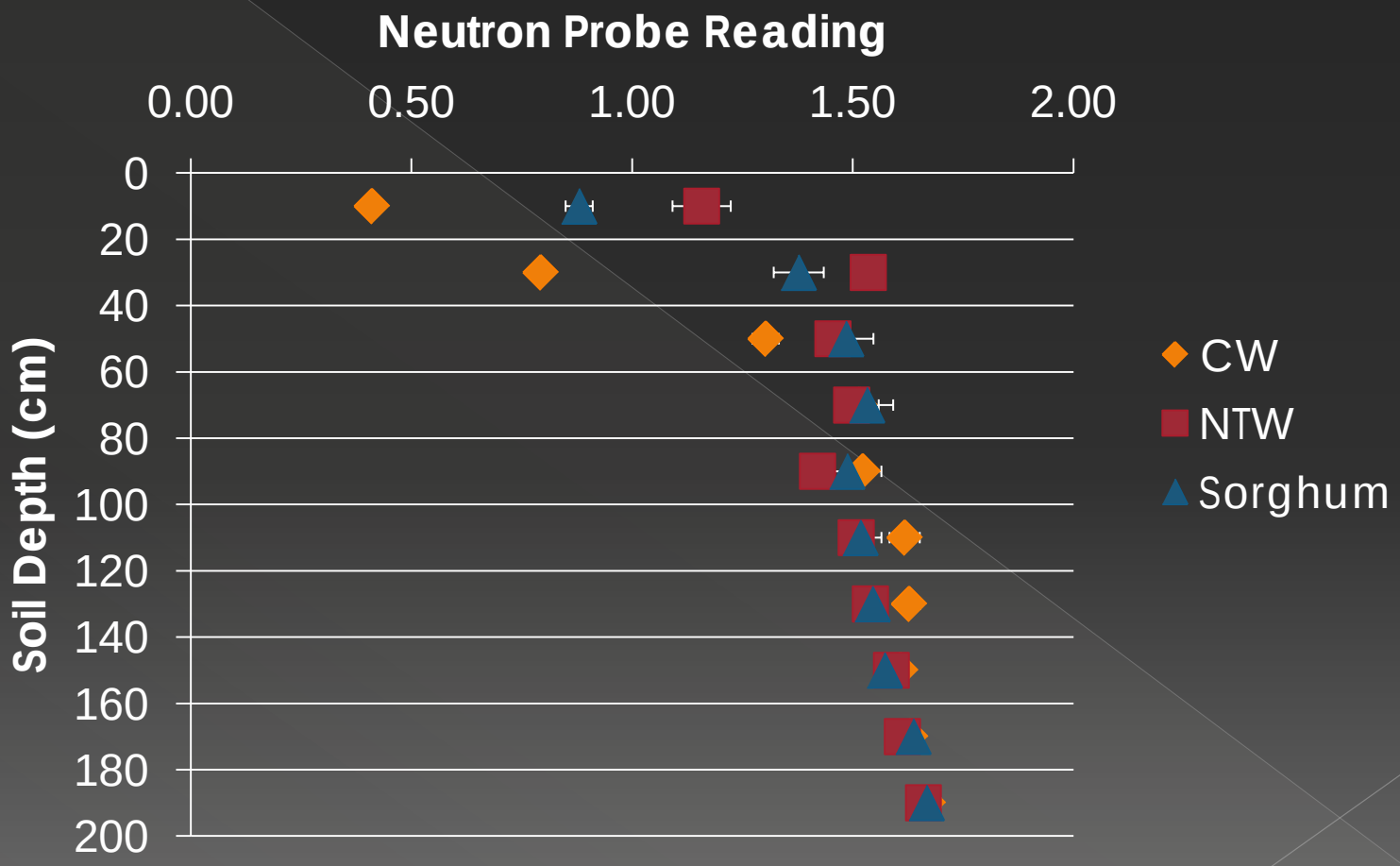
Crop Rotation Treatments

- Conventional Tillage Wheat
- No-till Wheat
- No-till Wheat, DC Sorghum, Soybean
- No-till Wheat, DC Soybean, Corn
- No-till Wheat, DC Sunflower, Sorghum

Soil Moisture Measurements

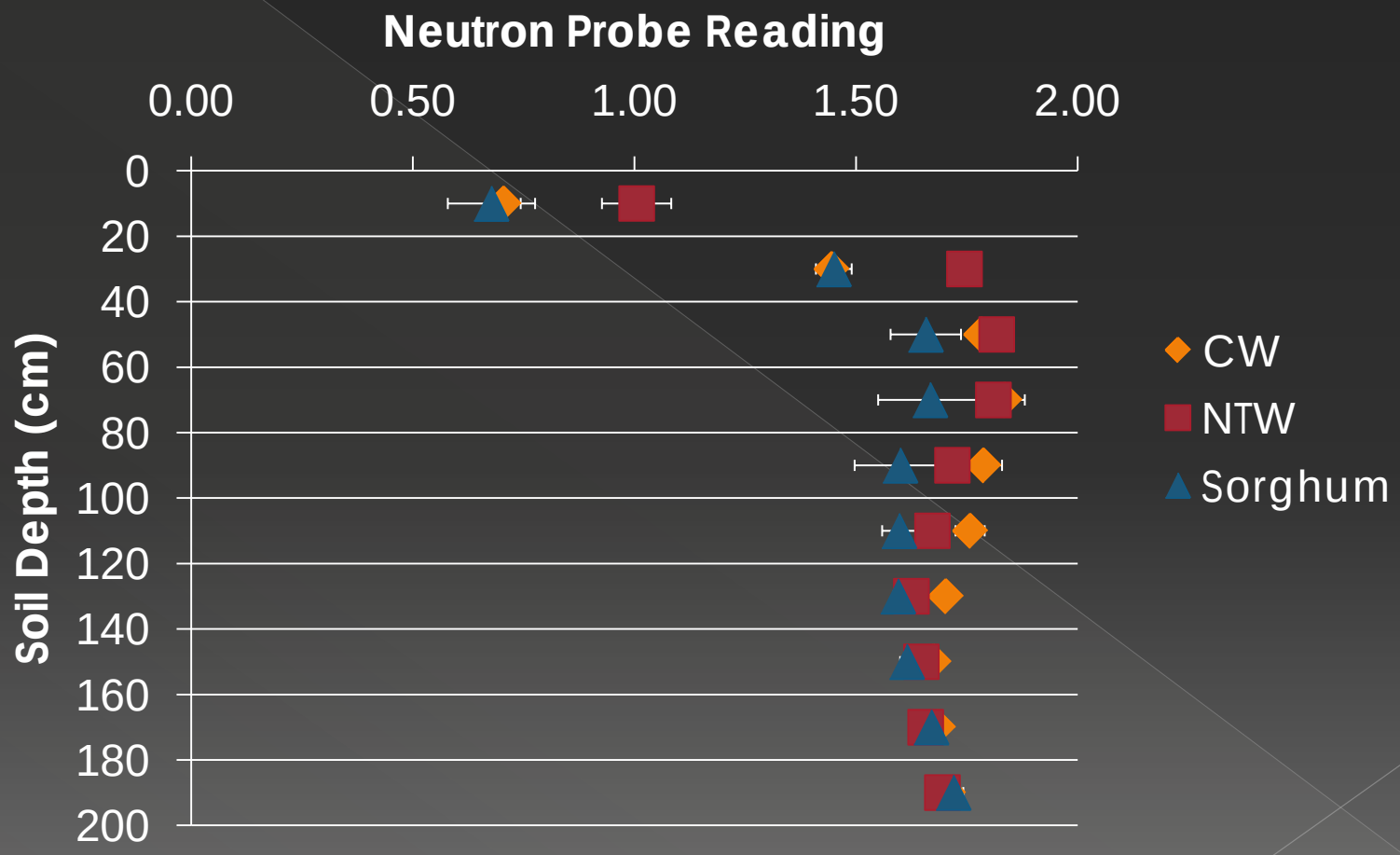
- Neutron Probe
- Access tubes place to a depth of 190 cm
- Measurements Collected Weekly

July 31, 2009



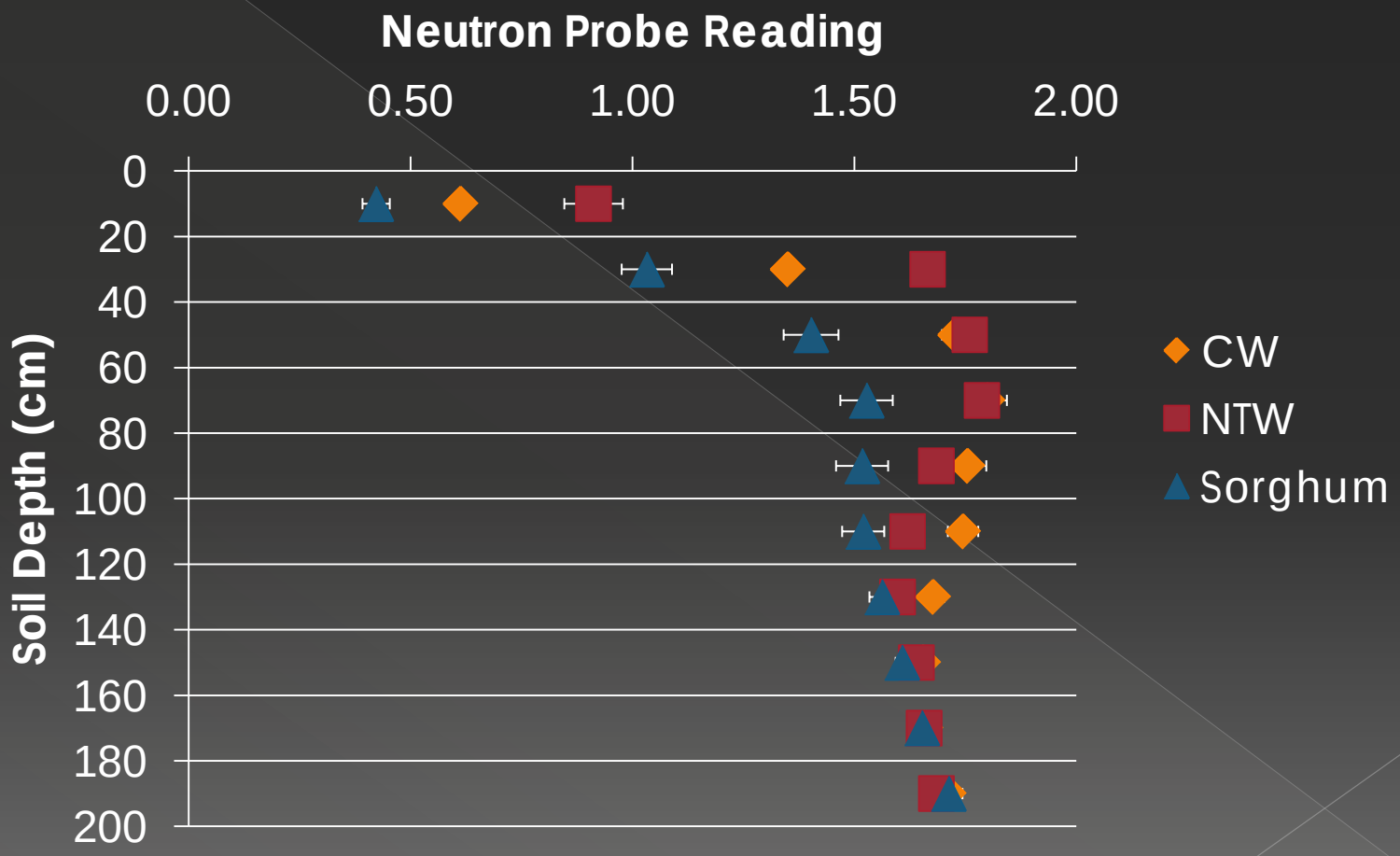
July Rainfall = 7.5 cm

Aug. 29, 2009,



Aug. Rainfall = 20 cm

Sept. 27, 2009



Sept. Rainfall = 1.3 cm

Summary

- The Surfaces of Cultivated Soils Tends to be Drier
- Double Crop Depletes Soil Water
- Little Difference Between No-till Fallow and Cultivated Sub Soils

Continued Research Activities

- Relate Data to Mesonet Data
- Calculate soil water Balances
  - Drainage, Runoff, ET, Storage
- Relate Soil Water Status to Crop Rotation Performance

Questions?