



Soil Hydrology of Sustainable Agriculture



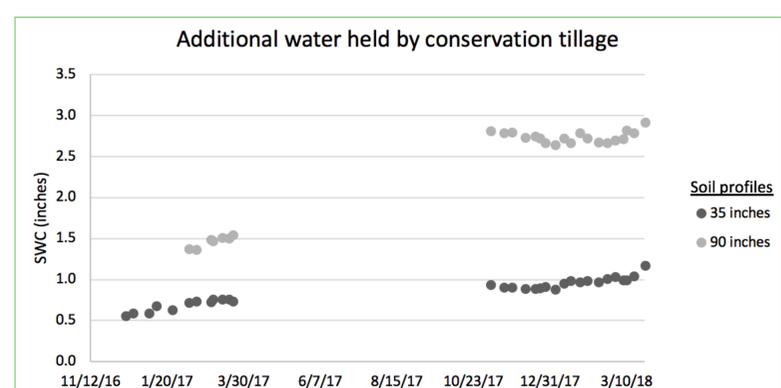
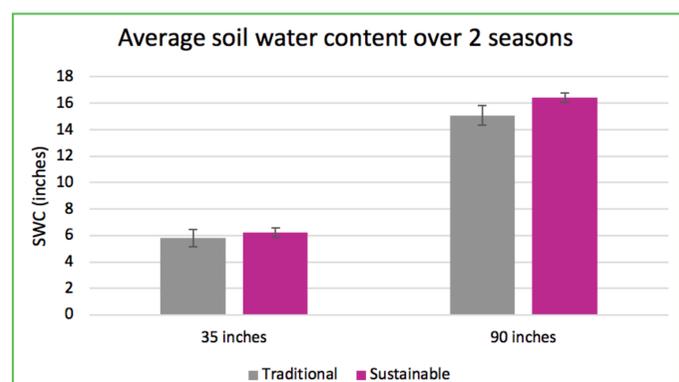
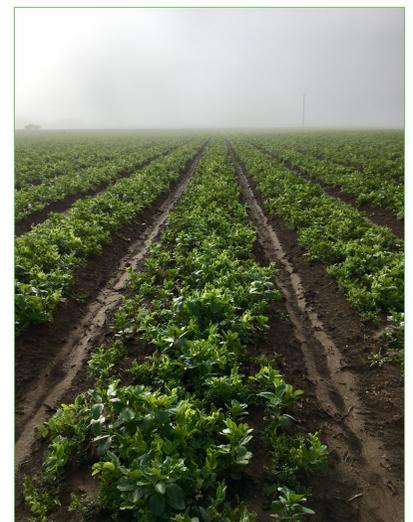
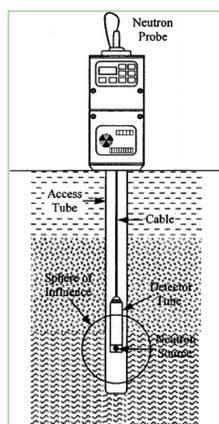
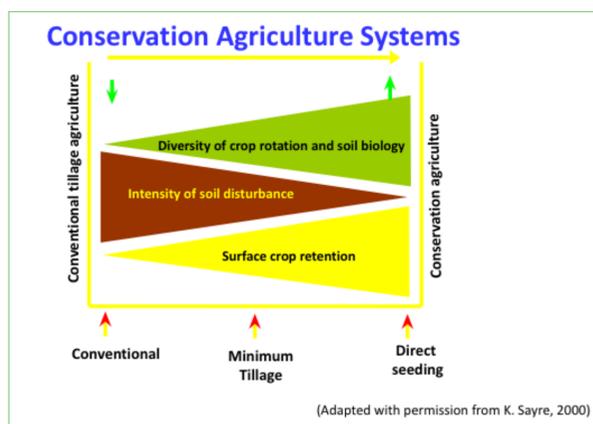
Allowing for Farming Practices Which Promote Soil Carbon Sequestration Due to Neutral Hydrologic Impact in California's San Joaquin Valley

The future of food production will require the use of farm practices that simultaneously improve soil health, reduce greenhouse gas emissions, and utilize water efficiently. Winter cover cropping and conservation tillage are two farm practices that may help to meet these needs, but uncertainties remain around their impacts on pre-season irrigation demands, on-farm logistics, and overall soil water content.

Missing Piece for Farmer Adoption?

Uncertain Hydrologic Impacts – Measuring Soil H₂O

We investigate this question using three years of robust data from a 20 year long-term field experiment in Five Points, CA, comparing standard tillage to conservation tillage and fallow fields, or no cover cropping, to winter cover cropping.



Increased soil carbon sequestration?

This work suggests that the use of conservation tillage and winter cover cropping on farms with similar climatic conditions and cash crop rotations may offer water-smart strategies that can achieve multiple ecosystem services and climate benefits, contributing to building a climate resilient agricultural sector in California.

Known Benefits of Sustainable Farming:

Prevent erosion, Reduce nutrient losses, Penetrate compacted soils, Aid in weed management, Promote soil microbial diversity, **Sequester carbon**, Form soil aggregates, Fix nitrogen, Add organic matter

(Aguilera, et al., 2013; Chen, et al. 2009; Decker, et al., 1994; Haramoto, et al., 2004; Harris, et al., 1994; Lu, et al., 2000; Roberson, et al., 1991; Sarrantino, et al., 2003; Teasdale, 1998; Vukicevich, et al., 2016; Wander, et al., 1994; Williams, et al., 2004)

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Preliminary Outcome: Gain Sequestration Benefits of Winter Cover Crops & Conservation Tillage Without Significantly Depleting SWC

