Quantifying fluxes of water and nitrate below the root zone of crops under drip irrigation: A combination of multi-sensory instruments and modeling

CDFA Project: **Evaluation of cover crop in reducing nitrate leaching in tomato fields**

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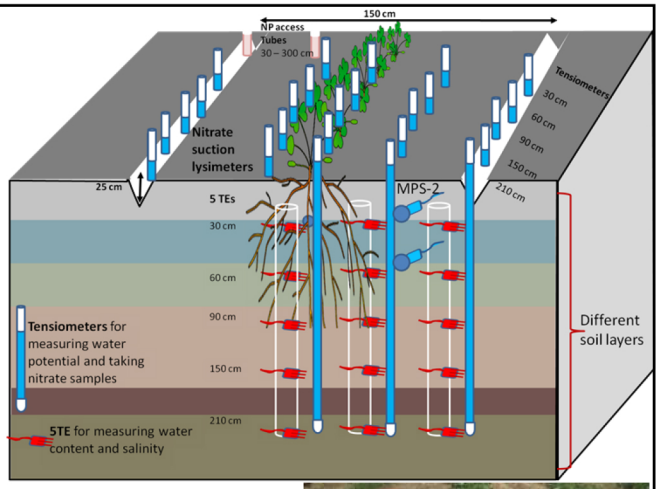
Getting internal information using multiple soil sensors

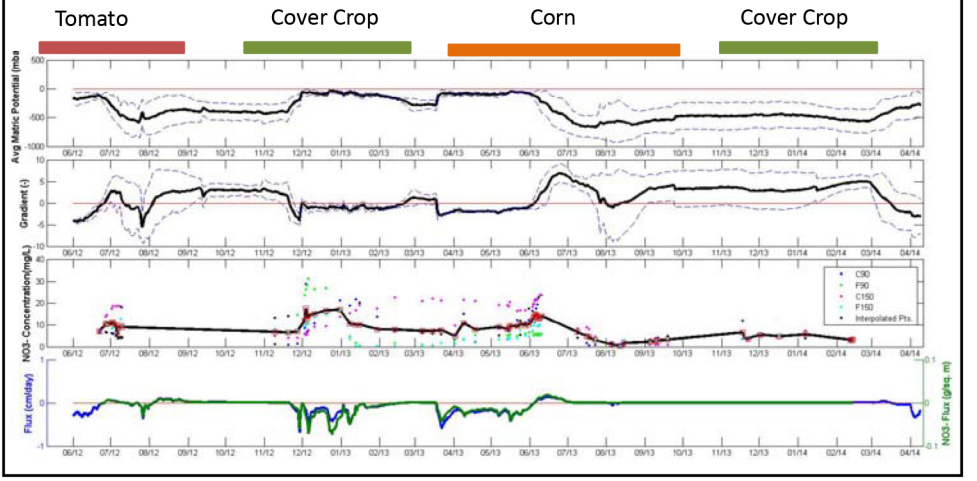


Treatments:

Winter fallow
Triticale
Bell beans

Daily leaching rates of water and nitrate in Bell Bean treatment

1st graph: Average water potential in soil profile (0 is soil saturation, the more negative the dryer the soil)
2nd graph: Soil water gradients (driving force for water movement) across a soil layer at 90-150 cm deep
3rd graph: Soil nitrate concentrations measured in soil solution in the 90-150 cm soil layer
4th graph: Daily vertical downward /upward fluxes of water (blue line on left Y axes) and nitrate (green line on the right axes). Negative fluxes are downward and positive fluxes are upward. Most of the leaching of water and nitrate seem to happen in the fall and early corn season.



Cumulative nitrate leaching in all three treatments

Vertical downward leaching of nitrate (negative values) throughout the crop rotations. Triticale showed to be the most efficient in reducing the nitrate leaching below the root zone (150 cm deep). Note the difference in nitrate leaching rate during different seasons in different treatments. While nitrate continuously leached below the root zone of winter fallow in fall through corn season, it slowed down in the two cover crop treatments.