SUSTAINABLE FOOD AND AGRICULTURE

California Tomato Cropping

Exploring the effect of improved agricultural techniques on N_2O emissions in California tomato cropping systems.

Field sites: This study was conducted in two tomato fields located in Winters, CA. One represents the standard tomato management practices while the second utilizes improved agricultural techniques: reduced tillage, drip irrigation and a grain cover crop.

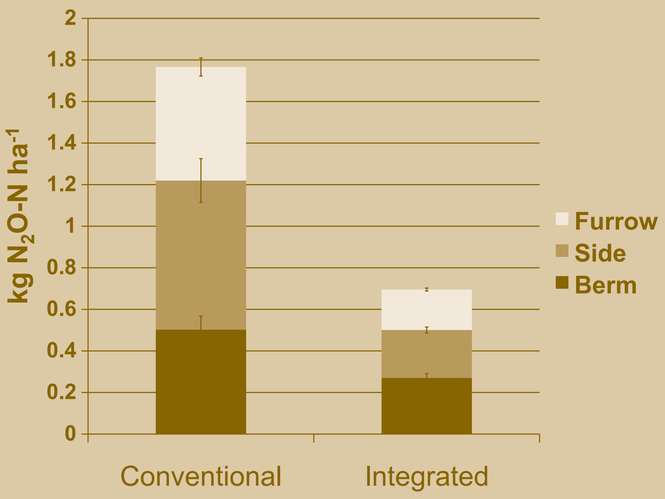
Conventional System

- Conventional Tillage
- Furrow Irrigation
- Rip and reform Beds

Integrated System

- Reduced Tillage
- Subsurface Drip Irrigation
- Winter Grain Cover Crop (Triticale trios)
- Preserve Planting Beds

Cummulative Emissions: Cumulative N_20 emissions are 2.5X lower in the integrated system than the conventional system, with more fertilizer applied and a higher crop yield.



Why N_20?

Nitrous oxide is a very potent greenhouse gas and contributes to the destruction of stratospheric ozone. Agricultural activities are the source of approximately 75% of global N_2O emissions. There is potential to reduce N_2O emissions in intensively managed agroecosystems. High uncertainty around N_2O emissions exists due to scarcity of accurate annual N_2O flux estimates.

Discussion:

- During the growing season, N20 emissions are lower in reduced tillage with drip irrigation due to increase synchrony between nitrogen availability and crop demand.

- Fertilizing through the subsurface drip system allows for more control over how much nitrogen is being added and results in lower levels of soil mineral nitrogen throughout the season.

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