

Grazing on Soil Health and Nutrient Cycling

Research being conducted by

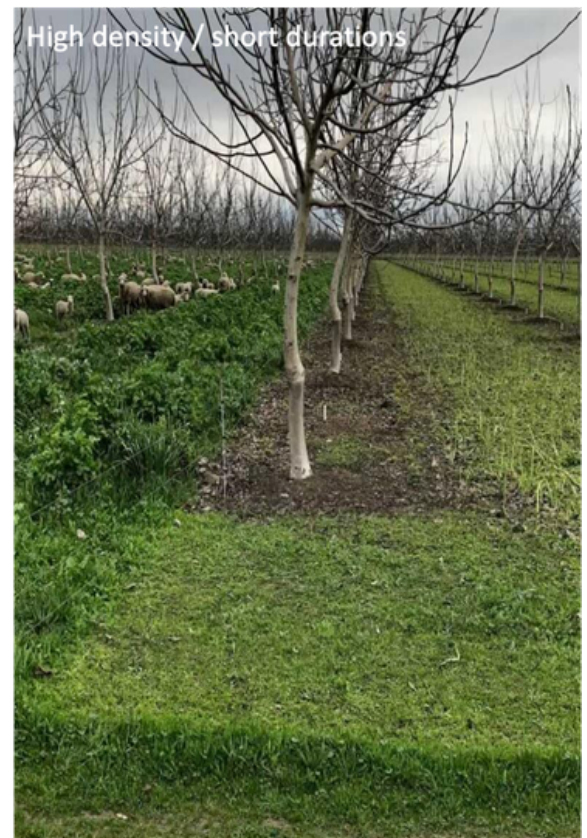
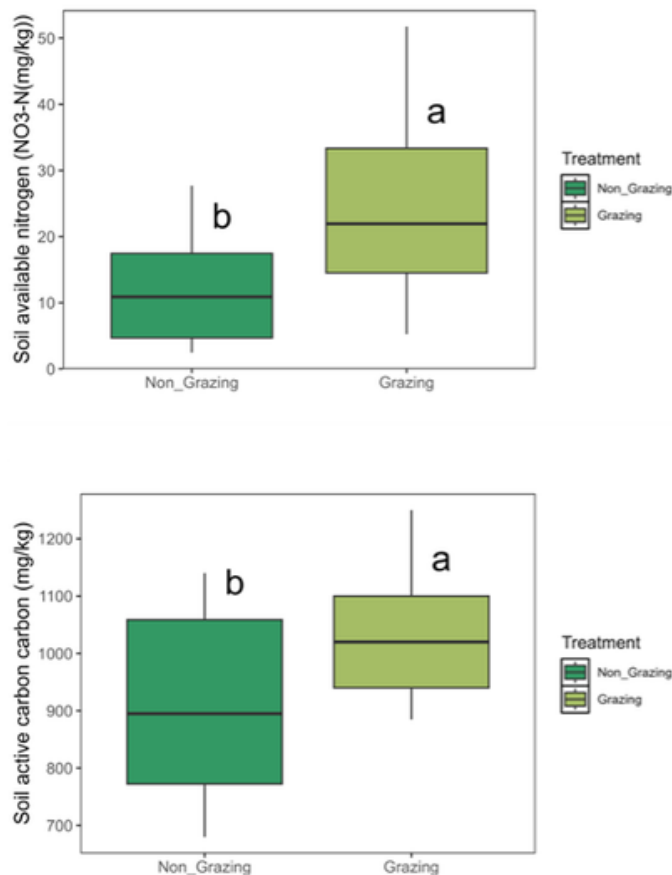
Agroecology Lab at UC Davis, led by Dr Gaudin and Dr Ji

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The research team determined that livestock grazing significantly increased soil available nitrogen. Since there was no difference in Total Nitrogen, results suggest that nitrogen is becoming more available rather than simply increasing in total volume. Soil active carbon, which is readily available to microbes, was also enhanced by grazing, while total soil carbon remained stable.

- The primary shift in soil health was related to nitrogen cycling and generally more biologically active carbon in all orchards (all cover crops).
- Livestock grazing significantly increased soil available nitrogen, particularly soil NO_3^- -N (9.5 lb N/acre). We did not detect increases in TN, indicating that N is more available.
- Soil active carbon, which is available to microbes, was also markedly enhanced by grazing (~106 mg/kg, 126 lb C/acre) but not total soil C.
- No significant impact and potential trade-offs for soil structure (compaction), soil water supply, and soil salinity.
- Other research has shown combining diverse understories with animal grazing has been shown to significantly enhance soil organic carbon, nitrogen, and biodiversity, whereas isolated or minimal practice adoption may fail to improve baseline conventional, bare-soil systems.



Marshall, K., Hodson, A., Bowles, T., Jarvis-Shean, K., Gaudin, A. (2025). Stacking soil health practices is necessary to enhance soil ecosystem multifunctionality of semi-arid almond agroecosystems, *Applied Soil Ecology*, Volume 210, 106066, ISSN0929-1393. <https://doi.org/10.1016/j.apsoil.2025.106066><https://www.sciencedirect.com/science/article/pii/S0929139325002045>.



Project website



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