

Grazing Cover Crops in Annual Cropping Systems

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A 2022 UCCE focus group with local growers (n=8) and ranchers (n=5) found that both groups

- see **some to many advantages** of grazing on cropland
- would like **grazing on cropland encouraged, adopted, and expanded**

What are the potential benefits to growers of grazing cover crops?

- Increased land use efficiency, forage value
- Increased nitrogen (N) availability
- Increased soil health and microbial activity
- Decreased weed pressure and biomass control
- Reduced reliance on fossil fuels/herbicides

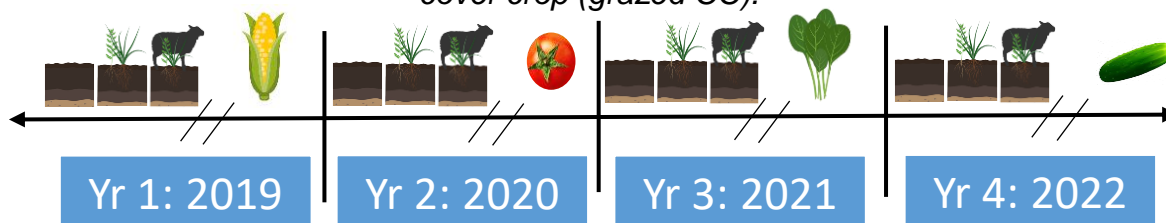
What concerns might growers have about grazing cover crops?

- Soil compaction risk
- Nitrate leaching risk
- Food safety risk
- Positive soil outcomes take too long to achieve
- Logistical complexity within operation cycle

2019-2022 winter cover crop grazing experiment

Objective: Investigate impacts of cover crops and cover crop grazing on soil health, soil carbon pools, soil nutrient cycling & foodborne pathogen risk in an organic vegetable system

We implemented a maize-tomato-spinach-cucumber rotation on tilled, organic plots at Russell Ranch at UC Davis. *There were three different winter treatments: fallow, ungrazed cover crop (ungrazed CC) and grazed cover crop (grazed CC).*



What have we found so far?

- Increase in *soil nitrate* in grazed CC plots
 - At vegetable planting in Yr3: fallow- 9 lb N/A, ungrazed CC- 28 lb N/A, grazed CC- 27 lb N/A
 - At peak nutrient uptake in Yr3: fallow-22 lb N/A, ungrazed CC- 59 lb N/A, grazed CC- 85 lb N/A
- *Nitrate leaching* wasn't significantly higher in grazed CC plots, though there were hotspots
- Trends toward higher *microbial activity* (respirable carbon) in grazed CC plots
 - At peak nutrient uptake in Yr3: 35% increase from fallow, 9% increase from ungrazed CC
- No difference in *soil structure* or *soil compaction* (bulk density) between treatments in Yr3
- Emergence of barnyard grass (a summer weed) was suppressed in grazed CC plots
- Higher rainfall and lower soil temperature are associated with greater generic *E.coli* risk in all treatments - USDA's National Organic Program 90-120 day wait-period between manuring/grazing and harvesting should take into account environmental factors.

Future Research Questions

- What are the *long term effects* of cover crop grazing on soil health in CA?
- What specific *N credits* from grazing can be used to guide nutrient management?
- Does *grazing intensity* affect soil health outcomes and crop yield?
- What are the *economics* of implementing grazing on annual land for ranchers and growers?

Thanks to the growers and ranchers who participated in the UCCE Focus Group on 3/1/2022