

# Overwintering Cauliflower as a Novel Rotational Crop for North Coast California Dairies

Western SARE Farmer/Rancher Grant Program

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## Summary

Dairies on the northern California coast have been facing severe financial headwinds, leading to the shuttering of businesses, while at the same time trying to meet conservation goals including management for nitrate leaching and invasive weeds. This project proposes a field-scale trial of a novel rotational crop, overwintering cauliflower, to add resilience to these operations by diversifying production to create new sales opportunities, while aiding conservation outcomes. Over the past 15 months, I have been conducting small-scale trials of overwintering cauliflower with two dairy producers to determine crop cultural practices and to assess yield and profitability. We are also beginning to explore possible rotational benefits for dairy systems including the forage value of cauliflower residues, and improvements to soil fertility and pH before reseeding to pasture.

## Project Narrative

Relevance to Sustainable Agriculture, Project Value, and Benefits:

Overwintering cauliflower are specific cauliflower varieties that are planting late summer for a harvest in early to mid-spring. It is not currently being grown at scale in the region, yet it is well-adapted to this maritime USDA Zone 9b region, and it comes to market at a time when local specialty crop production is at a seasonal low, and cauliflower prices nationwide trend higher. Additionally, there is a market premium for certified organic produce, and 100% of the dairies in Humboldt and Del Norte counties are already certified organic. There are currently produce distributors sending trucks to the region and leaving with extra capacity to back-haul to markets to the south in the San Francisco Bay and north into Southern Oregon, and there are increasing opportunities for local wholesale as well, with institutional buyers utilizing USDA's Local Food Purchase Assistance program (LFPA).

Most of the forage for dairies in Humboldt and Del Norte counties is from irrigated permanent pasture, with some fields tilled to produce silage corn. An overwintering vegetable crop fits cleanly into this system, either when permanent pasture is tilled and renovated, or preceding a silage corn crop. This rotational crop offers potential for resource conservation benefits as well. Canada thistle (*Cirsium arvense*) is a widespread weed in local pastures, and the tillage and cultivation of a vegetable crop will provide a significant degree of control. Additionally, there is a need to utilize liquid manure from dairies, while minimizing the risk of nitrate leaching. A cauliflower crop utilizes 180-240 lbs/acre of nitrogen (Van Den Boogaard and Thorup-Kristensen, 1997), with 60-80% of the total N demand in the above-ground biomass (Hartz, 2007). As most of the vegetative growth of an overwintering cauliflower crop occurs before the rainy season, and remains as living cover over the winter months, it is likely effective at utilizing and scavenging leachable nitrate.

## Research Plan:

To grow one acre of overwintering cauliflower, incorporating 3 varieties (Fredor, Osborne Quality Seeds; Medaillon, Osborne Quality Seeds; Prestige, Adaptive Seeds). Ground preparation will begin in May of 2024 to coincide with silage corn planting. Seeds will be sown in nursery trays in mid-June of 2024. Soil sampling will be used to determine fertilizer and lime requirements, and applications will be made in accordance with the farm's organic systems plan. The plot will be blind cultivated one to two times before final tillage and transplanting in late July of 2024. The plot will be overhead irrigated with hand lines at planting, and as needed (~ every 10-14 days) until significant fall precipitation. Weeds will be managed with a corn cultivator and hand-hoeing as needed. Cabbage looper may need to be controlled with one or two ground applications of *Bacillus thuringiensis* (DiPel DF). Pelletized chicken manure will be applied as a side-dressing in late February, and spring irrigation may be needed in a dry year. Each variety will have a harvest of around 2 weeks, with the trial concluding in April 2025. Weight of total & marketable yields and farmgate value will be collected during packing.

## Outcomes:

- Determine the viability of a new rotational crop
  - Profit & loss analysis
  - Compare varieties for yield and harvest timing
  - Identify marketing channels
- Determine the ability of this crop to aid conservation goals
  - Sequester soil nitrates to reduce leaching
  - Reduce Canada thistle in subsequent pasture
- Serve as a model to other producers... Project will include outreach to dairy farmers

## References:

Everaarts, A.P., de Moel, C.P., 1995. The effect of nitrogen and the method of application on the yield of cauliflower. *Netherlands Journal of Agricultural Science* 43, 409-418.

Hartz, T.K., 2007. Efficient nitrogen management for cool-season vegetables.

Van Den Boogaard, R., Thorup-Kristensen, K., 1997. Effects of nitrogen fertilization on growth and soil nitrogen depletion in cauliflower, *Acta Agriculturae Scandinavica, Section B — Soil & Plant Science* 47, 149-155.