Cover Crop for Co-Management

O'AHU RESOURCE CONSERVATION & DEVELOPMENT COUNCIL

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COOPERATIVE EXTENSION
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Co-management:
Refers to managing farms and their surrounding environments such that multiple goals are achieved: natural resource conservation *and* food safety.

Co-management practices:
Refers to those *best management practices* (BMPs) which meet objectives in both natural resource conservation and food safety.

Cover crops: Grasses, legumes, and forbs planted for seasonal vegetative cover and encouraging beneficial insects.

Sunn hemp growing in Windward Oahu

How do cover crops help?

Improves soil health and soil biodiversity, helping to encourage microbial competition that suppress pathogens. Cover crops can also improve soil structure, leading to increased infiltration of water and reduce the risk of potentially contaminated runoff or irrigated water to come in contact with adjacent cash crops. Some cover crops are also effective at increasing nutrients in the soil.

Functions

- ➔ Increased plant and microbial biodiversity
- ➔ Improved soil structure
- ➔ Increased water infiltration
- ➔ Increased available nutrients

Best use: *Good for farms that need to improve soil health, reduce fertilizer input, and attract beneficial insects.*

Benefits

...to food safety

- Balancing/suppressing populations of human pathogens
- Reducing potentially contaminated runoff or standing water

....to conservation

- Building soil carbon and health
- Reducing runoff and soil erosion
- Improved drought tolerance
- Improved nutrient availability

Practicality

the pros

- Reduced need for fertilizer
- Suppression of crop pests
- Reduced erosion and increased infiltration

the cons

- Uncertainty regarding which cover crops will best compliment the farmer's goals
- Using a cover crop incorrectly can be detrimental to the cash crop
- Lack of equipment for seeding and/or removal
- Cost and availability of seed

Literature Summary

- Glucosinolate compounds from Brassica cover crops and residues have an antibacterial effect on Salmonella and E. coli O157:H7 (Patel 2013).

- Higher soil organic matter and moisture content, soil microbial diversity, and lower soil pH suppress *E. coli* abundance in the soil (Williams et al. 2015; Xing et al. 2019).

References

Patel, J. 2013. Glucosinolate-derived compounds as a green manure for controlling *E. coli* O157:H7 and *Salmonella* in soil. Center for Produce Safety Interim Report.

Williams, M., LeJeune, J. T., and B.M. Gardener. 2015. Soil conditions that can alter natural suppression of *Escherichia coli* O157:H7 in Ohio Specialty Crop Soils. Applied and environmental microbiology, 81(14), 4634-4641.

Xing, J., Wang, H., Brookes, P. C., Salles, J. F., and J. Xu. 2019. Soil pH and microbial diversity constrain the survival of *E. coli* in soil. Soil Biology and Biochemistry, 128, 139-149.

Resources

1. Learn more about co-management: Wild Farm Alliance: Food safety and Conservation Resources
2. Learn more about food safety: Roots FSMA Guide & Produce Safety Alliance
3. Learn more about conservation practices and on-farm assistance opportunities: Oahu RC&D & CTAHR Extension

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