

Compost Amendment for Co-Management



O'AHU
RESOURCE
CONSERVATION &
DEVELOPMENT COUNCIL

October 2020



COOPERATIVE EXTENSION
UNIVERSITY OF HAWAII AT MANOA

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.

Compost Amendment: Application of decayed organic carbon-rich material with many microbiological, structural, and fertility benefits for soil.



Soil from an organic farm in Waianae, Oahu

How does compost help?

Compost amendments improve soil health and soil biodiversity, helping to encourage microbial diversity and competition that suppress pathogens. Compost can 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 produce.

Functions

- Increased microbial biodiversity
- Improved soil structure
- Increased water holding capacity
- Increased available nutrients

Best use: Good for farms that need to improve soil health and function.



Benefits

...to food safety

- ❖ Balancing/suppressing populations of human pathogens

...to conservation

- ❖ Building soil carbon and health
- ❖ Improved drought resistance
- ❖ Improved nutrient availability

Practicality

the pros

- ❖ Reduced need for fertilizer
- ❖ Compost tea is convenient to add into drip irrigation
- ❖ Long term benefits, requiring infrequent application in subsequent years

the cons

- ❖ May be too expensive/labor intensive for large scale operations
- ❖ Using an unfinished compost or improper application can pose food safety risk

Literature Summary

- *E. coli* O157:H7 growth in compost was negatively correlated with higher indigenous microorganism populations (Kim et al. 2011).
- Pathogens did not survive in stabilized compost with high indigenous microorganism populations, compared with sterilized compost (Paniel et al. 2010).
- 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

- Kim, J., C. Miller, M. Shephard, X. Liu, and X. Jiang. 2011. Impact of indigenous microorganisms on *Escherichia coli* O157:H7 growth in cured compost. *Bioresource Technology* 102: 9619–25.
- Paniel, N., Rousseaux, S., Gourland, P., Poitrenaud, M., and J. Guzzo. 2010. Assessment of survival of *Listeria monocytogenes*, *Salmonella Infantis* and *Enterococcus faecalis* artificially inoculated into experimental waste or compost. *Journal of applied microbiology*, 108(5), 1797-1809.
- 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](#)

Acknowledgements

Produced by O'ahu Resource Conservation and Development Council (O'ahu RC&D) in collaboration with CTAHR Cooperative Extension, University of Hawai'i at Mānoa

This fact sheet is provided by O'ahu RC&D in good faith, but without warranty. It is intended as an educational resource and not as advice tailored to a specific farm operation or a substitute for actual regulations and guidance from FDA or other regulatory agencies. We will not be responsible or liable directly or indirectly for any consequences resulting from use of information provided in this document or resources suggested in this document.

O'ahu RC&D supports sustainable agricultural operations throughout the state of Hawai'i by creating opportunities for grant funding to implement best management practices, providing conservation planning, and through development of farmer networks. Find out more at oahurcd.org.

This material is based upon work that is supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, under award number 2018-38640-28418 through the Western Sustainable Agriculture Research and Education program under project number WPDP19-24. USDA is an equal opportunity employer and service provider. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture.



COOPERATIVE EXTENSION
UNIVERSITY OF HAWAII AT MANOA



United States
Department of
Agriculture

National Institute
of Food and
Agriculture

Check out additional factsheets and learn more about co-management at oahurcd.org/comangement