Windbreaks for Co-Management

O'AHU RESOURCE CONSERVATION & DEVELOPMENT COUNCIL

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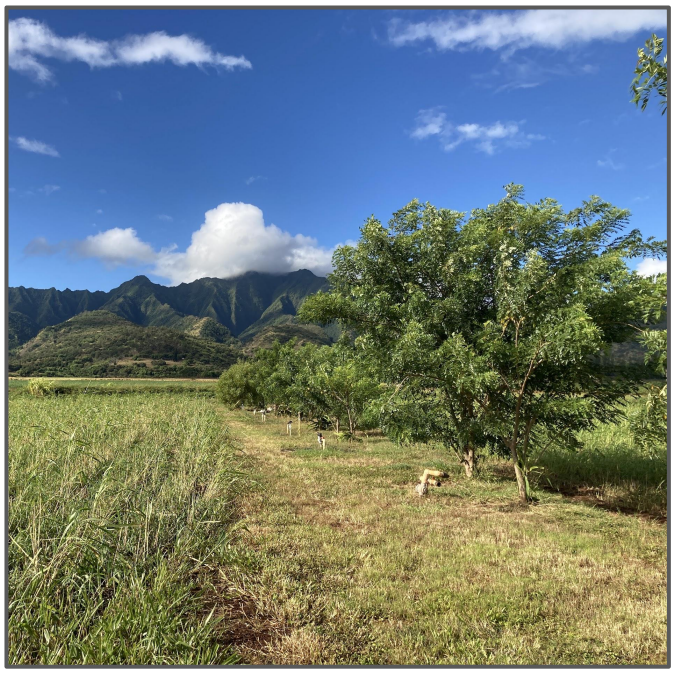
Co-management:
Refers to managing farms and their surrounding environments such that multiple goals are achieved: natural resource conservation *and* food safety.

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

Windbreak: Single or multiple rows of trees or shrubs, positioned to reduce wind speed.



A gliricidia windbreak installed near production fields in Waialua, Oahu

How do windbreaks help?

Blocks wind and reduces airborne contamination risks. A windbreak installed perpendicular to the direction of prevailing winds can block undesired sediment and pathogens from landing on production fields and introducing risk from neighboring areas. Windbreaks may also decrease the rate of evaporation from production zones, resulting in a reduced need for irrigation and risk of irrigated water runoff.

Functions

- ➔ Increased plant biodiversity
- ➔ Interception of airborne pathogens
- ➔ Increased pollination
- ➔ Reduced evaporation of irrigated water

Best use: *Good for farms seeking visual or airborne contamination protection, or wind-sensitive crops*

Benefits

...to food safety

- Reduced transmission of airborne contaminants

....to conservation

- Build soil health and carbon, habitat creation
- Water conservation
- Reduce wind erosion

Practicality

the pros

- Reduces wind stress on crop
- Reduces pesticides/herbicide drift and sediment transport from neighbor operations
- May be multi-purpose, such as food/timber

the cons

- Length of land lease may impact farmer desire to invest in permanent vegetation
- Can encourage undesired bird populations near fields

Literature Summary

- Vegetative tree buffers of cypress, willow, pine, or cedar reduced dust in the air downwind of the buffer strip by 30%-60% of dust (Malone 2004; Hernandez 2012).

- Vegetative tree buffers of maple, oak, poplar, adler, willow, and grasses reduced viral infections of chicken coops compared to the control in only the last year of a 3-year study. It was thought that once the buffers had grown to a fuller and greater height, they would have functioned better to reduce the spread of pathogens (Burley et al. 2011; Sames et al. 2020).

References

Burley, H. K., Adrizal, A., Patterson, P. H., Hulet, R. M., Lu, H., Bates, R. M., Martin, G. P., Myers, C. A. B. and Atkins, H. M. 2011. The potential of vegetative buffers to reduce dust and respiratory virus transmission from commercial poultry farms. Journal of Applied Poultry Research, 20(2), 210-222.

Hernandez, G., Trabue, S., Sauer, T., Pfeiffer, R., and Tyndall, J. 2012. Odor mitigation with tree buffers: Swine production case study. Agriculture, ecosystems & environment, 149, 154-163.

Malone, B. 2004. Using trees to reduce dust and odour emissions from poultry farms. Proc. Poult. Information Exchange, 33-38.

Sames, A., Noll, S., Wyatt, G. J., Zamora, D., Current, D., & Janni, K. 2020. Effects of Vegetative Windbreaks on Dispersal of Highly Pathogenic Avian Influenza-A Review of Literature. Journal of the NACAA, 13(1).

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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