

Strategies for Increasing On-Farm Biodiversity for Environmental Health and Farm Business Resilience



Mustard and canola cover crop growing in almond orchard alley

Biodiversity

enables:

Ecological intensification by enhancing biological processes to carry out agroecosystem functions for crop yield and ecosystem health, with potential to reduce external inputs and fuel use

Economic resilience by providing farms with more product offerings, reduced input costs, and/or stability of yield & income

UC SAREP collaborates with producers and researchers to conduct applied research and outreach on multiple types of biodiversity strategies that can help to diversify farming operations while improving environmental health for agroecosystems and natural ecosystems.

Access Our Resources Here!



UC ANR Cover Crops Website
<https://ucanr.edu/sites/covercrops/>



UC ANR Elderberry Website
<https://ucanr.edu/sites/Elderberry/>



Crop-Livestock Integration
Webinar Playlist

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a



b

Native blue elderberries (*Sambucus nigra* ssp. *cerulea*) (a) and a mixed hedgerow with elderberries growing next to strawberries (b)

Cover Crops

Strategies and Benefits

- Cover crops planted between main crops (in space or time) improve soil health, enhance water infiltration, provide food and habitat for beneficial insects, provide nitrogen.

New UC SAREP Resources and Tools

Expert Grower Database

- Free, searchable database describing cover cropping strategies, detailed practices, benefits, and challenges of over 50 experienced cover crop growers
- Targets orchards and vineyards in the southern Sacramento Valley and the North Coast viticulture region

New ANR Website: California Cover Crops Resources

- Grower case studies
- Research-based summaries on cover crop management and ecosystem services
- Links to cover crop selection tools and other grower resources

Crop-Livestock Integration

Strategies and Benefits

- Bring animals and crops together (in space or time). Livestock can graze cover crops, crop residue, or planted forage crops during fallow or in orchard alleys.
- Reduce tractor passes needed to manage cover crops in vineyards
- Build soil health and ecology, enhance soil carbon sequestration, and increase climate resilience of cropping systems^{1,2}

New UC SAREP Resources

- 2022 Orchard grazing and contract grazing webinars, with panels of experienced producers and researchers

References

¹de Faccio Carvalho, P. C., Anghinoni, I., ... & Bayer, C. 2010. Nutrient Cycling in Agroecosystems, 88(2), 259-273. ²de Albuquerque Nunes, P. A., ... & Gaudin, A. 2021. Scientific Reports, 11(1), 1-14. ³Brodt, S., Engelskirchen, G., Fyhrie, K. (accepted for publication). California Agriculture. ⁴Heath S.K., Soykan C.U., Velas K.L., Kelsey, R., Kross S.M. 2017. Biological Conservation, 212(Part A), 153-161. ⁵Morandin L.A., Long R.F., Kremen C. 2016. Journal of Economic Entomology 109(3), 1020-27. ⁶Smukler S.M., Sánchez-Moreno S. ... Jackson L.E. 2010. Agriculture, Ecosystems and Environment 139, 80-97. ⁷Uhl KR, Fyhrie KJ, Brodt SB, Mitchell AE. 2022. ACS Food Science and Technology 2, 347-358.

Elderberry Hedgerows for Harvest

Strategies and Benefits

- Harvestable hedgerow plants such as blue elderberry (*Sambucus nigra* ssp. *cerulea*), native to California and long used in Native cultures, can serve as a viable cash crop and promote ecosystem services.³
- Hedgerows provide natural habitat for native birds,⁴ crop pollinators,⁵ and natural enemies of crop pests,⁵ and store carbon in long-term woody biomass.⁶
- Elderberries are high in antioxidants and anthocyanin.⁷
- Net annual revenues of \$2-3,000 per 1,000-ft hedgerow in first 2-3 years can more than off-set establishment costs.³
- California value-added product makers are seeking local sources for elderberry

New UC SAREP Resources

- Producing Blue Elderberry as a Hedgerow-Based Crop in California* – growing and marketing guide (ANR Publications)
- Cost of establishment studies (UC Davis cost studies)
- Nutrient analyses of blue elderberry⁷



Sheep grazing on vineyard cover crops (photo credit: Gisele Herren)

