Overview: Benefits of Agroforestry in California

Sonja Brodt, PhD
Associate Director
University of California Sustainable Agriculture Research and Education Program
Davis, CA

sbbrodt@ucanr.edu

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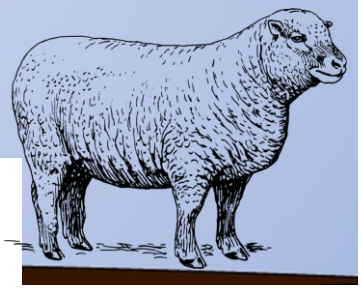


Current environmental and economic challenges in California agriculture

- Drought
- Climate Change
- Water pollution
- Biodiversity loss
- Labor shortages

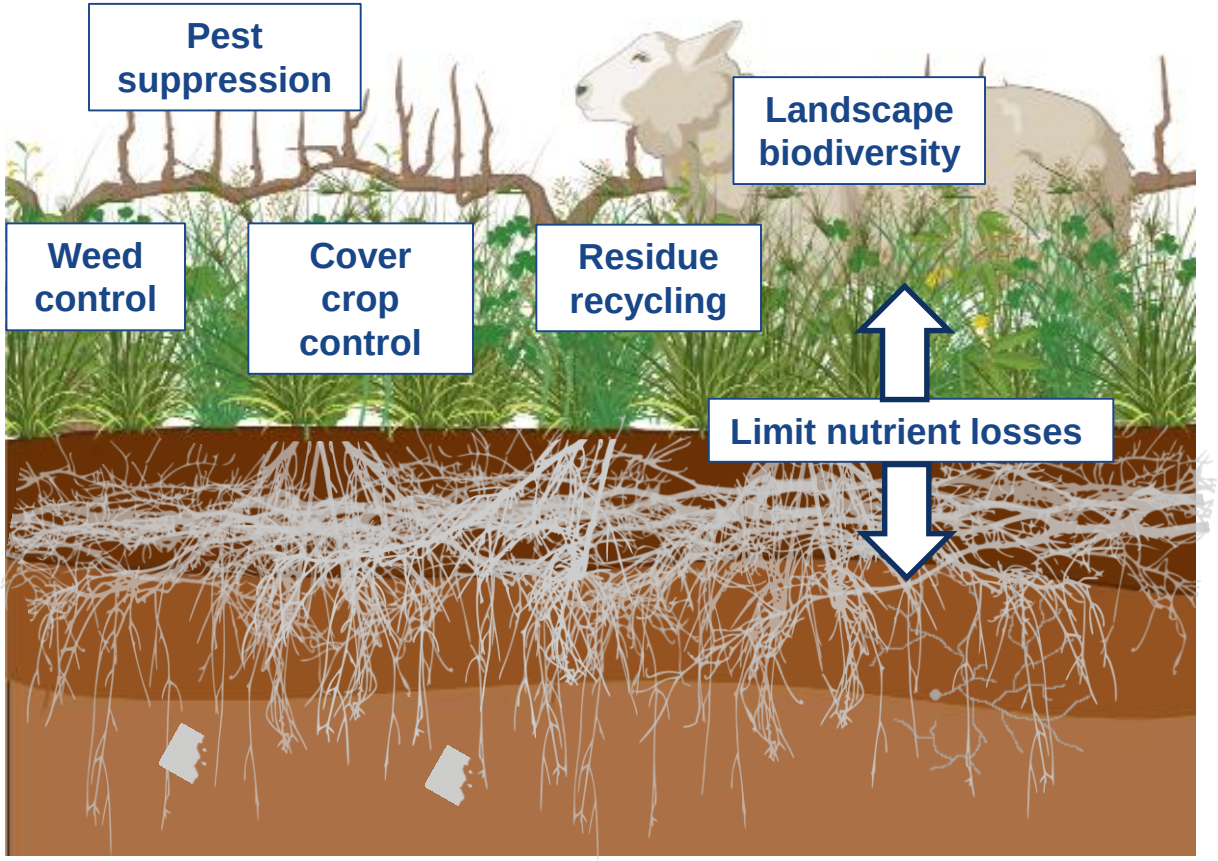
Ecological intensification: harnessing natural processes to keep agroecosystems functioning

Perennialization – adding more perennial components to a system

Diversification – increasing a system's biological diversity

Ecological Intensification: Sheep Grazing in Vineyards

Preliminary results from side-by-side study of grazed and ungrazed vineyards by K. Brewer & A. Gaudin, Univ. of California, Davis:



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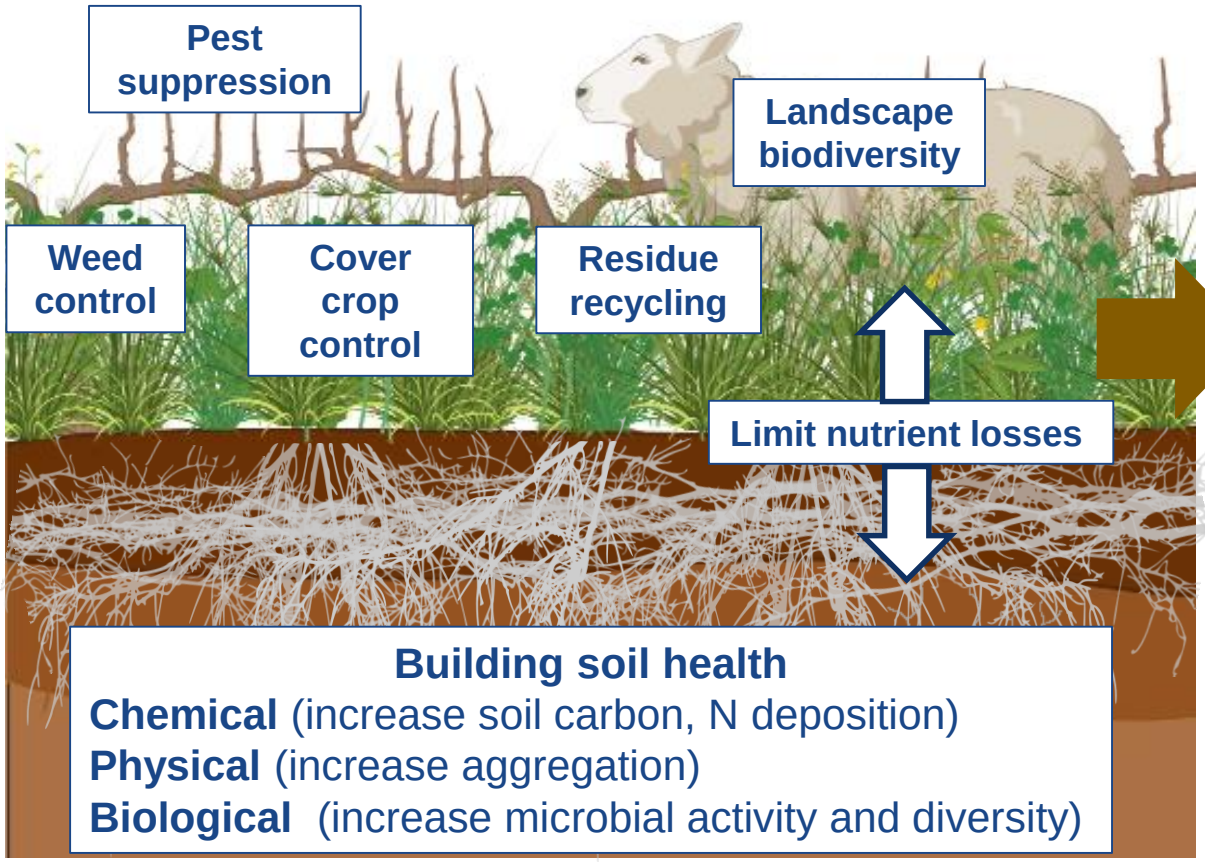


Niles et al. 2018 Agronomy for Sustainable Development 38 (1)

Vineyard managers report*:

- **Reduced mowing and herbicide use:** $87-174/acre savings
- **Leaf plucking labor savings** ($643/acre)
- **Fire prevention**
- **Marketing opportunities**

*Ryschawy, Tiffany, et al. 2021. Land Use Policy 109.

Ecological Intensification: Multi-species Native Hedgerows

- Carbon sequestration:
  - CA organic farm study: hedgerows stored 18% of the farmscape's total carbon while occupying only 6% of the area[a]
- Habitat and food for wildlife, pollinators and natural predators
  - Increased pollination rate in adjacent canola[b]
- Natural pest control for crops
  - Decreased need for insecticides in adjacent tomato fields[b]
- Water quality protection, runoff prevention

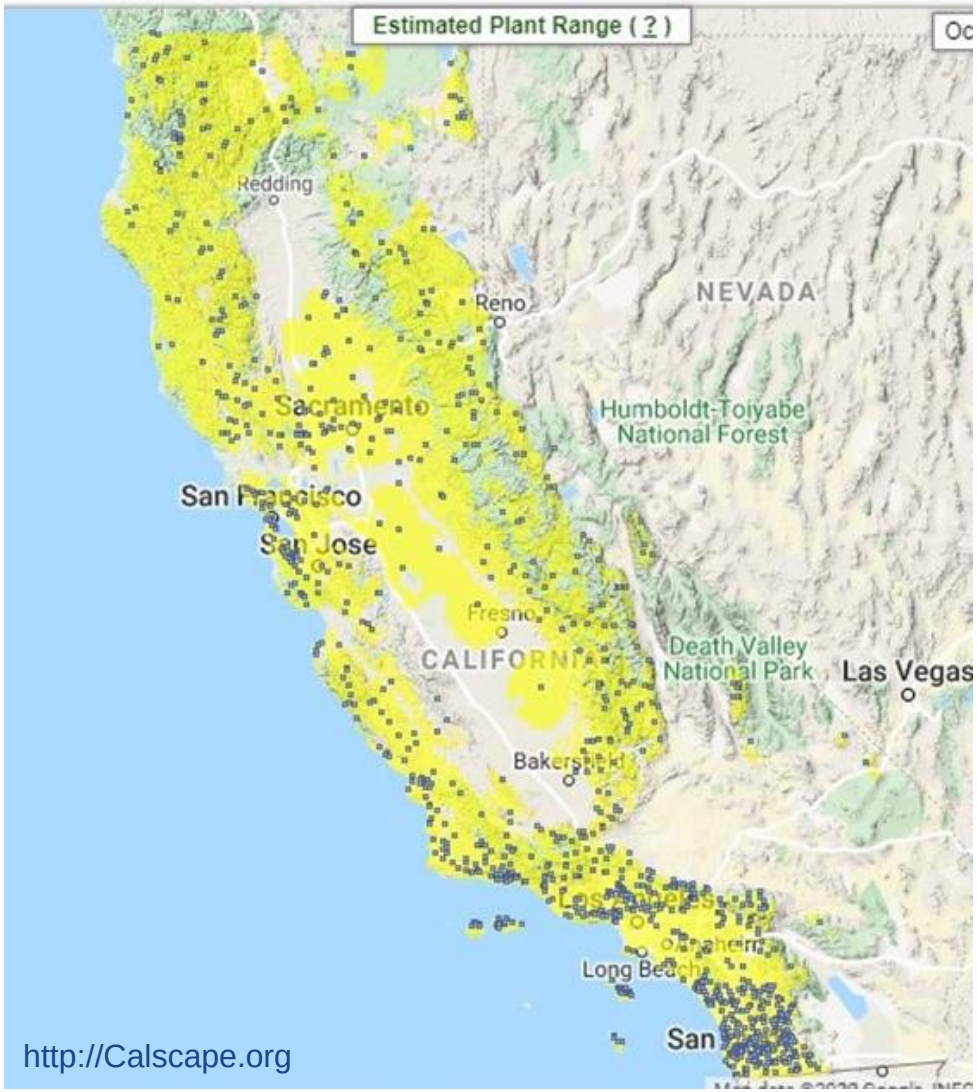
But hedgerows are expensive to plant...

[a]Smukler et al. (2010) Agriculture, Ecosystems, and Environment 139, 80–97.

[b]Long et al. (2017) California Agriculture, 117-119.

Blue elderberry – a component of native hedgerows

Sambucus nigra, spp. *cerulea*



- Drought- and heat-tolerant, fire-resilient, adapted to wide range of climate zones
- Long history of stewardship by California native tribes
- US elderberry sales were $107 million in 2019 and grew 241% in first half of 2020 (Herbalgram Smith 2020)

Sacramento Valley On-Farm Demonstration Trials 2017-20

6 months after spring planting of small plug

Per 1,000 ft hedgerow:

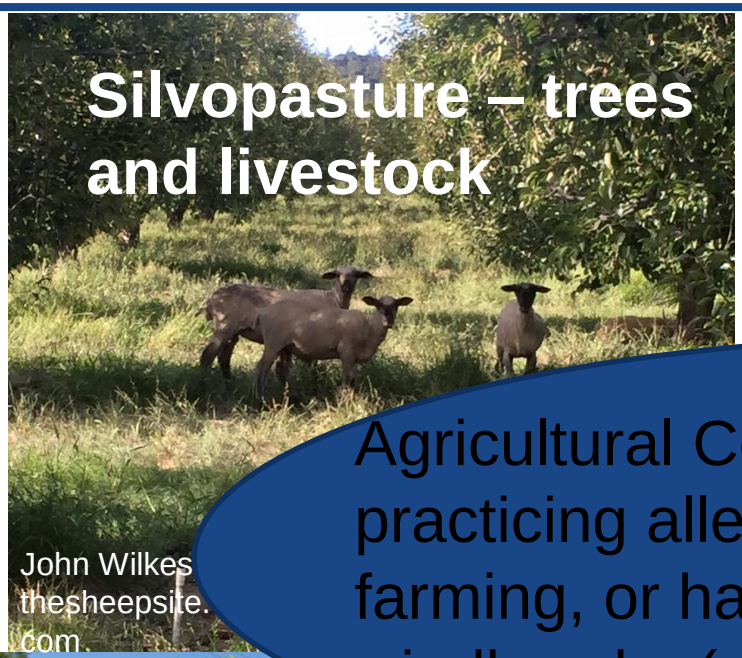
Establishment costs (3 yrs)	$3,000 – $4,000
Year 3 revenues (net of harvest and destemming labor)	$2,000 - $6,800

- **Recover costs of hedgerow establishment in 2-3 years**, based on conservative wholesale value of frozen, destemmed elderberries ($5/lb)

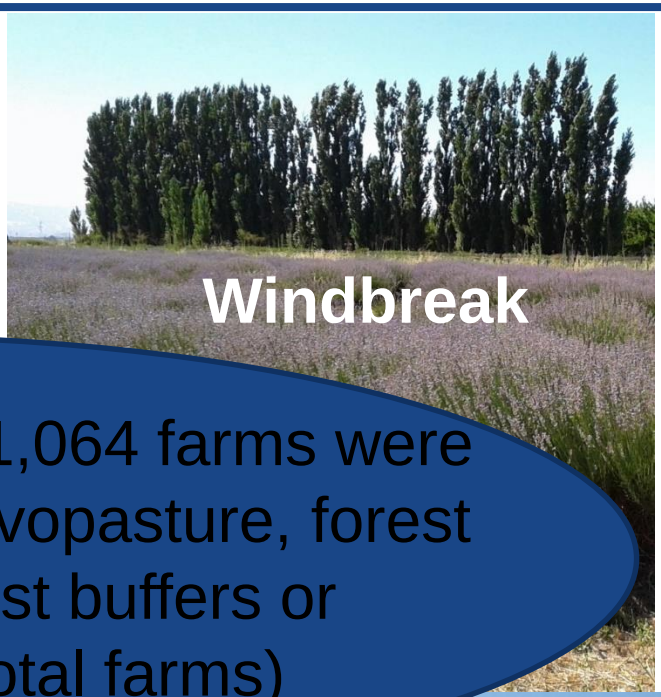
- Potential future market value of **over $12,000 per 1000-ft hedgerow** in good growing conditions

But needs more market development…..

Types of agroforestry systems



John Wilkes thesheepsite.com



Agricultural Census, 2017: 1,064 farms were practicing alley cropping, silvopasture, forest farming, or had riparian forest buffers or windbreaks (out of 70,521 total farms)

Frey Vineyards

For more information:

https://sarep.ucdavis.edu/

https://ucanr.edu/sites/Elderberry/

Youtube: “Agroforestry” lecture, Sonja Brodt (Permaculture for Peace): https://www.youtube.com/watch?v=xMkxBHGRuYg

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