

# Perennial Cover Crops In Orchards and Vineyards

## What they are

In a perennial cropping system, cover crops are a non-cash crop planted between orchard or vineyard rows.

Annuals or perennial grasses and legumes can be used as cover crops. They may be planted as a single species or as a species mix.

## How they work

Cover crop roots anchor soils throughout the winter or during irrigation, allowing rain and runoff to better percolate into the soil and reduce its erosive potential. The plants also provide “cover” for the soil, intercepting raindrops and diffusing energy before they hit the ground.

Cover crops help trap sediments and agri-chemicals attached to sediment and take up dissolved nutrients from surface runoff. Increased soil infiltration increases the opportunity for pesticides to break down on site.

As the plants and roots break down, they contribute organic matter and nutrients to the soil.



## Benefits

Cover crops:

- Boost soil fertility and improve soil tilth, structure, and water-holding capacity.
- Promote beneficial soil organisms, including certain bacteria, fungi and earthworms.
- Capture and recycle soil nutrients. Legumes can also “fix” additional nitrogen from the atmosphere and make it available to other plants.
- Reduce erosion and stabilize soil.
- Increase water infiltration and prevent the formation of crusts on the soil surface.
- Reduce the amount and intensity of runoff water. Storm runoff can be reduced by as much as 90% with fall-planted cover crops.
- Improve runoff water quality. Sediment concentration in runoff water can be reduced between 30 – 45%.

## Cover Crop Benefits, continued

- Suppress weeds by covering bare areas.
- Improve crossability of orchard or vineyard floors for winter access.
- Lessen dust production and associated mites.
- Provide habitat for wildlife and beneficial insects.
- Some cover crops can be harvested for forage hay or bedding mulch.

## Establishment

Establishing cover crops is similar to any other planting project.

Light discing or another form of tillage and smoothing are used to prepare the seedbed.

If perennial or re-seeding annuals will be used, the soil surface should be land planed or rolled, because it will not be worked in the future.

For planting, seed can be drilled in or broadcast. Recommended seeding rates will depend on the type of seed used, ranging from 15 or 20 pounds per acre for clovers and grasses to as much as 50

or 60 pounds per acre for large-seeded varieties of legumes and vetches. If seasonal rain is not expected, light irrigation will settle soil and speed up germination.

Grass-only cover crops may require additional fertilization. For legumes, inoculation with rhizobial bacteria may be needed.

The choice of what cover crop to use will depend on the desired benefits, the crop type, costs, water needs, soil characteristics, problematic diseases and pests, and equipment availability.

For example, annual cover crop species are often chosen for their nitrogen-fixing abilities and because they die back in time to leave a clean orchard floor at harvest.

Perennial or re-seeding annuals are often chosen because repeated planting is not needed and because their use improves crossability of orchard or vineyard floors for winter access.

# Perennial Cover Crops

## Management

Mowing and discing are the main types of labor involved in cover crop management.

Annual cover crop species can be mowed, disced, or even crimped into the soil with a roller. They can be allowed to re-seed by delaying mowing on a portion of the cover. If left to re-seed, the seed may need to be redistributed. Perennial cover crop species are managed with mowing.

Cover crops managed with mowing will usually require between 2 - 6 mowings, beginning in February or March, before the cash crop is harvested. The timing of mowings and cover crop height should be tailored to control weeds, to provide wildlife habitat or control pests, to limit the potential for frost damage, and to prepare for harvest.

Non-native perennial cover crops can increase the summer irrigation water demand. Most cool season native perennials and grasses tend to go dormant in the summer and do not significantly increase the use of irrigation water. For example, blue wild rye, California brome, Idaho fescue, and pine bluegrass are native perennial bunch grasses that go dormant in the summer.

Other maintenance needs may include keeping sprinklers or drip emitters clear.



Hairy vetch, *Vicia villosa*

## Cost

The costs to establish and maintain a cover crop are seed purchase, ground preparation and planting expenses, irrigation, and maintenance.

The cost of seeds is the biggest variable. Common legumes cost between \$ .50 - \$1.00 per pound, with a seeding rate of  $\approx$  60 pounds per acre. Native perennials can cost between \$4 - \$45 per pound, or more, with a seeding rate of  $\approx$  20-25 pounds per acre. Using perennials or re-seeding species reduces costs in subsequent years.

Looking at a range of options, for an annual cover crop mix, like clover and vetch, seed cost may be around \$30 per acre. For a perennial, non-native fescue grass mix, seed cost may be around \$45 per acre. For a perennial native grass mix, seed cost may be \$300 per acre. Costs for ground preparation can range from \$30 to over \$100 per acre.

## Planning and Financial Support

Advice on establishing cover crops is available through the Resource Conservation District, Natural Resources Conservation Service and University of California Cooperative Extension. The UC Sustainable Agriculture Research and Education Program (SAREP) has an excellent cover crop page on the world wide web located at <http://www.sarep.ucdavis.edu/ccrop/>. RCD, NRCS and UCCE staff is available to answer questions about the optimum type of cover crop to plant, when to plant it, seeding rates, and how it should be managed.

Financial assistance for implementing this practice is available through:

The Yolo-Solano Agricultural Water Quality Management Support Program can reimburse the costs of materials and time. Reimbursement amounts will be determined on a site by site basis.

The Environmental Quality Incentive Program (EQIP) provides cost-sharing for private land conservation practices.

For more information, contact:

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