For centuries, farmers planted cover crops to rejuvenate the soil and control erosion in their fields. By the 20th century, this practice was abandoned with the emergence of inexpensive and easy-to-apply commercial fertilizers and herbicides.

Today, the use of cover crops is regaining popularity because of increased interest in soil quality and the high cost of nitrogen fertilizer. Managing the orchard floor and ground cover can play a key role in improving production and maintaining healthy and fertile soil.

A cover crop is a non-cash crop that isn’t harvested for feed or for sale. It is grown between tree rows and in some cases between trees.

This guide outlines the steps for planting and maintaining a successful reseeding annual cover crop under no-till orchards in Sutter and Yuba county orchards.
What are the benefits of a cover crop?

A cover crop improves soil quality by adding organic matter and nutrients such as nitrogen from legumes. The benefits are:

- Protecting the soil from erosion, which is important in the Sacramento Valley;
- Better fall and winter orchard access due to firmer ground;
- Improving water infiltration into the soil, resulting in less storm water run-off, more efficient irrigation and better water quality downstream;
- Suppressing winter weeds with competition and summer weeds with a thick mulch after late-spring mowing;
- Saving labor and diesel fuel costs over tillage systems because the crop is usually mowed only a couple times – once in the early spring and again in early summer at maturity.

What are the challenges I might encounter?

Water use. Like any plants, cover crops need water to grow. In the spring, they can reduce soil moisture stored from the winter rainfall, decreasing what is normally available for your trees. Reseeding annually however, need no additional irrigations in late spring and summer. Over time cover crop water usage can be offset with improvements in soil quality components such as better soil water holding capacity and better soil water infiltration. In addition, the late-spring mowing will leave a mulch that may reduce evapotranspiration in the early summer.

Frost threat. A winter cover crop reduces the amount of heat absorbed by the orchard floor during the day, which can increase the risk of frost damage after leaf-out in the spring. This problem can be minimized by mowing the plant cover down to about 1½ – 2 inches during frost sensitive periods.

Impact on pruning. Removing and shading orchard prunings left on the floor is difficult once the cover crop grows around them. To avoid this problem, you should prune and remove brush before cover crop seeding in the fall or plant the crop in every other middle and prune in the areas that are unplanted.

Gophers and voles. Pocket gophers feed on the roots of annuals and cover crop stands hide the mounds that signal the presence of gophers in the orchard. The crop also can become a protective habitat for voles.

Late in the spring, the cover crop will set seed and die down. It is safe to mow when clover seeds have hardened and grass seed has matured.

To ensure success, have your seed and equipment lined up before the harvest is over. This prepares you for the possibility of an early rain, which can stop any part of the seeding process. If rain falls after ground preparation but before seeding, the weeds will get a head start on the cover crop and the ground can seal up, making it impossible to bury the cover crop seed with a roller or a standard grain drill.

How do I manage the cover crop?

Normal fall and winter rainfall is sufficient for the seeds to germinate and grow during the winter. A light irrigation may be needed by late November if there hasn’t been enough rain for seed germination.

If the cover crop consists of subclovers and/or medics, the height of the winter vegetation should remain below 2 feet. In late February or early March, mow the cover crop at two inches above the ground to lessen competition from winter weeds. Try not to mow off too much top growth because a deep mulch will prevent the clovers from growing back. Mow any time there is the threat of a damaging frost, but never closer than one inch from the soil surface. Frequent mowing can delay flowering and seed maturity, and reduce biomass and nitrogen production.

The cover crop is not mowed again until the seed fully matures in early- to mid-June. Waiting this long to mow can increase the risk of frost damage after leaf-out in the spring. This problem can be minimized by mowing the plant cover down to about 1½ – 2 inches during frost sensitive periods. If the cover crop consists of subclovers and/or medics, the height of the winter vegetation should remain below 2 feet. In late February or early March, mow the cover crop at two inches above the ground to lessen competition from winter weeds. Try not to mow off too much top growth because a deep mulch will prevent the clovers from growing back. Mow any time there is the threat of a damaging frost, but never closer than one inch from the soil surface. Frequent mowing can delay flowering and seed maturity, and reduce biomass and nitrogen production.

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especially where grasses and taller clovers are used, but it is essential to let the cover crop mature before final mowing to ensure good reseeding, and good biomass production. Holding off on mowing in the spring after the cover crop looks overgrown and ugly will maximize the benefit to soil and water quality. If managed properly, the crop will reseed annually and re-establish itself in the winter. The greatest cost comes from the initial seeds and planting.

When the dense crop dies back in the spring, it will leave a thick mulch layer on the ground that helps control noxious summer weeds such as puncture vine and bindweed.

Using a contact herbicide to control Johnsongrass or Bermuda during the summer will not harm the cover crop seed.

**Fertilizing.** While the clover cover crop does not require fertilizer, your orchard does. If at all possible, apply nitrogen fertilizer only in the tree rows. This will encourage the clovers to fix more atmospheric nitrogen.

**How much will the cover crop cost?**

Seed costs range from $15 to $50 an acre with the average running around $35 per acre. Soil preparation and planting usually adds another $45 to $65 per acre. However, the costs of reseeding annuals should be spread over many years.