Foothill Vineyard Post Harvest Activities: **Cover Cropping**

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Is Cover Cropping for YOU? Cover crops, and I use that term to mean intentionally planted covers-not just letting the natural ground cover grow, can have many benefits **in the right site with the right choice of cover. In the wrong site, however, cover crops will compete too much for precious water** with the grape crop, and can also affect frost incidence on the vine and pests like thrips and gophers.

Note: I am including this as a "post-harvest" activity; but many savvy growers who use cover crops prepare their seed beds when they have a chance prior to harvest, so they can catch the first rains. Large seeded varieties (peas, oats, barley) can withstand the cold and be planted in November; others need to be in by October.

How do you determine if cover cropping will help you?

1. **Know your site!** You should know the soil depth in various parts of your vineyard, the soil texture, permeability, organic matter content and water holding capacity. (By the way, these are all the factors we have been exploring at our Soil Pit Field Days with Toby O'Geen.) You should also be familiar with your microclimate: when and where frost occurs and how temperatures (which affect seed germination) might vary on your parcel. You should know your average rainfall and how much water you have to irrigate.

   In other words, you should know your "site capacity", which is a combination of factors that determine the potential to produce your crop. Rootstock selection, vine spacing and trellising choices, along with cultural management decisions like cover cropping, all consider your site capacity. (Remember! There are a lot of different site capacities in the foothills. Yours is uniquely YOURS). If you have deep soils, loaming texture with high water holding capacity, and are in a moderate microclimate, you have high site capacity which means you will probably need to fight the vigor of the vines. One way you can do this is by planting a cover crop which will compete with the vines and slow them down.

   If, however, you have a shallow site, with sandy textured soils, low water holding capacity and/or not a lot of available irrigation water, your site capacity is low which means you need to think carefully about installing a cover crop which can decrease your capacity even more. Perhaps your site is "moderate" in capacity, but you'd like to increase your water holding capacity in the soil or soil permeability, then you might also choose a cover crop understanding that it will take years of diligent management to achieve change in the soil and that the choice of cover and how it is managed will affect your site in numerous ways.

2. **Understand what cover crops can provide, so you can choose and manage them appropriately.** One reason I distinguish a cover crop from natural ground cover is that cover crops require careful planning and management while natural covers are typically managed almost as an

afterthought (this doesn't mean you can't get benefits out of natural covers). There are a large number of plant choices for cover crops, the choice will depend on what you want the cover to provide and determine how it is managed.

Cover crops can be either tilled-in to the soil (roots cut) where they will decompose or they can be no-till, i.e. mowed or rolled, (roots remain) which means they will be more competitive during the spring and into summer.

The benefit of tilling in a cover is to "build soil". This is why they are sometimes referred to as a "green manure". When a leguminous cover is chopped and tilled in at its flowering time nitrogen from root nodules where N-fixing bacteria reside is released. The better the cover is chopped before tilling in, the faster it decomposes. This process requires microbial processes and will "tie up" some N before a flush of N is released, which can affect the nutrition of the crop, especially if the process is slow due to dry soil conditions and/or there is a large grass component, which has a large carbon to nitrogen ration and uses nitrogen to break down, to the cover mix. Soil organic matter can be built this way over the long haul, which will help with water holding capacity. "Tilth" of the soil can be increased, leading to better permeability. Once the cover is tilled in, the aisles can be clean cultivated, with no competition to the vines.

Barley

Oats

Austrian Winter Pea

Magnus Pea

A typical mix of tilled-in cover crop plants might include barley, oats, and Austrian Winter or Magnus peas.

- Oats tolerate wet, heavy soils and low pH soils, common in the foothills. However, oats are less tolerant to drought and cold temps.
- Barley is inexpensive and fast growing, providing good biomass and competition against weeds. It is not as tolerant to wet conditions as oats.
- Austrian Winter pea has pink and red flowers, is dormant during the winter but produces large biomass if allowed to grow into spring. Magnus peas have large light and dark pink flowers and large tendrils; it grows during the winter and matures earlier than Austrian Winter, allowing for earlier tillage in spring.

The benefit of no-till covers is that they can increase soil permeability with permanent deep root structures, they can prevent erosion on slopes, they can effectively compete with weed species (i.e. yellow starthistle) and they can compete for water with the vine in high site capacity situations which means they can help de-vigorate the vines; which may help with vine balance in these types of sites. These permanent covers can provide nectar and pollen for beneficial insects as well.

A typical mix of no-till cover crop might include 'Zorro' fescue, 'Blando' brome, rose clover and sub clover mix.

- 'Zorro' fescue is a fast growing, early maturing grass. It is well suited to soils with rocks, volcanic pumice or gravel. It's a good choice for erosion control with minimal seedbed preparation needed. It can be mowed to 4 inches but try to avoid mowing for a month in spring, around early May, to allow reseeding. 'Zorro' fescue can substitute for 'Blando' brome where quicker fall growth and greater drought tolerance is needed, but it is more expensive than 'Blando' brome.

- 'Blando' brome, also referred to as 'soft chess', is low growing, mowable, and matures early. It has strong seedlings, excellent reseeding, and dense, fibrous roots. A good choice for reducing erosion without competing excessively with the vines.

- Rose clover grows well on rocky, dry soils with low pH but does poorly in wet, heavy soils. Reseeds well but stand can be thin and let weeds encroach.

- Subterranean clover (sub clover) tolerates close mowing, provides weed suppression, is loved by livestock, and likes low pH soils.

'Zorro' fescue

'Blando' brome

Rose clover

Subterranean clover

Photo credit: Cover Cropping in Vineyards. A Grower's Handbook. UCANR Publication 3338.

For more information on cover cropping, check out our UC resources.

UC Integrated Viticulture online page with many cover crop resource links:

Cover Cropping in Vineyards: A Grower's Handbook. Chuck Ingels. ANR publication 3338 available at http://anrcatalog.ucdavis.edu/SustainableandOrganic/3338.aspx

UC Integrated Viticulture website:

http://iv.ucdavis.edu/Viticultural_Information/?ds=351&reportnumber=516&catcol=2603&categorysearch=Cover%20Crops

"Selecting the right cover crop gives multiple benefits". 1994. California Agriculture article by Chuck Ingels et.al.
http://ucanr.org/repository/cao/landingpage.cfm?article=ca.v048n05p43&fulltext=yes

Weed Research and Information Center blog on using cover crops to suppress weeds at:
http://ucanr.edu/sites/wric3/?blogtag=cover%20crops&blogasset=32026