

Ground Covers and Weed Control in Texas Vineyards

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A vineyard floor is designed to manage water, soil character, erosion, and compaction.. It is comprised of any bare ground and plant material other than grapevines, whether native vegetation or planted ground cover.

The best floor for vine rows and row middles is determined by a combination of factors including - the vigor potential of the site, vigor potential of the vine varieties and rootstocks, and the annual precipitation and evapotranspiration of the area. How it is managed addresses the age of the vines, vine and soil water status, vine and site vigor, native vegetation, and challenges from drought or excess rainfall. A well-managed vineyard floor contributes to the ultimate vineyard goals of growing healthy productive vines for as long as possible.

This article addresses the advantages of eliminating vegetation, and of using vegetation to manage vine water status, weed population, soil erosion and compaction.



Vine Rows

Vine rows are commonly kept bare to remove competition between young vines and surrounding vegetation for nutrition and water. The small root system of young vines have little prospect of getting the water and nutrition necessary to grow and develop when sharing their space with the massive root systems of established native vegetation. Eliminating existing vegetation commonly takes years of diligent weed control.

Fig. 1 below illustrates vines of the same variety and rootstock planted on the same day. Dormant vines in the foreground were planted in a shared space with existing grasses. Dormant vines in the background were planted in rows void of all vegetation.



Keeping vine rows bare, or weed-free, decreases humidity and the ensuing fungal pathogens, reduces insect habitats, and manages competition for nutrients and water. The amount of water to a vine directly influences canopy growth and development, therefore, managing the width of vine rows from season to season helps manage vine water relations. This is especially useful between bloom and veraison when vigor affects berry development. In wet years, and/or in vineyards of high vigor, reducing the width of a weed-free vine row allows existing vegetation to spread and use water. In dry years or in dry regions, increasing the width of the weed-free vine row reduces root competition for available water.

Cover Crops

In some Texas vineyards, the resident stand of native vegetation makes up the best cover crop. Cover cropping the row middles with a specific species or mix of plant species can reduce erosion, relieve compaction, and encourage water percolation when roots penetrate the soil profile. In addition, the accumulation of organic matter promotes soil health.

In some drier environments of low rainfall, a cover crop competes with vines for water during the growing season. In fall, when high temperatures drop, a fall cover crop of winter annual species can help reduce erosion from winter winds. It grows up quickly before winter, then dies before vine water demands increase at budburst. The use and best species of cover crops in Texas could use further investigation. A full article on cover crops for vineyard floor management can be found [here](#).

Fig 2 below shows a stand of planted Elbon rye as a cover crop.



Mulch in Vineyards

Applying a mulch can be beneficial, depending on the source and composition of the mulch. Mulches have the potential to prevent weed growth, reduce evaporation of soil moisture, and improve soil character. A good cover of mulch is typically 4 inches deep. Mulches can be costly in product and in labor-hours to apply. Mulching a good soil is unnecessary and can interfere with its influence on the grape quality. As newly mulched

plant products break down, they can change nutrient composition and availability in the soil; therefore choosing a composted mulch that has already broken down should eliminate unwanted changes. Mulching with a synthetic mulch is not recommended for Texas vineyards. Such products hold heat into the soil which is not beneficial to vine roots.

Weed Control

Weeds can be controlled using herbicides, by mechanically tilling, hand hoeing, or applying a composted mulch. There are advantages and disadvantages to all methods.

Herbicides are most often used because they are time and cost effective when used appropriately. Herbicides are classified by whether they are applied before weed germination – pre-emergent, or applied after weeds have germinated – post-emergent. They can kill by contacting plant tissue or be absorbed and kill systemically, from the inside out. Herbicides are also classified by what they target – either broadleaf weeds or grasses (selective), or by targeting both (non-selective). A complete list of herbicides listed for Texas vineyards can be found in the [2019 Texas Grape Pest and Weed Management Guide](#) published by Texas A&M Agrilife Extension Service.

Mechanical tilling manages weeds without applying chemicals. However, it increases tractor and fuel usage. If considering using a mechanical tiller, it is important to anticipate adequate time for the learning curve. Mechanical tillers can damage vines and trellis infrastructure when not used appropriately. Mechanically trimming weeds is discouraged. Trunks are too easily and fatally damaged by trimming too closely, as seen in Fig 3.



Hand hoeing is the safest way to eliminate weeds, but by far the costliest in labor hours.

Conclusion

A vineyard's floor management program should reflect climate, vigor potential of the site and vine varieties, and production goals. Achieving these goals can take a few years to get under control and should begin well before planting. Contact your regional Extension viticulturist for more information and references.

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