A common sight at many new startup vineyards. But there's more to it than just the cosmetics!

WEED WARS, WINNING THE BATTLE!

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Recent Studies at the Cornell University's Fredonia Lab have shed new light on a poorly understood aspect of vineyard development. Although this study primarily centered around own-rooted Concord vines, the information collected in this study, would apply uniformly across the various cultivars.

A common myth is that some varieties, perceived as "deep rooted" types, are some how immune to the depleting effects of weed growth in the rows. When, factually speaking, ALL uptake and nutrient exchange takes place in the upper 18" of the soil horizon. Root systems that extend below that level serve primarily as an anchoring mechanism and do not significantly contribute to the overall function of the transpiration stream or nutrient mobility in the vascular system.

Cornell's Study showed that:

- Competition from weed or cover crop growth has a substantial effect on vine growth, and fruit yield and quality.

- Minimizing weed competition under the vines is particularly critical on newly-planted vines.

- Organic mulches can increase soil organic matter, conserve soil moisture, suppress weed growth, and lead to increased vine size. They can have a substantial effect on vine mineral nutrition and can result in higher potassium and lower magnesium status in grapevines.

- Actively growing cover crops, including legumes, between bloom and veraison can reduce vine size and fruit yield.

- Vine size and fruit yield increase proportionally to the width of the weed-free band under the vines. In one study in a mature Concord vineyard,

vine growth was increased by over 300% when the entire vineyard floor was managed to exclude weed and cover crop growth, as compared with vines grown in solid sod cover, and irrigation could only minimally overcome the competitive effect of the sod.

- Mowing a competitive cover crop such as orchardgrass has only a very limited and temporary effect on reducing the competitive effect of the sod.

Concord growers typically aim to grow large crops that meet processor quality standards. Conversely, premium vinifera growers often aim for low to moderate yields in order to produce high value fruit and wine. Where high vigor varieties or rootstocks are used, vine growth can often become excessive. In the arid regions of the western United States, regulated deficit irrigation practices are often used that create moderate water deficits. These deficits can lead to improved fruit quality, especially in red cultivars. Alice Wise, Cornell viticulturist on Long Island, NY, reports that several commercial growers are successfully reducing herbicide inputs by using ground covers or mowing weeds under the vines in mature vineyards. Excessive vine growth can be tamed to some extent where vine vigor is high due to variety, heavy soil, and during heavy rainy periods. In her experience, this practice can be risky on young vines, in vineyards with light sandy soil, and during extended summer droughts, especially where supplemental irrigation is not available.

Weed Management in Vineyards

It is clear that plant growth (weeds or cover crops) under the trellis can compete excessively with grapevines for water and nutrients, limiting vine growth and fruit yield. Vineyards are primarily a hillside crop, since good air drainage and movement are needed to minimize the risk of cold damage and the development of fungal diseases. On the other hand, large areas of bare soil (especially cultivated soil) are prone to soil erosion during episodes of heavy rainfall. In most commercial vineyards in the Eastern United States, a balance between excessive weed competition and minimizing the risk of erosion is struck by maintaining a relatively weed-free band underneath the vines while maintaining green cover crops in the row middles. Typically, about one-third of the vineyard soil is maintained relatively weed-free during the summer. There are several methods to accomplish this, some more practical in smaller vineyards than in larger ones:

Synthetic mulches, such as plastic or geotextile, can be effective. Drawbacks include expense of the product and/or installation, and keeping the mulch in place when the wind is blowing and from equipment or foot traffic in the vineyard.

Organic mulches need to be applied several inches deep in order to be effective in smothering weed growth. Concerns include expense, introduction of weed seed from the use of hay, creation of habitat favorable for rodents and cutworm,

and the risk of nitrogen imbalances in the vines as the organic matter decomposes.

Cultivating by hand as the sole means of weed control is only practical for very small vineyards. There are some effective tools for mechanical cultivation, but multiple passes are needed to maintain good weed control and it is difficult to eliminate weed growth at the base of the vines.

Due to the limitations and expense of these practices, chemical weed control is the most common means of weed control in commercial vineyards. Pre-emergence herbicides kill weed seedlings as they germinate. Options include Chateau, Diuron, Simazine, Prowl, Solicam, and Surflan. Often, two pre-emergence herbicides are tank-mixed to increase the spectrum of weeds controlled. They are also often mixed with post-emergence herbicides to kill weeds that have already emerged, in addition to providing residual control. Two or more applications of post-emergence herbicides only can also provide effective weed control in vineyards, but options are limited. Glyphosate is a systemic herbicide that (when applied at the proper time, depending on the weed species) kills the entire weed including the roots. Glyphosate also can cause damage to grapevines if grape leaves are contacted, and the risk of damage increases as the season progresses. Rely is a contact “burndown” herbicide that is also registered for use in grapes, and only kills contacted tissue with no risk of translocation to other parts of the vine. Unfortunately, Rely has been in very short supply for the past few years, but should be available again in 2016. Specific information on the use of herbicides in vineyards can be found here, in University pest management guidelines, and on product labels.

Weed Control in Newly-Planted Vineyards

As previously mentioned, weeds can be very competitive with newly-planted vines, to the extent that vine growth and yield can be severely compromised. Herbicide options for newly-planted vineyards include preemergents such as Surflan and Prowl, that, when applied with correct timing, can greatly reduce the loading of growing season weed growth, with little risk to the vines. **Glyphosate however, (Roundup) should never be used around young, actively growing, vines** and, as a rule, should be limited to the dormant season only. With the advent of the new (non-translocated) Glufosinate generation of products, such as Rely, the clean up process has been made considerable safer. Combining the use of the new generation herbicides with plastic grow tubes on newly-planted vines allows multiple applications of Glufosinate (Rely) during the first growing season by protecting the vines from herbicide contact while minimizing weed competition during establishment of the vineyard.

Preliminary hand work around the vines with weedeaters, cultivators, and hoes, to knock down the weed growth, greatly reduces accidental overspray. Cleanup

and removal of all vine foliage in the spray zone is mandatory prior to any precision application. Regular maintenance is the key to preventing the problem of excessive weed growth in new vine plantings. Simply conducting some hand maintenance can go a long way to averting a major overhaul.

Or as the saying goes…….

“Tickle Mother Earth with a hoe…..and She laughs with a bountiful harvest!”

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