One thing that makes vineyards stand out compared to other plantations, is that the harvested fruit is not primarily consumed as food but is used as raw materials in a wine industry.

Many decisions revolving the growing process during the vineyard's production cycle are taken with appreciation to winery demands for certain quantities and qualities. Most Israeli vineyards are associated with the larger wineries situated along the southern coastline and the Carmel coast, such as Carmel, Barkan and Teperberg. These vineyards are quantity-oriented vineyards, with the goal of producing the highest quantities of grapes per hectare, in order to meet the demand of the wineries to create relatively simple and cheap wine.

In contrast, quality-oriented vineyards are focused on the quality of the grapes, in order to meet the demand for quality brands of wine. Therefore, these vineyards do not put an emphasis on the quantity of fruit produced per hectare. Instead the focus is on the balance of acidity, richness of aromas, color in red grapes and other quality parameters.

In agronomy there is often a trade-off between quality and quantity. This means that some actions taken to ensure the right quality can inhibit the vegetative growth of the vineyard. For instance, fruit thinning, or topping the foliage, that establishes higher sun exposure and less fruit clusters competing for assimilated resources. All of this results in a more well-balanced vineyard, and therefore in turn a more well-balanced grape and wine. However, it comes at the limitation of growth and fruition.

Fertilizer management, particularly with regards to nitrogen, is used to decrease growth intensity. In quality-oriented vineyards it's common to apply very low levels of nitrogen in order to prevent the induction of vigor growth. Neither is any nitrogen applied after the veraision stage for the sake of grape's quality and color absorption[1]. With regards to quality parameters, there are certainly evidence that excess levels of nitrogen hurt the Bio - synthesis of Anthocyanins - the pigmentation substance inside grapes. Therefore, there are reasons to provide lower levels of nitrogen in quality-oriented vineyards[2].

Despite of the above, we at Gat Fertilizers believe that the proper course of action would be to fertilize all vineyards, including quality-oriented ones, in an orderly and balanced way over time.

Many studies that have been conducted over the years in vineyard fields have shown an advantage for balanced treatments in plantations with irrigation and clusters and foliage thinning, rather than extreme treatments. Extreme treatments often induce stress, and disturbed proportions between the vegetative growth and the resources divested towards fruition[3,4].

For instance, in quantity-oriented vineyards it's common to apply about 80-120 kg of nitrogen per hectare per season, in order to attain a yield of about 20-30 ton/hectare. Quality-oriented vineyards on the other hand, produce about half of that yield, should receive no more than half of that nitrogen rate; 40-60 kg per hectare per season.

It's in the long-term perspective that real problems can arise from low-level nitrogen fertilization, or even long-term avoidance, which is acceptable in some vineyards. However, ultimately this leads to low soil fertility and productivity, with inhibited growth, loss of potential yield crops, and occasionally even financial insecurity for those involved.

At Gat Fertilizers we are concerned with providing the know-how of how-to best supply nutrients with precision and balance over time, and to make it simpler and more reliable. Therefore, we recommend sequential nitrogen-fertigation throughout the season until the verasion stage, as well as sampling leaves (leaf tissue analysis) using lab analysis the nutrient levels in the vineyard to design accurate nutrient fertigation program.
Furthermore, it is highly recommended to use our fertilizers of the "Blue" brand, that contains nitrogen stabilizer, which makes nitrogen fertilization much more efficient. First, it ensures that the right levels actually remain in the soil by the root-zone, and second by leaving a higher proportion of the nitrogen in ammonium-form compared to nitrate form, which ammonium-form preferred to absorbed by roots.
The second benefit should not be underestimated; while the plant absorbed nitrogen as ammonium the soil-pH decrease in the root rhizosphere, which improves the conditions for absorbed of the micro-nutrients. This is particularly true in alkaline soils, in which many vineyards are located. Plant access to micro-nutrients impacts both yield levels and quality immensely, particularly in modern crop production in which it easily can become the missing link.

We would be more than happy to support you to receive a formulated fertilization program, fitted for your personal plot details, please contact a Gat Fertilizers agronomist in your area.

Yakov Henig, Gat Fertilizers agronomist

info@deshengat.co.il

References

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[2] Growth and photosynthetic responses to copper in wild grapevine

[3] Effect of irrigation and crop level on growth, yield and wine quality of cabernet sauvignon

[4] Water availability dynamics have long-term effects on mature stem structure in *Vitis vinifera*