P24 – Assessing the impact of organic soil amendments on grapevine vigor using sensor-based phenotyping

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Abstract

Soil organic amendments are known to have severel beneficial effects on soil fertility by improving, for instance, water holding capacity or nutrient availability. Furthermore, the incorporation of organic amendments into soils might also contribute to climate protection goals by reducing carbon from the atmosphere. A slow degradation of such amendments can be expected especially in the subsoil through physical isolation and the binding of organic carbon to minerals. Vineyard soils are especially suitable for long-term carbon storage, since deep tilling is performed once before planting a new vineyard followed by a long resting periode of the subsoil. This is why two organic amendments (greenwaste compost and biochar compost substrate) were incorporated in 30 – 60 cm depth in a vineyard prior to planting with the fungus-resistant cultivar 'Calardis Musqué'. The impact of this approach on grapevine vitality and grape quality was assessed around veraison and harvest during three consecutive years using several sensor-based applications. For the analysis of different leaf parameters, two non-imaging sensor (spectroradiometer (VIS-NIR-SWIR) and chlorophyllmeter) were applied focusing especially on chlorophyll content as an important plant stress indicator. Thereby, a high correlation between sensor and ground-truth data could be confirmed making sensor-based analyses reliable for practical application. In this study, chlorophyll content did not vary significantly between plants grown on the two organic amendments. However, significant differences between plants grown on organic amendments and control plants (no amendment) could be observed with control plants having lower chlorophyll contents. This indicates that the incorporation of the two organic amendments does not affect this parameter negatively. Furthermore, vines' position within a vineyard can have an important influence and should therefore not be neglected in analyses. Preliminary results further imply differences in resilience to *Botrytis* bunch rot and grape quality parameters depending on the respective substrate. However, grapevines are typically grown for several decades and soil conditions change rather slowly making long-term assessment of this vineyard necessary for a holistic evaluation.

Keywords: plant phenotyping, grapevine vitality, grape quality, precision viticulture, chlorophyll, *Botrytis*, *Vitis vinifera*