



Kurzfassung der Bachelor-Thesis

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Thema der Thesis

Impact of different viticultural management systems on vegetative growth (*Vitis vinifera* cv. Riesling)

The increasing demand of wines produced from biologically managed vineyards requires studies on wine quality parameters and the ecological efficiency of such management strategies. The performance of a vine's canopy and the capacity of the vegetative and generative growth measurements can be widely characterized by the leaf area of main and lateral shoots.

Within this study three management systems (integrated, bio-organic and bio-dynamic) were compared in an established vineyard (*Vitis vinifera* cv Riesling) at Geisenheim (Germany). To determine the leaf area of main shoots a non-destructive model by Lopes and Pinto (2000) was applied *in situ*. The leaf area of the smallest and largest leaf per main shoot was multiplied by two resulting the mean leaf area. By multiplying the result with number of leaves the mean leaf area per shoot was obtained. A high correlation ($R^2=0,98$) was proofed between this methodology and the leaf area measurements at the laboratory using a leaf area scanner. However, between the three management treatments no differences of the main shoot leaf area was detected.

To determine the lateral leaf area of the three treatments a non-destructive leaf area model of Mabrouk and Carbonneau (1996) was tested. The length of a lateral shoot was directly correlated with the leaf area ($R^2 = 0,96$). Significant differences between the treatments were found. The lateral leaf area per lateral shoot of the integrated treatment was significantly higher (328.98 cm^2) compared to the bio-organic (295.00 cm^2) and bio-dynamic treatment (254.77 cm^2). Hence, the applicability of both models was confirmed for *Vitis vinifera* cv Riesling.

Whether such differences in the canopy architecture are due to differences in leaf nutrient content was tested and thus the impact on fruit quality parameters. Spatial and temporal differences were studied referring the nutrient conditions of the vegetative parameters within the treatments using a hand-held, multi-parametric fluorescence sensor *in situ* (Multiplex®, FORCE-A). Since the correlation between the spectrometer and the selected analytical parameters was rather weak ($R^2 = 0,15$ for nitrogen, $R^2 = 0,17$ for magnesium). Further studies improving the methodology of such field measurements will be required

However, differences within fruit quality parameters were mainly related to berry health. Compared to the bio-organic and the bio-dynamic treatment the integrated system had a higher number of incidences of botrytis and acetic acid bacteria. Whether this was related to the way how diseases are controlled or to the differences in canopy microclimate will also require future studies.

Erklärung des Referenten: Diese Kurzfassung der Thesis

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in vorliegender Form kopiert und veröffentlicht werden.

Datum, Unterschrift

Schlagwörter: (max. sechs):

Leaf area, Proxy sensing, biodynamic, organic, Multiplex®