



**Master's Thesis Title:** Quantifying the effects of canopy structure and management on fruiting zone and canopy light exposure in vertically trained grapevines

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**Date and location of the oral examination (if known):**

**Confidential:**     Yes     No

**Abstract**

Solar radiation and light interception by grapevine canopies is an important subject to study. Light is the energy which drives photosynthesis, and may alter the performance of vines and the composition of the fruit, hence the wine. To properly understand this subject, light needs to be quantified. Measurement of radiation is challenging, since conventional instrumental methods are complicated and difficult to perform over long periods. Light sensitive films are available today and regarding to recent research they are applicable in agriculture. The objectives of this study are: Further evaluation using these films accompanied with other instrumental methods. Comparing the effects of canopy design and seasonal management practices and evaluating their result on light interception. The trial took place in two existing experimental vineyards in Germany. Light sensitive films were deployed into the fruiting zone of a trial with different row orientations (N-S, E-W and NE-SW) extended with an early and late-season defoliation. The goal was to follow bunch zone radiation throughout the whole season. Additional measurements were made in this trial with a canopy analyzer as well. A set of different, more sensitive films were mounted on metallic mesh panels and placed within sections of the foliage into a vineyard with different fruiting zone heights. The objective was to measure spatial radiation on the outside of the canopy during a shorter period. The results have shown that row orientation and defoliation has a significant effect on the cluster zone exposure. These effects were also justified with grape composition analysis. Bunch zone height also had a major effect on the radiation of the canopies. To conclude this work, light sensitive films are well fitted to viticultural research and further studies in the future may encounter numerous possibilities with them.

**Key-words:** Light interception; light sensitive films; row orientation; defoliation; fruiting zone.