Vinifera master thesis abstract (template 2014)

Thesis title: **The effect of leaf area to crop weight ratios on fruit quality and performance of grapevine (Vitis vinifera cv. Pinot Noir)**

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Institution/company involved: **Instituto Superior de Agronomia**

Tribunal members (name/position):

- Doutor Jorge Manuel Rodrigues Ricardo da Silva, Professor Catedrático do Instituto Superior de Agronomia da Universidade de Lisboa.
- Doutor Manfred Stoll, Professor da Universidade de Geisenheim, Hochschule Geisenheim University (DE);
- Doutor Carlos Manuel Antunes Lopes, Professor Associado com agregação do Instituto Superior de Agronomia da Universidade de Lisboa, coorientador;
- Doutora Sofia Cristina Gomes Catarino, Professora Auxiliar Convidada do Instituto Superior de Agronomia da Universidade de Lisboa.

Date & location of the oral examination:
15-12-14 10:00 AM on Instituto Superior de Agronomia

Confidential: ☐ **Yes** ☒ **No**

Abstract (max 300 words)

Vine performance, fruit and wine composition were investigated on field grown Pinot Noir grapevines subjected to a range of leaf removal and cluster thinning treatments. Both treatments were applied in three levels (25 %, 50 % and 100 % of leaves and clusters retained, respectively) at the phenological stage of pea-size. New emerging leaves were removed as they appeared.
Veraison was delayed when leaf area to fruit weight ratio (LA/Y) dropped below a certain threshold (13 cm2 g 1). On the contrary a high LA/Y ratio (> 26 cm2g-1) did not show any difference on fruit colouration. No significant differences in single leaf photosynthetic rate were observed between the treatments, however, there was a trend that vines from the 50 % leaf retained treatment tended to exhibit highest values for stomatal conductance and photosynthesis. Defoliated vines compensated for a restricted leaf area by increasing individual leaf size of the remaining leaves.
The results of the present study suggest that fruit is produced at the expense of vegetative growth. High crop levels resulted in a decrease of individual leaf size. Moreover, pruning weight and LA/Y ratio were positively correlated. Sugar accumulation in grape berries were shown to follow a saturation curve. An increase of the source to sink ratio up to a certain point was accompanied by an increase in sugar accumulation. If this threshold was exceeded, additional leaf area did not promote higher sugar accumulation, indicating that the vine might be sink-limited.
The most severe defoliation treatment significantly reduced berry size and berry weight. No consistent pattern between titratable acidity, pH and YAN and leaf area to fruit weight ratio could be found. Wine tannin content and wine colour parameters were not affected by the treatments.

Keywords (5): Leaf Area, crop level, vine balance, Pinot Noir, source-sink

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