Vinifera master thesis abstract (template 2013)

Thesis title: **Influence of pH and Temperature on Metatartaric Acid Efficiency in White Wine Tartaric Stabilization**

Student name: **Alessandro MORELLO**

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

Tribunal members (name/position):

- Jorge Ricardo da Silva, Professor, UTL/ISA
- Emilio Celloti, Professor, Universidad Udine
- Olga Laureano, Investigador Coordenador, UTL/ISA
- Manuel Malfeito, Professor, UTL/ISA

Date & location of the oral examination:
3-12-12 11:30 AM on Instituto Superior de Agronomia

Confidential: ☐ **Yes** ☒ **No**

Abstract (max 300 words)

The sensitivity of metatartaric acid (MA) to high temperatures is the main limit for its actual use in enology. For this reason MA is generally used only for ready-to-drink wines that are stored for few months in bottle. The objective of this work was to obtain more information about the use of MA in order to prevent tartaric salts precipitation in wine by monitoring its effectiveness along the time. Tartaric stability was followed in a white wine during a ten-week experiment. 10 g/Hl of MA was added to wines with different five pH values, namely 3.0, 3.2, 3.5, 3.7 and 3.9 at room temperature (20°C), and to wines at original pH of 3.2 under three different temperatures commonly found in real storage conditions, precisely 12°C, 20°C and 35°C. To monitor tartaric stability we used a test based on the electrical conductivity developed by Boulton (1983). At the end of the experiment we found both a pH and a temperature effect. It was found a polynomial relation (R^2 = 0,85) between tartaric stability and pH. The highest the pH, the highest the instability and the shortest the protection against tartrates precipitation. Furthermore, over 20°C we observed a rapid general decrease of MA effectiveness and that there was a linear relation (R^2 = 0,99) between temperature and tartaric stability, so that we can affirm that the highest the temperature, the higher the wine instability; this is probably due to a faster MA hydrolysis. Metatartaric acid is surely able to prevent tartrates precipitation, but since in our experimental conditions it could not protect the wine for longer than one month, we would suggest extreme prudence about its use especially during long storage periods.

Keywords (5): wine, tartaric stabilility, metatartaric acid, electrical conductivity, pH, temperature.

Corresponding contacts + emails of supervisors

- Olga Laureano olgalaureano@isa.utl.pt
- Alessandro MORELLO almorello.andrea@gmail.com