



Thesis title: Effect of different organic amendments on soil quality, vines growth, grape production and wine quality of mechanically pruned vineyards.

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Abstract (max 300 words)

Topic position & objectives:

The aim of this work was to study the effect of use of different types of organic amendments and pruning types on wine quality of syrah grape variety. Five different types of organic amendment treatment included use of biochar, composted municipal solid waste, cattle manure, sewage sludge and control treatment. Vines were subjected to two types of pruning treatment manual spur pruning and mechanical hedge pruning.

Methods:

The experimental work was established at two vineyards sites called Quinta do Gradil and Quinta do Coro in Portugal. Physiochemical analysis of wine samples was carried in order to evaluate pH, total acidity, volatile acidity and sulfur content. Chromatic characteristics of wine samples were analyzed by using spectrophotometer to estimate phenolic compound and total anthocyanins content. To measure tannin power method proposed by Freitas and Mateus (2001) was used. Mineral analysis was performed by standard methods prescribed by OIV. Heavy metal analysis was performed by using inductively coupled plasma mass spectrometry (ICP-MS). Tasting Panel performed Sensorial analysis of wine samples.

Results:

The results of the experimental work showed that there was no significant effect of type of organic amendment applied on wine composition with some exception of pH, total acidity, volatile acidity and total anthocyanin content. Mineral content of wine samples remained unchanged except the

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potassium content which showed higher values in Biochar treatment. Heavy metal content of wine samples remained much lower below to limits prescribed by OIV regulations. There was no effect of treatments applied on the sensorial analysis of tasting panel in case of Coro winery. While Gradil sample showed manual pruning treated wine samples had higher values compared to mechanical pruning. There was no much different between taster's preferences amongst wine samples coming from different types of organic amendment treatment.

Main conclusions:

The project work concludes that if there is sufficient yield compensation achieved mechanical pruning can be performed without affecting on final wine composition. This means that by using mechanical pruning higher yield can be achieved without negative effect on wine quality. Organic amendments can be applied in order to increase organic matter content of soil without increase in heavy metal content. This can be good strategy to reduce the cost of grape production with sustainable way of reutilizing organic wastes. But viticulturist must take into consideration the cumulative effect of amendment application on wine quality over longer period of time. Also it will be good idea to study the effect of similar treatment on soil heavy metal content treated for long duration.

Keywords (5):

Heavy metal, Organic amendment, Pruning, Composition .