Impact of the vaporization of essential oils on vine physiology

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Viticulture and Enology

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Objectives

Thymus and oregano essential oils effects were evaluated in a costum-made chamber under a continuous vaporization. This oils have been shown to be the most efficient against fungi diseases. They were tested to evaluate their impacts on vine physiology by monitoring the growth, leaf area, chlorophyll amount, photosynthesis, stomatal density and the concentrations of residues in and on leaves.

Methods | Experiences | Results

The first aim of the work was to construct and test a system that permits a continuous vaporization of essential oils with the hypothesis that a permanent exposure of oil vapors will be more efficient against pathogens than a direct application. The vine used is a scientific model called microvine.
The vaporization system was shown to be efficient thanks to GC-FID analysis but needed to be adjusted in terms of heating time to different EOs concentrations. Oregano EO vaporizations on microvines didn't seem to impact on the growth whereas thymus EO vaporizations seem to block it. The leaf area was decreasing in both scenarios. As a consequence, chlorophyll amount, photosynthesis and water use efficiency decreased during all the experiment periods. Concentration in and on leaves were found and may help antifungal EOs activity studies on vine.

Microvines in the costum-made climatic chamber with control side on the left and oil side on the right