



Influences of different nitrogen forms on growth and chemical composition of grapevines *Vitis vinifera* L. cv. Regent

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Nitrogen (N) is known to be the most limiting macronutrient for growth and development moreover it is the most important one in grapevines. Nitrogen has a considerable role for vigor control as well as yield and berry quality of grapevines. The N status of a grapevine can be expected to influence the concentration and composition of important quality components of the grape berry. Nitrogen assimilation may occur in different plant parts including roots, trunk, stem, leaves and berries. Consequently, N can be found in all plant organs in various forms, such as nitrate, ammonium, amino acids or small peptides. Amino acids are important for the quality of wine. They adjust the fermentation kinetics of the must, constitute a major source for yeast assimilable nitrogen and affect the vine metabolism, which is of oenological significance. N uptake is a multifactorial process.

Nitrogen uptake mechanisms are well studied over last decades but little is known about the ability of plants to absorb and allocate amino acids as N sources. Especially, in terms of physiological responses of grapevines regarding amino acids as a fertilizer application. Thus in this study we investigated (1) whether grapevines have the ability to take up various forms of N, namely nitrate, ammonium, urea and arginine and how these N forms affect (2) the plant physiology / performance and (3) the berry quality. In a pot experiment with grafted grapevines *Vitis vinifera* L. cv. Regent the influence of various N forms in combination with different N quantities were studied. Vegetative and generative growth, as well as N content in the plant organs was used as indicators of N uptake capacity. Berry quality was evaluated by the attributes pH, total acid, malic acid, tartaric acid and must weight. Results indicate that different N forms and quantities affect plant performances in terms of growth. Fresh weight of leaves differs within various N forms and quantities. With respect to berry quality, the chemical attributes were influenced by N form and quantity. Grape bunch yield and the resulting berry yield were not influenced by N form, however the N quantity affected grape bunch yield and berry yield.