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Original Research

The Content of Some Antioxidants in Apple Depends on the Type of Fertilization

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Abstract

Different agro-technical measures are used in growing apples and fruit crops in general in an attempt to increase the rate of photosynthesis and, hence, both the quantitative and qualitative value of the fruit. Very rapid and effective results in terms of an increase in the above parameters can be achieved through adequate fertilization adapted to plant requirements. Fertilization can substantially alter and disrupt the course of plant development if fertilizers are inadequately applied, regardless of the adequately pre-determined plant nutrient requirements.

The objective of this study was to evaluate the effect of four different types of fertilization on the pigment and antioxidant content of apple cv. Idared (*Malus domestica* cv. Idared) grown in orchards in the municipality of Gradačac.

The results obtained show that fertigation and foliar fertilization induced the statistically highest increase in the test parameters. These types of fertilization, if adequately employed, provide nutrition to plants according to their requirements at a specific phenostage, leading to increased yields and enhanced fruit quality, and indirectly reducing nutrient leaching from soils – a frequent accompanying manifestation of other fertilization types.

Keywords: fertigation, foliar application, pigments, vitamin C, phenols

Introduction

The current trend in apple production and agriculture in general is to enhance the quality of products by increasing the amount of antioxidant substances in edible parts of plants. Antioxidants are substances that have a very important role in strengthening the human immune system, particularly as regards neutralization of the adverse effects of free radicals [1]. Among the antioxidant substances found in apple fruits, β -carotene, vitamin C, and phenolic components occur in significant amounts [2]. The synthesis of these antioxidant substances in the plant is closely related to

the photosynthetic process; therefore, different agro-technical measures are used in apple cultivation to increase the rate of photosynthesis. Fertilization can significantly increase the rate of photosynthesis provided that all quality fertilization conditions are satisfied, including not only an adequate choice of fertilizer and formulation and fertilizer amount, but also proper fertilizer according to plant requirements during a certain stage of development [3].

The objective of this study conducted in an apple cv. Idared orchard located in the area of Gradačac was to evaluate the effect of four different types of fertilization on the pigment and antioxidant contents in apple, determine their mutual correlations according to plant development stages, and recommend the most suitable type of fertilization for

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