NITRATE CONTENT OF GREENHOUSE TOMATOES

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SUMMARY

Nitrate accumulation in plants is subject of concern for human health. Tomatoes are usually low in nitrate content. However, the effects of nutrition are straightforward on nitrate accumulation, especially when crops are grown in soilless systems. Because the mineral composition of tomatoes depends on the amount and type of nutrients taken from the growth medium it is necessary to adopt appropriate nutrient management practices (use of slow-release fertilizers, split applications, combining of radicular and foliar fertilization) which help to supply nutrients in quantities adequate to just meet crop demand and minimize losses, thus increasing the nutrient use efficiency. The study was carried out to determine the effects of fertilization and system of culture on nitrate content of greenhouse tomatoes fruit and had three experimental factors: 1. system of culture: soil and organic substrate (made from 80% peat and 20% long duration follow soil + well decomposed manure); 2. basic soil fertilization with two treatments (simple doze and double doze); 3. additional fertilization consisted of radicular and radicular + foliar treatments. Cronos F₁ was used as biological material.

The quantity of absorbed nitrogen and the way in which it is utilized in plant metabolism, mainly with respect to the nitrate accumulation in fruit, influence vegetables quality. However, both these factors are better managed in hydroponics, since in the small volume of rooting medium the nutrient supply is more efficiently controlled through the composition of the nutrient solution. In this experiment the recorded values of nitrates content of fruit were situated under normal accepted limits and varied between 49.87 mg/kg and 83.44 mg/kg, even if they were a little bigger in case of organic substrate culture than in soil culture. Potassium has major roles in production of proteins, thereby decreasing nitrate within the plant. Ruiz (2002), in case of cucumber, reported a positive effect of higher K fertilisation on uptake, translocation and reduction of nitrate in fruit compared with the lowest K rate. In this experiment nitrate ratios in the fruit decreased in case of variants with double doze basic fertilization (Multicote IV 12:0:43) and foliar fertilization (Ferticare 10:5:26) as response to high K rate of used fertilizers. Vitamin C is a health-promoting factor with antioxidant properties. It has been reported that the vitamin C content in the fruit is influenced by K supply. Vitamin C is very efficient at preventing the conversion of nitrate to nitrite in plant tissue and within the human body (Hill, 1991). High vitamin C contents were recorded in case of organic substrate culture (19.42–24.28 mg/100 g fresh matter) and vitamin C content increased in case of foliar fertilization both for soil culture and for organic substrate culture.

BIBLIOGRAPHY