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NONTOX-SILICA™ AND THE QUALITY OF TOMATO

TRAIL SITE AND DESIGN

Quality of tomato is inter alia related to the concentration of total dissolved solids (TDS) and colour of the fruit. Natural conditions that influence the concentration of TDS include climatic factors like above average temperatures during the day and night, humidity and water stress. In practise, water stress during ripening is induced artificially to increase the TDS of the fruit. In hydroponic cultures of tomato an increase in the electrical conductivity of the nutrient solution will also induce higher TDS. Two methods can be applied to increase the EC, a simple increase in the concentration of applied nutrients or the addition of sodium chloride. Both methods are risky and not suitable for open fields.

Recent research indicated that by adding silicon to the nutrient solution, the TDS can be increased (Stamatakis and others, Acta Hort 609, ISHS 2003). Adding silicon without increasing the EC the concentrations of TDS, β -carotene, lycopene, vitamin C, firmness were increased while the incidence of BER was reduced.

The results of an increase of the EC of the nutrient solution by adding NaCl, increase in the concentration of the nutrient elements with and without the addition of 63mg Si per litre on the quality of tomato fruit.

<i>Treatment.**</i>	<i>β-carotene*</i>	<i>Lycopene*</i>	<i>Vitamin C*</i>	<i>TDS % fresh mass</i>	<i>Firmness lb</i>
220 -Si	1,46 ^{bc}	3,42 ^{cd}	35 ^a	4,70 ^c	8,20 ^c
220 +Si	2,35 ^a	7,07 ^b	83 ^b	5,50 ^{ab}	10,20 ^b
480+Na -Si	1,14 ^c	2,43 ^d	68 ^b	5,40 ^b	10,90 ^b
480+Na+Si	1,75 ^b	4,49 ^c	68 ^b	5,70 ^a	10,80 ^b
480+NS+Si	2,44^a	11,00^a	72^b	6,00^a	12,22^a

* mg per kg fresh material

** EC of the nutrient solution in mSm-1

Na = Addition of NaCl to increase the EC to 480mSm-1 .

NS = The EC was increased to 480mSm-1 using a more concentrated nutrient solution.

+Si is the addition of 63mg Si per litre of the nutrient solution.

The results of an increase of the EC of the nutrient solution by adding NaCl, increase in the concentration of the nutrient elements with and without the addition of 63mg Si per litre on yield of tomato fruit.

<i>Treatment**</i>	<i>Kg fruit per plant</i>	<i>Number of fruit per plant</i>	<i>Average fruit mass</i>	<i>Fruit with BER per plant</i>	<i>Number class 1 fruit</i>
220 -Si	5,58 ^{ab}	49,7 ^{abc}	113 ^{ab}	10,0 ^b	1,83 ^a
220 +Si	5,78 ^a	47,1 ^c	122 ^a	6,8 ^a	2,08 ^a
480+Na -Si	5,01 ^{cd}	47,7 ^{bc}	104 ^b	12,1 ^b	1,39 ^b
480+Na +Si	5,18 ^{bc}	51,3 ^{ab}	100 ^b	10,9 ^b	1,33 ^b
480+VE+Si	4,63^d	52,7^a	87^c	16,1^c	1,02^b

The addition of 63 mg Si per litre nutrient solution will improve production and quality of tomatoes under optimal (EC of the nutrient solution = 220mSm-1) and stress conditions (High EC = 480mSm-1).

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