

The effect of Silicon on the organically grown tomato transplants growth and quality

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Introduction

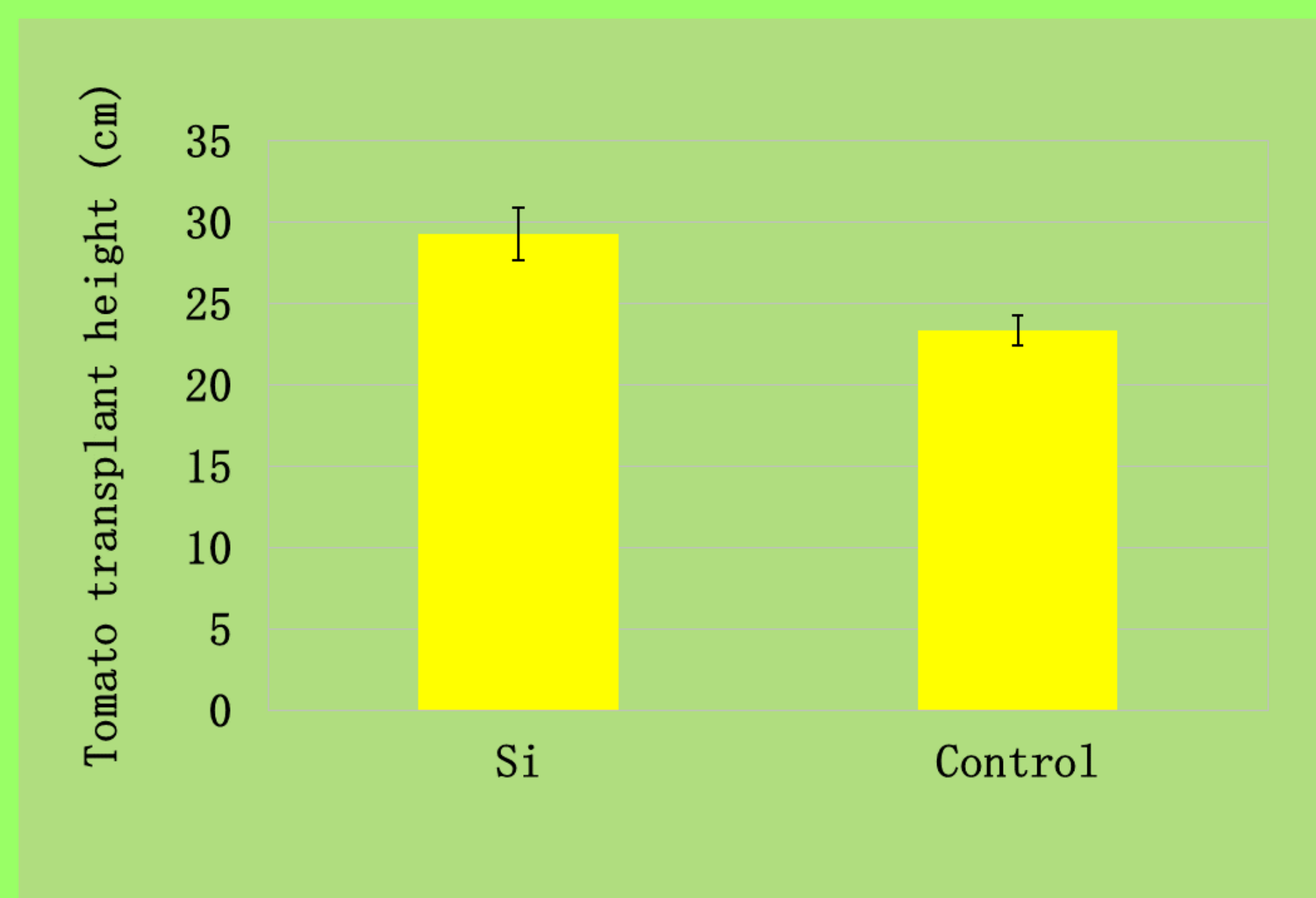
Supplying crops with adequate plant-available Si can suppress plant disease, reduce insect attack, improve environmental stress tolerance, and increase crop productivity.

Silicon plays important roles in mitigating the biotic (insects, pests, pathogens) and abiotic (heavy metals, salinity, drought, low and high temperature, lodging, UV light) stresses.

PROBLEM → No information about Silicon influence on tomato transplants growth and nutrient content.

AIM → The purpose of this investigation was to assess the influence of Silicon on the growth and nutrient content of tomato transplants.

Results



Conclusion:

Tomato transplants stay compact, have thicker stems and contain more nutrients in Si treatment.

Materials and Methods

Experimental site and time:

Estonian Crop Research Institute greenhouses, Winter of 2014

Substrate:

Seedlings and transplants were grown in:

Novarbo B2 Organic Biolan substrate for organic cultivation.

Treatments:

Item	Si treatment	Control
1 true leaf stage spraying	Silicic acid (2 mL L ⁻¹) solution	Water
2 weeks later	Silicic acid (2 mL L ⁻¹) solution	Water
2 weeks later	Silicic acid (2 mL L ⁻¹) solution	Water

The pH of Si treatment and Control solutions was 5.5.

The lighting at a plant level: 12000 lux

Day and night temperatures: 20 and 18° C.

Replications and experimental design:

Randomized block design, plot size 6 plants, 4 replications, experiment repeated 2 times.

Laboratory analyses:

N, P, K, Ca, Mg content

Statistics:

ANOVA by Excel 2010, comparison of means by Fisher LSD test

Results

Table:

The contents of nitrogen, phosphorus, potassium, calcium, and magnesium in tomato transplants dry matter (%).

	N	P	K	Ca	Mg
Si treatment	3.0 ***	0.87 **	6.3 ***	1.6**	0.42 NS
Control	2.1	0.79	4.8	1.5	0.43



Figure:

The picture of tomato transplants:

on the left – Si treatment, on the right – Control treatment

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