

Effect of silicon supply on growth and N, P and K accumulation by citrus rootstock seedlings

As with the N and K supply experiments, rootstock genotype was the major source of variation in shoot dry matter production under varying Si supply treatments, and volkameriana seedlings were more vigorous than seedlings of the other three rootstock genotypes (**Table 10**). Overall, plants grown with 2 mM Si in the nutrient solution produced approximately one third less shoot dry matter compared to seedlings grown without added Si. There was no evidence that any rootstock genotype was more or less sensitive to the presence of 2 mM Si in the nutrient solution compared to any other genotype.

Table 10 Effect of 2 mM Si on shoot dry matter production by four citrus rootstock seedling genotypes growing in sand culture

Values presented are means. Means followed by the same superscripted letter within either main effect or within the interaction are not significantly different at P=0.05. An * indicates a significant difference between Si supply means.

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	Rootstock					Si main effects
	mM Si	Sweet orange	Macro-phylla	Troyer citrange	Volk-ameriana	
Rootstock main effects		<i>g/shoot</i>				
	0	10.8	12.2	9.6	18.7	12.8
	2	6.7	7.0	7.0	11.4	8.0*
		8.7 ^A	9.6 ^A	8.3 ^A	15.1 ^B	

The effect of Si on shoot biomass production resulted in an increase in the concentration of N in the shoots because there was no significant effect of Si on the total amount of N accumulated by the shoots (**Table 11**). This suggests that the effect of Si on growth was not related to N uptake and transport.

Table 11 Effect of 2 mM Si on % N and total shoot N of four citrus rootstock seedling genotypes growing in sand culture

Values presented are means. Means followed by the same superscripted letter within rootstock main effects are not significantly different at P=0.05. An * indicates a significant difference between Si supply means.

Significant differences between Si supply means:						
	Rootstock					
	mM Si	Sweet orange	Macro-phylla	Troyer citrange	Volk-ameriana	Si main effects
		% N				
	0	2.2	2.2	2.6	2.1	2.3
	2	2.4	2.5	2.7	2.8	2.6*
Rootstock main effects		2.3 ^A	2.4 ^A	2.7 ^B	2.5 ^{AB}	
		mg N/shoot				
	0	234	284	253	446	304
	2	170	170	190	297	207
Rootstock main effects		202 ^A	227 ^A	222 ^A	371 ^B	

The effects of 2 mM Si on shoot P (**Table 12**) and shoot K (**Table 13**) were similar to the effect of 2 mM Si on shoot N; that is an overall concentration effect related to restricted

growth, but some evidence that possibly for P the effect was more pronounced in sweet orange and Troyer citrange seedlings.

Table 12 Effect of 2 mM Si on % P and total shoot P of four citrus rootstock seedling genotypes growing in sand culture

Values presented are means. Means followed by the same superscripted letter within rootstock main effects are not significantly different at P=0.05. An * indicates a significant difference between Si supply means.

		Rootstock				
	mM Si	Sweet orange	Macro-phylla	Troyer citrange	Volk-ameriana	Si main effects
		% P				
	0	0.21 ^A	0.20 ^A	0.24 ^C	0.24 ^C	0.23
	2	0.23 ^{BC}	0.21 ^{AB}	0.29 ^D	0.24 ^C	0.24*
Rootstock main effects		0.22 ^A	0.21 ^A	0.27 ^C	0.24 ^B	
		mg P/shoot				
	0	21	16	20	38	24
	2	11	9	10	30	25
Rootstock main effects		16 ^A	12 ^A	15 ^A	34 ^B	

Table 13 Effect of 2 mM Si on % K and total shoot K of four citrus rootstock seedling genotypes growing in sand culture

Values presented are means. Means followed by the same superscripted letter within rootstock main effects are not significantly different at P=0.05. An * indicates a significant difference between Si supply means.

		Rootstock				
	mM Si	Sweet orange	Macro-phylla	Troyer citrange	Volk-ameriana	Si main effects
% K						
Rootstock main effects	0	1.2	1.3	0.99	1.3	1.2
	2	1.7	1.9	1.3	1.6	1.6*
		1.4 ^A	1.6 ^A	1.1 ^B	1.4 ^A	
mg K/shoot						
Rootstock main effects	0	115	97	80	182	118
	2	84	74	45	202	151
		99 ^A	85 ^A	62 ^A	192 ^B	