Progress Report

Potassium Silicate Enhances Resistance of Floriculture Crops to Insect Attack

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Thrips and aphids are both key economic pests in rose greenhouses and nurseries. There is overwhelming scientific evidence that silicon is a beneficial plant nutrient. Increasing the plant silicon level may enhance plant growth, quality and yield. Moreover it can increase plant resistance to abiotic stress, diseases and insect pests. Our hypothesis that silicon has the potential to afford protection to rose plants from thrips and aphids is still in the process of being tested. We have additional work with silicon and cut flowers ongoing in my laboratory and I will provide a brief synopsis of that work that I think the members of the ICFG will find interesting. This too is an ongoing study and is not yet completed, but I will report the results to date.

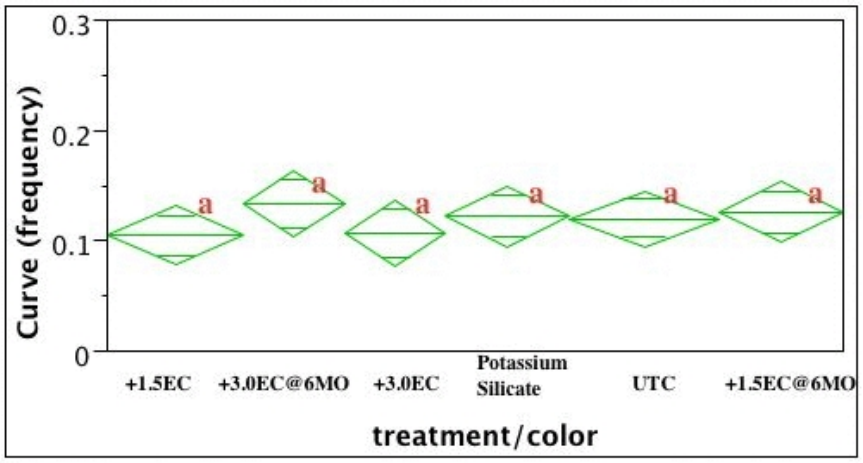
Will Potassium Silicate Sdded to the Liquid Feed in Hydroponic Gerbera Production Improve Yield, Quality and Vas-life of Flowers?

As mentioned above, increasing the plant silicon level may enhance plant growth, quality and yield. Working with the variety Corazon (from Terra Nigra) we filled 1/2 of our largest greenhouse (2500 ft^2) with plants grown in a modified hydroponic system (see Figure 1) using both a worm and trough system. On top of their normal fertilizer regimen, plants were fed 100ppm of potassium silicate each time they were watered. This was part of a larger water quality experiment with gerbera, but we are able to analyze the silica treated plants independently. This experiment has been in progress for about 1 year, and at regular intervals we would score the plants for number of flowers produced in

addition to various flower characteristics (length of stems, diameter of flowers, deformed flowers - bent stems (neck droop etc.). Furthermore, we recently completed our first post-harvest evaluation of the vase-life of silicate-treated flowers vs the control working with the postharvest lab on campus (with Drs. Michael Reid and Chai-Zhong Jiang).

Results to date have not supported the hypothesis. We did not find any differences in flower production or with any of the flower characteristics that were measured. I have provided one graph to show the data from flower deformation; all other graphs were similar to this. Vase life data were inconclusive, although more samples are needed for a definitive evaluation. We are planning to increase the level of potassium silicate added to the gerbera and will evaluated all the production characteristics again (including vase-life) during our peak production months (generally April and May). I will report back to the ICFCA on these results. In addition, we should have data from the rose trial available at that time as well.

Figure 1. View of gerbera grenhouse on the UC Davis campus. Hydopronic production is on the far side in the photo; flags denote different treatments.



Oneway Anova
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
treatment/color	5	0.31600	0.063199	0.6039	0.6970
Error	3231	338.13071	0.104652		
C. Total	3236	338.44671			

Means for Oneway Anova

Level	Number	Mean
+1.5EC	600	0.105000
+3.0@6MO	441	0.133787
+3.0EC	451	0.106430
PotassSilica	546	0.122711
UTC	657	0.120244
+1.5@6MO	542	0.125461

Figure 2. Flower deformation (curving of stem) across treatments in hydroponic gerbera flower production