Effect of Si sprays on TifEagle green speeds and clipping yields.
(Edited for public use)

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Location: A private country club in Auburn AL – TifEagle hybrid bermudagrass putting green. The test was located on a green at the practice facility.

Start Date: May 24th 2012

Treatments:

1. **Control**
2. **Si treatments:** Materials applied were a 17-0-11 + 1% Si at 7 oz 1,000 ft^{-2}; a 28% Si product at 6 oz 1,000 ft^{-2}; and a 0-0-26 + 2% Si product at 6 oz 1,000 ft^{-2}.
3. **Fertilizer only treatment (no Si):** Urea applied at 0.22 lb urea 1,000 ft^{-2}; K_2SO_4 at 0.44 lb K_2SO_4 1,000 ft^{-2}. Note that those rates are fertilizer, and not expressed as nutrient (N or K or K_2O). These rates supply the same amount of N and K as applied with each application of the fertilizers used in Treatment 2.

The treatments outlined above were sprayed weekly for 7 weeks, beginning on May 24th, 2012. The experiment was arranged as a randomized complete block with 4 replications of each treatment. Plot size was 5 x 10 feet. Each treatment was applied using a walk behind CO_2 sprayer, and no irrigation was applied for 24 hours after application. No fungicides were applied during the test period. All treatments were continued as outlined above for a total of 7 applications. Application dates were: May 24th, May 31st, June 7th, June 14th, June 21st, June 28th and July 5th, 2012.

All maintenance was performed by the golf course maintenance staff.

Collected data included color, quality, stimpmeter ball roll (average of six rolls, three in each direction), and clipping yield at 3 and 7 days after application. Shoot density was also determined at the end of the study.

Results:

Table 1. Relative ball roll as measured via a **modified** stimpmeter. Reference: Gaussoin et al., 1995. HortScience 30:547–548. Roll length should only be considered in comparison to other treatments within that same sampling date. Numbers are shown in inches, and are the average of six rolls, with half in opposite directions.

Trt	May 25	June 1	June 4	June 7	June 11	June 18
	golf ball roll (inches)					
1. control	59 a	60 a	60 a	68 a	52 a	56 a
2. Si + N and K	55 a	59 a	56 b	66 a	46 b	53 a
3. N and K only	56 a	58 a	58 ab	73 a	47 ab	54 a
	June 22	June 25	June 28	July 5	July 10	
	golf ball roll (inches)					
1. control	68 a	72 a	73 a	76 a	69 ab	
2. Si + N and K	61 a	60 b	62 b	64 a	59 b	
3. N and K only	59 a	60 b	69 ab	64 a	65 ab	

Within each sampling dates means followed by the same letter are not significantly different from each other via means separation at an alpha of 0.10.

N and K applied with each application are the same in treatments 2 and 3. Treatment 1 received no fertilizer nutrients.

Table 2. Clipping yield and shoot density as affected by treatment, Auburn, AL. Clipping yield is in grams per plot, and shoot density is shoots per square inch.

Trt	June 14	June 21	June 25	June 28	July 2
	Dry weight of clippings (grams per plot)				
1. control	12.0 b	7.4 a	3.3 b	1.4 a	1.5 b
2. Si + N and K	15.4 a	11.2 a	5.4 ab	2.4 a	2.6 ab
3. N and K only	13.7 ab	11.5 a	5.7 a	2.6 a	3.0 a
	July 5	July 9	July 12	July 12	
	Dry weight of clippings (g per plot)			shoots	
1. control	1.9 b	3.5 b	2.6 b	42 a	
2. Si + N and K	3.9 ab	6.6 a	4.0 a	46 a	
3. N and K only	4.3 a	7.2 a	4.5 a	40 a	

Within each sampling dates means followed by the same letter are not significantly different from each other via means separation at an alpha of 0.10.

N and K applied with each application are the same in treatments 2 and 3. Treatment 1 received no fertilizer nutrients.

Thoughts:

- Unfertilized plots sometimes had longer ball roll. This is likely a function of reduced leaf growth (this is supported by the lower clipping yields), which would have likely led to a harder and faster surface. Differences in turf color were apparent, and related to the fact that the control plots received no N for 7 weeks.
- There is no evidence that application of Si products improved the distance of ball roll, when compared to treatments receiving the same rates of N and K fertilization (as supplied in the Si-containing products).
- *Caveat* – this is a single 7 week trial at one location. Work like this should be conducted over multiple locations and for multiple years. Additionally, since this work was conducted devices such as the TruPutt might be also useful, possibly used to help determine if application of Si improves leaf stiffness. Another tool might be to measure green height of cut using a prism gauge. At the wackiest I'd use a scanning microscope to really try to pry apart possible differences in leaf structure as a result of Si applications.
- Does this data show that the addition of Si has no benefit? No, it shows that the weekly addition of Si, in this one-time experiment, did not increase the distance of a golf ball roll. There is other research which explores the utility of Si for disease control, especially in rice. Some work has explored this in St. augustinegrass as well. Mixed results have been shown in this work. Here are a few articles:

Journal of Entomological Science 47(1):17-26. 2012. https://doi.org/10.18474/0749-8004-47.1.17

The Influence of Silicon on the Components of Resistance to Gray Leaf Spot in St. Augustinegrass. 2010. M. O. Brecht , L. E. Datnoff , T. A. Kucharek & R. T. Nagata. J. Plant Nutrition. p. 1005-1021.

Brecht, M. O., Datnoff, L. E., Kucharek, T. A., and Nagata, R. T. 2004. Influence of silicon and chlorothalonil on the suppression of gray leaf spot and increased plant growth in St. Augustine-grass. Plant Dis. 88:338-344.

Effect of Soluble Silica on Brown Patch and Dollar Spot of Creeping Bentgrass. 2006. Ricardo F. Uriarte , H. David Shew & Daniel C. Bowman. J. Plant Nutrition. p. 325-339.