Silicon Trial

Objective: To determine the yield response of rice to calcium silicate, mill ash, and other potential Si sources

Silicon Trial

Average Pre-Plant Soil Test Values							
Soil Depth	pH	Pw	Pm3	K	Ca	Mg	Si
inches		lb/ac	g/m^3	lb/ac	lb/ac	lb/ac	g/m^3
0-6	6.7	11	8	74	4487	789	19
6-12	6.9	9	4	25	4459	778	29

Silicon Trial Harvest Weights and Flag Leaf Si Concentrations

Treatment	Material and Rate	Harvest Wt	Leaf Si
		lb/acre	%
1	No Si	4526ab	2.75a
2	Ca Silicate 2.5 tons/ac	4827ab	3.22a
3	Mill Ash 5 tons/ac	4339b	3.01a
4	Stainless Steel Slag (Alabama) 2.5 tons/ac	5206a	3.30a
5	Steel Slag (France) 2.5 tons/ac	4950ab	3.24a
6	Steel Slag (Germany) 2.5 tons/ac	5081ab	3.19a
P>F		0.052	0.123
Means followed by the same letter are not significantly different according to Tukey-Kramer at *P*≤0.10.			

Silicon Trial:
Pre-Plant Soil Si in Control Plots

	Row 6	Row 5	Row 4	Row 3	Row 2	Row 1
Col 6	2	5	3	6	4	23 96
Col 5	6	4	2	5	24 9	3
Col 4	3	34 28	5	4	2	6
Col 3	5	3	13 9	2	6	4
Col 2	8 21	6	4	3	5	2
Col 1	4	2	6	11 13	3	5

Soil Si: 0-6 inches and 6-12 inches

Analysis of Materials

Parameter	Tennessee Slag	Alabama Slag	France Slag	Germany Slag	Mill Ash
Ca (%)	28.4	33.9	29.9	29.2	----
Mg (%)	0.34	4.02	3.69	3.71	----
SiO_2 (Total %)	41.2	22.6	9.2	10.6	21.2
Si (Total %)	19.3	10.6	4.3	5.0	9.9
Si (Soluble %)	2.96	4.60	1.22	0.9	0.61
Cr (ppm)	194	887	762	1213	----
Ra 226 (pCi/g)	2.3	0.6	0.6	0.4	----

Silicon Trial: Conclusions

- There were no significant differences in yield or leaf Si between the control and the slag materials although there were trends of higher yield and leaf Si with slag application
- The Alabama stainless steel slag may be promising as a material supplying Si for rice
- Based on this and previous trials, mill ash does not appear to be a good source of Si
- We should consider another trial comparing Tennessee and Alabama slags on a uniform, low Si soil