

## **Corn Response to Amending Soil with Silicon**

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A field experiment was conducted with isolines of non-Bt (Pioneer 33B50) and Bt (Pioneer 33B51) field corn in 2002 and 2003 to study the effects of silicon (Si) amendment of soil on corn yield and damage from European corn borer (ECB). A Quakertown silt loam soil with an initial soil pH of 5.7 was amended in June 2000 with either  $\text{CaCO}_3$  (agricultural limestone) or  $\text{CaSiO}_3$  at the rate of 7000 lbs/acre of calcium carbonate equivalent. The plots had been used in 2000 and 2001 to evaluate pumpkin response to Si. Soil pH measured in December 2001 indicated no significant difference in pH between plots amended with  $\text{CaCO}_3$  (pH=6.8) and  $\text{CaSiO}_3$  (pH=6.9). In New Jersey, the cost of these liming materials is similar. Corn grain yield for the non-Bt hybrid 183 Bu/A and 153 Bu/A on the  $\text{CaCO}_3$  plots in 2002 and 2003, respectively, and 175 Bu/A and 167 Bu/A on the  $\text{CaSiO}_3$  plots in 2002 and 2003, respectively. Corn grain yield for the Bt hybrid was 192 Bu/A and 188 Bu/A on the  $\text{CaCO}_3$  plots in 2002 and 2003, respectively, and 182 Bu/A and 195 Bu/A on the  $\text{CaSiO}_3$  plots in 2002 and 2003, respectively. There was no significant difference in grain yield between  $\text{CaCO}_3$  and  $\text{CaSiO}_3$  treatments. In 2003, the Bt hybrid yielded significantly more than the non-Bt hybrid. The Bt hybrid exhibited little damage from ECB in either year. In 2002, the non-Bt hybrid had 1.5 ECB tunnels/plant when grown on  $\text{CaCO}_3$  treated plots but when grown on  $\text{CaSiO}_3$  treated plots there were only 0.8 ECB tunnels/plant. While the Si treatment reduced the number of ECB tunnels per plant, it did not decrease the overall length of ECB tunneling. In 2003, the number of tunnels was not significantly influenced by soil

amendment but tunnel length was reduced by the  $\text{CaSiO}_3$  treatment. Plant tissue samples are being analyzed for Si uptake.