Effects of N-Fertility on Bt Endotoxin and N Concentration of Early Growth Maize. (C02-bruns090518-Poster)

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Abstract:

Nitrogen deficiencies interfere with protein synthesis in maize (Zea mays L.). Maize hybrids with the Bt gene produce proteins that become insecticidal in the mid-gut of certain Lepidopteron insects. The effect N fertility has on Bt in early growth maize has yet to be documented. Two Bt maize hybrids (Pioneer 33V08 with Bt event MON-810 and Dekalb 626Bty with Bt event DBT 418) were grown in pots in duplicate greenhouse experiments with N fertility rates of 0, 112, 224 and 336 kg ha-1 N as NH4NO3. Fertilizer was blended into a potting mixture of a 2:1:1 ratio of peat moss:sand:soil. Plants were harvested at growth stage V5 and assayed for Bt using a commercial quantification plate kit. Nitrogen concentrations were determined by semi-micro kjeldahl. Nitrogen concentrations were 25.8, 33.1, 35.1 and 37.7 mg g-1 and Bt contrations were 350, 367, 486 and 534 ug kg-1 at N fertility levels of 0, 112, 224 and 336 kg ha-1, respectively. Increased N likely increases Bt synthesizing proteins and thus increases Bt concentration. The two Bt hybrids responded to increased N-fertility the same. Adequate levels of N during early growth appear essential for Bt production and may affect the ability of maize to resist insect predation.

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