CHANGES IN MAIZE GROWTH AND REPRODUCTIVE DEVELOPMENT ASSOCIATED WITH AMINOETHOXYVINYLGLYCINE APPLICATION
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We conducted field studies during 2008-2010 to investigate the sensitivity of maize reproductive development to early application of an ethylene biosynthesis inhibitor (aminoethoxyvinylglycine; AVG). AVG applied at the ten-leaf stage (V10) reduced cob length, spikelet initiation, and final grain yield. Despite the decrease of total grain yield, individual kernel weights increased by 12% along with an increase in grain protein concentration (73 g kg\(^{-1}\) to 92 g kg\(^{-1}\)). In addition to perturbed ear development, application of AVG resulted in a persistent leaf bleaching phenotype. Our results show that ethylene biosynthesis, or other pyridoxal phosphate dependent enzymes which could be inhibited by AVG, are critical for proper early development of the female maize inflorescence as well as chlorophyll synthesis. Individual kernel weight and grain protein concentration were affected by a pre-flowering treatment suggesting that these yield and quality components could be regulated by developmental cues that occur during early differentiation of the maize ear.