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Semi-Continuous Carbon Dioxide Exchange Rates in Cotton Treated with Commercially Available Plant Growth Regulators

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The usefulness of foliar-applied growth-enhancing compounds in producing high-yielding, high-quality cotton (*Gossypium hirsutum* L.) is unresolved. Since plant growth regulators may increase dry-weight accumulation through increased net carbon assimilation, a study was designed to determine if commercially available plant growth regulators influence CO₂ exchange rates in cotton. Fifteen 3-week-old cotton plants, 'SureGrow 404' were placed inside transparent chambers after foliar application of PGR IV, Stimulate, RyzUp, Early Harvest, or tap water (control). The transparent chambers were then placed inside two growth chambers. Gas exchange was measured for 90 seconds in each transparent chamber every 20 minutes for 14 days. Daily averages of net photosynthesis during the light period and respiration during the dark period were calculated, and daily C gain, gross photosynthesis, and C use efficiency were determined from the gas exchange data. Significant differences in net photosynthesis, dark respiration, daily C gain, C use efficiency, and cumulative C gain were not detected during the study. Also, significant increases above the untreated control in leaf area, shoot dry weight, and leaf area ratio were not detected at the completion of the study. We conclude that the growth regulators used in this study did not influence C exchange rate or any associated parameters.