

**COMPENSATORY ABILITY OF COTTON IN VARIABLE
CROP ENVIRONMENTS: A SHADED PERIOD**

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Abstract

Over seventy-five percent of cotton (*Gossypium hirsutum* L.) planted in North Carolina is Roundup Ready[®]. Despite this fact, there are still concerns with fruit retention and cavitation with these transgenic varieties. Research has shown inconsistent results regarding fruit loss associated with Roundup Ready[®] cotton, suggesting that something else may be involved. The question remains: Is this an herbicidal problem, or are there environmental factors involved. A field study was designed and conducted at the Central Crops research station near Clayton, North Carolina to evaluate the possibilities of physiological alterations to growth habits and yield of cotton due to a prolonged overcast period in combination with various Roundup treatments. Four Delta and Pine Land varieties were used including 5415, 5690, 5415 RR, and 5690 RR. All management systems were according to North Carolina extension recommendations including conventional weed control. The eight main-plot treatments were variety and Roundup application combinations. The two conventional varieties received no Roundup. The three Roundup treatments were untreated, broadcast foliar at the four-leaf stage, and a four-leaf broadcast followed by a sloppy post-direct at the eight-leaf stage. Shade was imposed at early bloom for twelve consecutive days. Commercial nylon shade cloth was draped over a seven by four foot polyvinyl chloride structure. Shade was a sub-plot effect, to which seven feet of one row of a four row plot was subjected. At the end of shading, five plants were cut from both the shaded area, and the unshaded area for biomass partitioning. Data were analyzed in SAS 8.2e under the general linear model. Means were separated by Fisher's protected LSD at $\alpha=0.05$. There were no Roundup by variety or shade by variety interactions. Roundup treatments had no significant effects. Shading increased plant structural growth and vegetative to reproductive biomass in all treatment combinations. Shading decreased total bolls at harvest, and lint yield in all treatment combinations. Varieties 5415 and 5415 RR yielded better than 5690 and 5690 RR when means were combined over all conditions.