Effect of Thermal Defoliation on Cotton Leaf Desiccation, Senescence, Post-harvest Regrowth, and Lint Quality

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Thermal defoliation is a potential alternative to chemical defoliation, particularly for organically grown cotton. A two-row prototype thermal defoliation vehicle that forces air at 193 °C through cotton was compared with the application of a chemical defoliant in three field experiments. The thermal and chemical treatments caused >80% leaf mortality within 24 h and 6 d, respectively. Leaf abscission with the chemical treatment was >80% after 6 d, but abscission in the thermal treatment did not exceed 65% even after 13 d. Fiber length uniformity, strength, micronaire, and value, and percentage trash were not affected by thermal defoliation. Staple length was 2.8% less ($P < 0.05$) in the thermal treatment than in the chemical treatment in one of the three field tests. Regrowth at the base of defoliated cotton plants occurred in both treatments, so total stalk destruction by cultivation or use of herbicides will have to occur as part of boll weevil management or eradication strategies.