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## Evaluation of Cotton Stickiness via the Thermochemical Production of Volatile Compounds

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Authors: Gary R. Gamble  
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Insect honeydew contamination of cotton lint can interfere with carding, roving, and spinning processes at the mill, and thus presents a major concern for the textile industry. Several methods exist for the detection of insect honeydew on cotton lint, but none have proven to be sufficiently reliable, cost effective, and rapid enough to be used as an online screening method. The objective of this study was to determine whether production of volatile compounds resulting from the heating of honeydew-contaminated cotton can be utilized to quantify the level of contamination. A set of 17 cotton samples with varying levels of whitefly honeydew contamination were heated to 180°C under a stream of air. Honeydew present on the cotton underwent thermochemical degradation with concomitant production of the compound 5-hydroxymethyl-2-furaldehyde (HMF). HMF is volatile at 180°C and was collected from the gas phase using a fiber coated with an adsorbent material and subsequently quantified using gas chromatography. Results indicate that the level of HMF production from honeydew-contaminated cotton correlates with the stickiness level as measured by the sticky cotton thermodetector ( $R^2 = 0.77$ ) and with sugar levels as measured by both high performance anion exchange chromatography ( $R^2 = 0.73$ ) and by the glucose oxidase enzyme method ( $R^2 = 0.74$ ). This work is a feasibility study for the development of a potentially rapid, cost effective, and portable method for the detection of sticky cotton based on the release and subsequent measurement of volatile compounds.