

**NEW EVIDENCE ON COTTON STICKINESS PART II:
EFFECT OF TEMPERATURE AND RELATIVE
HUMIDITY ON COTTON STICKINESS**

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Abstract

In part one (Abidi, Hequet. 2001. New Evidence on Cotton Stickiness. Part I: Thermal and Hygroscopic Properties of Individual Sugar Presents on Sticky Cotton. Beltwide Cotton Conferences), it was shown that the individual sugars present on contaminated cotton lint have different hygroscopic and thermal properties. Therefore, humidity and temperature would have an effect on stickiness measurements.

One hundred and fifty cotton bales representing a wide range of stickiness and different types of contamination, i.e. white fly, aphid and physiological sugars, were selected. Those samples are coming from 3 areas, one known to have important white fly populations and very little to no aphids (Area 1), one where both types of insects coexist (Area 2) and one where large populations of aphids exist and very little to no white flies (Area 3). In addition, for Area 3 mainly, high physiological sugar contents could be obtained after a freeze. This could also happen in Area 2 but this is a rare event. The bales have been sampled, and then the samples tested on the High Speed Stickiness Detector (H2SD). The recommended manufacturer setting for the hot plate of the H2SD is 53°C. We have modified this setting to be able to perform the tests at: 27°C, 34°C, 40°C, 54°C and 67°C. We consider that, in average, when the H2SD reading is equal to 10 or below, with the hot plate setting at 53°C, the cotton will not cause short term processing problems at the mill level.

The results obtained, demonstrate that by testing at a lower relative humidity (55% RH instead of 65% RH), the H2SD readings are significantly lower, 34.4% in average. By testing at high temperature, nearly all the contaminated cottons become sticky, even the one having little to no trehalulose. At low temperature, only the cotton having significant trehalulose amount are sticky. This shows that the H2SD principle needs to be revisited.

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