

SAMPLING ISSUES FOR STICKINESS MEASUREMENTS
Richard Frydrych, Jean-Paul Gurlot, Eric Gozé,
Bernard Lebrun, Serge Lassus, and Jean-Charles Nieweadoński
CIRAD-CA
Montpellier, France
Jean-Yves Drean and Mohamed Lekcir
ENSITM, UHA
Mulhouse, France

Abstract

The cut cotton sample used for the commercial evaluation of cotton bales is taken at a single point from one or two sides of the bale. It should be verified that this sample is sufficient to perform an H2SD stickiness measurement that is adequately precise to avoid litigation. If a more representative sampling method must be used, this is also beneficial for other technological measurements.

The study into the feasibility of producing standard cottons (Beltwide, 2002) has already demonstrated the advantages of mixing cotton bales by cotton breaker as this reduces the dispersion coefficient of H2SD measurements from 7 to 1.5. The dispersion coefficient corresponds to the ratio between the variance and the mean of the counts. Its value is ideally 1 for sticky points distributed randomly within a perfectly homogeneous bale. It reaches 4.4 for cotton from the Sudan (Fonteneau Tamime, 2000) and only 2.7 for cotton from the USA (Héquet, 2003). A large part of the variability observed in stickiness measurements is therefore due to within-bale heterogeneity, and attempts can be made to reduce this by improving sampling methods.

When preparing a bale, different layers of cotton are superimposed by a tramper before pressing. Our hypothesis is that within-bale variability is primarily located between the layers (vertically) whereas within-layer variability (horizontal) is low. If such is the case, samples taken from the entire side of the bale, i.e. in the form of a superficial strip involving all the layers, should be more representative than a simple cut cotton sample that involves only some of the layers.

We tested this hypothesis by means of a sampling study that involved 24 bales from 4 different origins (3 continents). A three-dimensional grid of 8x2x2 was used to study variability in all 3 directions. Also, a comparison between the conventional cut cotton sample and the superficial vertical strips determined which method, in practice, gave the best results.

The H2SD results clearly showed that stickiness was variable within the bale. The superficial vertical strip is close to the mean of the different layers, and the variability obtained was less pronounced than with the cut cotton samples. The other technological measurements are ongoing.

The vertical strips were removed using a specially-designed, manual tool. Further research is required to develop an automatic sampling device to remove this sample, which is representative of bale stickiness.