WEED SPECIES DENSITY AND DIVERSITY IN ROUNDUP READY COTTON: PERCEPTIONS VERSUS REALITY

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Abstract

A set of cotton samples was tested for moisture content in Cotton Incorporated and Southern Regional Research Center on two HVIs that were equipped with moisture sensors in the sample clamps. The cottons were also tested by oven method. The moisture contents from CI and SRRC had a very high correlation coefficient (R=0.97). However, the results showed a moisture level difference measured on the CI and SRRC's HVI instruments. All samples (from jars and vacuum-sealed bags) gained moisture after 48 hours of conditioning shown by both HVI and oven methods. Samples in the vacuum-sealed bags still had lower moisture content than that in the jars even after 48 hours of conditioning due to the moisture hysteresis. The HVI moisture measurement detected the change in sample moisture very well.

Introduction

Many cotton fiber properties are influenced by the moisture content. Therefore, cotton samples generally have to be conditioned under the standard atmosphere for sufficient time to achieve moisture equilibrium before testing, and most tests for cotton properties need to be performed under this standard condition also. Maintaining a well-controlled testing lab is costly and challenging, and this is especially true for developing countries. There has been interest to test cotton fibers in less strictly controlled or non-conditioned laboratories and to correct the test results from the sample moisture. The Uster HVI can be equipped (optional) with a sensor on the sample comb/clamp to measure the moisture of the specimen fiber beard . The measured fiber breaking strength can be corrected by the measured moisture content using a build-in equation. Cotton Incorporated (CI) initiated a project to compare the moisture content measured by HVI at CI and the Southern Regional Research Center (SRRC).

Materials and Procedures

Nine samples were tested on the HVI 1000 at Cotton Incorporated. Then a set of the 9 samples was sealed in vacuum-sealed plastic bags, and the other set in Mason jars. The samples were send by FedEx to SRRC. We had the following objectives: a) to compare the HVI moisture values measured in CI and SRRC; b) to compare HVI moisture values with that from the oven method; c) to compare the moisture values of samples sealed in jars with that in vacuum bags (to see if there is any influence of the packaging method); d) to compare moisture values of samples immediately out of jars or bags vs. after 48 hours of conditioning; and e) to compare results from left comb and right comb on HVI.

The procedures were the flowing: Samples remained in the sealed jars and bags before testing in the conditioned lab. Jars were opened one by one. Three specimens were taken immediately after a jar was opened, sealed in small weighing bottles, weighed in the same conditioned room with lid closed, and ready for oven moisture testing. Each sample was tested on HVI immediately after the oven test samples were taken, within minutes being removed from the jar. The samples from the vacuum bags and the jars were conditioned for 48 hours, and tested again on HVI. Then five samples were taken from each conditioned sample for oven testing. A total of 20 beards (10 from the left comb and 10 from the right comb) were tested on each sample in "Module Test" mode.

For moisture measurements, an initial tare weight of the bottle was obtained, followed by the weight of the bottle plus the sample; samples were dried in a static oven overnight at 105 °C with lids open. Did not close lids when

oven was opened. Removed bottles from oven with lids open and immediately place in a dessicator. Closed the dessicator lid immediately. Allow cooling in the dessicator for 60-90 min. When the desiccator's lid was opened, closed all lids on bottles. Weighed bottle plus dried cotton, then a final tare weight of empty bottle.

Results and Discussion

The HVI moisture results from CI and SRRC are given in Figure 1. The SRRC HVI moisture values include those from samples immediately tested after opening the jar, and samples from the bags and jars after 48 hours of conditioning. The results by CI and SRRC showed very high correlation coefficient (R=0.97). However, there was a level difference of about 0.5% moisture content. It could have been caused by a instrumental level difference and/or relative humidity difference between the two labs. Both CI and SRRC labs had tight temperature and humidity control. Even if there was a relative small humidity difference between the two labs, it would not cause a 0.5% moisture difference in the samples. Therefore, it is plausible that the moisture levels of the two HVIs were different. Also from the SRRC HVI results shown in Figure 1, the moisture values were higher after 48 hours of conditioning. After conditioning, the samples from the vacuum bags still had slightly lower moisture than those in the jars. These were also confirmed by the results from oven test shown later. The HVI detected these small differences consistently.

The moisture results from oven method are given in Table 1. The results from the oven methods confirmed the test results from the HVI, i.e., the sample moisture values were higher after 48 hours of conditioning, and after conditioning, the samples from the vacuum bags still had slightly lower moisture than the jars. The HVI moisture values were higher than the oven method.

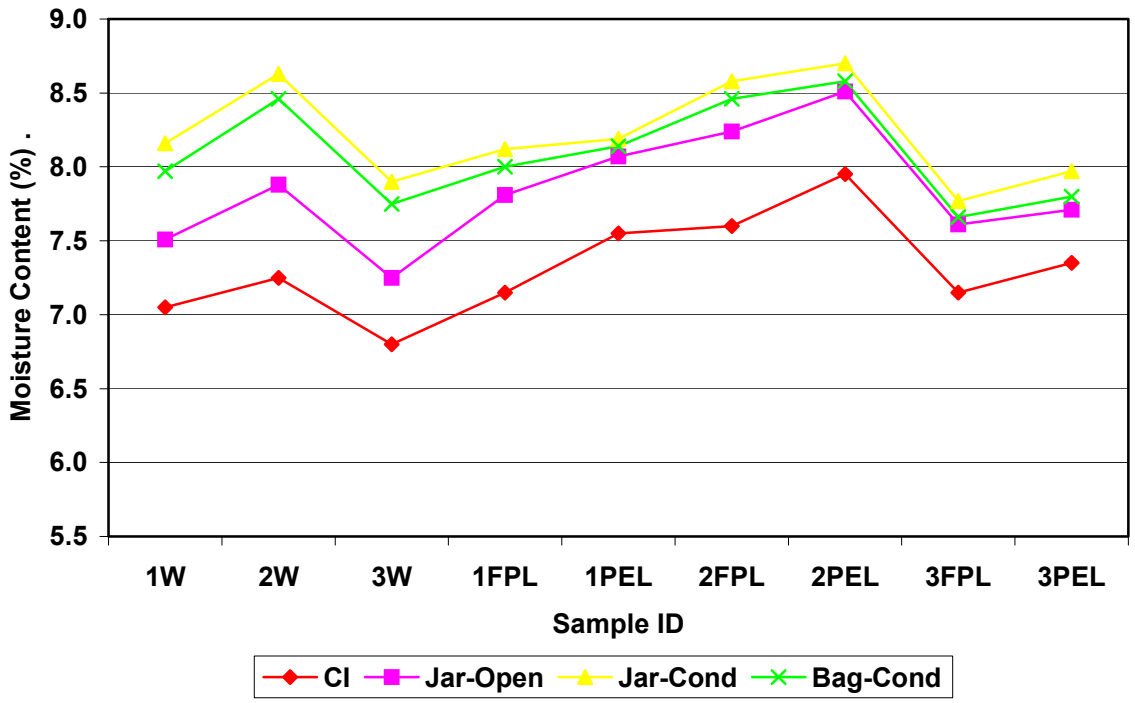

Figure 1. Comparison of sample moisture content measure by HVI

Table 1. Comparison of Moisture Contents from HVI and Oven Methods

	SRRC HVI	Oven
Jar-after opening	7.84	6.47
Bag- after opening	-----	6.35
Jar-after 48 h conditioning	8.23	6.83
Bag- after 48 h conditioning	8.09	6.48
Grand Avg.	8.05	6.53

The grand average moisture contents by the HVI are 7.98% from the right comb and 8.13% from the left comb. This small difference would not affect the test results significantly.

Conclusions

A set of cotton samples was tested for moisture content in CI and SRRC on two HVIs that were equipped with moisture sensors in the sample clamps. The cottons were also tested by oven method. The moisture contents from CI and SRRC had a very high correlation coefficient (R=0.97). However, the results showed a moisture level difference measured on the CI and SRRC's HVI instruments. All samples (from jars and vacuum-sealed bags) gained moisture after 48 hours of conditioning shown by both HVI and oven methods. Samples in the vacuum-sealed bags still had lower moisture content than that in the jars even after 48 hours of conditioning due to the moisture hysteresis. The HVI moisture measurement detected the change in sample moisture very well.

Disclaimer

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References

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