Short report on the Training Session given in CIRAD Montpellier to the Experts of the Regional Technical Centers of Africa in the frame of the CFC/ICAC/33 project Year 2 (2009)

By Jean-Paul GOURLOT, CIRAD

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6.4.5 - Data management
6.4.5.1 - Data management for retest
6.4.5.2 - Data management for D.2.2. Variability study

6.5 - On June 12th, 2009
6.5.1 - Presentation of documents for D.2.2. variability study
6.5.2 - Validation / approval of Air Management System
6.5.3 - Management of the lab

7 - Support of information provided to the Experts

8 - Evaluation of the training session by the Experts (to be finished after trainees leave)
1 - **Important notice:**

Even tough the contents of the documents of this training session have been updated and formatted according to a specific model, the training contents are the results of more than twenty years of expertise in the cotton area acquired by CIRAD. In consequence, CIRAD would really appreciate that the training documents and their content stay confidential and that theses training documents should not be disclosed in any public media by Common Fund for Commodities, International Cotton Advisory Committee, Project Executive Agency and/or anybody involved in the CFC/ICAC/33 project.

2 - **Programme: AM: 9-12; PM: 13:30 – 17:30):**

<table>
<thead>
<tr>
<th>Date</th>
<th>Location (Building/Room)</th>
<th>Program</th>
</tr>
</thead>
</table>
| **Monday** | AM 2/124                 | o Welcome and Generalities  
|            |                          | o Planning the week  
| 8/06       |                          | o Projects and reports  
|            |                          | o AWBP  
|            |                          | o D.2.2. budgets  
|            |                          | o D.2.2. sample preparation and analysis  
|            | PM 2/124                 | o D.2.2. Mission JPG ??? planning  
|            |                          | o Physiology and co  
|            |                          | o Excel Budget  
|            |                          | o Project plan  
|            |                          | o Debriefing  
| **Tuesday**| AM 2/124                 | o Cotton fibres characteristics  
| 9/06       |                          | o HVI Testing  
|            | PM 2/124                 | o Coffee break  
|            |                          | o Debriefing  
| **Wednesday**| AM 16/249               | o Practical use of the homogenizing machine  
| 10/06      |                          | o Coffee break  
|            |                          | o Labelling lot ID and samples IDs  
|            | PM 16/249                | o Organizing storage of reference material results  
| **Thursday**| AM 16/249               | o Data analysis  
| 11/06      |                          | o Coffee break  
|            |                          | o International standardization and round tests  
|            | PM 16/249                | o Ginning  
|            |                          | o Dinner  
| **Friday** | AM 16/249               | o Ginning  
| 12/06      |                          | o Coffee break  
|            | PM 16/249                | o Ginning  
|            |                          | o RT  
|            |                          | o Coffee break  
|            |                          | o Closing  

3 - List of points to be seen: demands from the participants

3.1 - DM : Dominic MWAKANGALE
➤ physiology, fibre characteristics, ➔ BB, done June 8th, 2009
➤ review of training documents done June 10th, 2009
➤ categorization of trainees, and appealing training / advertising done June 10th, 2009

3.2 - MT: Mamadou TOGOLA
➤ Best topics for trainees f(public)? done June 10th, 2009
➤ Lab management and data management done June 10th, 2009
➤ Excel (computer?) done June 11th, 2009
➤ Prepare time table for next training session done June 11th, 2009
➤ Document in French

3.3 - KG: Kaisi Gervas MWANJABALA
➤ Lab management and data management done June 9th, 2009
➤ Data transfer
➤ Fibre characteristics done June 9th, 2009
➤ Projects and reports done June 8th, 2009

3.4 - LP: Laura PAYET
➤ Reasons for working on Excel done June 8th, 2009
➤ Project
➤ Reasons for any decision

3.5 - By JPG
➤ General presentation of project done June 8th, 2009
➤ Check RTC training material done June 9th, 2009
➤ Answer technical question done everyday
➤ Ginning ➔ GG done June 11th, 2009
➤ Show / use homogenizing machine done June 10th, 2009
➤ Data management on HVI 1000/700 done June 10th, 2009
  o Identification of lots of samples
    ▪ For inter-laboratories tests
  o For retests
  o For other tests as a testing center
  o For private customers
  o For other tests
➤ Data management in labs done June 11th, 2009
  o Histogrammes done June 11th, 2009
  o Trend curves done June 11th, 2009
➤ Management of the laboratories done June 12th, 2009
➤ Adds-on
  o Excel done June 8th, 2009
  o Filters done June 8th, 2009, done June 11th, 2009
  o Models used by the project done June 8th, 2009
  o Round-Tests done June 11th, 2009
  o Restest file done June 10th, 2009
Other questions
- Regional Round test after the first training?! How to organize? Sources of cottons?
  Data analysis and advises to labs? done June 11th, 2009

4 - List of CIRAD Personnel involved during this session

Speakers: Bruno BACHELIER, Gérard GAWRYSIAK, Jean-Paul GOURLOT
Organization: Jean-Paul GOURLOT, Michel GINER, Liliane De CLOEDT
Other inputs: Philippe FRANCALANCI, Brigitte GIUDICELLI, Marie-Elise LAPEYRE, Mireille POITEL, Michèle VIALLE

5 - Major given presentations

5.1 - On June 8th, 2009
1) 0624_03_JPG_Explications_CFC_ICAC-33_v1.ppt
2) BudgetTableOV7_EUR.xls
3) 0623_04_BB_CSITC_Genesis_of_a_hair.pdf
4) CSITC_Project-Plan.xls_OV15.xls (I gave version OV16 just arrived today)
5) AWPY2_2009-01-14_OV1.doc (not given as only valid for Cirad)
6) Calendar from Microsoft Outlook for recording time, +
   Modele_Outlook_Calendrier_TempsTravail_V0.xls
7) Contrat_TBS_LZARDI_CIRAD.pdf

5.2 - On June 9th, 2009
8) HVI_Training_V0.pdf
9) Lab_Air_Management_V0.ppt (not given)
10) powerSupply_V0.xls (not given)

5.3 - On June 10th, 2009
11) ValidOuvreur_ManipAFaire_V0_Prepa.ppt (not given)
13) Data files with results and output from data analysis (not given)

5.4 - On June 11th, 2009
14) Several examples of Excel files for data analysis (not given)
15) Ginning_V0.pdf

5.5 - On June 12th, 2009
16) VariabilityStudy_West_V7.doc
17) VariabilityStudy_East_V6.doc
18) Visit_Everina_Modeste20090224-0315_V7.pdf
19) Docu_of_act_2008-11-25_TRACKING_Trim5_JPG.doc
20) Test_HVAC_V0.xls
21) salle22_temp.bmp
6 - Discussed topics
This file was updated according to the progress of our discussions during this week. This file collects all questions, remarks, decisions, …, made at that time.

6.1 - On June 8th, 2009
- How to fill-in a calendar for WTR (Working Time Report).
- How the budget lines for D.2.2. “variability studies” were divided up into several lines in the contracts
  o In East, between LZARDI, TBS and CIRAD,
  o In West, between SONAPRA/AIC, CERFITEX and CIRAD.
- Beginning of explanation of the hypothesis tested in D.2.2. “variability studies”.

6.2 - On June 9th, 2009
- Check West Africa presentations
- D.2.2_Mixing_Machine_UserManual_V1.pdf and display actual results from the validation experiment ongoing in Cirad.

6.2.1 - List of required standards
  o Obliged
    - ISO 139-2005
    - ASTM 5867-05 Test methods for measurement of physical properties of cotton fibres by High Volume Instruments
    - ASTM 1776-04: Practice for conditioning Textiles
  o Optional
    - ISO 17025-2005:
      - (ASTM 2495-01: Moisture in cotton by oven drying)
    o PEA: Consider a book grouping several standards linked to cotton and/or textile and/or fibres?

6.2.2 - Training topics for Laboratory supervisors year 1

<table>
<thead>
<tr>
<th>Topic</th>
<th>Preparation in French</th>
<th>Preparation in English</th>
<th>To be done?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Cotton and cotton properties, different views</td>
<td>XX</td>
<td>To be done</td>
<td>To be done</td>
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<tr>
<td>2. Description of the cotton quality assessment on the world cotton market - current situation</td>
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<tr>
<td>3. Instrument Classification on the example of USDA</td>
<td>X</td>
<td>X</td>
<td></td>
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<tr>
<td>4. About the CFC/ICAC/33 CSITC project</td>
<td>XX</td>
<td>X</td>
<td>X (2h00)</td>
</tr>
<tr>
<td>5. Instrument testing and HVI measurement principles</td>
<td></td>
<td>X</td>
<td>To be done</td>
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<tr>
<td>Topic</td>
<td>Preparation in French</td>
<td>Preparation in English</td>
<td>To be done?</td>
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<td><strong>6.</strong> Calibration) xx</td>
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<tr>
<td>6. HVI test result interpretation and factors influencing test results</td>
<td>X</td>
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<tr>
<td>7. Quality management according to ISO 17025 xx (technical requirements mainly)</td>
<td>To be done</td>
<td>X (2h00)</td>
<td></td>
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<tr>
<td>8. Overview: Laboratory management xx</td>
<td>To be done</td>
<td>To be done</td>
<td></td>
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<tr>
<td>9. Instrument and testing procedures maintenance… xx</td>
<td>X</td>
<td>To be done</td>
<td></td>
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<tr>
<td>10. Instrument calibration / reference material xx</td>
<td>X</td>
<td>X (0h20)</td>
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<tr>
<td>11. Laboratory conditioning xx</td>
<td>To be done</td>
<td>X</td>
<td></td>
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<tr>
<td>12. Additional technical laboratory prerequisites / supplies xx</td>
<td>X X</td>
<td>X</td>
<td></td>
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<tr>
<td>13. Laboratory management procedures - sample flow, xx</td>
<td>To be done</td>
<td>To be done</td>
<td></td>
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<tr>
<td>14. Round Testing and other verification programmes xx</td>
<td>X</td>
<td>To be done (from opening seminar by Axel)</td>
<td></td>
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<tr>
<td>15. Cotton production and harvesting x</td>
<td></td>
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<tr>
<td>16. Ginning x</td>
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<tr>
<td>17. Bale sampling procedure (and variability) xxX</td>
<td>To be modified from USDA presentation</td>
<td>to be modified from USDA presentation</td>
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<tr>
<td>18. Cotton processing / yarn / fabric x</td>
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<td>19. Practical exercises</td>
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<tr>
<td>20. Visit of labs</td>
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xx: priority for presentation, to be prepared and presented
XX: JPG added to the priority
x; least priority, could be discussed, to be prepared for sure for next sessions.

### 6.3 - On June 10th, 2009

- Conversions between inch and mm to be included in training sessions.
- Buy reference materials for calibration at a proper level comparable to the one which is true worldwide; reference materials are only valid for a 2 years period.
- IM, MR, H, Hs relationships; dye uptake and price information give a target to achieve in terms of maturity, fineness and micronaire of the fibres to be sold.
- Color measurement can be used to manage the bales in order to arrange lots with homogeneous color in order to save/add chemicals during the dying processes.
- Participation to CSITC round-test by accepting/rejecting claims depending on the participation of the customer / provider to this test with “good” evaluation results.
- Instrument classing in Africa will modify the Cotlook Index (price) as Africa will bring a proof of their cotons’s quality in comparison to other origins; at the breeding level, varieties in Africa are better than any other places, it has to be converted into practical production AND PROPER instrumental characterization FIRST to be seen in the price on the international market after getting a long term GOOD reputation. This requires knowledges, practices, …. in RTCs and to be transferred in the Labs.
- African Cotton Standards have been developped compared to national and US standards; these will be kept in parallel to instrument classing; however, as instruments are measuring color (Rd%, +b), those reference materials will only serve the purpose of “contamination” classing (trash, leaf, pepper trash …).
- Deliver of temp and hr recorders
- Air mangemenn system: add a second filtration for water in the schematic.
- Power supply:
  - consider a power stabilizer at the source of electricity
  - consider an UPS only for instrument and regulation
- Review of training documents
  - Modifications were made in the files saved as V1 files
  - These V1 version files have to be matched with C files (corrected in Bremen) to make a V2 file that will be the final files for next training session.
  - Data management PPT should not be used as it is describing SISTER which is CIRAD software, and which is not for sale. However, a proper data management system should take care of storing, for any sample (see DATA MANAGEMENT_V1.ppt):
    - The information about the origin of this sample along with
    - The way the equipment / technician / operator / ambiant conditions are set along with
    - The information about the calibrati on status of the equipment along with
    - The results for this sample.

6.4 - On June 11th, 2009

6.4.1 - List of softwares to analyze the collected data
A list of free softwares can be found on this website: http://fr.freestatistics.info/stat.php

Discussion around how to analyse data (histograms, regressions …)
Explanations were given with examples in Excel most of the time.
It is difficult to relate in text all the required operation; thus use the support system for any question (key F1 on the keyboard).
Histograms is a kind of descriptive analysis when nothing is known about the experiment setting (setting= what is test ed ? which treatments are applied ?). Calculation of mean, standrad deviation, CV% can be added in Excel as well.
Regression analysis can be use for example in the follow-up on reference materials results when they are tested as samples along the time : the objective is to check if is there any drift or deviation in the results.

6.4.2 - Activité C.1.2.11 : Regional round test for RTC East
6.4.2.1 - Objectives and main principles to be respected

- Use homogeneous cottons (unless, homogenize them) to insure that the differences in observed results between participating laboratories are not due to differences in raw materials;
- Use the mean of all labs as a basis of comparison, unless or in complement, include results from FIBRE, USDA and CIRAD in the mean used as reference for the comparison. Indeed, 5 laboratories are required to start a inter-laboratory test.

Note: budget to send out the samples to the laboratories is given in the activity C.1.2.11 of the BudgetTableOV7_EUR.xls file.

TBS / TCB lab will be considered as any other participating lab, not more, not less.

6.4.2.2 - To rapidly start the tests

To organize a first round-test, we need 500 grams per cotton and per laboratory, 15 participating laboratories. Thus, 7 kg of fibres are required for one round-test, for one cotton and 15 laboratories (laboratories of East Africa already functioning, FIBRE, USDA, CIRAD). Furthermore, for each round-test, a set of 5 various cottons are required for checking possible bias or drift and find their reasons.

For instance, a set of 5 cottons could be:
- a cotton with low micronaire;
- a long cotton;
- a strong cotton;
- a yellow cotton;
- a medium cotton.

To start, the RTC East may request from LZARDI and local companies if they could provide 7 kg of their saw ginned cotton.

For one round-test, with 7 kg of material being in RTC:
- each cotton should be homogenized very well.
- each cotton should be sampled to constitute 10 to 20 enveloppes of 500 grammes, carrying the cotton name on it;
- when all cottons are ready in enveloppes, we will have 5 cottons * 20 enveloppes = 100 enveloppes de 500 grammes.
- Then, sets of 5 cottons should be constituted with 5 different cottons, each set being sent to a different laboratory.

Envisaged laboratories (private, public, …) for the first round-test (in green = certain, unless take in touch with them to know their position):

- TANZANIA
  - TBS
  - TCB
  - Wakefield
  - 21st Century
  - …

- INTERNATIONAUX
  - FIBRE
  - USDA
  - CIRAD

Do we accept labs with individual instruments? NO
Do we accept results when a module of the instrument is not working? YES
6.4.2.3 - To prepare the normal routine work of the round-test

On a routine basis, sets of 5 cottons of 500 grams each should sent to all labs every 3 months (20 labs expected within 2.5 years). Thus, 20 * 4 tests/year * 2.5 years * 500 grams of cotton, or 100 kg of fibres per cotton are required.

Note 1: we assume that there will be no modification of technical characteristics within 2.5 years; to insure this, bales of cotton should be stored without light and without humidity.

Note 2: a too large mass of cotton necessitate a long storage duration which could affect its characteristics. Thus, it is not too good to get too much material in advance. However, it could be nice that a large quantity of 2 to 4 cottons would allow their use in several round-tests (successive or no) and thus allow a long time study of their performances.

A wide range of cotton qualities is required. We could consider that 10 to 15 cottons are necessary to allow a random choice among them for their participation into the tests; this avoid labs to get used on similar cottons along time.

Please consider asking to surrounding countries to provide you with various cottons (100 kg each). There are 7 countries around to provide you with material.

With 100 kg, each cotton should:
- Be homogenized
- Be sampled to create around 200 envelopes of 500 grams carrying the name of the cotton on the envelope;

When preparing a new round test, it is required to:
- Randomly choose 5 cottons tirer au hasard le nom des 5 cotons qui y participeront (see Excel Random_Cotons_RT.xls),
- constitute as many sets of 5 cottons as there are participating labs,
- Attention, the name of the cottons written initially on the cotton bale (its true name) should be changed on the envelopes going to the laboratories as Cotton 1, Cotton 2, Cotton 3, Cotton 4 et Cotton 5 (nothing else)
- Each set should be sent to a different lab.

6.4.2.4 - Routine operations

When the available amount of cotton is decreasing, or when the range in any given characteristic is not extended enough (UHML, UI, Strength, Micronaire, Rd and +b), you should:
- Find new sources of cottons
- And proceed as explained above

6.4.2.5 - Results from the labs and interpretation

It was decide to create a simple system at first before moving to the CSITC data base system from 2010 as stated in « Training Bremen Agenda and Minutesv9b preliminary.doc ».

6.4.2.6 - Support to the labs after the round-tests

The overall data analysis will provide charts to bring expertise to the labs (the same as given in the CSITC round test).

From these charts, where results from all of the 5 cottons during 5 days are compared to the average of all labs (the 0 line) could inform about any drift or deviation as:
- A trend in the results would indicate a calibration problem (machine, material..)
- Non-stable results would come from lack of practice or missing operating method, or from the AMS
- See presentation from the opening seminar.

It is possible to use the file Suivi_CSITC_Cerfitex.xls and apply it to all labs to track problems and solutions.
6.4.2.7 - Planning of the next Regional round tests

- East
  - Samples out: First RT: July during the training + mailing to others => this requires preparation in June
  - Results back for first RT: from the labs to RTC: July 15\(^{th}\);
  - Then, results will be sent with next samples to RTC beginning of October, results expected December 15\(^{th}\) …
  ➔ DM should send to JPG a file to evaluate the Round Trial results (for instance on water); this will serve as a basis to make the one for round tests on cottons for the 2 first RT; after, it will be done by the data base system on the csite.org website or similar. ➔ JPG +AD should make the adaptation of this file.

- West
  - Samples out: First RT: July during the training + mailing to others
  - Results back for first RT: from the labs to RTC: July 15\(^{th}\);
  - Then, results will be sent with next samples to RTC beginning of October, results expected December 15\(^{th}\) …

6.4.3 - Ginning with Gérard Gawrysiak

A presentation was made on the ginning process and the methods to be used to secure the original fibre quality by maintaining proper settings in the gin.

6.4.4 - Compressed images to save disk space and ease data transfer between partners

When an image is inserted in Word and PowerPoint, it is stored in its original size (big!). To avoid this, it is possible to compress the images to a smaller size by:
- right click on the image;
- go to menu “image format”;
- click “compress”;
- select if you want to compress this image or all in the document;
- choose “web/ screen display” in place of “printing” (ppp indication should come down from xxx to some 90 ppp);
- click apply, and images are compressed;
- save the file in this new configuration.

6.4.5 - Data management

Due to the HVI data base existing systems:
- only unique Lot ID name
- and sample ID name within a Lot ID name could exist.
So, please consider organize LOT IDs and Samples ID according to the activities of the RTC:
- round test
- retest,
- lab test …

Also consider organize these IDs for reference materials tested as samples
Please consider having training on Microsoft softwares (Word, Excel mainly and maybe Access for managing Uster HVI data bases).

6.4.5.1 - Data management for retest

Shown Modele_Retest Form_V3.xls for M1000 and M700 (to be sent to all RTCs when approved by PEA).
➔ DM + MT should send a Premier data file to JPG to set this model to that specific data set format.
6.4.5.2 - Data management for D.2.2. Variability study

Please respect the order of testing that is advised by Everina and JPG

- RTC East: Please order reference materials from now before Everina’s samples come to the laboratory for testing.
- RTCs: Please respect: one calibration for the whole study (print and file this information), then daily calibration checks (print and file this information)+ reference materials tested as samples (print and file this information) + send export files (*.xls or *.dat) to JPG and Everina.

6.5 - On June 12th, 2009

6.5.1 - Presentation of documents for D.2.2. variability study

The given documents can serve the purpose of informing people according to this study.

6.5.2 - Validation / approval of Air Management System

The first step when the AMS will be installed, you have to approve the system, for instance using heaters of various powers working one by one or in combination during the time records of temperature and humidity are taken every minute from independent sensors from the regulation sensors. Sensor positions to be agreed with the manufacturer (for instance, one meter from the in-let and/or out-let at one meter of altitude). The file Test_HVAC_V0.xls is giving an example of combination for running the heaters on a 33 hours period.

- PEA: independent sensors to be delivered when?
- PEA: request to get rechargeable batteries for these sensors or to get adapter connectable to the power supply.
- PEA those sensors should be able to safely store the data even when the power goes off.

As stated in ISO139, averages of measurements covering one hour are to be considered; these averages should be kept within the agreed tolerances by ISO 139 to approve the system from the person installing the AMS system (e.g. Branca Idealair or Cotimes).

The second step is to built the cartography of the room in order to homogenize the characteristics of the air everywhere (at least in the working / usefull zones) in the room (to be shown later e.g. Laura).

6.5.3 - Management of the lab

Procedures were prepared in Bremen. They have now to be applied, extended to other missing activities, and applied (who is doing what for when?) on sites.

Clear missions and time table should be described from the start to manage the lab to everyone; authorities and responsibility should be defined.

7 - Support of information provided to the Experts

At the end of the training session, one CDROM containing 19 files and 60.9 Mo of data was delivered to each Expert before they leave.

After the session, a Certificate was delivered to each Expert by postmail stating his participation to this Training Session.

8 - Evaluation of the training session by the Experts (to be finished after trainees leave)

Figure 1 gives the averaged notes given by the four Experts attending during the training sessions for ten criterias. Their feeling is stated in their overall comment “Satisfactory”.
Training session in Montpellier from June 8th to 12th, 2009 - CFC/ICAC/33 project

Figure 1: For ten criteria, averaged notes given in the CIRAD Training Evaluation Questionnaire by the Experts at the end of the Training Session 2009.