

AFIS/HVI Maturity Measurement Revised Algorithm, cont.

ITMF 2016

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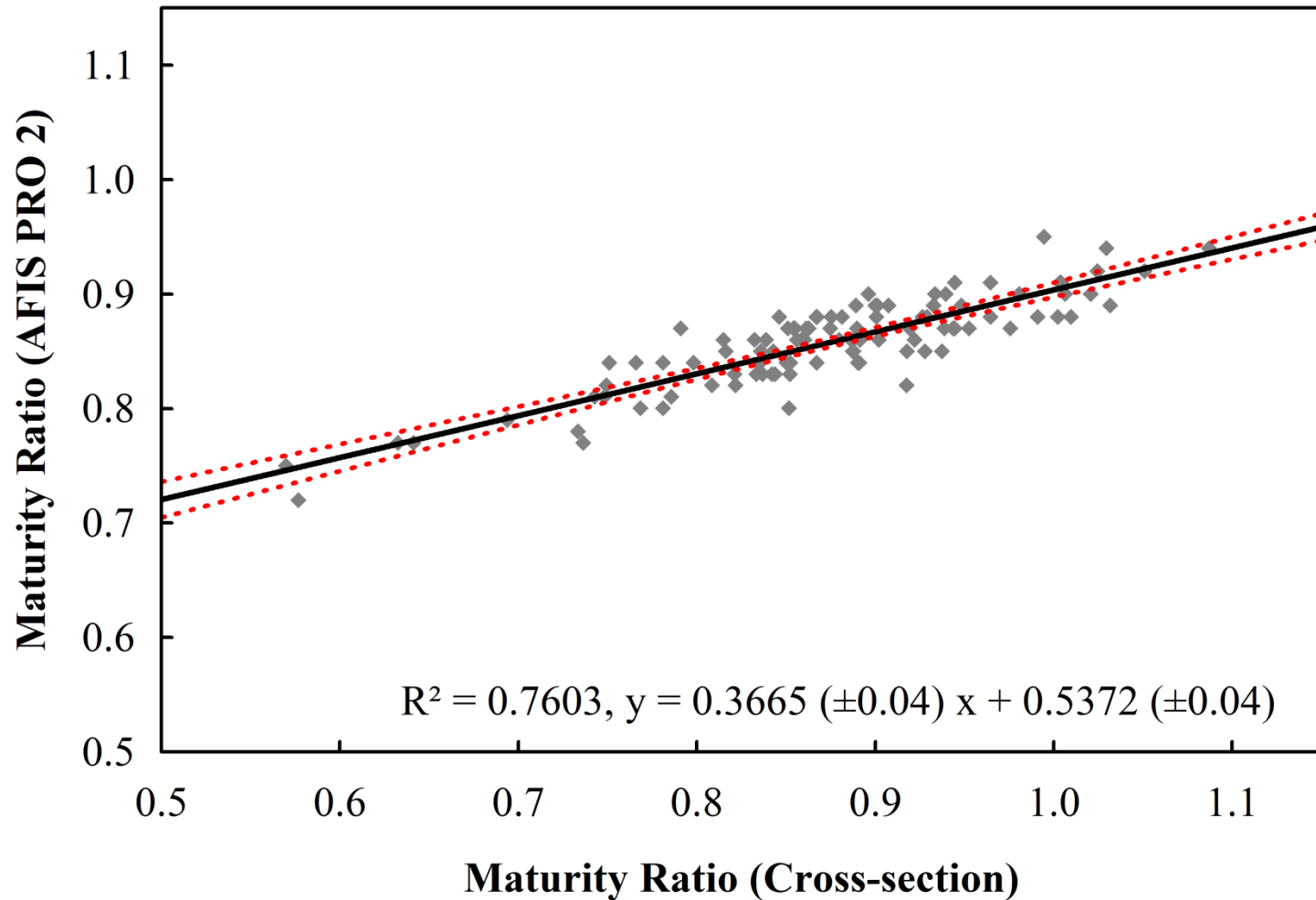
AFIS and HVI Maturity Measurement

Background

- Maturity as a measured parameter was introduced in AFIS in 1996, and in HVI in 1998. The reference for the AFIS maturity measurement is image analysis (IA). The reference for the HVI maturity measurement is AFIS.
- On AFIS, the maturity measurements Maturity Ratio, Immature Fiber Content (IFC), and Fineness replaced the previously used parameter Diameter.
- IA data from 36 cottons provided by Texas Tech and measured by USDA-ARS (SRRC) was used to establish AFIS maturity and its initial calibration.
- As an effort to improve the accuracy and the range of reference data, a sample set of 104 cottons was collected and tested thoroughly via image analysis establishing maturity values.
- Comparison tests on AFIS and HVI, while showing good correlation, indicated a narrower range for this measurement reflecting the characteristics of the original reference samples, as also confirmed by Dr. Jim Rogers of USDA SRRC in a previous CSITC Task Force meeting.

AFIS and HVI Maturity Measurement

Dr. Rogers Study Results



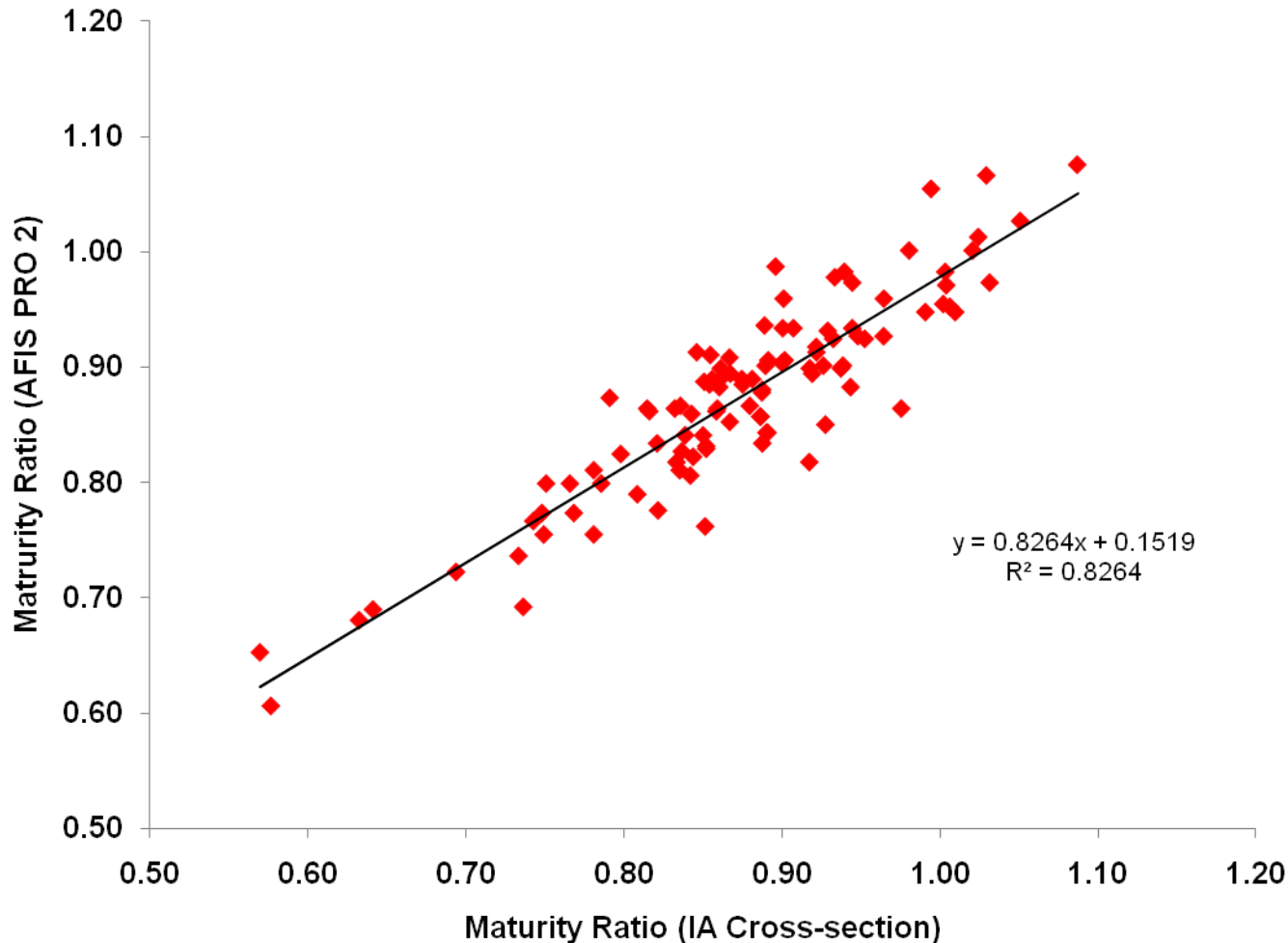
AFIS/HVI Maturity

2014 Study Methodology

- The purpose of the study was to take the IA data for the 104 cottons and create a new calibration for AFIS and HVI to improve the maturity measurement range
- New calibrations were created for the AFIS PRO2 and HVI 1000 and applied in order to compare the their respective maturity measurements to IA.

AFIS and HVI Maturity Measurement

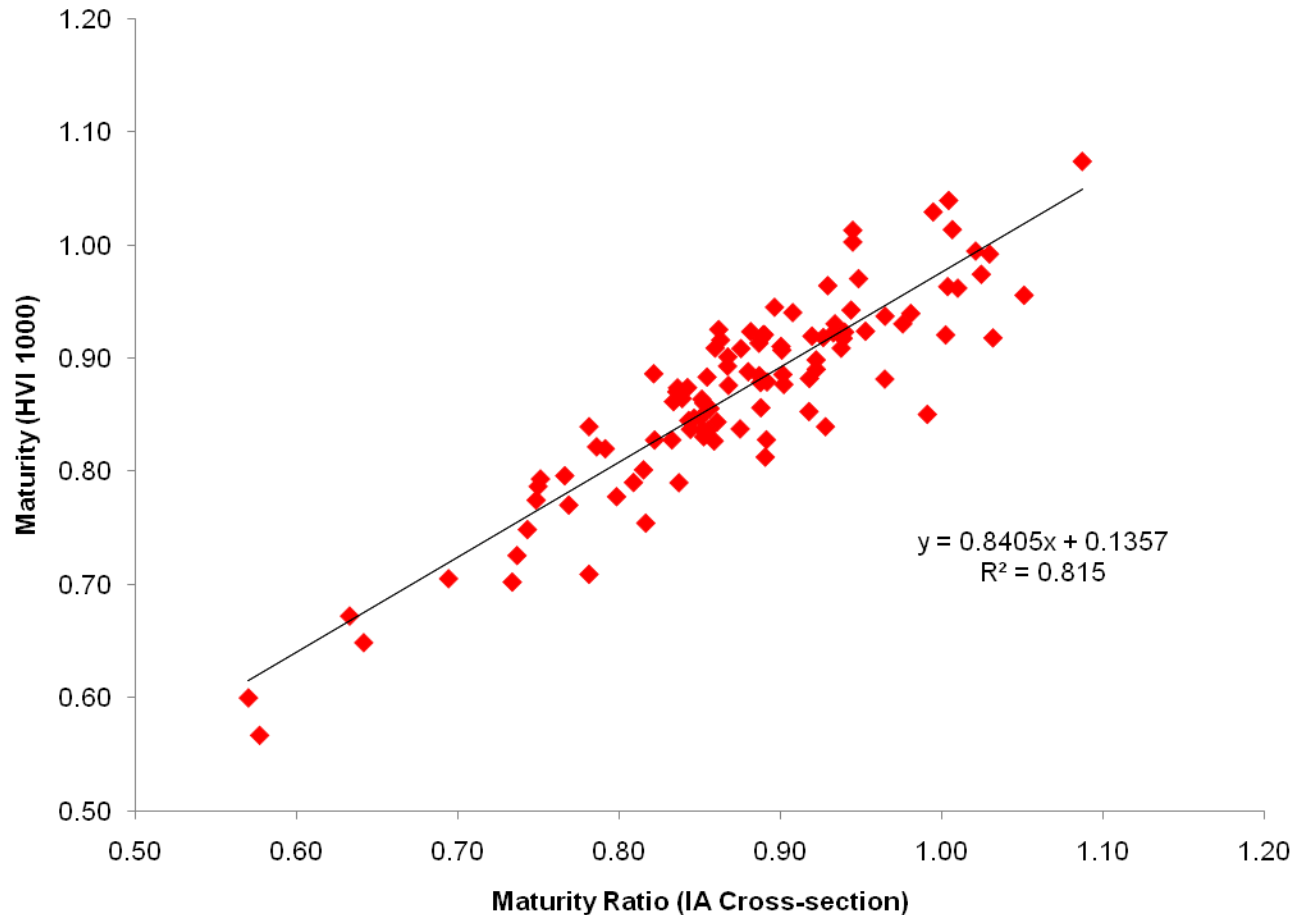
2014 AFIS PRO 2 results – correlation to IA results



- Correlation improved from $R^2 = 0.76$ to $R^2 = 0.83$
- Likewise, the measurement range improved from 0.23 to **0.47**
- The range for IA is 0.51

AFIS and HVI Maturity Measurement

2014 HVI 1000 results – correlation to IA results



- Correlation improved from $R^2 = 0.73$ to $R^2 = 0.82$
- Likewise, the measurement range improved from 0.09 to **0.50**
- The range for IA is 0.51

AFIS and HVI Maturity Measurement

2014 Conclusions

- Using the IA maturity data from the 104 cottons, new maturity calibrations were devised & implemented for AFIS PRO 2 and HVI 1000.
- With the new calibrations, the correlations of AFIS PRO 2 and HVI 1000 to IA maturity data is further improved.
- Additionally, the measurement range for this measurement increased significantly to a similar range of the IA maturity data.

ITMF Progress Report 2014:

- *Axel Drieling indicated that with a change of the maturity parameter in the given instruments it should be assured that the results based on the old definition should not be mixed up with the results based on a new definition. This should preferably be assured by giving a different parameter name.*

AFIS and HVI Maturity Measurement

2016 Implementation

- An entirely different name is not easily implemented when the same parameter is being measured but with a revised algorithm/ calibration range only.
- Example: Change from Diameter to Maturity measurements on AFIS took years to be accepted by the end-user, especially those with AFIS units already installed and data being actively used. Many wanted to keep the Diameter measurement, despite Maturity being an improvement at that time.
- **Proposal:** Keep the definitions similar but easy to distinguish, and make them user-selectable!

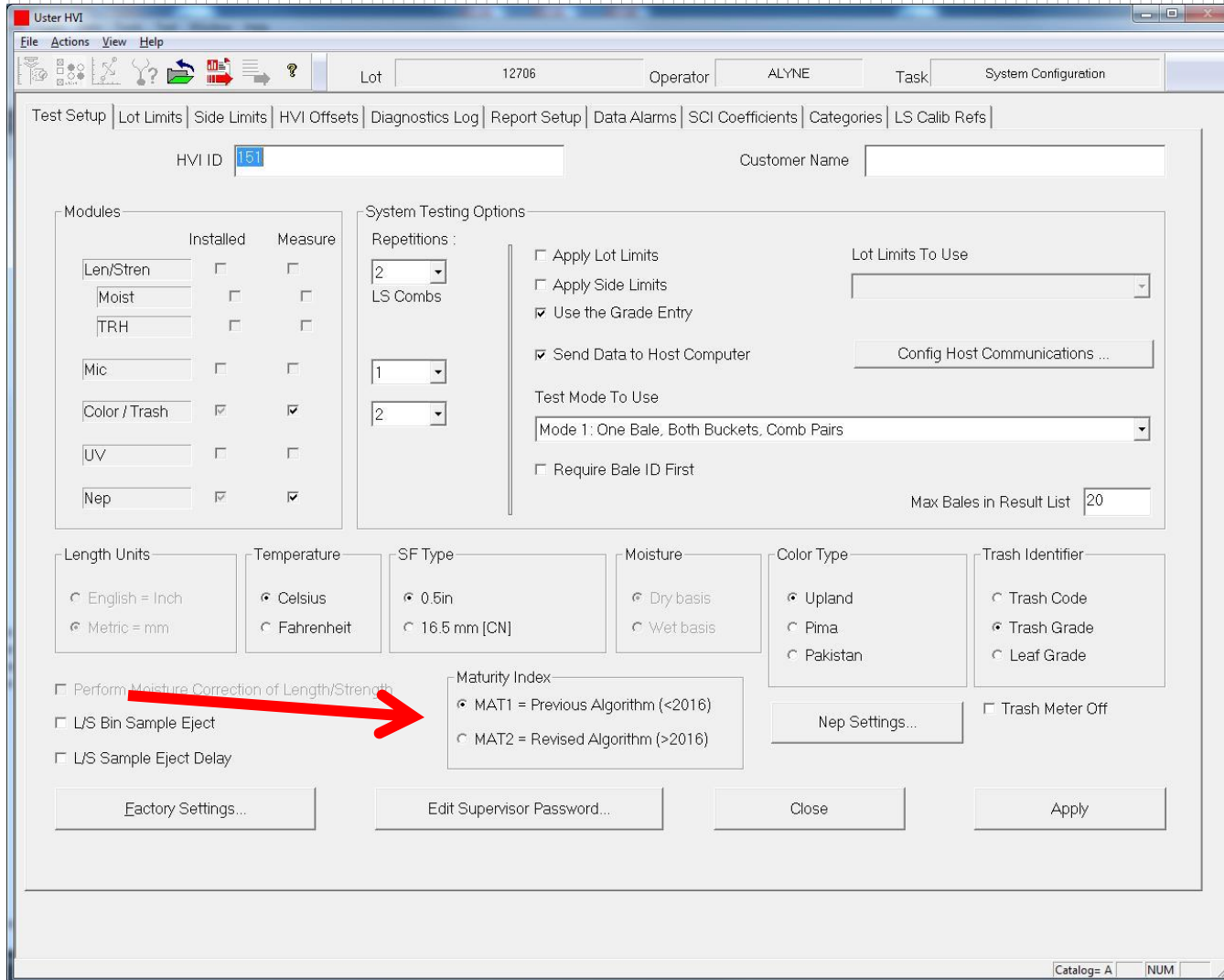
AFIS and HVI Maturity Measurement 2016 Implementation

- AFIS PRO 2

The screenshot displays the AFIS PRO 2 software interface. At the top, there is a 'Current Test' button and a help icon. Below this is a menu bar with 'Program Editor', 'Cassette Editor', 'Test Control', 'Reports', and 'Setup'. The 'Setup' menu is active, showing a 'Program ID' dropdown, 'Save', and 'Clear' buttons. A 'Title' field and an 'Add To Cassette' button are also present. The main area is divided into four tabs: 'Characteristic Data', 'Module Selection and Setup', 'Control Limits', and 'Automatic Reports'. The 'Module Selection and Setup' tab is selected, showing three sections: 'Modules to Test', 'Data to Display', and 'SFC Definition'. The 'Modules to Test' section has three checked items: 'Length / Maturity', 'Trash Classification', and 'Nep Classification'. The 'Data to Display' section has three columns of checked items. The first column includes 'L(w)', 'L(w) %CV', 'SFC(w)', 'UQL(w)', 'L(n)', 'L(n) %CV', 'SFC(n)', '5%(n)', 'Fineness', 'MaturityRatio', and 'IFC'. The second column includes 'Total Trash Count', 'Total Trash Mean Size', 'Dust Count', 'Dust Mean Size', 'Trash Count', 'Trash Mean Size', and 'Visible Foreign Matter (VFM %)'. The third column includes 'Nep cnt / g', 'Nep Size', 'Fiber Nep cnt / g', 'Fiber Nep Size', 'SCN cnt / g', and 'SCN Size'. The 'MaturityRatio' section has two radio buttons: 'MR1 = Previous Algorithm (< 2016)' and 'MR2 = Revised Algorithm (> 2016)'. A red arrow points to the 'MR1' radio button. Below this, there is a 'SFC Definition' dropdown set to '0.5' and 'Units' radio buttons for 'inches' and 'mm'.

AFIS and HVI Maturity Measurement 2016 Implementation

- HVI1000



AFIS and HVI Maturity Measurement

2016 Implementation

- Roll-out with next regularly scheduled software release in 2016 (exact dates TBD).

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