

CSITC Task Force Contributions

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Meeting of the CSITC Task Force,
Washington, D.C., USA, May 12, 2011

1 – Round Trial results

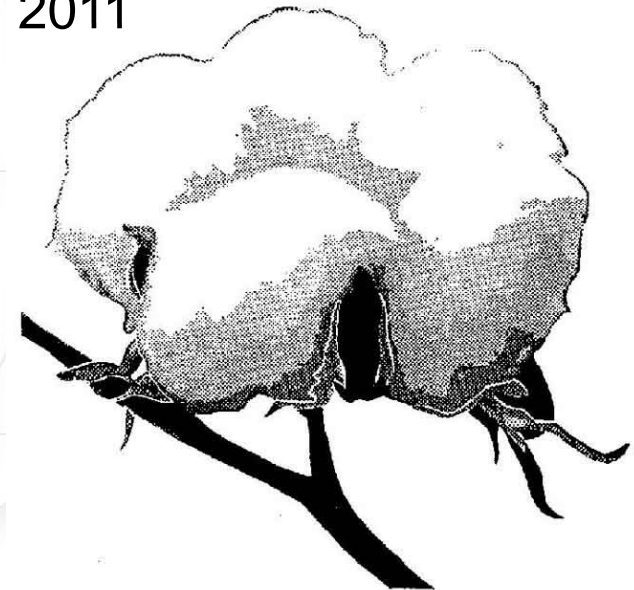
1.1 – RTs 2010 / 2011-1

1.2 – New evaluations

2 – Treatment of biased results

4 – Development of RTCs in Africa

6 – Best Practices Guide





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Review of Round Trial Results

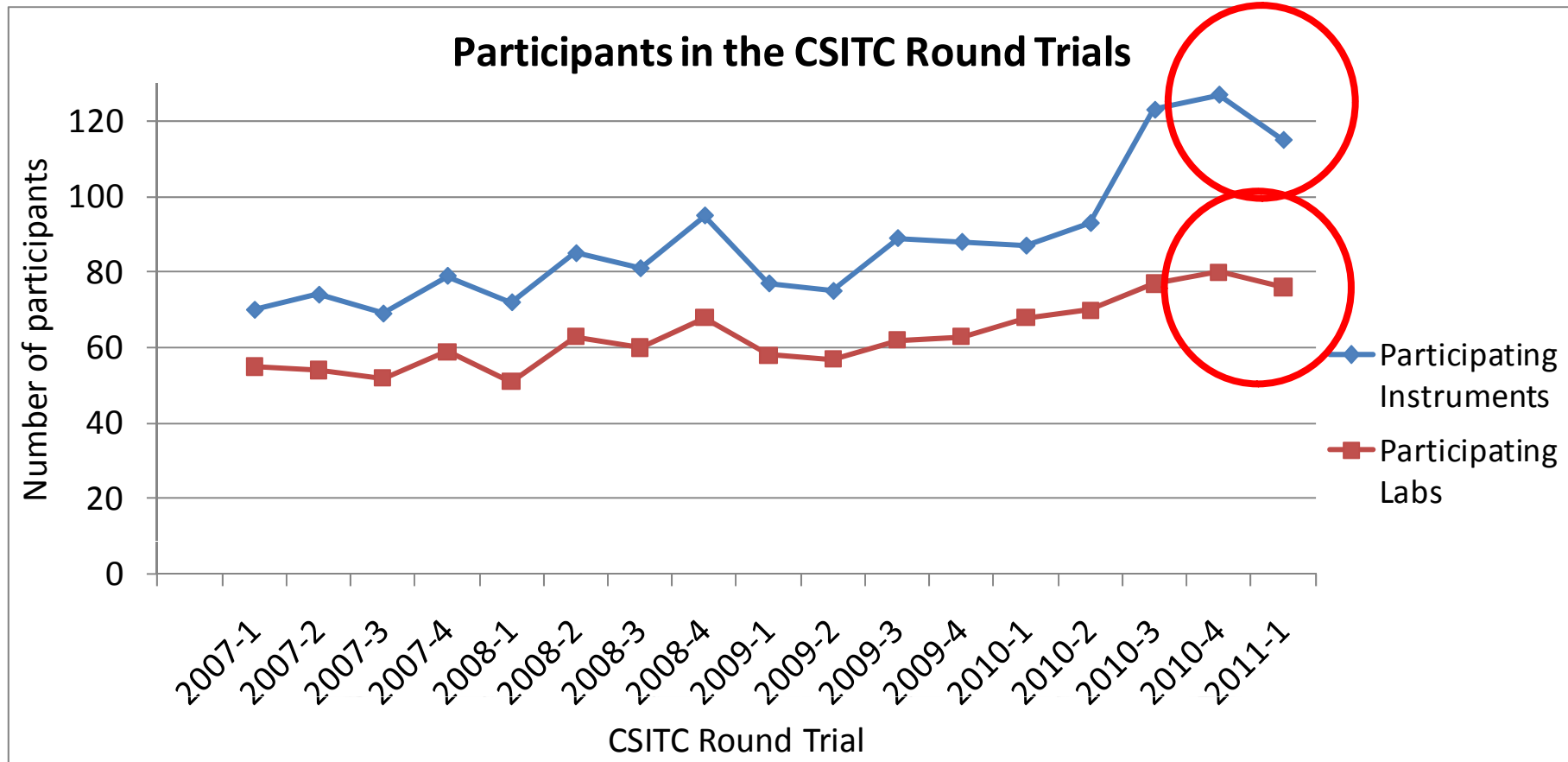
- Current: 2010-4 and 2011-1
- Compared to Summary since 2007
- Specific topics

- The six properties for instrument evaluation are
 - Mic, Strength
 - Length, Uniformity
 - Color Rd, Color +b
- Other parameters are included, but not taken for evaluation
 - SFI, Maturity (since 2009)
 - New: Trash Count, Trash Area (since 2010)

All results can be found and downloaded on/from

www.csitc.org

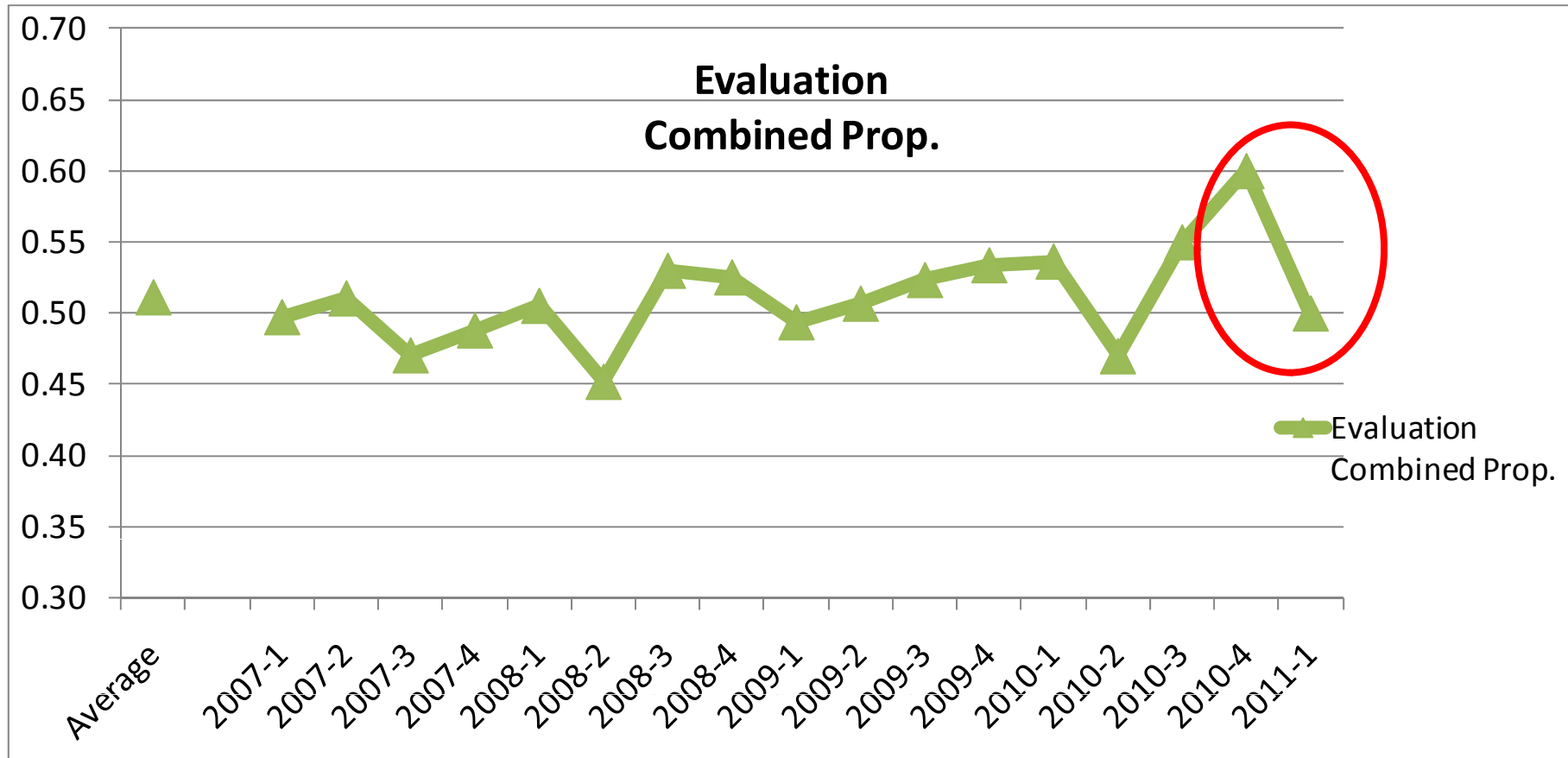
Round Trial Review Participants



Currently 111 laboratories are registered for at least 1 RT in 2011

Round Trial Review

Evaluation Combined Properties





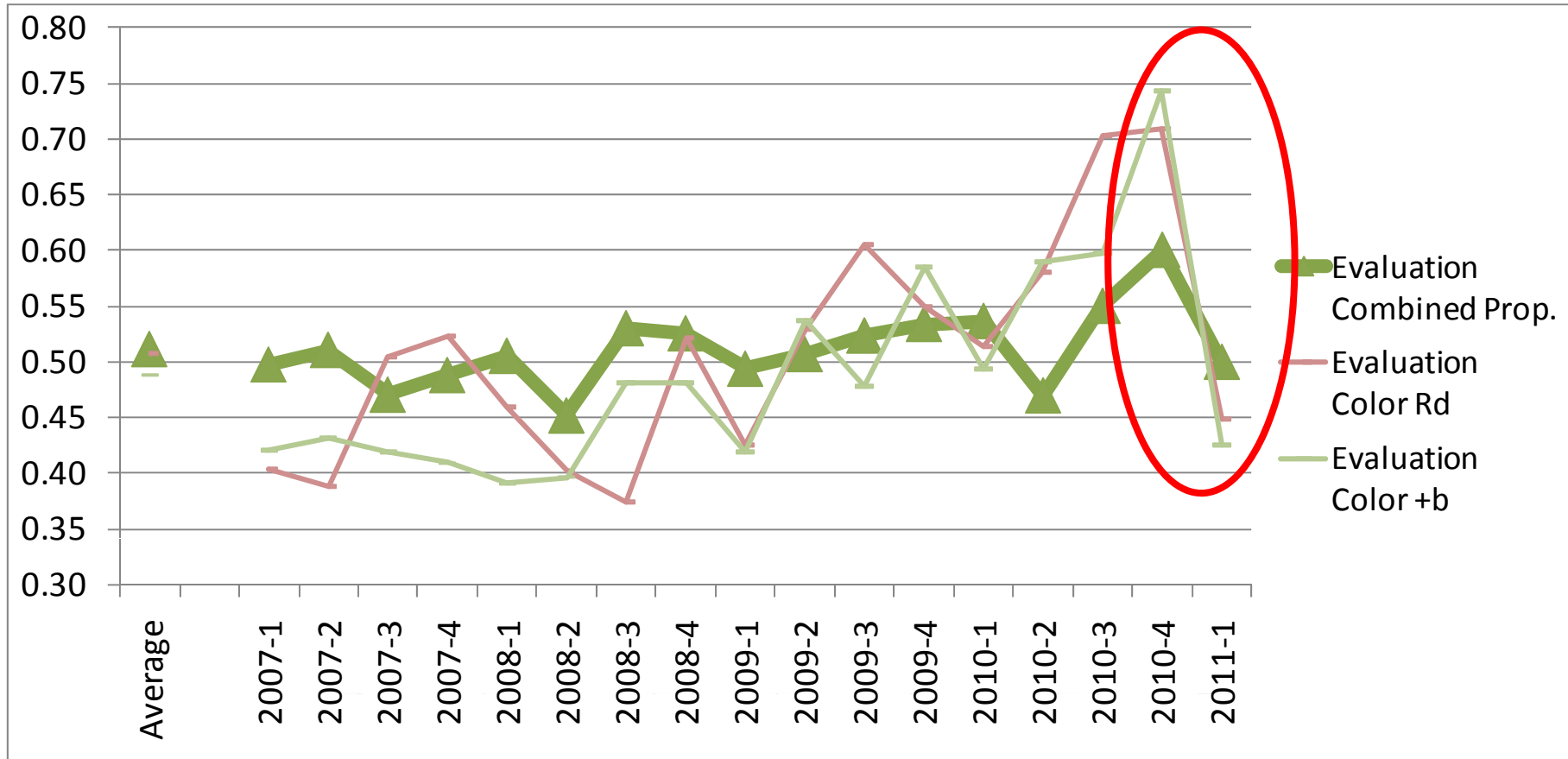
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Round Trial Review Evaluation Combined Properties



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Round Trial Review Evaluations of the Properties



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	Number of Participants		Median Evaluations						
	Participating Instruments	Participating Labs	Evaluation Combined Prop.	Evaluation Micronaire	Evaluation Strength	Evaluation Length	Evaluation Uniformity	Evaluation Color Rd	Evaluation Color +b
Average since 2007	88.2	63.1	0.51	0.51	0.48	0.42	0.37	0.51	0.49
2010-4	127	80	0.60	0.47	0.45	0.46	0.49	0.71	0.74
2011-1	115	76	0.50	0.48	0.47	0.40	0.34	0.45	0.43



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Going along with one bale over the years



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Bale ID	USDA Upland - same bale						
	Mic	Mic	Str	Len	Unf	Rd	+b
RT	Average	SD interlab (1)	Average	Average	Average	Average	Average
2007-3	3.85	0.09	33.24	1.177	83.66	75.91	11.11
2008-1	3.88	0.08	33.25	1.176	83.70	76.05	11.11
2009-2	3.87	0.07	33.22	1.173	83.62	76.01	11.37
2009-4	3.87	0.10	33.46	1.178	83.78	75.47	11.42

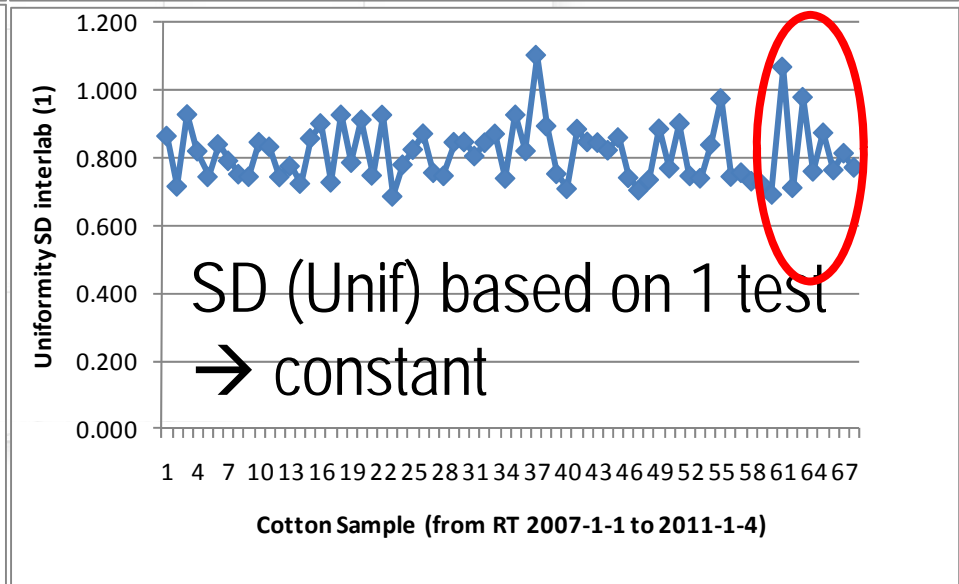
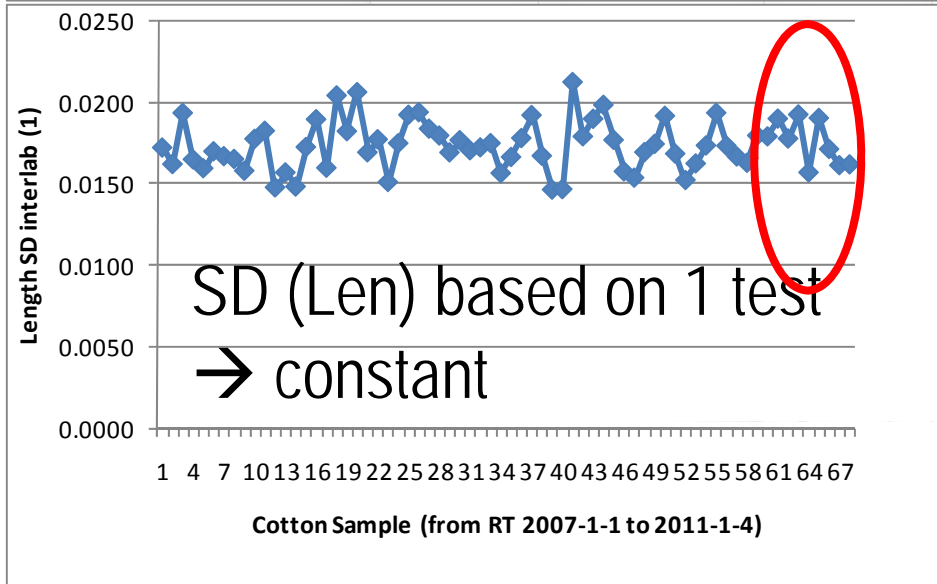
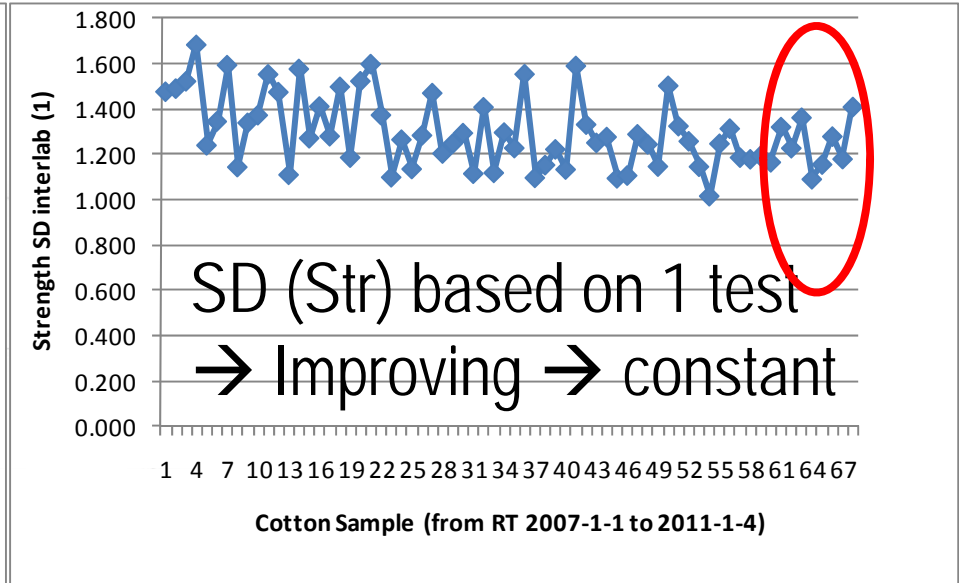
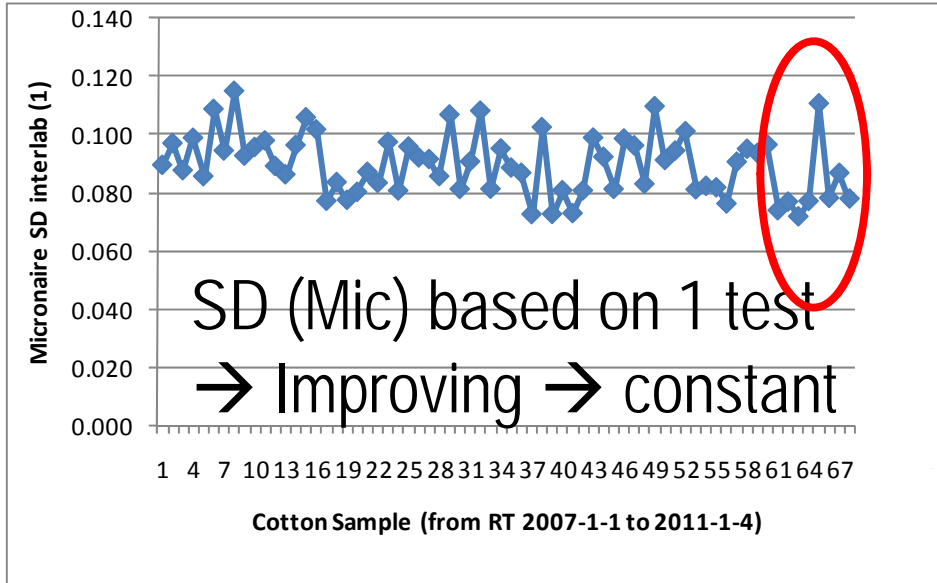


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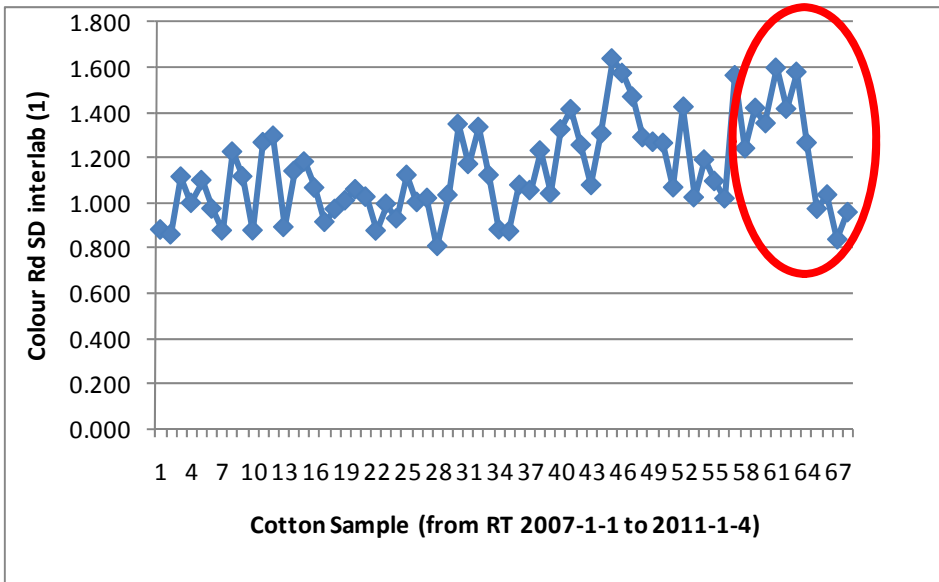
Interlab Result Variation SD(property) based on 1 test



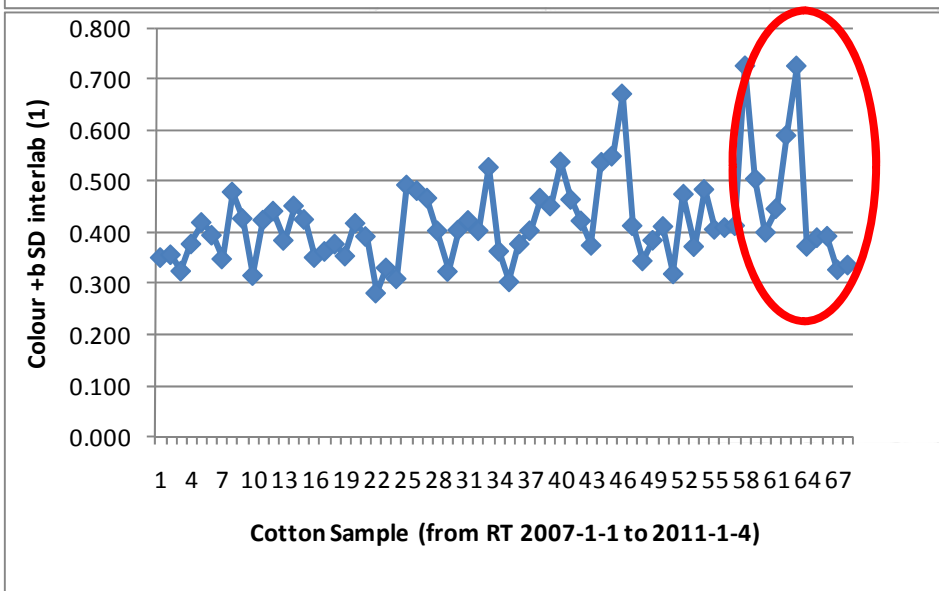
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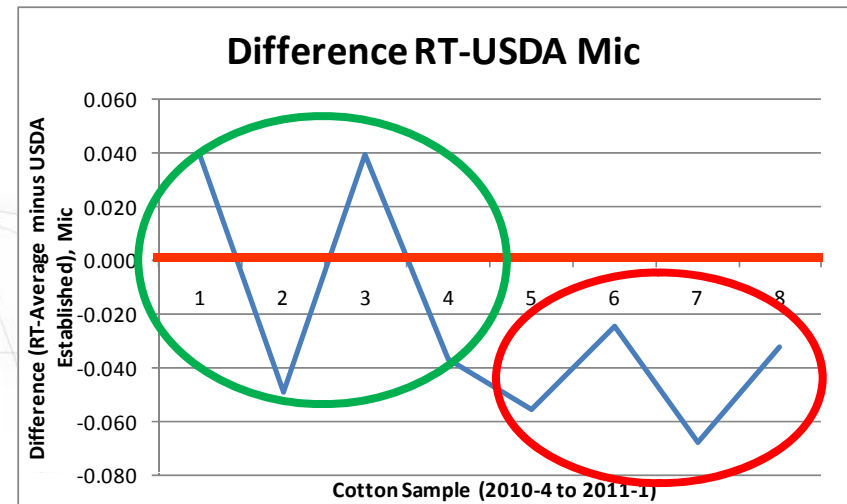
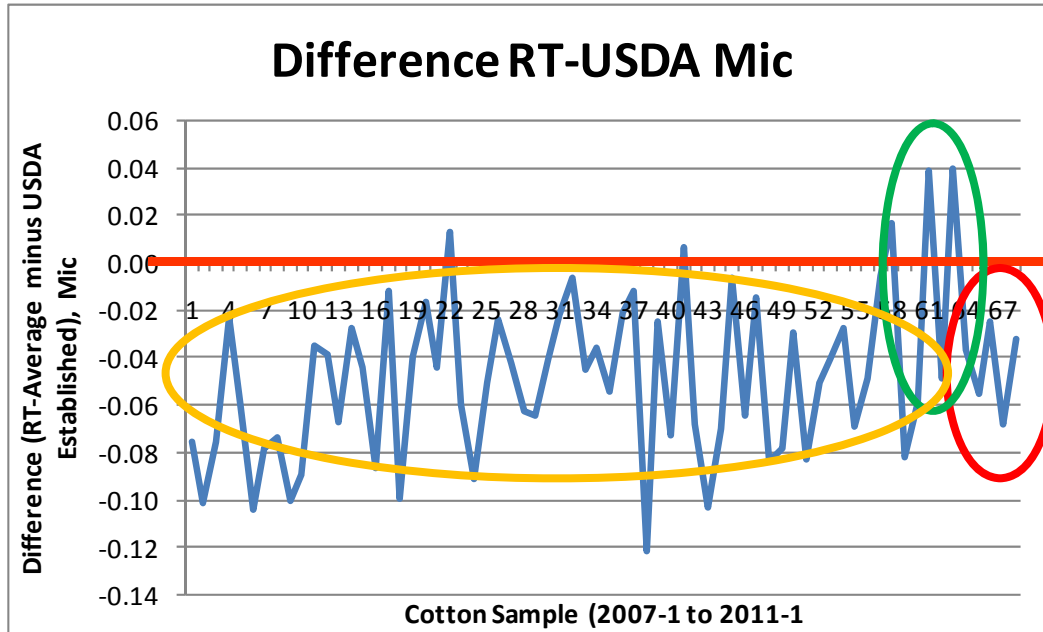
Interlab Result Variation SD(property) based on 1 test



SD (Rd) based on 1 test
 → Worsening
 → (except for RT 2011-1)



SD (+b) based on 1 test
 → Worsening
 → (except for RT 2011-1)



- Up to 2010-3 unsatisfying: biased results compared to USDA established.
- 2010-4: New Calib. Material given to all labs: the difference disappeared fully.
- 2011-1: Unfortunately the difference appeared again
→ obviously the calibration material was only taken in RT 2010-4
- What can we learn from this?

Average Difference Micronaire (RT – USDA) - 0.048 units

→ It will be possible to solve this difference

Average Difference Strength (RT – USDA): -0.05 gf/tex

→ Ideally fitting

Average Difference Length (RT – USDA): 0.002" (=0.05mm)

→ Ideally fitting

Average Difference L-Unif (Rt – USDA): 0.15 units

→ Well fitting



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Website / Database



CSITC Website

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Commercial Standardization of Instrument Testing of Cotton



International Cotton Advisory Committee



Round Trial Login

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[Technical information - Instrument testing](#)

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[RTC West Africa](#)

[Regions Without RTC](#)

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The ICAC Task Force on CSITC was created after representatives of merchants and spinners agreed that an international agreement on the use of instrument based quality evaluation systems was needed to standardize quality test results.

[Read more.....](#)



The aim of the project, which is funded by the Common Fund for Commodities (CFC) and the European Union, aims to improve the integrity of worldwide cotton trade by establishing a reliable system of instrumental cotton characterisation, adoptable by all cotton producing countries, especially developing countries.

[Read more.....](#)

Latest News

[CSITC Round Trial GL-2010-3 with record participation](#)

[Read more.....](#)

[CSITC Round Trial GL-2010-2 results are available](#)

[Read more.....](#)

[CSITC Round Trial database system available on-line](#)

[Read more.....](#)



The ICAC Task Force on CSITC is conducting global CSITC Round Trials consisting of quarterly tests. All cotton fiber testing laboratories capable of measuring cotton samples with rapid testing instruments, often referred to as high volume instruments (HVI), and based on the Universal Calibration Cotton Standards for Micronaire, Upper-half mean length, Length uniformity index, Strength, Rd color, and +b color are encouraged to participate.

[Read more.....](#)



The CFC/ICAC/33 project is co-funded by the European Union and the Common Fund for Commodities

a collaboration between

content | structure | design



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CSITC Website



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- All information available
 - CSITC Round Trial results
 - CSITC Task Force
 - CSITC Project
 - Instrument testing
 - Access to RT database
- RT participating Laboratories → database
 - Upload of data
 - All lab/instrument specific Round Trial reports
- Password for confidential data



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New Evaluation Systems

- Idea for an additional evaluation
(not meant to replace the existing one):
 - Compare the results of each instrument for each cotton based on suitable test result limits:
 - Looks at in/out criteria for results instead how far results are away from the reference result
 - The evaluation is more close to industry procedures
 - Achieve expressive/meaningful evaluation result instead of an Overall Evaluation result („0.57“), which is difficult to understand
 - Basis for applying commercial trade limits
 - The evaluation shows high selectivity for reproducibility of different instruments

- Procedure

- Compare absolute difference for each cotton and property with allowed limits (in/out response)
- For each property: Count number of cottons outside limits
- Finally: Is for one instrument any property having cottons with test results outside the limits?
- Possible addition: does the share of test results outside the limits exceed any allowed tolerance?
- Next step of addition: combine the evaluations of 4 Round Trials in one year

Additional Evaluation

Step 1

<u>Rt 2010</u>		Share	0						
<u>4</u>		Limits	0.2	2	0.03	2	100000	100000	
	Lab/Instr.	Sample	Micronaire	Strength	Length	Uniformity	Color Rd	Color +b	
Reference Values		Cotton 1	2.539	22.156	0.9714	77.669	78.371	11.883	
Reference Values		Cotton 2	4.211	32.854	1.2217	83.467	75.840	12.337	
Reference Values		Cotton 3	2.550	23.477	1.0364	79.270	73.549	14.609	
Reference Values		Cotton 4	5.013	29.334	1.0788	83.360	72.935	10.528	
Reference Values		Cotton 5	3.630	27.279	1.1110	81.940	75.836	10.837	
	C1	Cotton 1	2.577	20.417	0.9730	78.197	78.757	11.827	
	C1	Cotton 2	4.183	32.350	1.2127	83.297	76.317	12.380	
	C1	Cotton 3	2.563	22.043	1.0173	78.613	73.653	14.750	
	C1	Cotton 4	4.990	29.310	1.0761	83.010	72.970	10.400	
	C1	Cotton 5	3.633	26.220	1.1064	81.440	75.967	10.747	
	G1	Cotton 1	2.617	24.717	0.9997	77.803	78.003	11.270	
	G1	Cotton 2	4.257	30.020	1.2037	82.957	75.727	10.777	
	G1	Cotton 3	2.590	24.963	0.9947	78.183	73.480	13.973	
	G1	Cotton 4	5.033	29.200	1.0853	82.350	73.930	9.940	
	G1	Cotton 5	3.720	28.610	1.1203	82.497	76.660	10.037	

Additional Evaluation

Step 2

<u>Rt 2010</u>	Share								
<u>4</u>	Limits		0.2	2	0.03	2	1000000	1000000	
	Lab/Instr. Code	Sample	Mic Diff	Str Diff	UHML Diff	LU Diff	Rd Diff	+b Diff	
Reference Values		Cotton 1							
Reference Values		Cotton 2							
Reference Values		Cotton 3							
Reference Values		Cotton 4							
Reference Values		Cotton 5							
	C1	Cotton 1	0.038	-1.740	0.002	0.527	0.386	-0.056	
	C1	Cotton 2	-0.028	-0.504	-0.009	-0.170	0.476	0.043	
	C1	Cotton 3	0.014	-1.434	-0.019	-0.656	0.104	0.141	
	C1	Cotton 4	-0.023	-0.024	-0.003	-0.350	0.035	-0.128	
	C1	Cotton 5	no eval	no eval	no eval	no eval	no eval	no eval	
	G1	Cotton 1	0.078	2.560	0.028	0.134	-0.368	-0.613	
	G1	Cotton 2	0.046	-2.834	-0.018	-0.510	-0.114	-1.561	
	G1	Cotton 3	0.040	1.486	-0.042	-1.086	-0.069	-0.636	
	G1	Cotton 4	0.020	-0.134	0.007	-1.010	0.995	-0.588	
	G1	Cotton 5	no eval	no eval	no eval	no eval	no eval	no eval	

Additional Evaluation

Step 3

Rt 2010		Share							
4		Limits		0.2	2	0.03	2	1000000	1000000
				UHML					
				Mic out	Str out	out	LU out	Rd out	+b out
		Code	Sample	of limits	of limits	of limits	of limits	of limits	of limits
Reference Values			Cotton 1	0.2	2	0.03	2	1000000	1000000
Reference Values			Cotton 2						
Reference Values			Cotton 3						
Reference Values			Cotton 4						
Reference Values			Cotton 5						
		C1	Cotton 1	0	0	0	0	0	0
		C1	Cotton 2	0	0	0	0	0	0
		C1	Cotton 3	0	0	0	0	0	0
		C1	Cotton 4	0	0	0	0	0	0
		C1	Cotton 5	no eval	no eval	no eval	no eval	no eval	no eval
		G1	Cotton 1	0	1	0	0	0	0
		G1	Cotton 2	0	1	0	0	0	0
		G1	Cotton 3	0	0	1	0	0	0
		G1	Cotton 4	0	0	0	0	0	0
		G1	Cotton 5	no eval	no eval	no eval	no eval	no eval	no eval

Additional Evaluation

Step 4: End?

Rt 2010		Share							
4		Limits							
Lab/Instr.									
Code	Sample			Mic share out of limits	Str share out of limits	UHML share out of limits	LU share out of limits	Rd Share out of limits	+b share out of limits
Reference Values	Cotton 1								
Reference Values	Cotton 2								
Reference Values	Cotton 3								
Reference Values	Cotton 4								
Reference Values	Cotton 5								
	C1	Cotton 1		0	0	0	0	0	0
	C1	Cotton 2							
	C1	Cotton 3							
	C1	Cotton 4							
	C1	Cotton 5							
	G1	Cotton 1		0	0.5	0.25	0	0	0
	G1	Cotton 2							
	G1	Cotton 3							
	G1	Cotton 4							
	G1	Cotton 5							

Additional Evaluation

Step 5: End?
Step 6: End?

Rt 2010										
4			0.2	2	0.03	2	1000000	1000000		
			0	1	1	0	0	0	50.0%	
	Lab/Instr.		Mic ok	Str ok	UHML ok	LU ok	Rd ok	+b ok	Sum out	Out
	Code	Sample								
Reference Values		Cotton 1	0	0	0	0	0	0		
Reference Values		Cotton 2								
Reference Values		Cotton 3								
Reference Values		Cotton 4								
Reference Values		Cotton 5								
	C1	Cotton 1	0	0	0	0	0	0	0	0
	C1	Cotton 2								
	C1	Cotton 3								
	C1	Cotton 4								
	C1	Cotton 5								
	G1	Cotton 1	0	1	1	0	0	0	2	1
	G1	Cotton 2								
	G1	Cotton 3								
	G1	Cotton 4								
	G1	Cotton 5								



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Additional Evaluation: Exemplary results for 2011-1



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	Mic	Str	Len	Unif	Rd	+b		
Allowed share	0							all: 115 instr.
Allowed limits	0.2	2	0.03	2	1.5	1		
No. Of labs out	8	21	13	1	25	9	Total	45.2%

	Mic	Str	Len	Unif	Rd	+b		
Allowed share	0							all: 115 instr.
Allowed limits	0.1	1	0.015	1	1	0.5		
No. Of labs out	47	71	53	22	67	31	Total	93.0%

	Mic	Str	Len	Unif	Rd	+b		
Allowed share	0							all: 115 instr.
Allowed limits	0.3	3	0.04	2	2	1.5		
No. Of labs out	0	6	6	1	14	2	Total	17.4%

- For the newly developed evaluation it is essential to choose suitable limits for each characteristic.
- Ideally they should fit to commercial trade limits
- The evaluation shows to each laboratory directly if it delivers results inside possible commercial trade limits
- The precision of the instruments can be added by evaluating the single test results instead of the average of 30 test results (currently not done)

Treatment of Biased Results: Bimodal Distributions in Color Results

- Mainly for color Rd
- Additionally for color +b

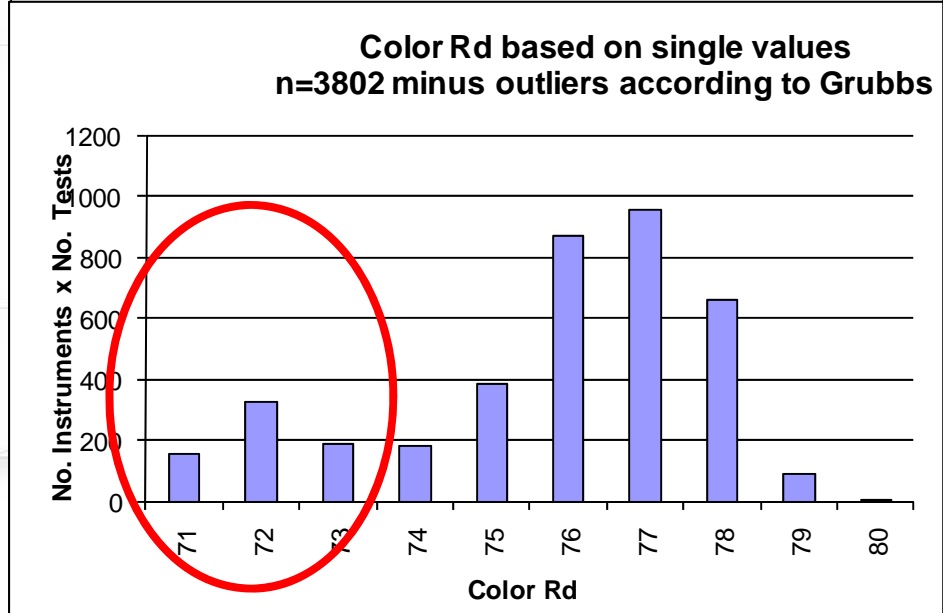
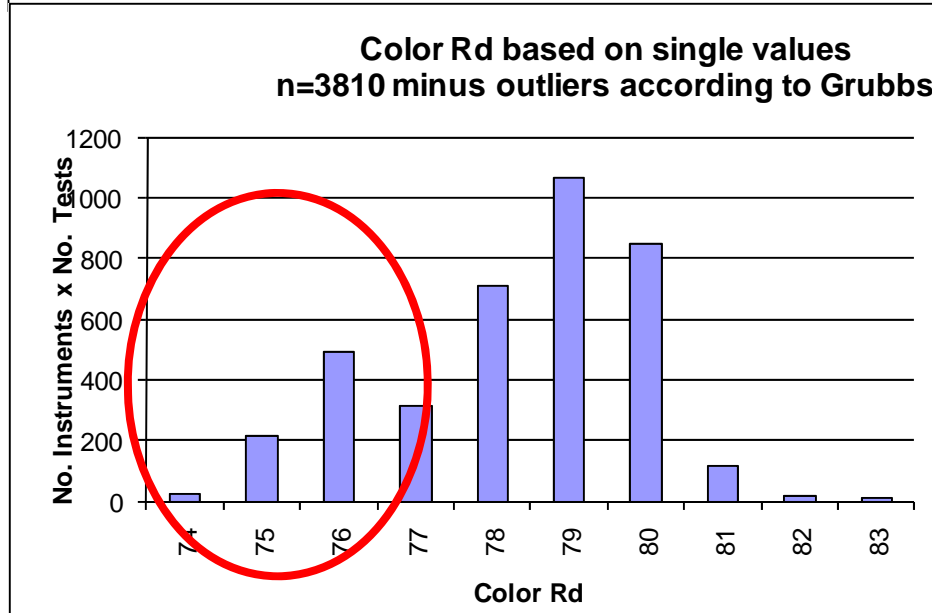
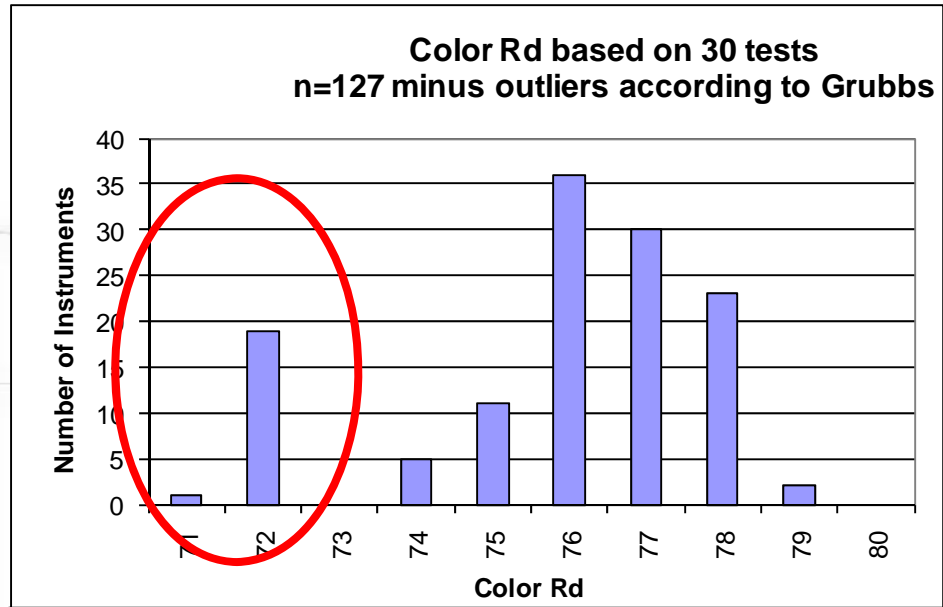
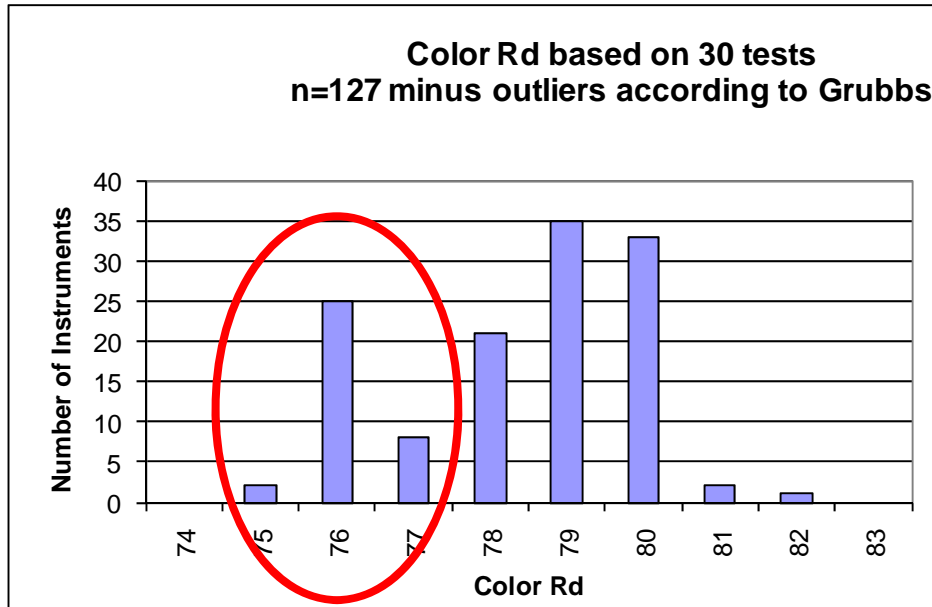


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Biased results: Bimodal Distrib. for Color Rd in RT 2010-4



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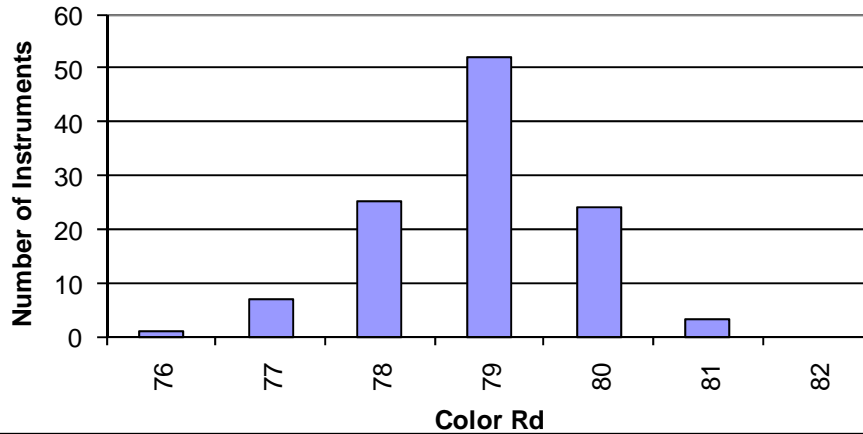
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Less biased results: Color Rd in other RTs

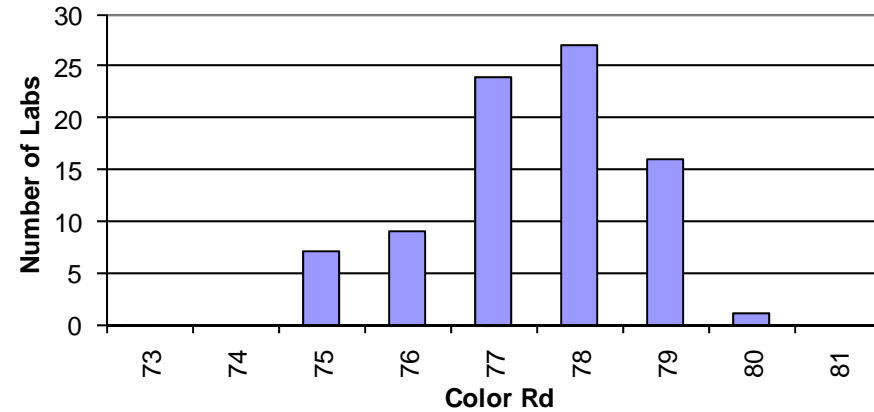


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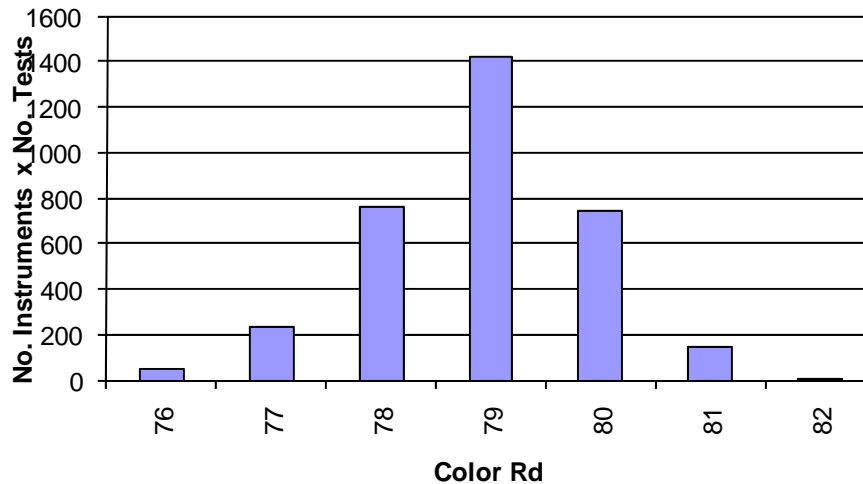
**Color Rd based on 30 tests
n=115 minus outliers according to Grubbs**



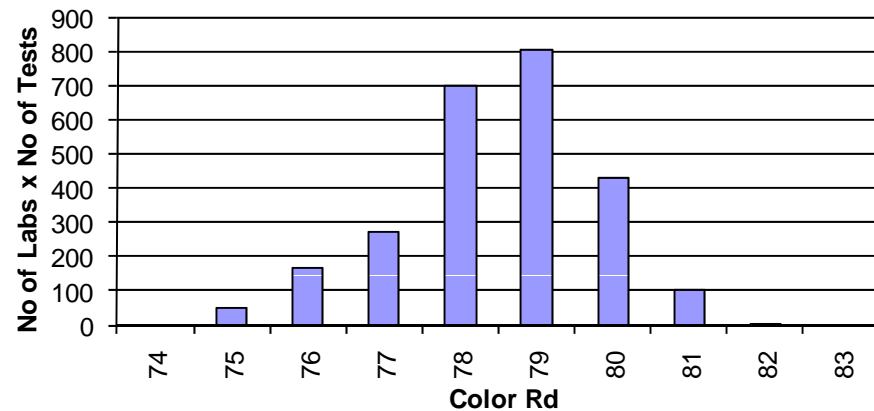
**Color Rd based on 30 tests
n=87 minus outliers according to Grubbs**



**Color Rd based on single values
n=3443 minus outliers according to Grubbs**



**Color Rd based on single values
n=2610 minus outliers according to Grubbs**



- Consequences:

- This effect is only dangerous in case that a large interrelated group of instruments shows similar behaviour (else we have single outliers in both directions, cancelling each other)
- Interlaboratory average as the reference for evaluating labs is strongly influenced
 - very dangerous, changes evaluation for all instruments
- Interlaboratory variation is strongly increased
 - shows higher interlab SDs, else no consequence
- The average laboratory evaluation for color is getting worse
 - shows worse evaluation distributions, else no consequence
- Single instruments are getting bad evaluations
 - adequate result for these instruments

- What to do:
 - Choose deviating instruments (how...) ?
 - Delete deviating instruments from interlab average ?
 - Delete deviating instruments from interlab SD ?
 - Delete deviating instruments from the lab evaluation ??
 - Delete deviating instrument results from all calculations ??
 - Exclude deviating instruments from participation ???

- How to do:

- Choosing the second maximum results from each sample – not suitable (distributions are not distinct)
- Choosing single instruments with „suspicious“ results – not suitable
- Shifting to USDA Established results – not possible (but master colorimeter)
- Choosing „trustable laboratories“ – too subjective
- Preferable way:
 - Compare results of at least 2 Round Trials with bimodal results on several cottons
 - Choosing „groups“ of interrelated instruments: Same lab or same organization or intense cooperation or linked quality management or same instrument type



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Biased results



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- Preferable way:
 - Start for Color Rd
 - Compare results of at least 2 finished Round Trials with bimodal results on several cottons
 - Examine all instruments in the second maximum of each cotton; find instruments with constantly wrong behaviour
 - Choosing „groups“ of interrelated instruments
 - Same lab or same organization or intense cooperation or linked quality management or same instrument type
 - Agree choice between FIBRE and USDA (and ICAC)
 - Choice will be treated totally confidential
 - Inform laboratories in advance
 - Exclude these results from the interlab. average (reference)
 - No exclusion from calculations for variation and instrument evaluations
 - Exclude the same instruments from +b
 - Continue exclusion until results fit again

- Findings:

- It was possible to choose a distinct group of instruments in the last 2 / 3 RTs
- The same instruments resulted in a bias in color +b, too, although not creating a bimodal distribution
- Exclusion of the chosen instruments results in suitable distributions
- After excluding the chosen instruments, the interlaboratory average was much closer to a group of „trustable laboratories“ (certainly subjective)
- It will be possible to start this procedure for RT 2011-2 if necessary and agreed



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Development of the Regional Technical Centers in Africa



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Africa: Participation in RTs



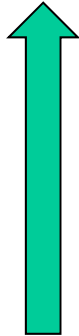
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	2007	2008	2009	2010	2011
Labs	8	11	9	12	14 registered
Instr. (parallel)	13	16	12	16	?
Countries	6	8	7	8	10 registered
Countries	Benin Egypt South Afr. Tanz. Zambia Zimbabwe	Benin Egypt Kenya South Afr. Sudan Tanz. Zambia Zimbabwe	Egypt Mali South Afr. Tanz. Uganda Zambia Zimbabwe	Burkina Faso Egypt Mali South Africa Tanz. Uganda Zambia Zimbabwe	Burkina Faso Egypt Mali Senegal South Africa Sudan Tanz. Uganda Zambia Zimbabwe

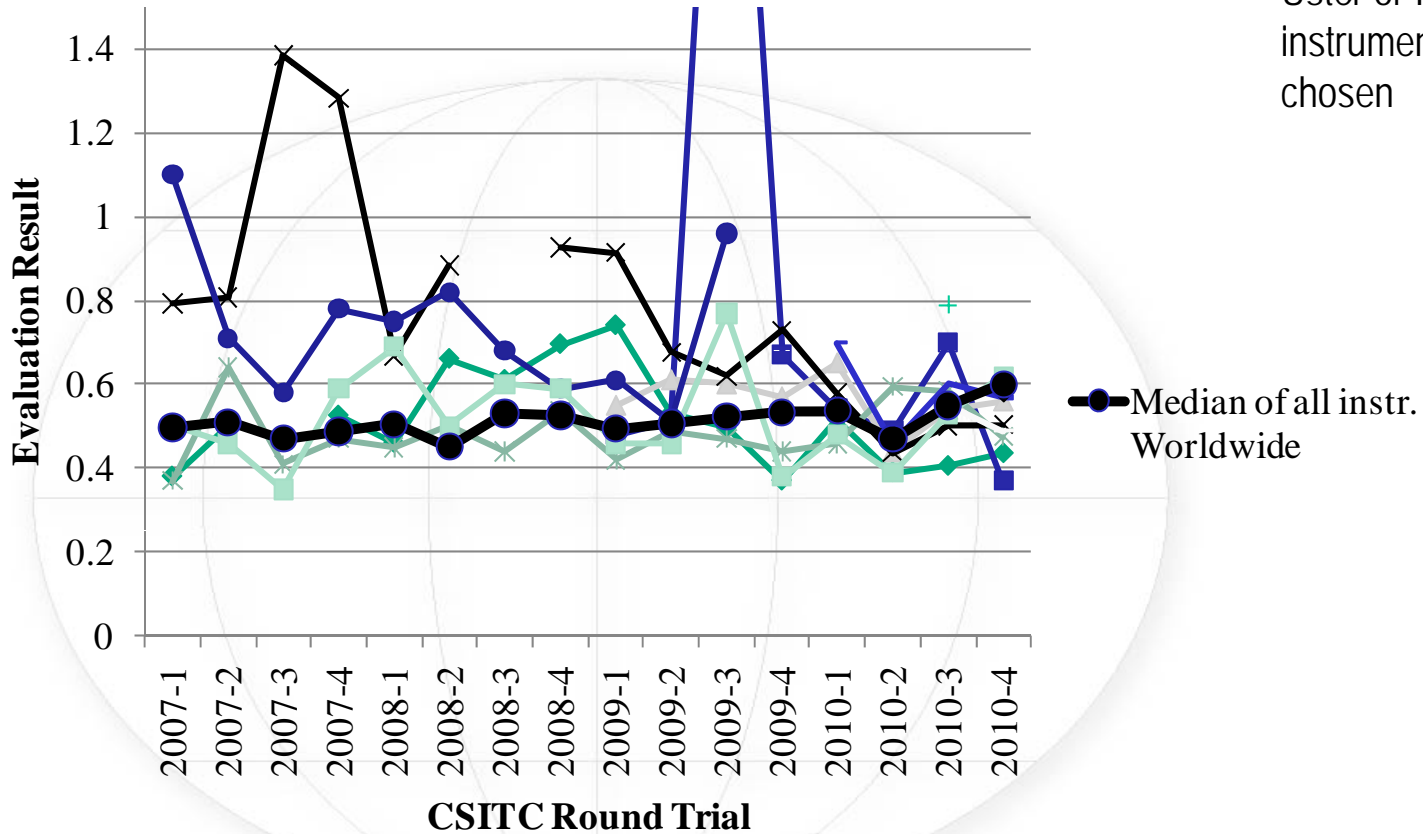
All African Laboratories in Comparison to Median of all Labs worldwide

Evaluation

Worse performance



Best performance



Only labs with Uster or Premier instruments chosen

There is a trend that the African labs are getting better and closer together



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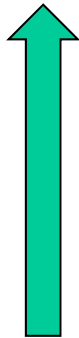
African Lab Evaluation Results in CSITC RT



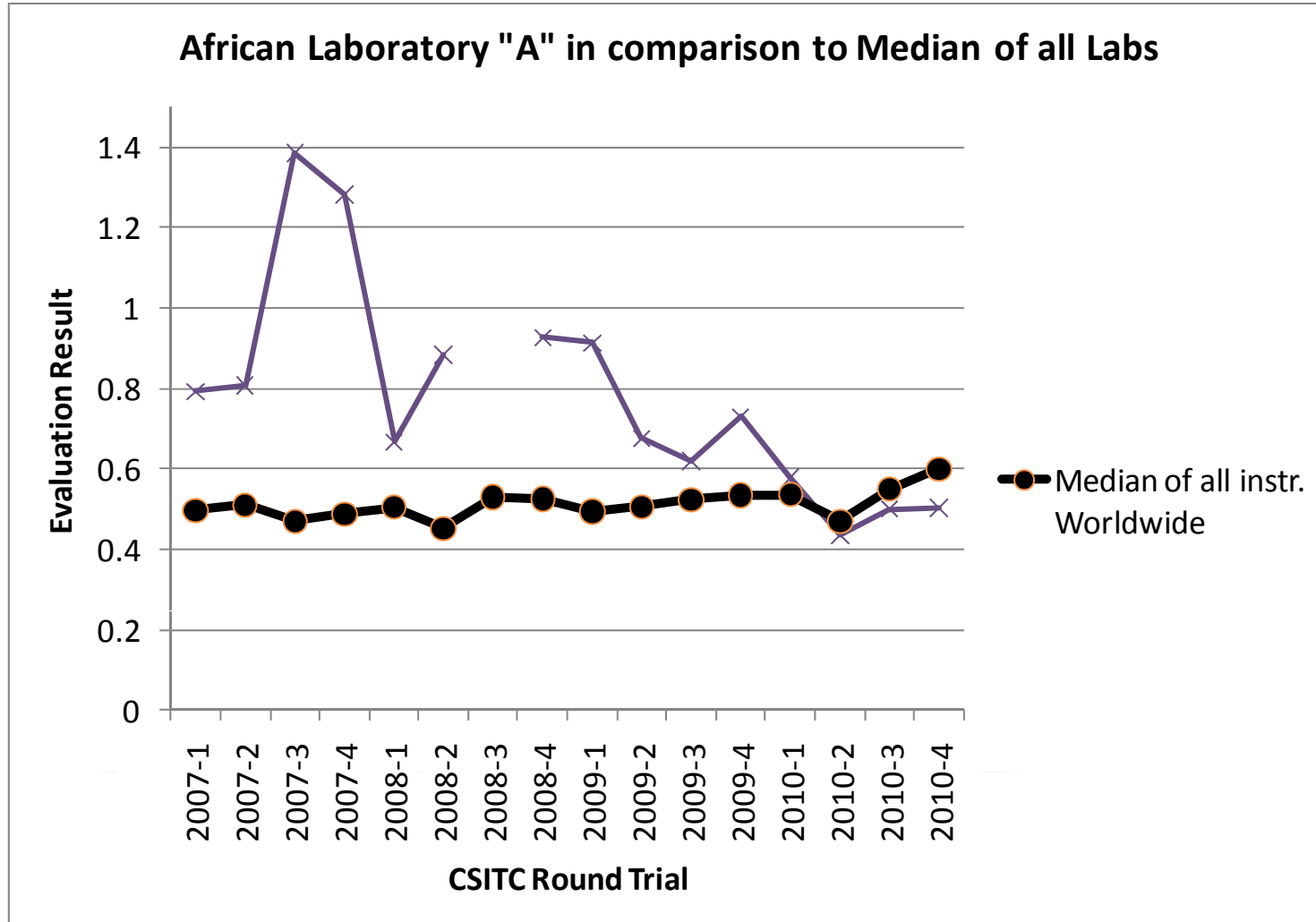
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Evaluation

Worse performance



Best performance

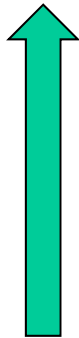


This lab improved strongly based on the CSITC support and RT evaluations

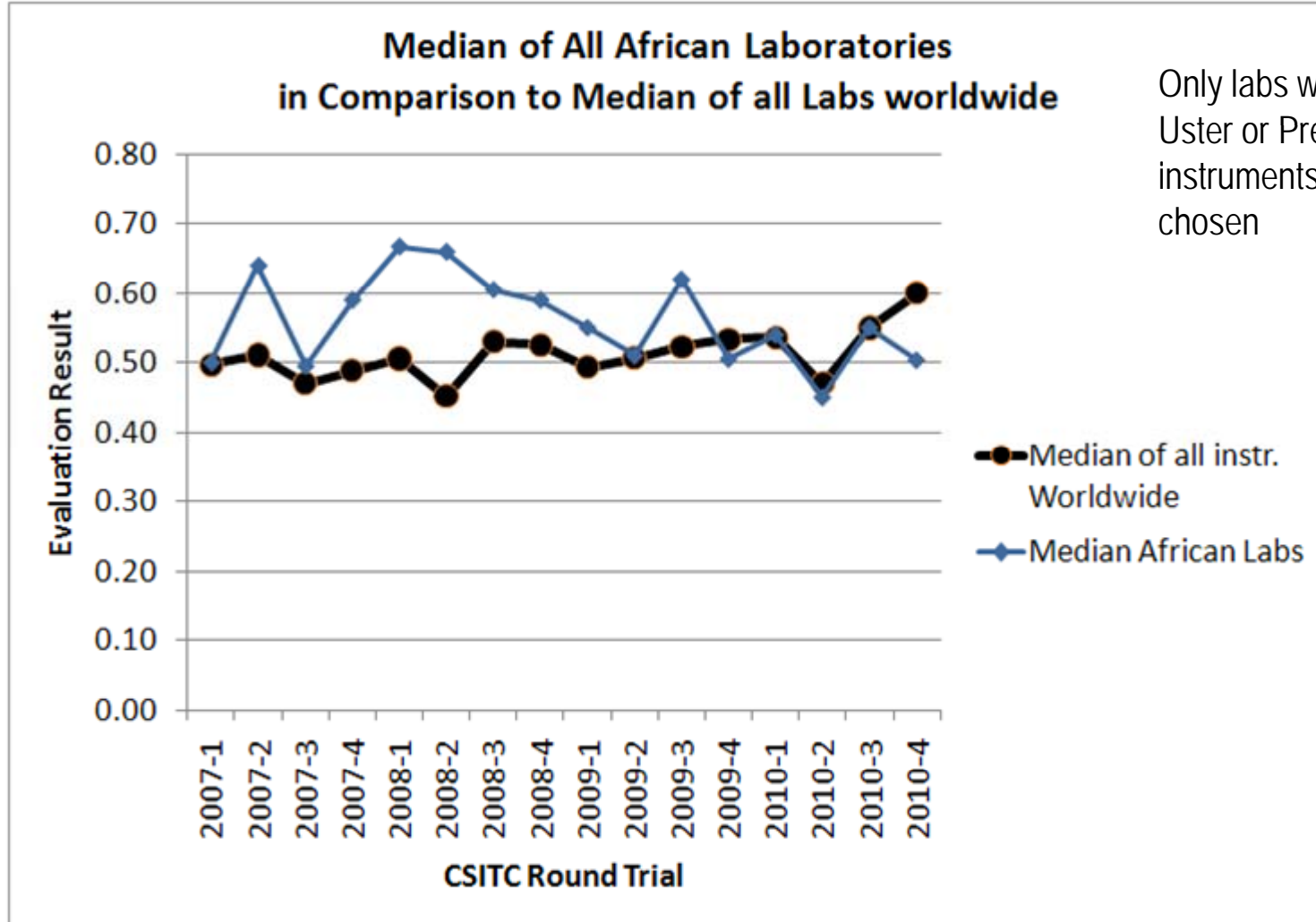
African Lab Evaluation Results in CSITC RT

Evaluation

Worse performance



Best performance



It is clearly visible that the African labs are getting better



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Best Practices Guideline



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Guideline



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Guideline for Commercial Standardized Instrument Testing of Cotton

ICAC Task Force on Commercial Standardization of Instrument Testing of Cotton

ITMF International Committee on Cotton Testing Methods

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Guideline



Lab of the Bremen Cotton Exchange

- 2 versions
 - Full version with explanations, requirements, additional recommendations and more information (currently 30 pages)
 - Small version with requirements and few basic explanations only (currently 15 pages)
 - Both are edited similarly, and the extraction is done afterwards
- Current version available on csitc.org → Technical information → Public information
- Finished for approval before next CSITC meeting



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Guideline



Lab of the Bremen Cotton Exchange

- **Planned timeline**
 - Filling of all chapters July/August
 - Inclusion of comments / changes from contributors before CSITC TF in September – 1st final draft
 - Comments from CSITC TF in September
 - 2nd final draft October – distributed to CSITC TF and ITMF ICCTM
 - Approval by CSITC TF in March 2012 (Bremen)
 - Approval by ITMF ICCTM in March 2012 (Bremen)