International Cotton Advisory Committee

CSITC
Global - Round Trial 2019 - 4
General Evaluation

Section One: Result Distribution
Section Two: Instrument Evaluation
Section Three: Within Limits Evaluation

Section One: Result Distribution

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System Provided by:
Generation 10 Limited

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** Faserinstitut Bremen are a Cooperation Partner with ICA Bremen*

Global - Round Trial 2019 - 4

Inter-Instrument Averages, Inter-Instrument Variations, Typical within-instrument Variations

Micronaire							
			Cotton 1	**Cotton 2**	**Cotton 3**	**Cotton 4**	**Average**
Average of Instruments (Grubbs)			3.324	4.992	4.017	4.169	
Reference Values for Evaluation			3.324	4.992	4.017	4.169	
Number Of Instruments			131	131	131	131	**131**
Inter-Instrument Variation	based on 30 tests	SD	0.050	0.043	0.046	0.051	**0.048**
		CV %	1.5	0.9	1.2	1.2	**1.2**
	based on 6 tests	SD	0.056	0.052	0.052	0.057	**0.054**
		CV %	1.7	1.0	1.3	1.4	**1.3**
	based on single tests	SD	0.063	0.060	0.061	0.071	**0.063**
		CV %	1.9	1.2	1.5	1.7	**1.6**
Typical within-instrument Variation (Median)	between different days with each 6 tests	SD	0.018	0.021	0.023	0.023	**0.021**
		CV %	0.5	0.4	0.6	0.6	**0.5**
	between single tests on one day	SD	0.026	0.030	0.033	0.036	**0.031**
		CV %	0.8	0.6	0.8	0.9	**0.8**
	between all tests on different days	SD	0.033	0.037	0.041	0.043	**0.038**
		CV %	1.0	0.7	1.0	1.0	**0.9**

Strength							
			Cotton 1	**Cotton 2**	**Cotton 3**	**Cotton 4**	**Average**
Average of Instruments (Grubbs)			29.561	26.358	33.911	22.732	
Reference Values for Evaluation			29.561	26.358	33.911	22.732	
Number Of Instruments			131	131	131	131	**131**
Inter-Instrument Variation	based on 30 tests	SD	0.582	0.783	0.624	0.640	**0.657**
		CV %	2.0	3.0	1.8	2.8	**2.4**
	based on 6 tests	SD	0.792	0.857	0.799	0.752	**0.800**
		CV %	2.7	3.3	2.4	3.3	**2.9**
	based on single tests	SD	0.955	1.004	0.983	0.888	**0.958**
		CV %	3.2	3.8	2.9	3.9	**3.5**
Typical within-instrument Variation (Median)	between different days with each 6 tests	SD	0.390	0.280	0.408	0.335	**0.353**
		CV %	1.3	1.1	1.2	1.5	**1.3**
	between single tests on one day	SD	0.546	0.492	0.568	0.502	**0.527**
		CV %	1.8	1.9	1.7	2.2	**1.9**
	between all tests on different days	SD	0.727	0.564	0.730	0.581	**0.651**
		CV %	2.5	2.1	2.2	2.6	**2.3**

Length							
			Cotton 1	**Cotton 2**	**Cotton 3**	**Cotton 4**	**Average**
Average of Instruments (Grubbs)			1.1107	1.0442	1.1833	0.9531	
Reference Values for Evaluation			1.1107	1.0442	1.1833	0.9531	
Number Of Instruments			131	131	131	131	**131**
Inter-Instrument Variation	based on 30 tests	SD	0.0099	0.0091	0.0078	0.0090	**0.0090**
		CV %	0.9	0.9	0.7	0.9	**0.8**
	based on 6 tests	SD	0.0111	0.0111	0.0104	0.0113	**0.0110**
		CV %	1.0	1.1	0.9	1.2	**1.0**
	based on single tests	SD	0.0139	0.0145	0.0136	0.0152	**0.0143**
		CV %	1.2	1.4	1.1	1.6	**1.3**
Typical within-instrument Variation (Median)	between different days with each 6 tests	SD	0.0049	0.0054	0.0048	0.0059	**0.0053**
		CV %	0.4	0.5	0.4	0.6	**0.5**
	between single tests on one day	SD	0.0090	0.0091	0.0087	0.0104	**0.0093**
		CV %	0.8	0.9	0.7	1.1	**0.9**
	between all tests on different days	SD	0.0102	0.0103	0.0102	0.0118	**0.0106**
		CV %	0.9	1.0	0.9	1.2	**1.0**

Uniformity							
			Cotton 1	**Cotton 2**	**Cotton 3**	**Cotton 4**	**Average**
Average of Instruments (Grubbs)			81.059	78.880	83.835	76.681	
Reference Values for Evaluation			81.059	78.880	83.835	76.681	
Number Of Instruments			131	131	131	131	**131**
Inter-Instrument Variation	based on 30 tests	SD	0.420	0.454	0.383	0.624	**0.470**
		CV %	0.5	0.6	0.5	0.8	**0.6**
	based on 6 tests	SD	0.528	0.564	0.474	0.707	**0.568**
		CV %	0.7	0.7	0.6	0.9	**0.7**
	based on single tests	SD	0.721	0.772	0.631	0.894	**0.755**
		CV %	0.9	1.0	0.8	1.2	**0.9**
Typical within-instrument Variation (Median)	between different days with each 6 tests	SD	0.253	0.282	0.224	0.323	**0.271**
		CV %	0.3	0.4	0.3	0.4	**0.3**
	between single tests on one day	SD	0.474	0.507	0.422	0.530	**0.483**
		CV %	0.6	0.6	0.5	0.7	**0.6**
	between all tests on different days	SD	0.551	0.585	0.490	0.620	**0.561**
		CV %	0.7	0.7	0.6	0.8	**0.7**

Color Rd							
			Cotton 1	**Cotton 2**	**Cotton 3**	**Cotton 4**	**Average**
Average of Instruments (Grubbs)			69.810	78.409	74.570	77.815	
Reference Values for Evaluation			69.810	78.409	74.570	77.815	
Number Of Instruments			129	129	129	129	**129**
Inter-Instrument Variation	based on 30 tests	SD	0.422	0.494	0.439	0.454	**0.452**
		CV %	0.6	0.6	0.6	0.6	**0.6**
	based on 6 tests	SD	0.463	0.521	0.458	0.507	**0.487**
		CV %	0.7	0.7	0.6	0.7	**0.6**
	based on single tests	SD	0.502	0.540	0.492	0.546	**0.520**
		CV %	0.7	0.7	0.7	0.7	**0.7**
Typical within-instrument Variation (Median)	between different days with each 6 tests	SD	0.194	0.175	0.146	0.174	**0.172**
		CV %	0.3	0.2	0.2	0.2	**0.2**
	between single tests on one day	SD	0.142	0.138	0.123	0.120	**0.131**
		CV %	0.2	0.2	0.2	0.2	**0.2**
	between all tests on different days	SD	0.260	0.242	0.199	0.222	**0.231**
		CV %	0.4	0.3	0.3	0.3	**0.3**

Color +b							
			Cotton 1	**Cotton 2**	**Cotton 3**	**Cotton 4**	**Average**
Average of Instruments (Grubbs)			14.894	8.676	14.121	9.573	
Reference Values for Evaluation			14.894	8.676	14.121	9.573	
Number Of Instruments			129	129	129	129	**129**
Inter-Instrument Variation	based on 30 tests	SD	0.363	0.228	0.308	0.230	**0.282**
		CV %	2.4	2.6	2.2	2.4	**2.4**
	based on 6 tests	SD	0.397	0.257	0.306	0.253	**0.303**
		CV %	2.7	3.0	2.2	2.6	**2.6**
	based on single tests	SD	0.415	0.276	0.326	0.262	**0.320**
		CV %	2.8	3.2	2.3	2.7	**2.8**
Typical within-instrument Variation (Median)	between different days with each 6 tests	SD	0.102	0.094	0.100	0.076	**0.093**
		CV %	0.7	1.1	0.7	0.8	**0.8**
	between single tests on one day	SD	0.080	0.065	0.072	0.062	**0.070**
		CV %	0.5	0.7	0.5	0.6	**0.6**
	between all tests on different days	SD	0.147	0.114	0.143	0.106	**0.128**
		CV %	1.0	1.3	1.0	1.1	**1.1**

Optional Parameters

Inter-Instrument Averages, Inter-Instrument Variations, Typical within-instrument Variations

Trash Count							
			Cotton 1	**Cotton 2**	**Cotton 3**	**Cotton 4**	**Average**
Average of Instruments (Grubbs)			19.78	13.98	25.70	25.72	
Reference Values for Evaluation			19.78	13.98	25.70	25.72	
Number Of Instruments			77	77	77	77	**77**
Inter-Instrument Variation	based on 30 tests	SD	5.00	3.60	7.12	7.39	**5.78**
		CV %	25.3	25.7	27.7	28.7	**26.9**
	based on 6 tests	SD	5.32	3.91	7.20	8.60	**6.26**
		CV %	26.9	28.0	28.0	33.4	**29.1**
	based on single tests	SD	5.88	4.78	7.68	9.14	**6.87**
		CV %	29.7	34.2	29.9	35.5	**32.4**
Typical within-instrument Variation (Median)	between different days with each 6 tests	SD	2.09	1.48	2.05	2.13	**1.94**
		CV %	10.6	10.6	8.0	8.3	**9.4**
	between single tests on one day	SD	2.52	1.83	2.54	2.90	**2.45**
		CV %	12.8	13.1	9.9	11.3	**11.8**
	between all tests on different days	SD	3.27	2.65	3.59	3.85	**3.34**
		CV %	16.5	18.9	14.0	15.0	**16.1**

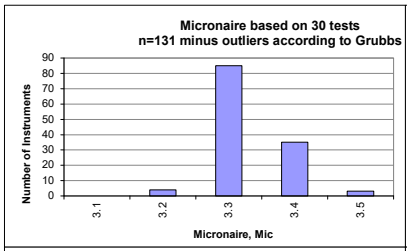
Trash Area							
			Cotton 1	**Cotton 2**	**Cotton 3**	**Cotton 4**	**Average**
Average of Instruments (Grubbs)			0.166	0.127	0.186	0.190	
Reference Values for Evaluation			0.166	0.127	0.186	0.190	
Number Of Instruments			77	77	77	77	**77**
Inter-Instrument Variation	based on 30 tests	SD	0.038	0.033	0.051	0.054	**0.044**
		CV %	22.9	26.2	27.3	28.3	**26.2**
	based on 6 tests	SD	0.045	0.042	0.052	0.056	**0.049**
		CV %	26.8	32.8	28.1	29.5	**29.3**
	based on single tests	SD	0.056	0.046	0.061	0.066	**0.057**
		CV %	33.7	36.4	32.5	34.7	**34.3**
Typical within-instrument Variation (Median)	between different days with each 6 tests	SD	0.023	0.016	0.019	0.018	**0.019**
		CV %	13.9	12.6	10.1	9.5	**11.5**
	between single tests on one day	SD	0.026	0.020	0.024	0.023	**0.023**
		CV %	15.4	15.8	12.7	12.2	**14.0**
	between all tests on different days	SD	0.034	0.029	0.033	0.034	**0.032**
		CV %	20.5	22.8	17.5	17.8	**19.6**

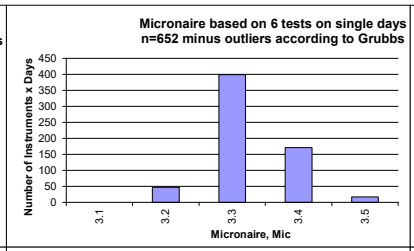
Maturity							
			Cotton 1	**Cotton 2**	**Cotton 3**	**Cotton 4**	**Average**
Average of Instruments (Grubbs)			84.02	88.26	85.70	85.40	
Reference Values for Evaluation			84.02	88.26	85.70	85.40	
Number Of Instruments			71	71	71	71	**71**
Inter-Instrument Variation	based on 30 tests	SD	0.79	0.70	0.90	0.94	**0.83**
		CV %	0.9	0.8	1.0	1.1	**1.0**
	based on 6 tests	SD	0.81	0.73	0.85	0.93	**0.83**
		CV %	1.0	0.8	1.0	1.1	**1.0**
	based on single tests	SD	0.84	0.78	0.88	0.95	**0.86**
		CV %	1.0	0.9	1.0	1.1	**1.0**
Typical within-instrument Variation (Median)	between different days with each 6 tests	SD	0.09	0.09	0.09	0.13	**0.10**
		CV %	0.1	0.1	0.1	0.2	**0.1**
	between single tests on one day	SD	0.11	0.13	0.13	0.18	**0.14**
		CV %	0.1	0.1	0.1	0.2	**0.2**
	between all tests on different days	SD	0.18	0.20	0.18	0.31	**0.22**
		CV %	0.2	0.2	0.2	0.4	**0.3**

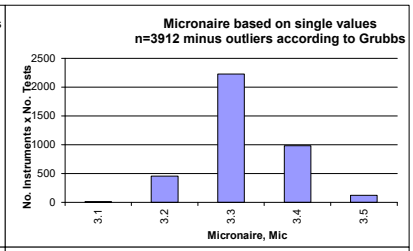
SFI							
			Cotton 1	**Cotton 2**	**Cotton 3**	**Cotton 4**	**Average**
Average of Instruments (Grubbs)			10.13	13.23	7.16	18.54	
Reference Values for Evaluation			10.13	13.23	7.16	18.54	
Number Of Instruments			79	79	79	79	**79**
Inter-Instrument Variation	based on 30 tests	SD	0.86	1.33	0.64	2.55	**1.34**
		CV %	8.5	10.0	8.9	13.7	**10.3**
	based on 6 tests	SD	0.89	1.38	0.66	2.59	**1.38**
		CV %	8.8	10.4	9.2	14.0	**10.6**
	based on single tests	SD	1.02	1.50	0.74	2.68	**1.48**
		CV %	10.1	11.3	10.4	14.5	**11.6**
Typical within-instrument Variation (Median)	between different days with each 6 tests	SD	0.28	0.38	0.16	0.48	**0.33**
		CV %	2.8	2.9	2.2	2.6	**2.6**
	between single tests on one day	SD	0.52	0.63	0.31	0.91	**0.59**
		CV %	5.1	4.8	4.3	4.9	**4.8**
	between all tests on different days	SD	0.60	0.73	0.35	0.99	**0.67**
		CV %	5.9	5.5	4.9	5.4	**5.4**

Test Result Distributions
Micronaire

Cotton 1







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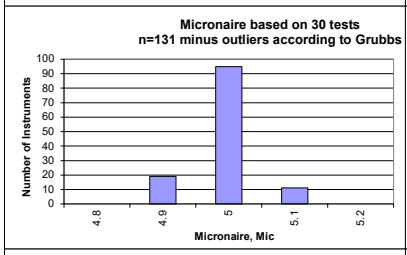

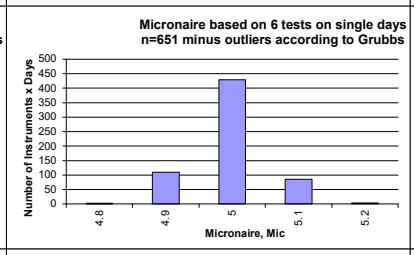

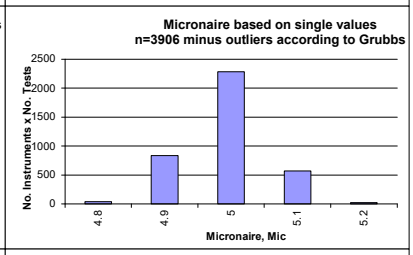

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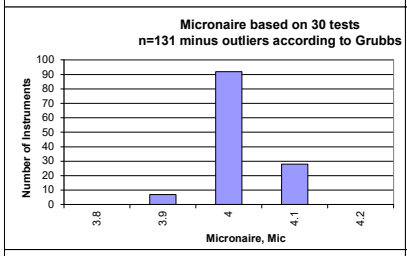

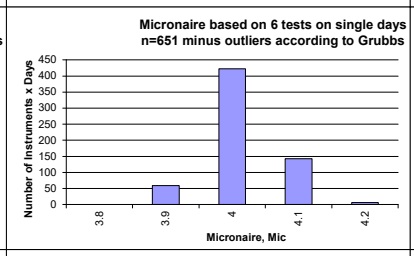

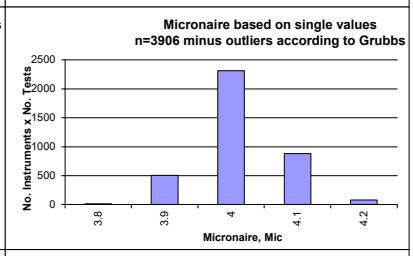

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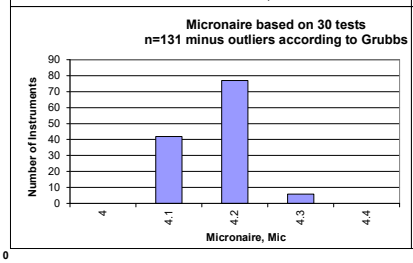

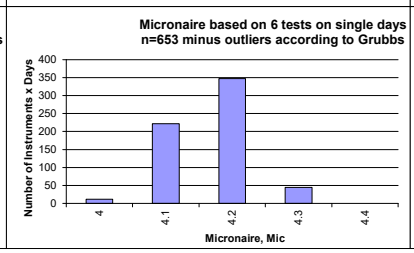

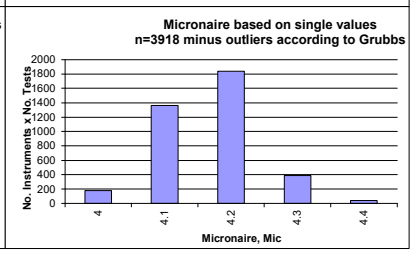

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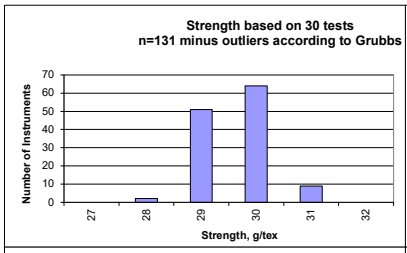
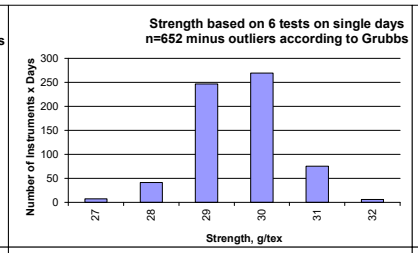
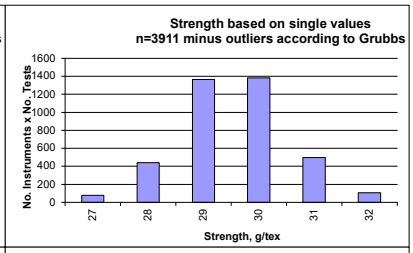
(Only results from instruments/days/single tests that are not regarded as outliers according to Grubbs' method.)
(classes are defined as > lower limit and <= upper limit)

Test Result Distributions
Strength

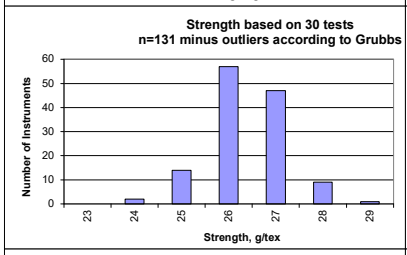
Cotton 1

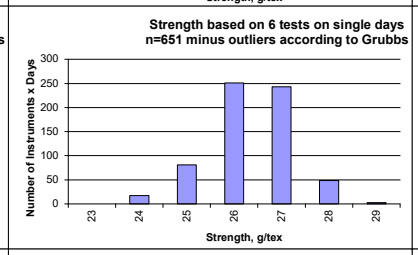


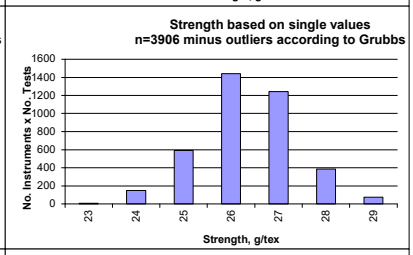




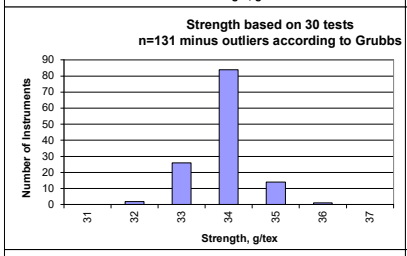
Cotton 2

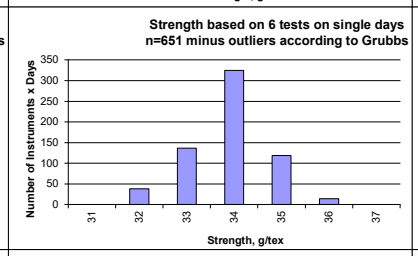


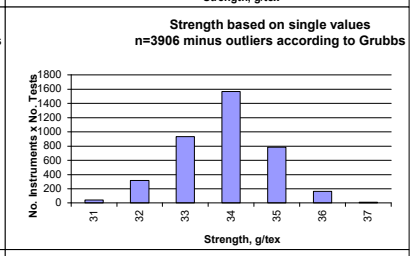




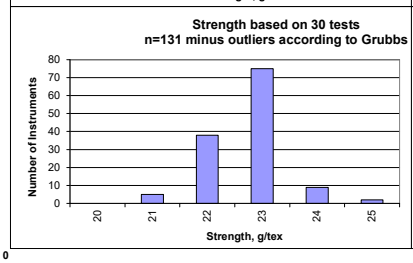
Cotton 3

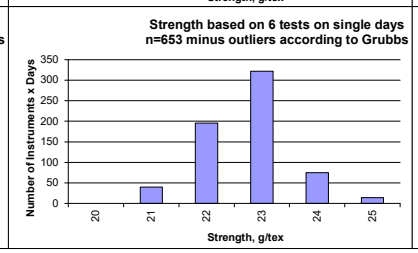


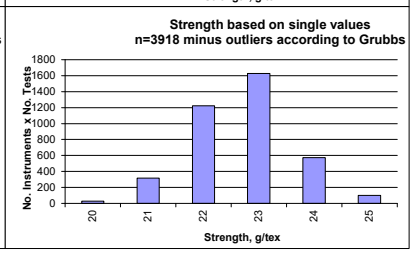




Cotton 4







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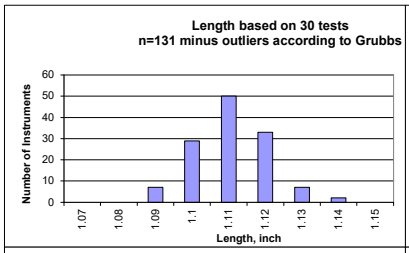
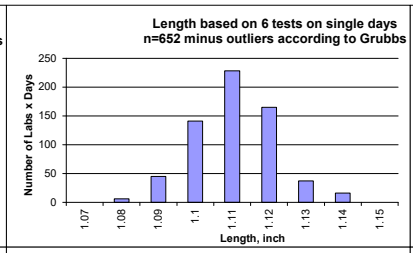
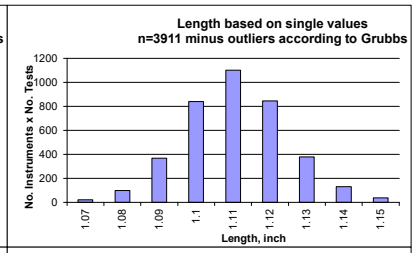
(Only results from instruments/days/single tests that are not regarded as outliers according to Grubbs' method)
(classes are defined as > lower limit and <= upper limit)

Test Result Distributions
Length

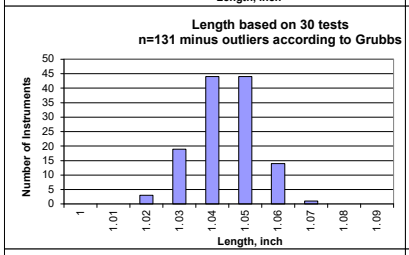
Cotton 1

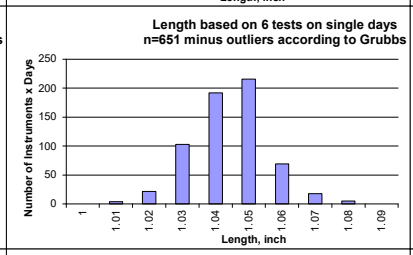


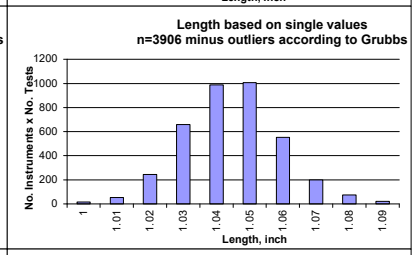




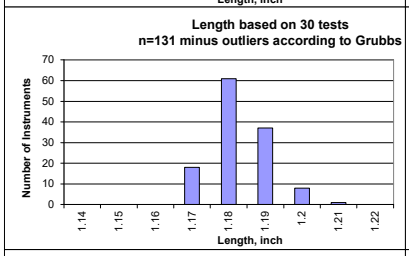
Cotton 2

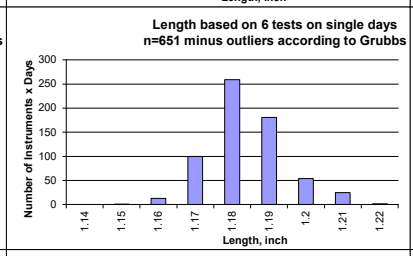


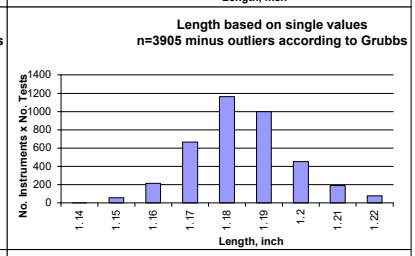




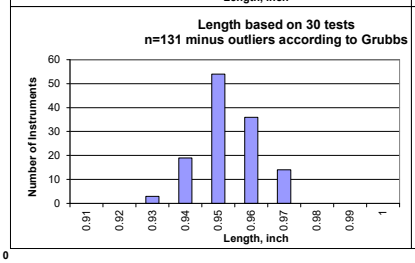
Cotton 3

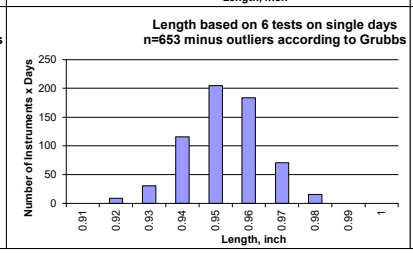


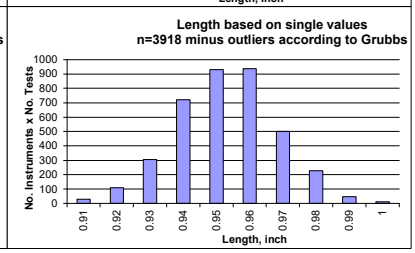




Cotton 4







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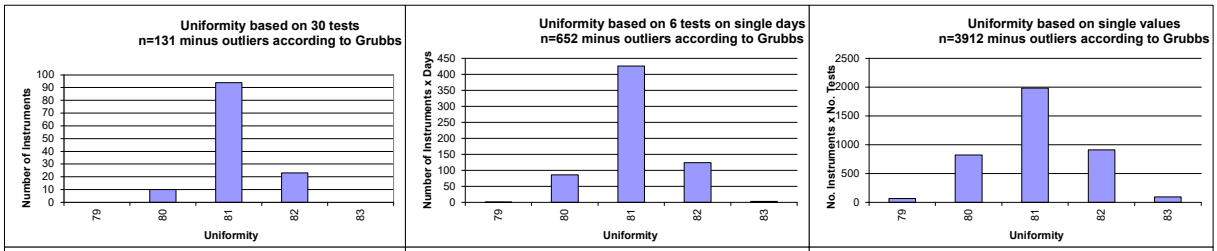
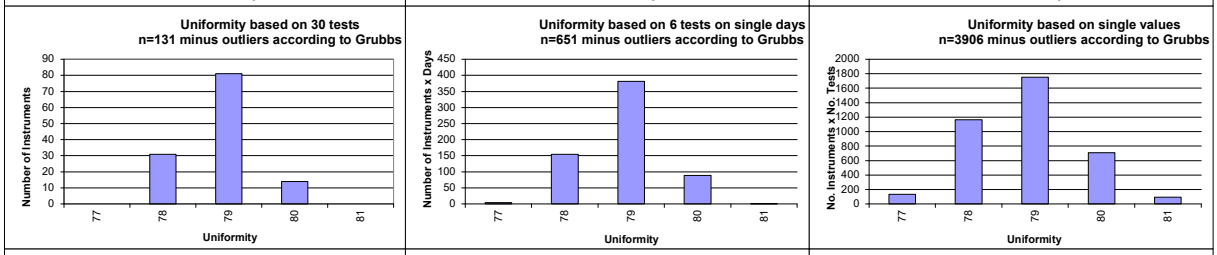
(Only results from instruments/days/single tests that are not regarded as outliers according to Grubbs' method)
(classes are defined as > lower limit and <= upper limit)

Test Result Distributions
Uniformity

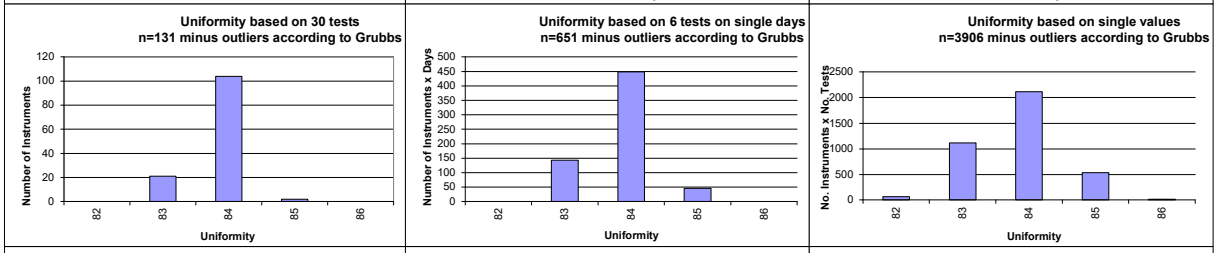
Cotton 1



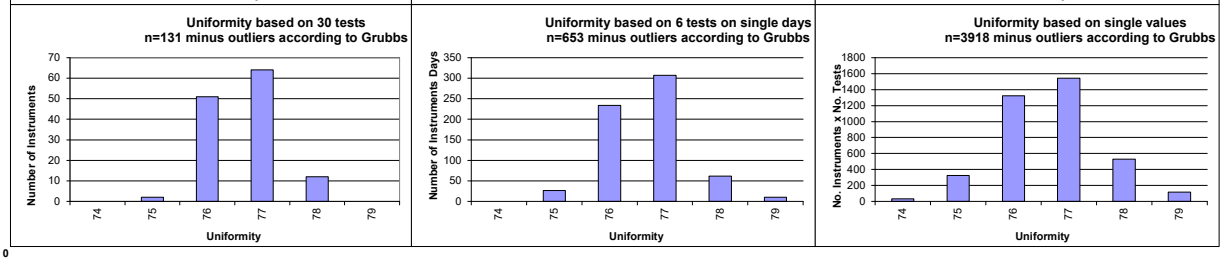
Cotton 2



Cotton 3



Cotton 4



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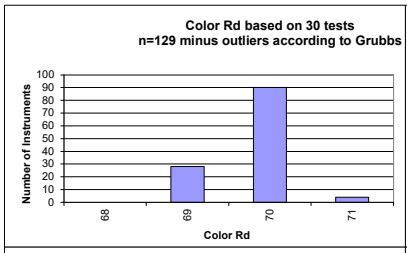
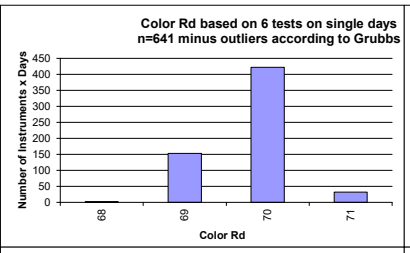
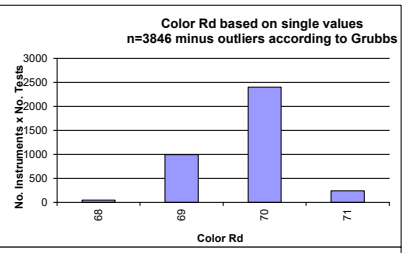
(Only results from instruments/days/single tests that are not regarded as outliers according to Grubbs' method)
(classes are defined as > lower limit and <= upper limit)

Test Result Distributions
Color Rd

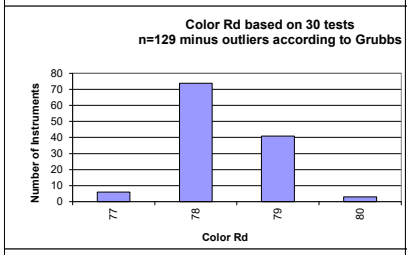
Cotton 1

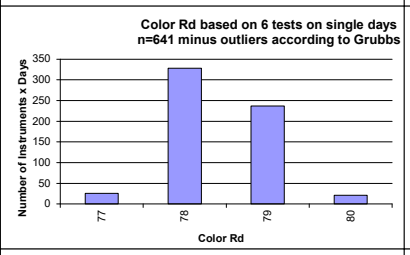


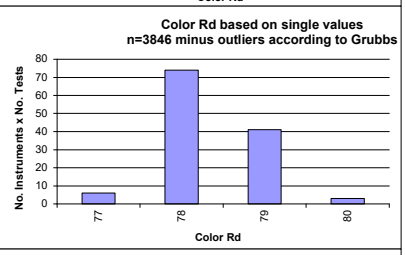




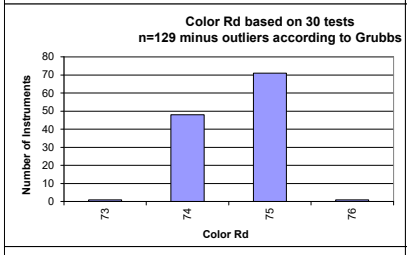
Cotton 2

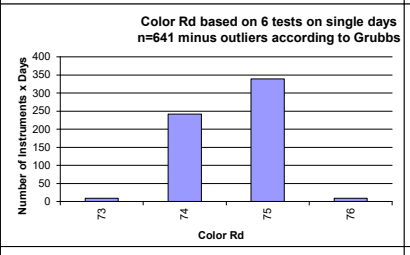


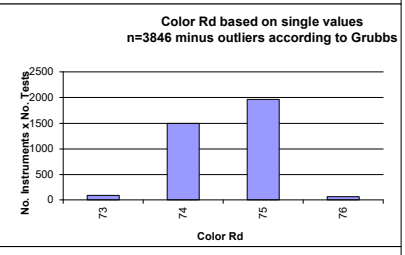




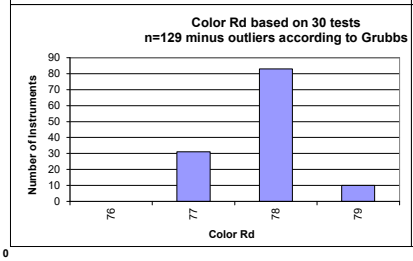
Cotton 3

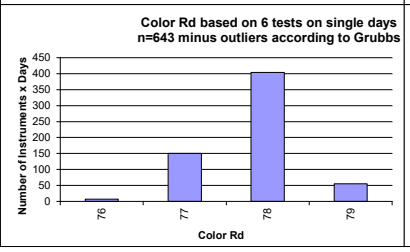


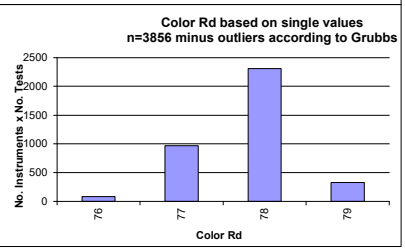




Cotton 4







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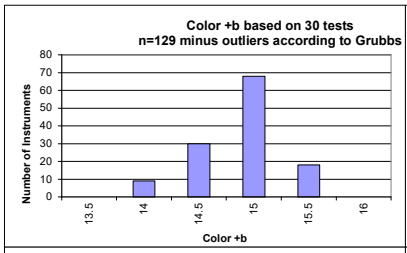
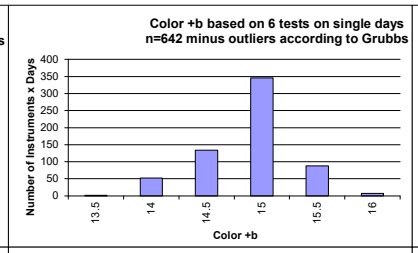
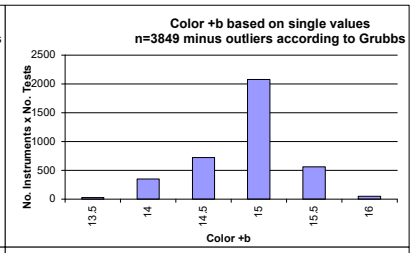
(Only results from instruments/days/single tests that are not regarded as outliers according to Grubbs' method)
(classes are defined as > lower limit and <= upper limit)

Test Result Distributions
Color +b

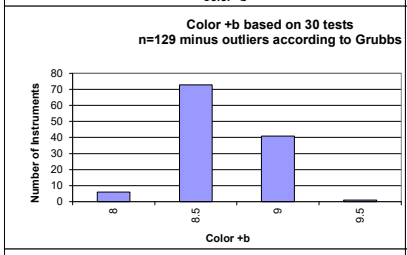
Cotton 1

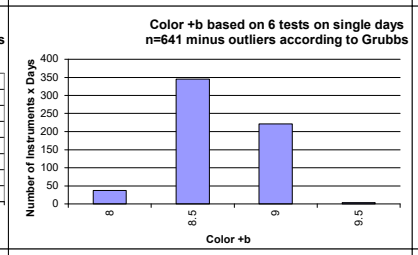


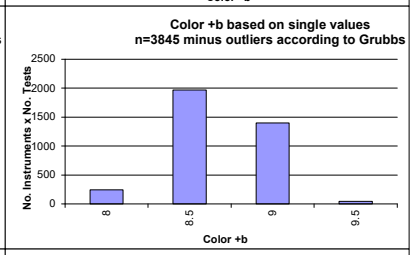




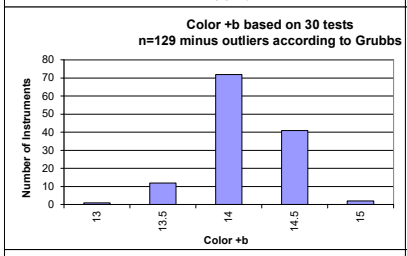
Cotton 2

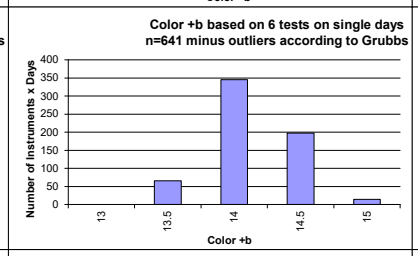


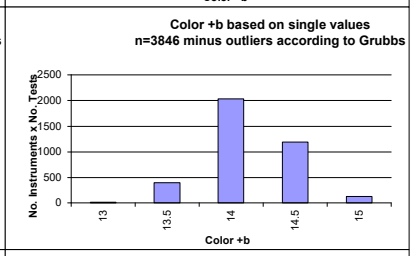




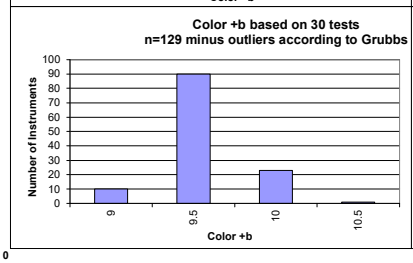
Cotton 3

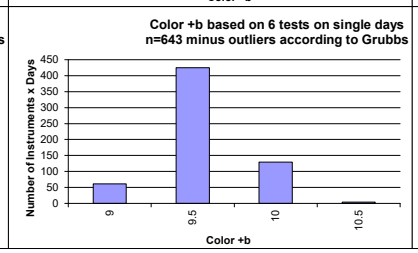


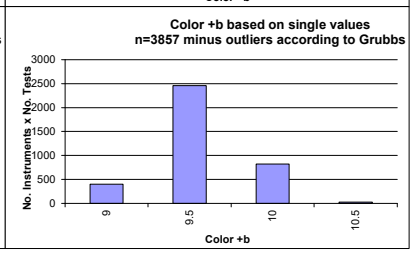




Cotton 4







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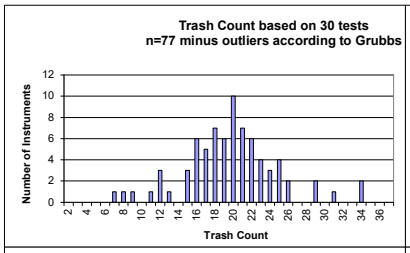
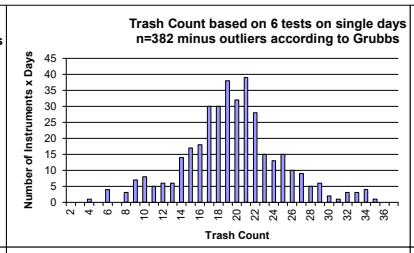
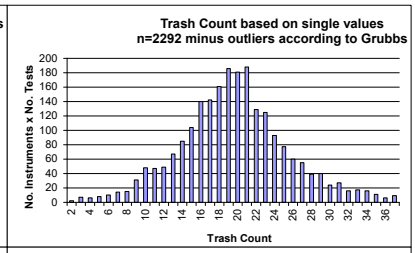
(Only results from instruments/days/single tests that are not regarded as outliers according to Grubbs' method)
(classes are defined as > lower limit and <= upper limit)

Test Result Distributions
Trash Count

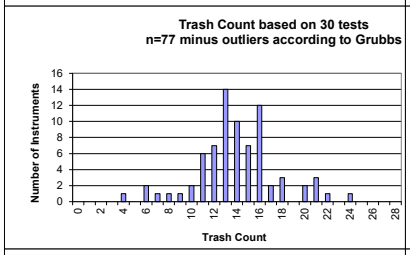
Cotton 1

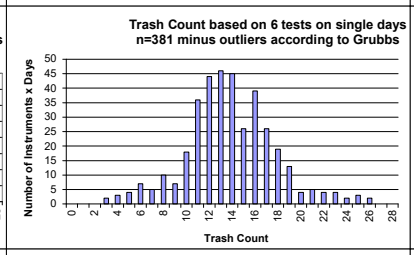


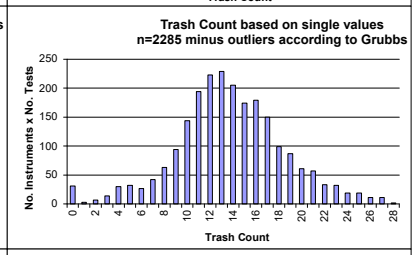




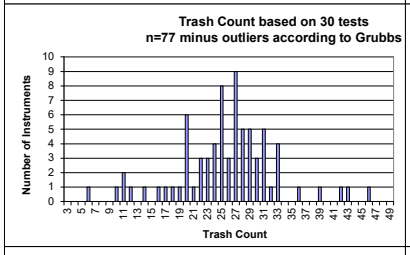
Cotton 2

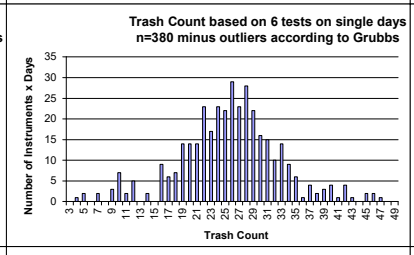


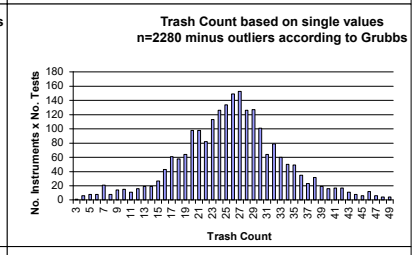




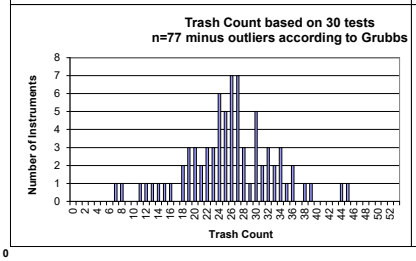
Cotton 3

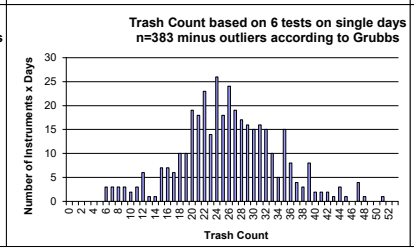


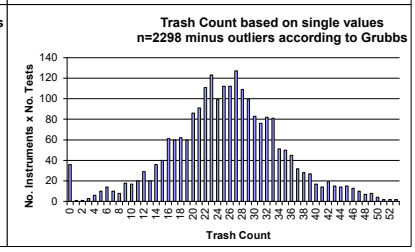




Cotton 4







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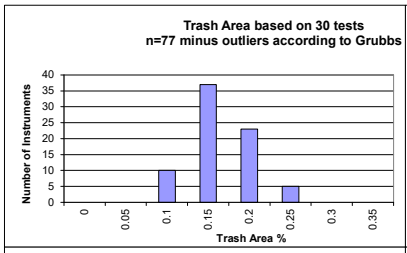
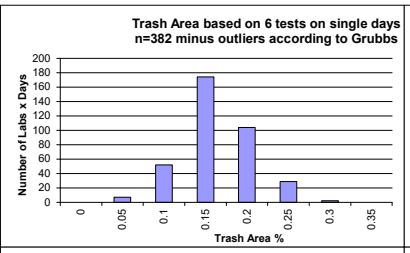
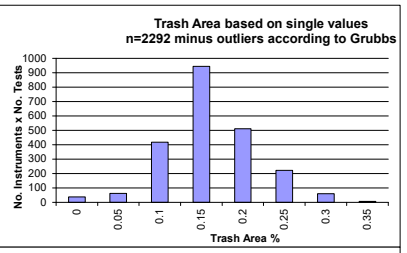
(Only results from instruments/days/single tests that are not regarded as outliers according to Grubbs' method)
(classes are defined as > lower limit and <= upper limit)

Test Result Distributions
Trash Area

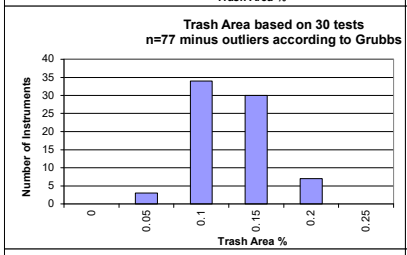
Cotton 1

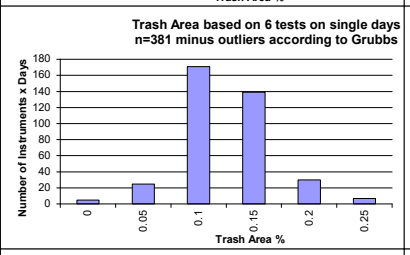


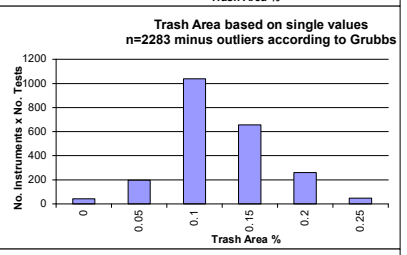




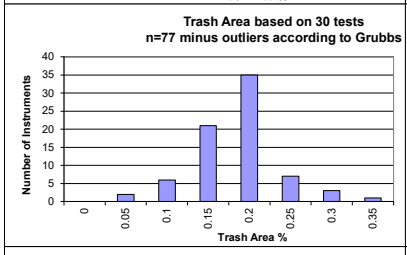
Cotton 2

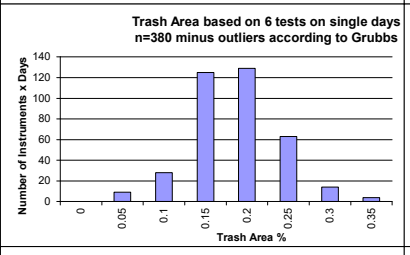


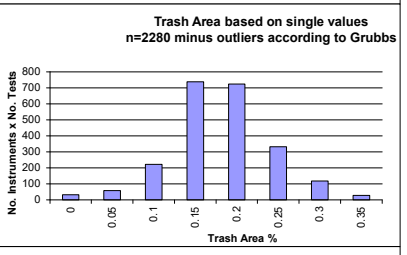




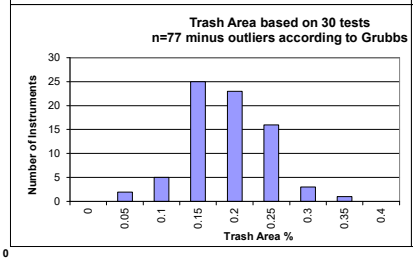
Cotton 3

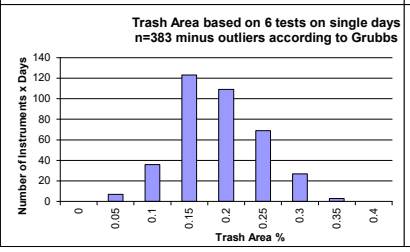


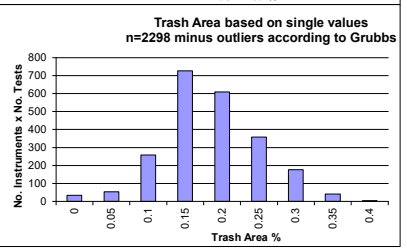




Cotton 4







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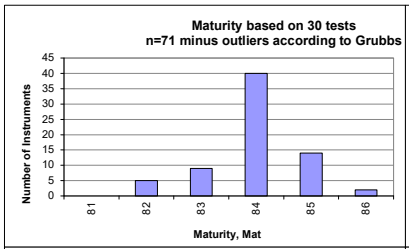
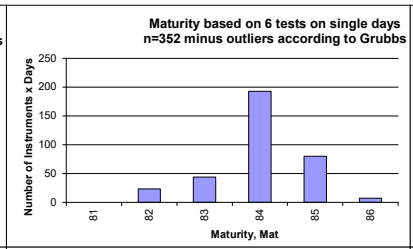
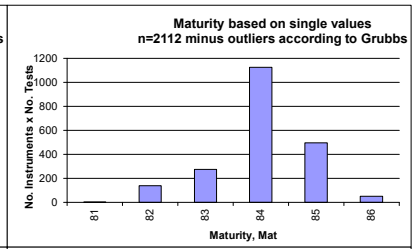
(Only results from instruments/days/single tests that are not regarded as outliers according to Grubbs' method)
(classes are defined as > lower limit and <= upper limit)

Test Result Distributions
Maturity

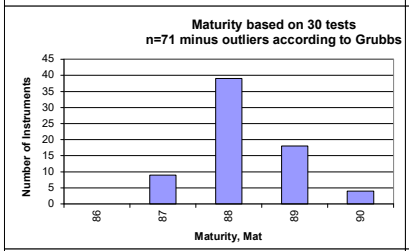
Cotton 1

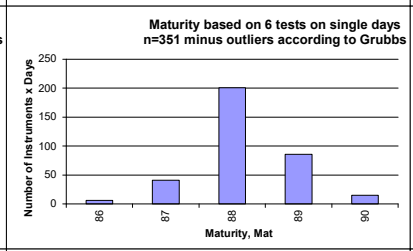


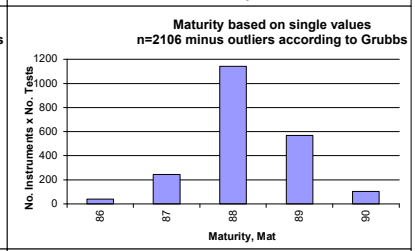




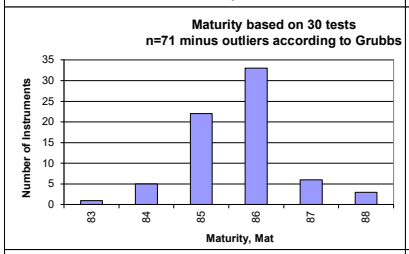
Cotton 2

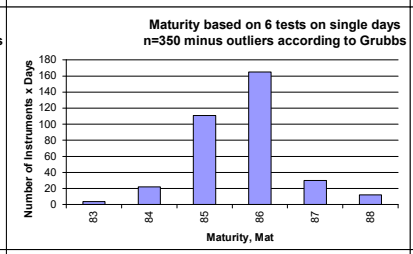


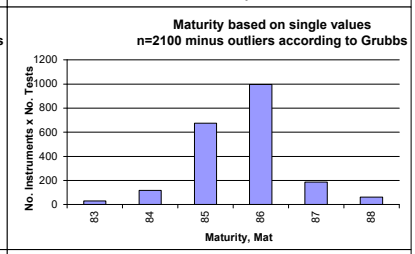




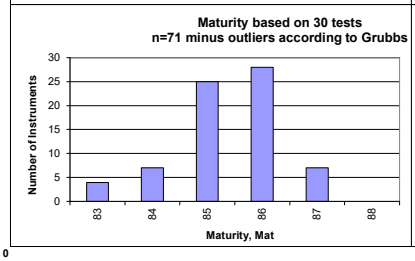
Cotton 3

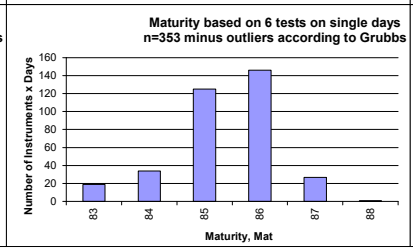


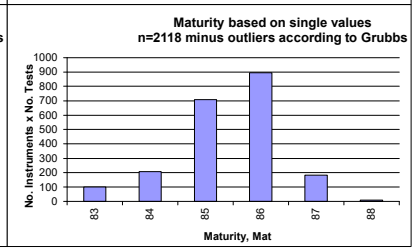




Cotton 4







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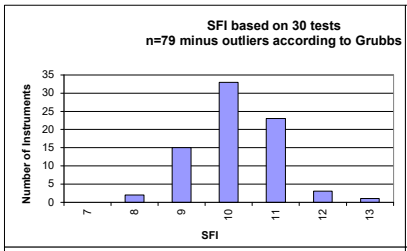
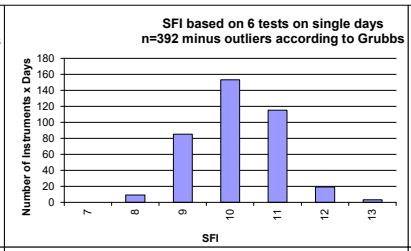
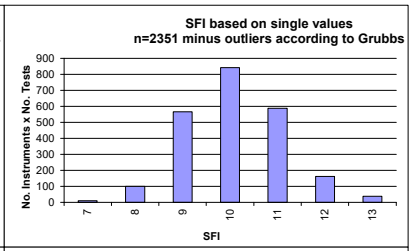
(classes are defined as > lower limit and <= upper limit)

Test Result Distributions
SFI

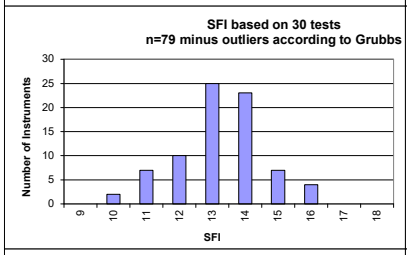
Cotton 1

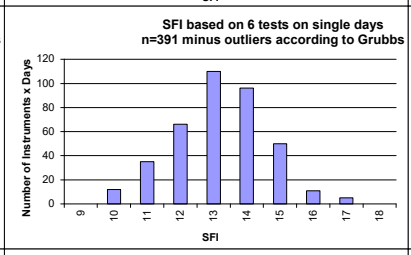


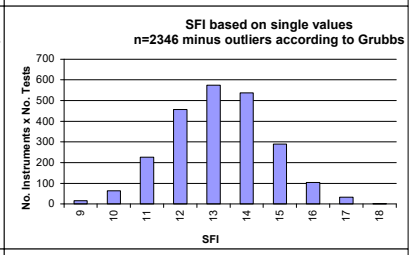




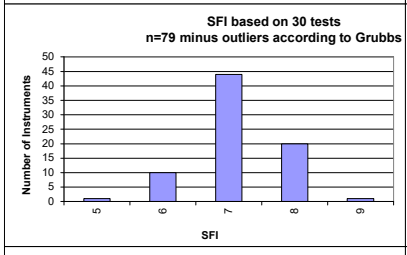
Cotton 2

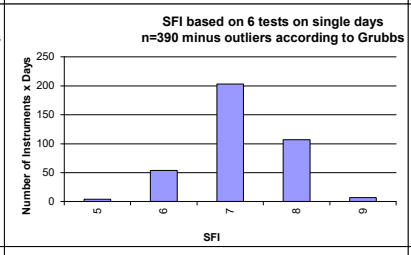


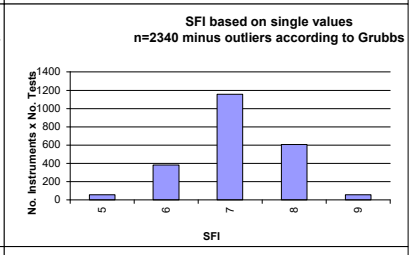




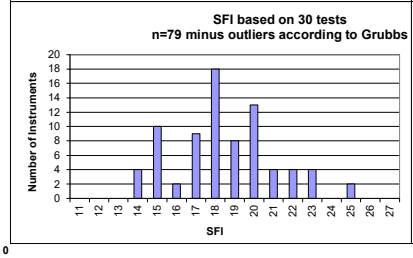
Cotton 3

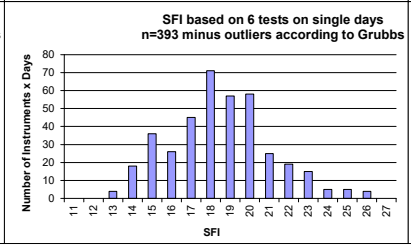


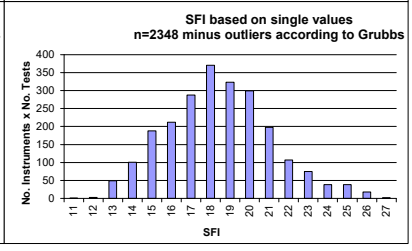




Cotton 4







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(Only results from instruments/days/single tests that are not regarded as outliers according to Grubbs' method)
(classes are defined as > lower limit and <= upper limit)

International Cotton Advisory Committee

CSITC
Global - Round Trial 2019 - 4
General Evaluation

Section One: Result Distribution
Section Two: Instrument Evaluation
Section Three: Within Limits Evaluation

Section Two: Instrument Evaluation

Content:
- -Evaluation of Combined Parameters
- -Evaluation of Single Parameters

Executed By:
Faserinstitut Bremen e.V., Bremen, Germany*
USDA-AMS, Memphis, TN, USA

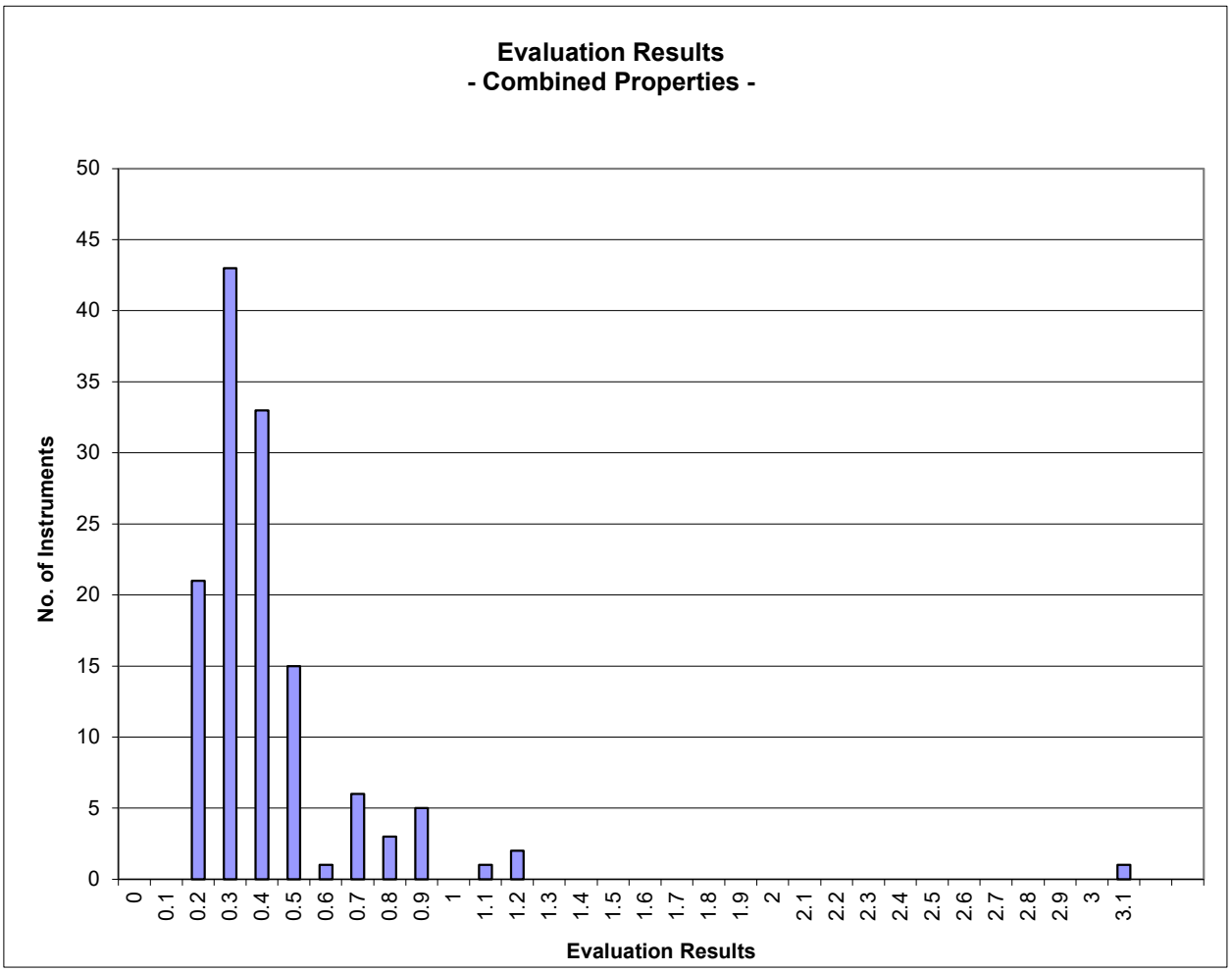
System Provided by:
Generation 10 Limited

This report is an outcome of the Project CFC/ICAC/33 – CSITC,
which benefitted from support from the Common Fund for Commodities
and the European Union, partners in Commodity Development.

** Faserinstitut Bremen are a Cooperation Partner with ICA Bremen*

Instrument Evaluation
- Graph of Combined Properties -
According to ICAC CSITC Task Force Recommendations
Global - Round Trial 2019 - 4

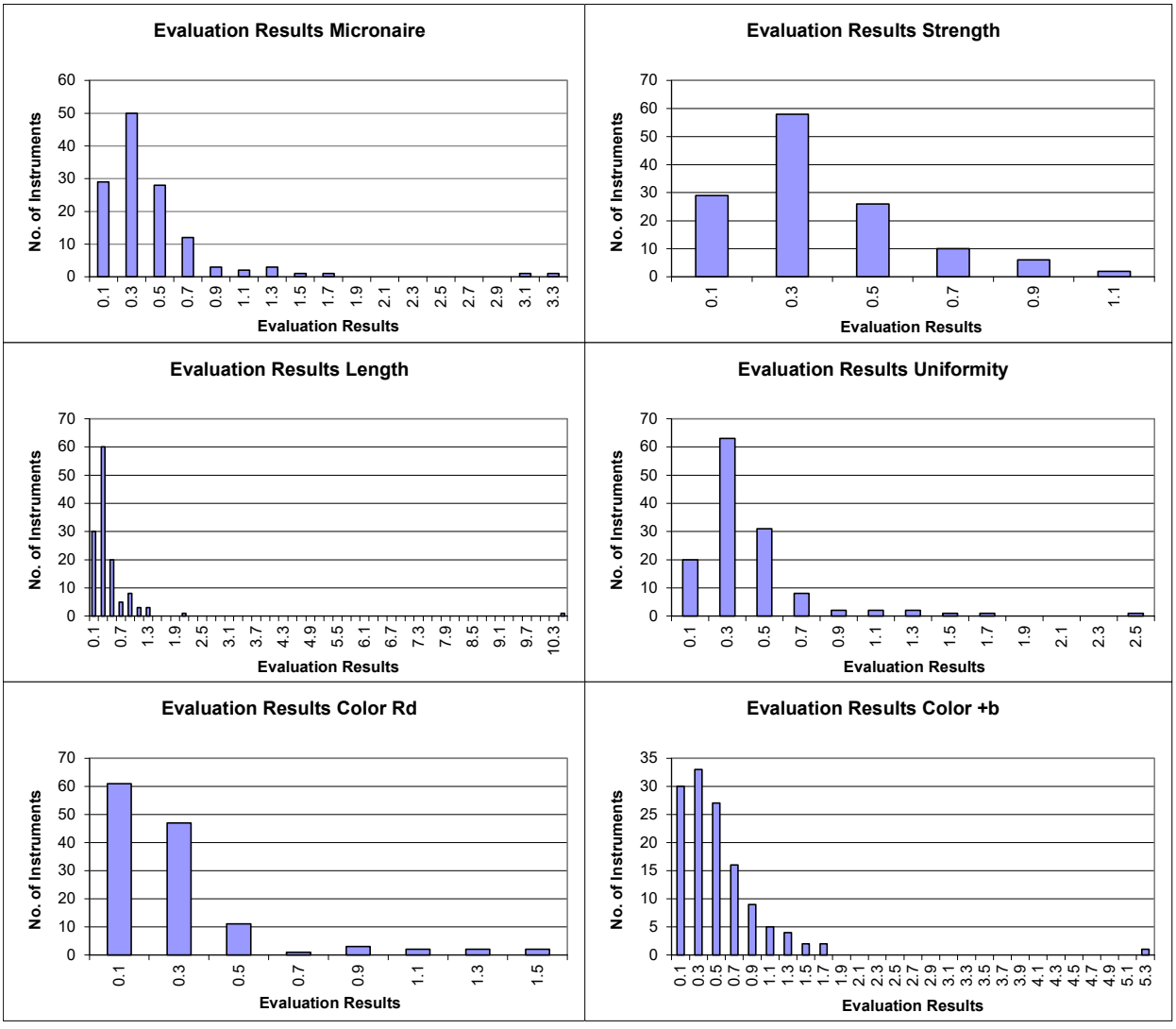
		Evaluation Combined Prop.
Statistics	Average	0.42
	Median	0.35
	Best Instrument	0.16
	Worst Instrument	3.13



x-Axis shows midpoints of classes
The evaluation results are entered based on the unrounded values
(classes are defined as > lower limit and <= upper limit)

Instrument Evaluation
- Graph of Single Properties -
According to ICAC CSITC Task Force Recommendations
Global - Round Trial 2019 - 4

		Evaluation Micronaire	Evaluation Strength	Evaluation Length	Evaluation Uniformity	Evaluation Color Rd	Evaluation Color +b
Statistics	Average	0.46	0.37	0.47	0.42	0.30	0.52
	Median	0.36	0.30	0.32	0.35	0.21	0.41
	Best Instr.	0.06	0.06	0.06	0.10	0.06	0.08
	Worst Instr.	3.21	1.17	10.50	2.45	1.55	5.32



x-Axis shows midpoints of classes
The evaluation results are entered based on the unrounded values

International Cotton Advisory Committee

CSITC
Global - Round Trial 2019 - 4
General Evaluation

Section One: Result Distribution
Section Two: Instrument Evaluation
Section Three: Within Limits Evaluation

Section Three: Within Limits Evaluation

Content:
- -Based on Average of 30 Test Results
- -Based on Single Test Results

Executed By:
Faserinstitut Bremen e.V., Bremen, Germany*
USDA-AMS, Memphis, TN, USA

System Provided by:
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Within Limits Evaluation

Based on average of 30 test results for each sample

	Micronaire	Strength	Length	Uniformity	Color Rd	Color +b
Limits	0.20	2.0	0.030	2.0	1.5	0.5
	units	g/tex	inch	%	units	units
Average % Results within Limits	97.5	97.1	96.6	99.0	95.3	88.8
Completely within limits	95.4	90.1	93.1	97.7	91.5	72.1
% of Instruments ≥75% within limits	97.7	98.5	96.2	99.2	93.8	89.1
% of Instruments ≥50% within limits	98.5	100.0	98.5	99.2	96.9	95.3

Within Limits Evaluation

Based on Single Test Results

	Micronaire	Strength	Length	Uniformity	Color Rd	Color +b
Limits	0.20	2.0	0.030	2.0	1.5	0.5
	units	g/tex	inch	%	units	units
Average % Results within Limits	96.8	94.2	95.5	97.4	94.5	84.9
% of Instruments 100% within limits	68.7	33.6	38.2	58.8	70.5	31.8
% of Instruments ≥95% within limits	90.8	64.1	86.3	87.8	83.7	53.5
% of Instruments ≥75% within limits	97.7	95.4	96.2	97.7	93.0	82.2
% of Instruments ≥65% within limits	97.7	98.5	97.7	99.2	93.8	85.3
% of Instruments ≥50% within limits	97.7	100.0	98.5	99.2	96.1	92.2