International Cotton Advisory Committee

CSITC
Global - Round Trial 2020 - 2
General Evaluation

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

Section One: Result Distribution

Content:
  Mandatory Parameters
    -Summary Table
    -Distribution Graphs

  Optional Parameters
    -Summary Table
    -Distribution Graphs

Global - Round Trial 2020 - 2
Inter-Instrument Averages, Inter-Instrument Variations, Typical within-instrument Variations

Micronaire			Cotton 1	Cotton 2	Cotton 3	Cotton 4	Average
Average of Instruments (Grubbs)			4.501	4.102	4.249	3.607	
Reference Values for Evaluation			4.501	4.102	4.249	3.607	
Number Of Instruments			87	87	87	87	**87**
Inter-Instrument Variation	based on 30 tests	SD	0.047	0.050	0.060	0.059	**0.054**
		CV %	1.0	1.2	1.4	1.6	**1.3**
	based on 6 tests	SD	0.051	0.054	0.069	0.059	**0.058**
		CV %	1.1	1.3	1.6	1.6	**1.4**
	based on single tests	SD	0.057	0.061	0.078	0.068	**0.066**
		CV %	1.3	1.5	1.8	1.9	**1.6**
Typical within-instrument Variation (Median)	between different days with each 6 tests	SD	0.021	0.022	0.031	0.024	**0.024**
		CV %	0.5	0.5	0.7	0.7	**0.6**
	between single tests on one day	SD	0.029	0.032	0.040	0.033	**0.033**
		CV %	0.6	0.8	0.9	0.9	**0.8**
	between all tests on different days	SD	0.035	0.038	0.053	0.038	**0.041**
		CV %	0.8	0.9	1.2	1.1	**1.0**

Strength			Cotton 1	Cotton 2	Cotton 3	Cotton 4	Average
Average of Instruments (Grubbs)			24.056	22.777	31.747	25.574	
Reference Values for Evaluation			24.056	22.777	31.747	25.574	
Number Of Instruments			87	87	87	87	**87**
Inter-Instrument Variation	based on 30 tests	SD	0.424	0.670	0.698	0.613	**0.601**
		CV %	1.8	2.9	2.2	2.4	**2.3**
	based on 6 tests	SD	0.573	0.691	0.812	0.729	**0.701**
		CV %	2.4	3.0	2.6	2.9	**2.7**
	based on single tests	SD	0.719	0.803	1.027	0.880	**0.857**
		CV %	3.0	3.5	3.2	3.4	**3.3**
Typical within-instrument Variation (Median)	between different days with each 6 tests	SD	0.273	0.273	0.351	0.316	**0.303**
		CV %	1.1	1.2	1.1	1.2	**1.2**
	between single tests on one day	SD	0.420	0.500	0.677	0.555	**0.538**
		CV %	1.7	2.2	2.1	2.2	**2.1**
	between all tests on different days	SD	0.495	0.562	0.772	0.662	**0.623**
		CV %	2.1	2.5	2.4	2.6	**2.4**

Length			Cotton 1	Cotton 2	Cotton 3	Cotton 4	Average
Average of Instruments (Grubbs)			1.0149	1.0007	1.1978	1.0843	
Reference Values for Evaluation			1.0149	1.0007	1.1978	1.0843	
Number Of Instruments			87	87	87	87	**87**
Inter-Instrument Variation	based on 30 tests	SD	0.0084	0.0078	0.0071	0.0073	**0.0077**
		CV %	0.8	0.8	0.6	0.7	**0.7**
	based on 6 tests	SD	0.0095	0.0092	0.0092	0.0089	**0.0092**
		CV %	0.9	0.9	0.8	0.8	**0.9**
	based on single tests	SD	0.0120	0.0131	0.0139	0.0131	**0.0130**
		CV %	1.2	1.3	1.2	1.2	**1.2**
Typical within-instrument Variation (Median)	between different days with each 6 tests	SD	0.0040	0.0049	0.0058	0.0053	**0.0050**
		CV %	0.4	0.5	0.5	0.5	**0.5**
	between single tests on one day	SD	0.0078	0.0094	0.0115	0.0103	**0.0097**
		CV %	0.8	0.9	1.0	0.9	**0.9**
	between all tests on different days	SD	0.0086	0.0105	0.0123	0.0113	**0.0107**
		CV %	0.8	1.0	1.0	1.0	**1.0**

Uniformity			Cotton 1	Cotton 2	Cotton 3	Cotton 4	Average
Average of Instruments (Grubbs)			80.296	77.628	83.827	79.461	
Reference Values for Evaluation			80.296	77.628	83.827	79.461	
Number Of Instruments			87	87	87	87	**87**
Inter-Instrument Variation	based on 30 tests	SD	0.326	0.376	0.325	0.303	**0.333**
		CV %	0.4	0.5	0.4	0.4	**0.4**
	based on 6 tests	SD	0.402	0.490	0.435	0.437	**0.441**
		CV %	0.5	0.6	0.5	0.5	**0.6**
	based on single tests	SD	0.587	0.689	0.658	0.645	**0.645**
		CV %	0.7	0.9	0.8	0.8	**0.8**
Typical within-instrument Variation (Median)	between different days with each 6 tests	SD	0.249	0.288	0.275	0.261	**0.268**
		CV %	0.3	0.4	0.3	0.3	**0.3**
	between single tests on one day	SD	0.460	0.551	0.520	0.503	**0.509**
		CV %	0.6	0.7	0.6	0.6	**0.6**
	between all tests on different days	SD	0.513	0.632	0.586	0.560	**0.573**
		CV %	0.6	0.8	0.7	0.7	**0.7**

Color Rd			Cotton 1	Cotton 2	Cotton 3	Cotton 4	Average
Average of Instruments (Grubbs)			75.445	76.843	78.671	71.303	
Reference Values for Evaluation			75.445	76.843	78.671	71.303	
Number Of Instruments			87	87	87	87	**87**
Inter-Instrument Variation	based on 30 tests	SD	0.391	0.463	0.461	0.519	**0.458**
		CV %	0.5	0.6	0.6	0.7	**0.6**
	based on 6 tests	SD	0.391	0.480	0.530	0.544	**0.486**
		CV %	0.5	0.6	0.7	0.8	**0.6**
	based on single tests	SD	0.422	0.477	0.536	0.567	**0.500**
		CV %	0.6	0.6	0.7	0.8	**0.7**
Typical within-instrument Variation (Median)	between different days with each 6 tests	SD	0.137	0.168	0.183	0.167	**0.164**
		CV %	0.2	0.2	0.2	0.2	**0.2**
	between single tests on one day	SD	0.104	0.107	0.113	0.120	**0.111**
		CV %	0.1	0.1	0.1	0.2	**0.1**
	between all tests on different days	SD	0.205	0.208	0.250	0.244	**0.227**
		CV %	0.3	0.3	0.3	0.3	**0.3**

Color +b			Cotton 1	Cotton 2	Cotton 3	Cotton 4	Average
Average of Instruments (Grubbs)			13.990	9.888	11.569	16.733	
Reference Values for Evaluation			13.990	9.888	11.569	16.733	
Number Of Instruments			87	87	87	87	**87**
Inter-Instrument Variation	based on 30 tests	SD	0.357	0.242	0.318	0.403	**0.330**
		CV %	2.5	2.4	2.8	2.4	**2.5**
	based on 6 tests	SD	0.364	0.261	0.318	0.403	**0.337**
		CV %	2.6	2.6	2.8	2.4	**2.6**
	based on single tests	SD	0.380	0.277	0.336	0.414	**0.352**
		CV %	2.7	2.8	2.9	2.5	**2.7**
Typical within-instrument Variation (Median)	between different days with each 6 tests	SD	0.089	0.088	0.100	0.116	**0.098**
		CV %	0.6	0.9	0.9	0.7	**0.8**
	between single tests on one day	SD	0.071	0.056	0.064	0.079	**0.068**
		CV %	0.5	0.6	0.6	0.5	**0.5**
	between all tests on different days	SD	0.145	0.117	0.144	0.157	**0.141**
		CV %	1.0	1.2	1.2	0.9	**1.1**

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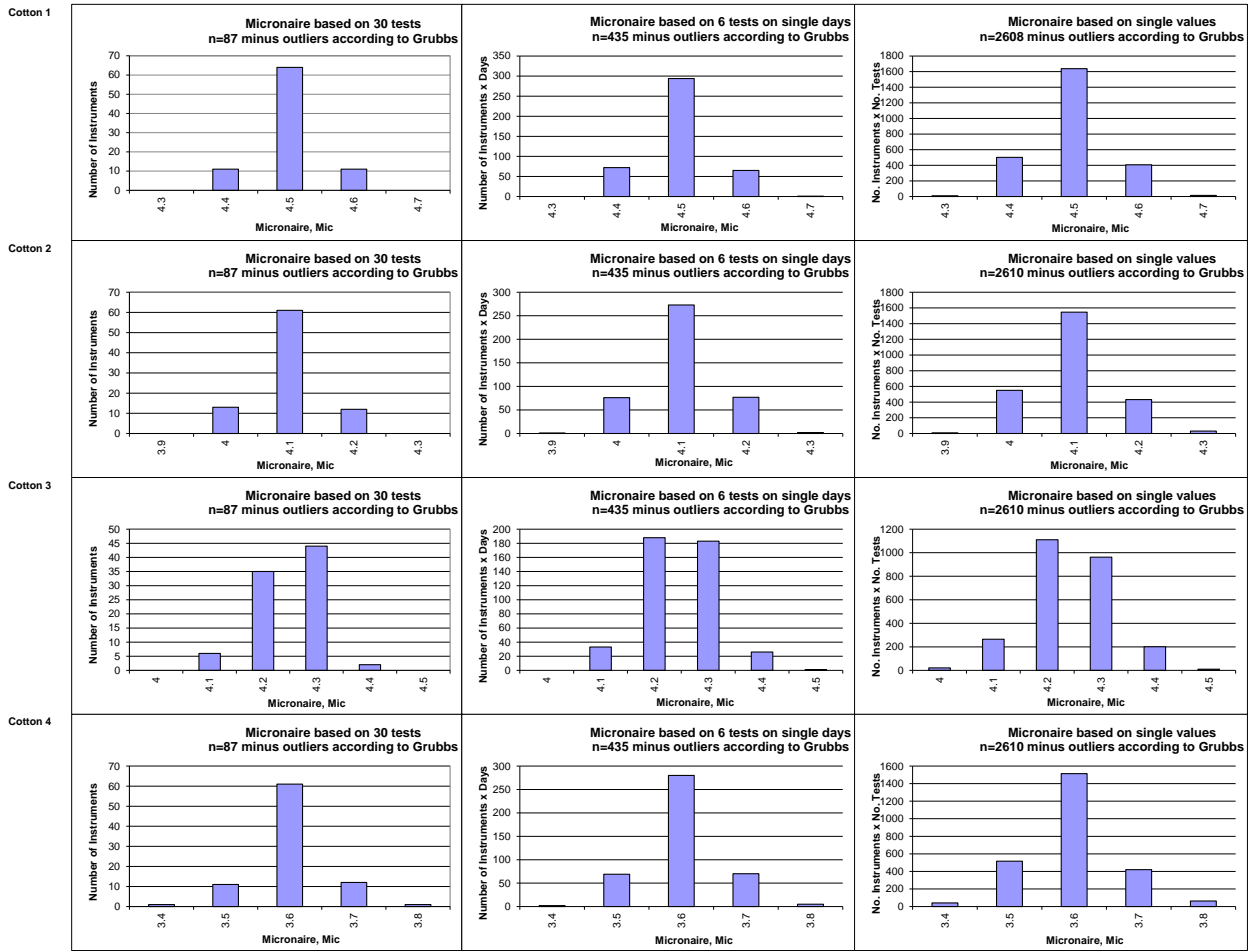Inter-Instrument Averages, Inter-Instrument Variations, Typical within-instrument Variations

Trash Count			Cotton 1	Cotton 2	Cotton 3	Cotton 4	Average
Average of Instruments (Grubbs)			10.01	16.52	27.83	10.75	
Reference Values for Evaluation			10.01	16.52	27.83	10.75	
Number Of Instruments			80	80	80	80	**80**
Inter-Instrument Variation	based on 30 tests	SD	2.81	4.93	6.83	2.91	**4.37**
		CV %	28.0	29.9	24.6	27.1	**27.4**
	based on 6 tests	SD	3.22	5.68	7.34	3.51	**4.94**
		CV %	32.2	34.4	26.4	32.7	**31.4**
	based on single tests	SD	3.58	6.07	7.70	3.88	**5.31**
		CV %	35.8	36.8	27.7	36.1	**34.1**
Typical within-instrument Variation (Median)	between different days with each 6 tests	SD	1.24	1.88	2.50	1.45	**1.77**
		CV %	12.4	11.4	9.0	13.5	**11.6**
	between single tests on one day	SD	1.27	1.95	2.30	1.48	**1.75**
		CV %	12.7	11.8	8.3	13.8	**11.6**
	between all tests on different days	SD	2.02	3.10	3.56	2.45	**2.78**
		CV %	20.1	18.7	12.8	22.8	**18.6**

Trash Area			Cotton 1	Cotton 2	Cotton 3	Cotton 4	Average
Average of Instruments (Grubbs)			0.103	0.181	0.260	0.118	
Reference Values for Evaluation			0.103	0.181	0.260	0.118	
Number Of Instruments			80	80	80	80	**80**
Inter-Instrument Variation	based on 30 tests	SD	0.024	0.053	0.061	0.023	**0.040**
		CV %	23.3	29.1	23.5	19.2	**23.8**
	based on 6 tests	SD	0.030	0.064	0.070	0.032	**0.049**
		CV %	28.9	35.0	26.9	27.5	**29.6**
	based on single tests	SD	0.035	0.069	0.083	0.040	**0.057**
		CV %	34.1	38.0	32.1	33.8	**34.5**
Typical within-instrument Variation (Median)	between different days with each 6 tests	SD	0.016	0.032	0.029	0.022	**0.025**
		CV %	15.7	17.5	11.2	18.3	**15.7**
	between single tests on one day	SD	0.011	0.027	0.023	0.020	**0.020**
		CV %	10.5	14.7	8.8	17.3	**12.8**
	between all tests on different days	SD	0.025	0.045	0.044	0.031	**0.036**
		CV %	24.4	24.5	17.1	26.1	**23.0**

Maturity			Cotton 1	Cotton 2	Cotton 3	Cotton 4	Average
Average of Instruments (Grubbs)			86.52	85.38	85.60	84.23	
Reference Values for Evaluation			86.52	85.38	85.60	84.23	
Number Of Instruments			75	75	75	75	**75**
Inter-Instrument Variation	based on 30 tests	SD	0.59	0.67	0.57	0.66	**0.62**
		CV %	0.7	0.8	0.7	0.8	**0.7**
	based on 6 tests	SD	0.60	0.63	0.63	0.69	**0.64**
		CV %	0.7	0.7	0.7	0.8	**0.7**
	based on single tests	SD	0.63	0.65	0.65	0.76	**0.67**
		CV %	0.7	0.8	0.8	0.9	**0.8**
Typical within-instrument Variation (Median)	between different days with each 6 tests	SD	0.07	0.08	0.12	0.14	**0.10**
		CV %	0.1	0.1	0.1	0.2	**0.1**
	between single tests on one day	SD	0.09	0.12	0.15	0.18	**0.14**
		CV %	0.1	0.1	0.2	0.2	**0.2**
	between all tests on different days	SD	0.17	0.18	0.25	0.31	**0.23**
		CV %	0.2	0.2	0.3	0.4	**0.3**

SFI			Cotton 1	Cotton 2	Cotton 3	Cotton 4	Average
Average of Instruments (Grubbs)			11.81	15.90	7.04	12.14	
Reference Values for Evaluation			11.81	15.90	7.04	12.14	
Number Of Instruments			80	80	80	80	**80**
Inter-Instrument Variation	based on 30 tests	SD	1.20	1.90	0.67	1.20	**1.24**
		CV %	10.2	11.9	9.5	9.9	**10.4**
	based on 6 tests	SD	1.28	1.93	0.69	1.24	**1.29**
		CV %	10.9	12.1	9.8	10.2	**10.8**
	based on single tests	SD	1.39	2.16	0.80	1.42	**1.44**
		CV %	11.7	13.6	11.4	11.7	**12.1**
Typical within-instrument Variation (Median)	between different days with each 6 tests	SD	0.29	0.40	0.17	0.35	**0.30**
		CV %	2.5	2.5	2.4	2.9	**2.6**
	between single tests on one day	SD	0.60	0.79	0.36	0.60	**0.59**
		CV %	5.1	5.0	5.2	4.9	**5.0**
	between all tests on different days	SD	0.68	0.92	0.40	0.70	**0.67**
		CV %	5.7	5.8	5.7	5.8	**5.7**

Test Result Distributions
Micronaire

Cotton 1

Micronaire based on 30 tests
n=87 minus outliers according to Grubbs

Micronaire based on 6 tests on single days
n=435 minus outliers according to Grubbs

Micronaire based on single values
n=2608 minus outliers according to Grubbs

Cotton 2

Micronaire based on 30 tests
n=87 minus outliers according to Grubbs

Micronaire based on 6 tests on single days
n=435 minus outliers according to Grubbs

Micronaire based on single values
n=2610 minus outliers according to Grubbs

Cotton 3

Micronaire based on 30 tests
n=87 minus outliers according to Grubbs

Micronaire based on 6 tests on single days
n=435 minus outliers according to Grubbs

Micronaire based on single values
n=2610 minus outliers according to Grubbs

Cotton 4

Micronaire based on 30 tests
n=87 minus outliers according to Grubbs

Micronaire based on 6 tests on single days
n=435 minus outliers according to Grubbs

Micronaire based on single values
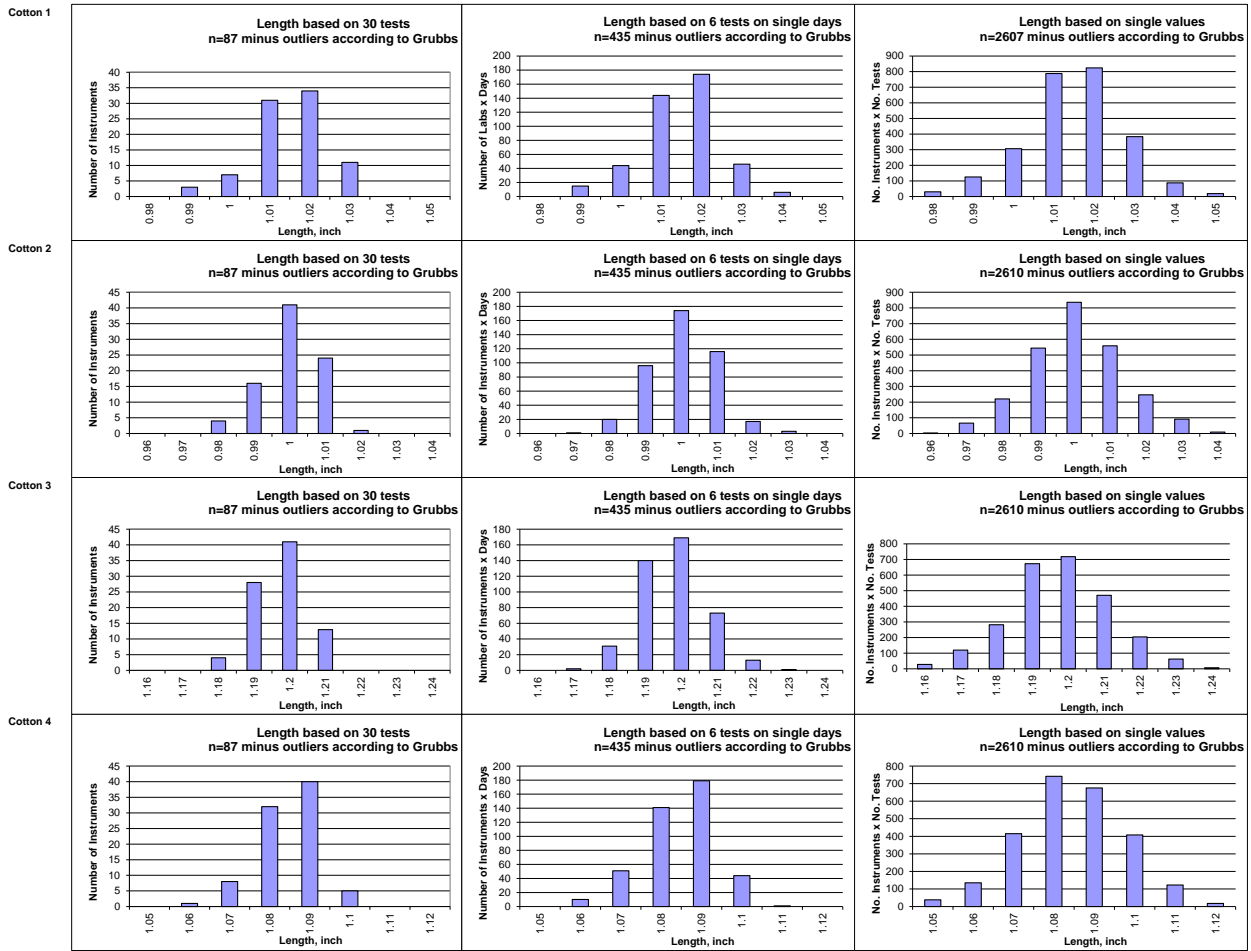n=2610 minus outliers according to Grubbs

(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)
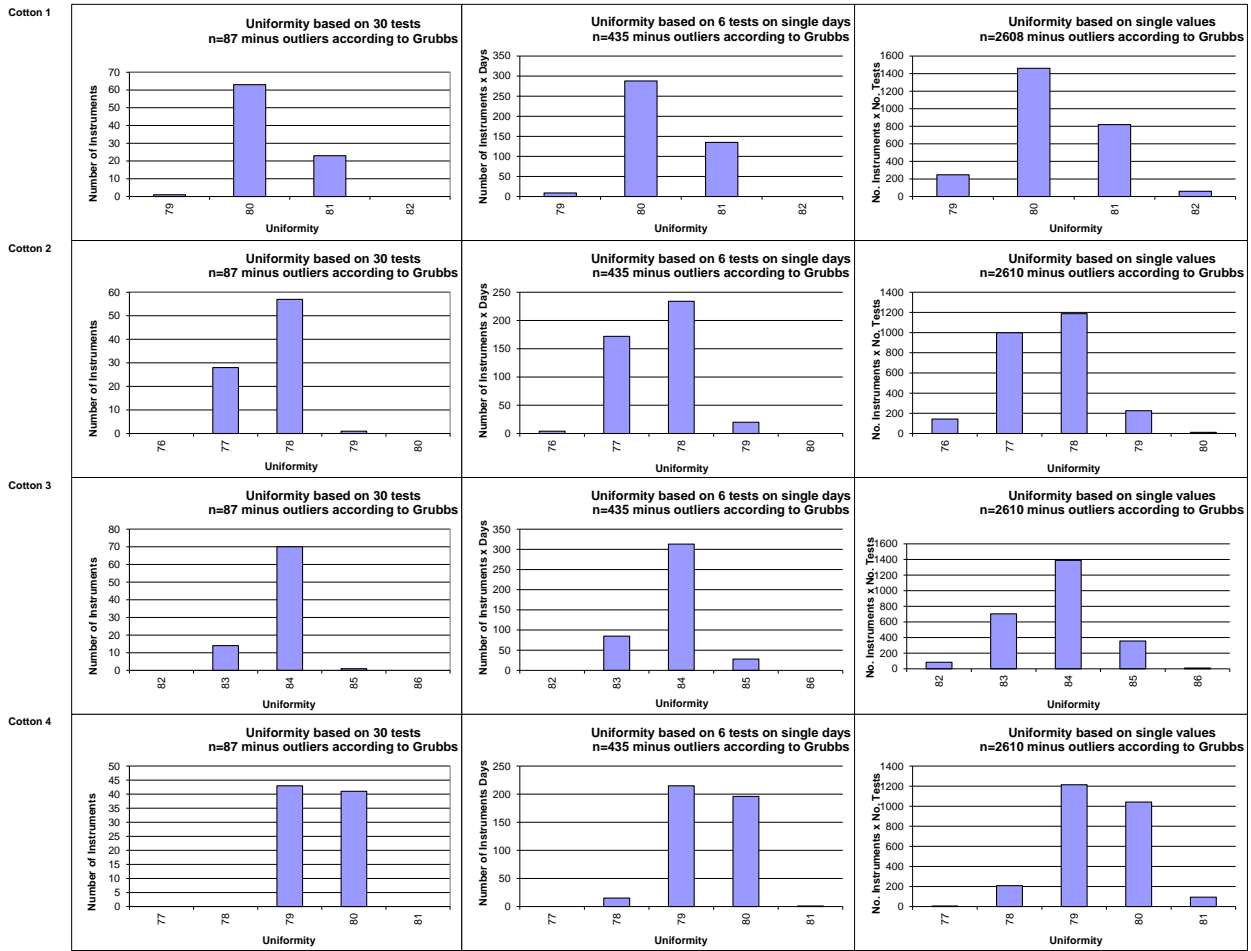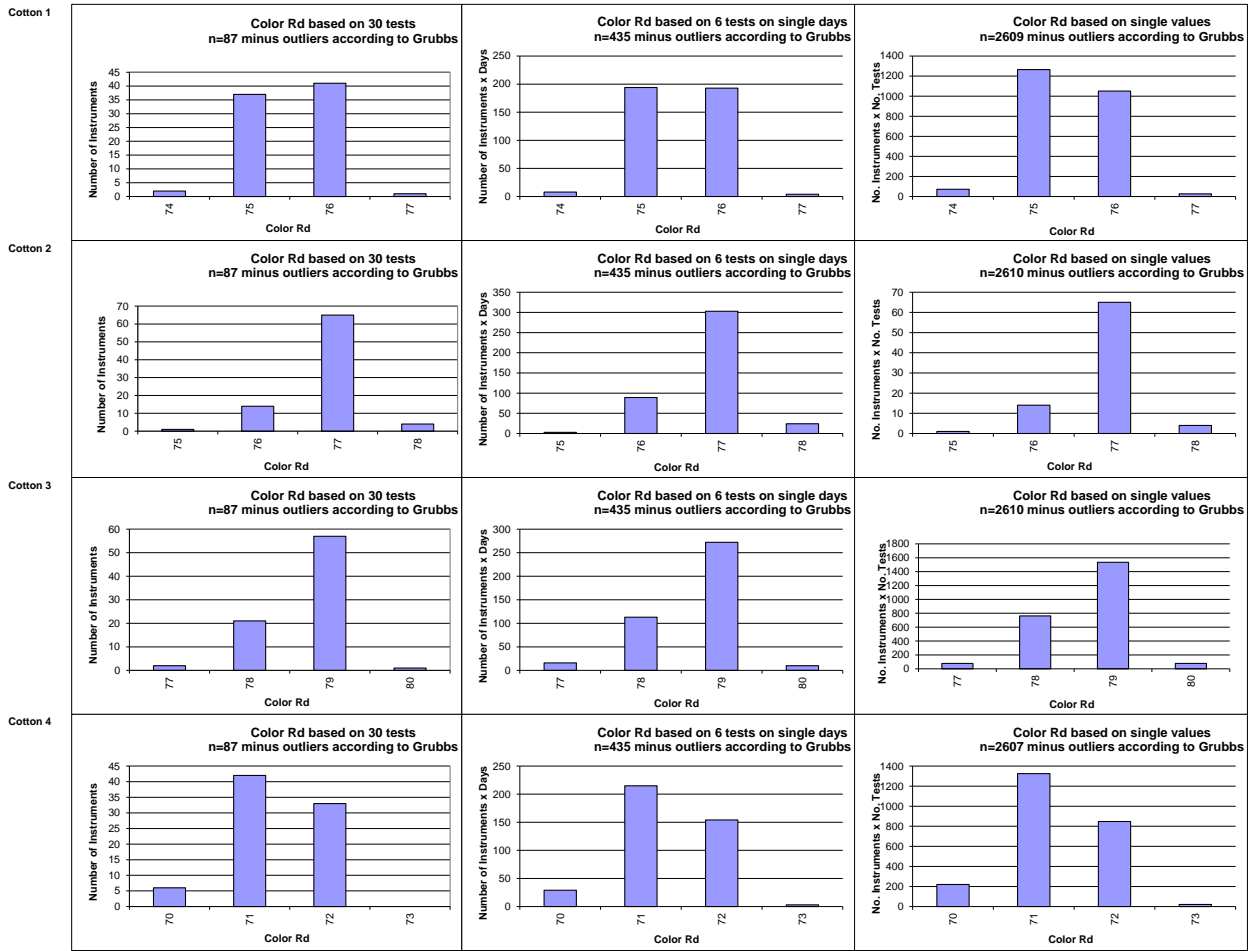
Test Result Distributions
Strength

Cotton 1

Strength based on 30 tests
n=87 minus outliers according to Grubbs

Strength based on 6 tests on single days
n=435 minus outliers according to Grubbs

Strength based on single values
n=2609 minus outliers according to Grubbs

Cotton 2

Strength based on 30 tests
n=87 minus outliers according to Grubbs

Strength based on 6 tests on single days
n=435 minus outliers according to Grubbs

Strength based on single values
n=2610 minus outliers according to Grubbs

Cotton 3

Strength based on 30 tests
n=87 minus outliers according to Grubbs

Strength based on 6 tests on single days
n=435 minus outliers according to Grubbs

Strength based on single values
n=2608 minus outliers according to Grubbs

Cotton 4

Strength based on 30 tests
n=87 minus outliers according to Grubbs

Strength based on 6 tests on single days
n=435 minus outliers according to Grubbs

Strength based on single values
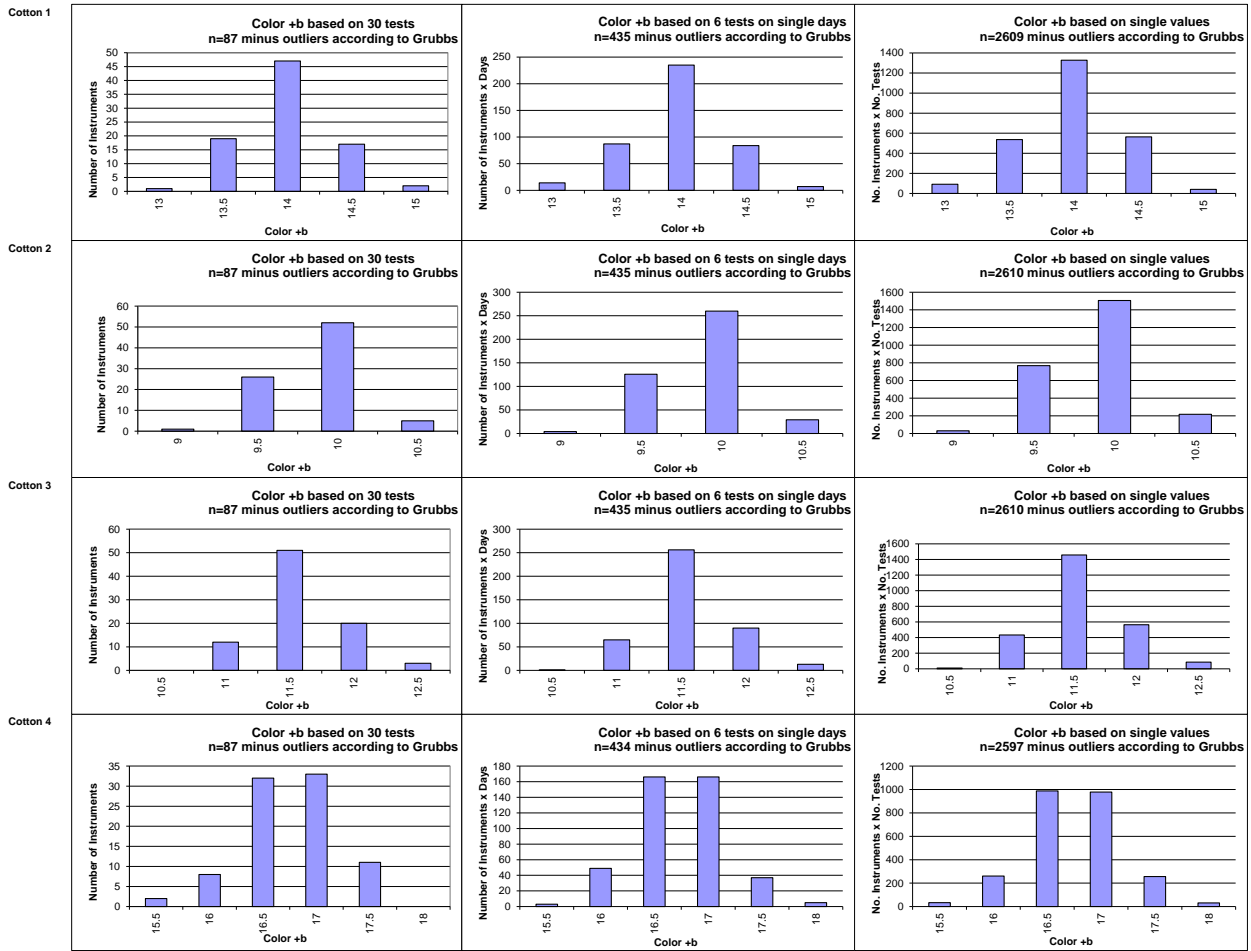n=2610 minus outliers according to Grubbs

(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)
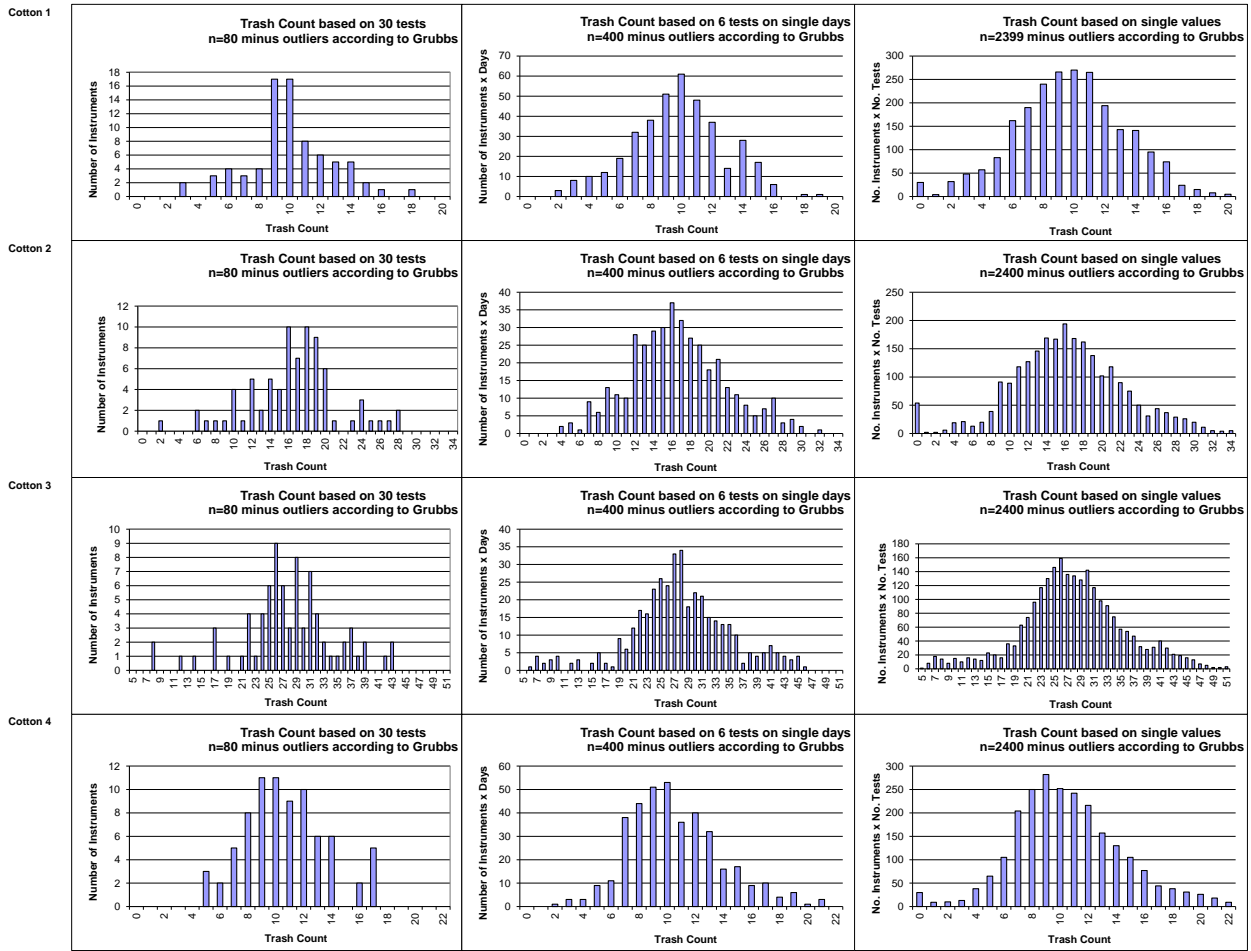
Test Result Distributions
Length

(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

Uniformity based on 30 tests
n=87 minus outliers according to Grubbs

Uniformity based on 6 tests on single days
n=435 minus outliers according to Grubbs

Uniformity based on single values
n=2608 minus outliers according to Grubbs

Cotton 2

Uniformity based on 30 tests
n=87 minus outliers according to Grubbs

Uniformity based on 6 tests on single days
n=435 minus outliers according to Grubbs

Uniformity based on single values
n=2610 minus outliers according to Grubbs

Cotton 3

Uniformity based on 30 tests
n=87 minus outliers according to Grubbs

Uniformity based on 6 tests on single days
n=435 minus outliers according to Grubbs

Uniformity based on single values
n=2610 minus outliers according to Grubbs

Cotton 4

Uniformity based on 30 tests
n=87 minus outliers according to Grubbs

Uniformity based on 6 tests on single days
n=435 minus outliers according to Grubbs

Uniformity based on single values
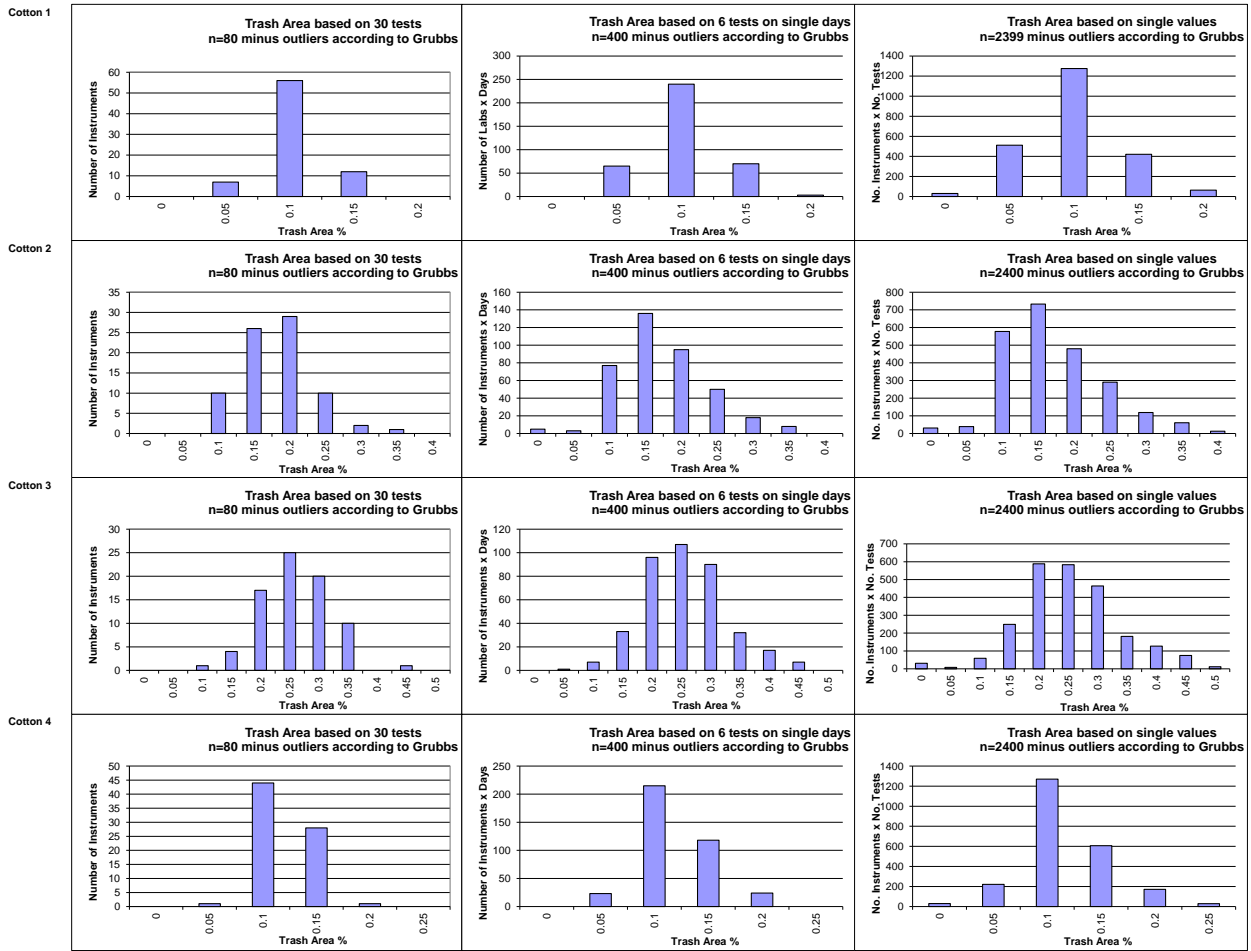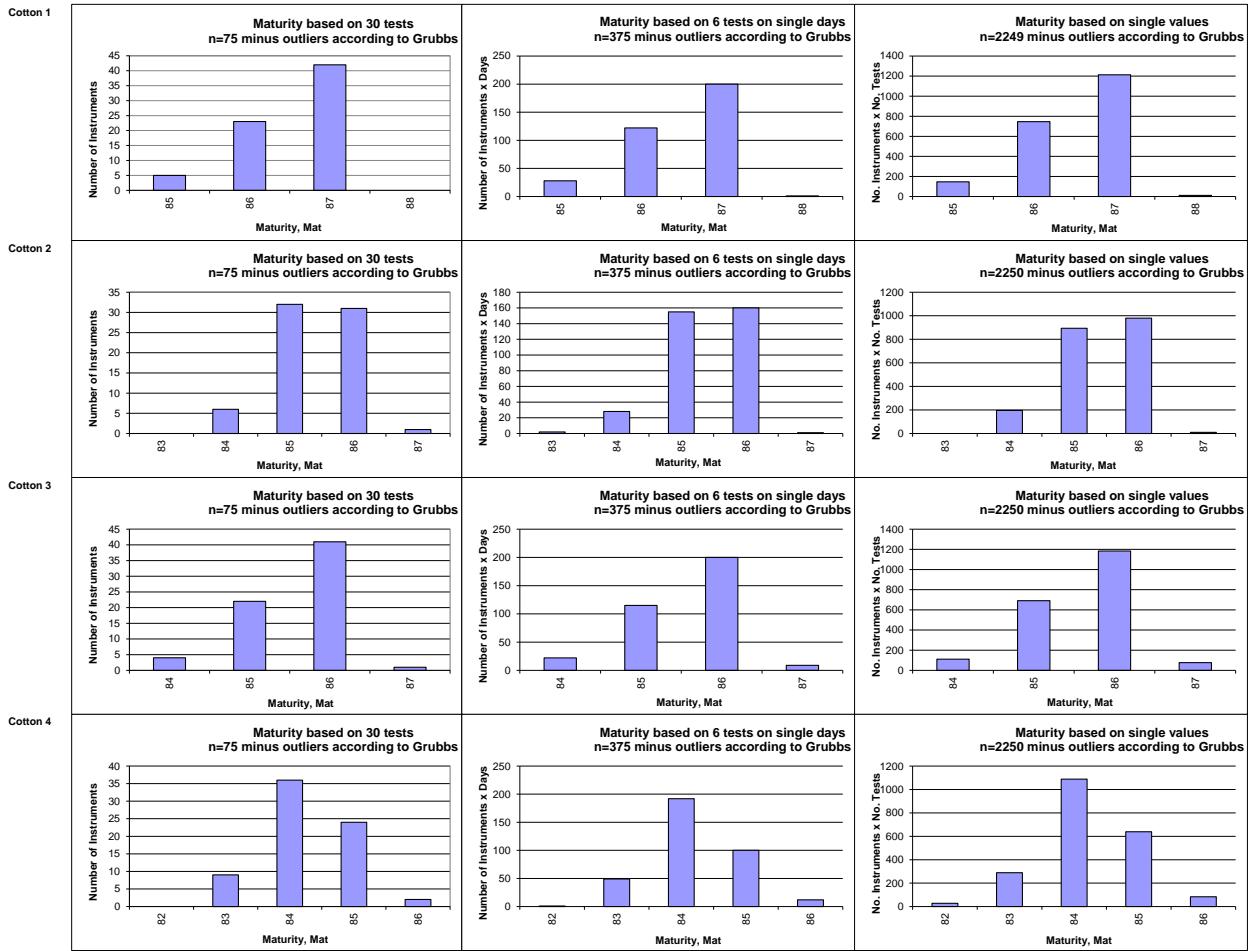n=2610 minus outliers according to Grubbs

0

(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
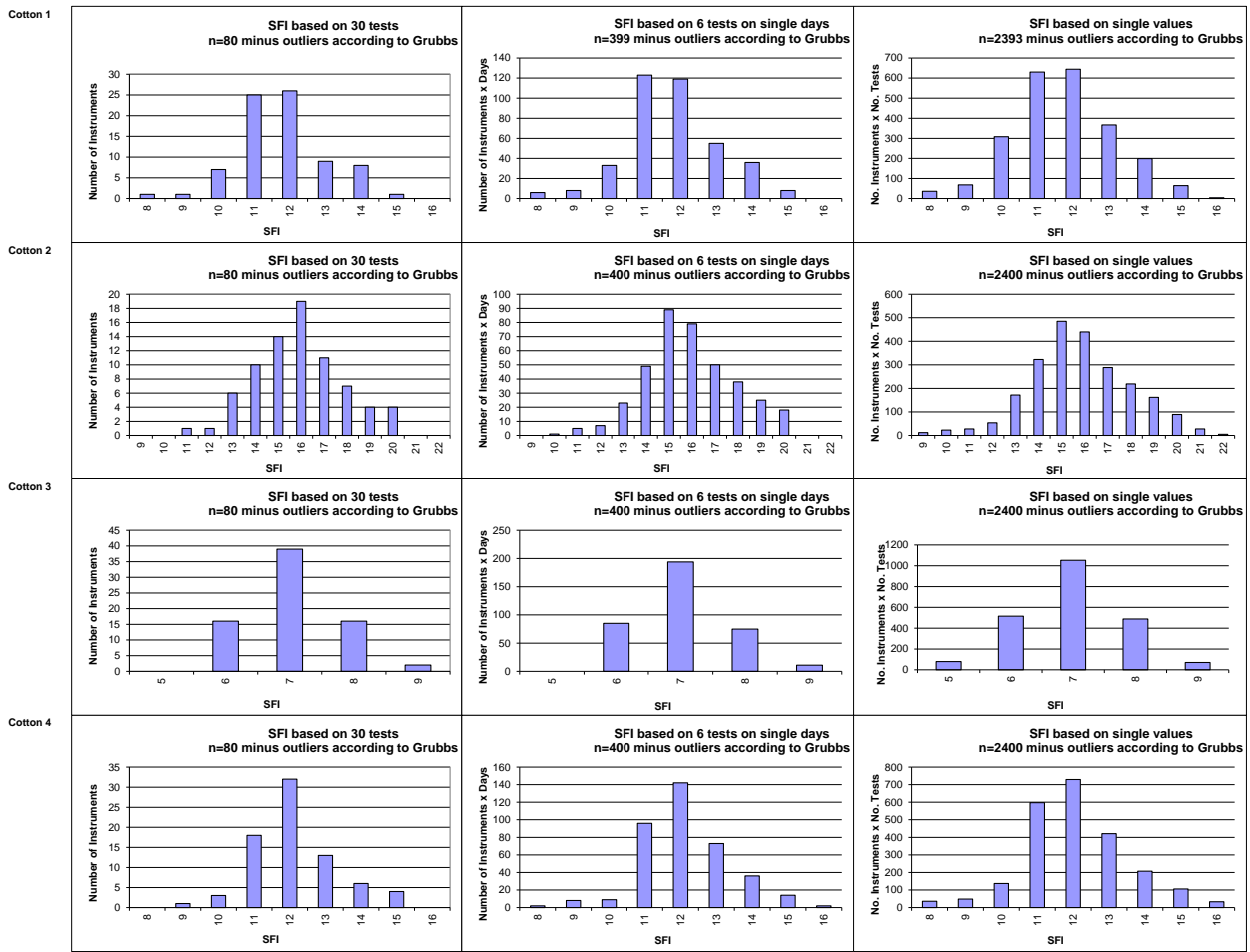Color Rd

(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

Color +b based on 30 tests
n=87 minus outliers according to Grubbs

Color +b based on 6 tests on single days
n=435 minus outliers according to Grubbs

Color +b based on single values
n=2609 minus outliers according to Grubbs

Cotton 2

Color +b based on 30 tests
n=87 minus outliers according to Grubbs

Color +b based on 6 tests on single days
n=435 minus outliers according to Grubbs

Color +b based on single values
n=2610 minus outliers according to Grubbs

Cotton 3

Color +b based on 30 tests
n=87 minus outliers according to Grubbs

Color +b based on 6 tests on single days
n=435 minus outliers according to Grubbs

Color +b based on single values
n=2610 minus outliers according to Grubbs

Cotton 4

Color +b based on 30 tests
n=87 minus outliers according to Grubbs

Color +b based on 6 tests on single days
n=434 minus outliers according to Grubbs

Color +b based on single values
n=2597 minus outliers according to Grubbs

(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

(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

Trash Area based on 30 tests
n=80 minus outliers according to Grubbs

Trash Area based on 6 tests on single days
n=400 minus outliers according to Grubbs

Trash Area based on single values
n=2399 minus outliers according to Grubbs

Cotton 2

Trash Area based on 30 tests
n=80 minus outliers according to Grubbs

Trash Area based on 6 tests on single days
n=400 minus outliers according to Grubbs

Trash Area based on single values
n=2400 minus outliers according to Grubbs

Cotton 3

Trash Area based on 30 tests
n=80 minus outliers according to Grubbs

Trash Area based on 6 tests on single days
n=400 minus outliers according to Grubbs

Trash Area based on single values
n=2400 minus outliers according to Grubbs

Cotton 4

Trash Area based on 30 tests
n=80 minus outliers according to Grubbs

Trash Area based on 6 tests on single days
n=400 minus outliers according to Grubbs

Trash Area based on single values
n=2400 minus outliers according to Grubbs

(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

(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
SFI

(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)

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<u>Section Two: Instrument Evaluation</u>

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

Instrument Evaluation

- Graph of Combined Properties -

According to ICAC CSITC Task Force Recommendations

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		Evaluation Combined Prop.
Statistics	Average	0.40
	Median	0.33
	Best Instrument	0.17
	Worst Instrument	3.68
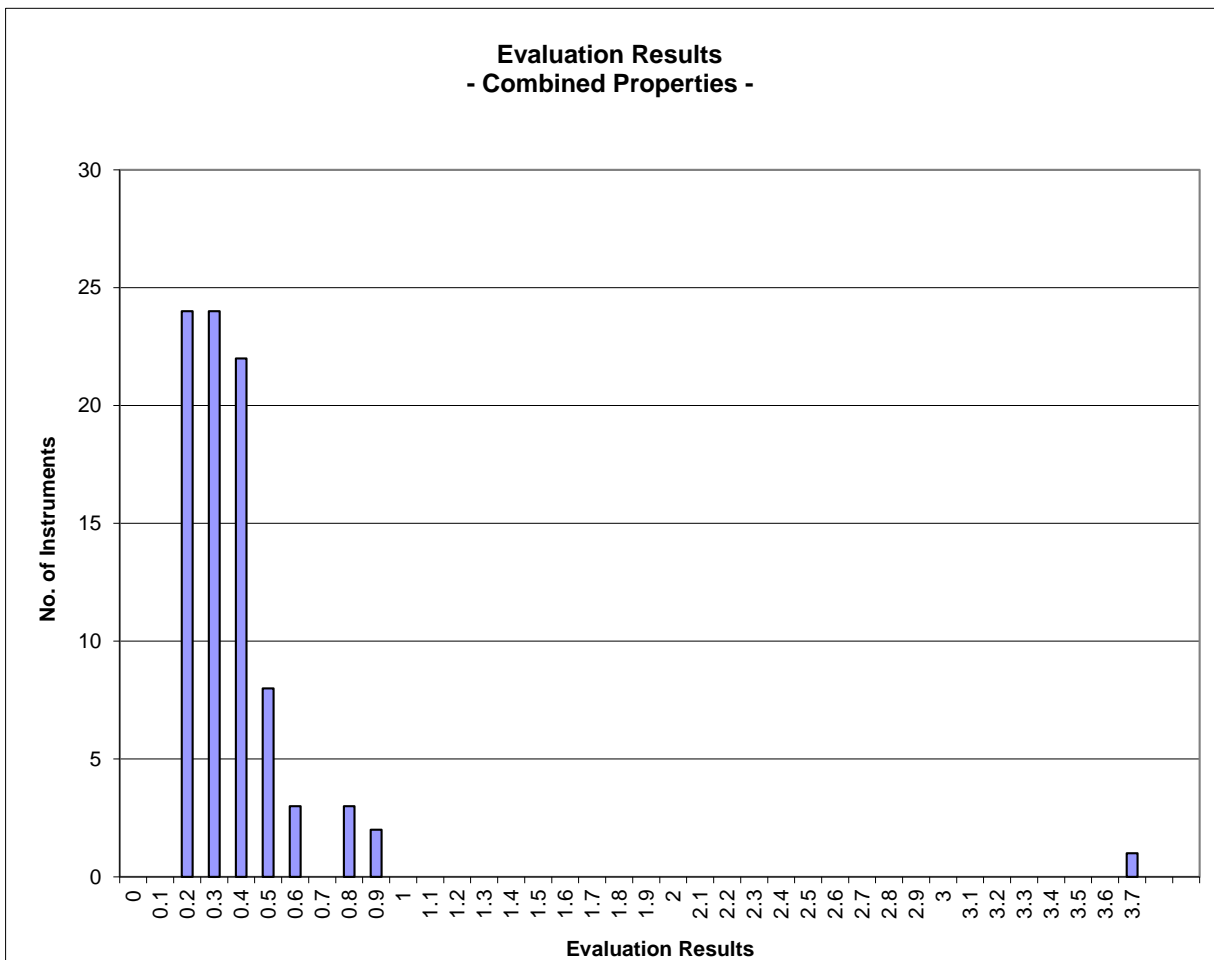
Evaluation Results
- Combined Properties -

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
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Statistics		Evaluation Micronaire	Evaluation Strength	Evaluation Length	Evaluation Uniformity	Evaluation Color Rd	Evaluation Color +b
Statistics	Average	0.44	0.38	0.35	0.30	0.33	0.59
	Median	0.38	0.30	0.28	0.23	0.22	0.43
	Best Instr.	0.04	0.06	0.05	0.05	0.03	0.05
	Worst Instr.	1.75	4.32	4.91	2.55	2.31	6.99
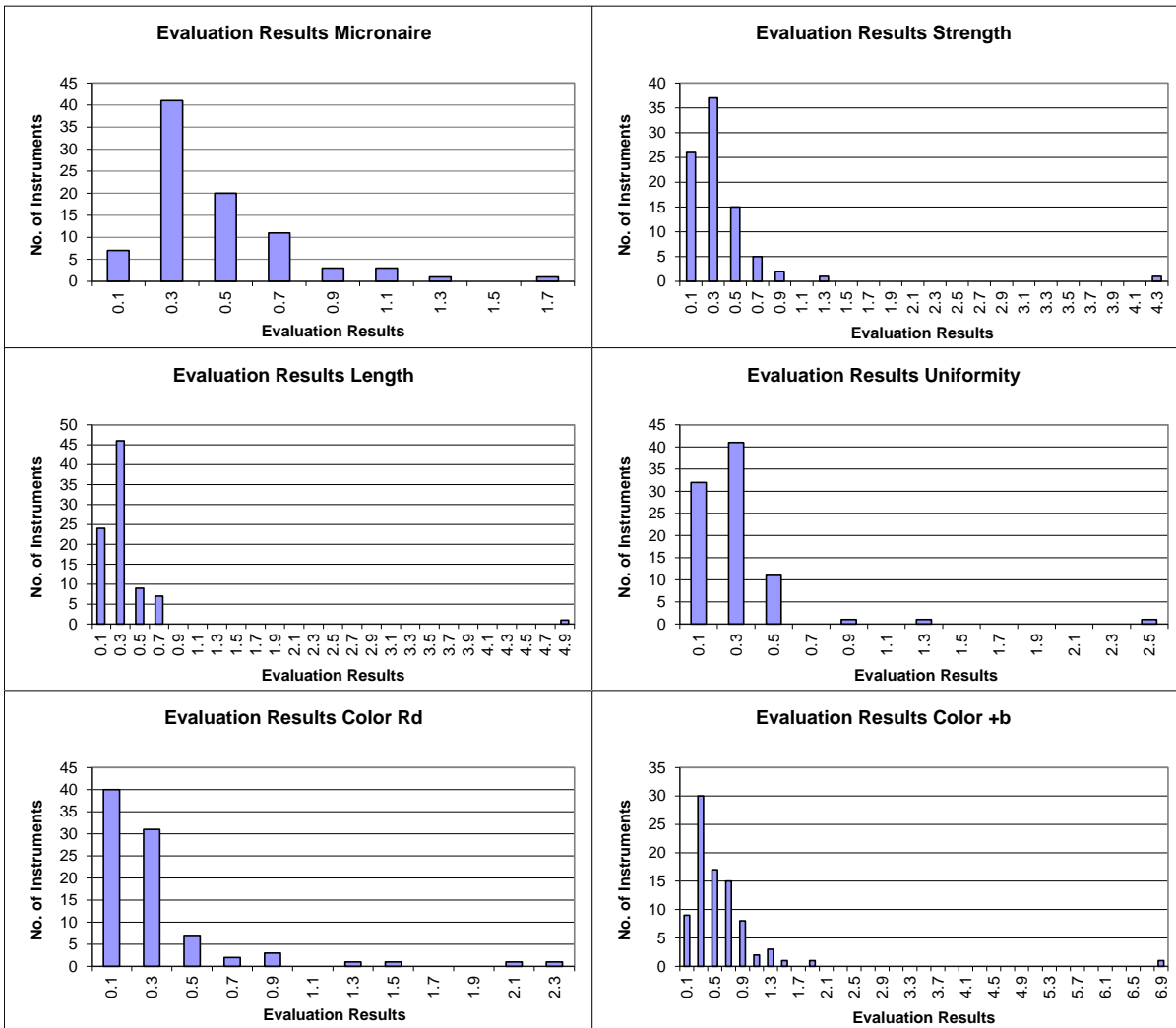
x-Axis shows midpoints of classes
The evaluation results are entered based on the unrounded values

International Cotton Advisory Committee

CSITC
Global - Round Trial 2020 - 2
General Evaluation

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

<u>Section Three: Within Limits Evaluation</u>

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

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	99.7	98.0	98.9	99.1	94.5	83.6
Completely within limits	98.9	95.4	98.9	98.9	90.8	62.1
% of Instruments ≥75% within limits	100.0	98.9	98.9	98.9	94.3	85.1
% of Instruments ≥50% within limits	100.0	98.9	98.9	98.9	96.6	92.0

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	98.3	94.6	97.5	98.3	93.9	81.7
% of Instruments 100% within limits	62.1	29.9	42.5	60.9	71.3	29.9
% of Instruments ≥95% within limits	94.3	73.6	93.1	96.6	86.2	49.4
% of Instruments ≥75% within limits	98.9	97.7	98.9	98.9	89.7	72.4
% of Instruments ≥65% within limits	100.0	97.7	98.9	98.9	93.1	82.8
% of Instruments ≥50% within limits	100.0	98.9	98.9	98.9	96.6	86.2