Round Test 2018-2 on

stickiness characterization methods

- FINAL REPORT –

date: January 28, 2019

Stickiness Task Force of the 'International Committee on Cotton Testing Methods' (ICCTM) of the 'International Textile Manufacturers Federation' (ITMF)

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Introduction

Confidentiality and use of information from this report

This report is both public and confidential:

- It is public as it will be released on the internet website of the ITMF (www.itmf.org) without providing any private information.

- It also is confidential as we provide Participating Laboratories with their own confidential laboratory LabID code that gives access to understanding each piece of information of the report; indeed with this LabID code number, more information can be extracted from the report. Please note that this LabID is changed for each test.

The Authors will not be held responsible to any degree for dissemination of the LabID code after the confidential distribution of their LabID code to the participating laboratories.

Preparation of cottons and samples

A range of five cottons was selected for their stickiness potential range. Basically, the stickiness level of these cottons is not known a priori and their level is being better known after the test, expecting that these cottons cover a range of stickiness.

All cottons in this test got a similar level of homogenization using an homogenizing machine developed during CFC/ICAC/33 project 'CSITC' project (so called CSITC homogenizing machine). The main goal of this preparation is to ensure that any drawn sample from the original mass would carry the "same" stickiness potential as any other sample for evaluating the laboratory performance, but without affecting too much the size of individual sticky points that could affect some measurement methods.

The degree of this preparation affects the distribution of sticky points within the mass of the fibers. When homogenization is 'perfectly performed', then the sticky point distribution follows Poisson's distribution within the fibers; in other cases, sticky point distribution follows over-dispersed distributions, such as negative binomial distributions. In these conditions, many repetitions of measurements are required to statistically compare laboratory performances or method performances.

From the beginning, we knew that homogenizing the cottons would induce 'preparation', and this was several times reported to us with the results. However, this has been the only way to ensure that all samples would be alike for any given cotton in order to compare method performances or laboratory performances within methods.

Once the cottons were homogenized, samples were drawn from their original cotton mass, and ranges of cottons were constituted for each participating laboratory, whatever the method used. Envelopes were sent out to laboratories in end of November 2018.

All laboratories were supposed to send their results back by January 12, 2019. Practically, this date was reported to January 22, 2019. This FINAL REPORT is prepared after this date when most Laboratories who received the material lately sent back their results.

Organizing this round-test, at present running for free, takes time and uses precious materials; therefore we really appreciate when all registered Laboratories who received RT samples provided us with results.

Organization of this report

As stated in the Contents,

- Individual results provided by Participating Laboratories are reported, cotton by cotton, sorted by method and then by LabID. A mail was sent out in a confidential manner to each participating laboratory for reading this public report, and therefore getting more out of it.

- Statistics are then presented in summary tables or in boxplot charts, cotton by cotton, sorted by method and then by LabID. This section allows the comparison of results by LabID within each method. Both the mean results and the variation of individual results are then highlighted.

- Correlation matrix are given for comparing LabID Mean results cotton by cotton, and sorted by method.

- Charts linking the within-laboratory variances of LabIDs for each method to the calculated mean results per LabID are displayed. Precision and accuracy of individual LabID performance can be deduced from these charts.

- Finally, distances between LabID mean result to the Grand Mean are displayed by method, sorted by method and by LabID.

Conversion of 'laboratories raw records' into numeric data for use in this report

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Answers to this round-test were provided **freely** by laboratories in a table having five columns (one per cotton) and six lines (for potentially recording six results for each cotton) for a total of 30 table cells.

For comparing results between laboratories, results were expected to be reported in a coordinated and harmonized manner within each method. However, for this test also, laboratories reported results the way they probably are used to do in their every day practice: the observation is that the report was not always harmonized within methods.

For allowing a comparison, we were obliged to convert some laboratory records into harmonized numeric values by applying the following rules when needed (most accronyms are explained in the 'Frequently asked questions' section):

- For Caramelization : one measurement = one cell. No transformation of the data.
- For Clinitest: >1: was converted into 1.5.
- For Contest and Fibermap: Since RT2018-1 included: these devices are using the same technology for characterizing stickines and their results are grouped together into one single 'Contest-Fibermap' category. No transformation of the data.
- For GB/T13785-1992: one measurement = one cell. No transformation of the data.
- For H2SD: one measurement = one cell. No transformation of the data.
- For HSI-NIR: one measurement = one cell. No transformation of the data that has been calibrated to H2SD count at the beginning.
- For KOTITI: grades were converted into numeric values as follows:
  - A: 0
  - A+ = B-: 1
  - B: 2
  - B+ = C-: 3
  - C: 4
  - C+ = D-: 5
  - D: 6
  - D+ = E-: 7
  - E: 8
  - E+: 9.
- For minicard: ITMF grades 0 to 3 were used for reporting, one measurement = one cell. No transformation of the data.
- For Qualitative: (NEW)

  - NIL: 0
  - Trace: 1
  - Light: 2

- For SCT: one measurement = one record = sum of reading of top foil + reading of bottom foil.
- For TDM-A: one measurement = one record. No transformation of the data.

All individual results per Method and LabID for each cotton [1]

[1] Footnote

* Results sorted by Method and then by LabID.
* NA or NaN : no results provided.

Table for Cotton A

Meth	LabID	R1	R2	R3	R4	R5	R6	Un
Carameliza	5	2.0	NA	NA	NA	NA	NA	Color degree
Carameliza	40	2.7	NA	NA	NA	NA	NA	Color degree
Carameliza	145	5.0	4.5	4.0	3.5	3.0	3.0	Color degree
Carameliza	150	2.1	2.8	NA	NA	NA	NA	Color degree
Clinitest	155	4.0	3.0	3.0	NA	NA	NA	Color Chart
Contest-Fi	30	664.0	695.0	698.0	727.0	754.0	787.0	C/F Grade
Contest-Fi	100	602.0	577.0	604.0	568.0	589.0	536.0	C/F Grade
Contest-Fi	105	566.0	445.0	406.0	452.0	528.0	500.0	C/F Grade
Contest-Fi	110	665.0	463.0	651.0	589.0	556.0	562.0	C/F Grade
Contest-Fi	115	520.0	480.0	434.0	590.0	499.0	505.0	C/F Grade
Contest-Fi	140	620.0	631.0	573.0	702.0	NA	NA	C/F Grade
GB/T13785-	50	5.0	5.0	5.0	5.0	4.0	5.0	Color degree
H2SD	15	31.0	42.0	46.0	39.0	40.0	35.0	Sticky point
H2SD	35	22.0	36.0	31.0	36.0	49.0	23.0	Sticky point
H2SD	60	26.0	29.0	33.0	37.0	42.0	33.0	Sticky point
H2SD	75	44.0	45.0	56.0	36.0	44.0	45.0	Sticky point
HSI-NIR	55	49.0	38.0	41.0	34.0	36.0	40.0	Sticky point
KOTITI	90	7.0	7.0	7.0	7.0	7.0	7.0	Sticky point
Minicard	80	2.0	1.5	1.5	NA	NA	NA	ITMF grades
Minicard	125	2.0	3.0	3.0	NA	NA	NA	ITMF grades
Qualitativ	45	2.0	2.0	1.0	2.0	2.0	2.0	Grade
Quantitati	135	0.5	0.7	0.8	0.6	1.0	0.6	Percent
Reactive S	160	3.0	3.0	4.0	NA	NA	NA	Spray Grade
SCT	10	56.0	44.0	42.0	38.0	45.0	51.0	Sticky point
SCT	20	114.0	105.0	95.0	99.0	93.0	108.0	Sticky point
SCT	25	95.0	108.0	102.0	90.0	103.0	97.0	Sticky point
SCT	65	106.0	103.0	113.0	107.0	105.0	101.0	Sticky point
SCT	70	48.0	55.0	52.0	NA	NA	NA	Sticky point
SCT	85	24.5	39.0	37.0	28.0	43.5	30.5	Sticky point
SCT	95	111.0	90.0	98.0	NA	NA	NA	Sticky point
SCT	130	7.0	17.0	35.0	NA	NA	NA	Sticky point
SCT	165	83.0	92.0	78.0	NA	NA	NA	Sticky point
TDM-A	120	21.0	24.0	29.0	25.0	13.0	NA	Sticky point

Table for Cotton B

Meth	LabID	R1	R2	R3	R4	R5	R6	Un
Carameliza	5	2.6	NA	NA	NA	NA	NA	Color degree
Carameliza	40	4.5	NA	NA	NA	NA	NA	Color degree
Carameliza	145	1.5	1.5	1.5	1.5	1.5	1.5	Color degree
Carameliza	150	3.1	3.2	NA	NA	NA	NA	Color degree
Clinitest	155	2.0	2.0	3.0	NA	NA	NA	Color Chart
Contest-Fi	30	38.0	27.0	37.0	50.0	44.0	28.0	C/F Grade
Contest-Fi	100	33.0	42.0	69.0	21.0	42.0	35.0	C/F Grade
Contest-Fi	105	46.0	36.0	48.0	51.0	45.0	47.0	C/F Grade
Contest-Fi	110	15.0	17.0	35.0	57.0	47.0	57.0	C/F Grade
Contest-Fi	115	26.0	11.0	21.0	25.0	16.0	19.0	C/F Grade
Contest-Fi	140	22.0	78.0	95.0	98.0	31.0	NA	C/F Grade
GB/T13785-	50	2.0	2.0	1.0	2.0	2.0	1.0	Color degree
H2SD	15	4.0	4.0	3.0	5.0	5.0	2.0	Sticky point
H2SD	35	3.0	7.0	12.0	3.0	0.0	4.0	Sticky point
H2SD	60	3.0	2.0	0.0	1.0	2.0	4.0	Sticky point
H2SD	75	17.0	17.0	8.0	11.0	2.0	7.0	Sticky point
HSI-NIR	55	16.0	13.0	11.0	15.0	6.0	10.0	Sticky point
KOTITI	90	5.0	5.0	5.0	5.0	5.0	5.0	Sticky point
Minicard	80	0.0	0.0	0.0	NA	NA	NA	ITMF grades
Minicard	125	0.0	0.0	1.0	NA	NA	NA	ITMF grades
Qualitativ	45	0.0	1.0	1.0	0.0	0.0	0.0	Grade
Quantitati	135	0.4	0.5	0.4	0.5	0.4	0.5	Percent
Reactive S	160	3.0	4.0	3.0	NA	NA	NA	Spray Grade
SCT	10	14.0	12.0	10.0	9.0	8.0	7.0	Sticky point
SCT	20	2.0	5.0	2.0	8.0	3.0	6.0	Sticky point
SCT	25	19.0	19.0	19.0	11.0	14.0	16.0	Sticky point
SCT	65	10.0	8.0	14.0	9.0	11.0	13.0	Sticky point
SCT	70	0.0	4.0	6.0	NA	NA	NA	Sticky point
SCT	85	3.0	5.5	5.5	4.5	5.0	4.5	Sticky point
SCT	95	16.0	12.0	12.0	NA	NA	NA	Sticky point
SCT	130	0.0	2.0	2.0	NA	NA	NA	Sticky point
SCT	165	6.0	13.0	10.0	NA	NA	NA	Sticky point
TDM-A	120	4.0	6.0	3.0	1.0	1.0	NA	Sticky point

Table for Cotton C

Meth	LabID	R1	R2	R3	R4	R5	R6	Un
Carameliza	5	1.3	NA	NA	NA	NA	NA	Color degree
Carameliza	40	2.4	NA	NA	NA	NA	NA	Color degree
Carameliza	145	2.5	2.5	2.0	1.5	1.5	1.5	Color degree
Carameliza	150	1.6	1.7	NA	NA	NA	NA	Color degree
Clinitest	155	2.0	2.0	2.0	NA	NA	NA	Color Chart
Contest-Fi	30	221.0	224.0	300.0	178.0	220.0	281.0	C/F Grade
Contest-Fi	100	283.0	246.0	284.0	260.0	228.0	283.0	C/F Grade
Contest-Fi	105	134.0	112.0	60.0	142.0	115.0	156.0	C/F Grade
Contest-Fi	110	249.0	168.0	130.0	151.0	187.0	216.0	C/F Grade
Contest-Fi	115	227.0	103.0	223.0	125.0	73.0	124.0	C/F Grade
Contest-Fi	140	292.0	269.0	329.0	264.0	360.0	311.0	C/F Grade
GB/T13785-	50	2.0	1.0	1.0	1.0	1.0	1.0	Color degree
H2SD	15	6.0	5.0	5.0	7.0	6.0	4.0	Sticky point
H2SD	35	12.0	16.0	8.0	10.0	9.0	17.0	Sticky point
H2SD	60	0.0	1.0	3.0	5.0	2.0	7.0	Sticky point
H2SD	75	15.0	26.0	30.0	31.0	30.0	34.0	Sticky point
HSI-NIR	55	41.0	32.0	36.0	31.0	27.0	39.0	Sticky point
KOTITI	90	9.0	9.0	9.0	8.0	8.0	8.0	Sticky point
Minicard	80	0.8	0.8	0.5	NA	NA	NA	ITMF grades
Minicard	125	1.0	1.0	2.0	NA	NA	NA	ITMF grades
Qualitativ	45	1.0	0.0	1.0	2.0	1.0	2.0	Grade
Quantitati	135	0.4	0.4	0.5	0.4	0.4	0.4	Percent
Reactive S	160	2.0	2.0	3.0	NA	NA	NA	Spray Grade
SCT	10	15.0	13.0	14.0	13.0	15.0	13.0	Sticky point
SCT	20	16.0	22.0	16.0	44.0	12.0	18.0	Sticky point
SCT	25	57.0	54.0	56.0	51.0	59.0	55.0	Sticky point
SCT	65	36.0	35.0	30.0	31.0	37.0	32.0	Sticky point
SCT	70	10.0	13.0	27.0	NA	NA	NA	Sticky point
SCT	85	14.5	12.0	12.5	16.5	15.5	20.5	Sticky point
SCT	95	27.0	19.0	12.0	NA	NA	NA	Sticky point
SCT	130	0.0	12.0	3.0	NA	NA	NA	Sticky point
SCT	165	23.0	29.0	31.0	NA	NA	NA	Sticky point
TDM-A	120	5.0	10.0	8.0	11.0	5.0	NA	Sticky point

Table for Cotton D

Meth	LabID	R1	R2	R3	R4	R5	R6	Un
Carameliza	5	1.2	NA	NA	NA	NA	NA	Color degree
Carameliza	40	2.5	NA	NA	NA	NA	NA	Color degree
Carameliza	145	2.5	2.5	2.0	1.5	1.5	1.5	Color degree
Carameliza	150	2.5	2.6	NA	NA	NA	NA	Color degree
Clinitest	155	3.0	4.0	4.0	NA	NA	NA	Color Chart
Contest-Fi	30	550.0	604.0	592.0	535.0	525.0	433.0	C/F Grade
Contest-Fi	100	379.0	430.0	400.0	285.0	381.0	343.0	C/F Grade
Contest-Fi	105	418.0	351.0	228.0	289.0	218.0	408.0	C/F Grade
Contest-Fi	110	426.0	460.0	446.0	503.0	400.0	396.0	C/F Grade
Contest-Fi	115	220.0	352.0	312.0	315.0	214.0	261.0	C/F Grade
Contest-Fi	140	545.0	528.0	523.0	570.0	518.0	579.0	C/F Grade
GB/T13785-	50	1.0	1.0	2.0	1.0	1.0	1.0	Color degree
H2SD	15	29.0	25.0	19.0	32.0	18.0	24.0	Sticky point
H2SD	35	25.0	27.0	26.0	13.0	25.0	15.0	Sticky point
H2SD	60	22.0	30.0	27.0	22.0	22.0	20.0	Sticky point
H2SD	75	31.0	26.0	23.0	19.0	19.0	20.0	Sticky point
HSI-NIR	55	23.0	21.0	30.0	27.0	13.0	24.0	Sticky point
KOTITI	90	8.0	8.0	8.0	8.0	8.0	8.0	Sticky point
Minicard	80	1.8	0.8	1.2	NA	NA	NA	ITMF grades
Minicard	125	2.0	1.0	1.0	NA	NA	NA	ITMF grades
Qualitativ	45	0.0	0.0	0.0	0.0	0.0	0.0	Grade
Quantitati	135	0.4	0.4	0.4	0.4	0.4	0.4	Percent
Reactive S	160	3.0	3.0	2.0	NA	NA	NA	Spray Grade
SCT	10	36.0	33.0	31.0	34.0	37.0	29.0	Sticky point
SCT	20	52.0	64.0	56.0	62.0	56.0	52.0	Sticky point
SCT	25	85.0	73.0	83.0	79.0	82.0	66.0	Sticky point
SCT	65	57.0	53.0	59.0	51.0	59.0	65.0	Sticky point
SCT	70	45.0	79.0	48.0	NA	NA	NA	Sticky point
SCT	85	13.5	27.5	23.0	19.0	19.0	20.5	Sticky point
SCT	95	62.0	40.0	62.0	NA	NA	NA	Sticky point
SCT	130	10.0	9.0	10.0	NA	NA	NA	Sticky point
SCT	165	47.0	41.0	51.0	NA	NA	NA	Sticky point
TDM-A	120	8.0	12.0	8.0	6.0	8.0	NA	Sticky point

Table for Cotton E

Meth	LabID	R1	R2	R3	R4	R5	R6	Un
Carameliza	5	4.0	NA	NA	NA	NA	NA	Color degree
Carameliza	40	5.5	NA	NA	NA	NA	NA	Color degree
Carameliza	145	2.0	2.0	2.0	1.5	1.5	1.5	Color degree
Carameliza	150	4.9	4.6	NA	NA	NA	NA	Color degree
Clinitest	155	3.0	3.0	2.0	NA	NA	NA	Color Chart
Contest-Fi	30	147.0	276.0	187.0	277.0	253.0	270.0	C/F Grade
Contest-Fi	100	129.0	140.0	152.0	133.0	136.0	86.0	C/F Grade
Contest-Fi	105	92.0	84.0	72.0	90.0	86.0	69.0	C/F Grade
Contest-Fi	110	121.0	119.0	132.0	122.0	98.0	91.0	C/F Grade
Contest-Fi	115	91.0	94.0	138.0	119.0	99.0	57.0	C/F Grade
Contest-Fi	140	108.0	106.0	132.0	137.0	189.0	194.0	C/F Grade
GB/T13785-	50	1.0	1.0	2.0	1.0	1.0	1.0	Color degree
H2SD	15	4.0	2.0	2.0	1.0	5.0	4.0	Sticky point
H2SD	35	5.0	8.0	4.0	10.0	1.0	8.0	Sticky point
H2SD	60	6.0	4.0	2.0	0.0	3.0	5.0	Sticky point
H2SD	75	26.0	17.0	16.0	11.0	8.0	16.0	Sticky point
HSI-NIR	55	17.0	12.0	21.0	21.0	14.0	19.0	Sticky point
KOTITI	90	9.0	6.0	6.0	6.0	6.0	6.0	Sticky point
Minicard	80	0.5	1.2	0.8	NA	NA	NA	ITMF grades
Minicard	125	1.0	0.0	1.0	NA	NA	NA	ITMF grades
Qualitativ	45	2.0	2.0	0.0	0.0	2.0	2.0	Grade
Quantitati	135	0.4	0.6	0.5	0.6	0.5	0.4	Percent
Reactive S	160	2.0	3.0	2.0	NA	NA	NA	Spray Grade
SCT	10	10.0	14.0	10.0	7.0	10.0	7.0	Sticky point
SCT	20	11.0	18.0	4.0	21.0	5.0	9.0	Sticky point
SCT	25	12.0	10.0	13.0	10.0	8.0	18.0	Sticky point
SCT	65	7.0	13.0	10.0	12.0	9.0	10.0	Sticky point
SCT	70	5.0	6.0	2.0	NA	NA	NA	Sticky point
SCT	85	2.5	7.5	4.5	1.5	2.0	5.0	Sticky point
SCT	95	5.0	18.0	18.0	NA	NA	NA	Sticky point
SCT	130	0.0	8.0	6.0	NA	NA	NA	Sticky point
SCT	165	10.0	13.0	14.0	NA	NA	NA	Sticky point
TDM-A	120	3.0	6.0	3.0	3.0	2.0	NA	Sticky point

Statistics per Method, LabID for cottons A, B and C [2]

[2]Footnote

* Mean of all readings per LabID (NA excluded, expressed in Unit).
* Var = variance taking care of all available readings per LabID (NA excluded).
* CV = CV between reading per LabID expressed in percent.
* GMean = Grand Mean of all laboratory means, calculated by Method.
* Delta = LabID Mean - GMean.
* NA or NaN : no result provided.

Table for Cotton A

Meth	LabID	MeanIntraLab	Un	VarIntraLab	CVIntraLab	MeanInterLab	Delta
Carameliza	5	2.0	Color degree	NA	NA	2.7	-0.7
Carameliza	40	2.7	Color degree	NA	NA	2.7	0.0
Carameliza	145	3.8	Color degree	0.7	21.3	2.7	1.1
Carameliza	150	2.5	Color degree	0.2	20.2	2.7	-0.3
Clinitest	155	3.3	Color Chart	0.3	17.3	3.3	0.0
Contest-Fi	30	720.8	C/F Grade	1987.0	6.2	583.4	137.5
Contest-Fi	100	579.3	C/F Grade	645.5	4.4	583.4	-4.0
Contest-Fi	105	482.8	C/F Grade	3507.4	12.3	583.4	-100.5
Contest-Fi	110	581.0	C/F Grade	5386.0	12.6	583.4	-2.4
Contest-Fi	115	504.7	C/F Grade	2630.3	10.2	583.4	-78.7
Contest-Fi	140	631.5	C/F Grade	2841.7	8.4	583.4	48.1
GB/T13785-	50	4.8	Color degree	0.2	8.4	4.8	0.0
H2SD	15	38.8	Sticky point	27.8	13.6	37.5	1.3
H2SD	35	32.8	Sticky point	99.8	30.4	37.5	-4.7
H2SD	60	33.3	Sticky point	32.3	17.0	37.5	-4.2
H2SD	75	45.0	Sticky point	40.8	14.2	37.5	7.5
HSI-NIR	55	39.7	Sticky point	27.5	13.2	39.7	0.0
KOTITI	90	7.0	Sticky point	0.0	0.0	7.0	0.0
Minicard	80	1.7	ITMF grades	0.1	17.3	2.2	-0.5
Minicard	125	2.7	ITMF grades	0.3	21.7	2.2	0.5
Qualitativ	45	1.8	Grade	0.2	22.3	1.8	0.0
Quantitati	135	0.7	Percent	0.0	25.0	0.7	0.0
Reactive S	160	3.3	Spray Grade	0.3	17.3	3.3	0.0
SCT	10	46.0	Sticky point	42.0	14.1	71.4	-25.4
SCT	20	102.3	Sticky point	65.5	7.9	71.4	31.0
SCT	25	99.2	Sticky point	41.4	6.5	71.4	27.8
SCT	65	105.8	Sticky point	17.0	3.9	71.4	34.5
SCT	70	51.7	Sticky point	12.3	6.8	71.4	-19.7
SCT	85	33.8	Sticky point	52.5	21.5	71.4	-37.6
SCT	95	99.7	Sticky point	112.3	10.6	71.4	28.3
SCT	130	19.7	Sticky point	201.3	72.1	71.4	-51.7
SCT	165	84.3	Sticky point	50.3	8.4	71.4	13.0
TDM-A	120	22.4	Sticky point	35.8	26.7	22.4	0.0

Table for Cotton B

Meth	LabID	MeanIntraLab	Un	VarIntraLab	CVIntraLab	MeanInterLab	Delta
Carameliza	5	2.6	Color degree	NA	NA	2.9	-0.3
Carameliza	40	4.5	Color degree	NA	NA	2.9	1.6
Carameliza	145	1.5	Color degree	0.0	0.0	2.9	-1.4
Carameliza	150	3.2	Color degree	0.0	2.2	2.9	0.2
Clinitest	155	2.3	Color Chart	0.3	24.7	2.3	0.0
Contest-Fi	30	37.3	C/F Grade	79.9	23.9	40.9	-3.6
Contest-Fi	100	40.3	C/F Grade	256.7	39.7	40.9	-0.6
Contest-Fi	105	45.5	C/F Grade	25.9	11.2	40.9	4.6
Contest-Fi	110	38.0	C/F Grade	356.4	49.7	40.9	-2.9
Contest-Fi	115	19.7	C/F Grade	31.9	28.7	40.9	-21.3
Contest-Fi	140	64.8	C/F Grade	1290.7	55.4	40.9	23.9
GB/T13785-	50	1.7	Color degree	0.3	31.0	1.7	0.0
H2SD	15	3.8	Sticky point	1.4	30.5	5.2	-1.4
H2SD	35	4.8	Sticky point	17.4	86.2	5.2	-0.4
H2SD	60	2.0	Sticky point	2.0	70.7	5.2	-3.2
H2SD	75	10.3	Sticky point	35.1	57.3	5.2	5.1
HSI-NIR	55	11.8	Sticky point	13.4	30.9	11.8	0.0
KOTITI	90	5.0	Sticky point	0.0	0.0	5.0	0.0
Minicard	80	0.0	ITMF grades	0.0	NaN	0.2	-0.2
Minicard	125	0.3	ITMF grades	0.3	173.2	0.2	0.2
Qualitativ	45	0.3	Grade	0.3	154.9	0.3	0.0
Quantitati	135	0.4	Percent	0.0	7.9	0.4	0.0
Reactive S	160	3.3	Spray Grade	0.3	17.3	3.3	0.0
SCT	10	10.0	Sticky point	6.8	26.1	8.2	1.8
SCT	20	4.3	Sticky point	5.9	55.9	8.2	-3.9
SCT	25	16.3	Sticky point	11.1	20.4	8.2	8.1
SCT	65	10.8	Sticky point	5.4	21.4	8.2	2.6
SCT	70	3.3	Sticky point	9.3	91.7	8.2	-4.9
SCT	85	4.7	Sticky point	0.9	19.9	8.2	-3.5
SCT	95	13.3	Sticky point	5.3	17.3	8.2	5.1
SCT	130	1.3	Sticky point	1.3	86.6	8.2	-6.9
SCT	165	9.7	Sticky point	12.3	36.3	8.2	1.5
TDM-A	120	3.0	Sticky point	4.5	70.7	3.0	0.0

Table for Cotton C

Meth	LabID	MeanIntraLab	Un	VarIntraLab	CVIntraLab	MeanInterLab	Delta
Carameliza	5	1.3	Color degree	NA	NA	1.8	-0.5
Carameliza	40	2.4	Color degree	NA	NA	1.8	0.6
Carameliza	145	1.9	Color degree	0.2	25.6	1.8	0.1
Carameliza	150	1.6	Color degree	0.0	4.3	1.8	-0.2
Clinitest	155	2.0	Color Chart	0.0	0.0	2.0	0.0
Contest-Fi	30	237.3	C/F Grade	2019.9	18.9	209.1	28.2
Contest-Fi	100	264.0	C/F Grade	551.6	8.9	209.1	54.9
Contest-Fi	105	119.8	C/F Grade	1133.0	28.1	209.1	-89.3
Contest-Fi	110	183.5	C/F Grade	1903.5	23.8	209.1	-25.6
Contest-Fi	115	145.8	C/F Grade	4118.6	44.0	209.1	-63.3
Contest-Fi	140	304.2	C/F Grade	1355.8	12.1	209.1	95.1
GB/T13785-	50	1.2	Color degree	0.2	35.0	1.2	0.0
H2SD	15	5.5	Sticky point	1.1	19.1	12.0	-6.5
H2SD	35	12.0	Sticky point	14.0	31.2	12.0	0.0
H2SD	60	3.0	Sticky point	6.8	86.9	12.0	-9.0
H2SD	75	27.7	Sticky point	45.1	24.3	12.0	15.6
HSI-NIR	55	34.3	Sticky point	27.9	15.4	34.3	0.0
KOTITI	90	8.5	Sticky point	0.3	6.4	8.5	0.0
Minicard	80	0.7	ITMF grades	0.0	21.7	1.0	-0.3
Minicard	125	1.3	ITMF grades	0.3	43.3	1.0	0.3
Qualitativ	45	1.2	Grade	0.6	64.5	1.2	0.0
Quantitati	135	0.4	Percent	0.0	11.5	0.4	0.0
Reactive S	160	2.3	Spray Grade	0.3	24.7	2.3	0.0
SCT	10	13.8	Sticky point	1.0	7.1	23.1	-9.3
SCT	20	21.3	Sticky point	133.9	54.2	23.1	-1.8
SCT	25	55.3	Sticky point	7.5	4.9	23.1	32.2
SCT	65	33.5	Sticky point	8.3	8.6	23.1	10.4
SCT	70	16.7	Sticky point	82.3	54.4	23.1	-6.4
SCT	85	15.2	Sticky point	9.6	20.3	23.1	-7.9
SCT	95	19.3	Sticky point	56.3	38.8	23.1	-3.8
SCT	130	5.0	Sticky point	39.0	124.9	23.1	-18.1
SCT	165	27.7	Sticky point	17.3	15.0	23.1	4.6
TDM-A	120	7.8	Sticky point	7.7	35.6	7.8	0.0

Table for Cotton D

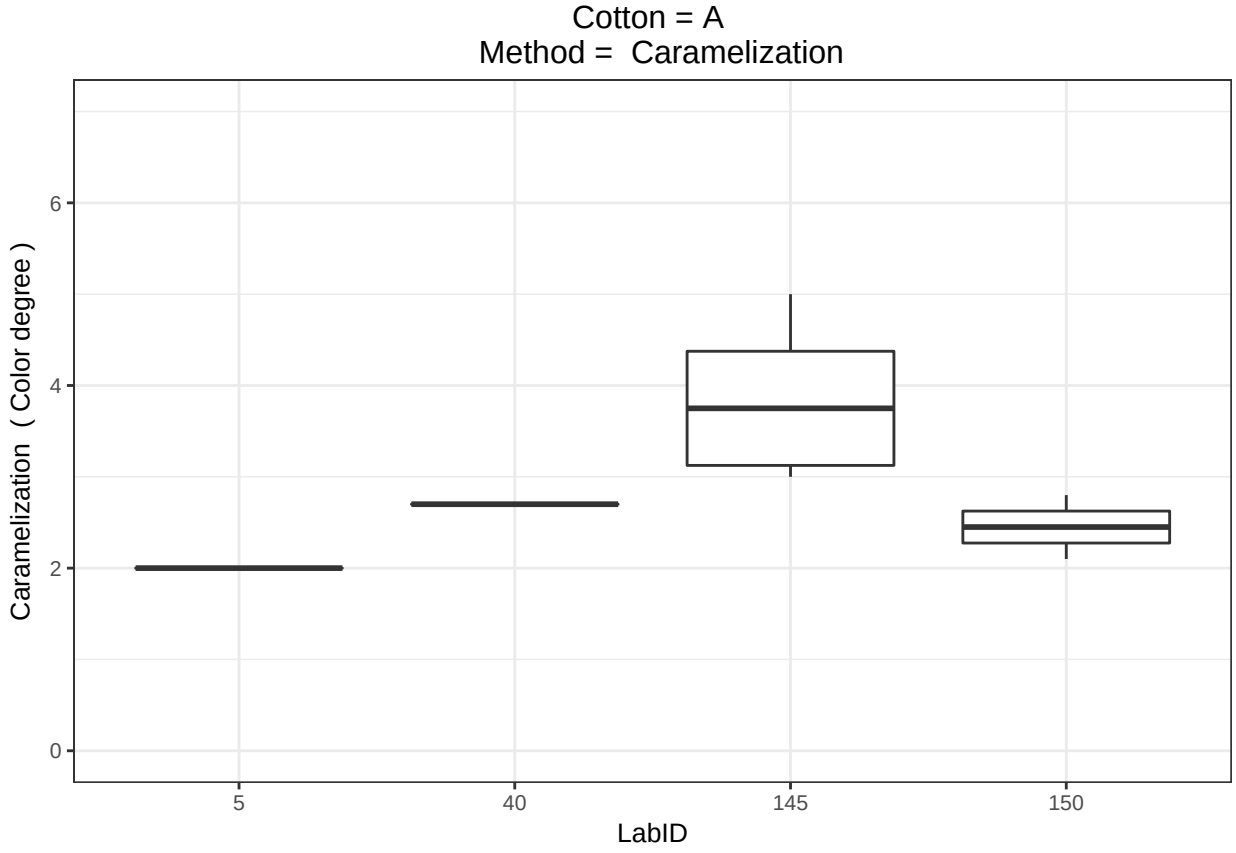
Meth	LabID	MeanIntraLab	Un	VarIntraLab	CVIntraLab	MeanInterLab	Delta
Carameliza	5	1.2	Color degree	NA	NA	2.0	-0.8
Carameliza	40	2.5	Color degree	NA	NA	2.0	0.5
Carameliza	145	1.9	Color degree	0.2	25.6	2.0	-0.1
Carameliza	150	2.5	Color degree	0.0	2.8	2.0	0.5
Clinitest	155	3.7	Color Chart	0.3	15.7	3.7	0.0
Contest-Fi	30	539.8	C/F Grade	3719.8	11.3	414.9	124.9
Contest-Fi	100	369.7	C/F Grade	2531.1	13.6	414.9	-45.2
Contest-Fi	105	318.7	C/F Grade	7625.5	27.4	414.9	-96.2
Contest-Fi	110	438.5	C/F Grade	1624.7	9.2	414.9	23.6
Contest-Fi	115	279.0	C/F Grade	3148.8	20.1	414.9	-135.9
Contest-Fi	140	543.8	C/F Grade	655.0	4.7	414.9	128.9
GB/T13785-	50	1.2	Color degree	0.2	35.0	1.2	0.0
H2SD	15	24.5	Sticky point	29.9	22.3	23.3	1.2
H2SD	35	21.8	Sticky point	37.8	28.1	23.3	-1.5
H2SD	60	23.8	Sticky point	14.6	16.0	23.3	0.5
H2SD	75	23.0	Sticky point	22.8	20.8	23.3	-0.3
HSI-NIR	55	23.0	Sticky point	34.0	25.4	23.0	0.0
KOTITI	90	8.0	Sticky point	0.0	0.0	8.0	0.0
Minicard	80	1.2	ITMF grades	0.2	40.0	1.3	0.0
Minicard	125	1.3	ITMF grades	0.3	43.3	1.3	0.0
Qualitativ	45	0.0	Grade	0.0	NaN	0.0	0.0
Quantitati	135	0.4	Percent	0.0	7.5	0.4	0.0
Reactive S	160	2.7	Spray Grade	0.3	21.7	2.7	0.0
SCT	10	33.3	Sticky point	9.1	9.0	46.0	-12.7
SCT	20	57.0	Sticky point	25.2	8.8	46.0	11.0
SCT	25	78.0	Sticky point	52.0	9.2	46.0	32.0
SCT	65	57.3	Sticky point	24.7	8.7	46.0	11.3
SCT	70	57.3	Sticky point	354.3	32.8	46.0	11.3
SCT	85	20.4	Sticky point	21.7	22.8	46.0	-25.6
SCT	95	54.7	Sticky point	161.3	23.2	46.0	8.7
SCT	130	9.7	Sticky point	0.3	6.0	46.0	-36.3
SCT	165	46.3	Sticky point	25.3	10.9	46.0	0.3
TDM-A	120	8.4	Sticky point	4.8	26.1	8.4	0.0

Table for Cotton E

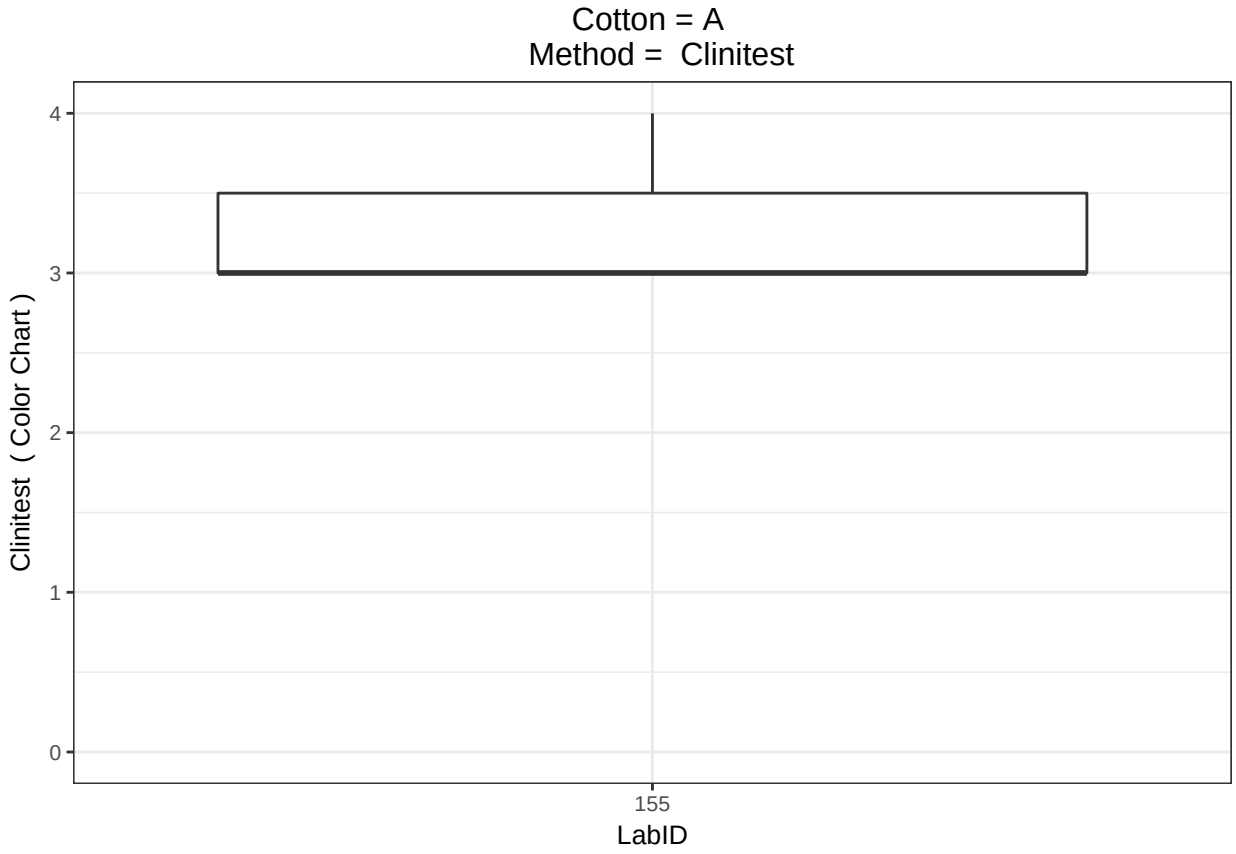
Meth	LabID	MeanIntraLab	Un	VarIntraLab	CVIntraLab	MeanInterLab	Delta
Carameliza	5	4.0	Color degree	NA	NA	4.0	0.0
Carameliza	40	5.5	Color degree	NA	NA	4.0	1.5
Carameliza	145	1.8	Color degree	0.1	15.6	4.0	-2.2
Carameliza	150	4.8	Color degree	0.0	4.5	4.0	0.8
Clinitest	155	2.7	Color Chart	0.3	21.7	2.7	0.0
Contest-Fi	30	235.0	C/F Grade	3008.4	23.3	134.1	100.9
Contest-Fi	100	129.3	C/F Grade	512.7	17.5	134.1	-4.7
Contest-Fi	105	82.2	C/F Grade	90.6	11.6	134.1	-51.9
Contest-Fi	110	113.8	C/F Grade	249.4	13.9	134.1	-20.2
Contest-Fi	115	99.7	C/F Grade	754.3	27.6	134.1	-34.4
Contest-Fi	140	144.3	C/F Grade	1491.5	26.8	134.1	10.3
GB/T13785-	50	1.2	Color degree	0.2	35.0	1.2	0.0
H2SD	15	3.0	Sticky point	2.4	51.6	7.0	-4.0
H2SD	35	6.0	Sticky point	10.8	54.8	7.0	-1.0
H2SD	60	3.3	Sticky point	4.7	64.8	7.0	-3.7
H2SD	75	15.7	Sticky point	37.9	39.3	7.0	8.7
HSI-NIR	55	17.3	Sticky point	13.9	21.5	17.3	0.0
KOTITI	90	6.5	Sticky point	1.5	18.8	6.5	0.0
Minicard	80	0.8	ITMF grades	0.1	45.8	0.8	0.1
Minicard	125	0.7	ITMF grades	0.3	86.6	0.8	-0.1
Qualitativ	45	1.3	Grade	1.1	77.5	1.3	0.0
Quantitati	135	0.5	Percent	0.0	16.4	0.5	0.0
Reactive S	160	2.3	Spray Grade	0.3	24.7	2.3	0.0
SCT	10	9.7	Sticky point	6.7	26.7	9.1	0.6
SCT	20	11.3	Sticky point	47.5	60.8	9.1	2.2
SCT	25	11.8	Sticky point	12.2	29.5	9.1	2.7
SCT	65	10.2	Sticky point	4.6	21.0	9.1	1.1
SCT	70	4.3	Sticky point	4.3	48.0	9.1	-4.8
SCT	85	3.8	Sticky point	5.2	59.3	9.1	-5.3
SCT	95	13.7	Sticky point	56.3	54.9	9.1	4.6
SCT	130	4.7	Sticky point	17.3	89.2	9.1	-4.4
SCT	165	12.3	Sticky point	4.3	16.9	9.1	3.2
TDM-A	120	3.4	Sticky point	2.3	44.6	3.4	0.0

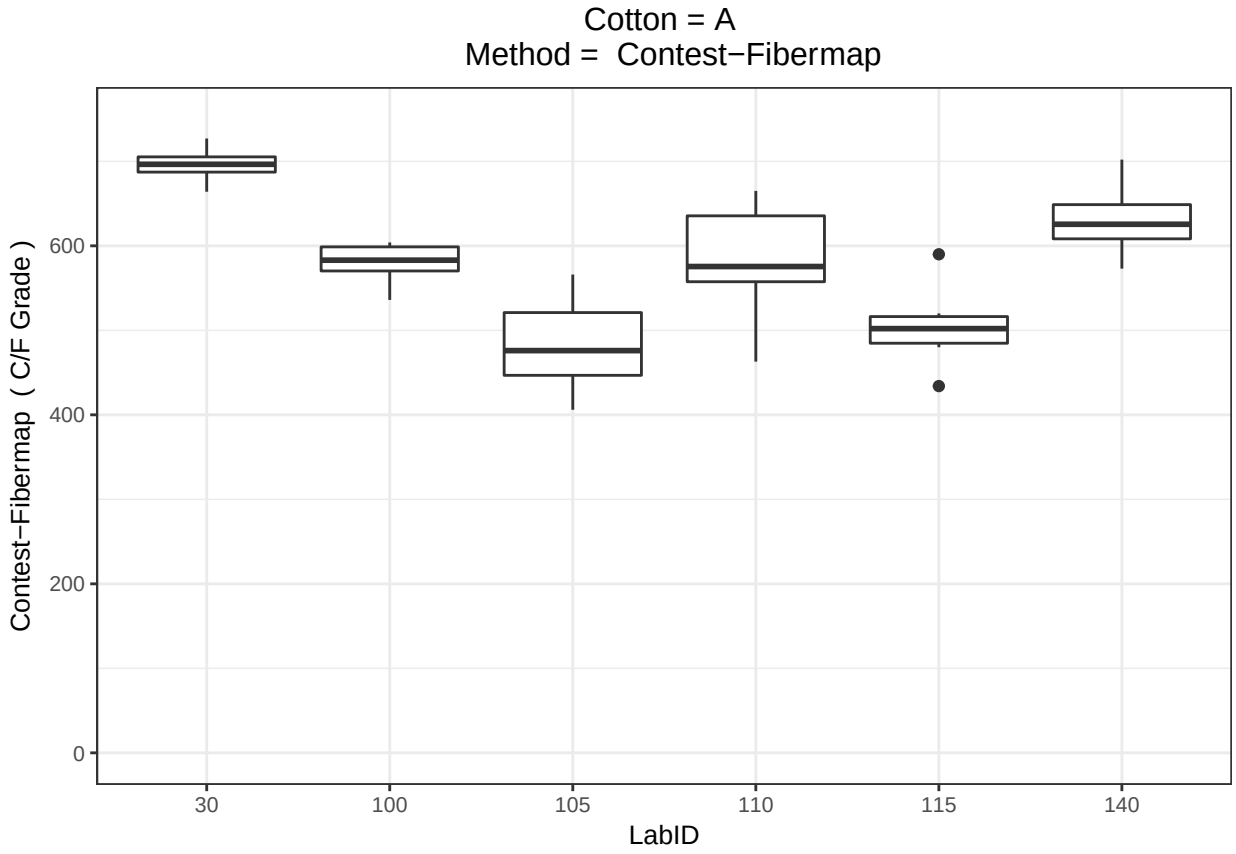
Data presented by boxplots per Method, LabID for cottons A, B and C [3]

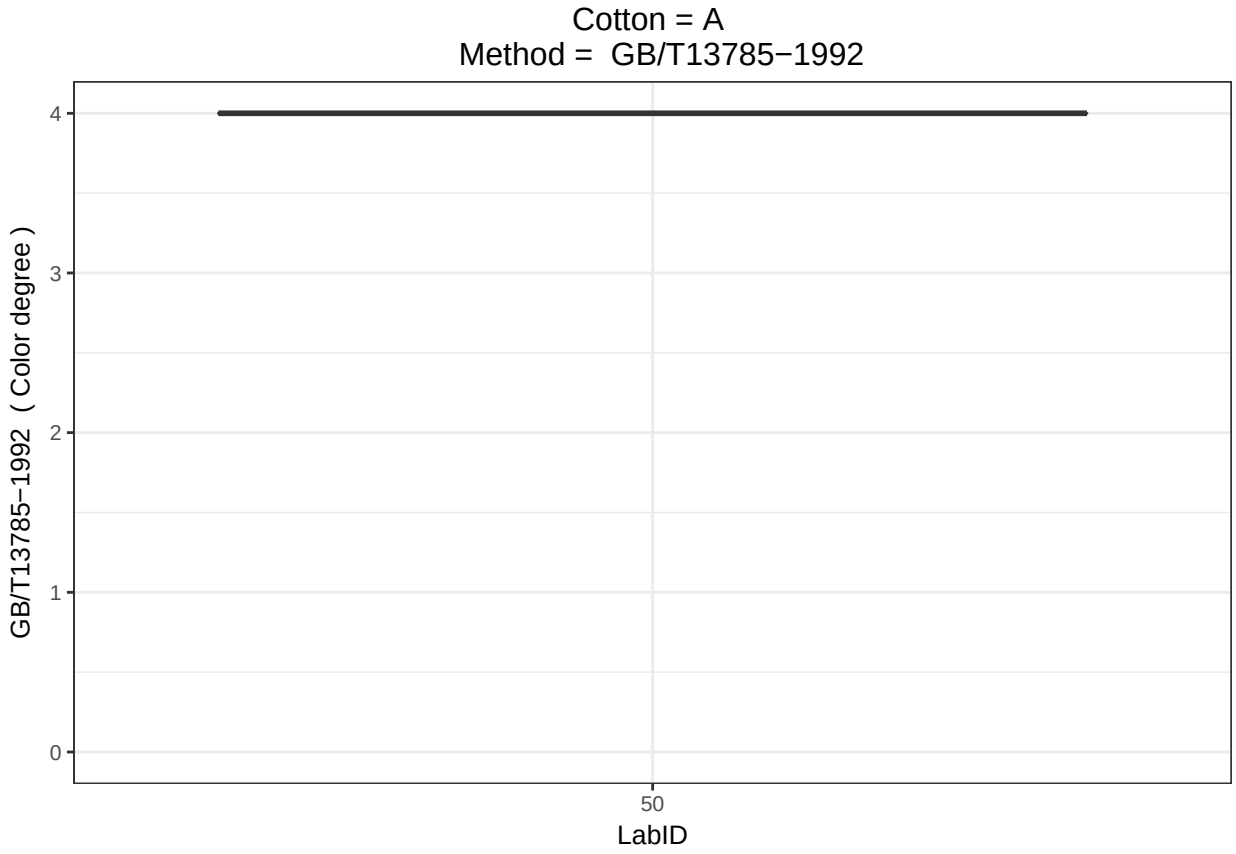
Boxplots for Cotton A

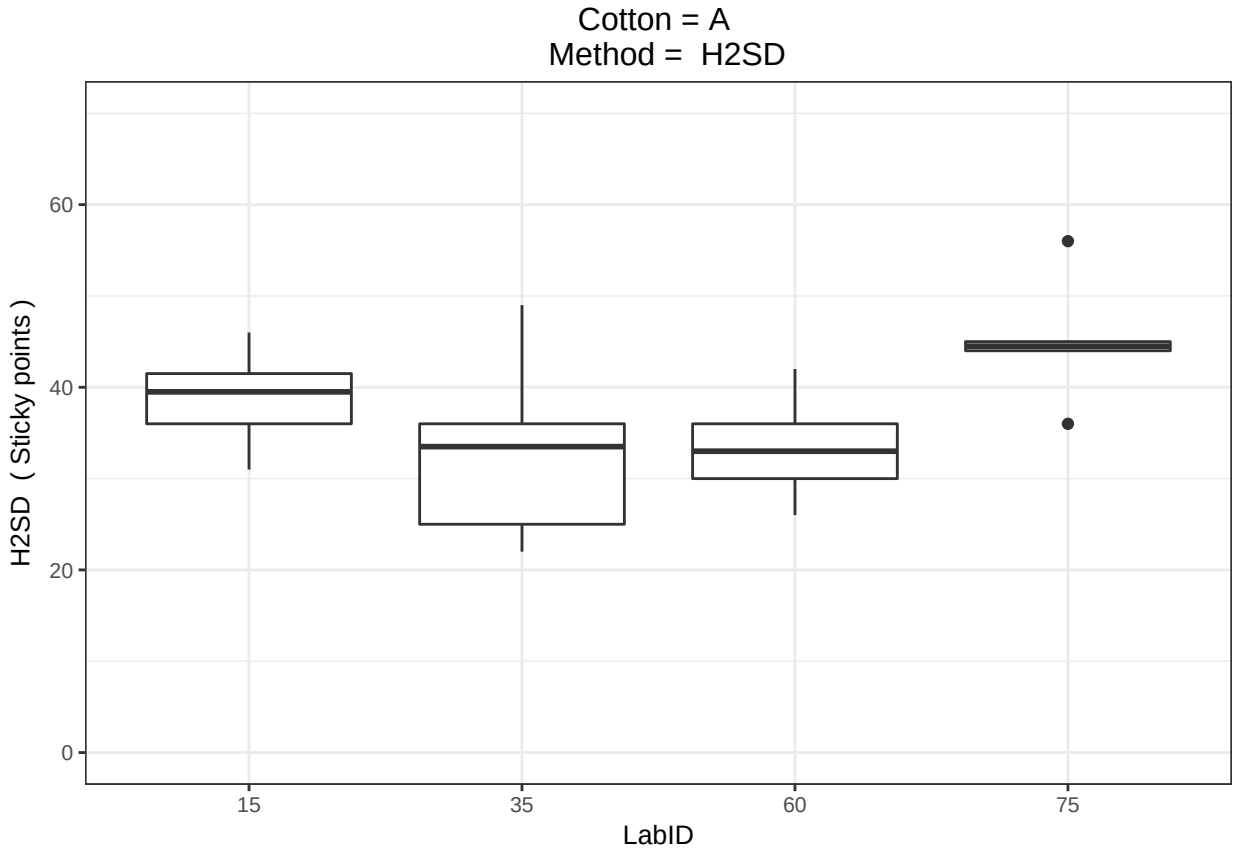


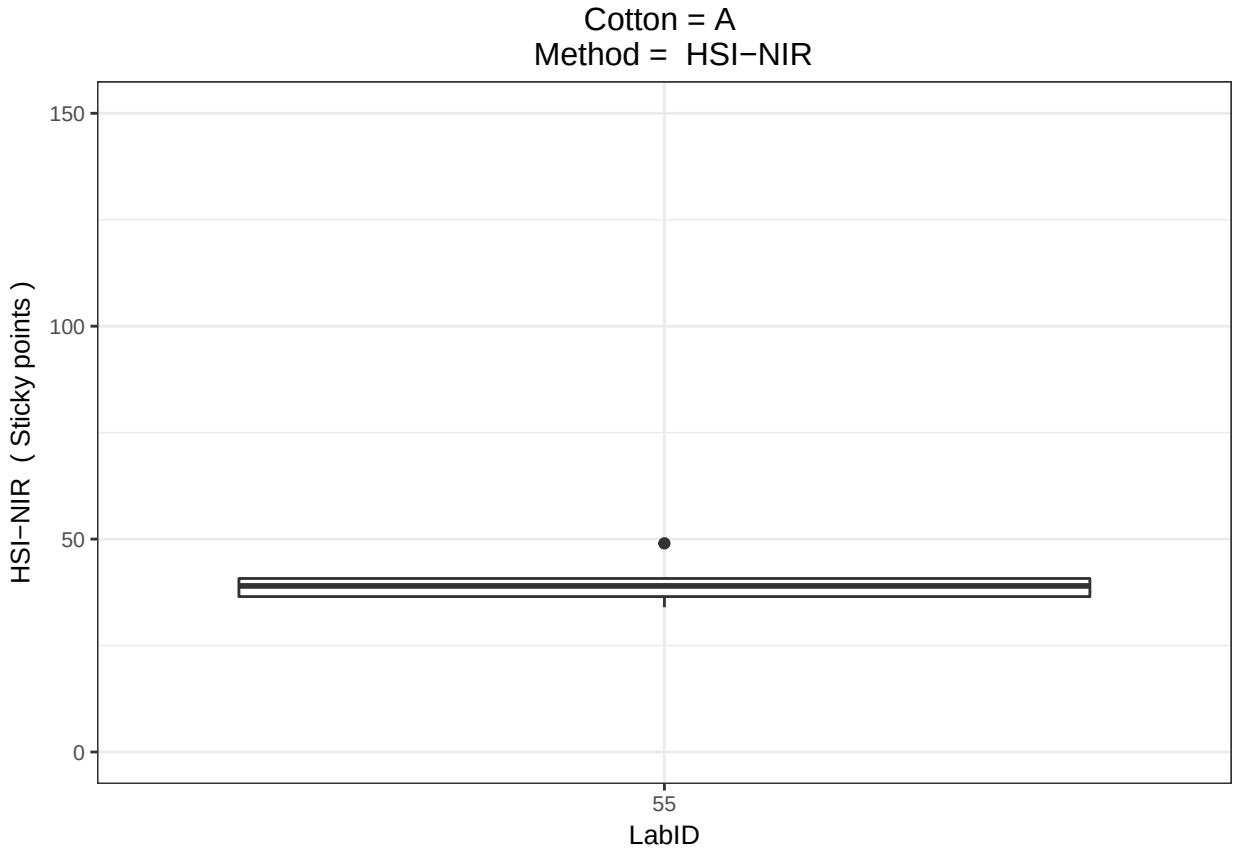
[3]Footnote
* NA excluded.
* In each box, the bolded line represents the median of all individual results for the considered LabID.
* The square represents the upper 75% (Q75) and lower 25% (Q25) percentiles of the individual results.
* The whiskers represent the quantiles that included in +/- 1.5 * (Q75-Q25).
* Extreme points may additionally be displayed by a point further out from the whiskers.

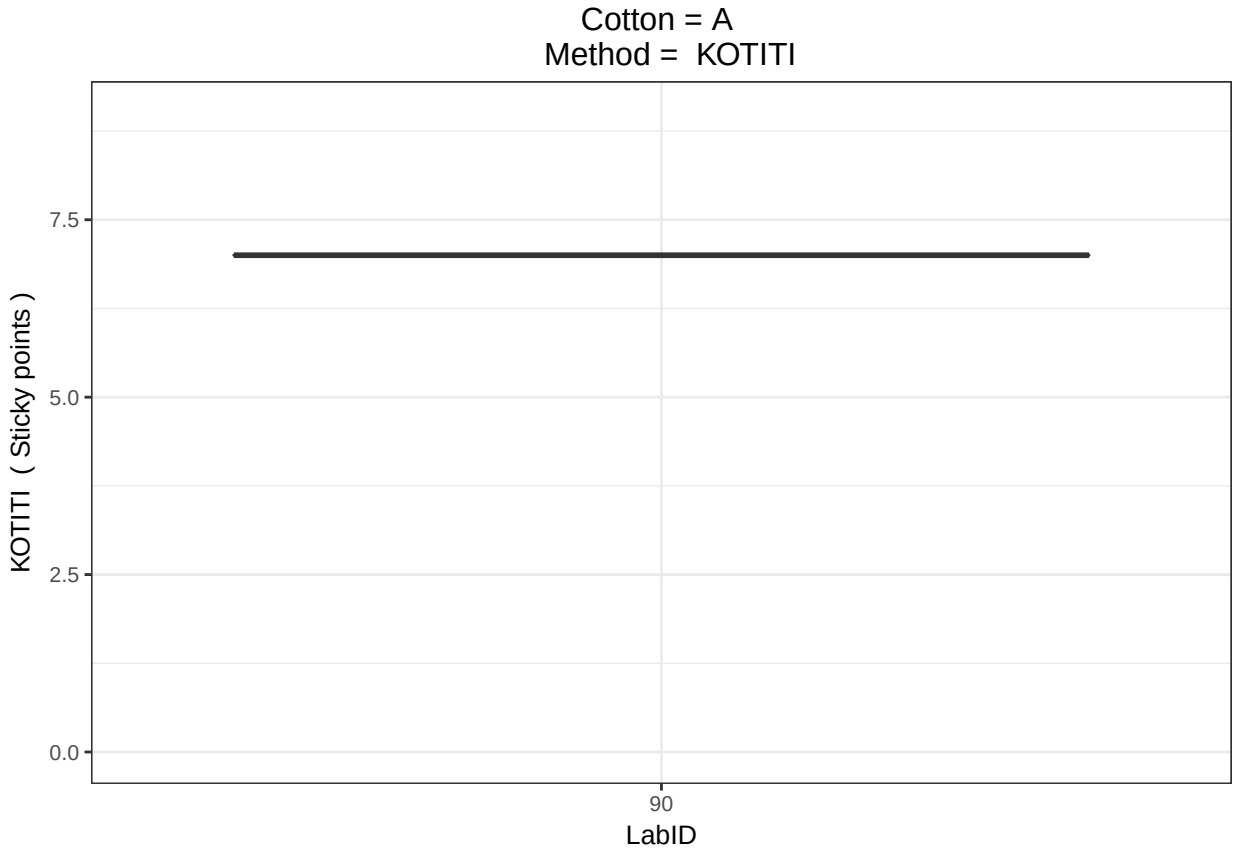

Cotton = A
Method = Clinitest
Clinitest (Color Chart)
4
3
2
1
0
155
LabID

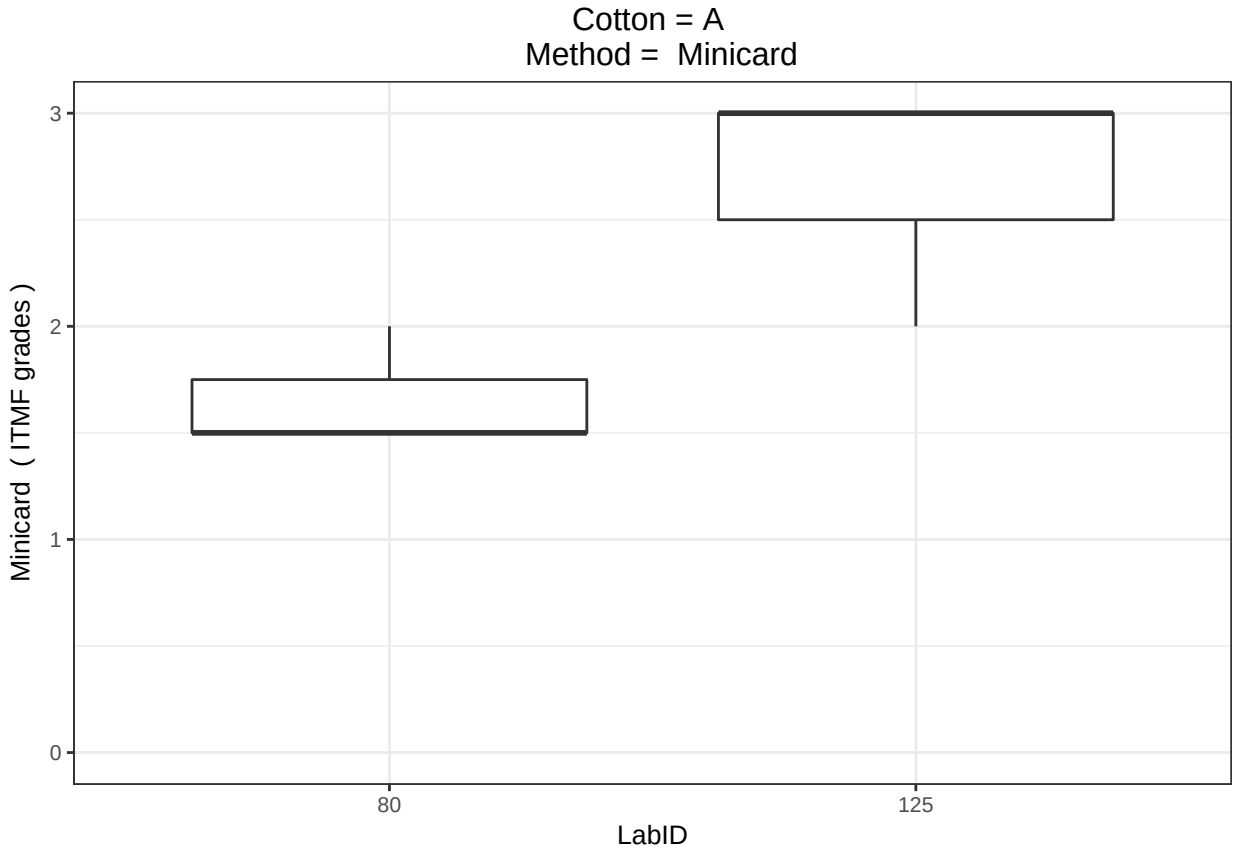

Cotton = A
Method = Contest−Fibermap
Contest−Fibermap (C/F Grade)
600
400
200
0
30
100
105
110
115
140
LabID

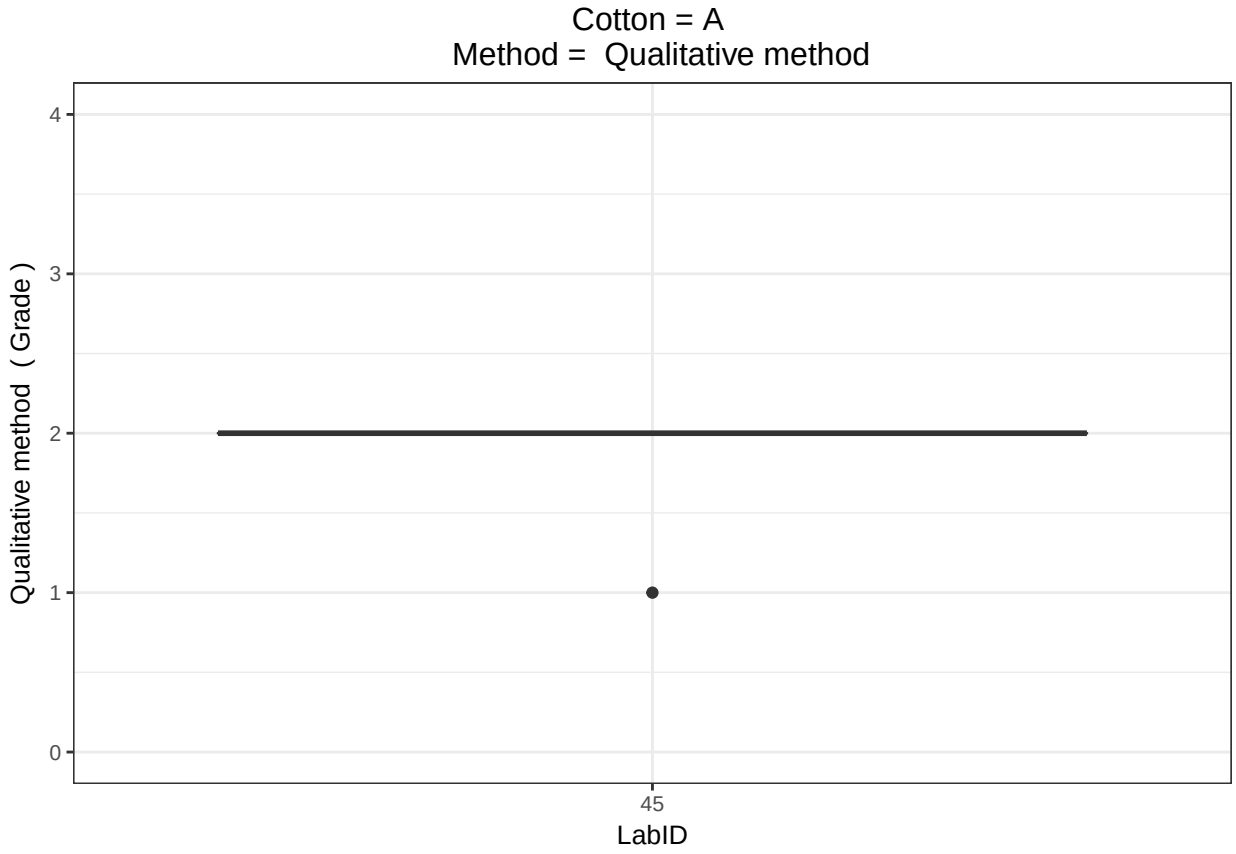

Cotton = A
Method = GB/T13785−1992
GB/T13785−1992 (Color degree)
4
3
2
1
0
50
LabID

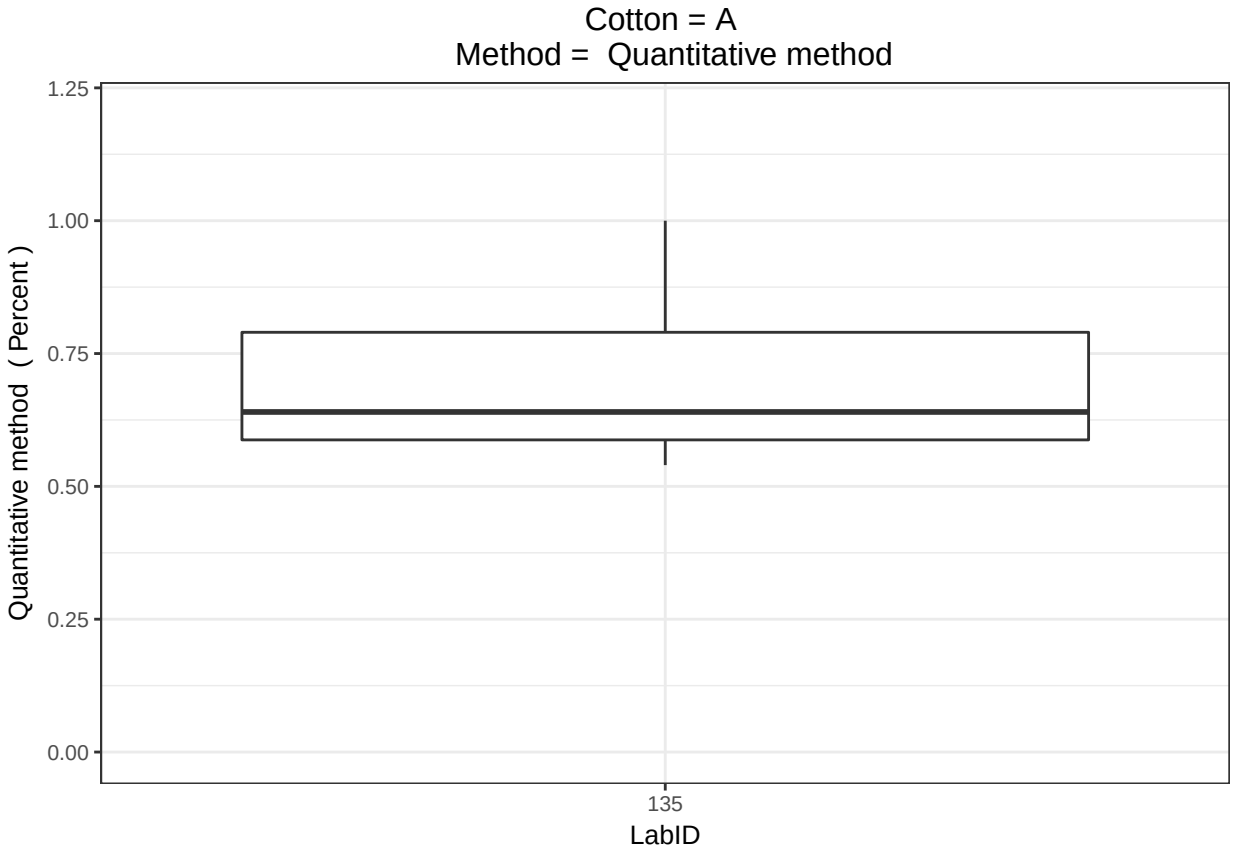

Cotton = A
Method = H2SD
H2SD (Sticky points)
60
40
20
0
15
35
60
75
LabID

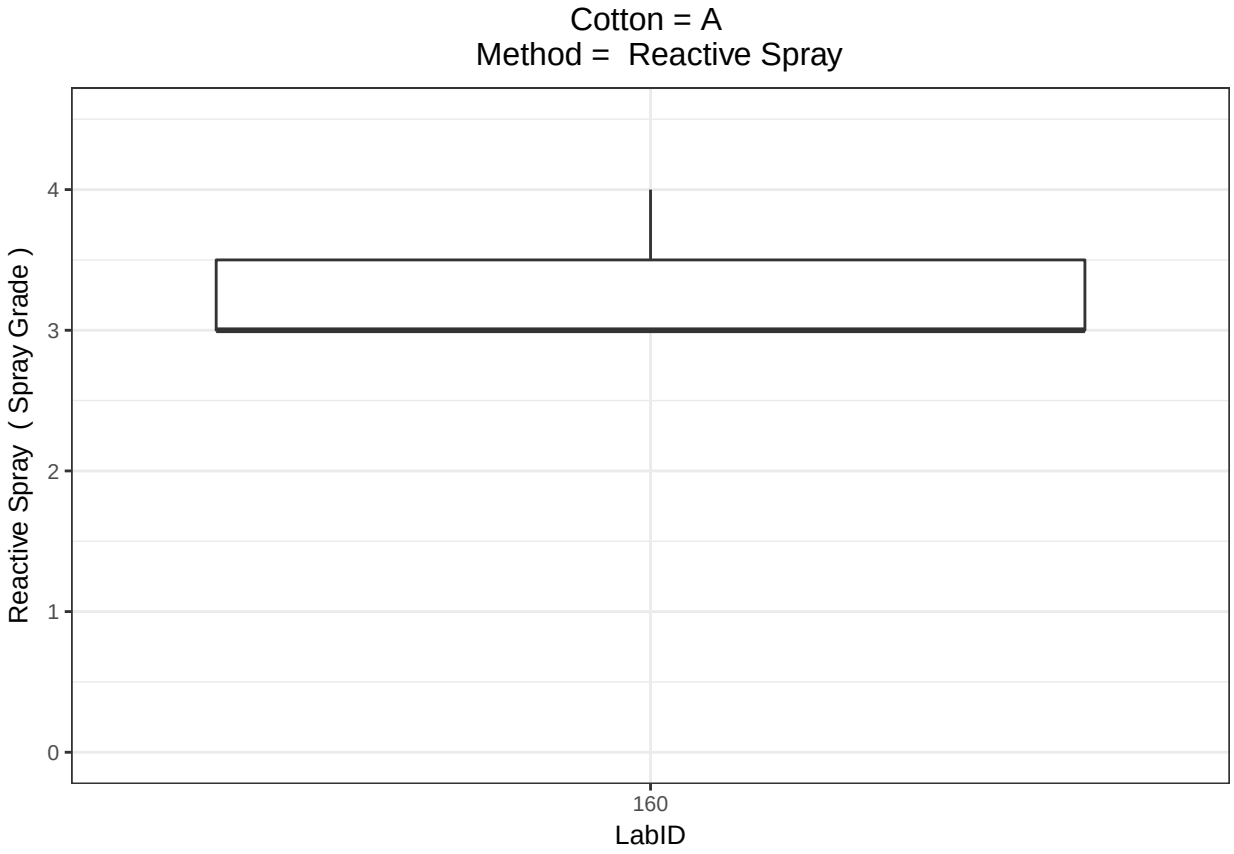

Cotton = A
Method = HSI−NIR
150
100
50
0
HSI−NIR (Sticky points)
55
LabID

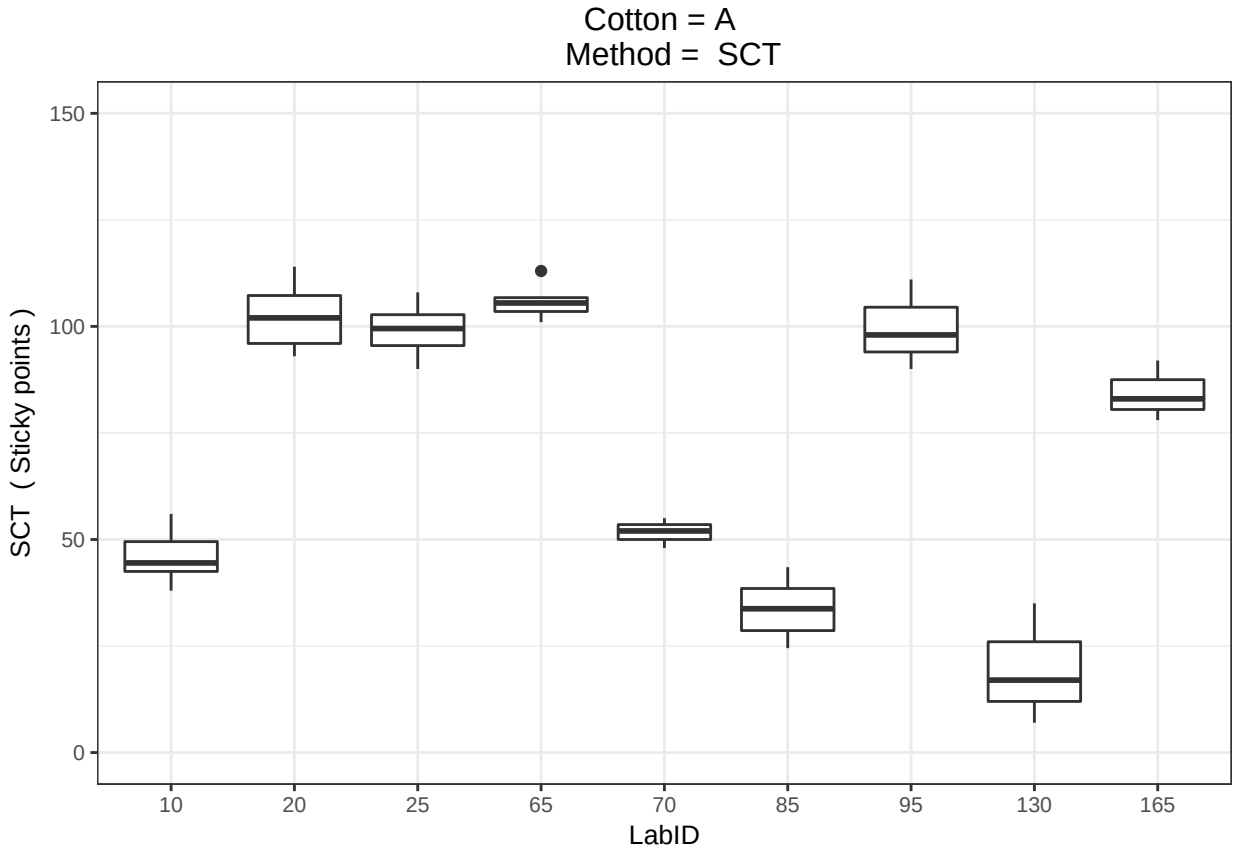

Cotton = A
Method = KOTITI
KOTITI (Sticky points)
7.5
5.0
2.5
0.0
90
LabID

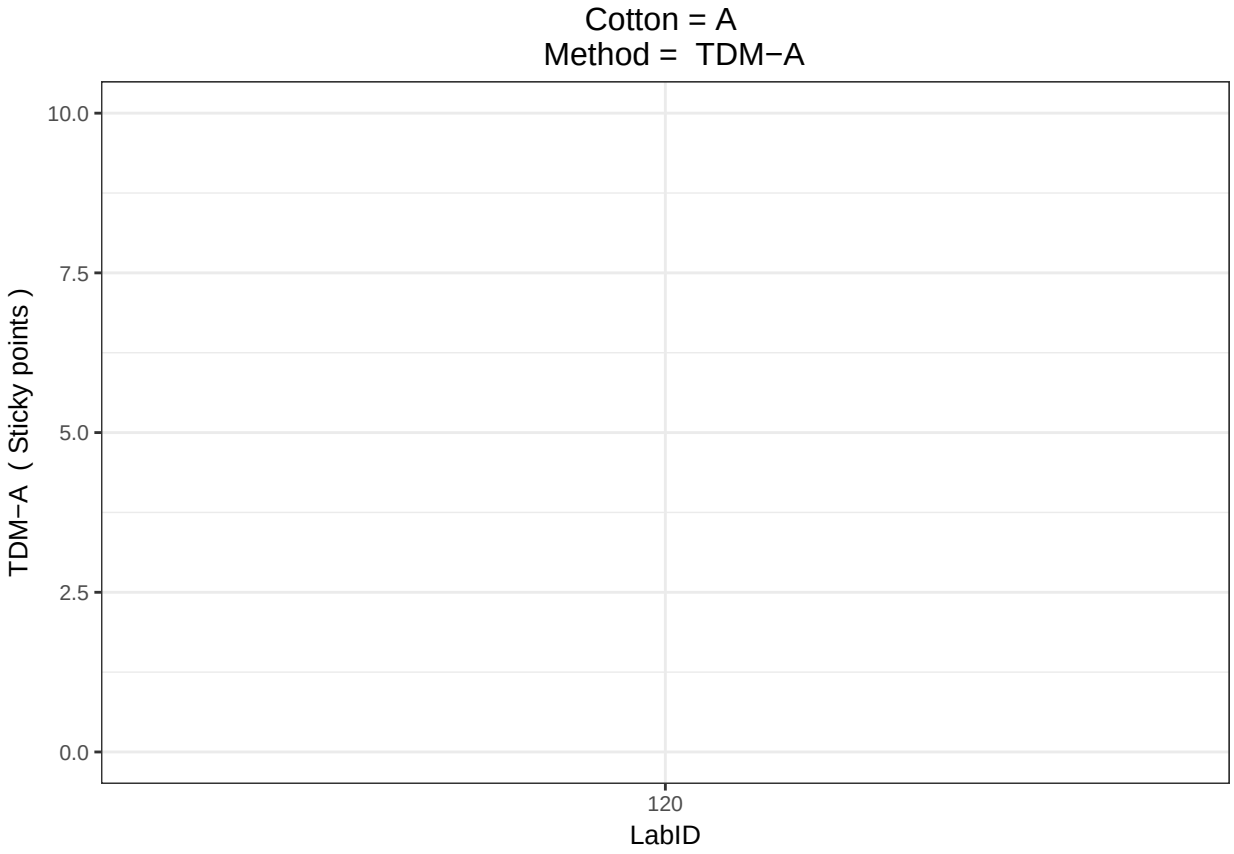

Cotton = A
Method = Minicard
Minicard (ITMF grades)
3
2
1
0
80
125
LabID


Cotton = A
Method = Qualitative method
Qualitative method (Grade)
4
3
2
1
0
45
LabID

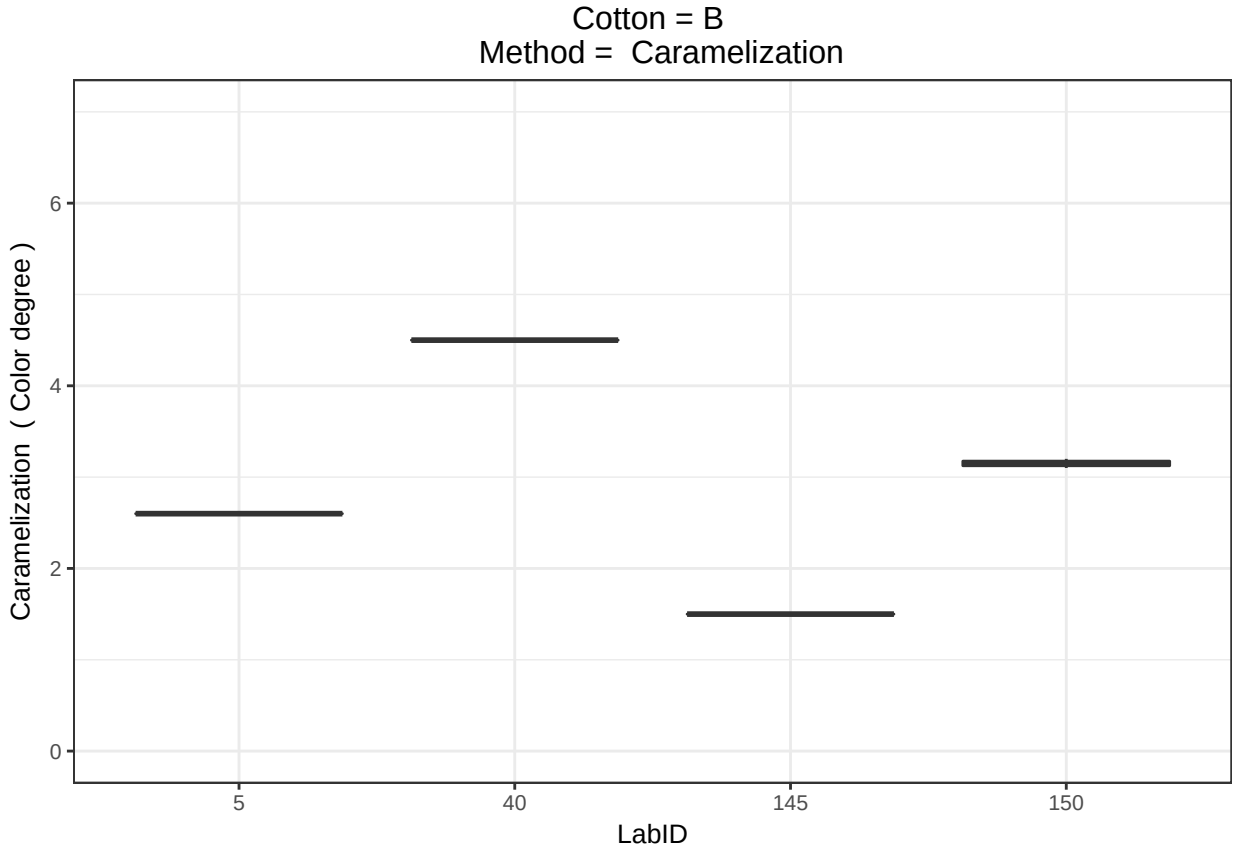

Cotton = A
Method = Quantitative method
Quantitative method (Percent)
1.25
1.00
0.75
0.50
0.25
0.00
135
LabID

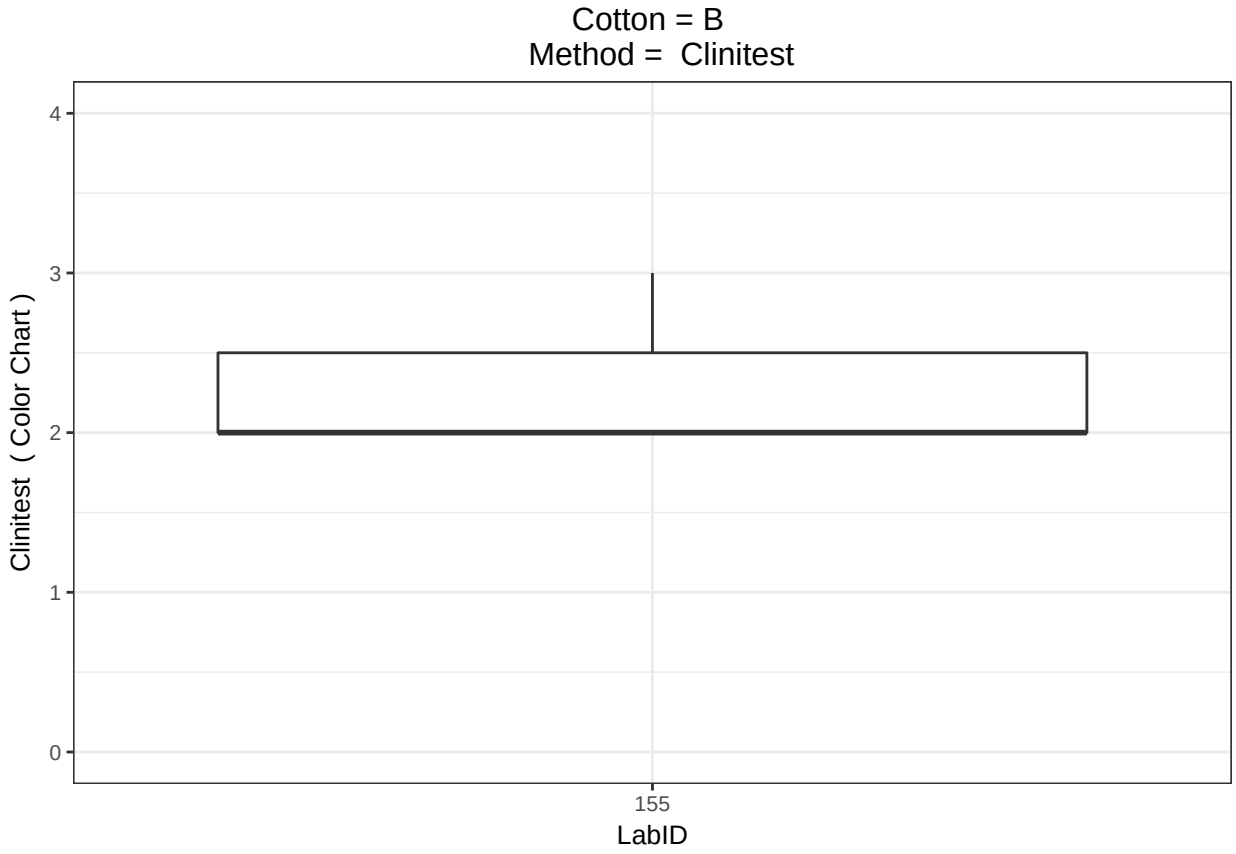

Cotton = A
Method = Reactive Spray
Reactive Spray (Spray Grade)
4
3
2
1
0
160
LabID

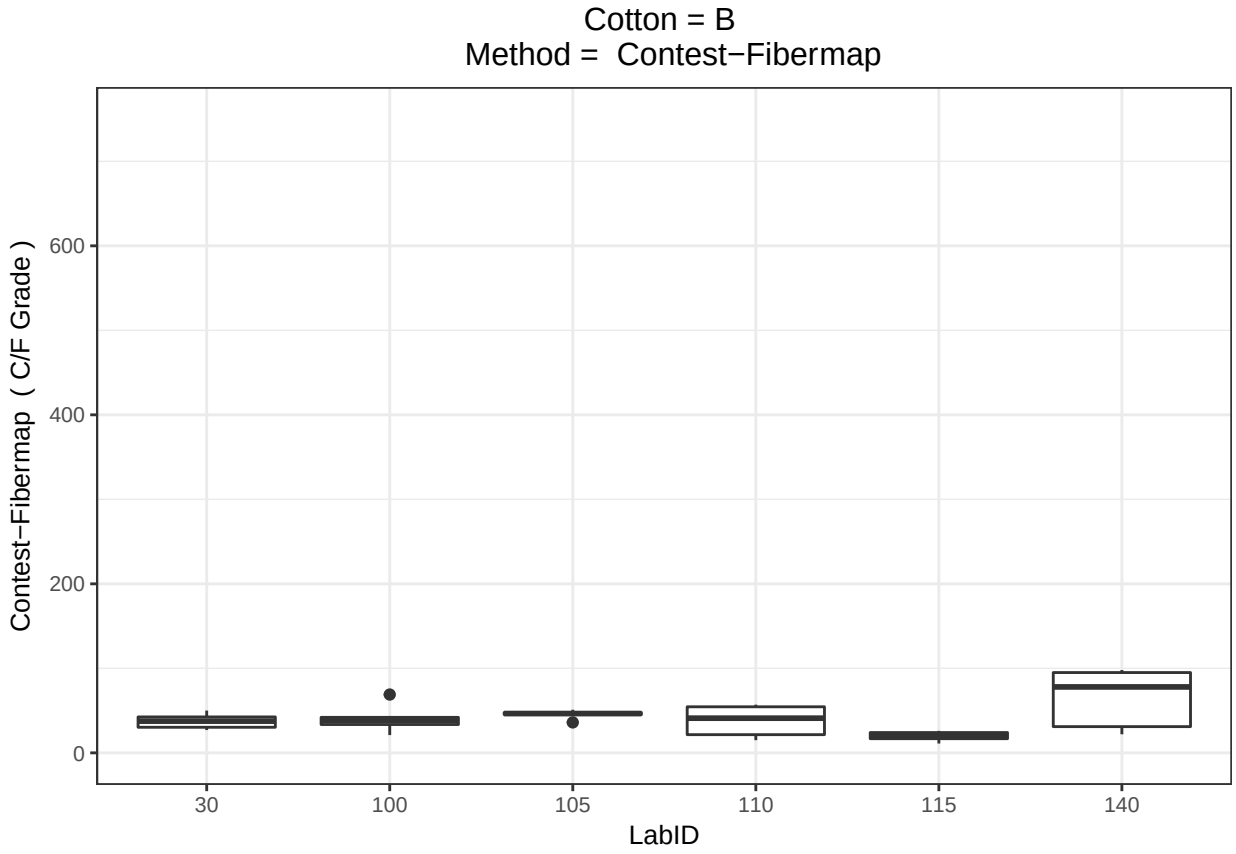

Cotton = A
Method = SCT
SCT (Sticky points)
150
100
50
0
10
20
25
65
70
85
95
130
165
LabID

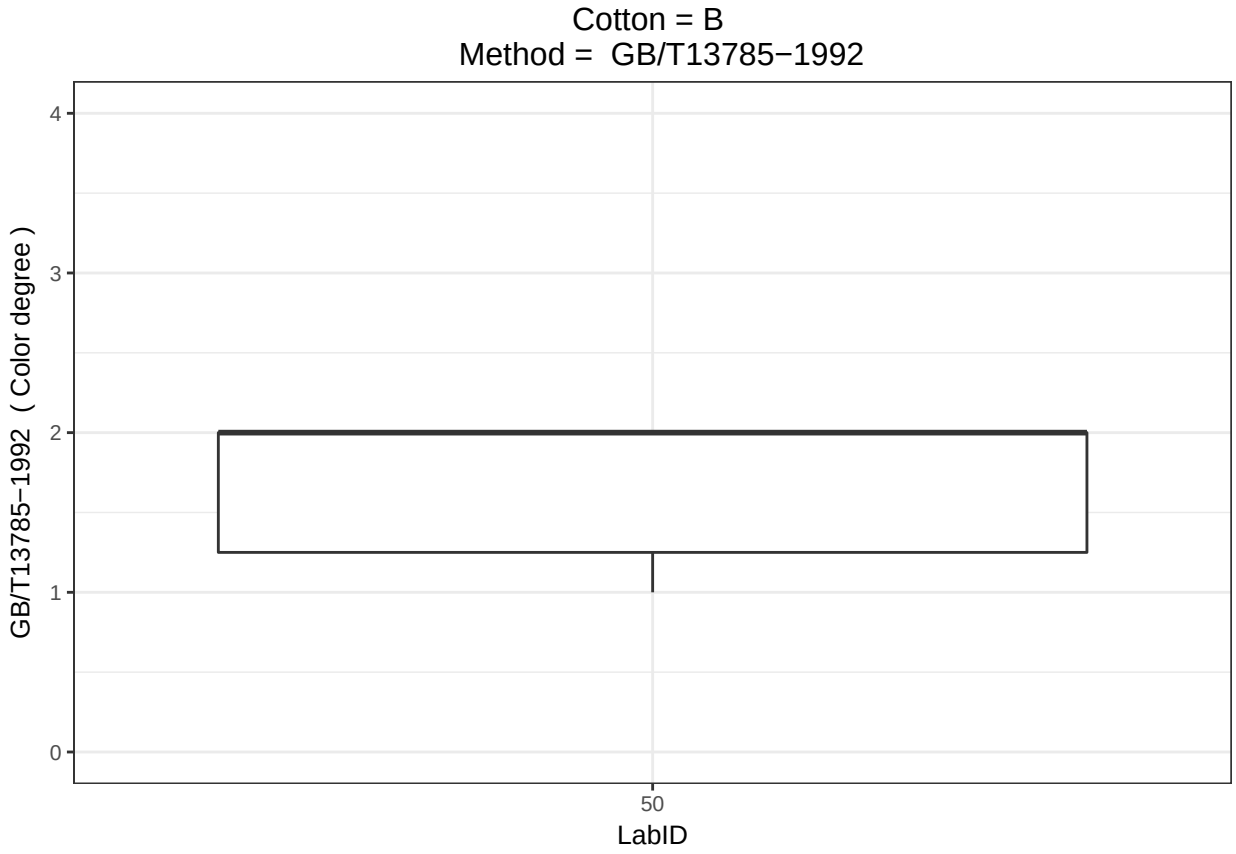

Cotton = A
Method = TDM−A
10.0
7.5
5.0
2.5
0.0
TDM−A (Sticky points)
120
LabID

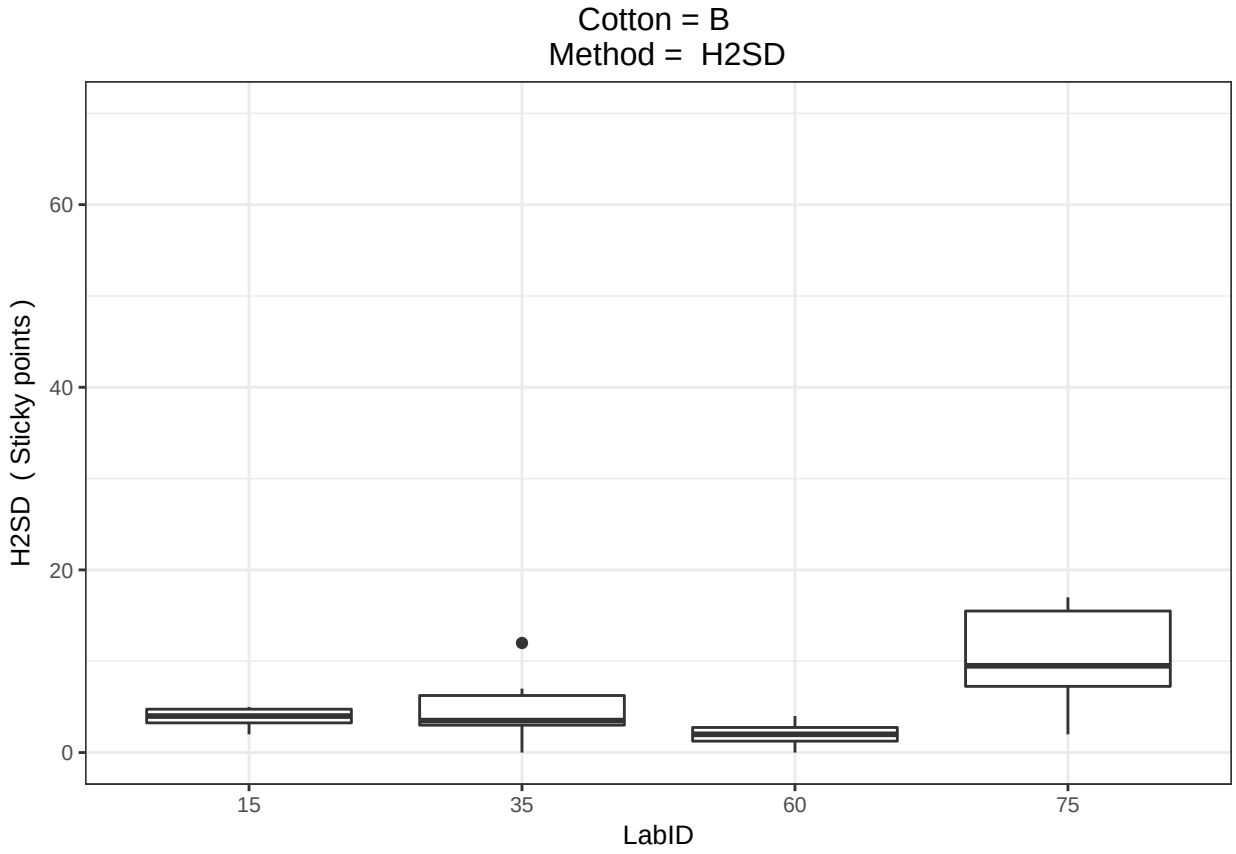
Boxplots for Cotton B

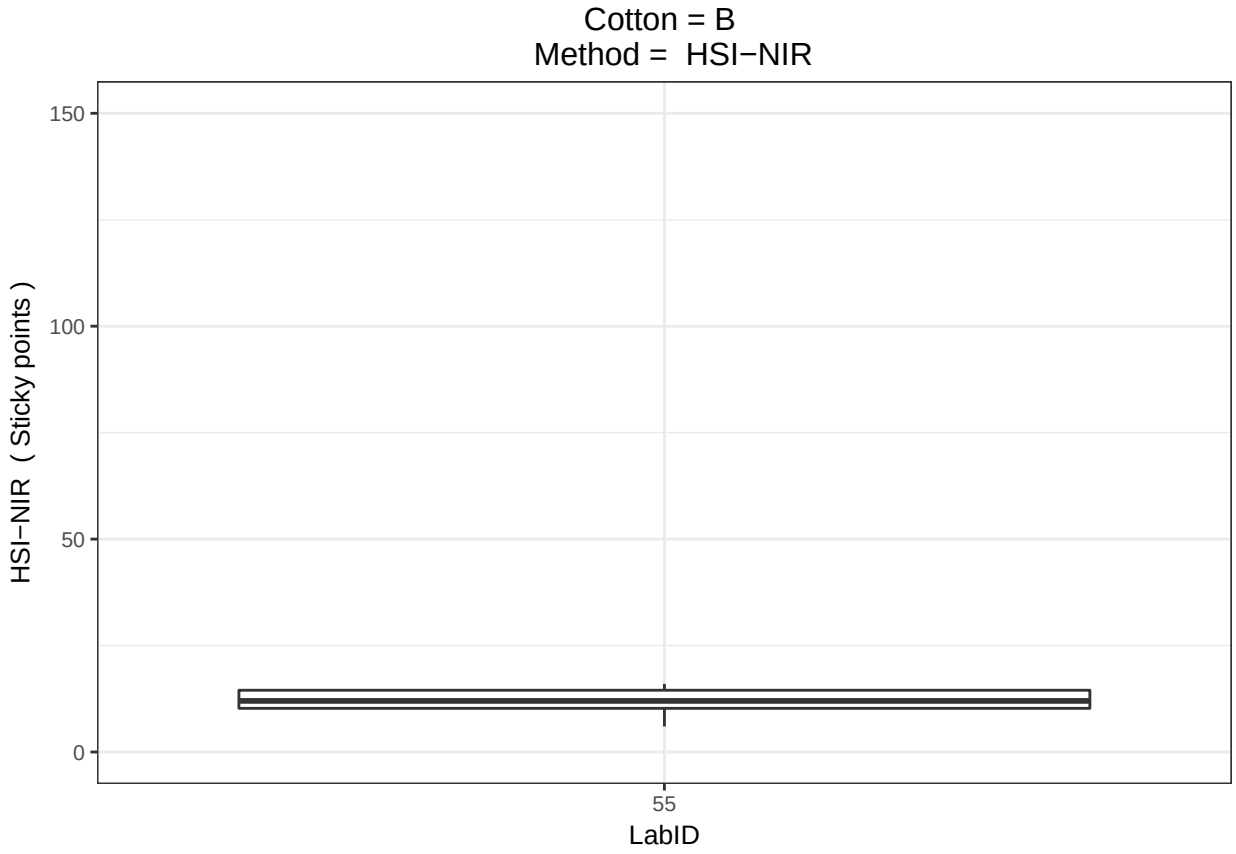


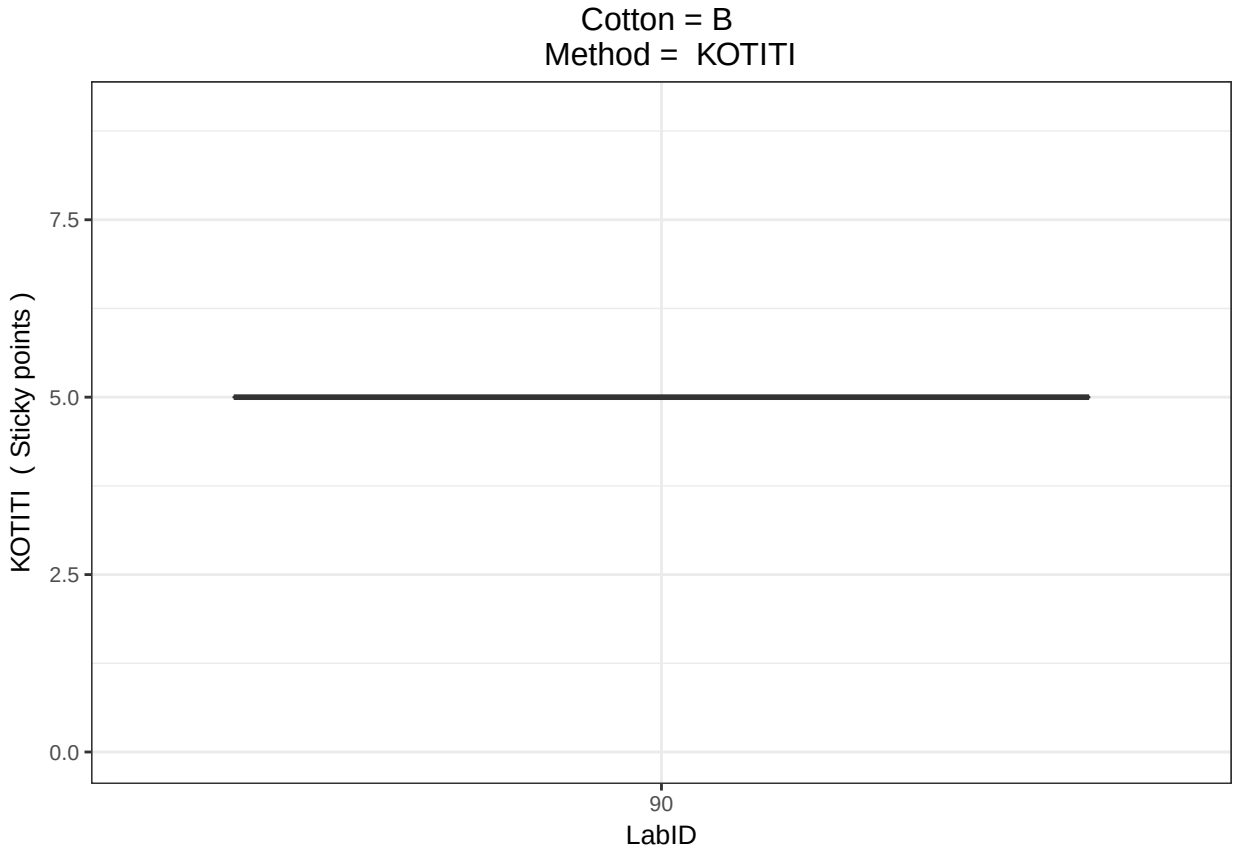

Cotton = B
Method = Clinitest
Clinitest (Color Chart)
4
3
2
1
0
155
LabID

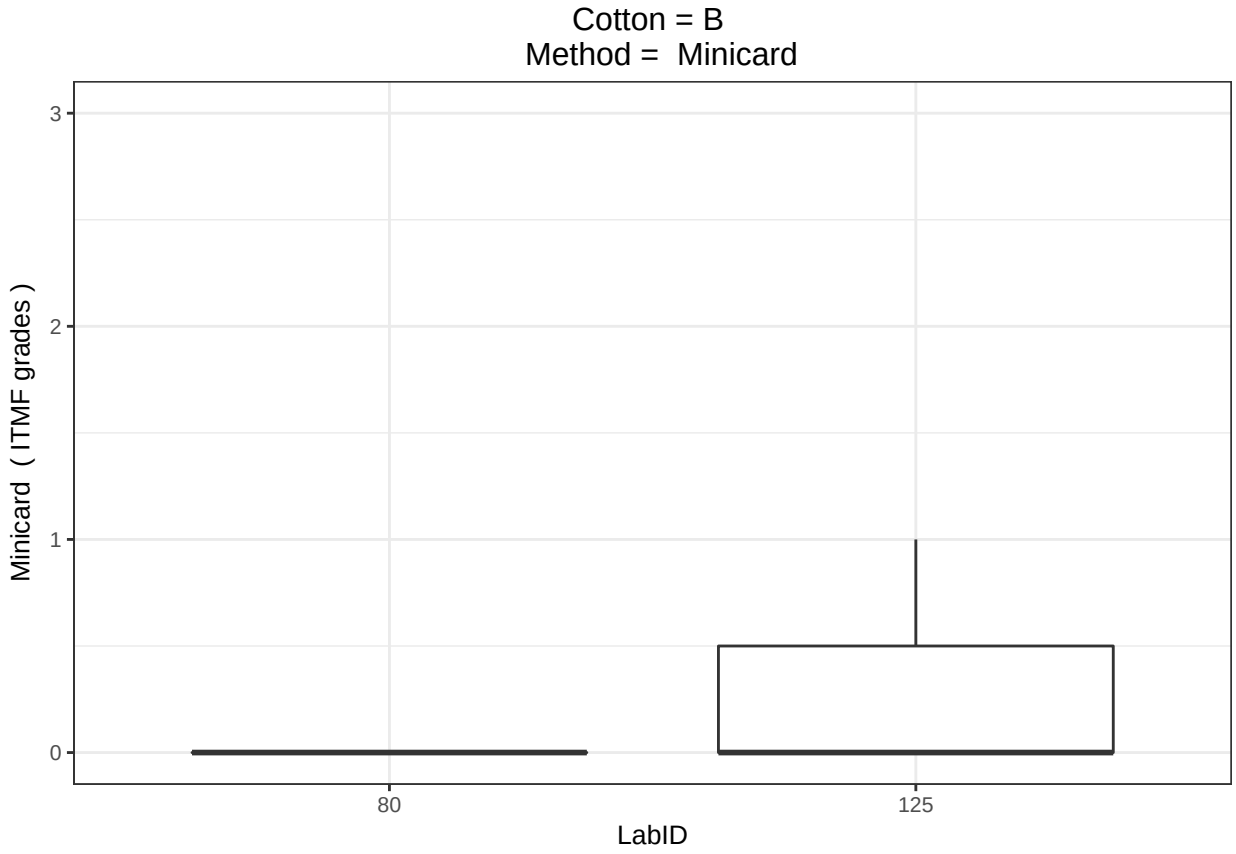

Cotton = B
Method = Contest−Fibermap
Contest−Fibermap (C/F Grade)
600
400
200
0
30
100
105
110
115
140
LabID

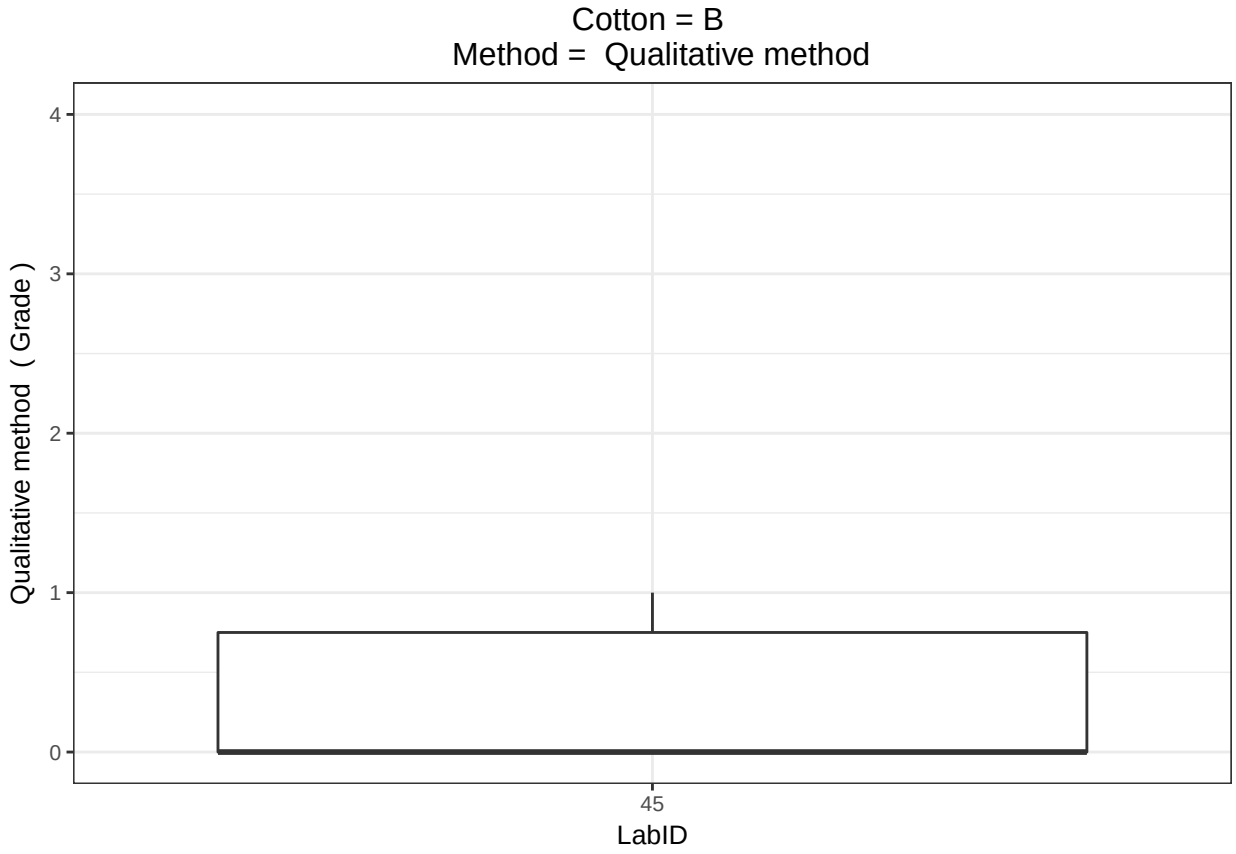

Cotton = B
Method = GB/T13785−1992
GB/T13785−1992 (Color degree)
4
3
2
1
0
50
LabID

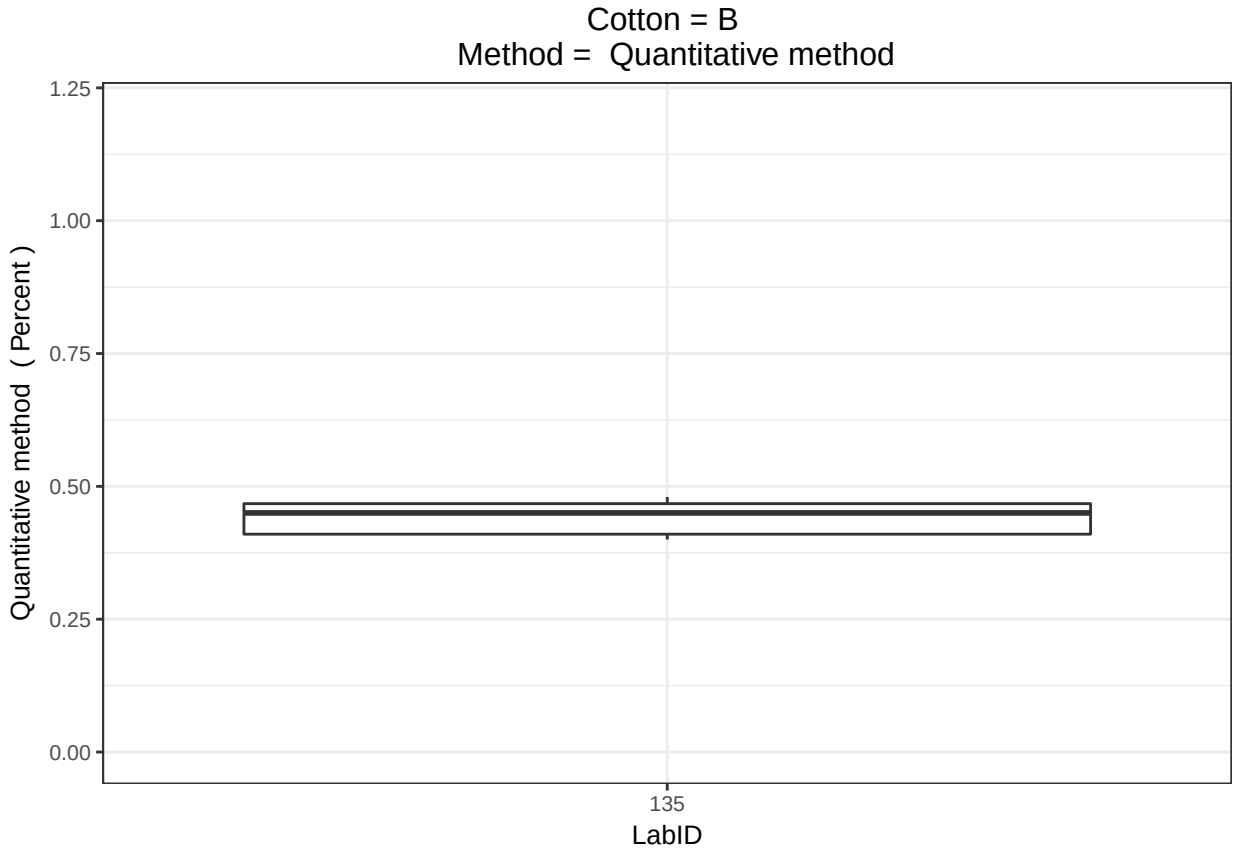

Cotton = B
Method = H2SD
H2SD (Sticky points)
60
40
20
0
15
35
60
75
LabID

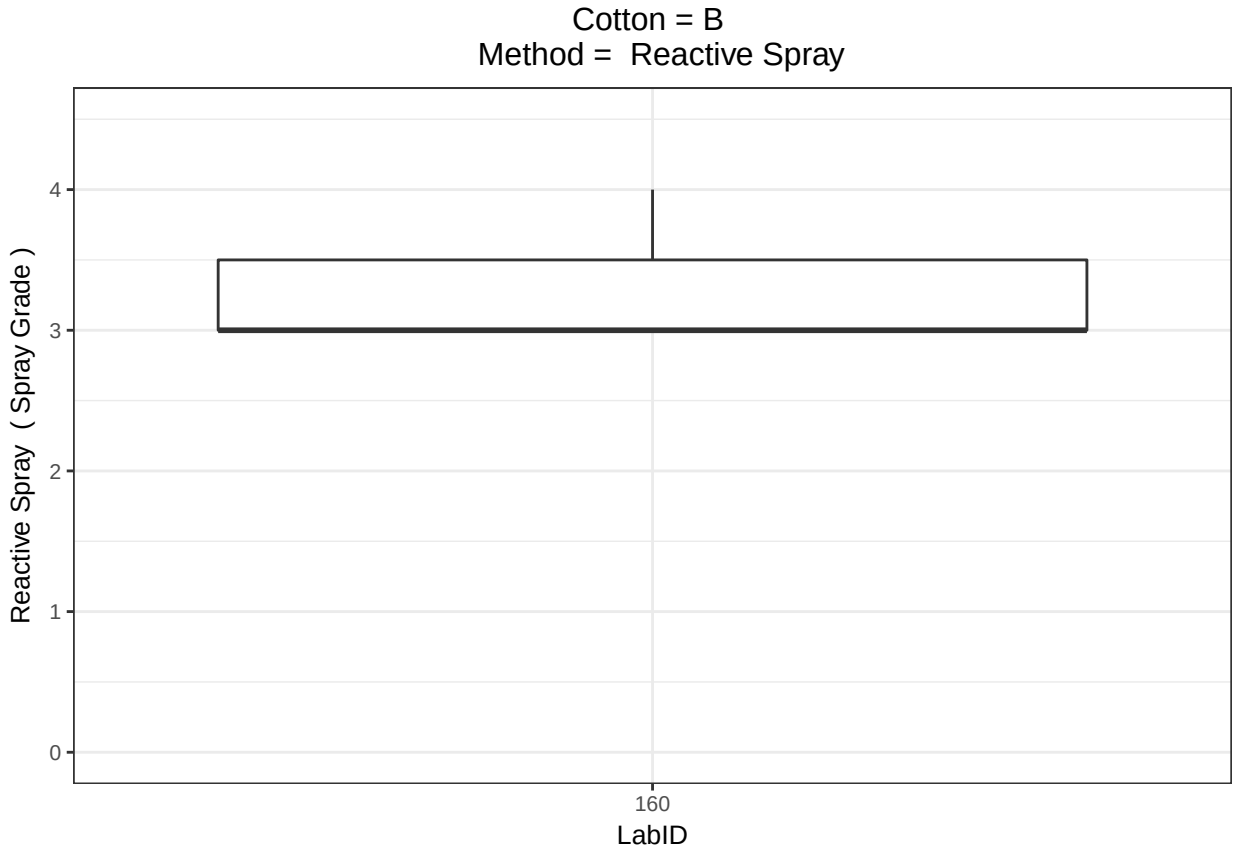

Cotton = B
Method = HSI−NIR
150
100
50
0
HSI−NIR (Sticky points)
55
LabID

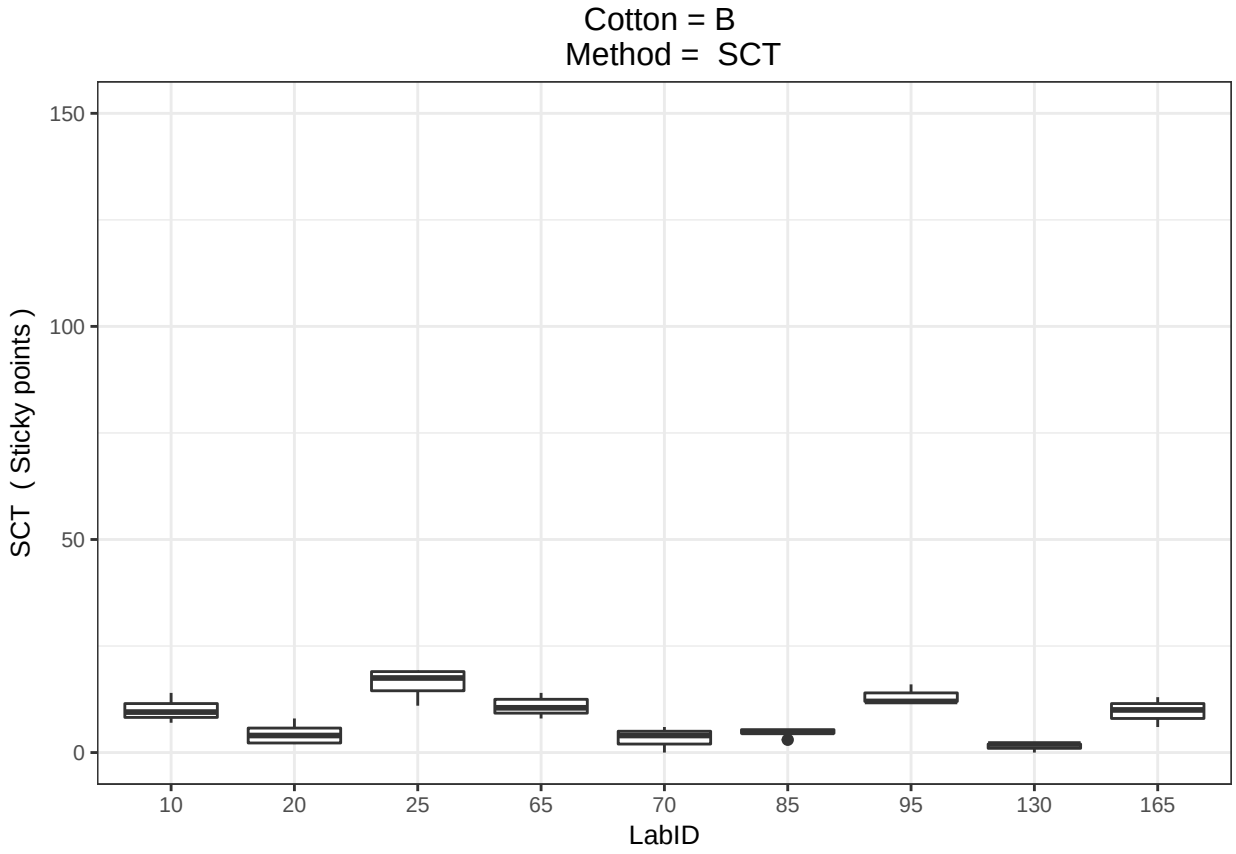

Cotton = B
Method = KOTITI
KOTITI (Sticky points)
7.5
5.0
2.5
0.0
90
LabID

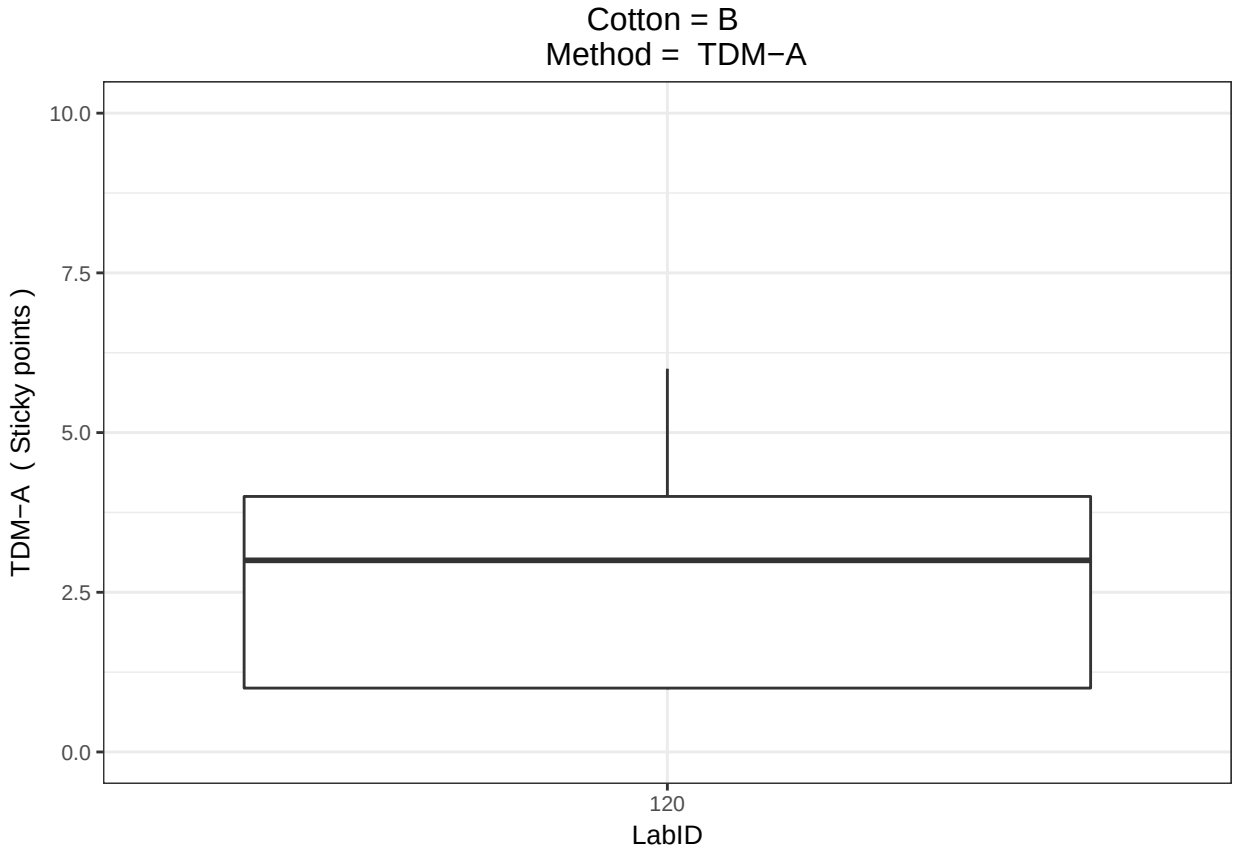

Cotton = B
Method = Minicard
Minicard (ITMF grades)
3
2
1
0
80
125
LabID


Cotton = B
Method = Qualitative method
Qualitative method (Grade)
4
3
2
1
0
45
LabID

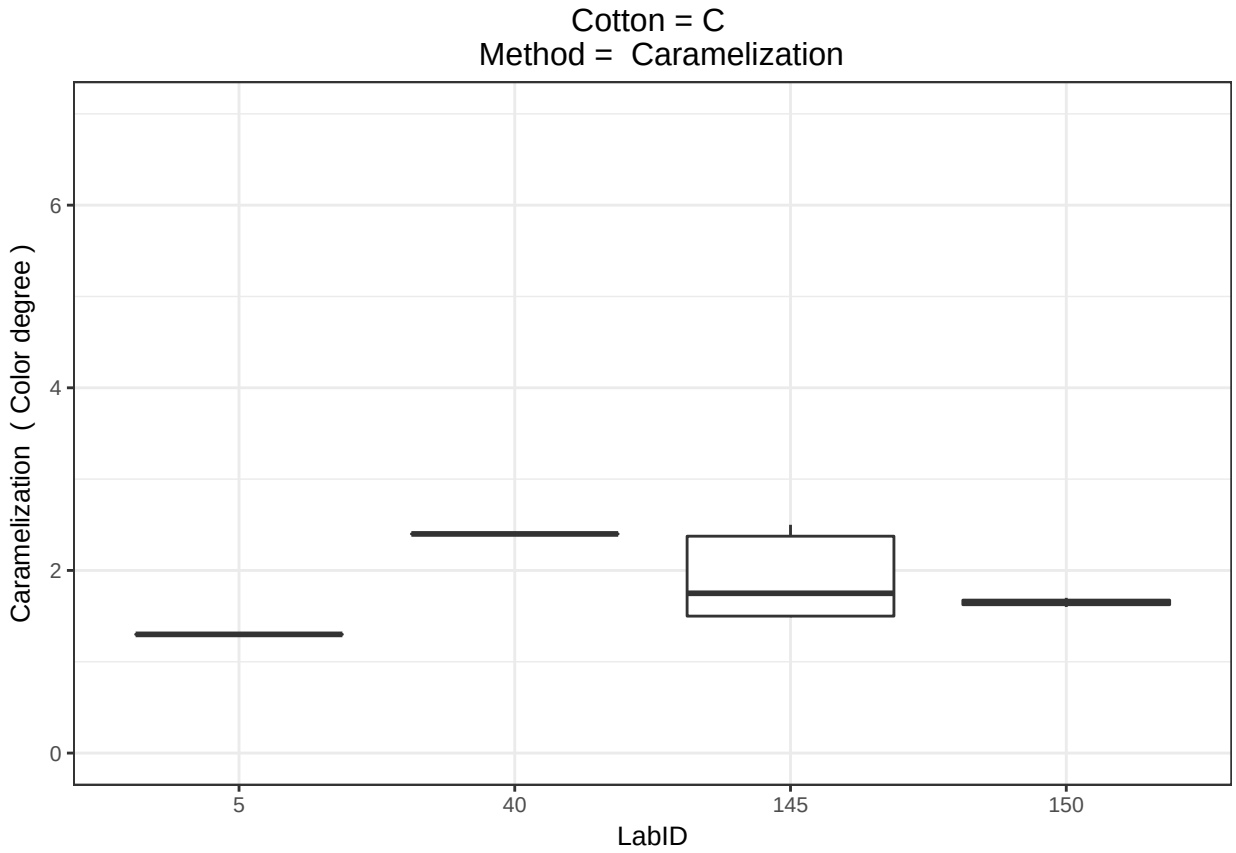

Cotton = B
Method = Quantitative method
Quantitative method (Percent)
1.25
1.00
0.75
0.50
0.25
0.00
135
LabID

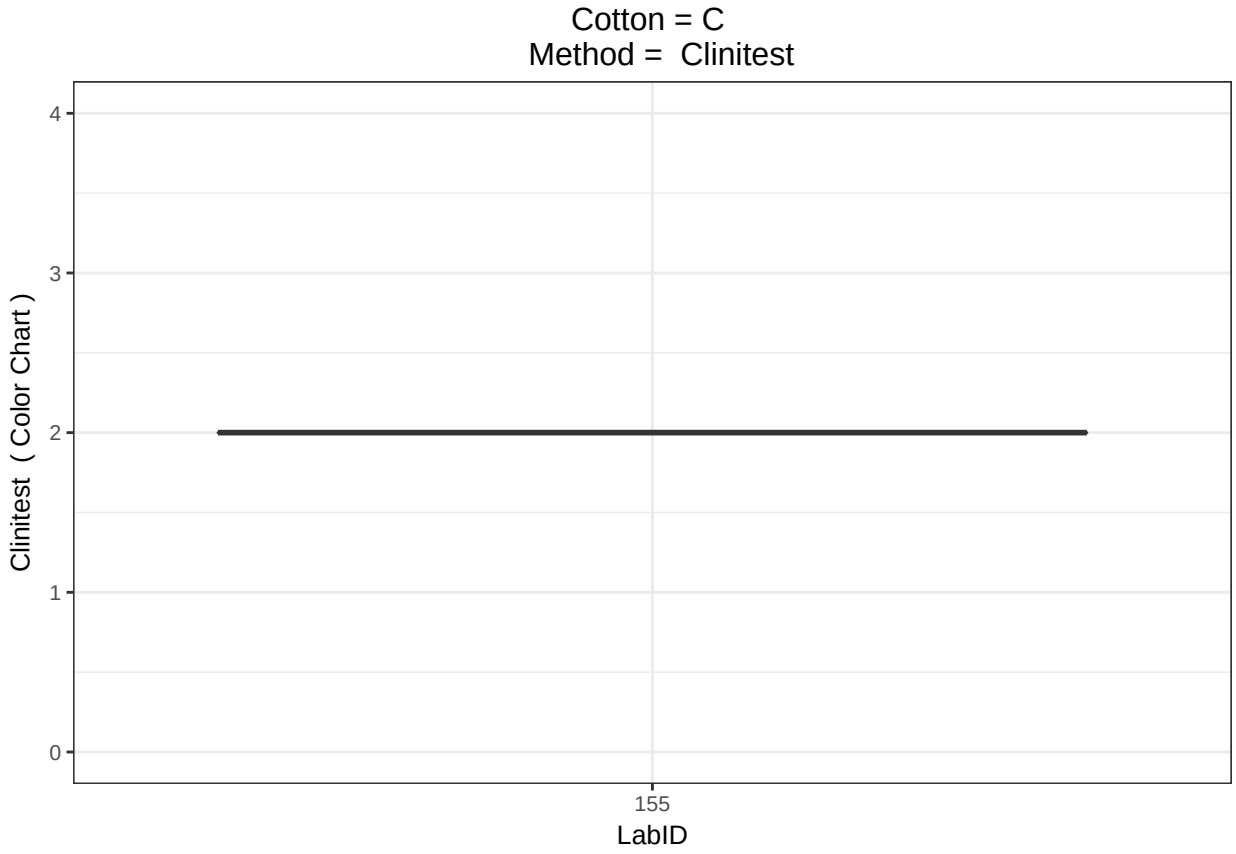

Cotton = B
Method = Reactive Spray
Reactive Spray (Spray Grade)
4
3
2
1
0
160
LabID

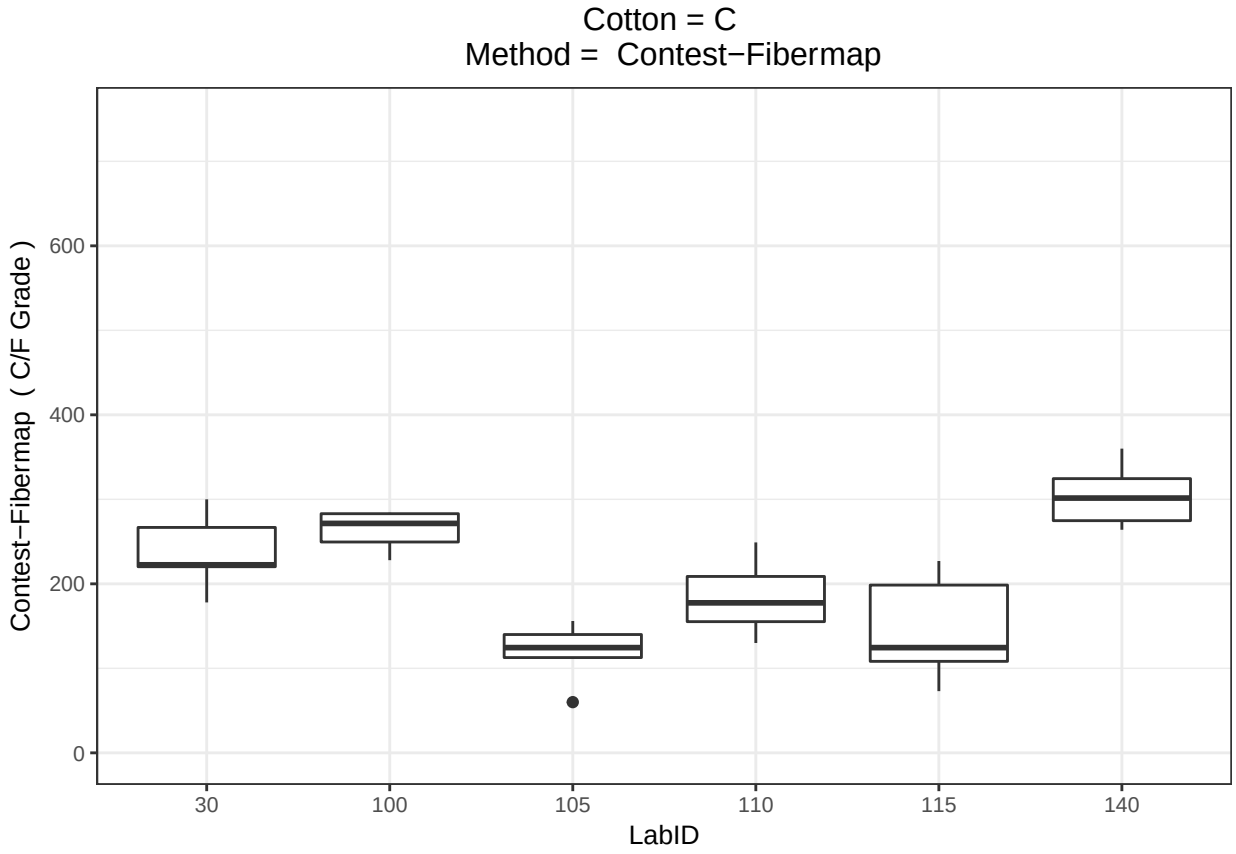

Cotton = B
Method = SCT
SCT (Sticky points)
150
100
50
0
10
20
25
65
70
85
95
130
165
LabID

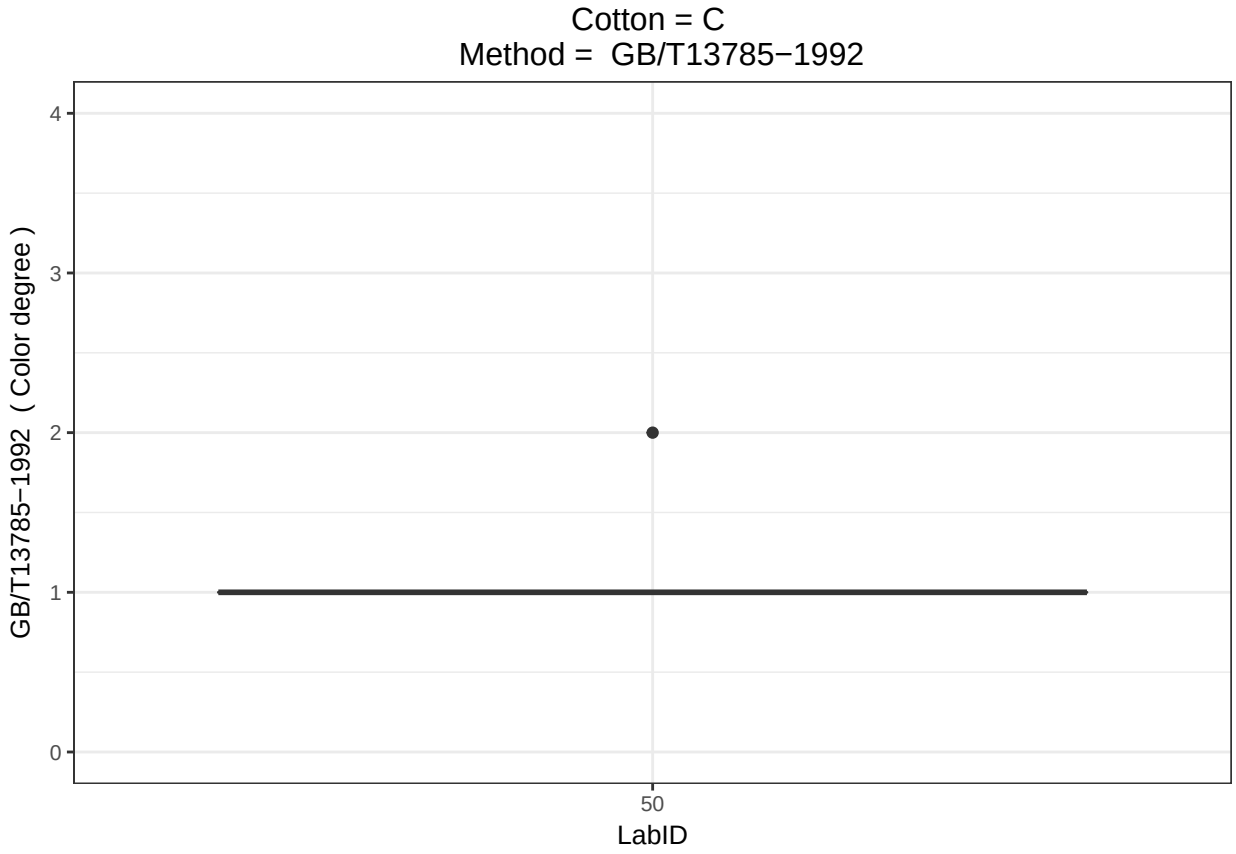

Cotton = B
Method = TDM−A
TDM−A (Sticky points)
10.0
7.5
5.0
2.5
0.0
120
LabID

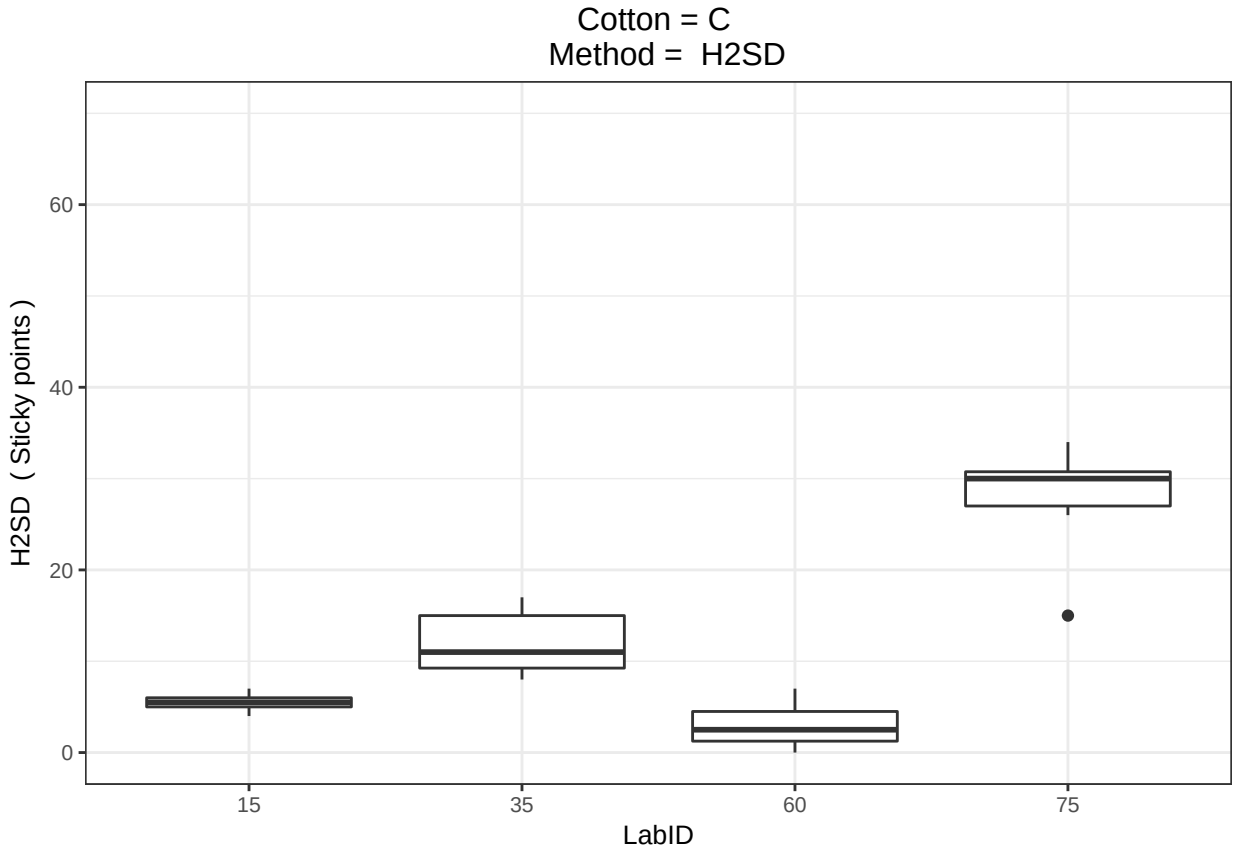
Boxplots for Cotton C

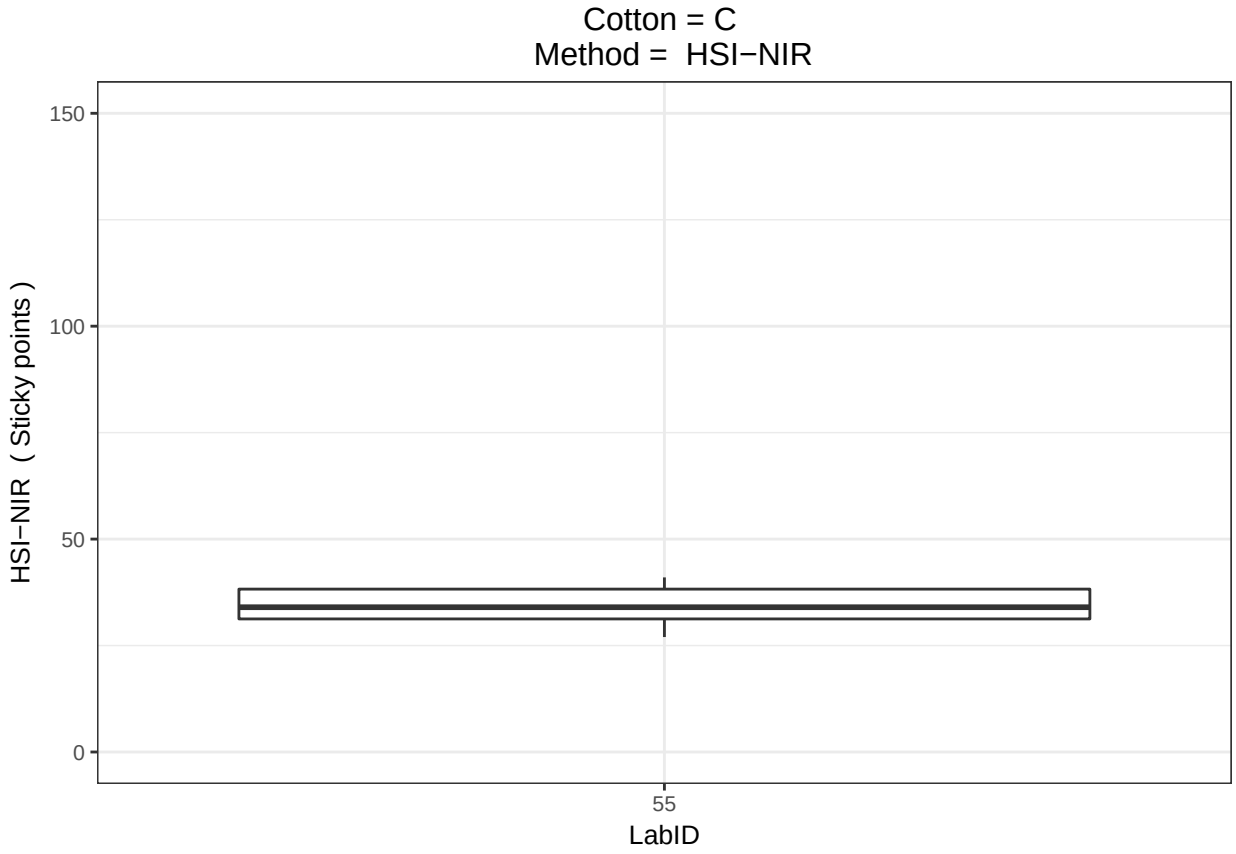


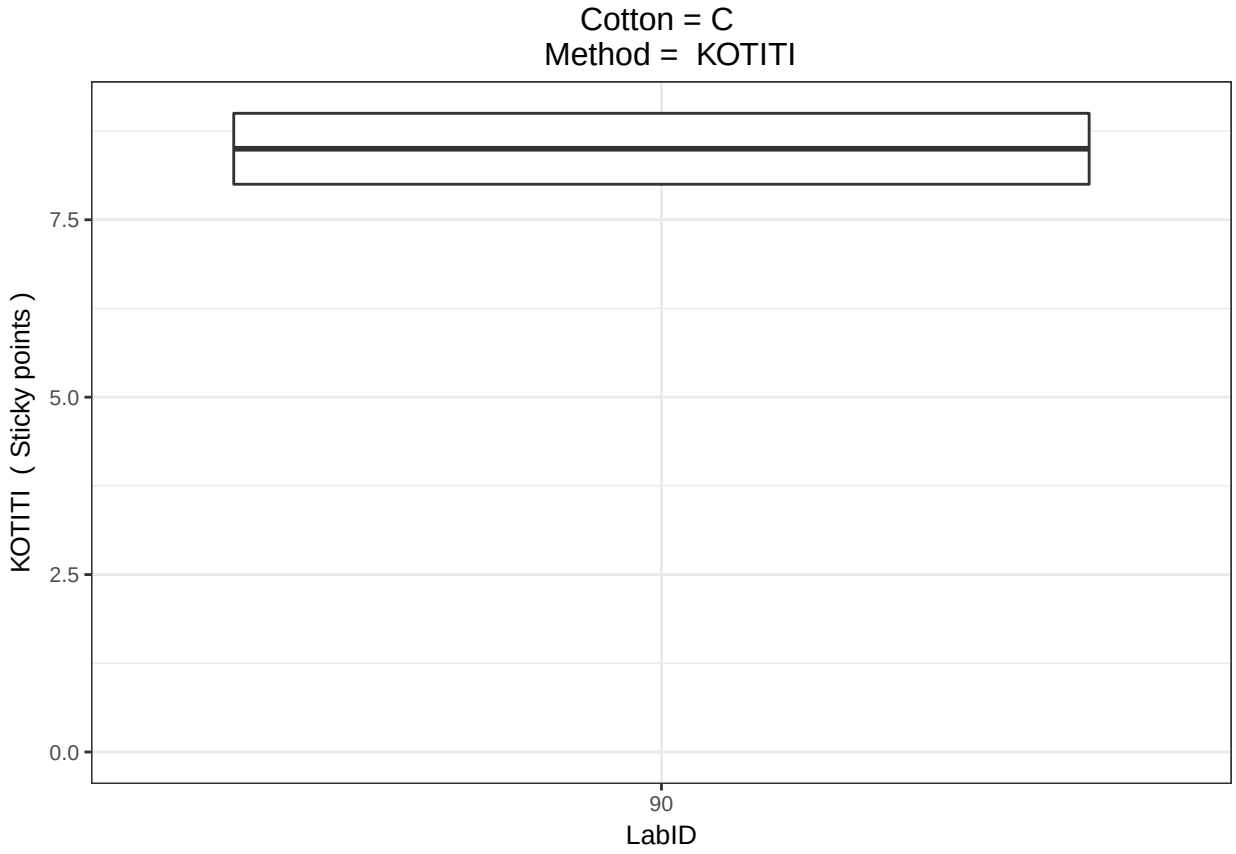

Cotton = C
Method = Clinitest
Clinitest (Color Chart)
4
3
2
1
0
155
LabID

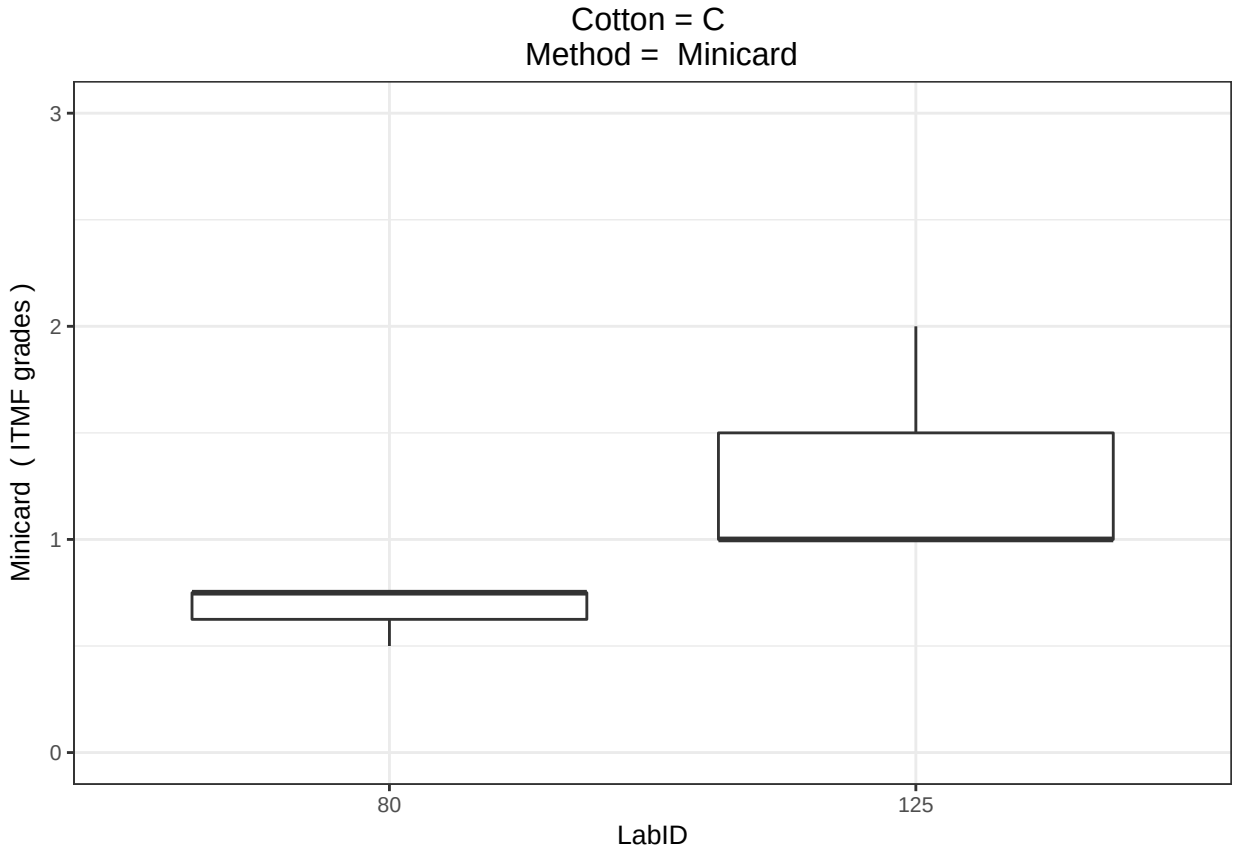

Cotton = C
Method = Contest−Fibermap
Contest−Fibermap (C/F Grade)
600
400
200
0
30
100
105
110
115
140
LabID

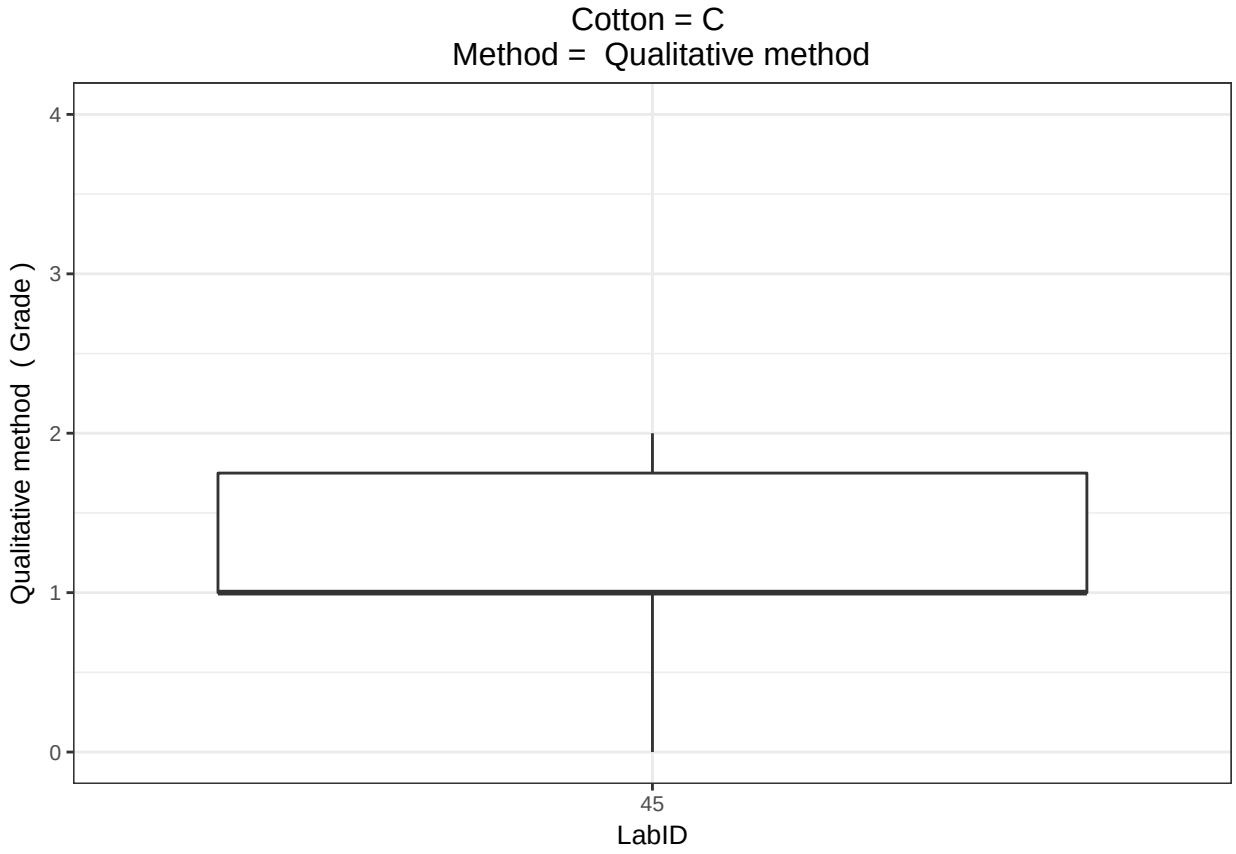

Cotton = C
Method = GB/T13785−1992
GB/T13785−1992 (Color degree)
4
3
2
1
0
50
LabID

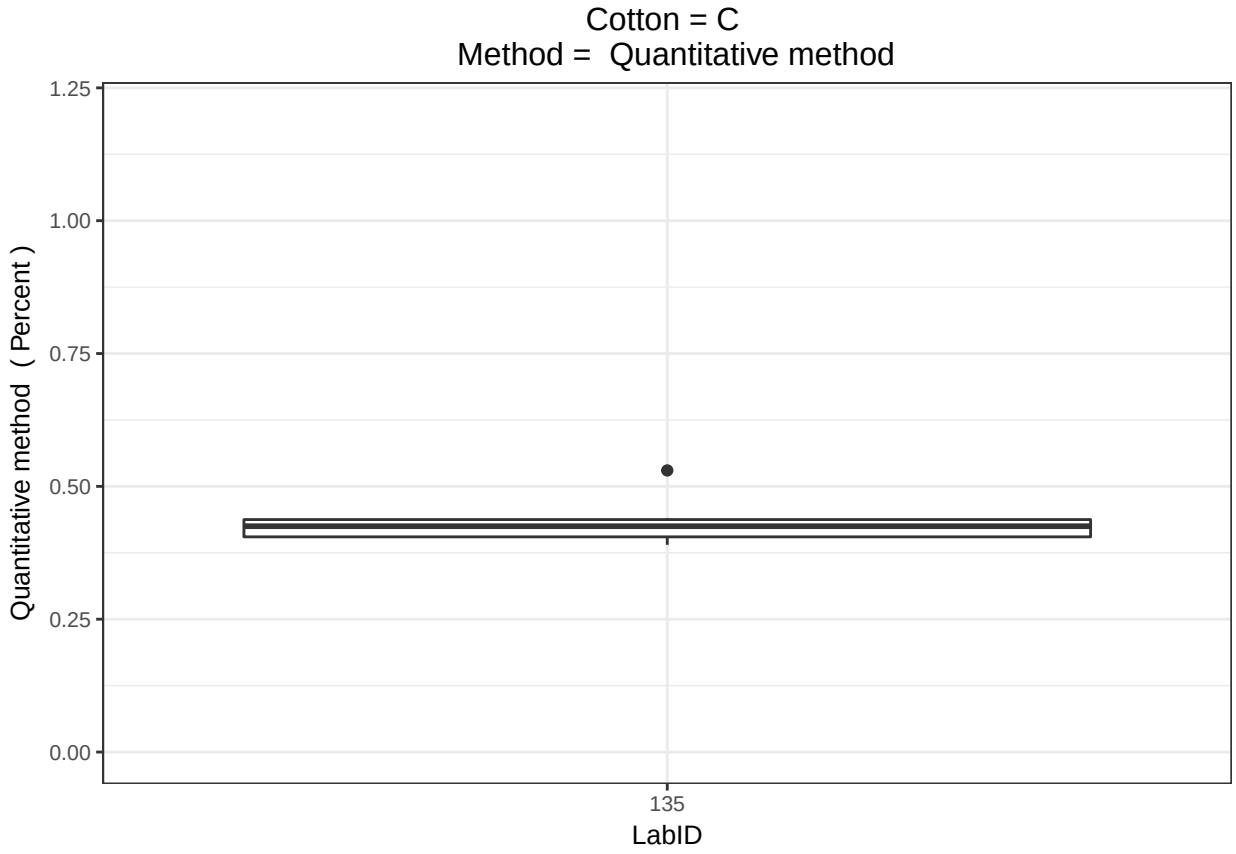

Cotton = C
Method = H2SD
H2SD (Sticky points)
60
40
20
0
15
35
60
75
LabID

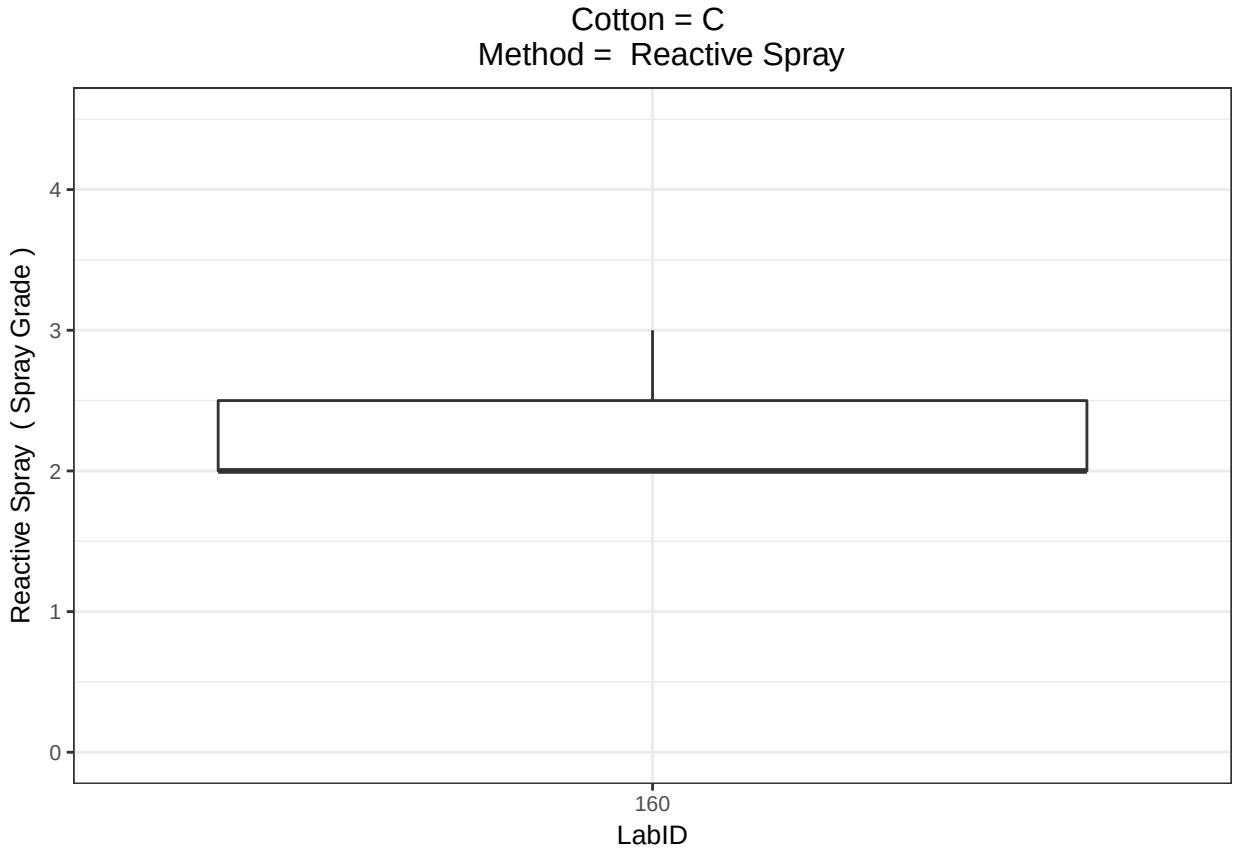

Cotton = C
Method = HSI−NIR
150
100
50
0
HSI−NIR (Sticky points)
55
LabID

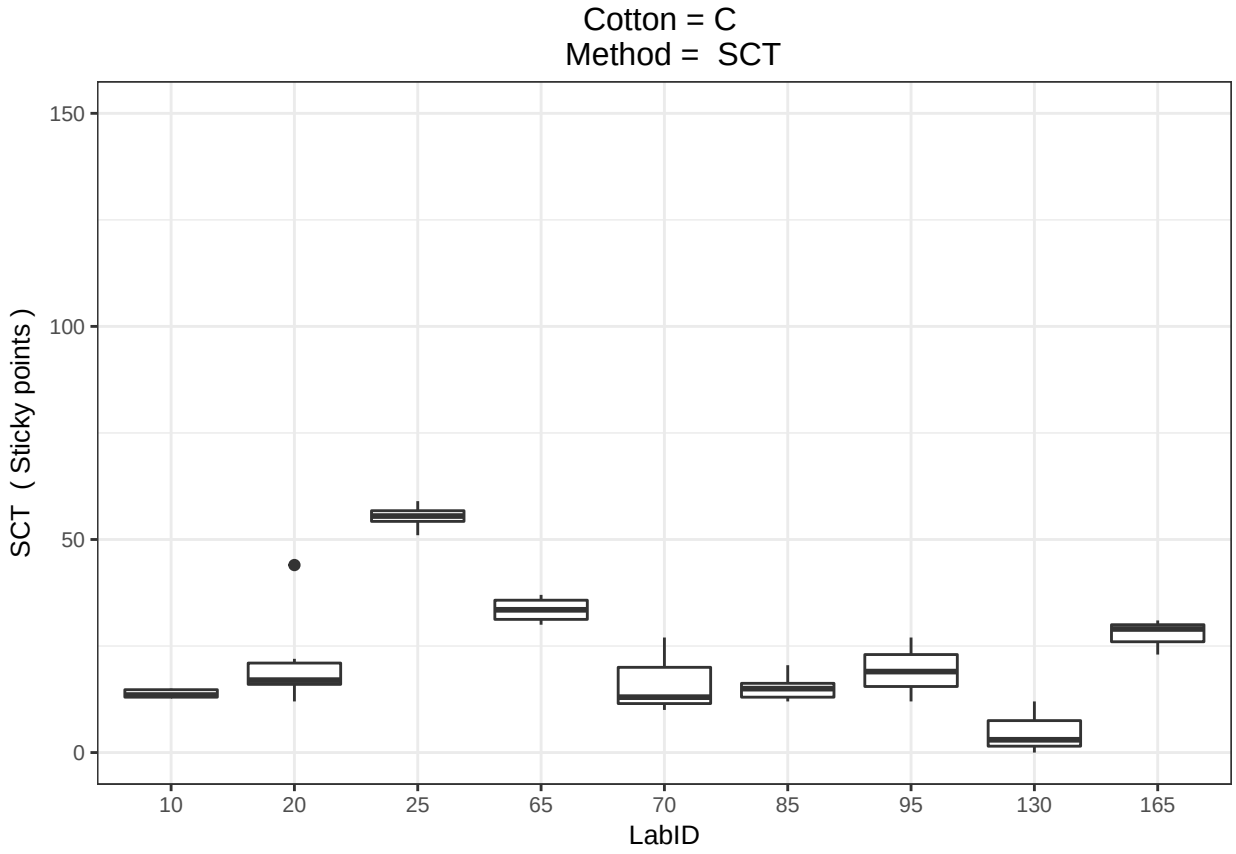

Cotton = C
Method = KOTITI
KOTITI (Sticky points)
7.5
5.0
2.5
0.0
90
LabID

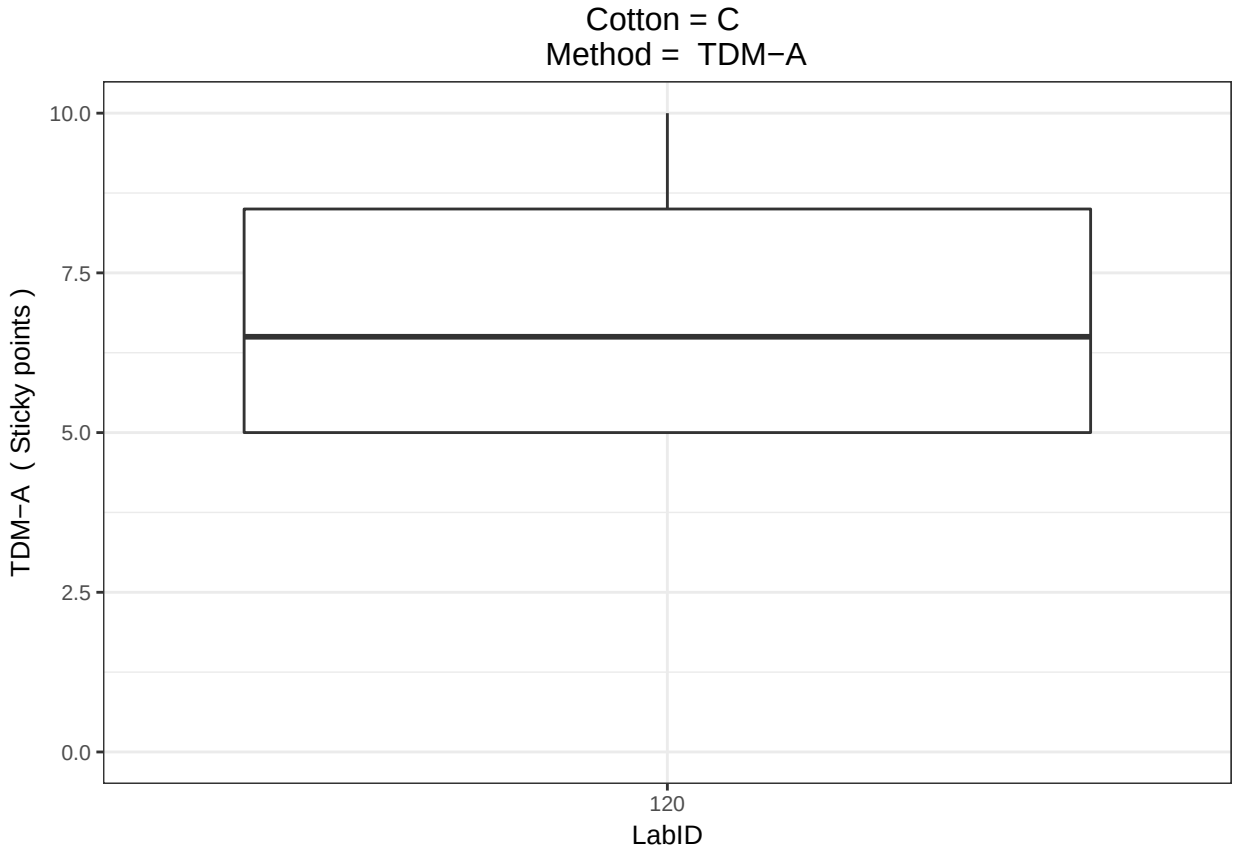

Cotton = C
Method = Minicard
Minicard (ITMF grades)
3
2
1
0
80
125
LabID


Cotton = C
Method = Qualitative method
Qualitative method (Grade)
4
3
2
1
0
45
LabID

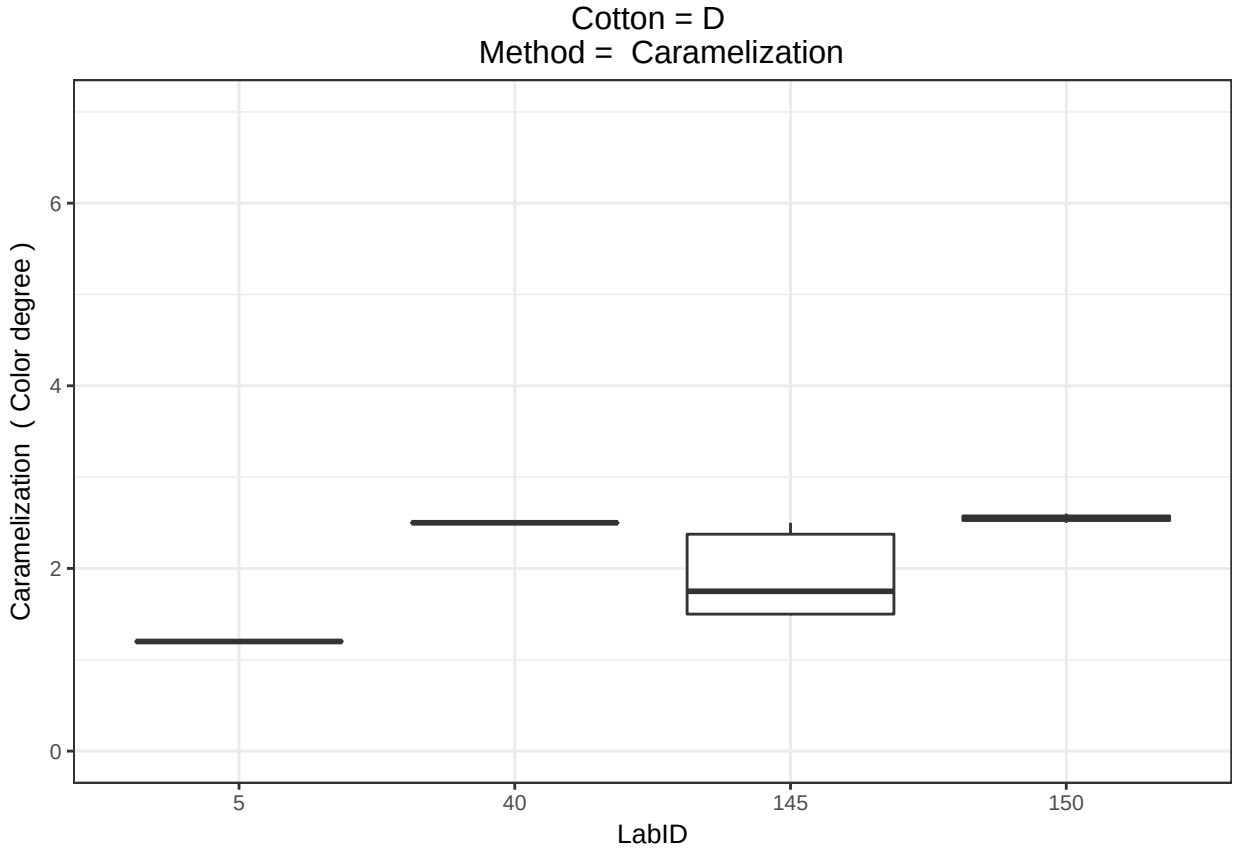

Cotton = C
Method = Quantitative method
Quantitative method (Percent)
1.25
1.00
0.75
0.50
0.25
0.00
135
LabID

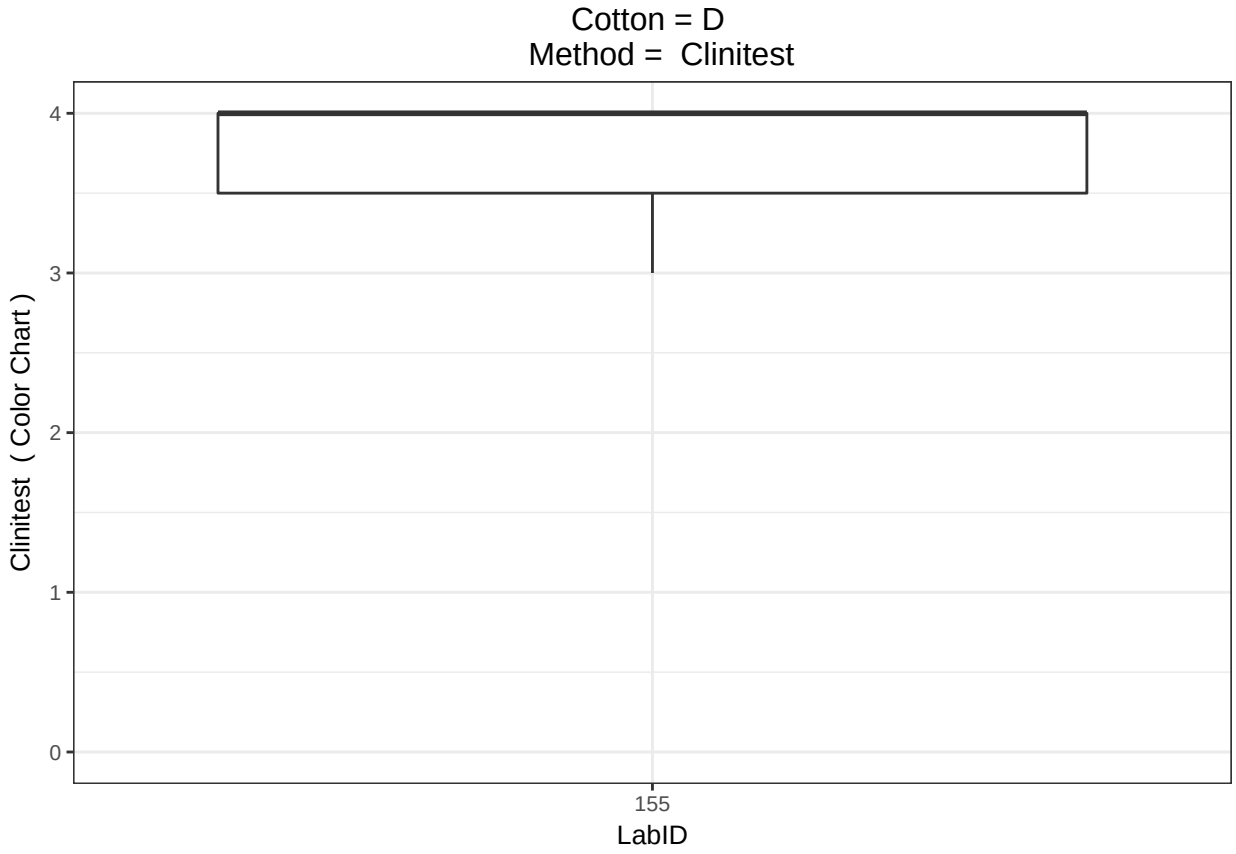

Cotton = C
Method = Reactive Spray
Reactive Spray (Spray Grade)
4
3
2
1
0
160
LabID

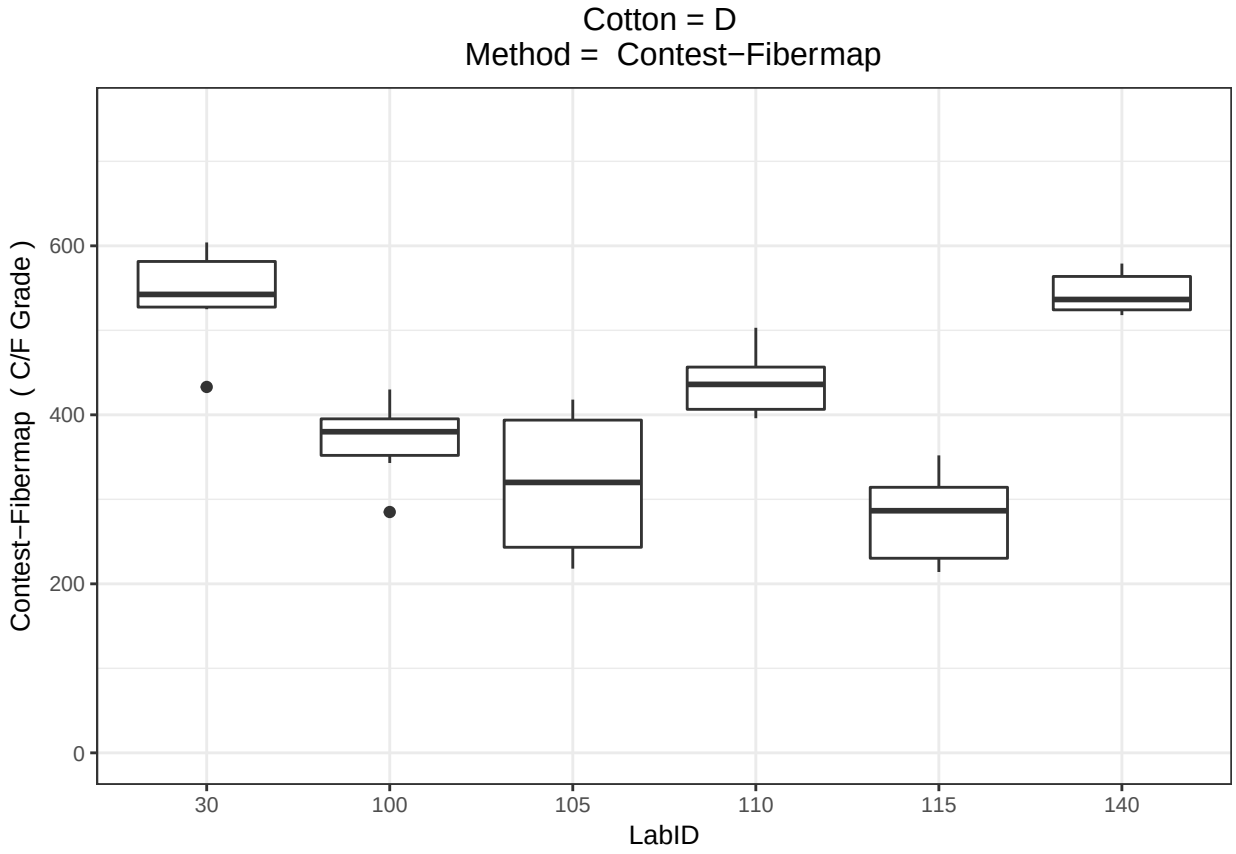

Cotton = C
Method = SCT
SCT (Sticky points)
150
100
50
0
10
20
25
65
70
85
95
130
165
LabID

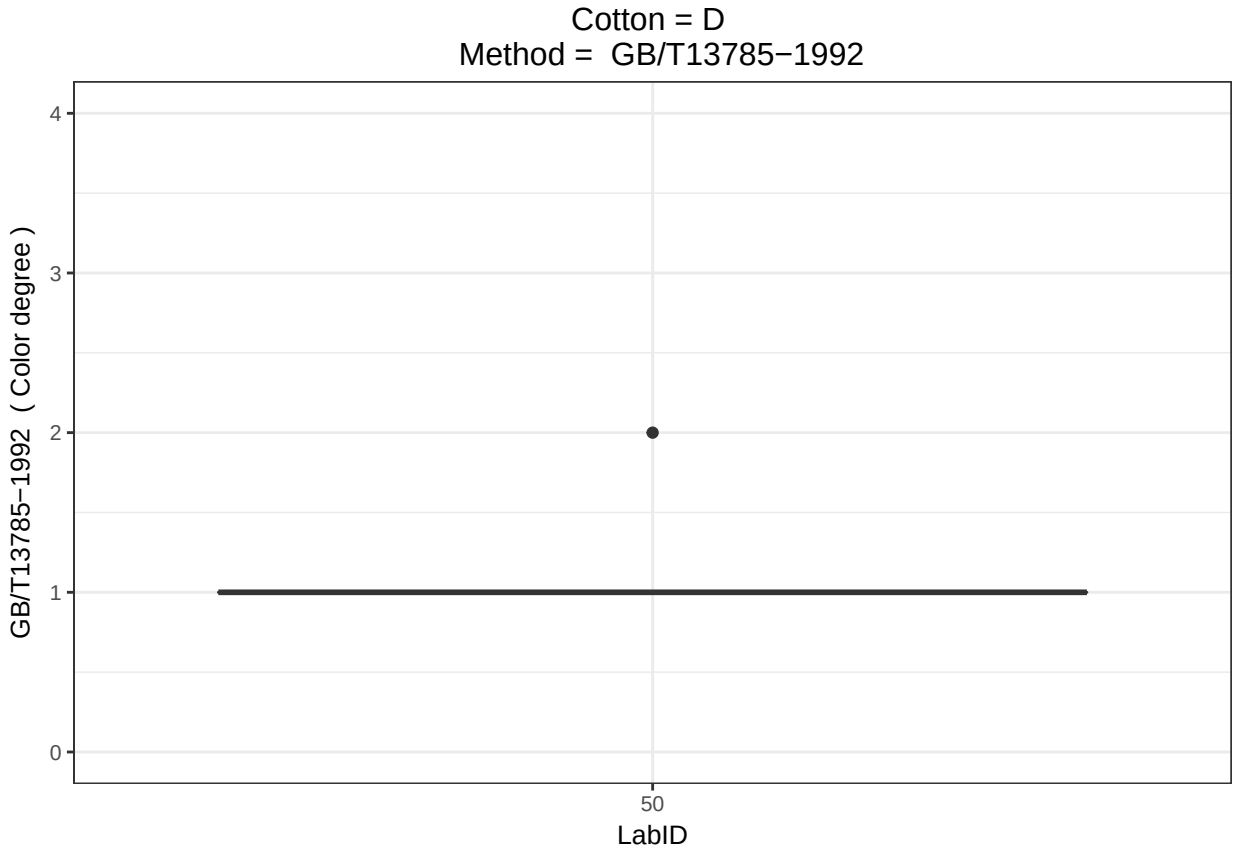

Cotton = C
Method = TDM−A
10.0
7.5
5.0
2.5
0.0
TDM−A (Sticky points)
120
LabID

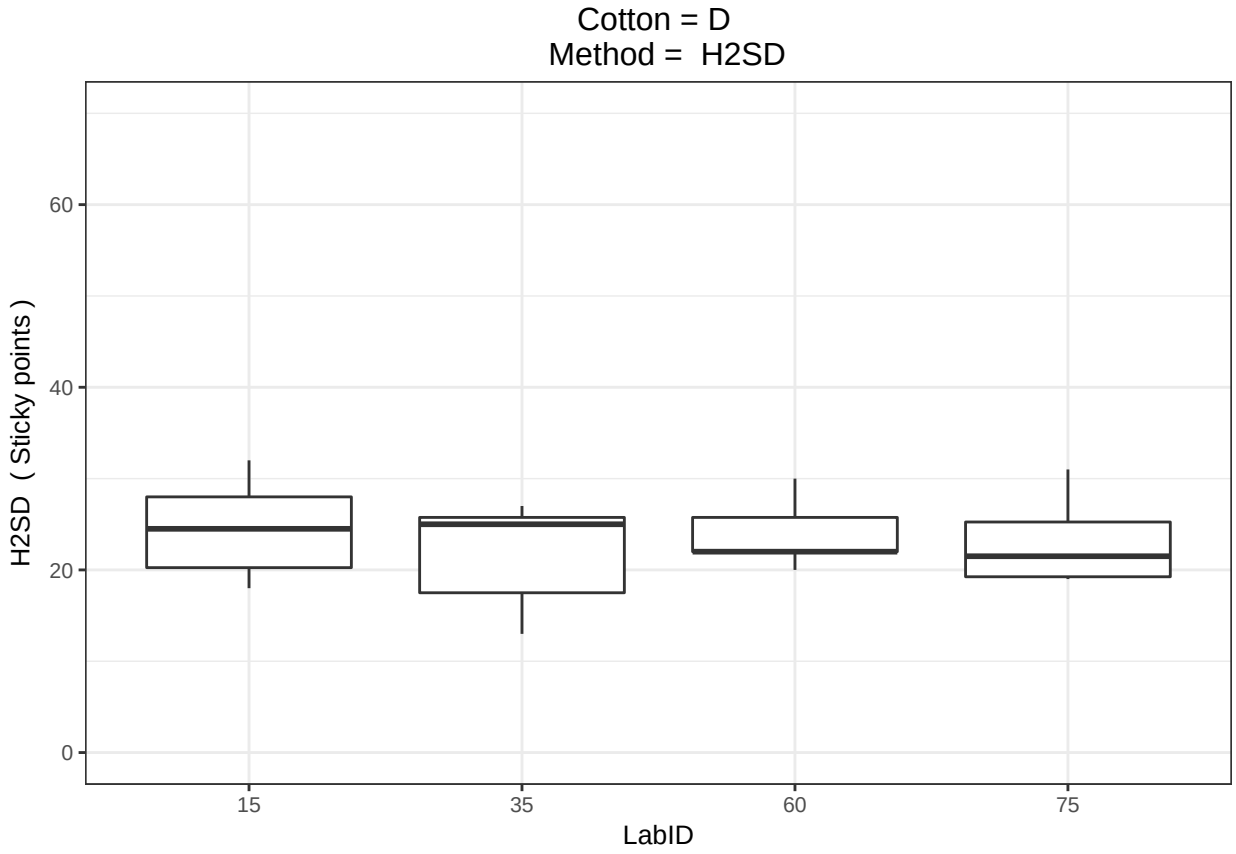
Boxplots for Cotton D

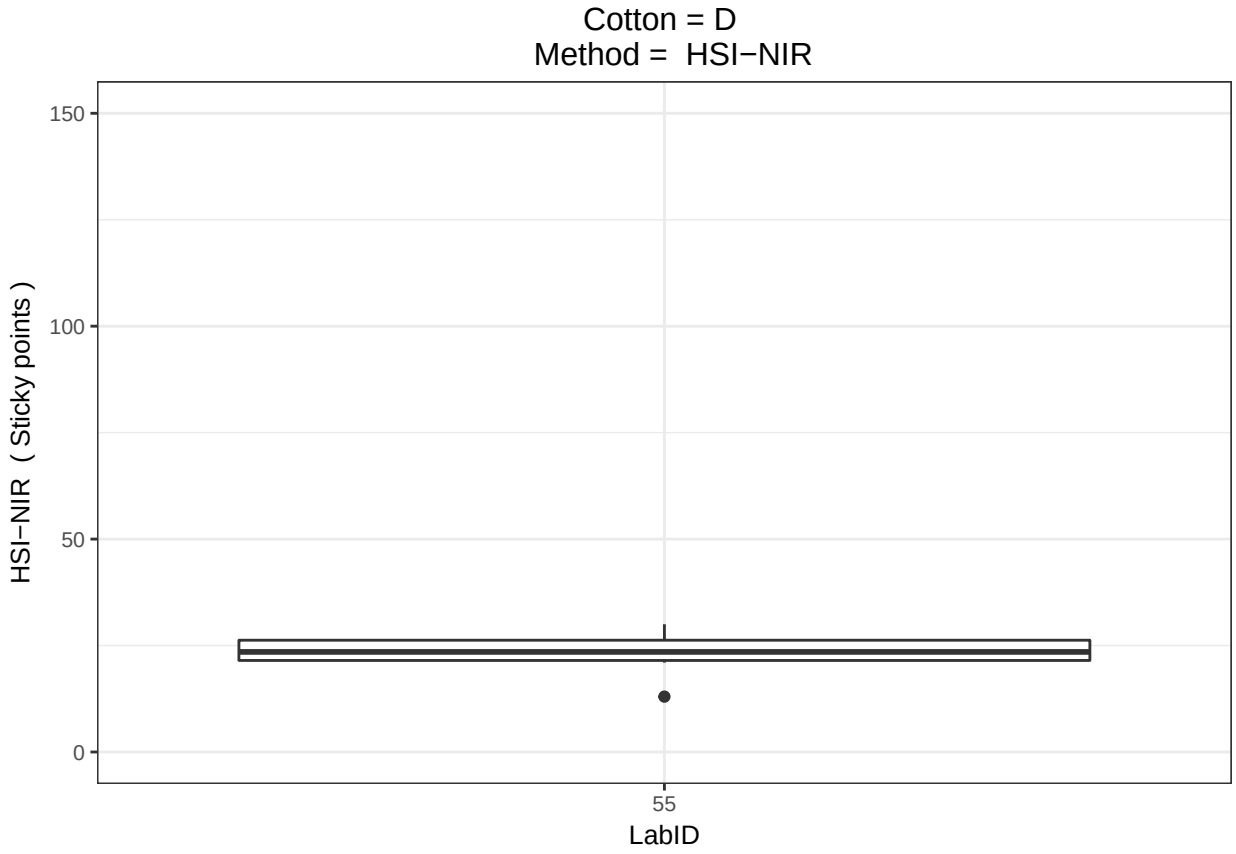


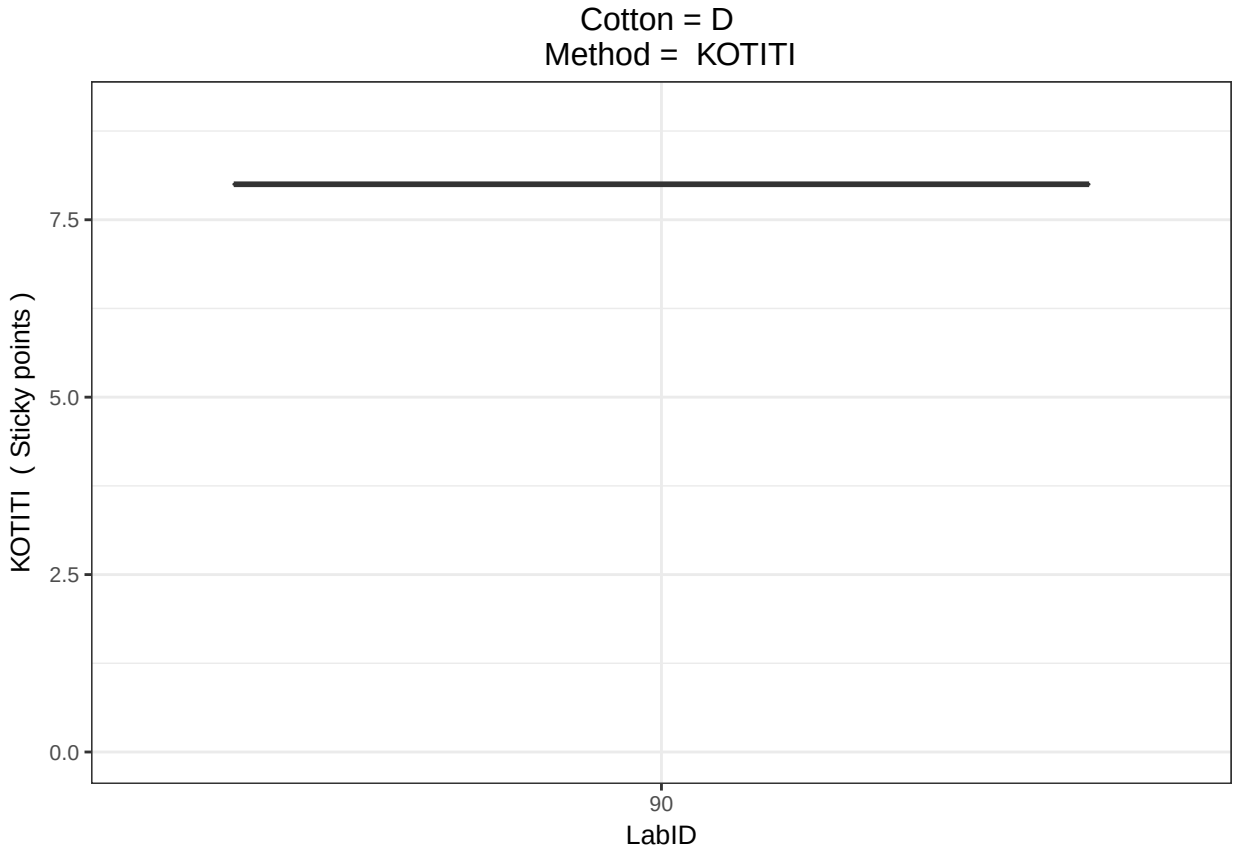

Cotton = D
Method = Clinitest
Clinitest (Color Chart)
4
3
2
1
0
155
LabID

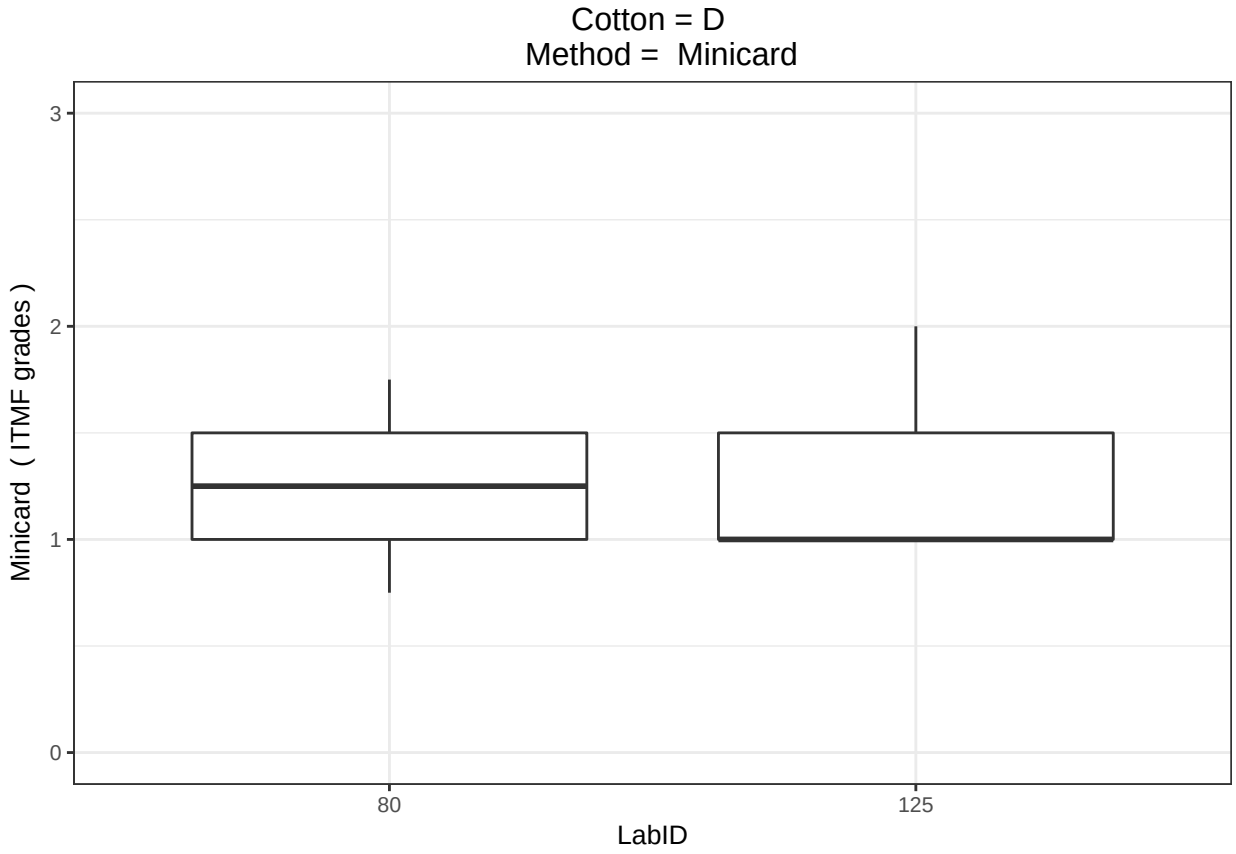

Cotton = D
Method = Contest−Fibermap
Contest−Fibermap (C/F Grade)
600
400
200
0
30
100
105
110
115
140
LabID

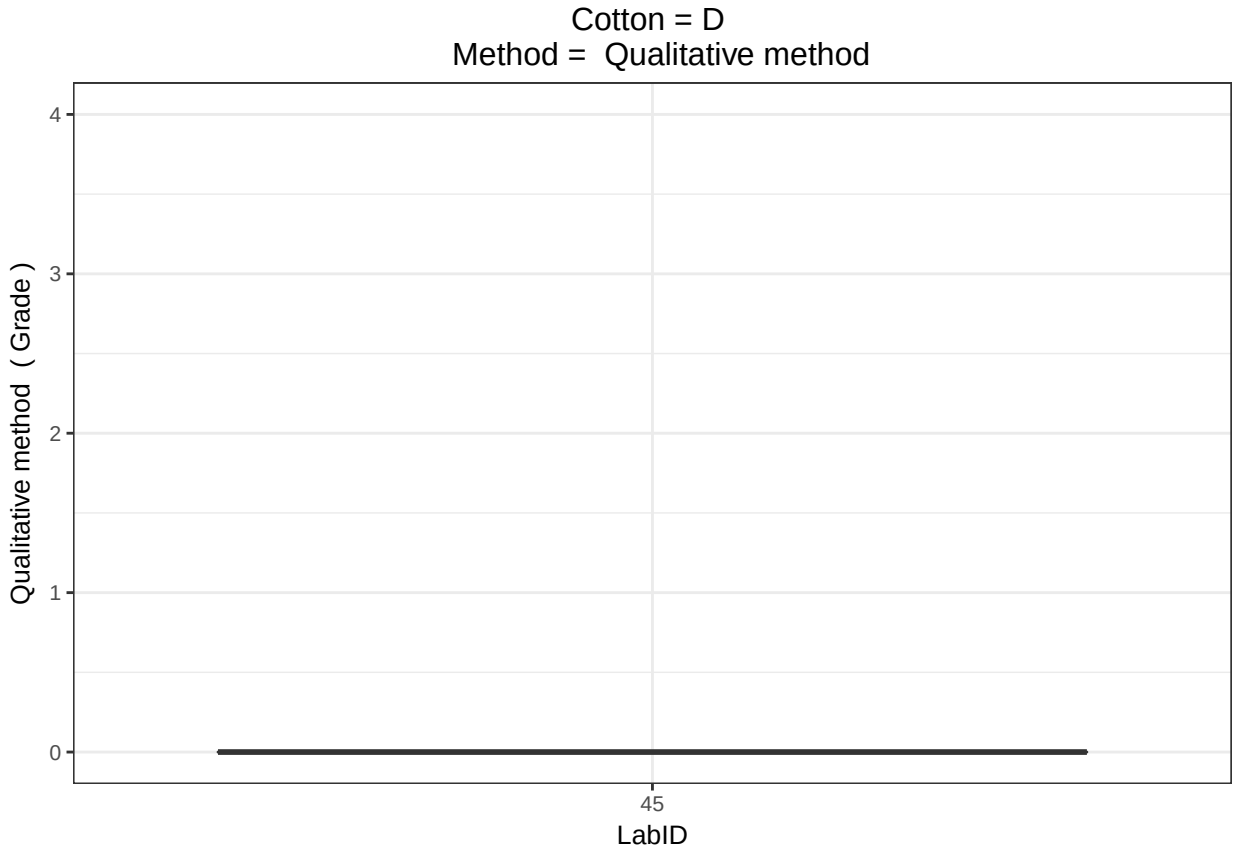

Cotton = D
Method = GB/T13785−1992
GB/T13785−1992 (Color degree)
4
3
2
1
0
50
LabID

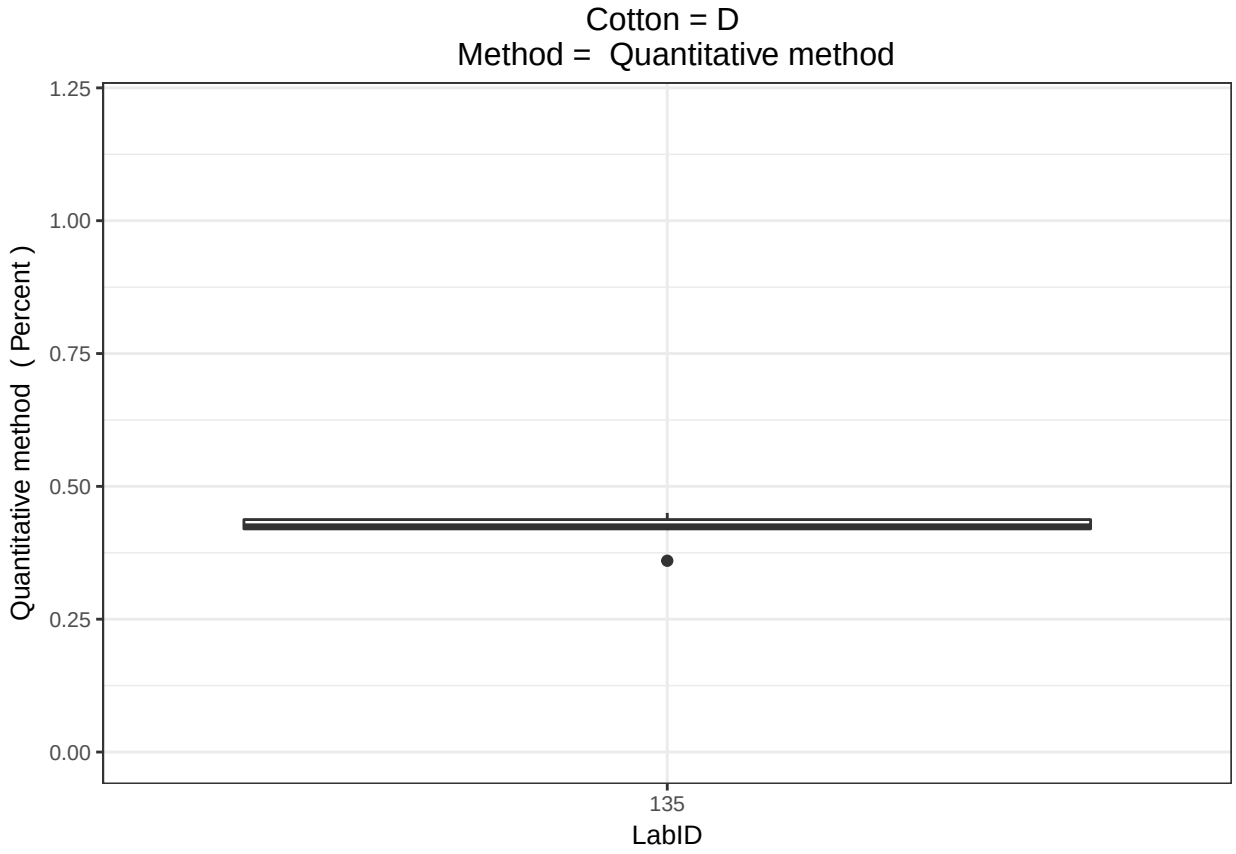

Cotton = D
Method = H2SD
H2SD (Sticky points)
60
40
20
0
15
35
60
75
LabID

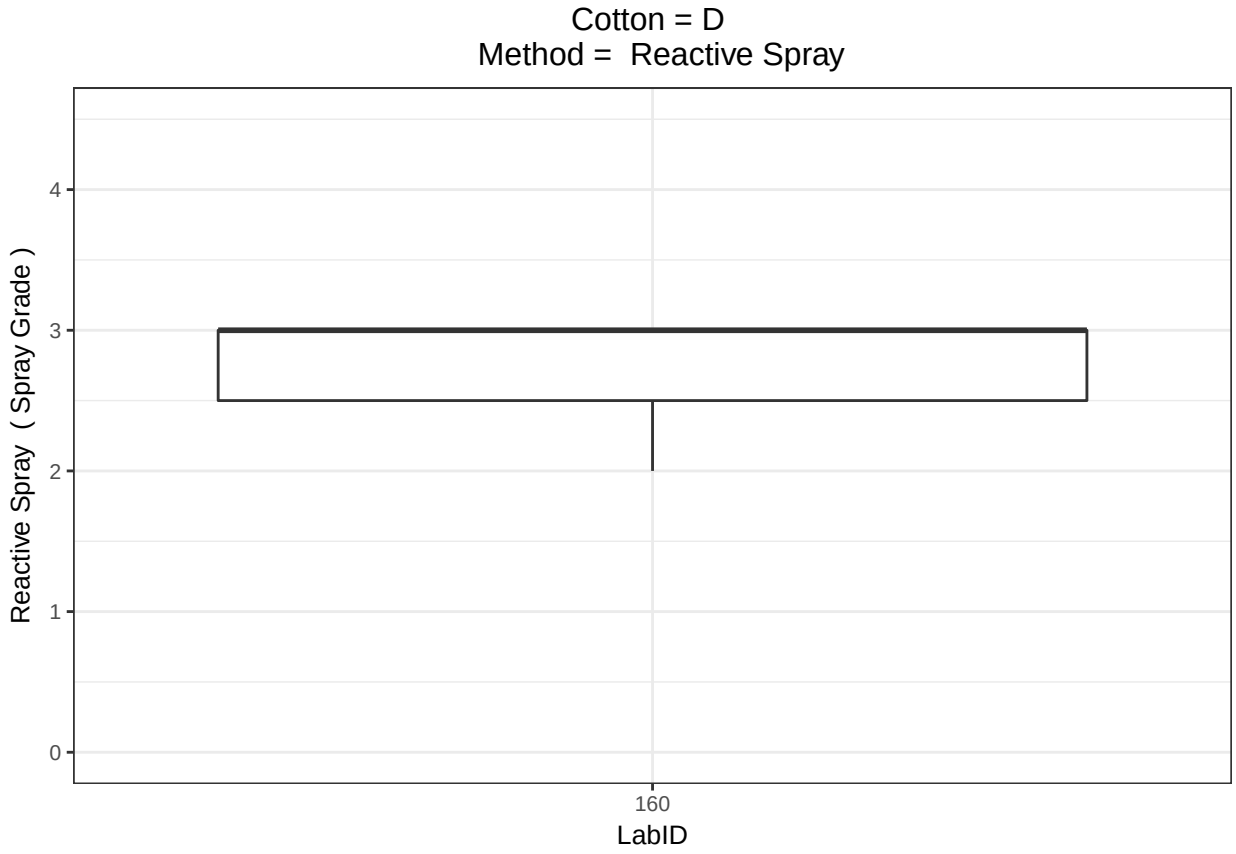

Cotton = D
Method = HSI−NIR
150
100
50
0
HSI−NIR (Sticky points)
55
LabID

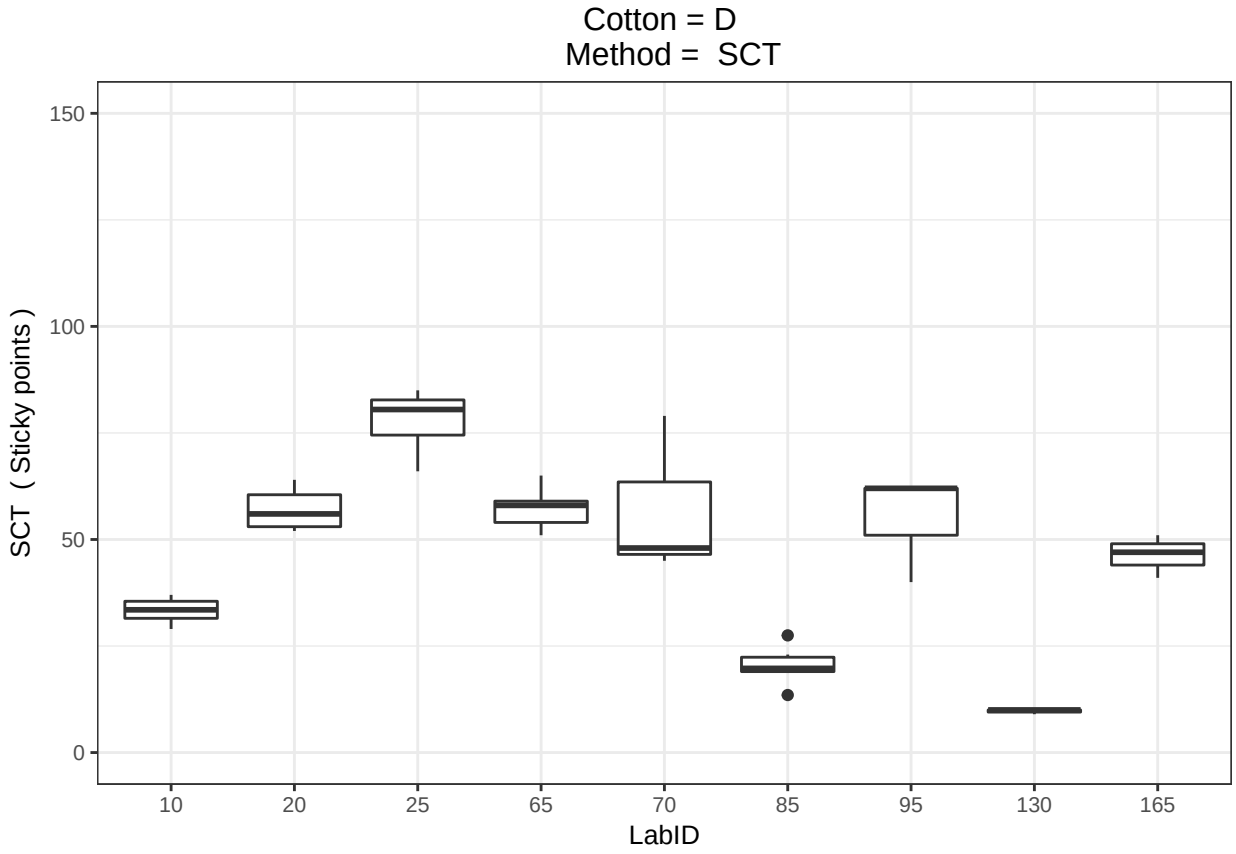

Cotton = D
Method = KOTITI
KOTITI (Sticky points)
7.5
5.0
2.5
0.0
90
LabID

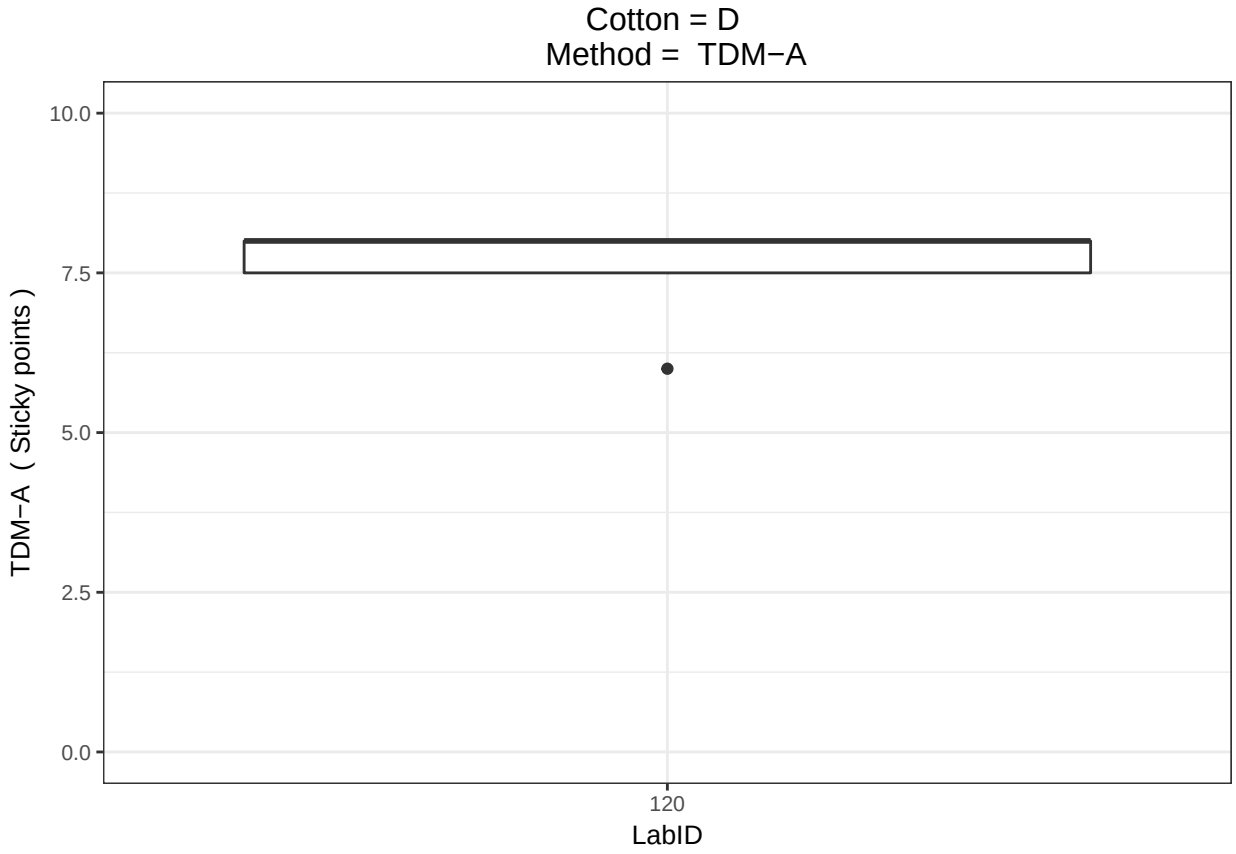

Cotton = D
Method = Minicard
Minicard (ITMF grades)
3
2
1
0
80
125
LabID


Cotton = D
Method = Qualitative method
Qualitative method (Grade)
4
3
2
1
0
45
LabID

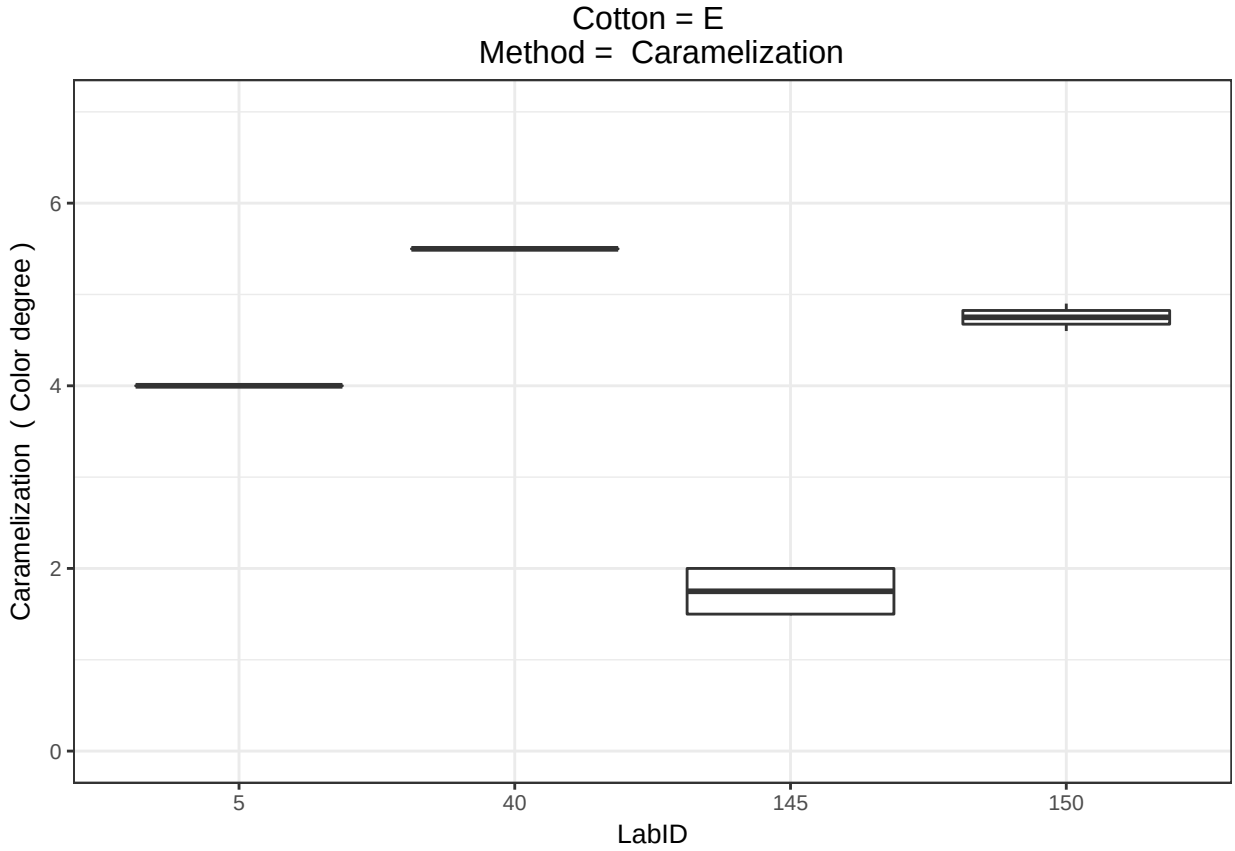

Cotton = D
Method = Quantitative method
Quantitative method (Percent)
1.25
1.00
0.75
0.50
0.25
0.00
135
LabID

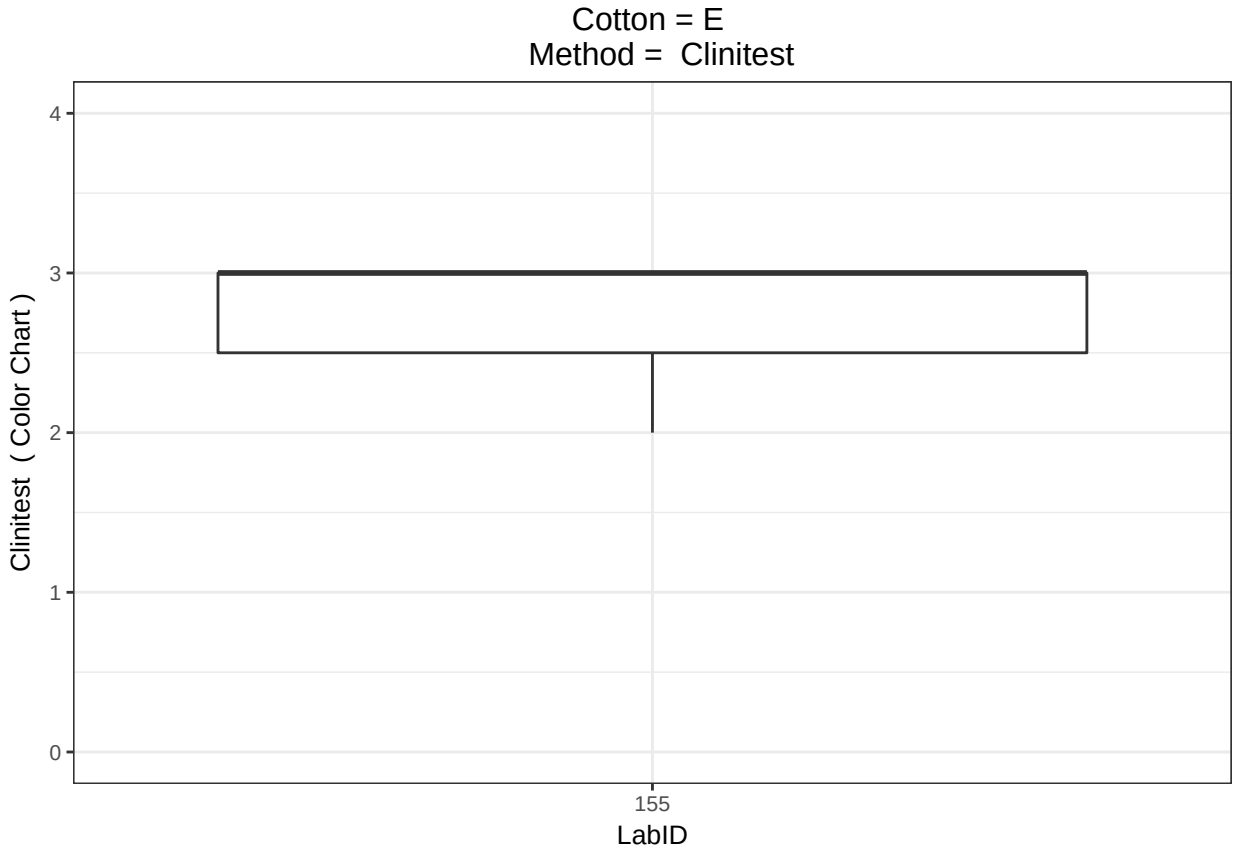

Cotton = D
Method = Reactive Spray
Reactive Spray (Spray Grade)
4
3
2
1
0
160
LabID

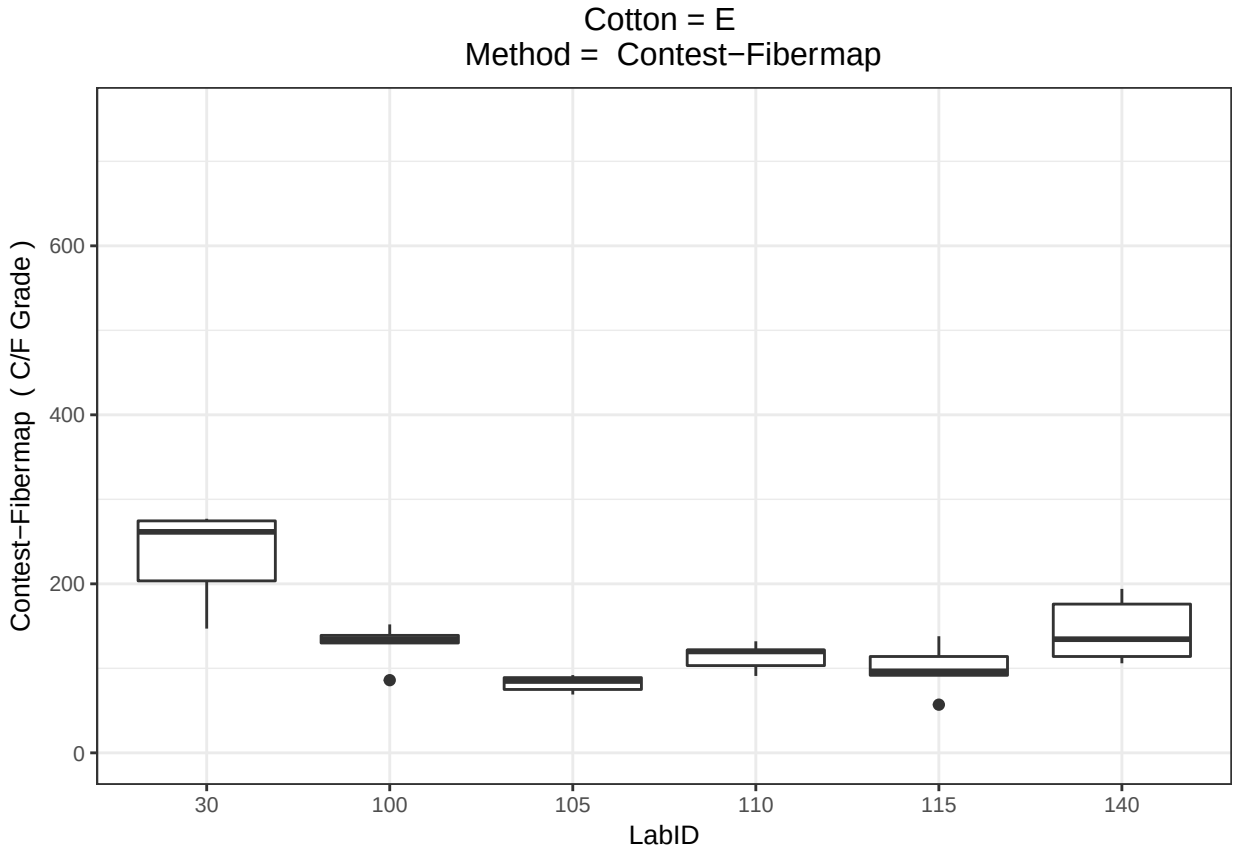

Cotton = D
Method = SCT
SCT (Sticky points)
150
100
50
0
10
20
25
65
70
85
95
130
165
LabID

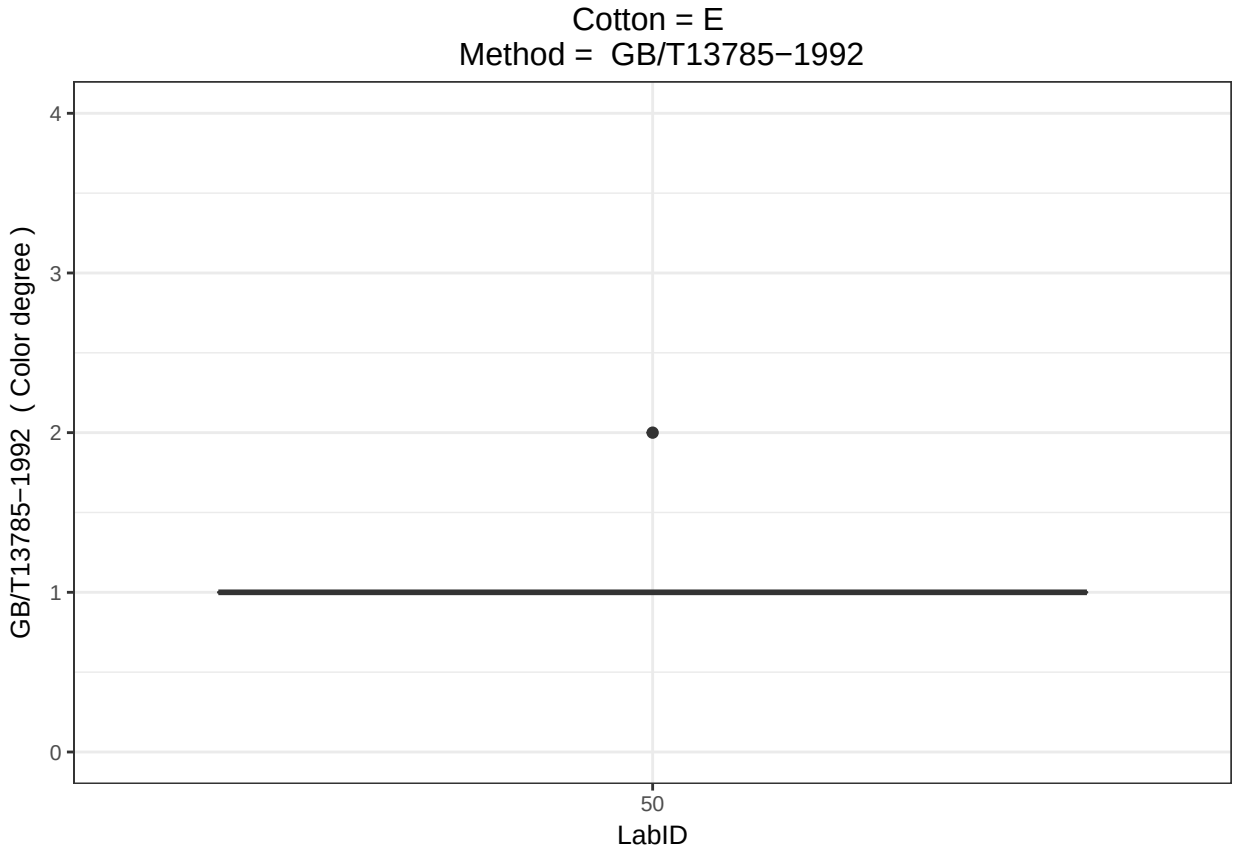

Cotton = D
Method = TDM−A
10.0
7.5
5.0
2.5
0.0
TDM−A (Sticky points)
120
LabID

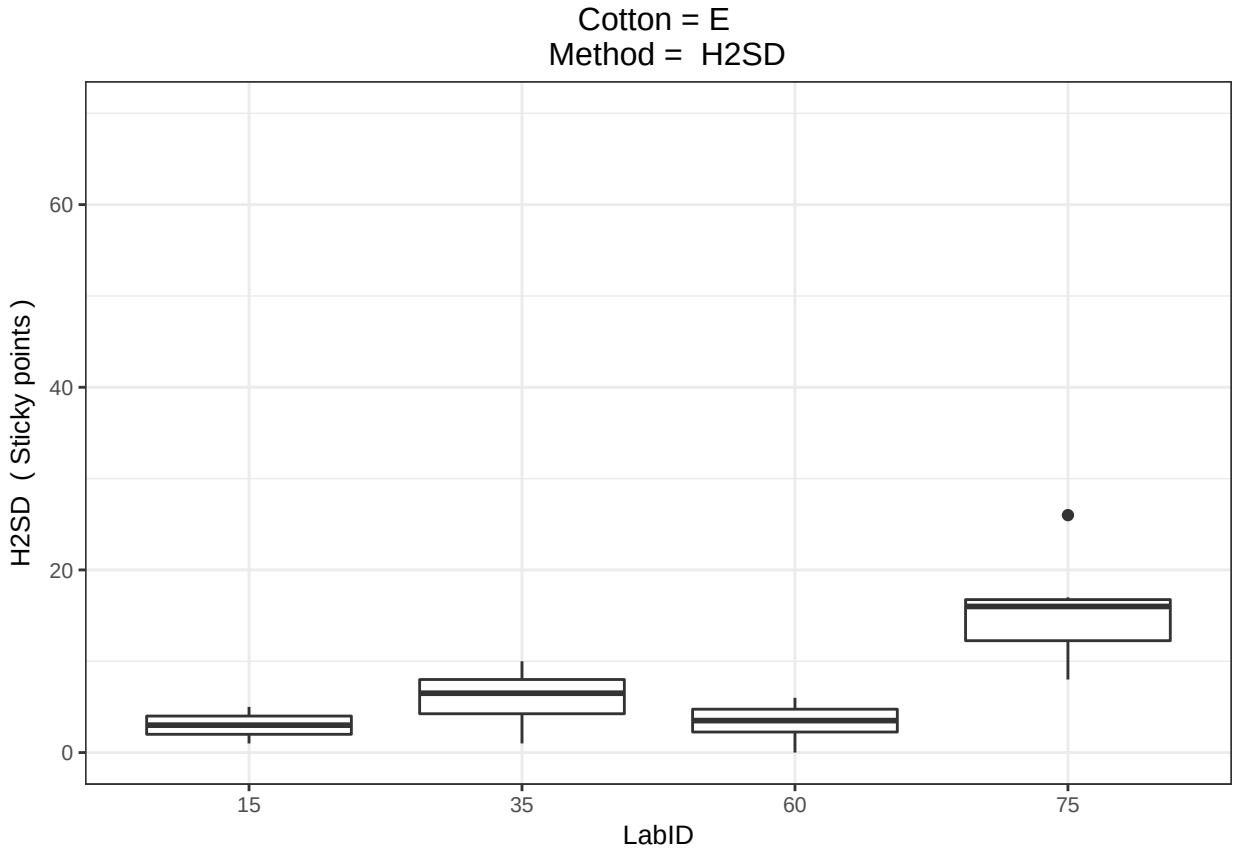
Boxplots for Cotton E

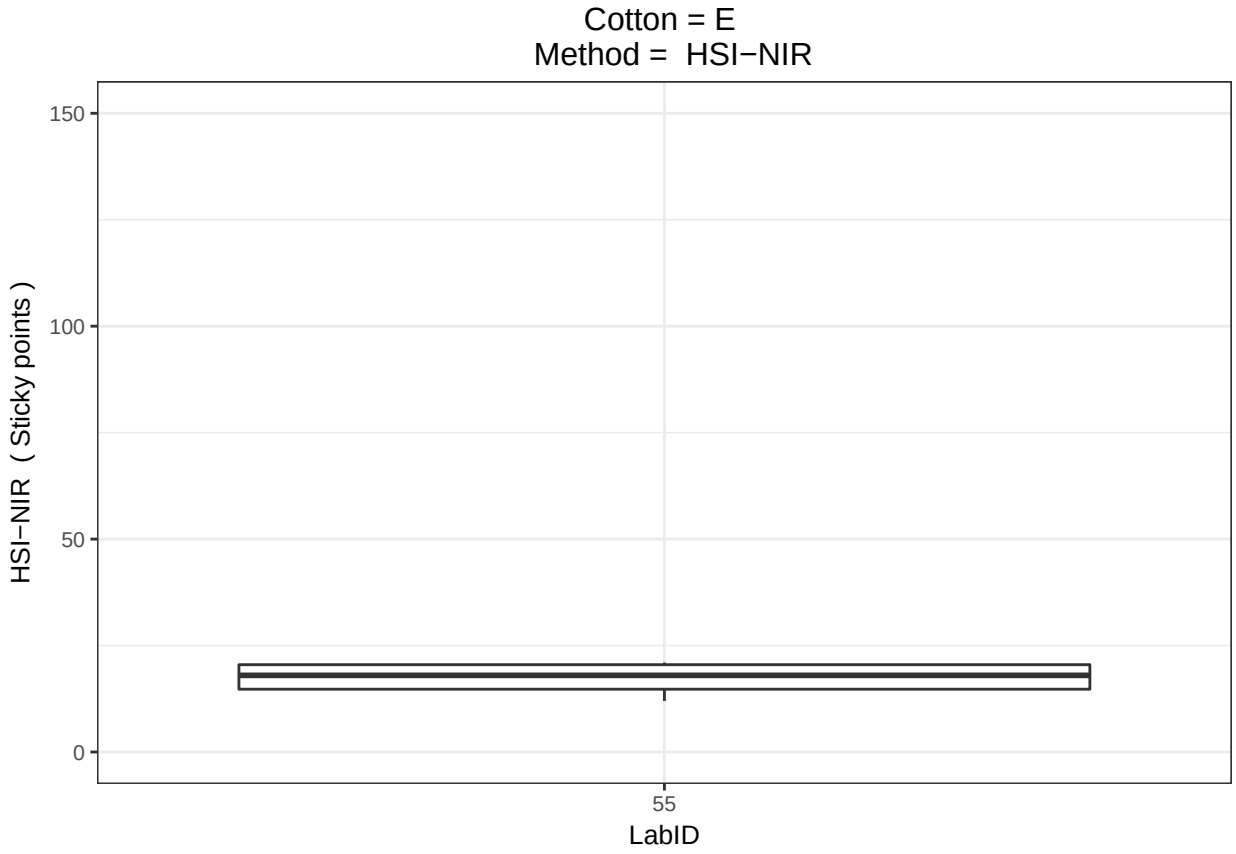


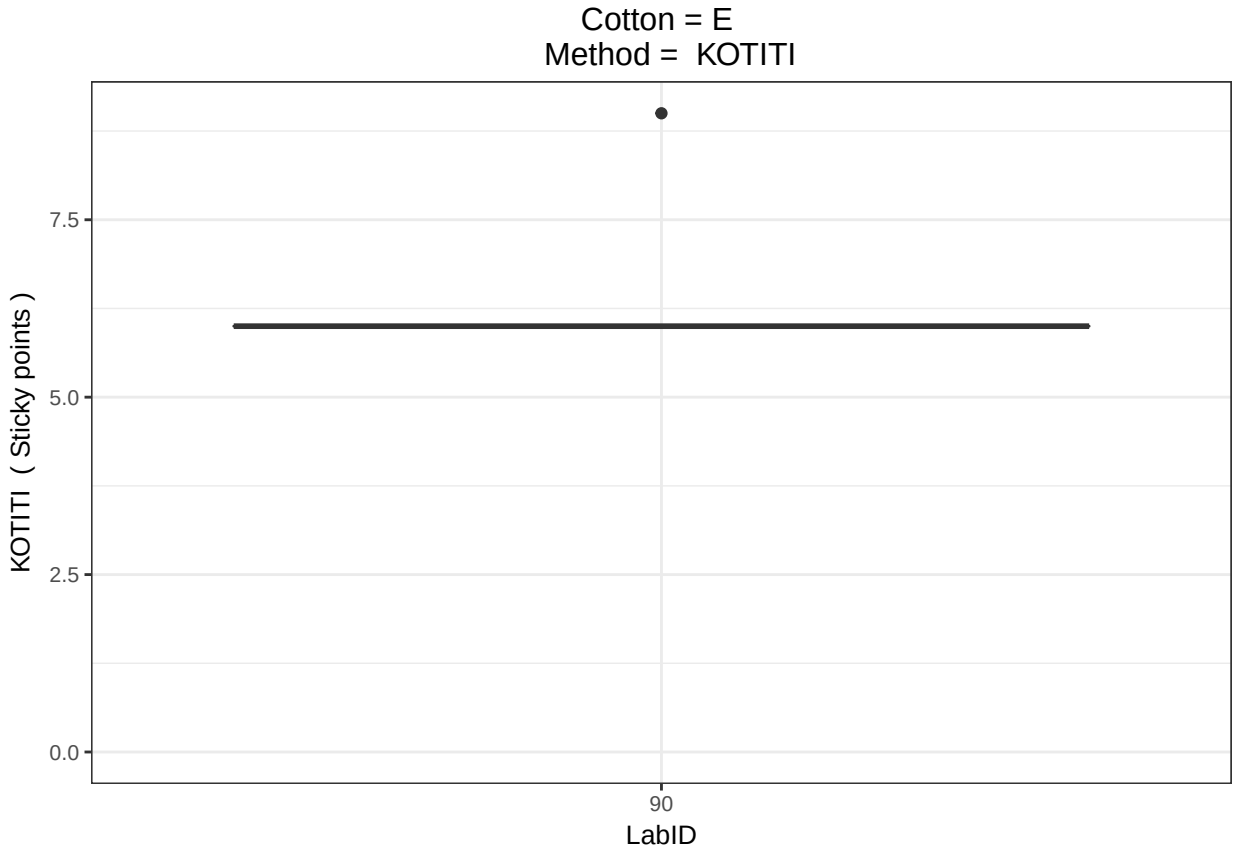

Cotton = E
Method = Clinitest
Clinitest (Color Chart)
4
3
2
1
0
155
LabID

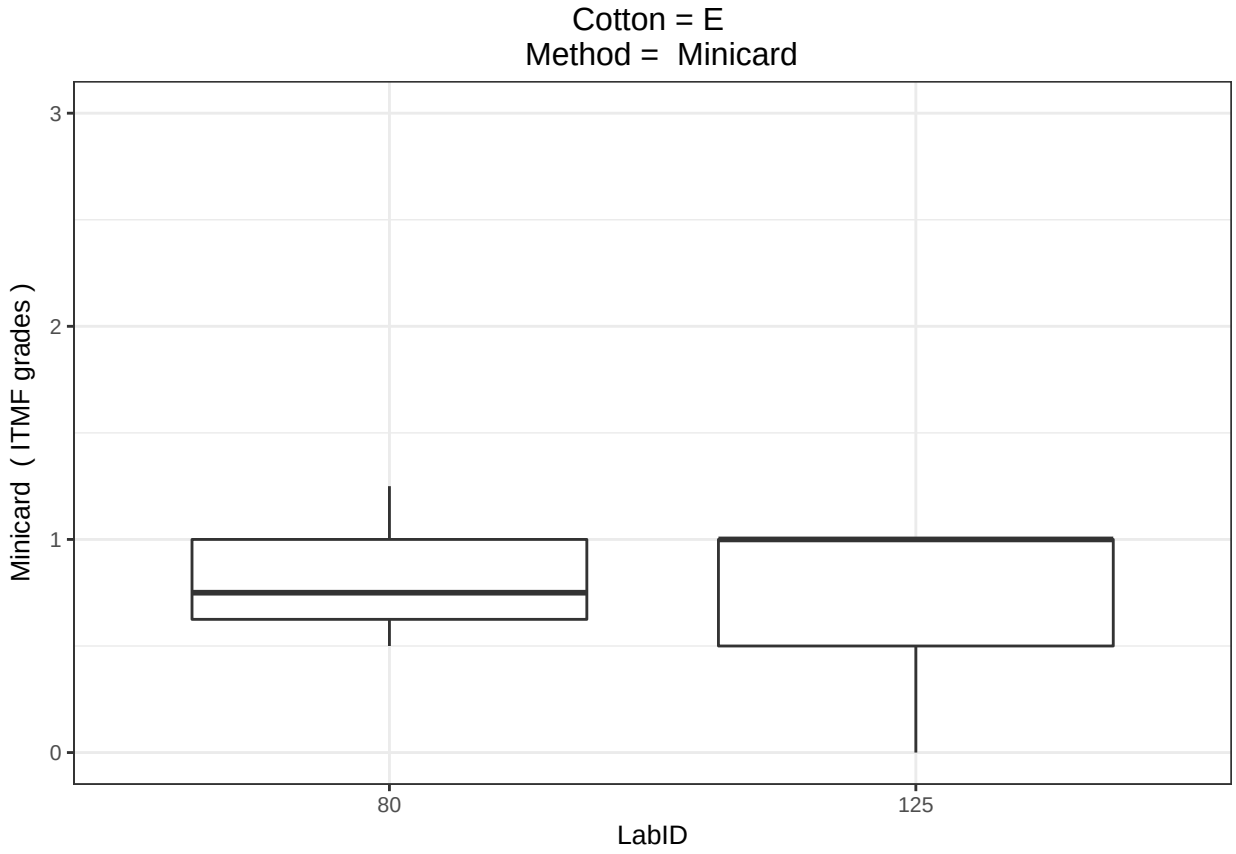

Cotton = E
Method = Contest−Fibermap
Contest−Fibermap (C/F Grade)
600
400
200
0
30
100
105
110
115
140
LabID

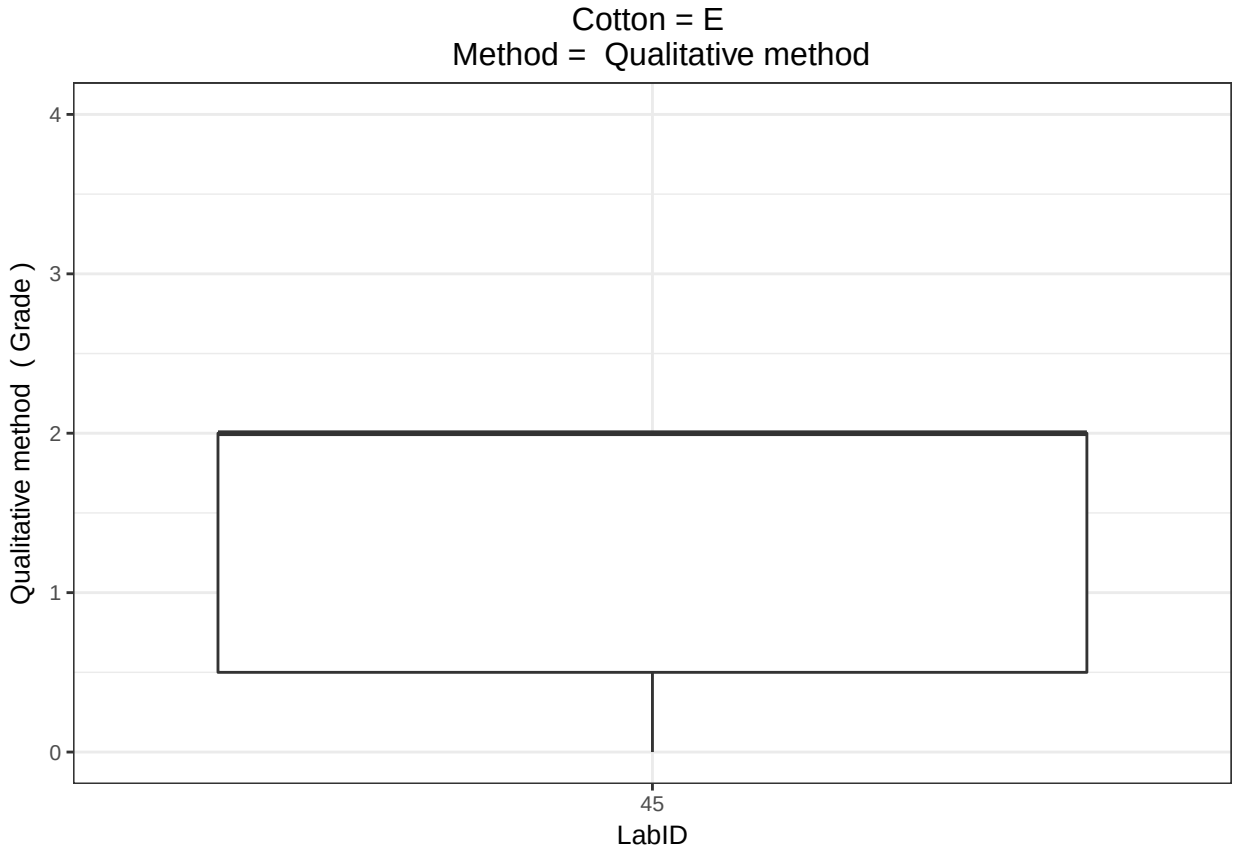

Cotton = E
Method = GB/T13785−1992
GB/T13785−1992 (Color degree)
4
3
2
1
0
50
LabID

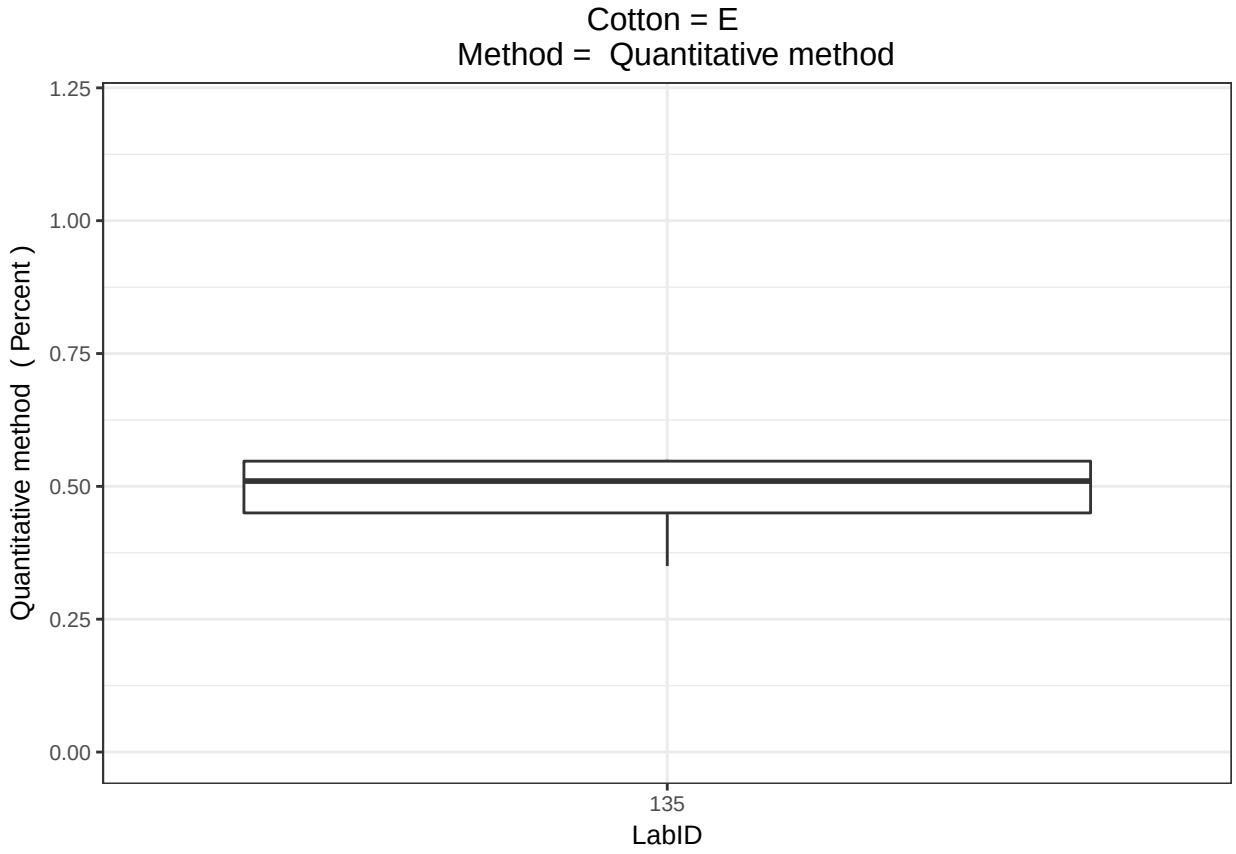

Cotton = E
Method = H2SD
H2SD (Sticky points)
60
40
20
0
15
35
60
75
LabID

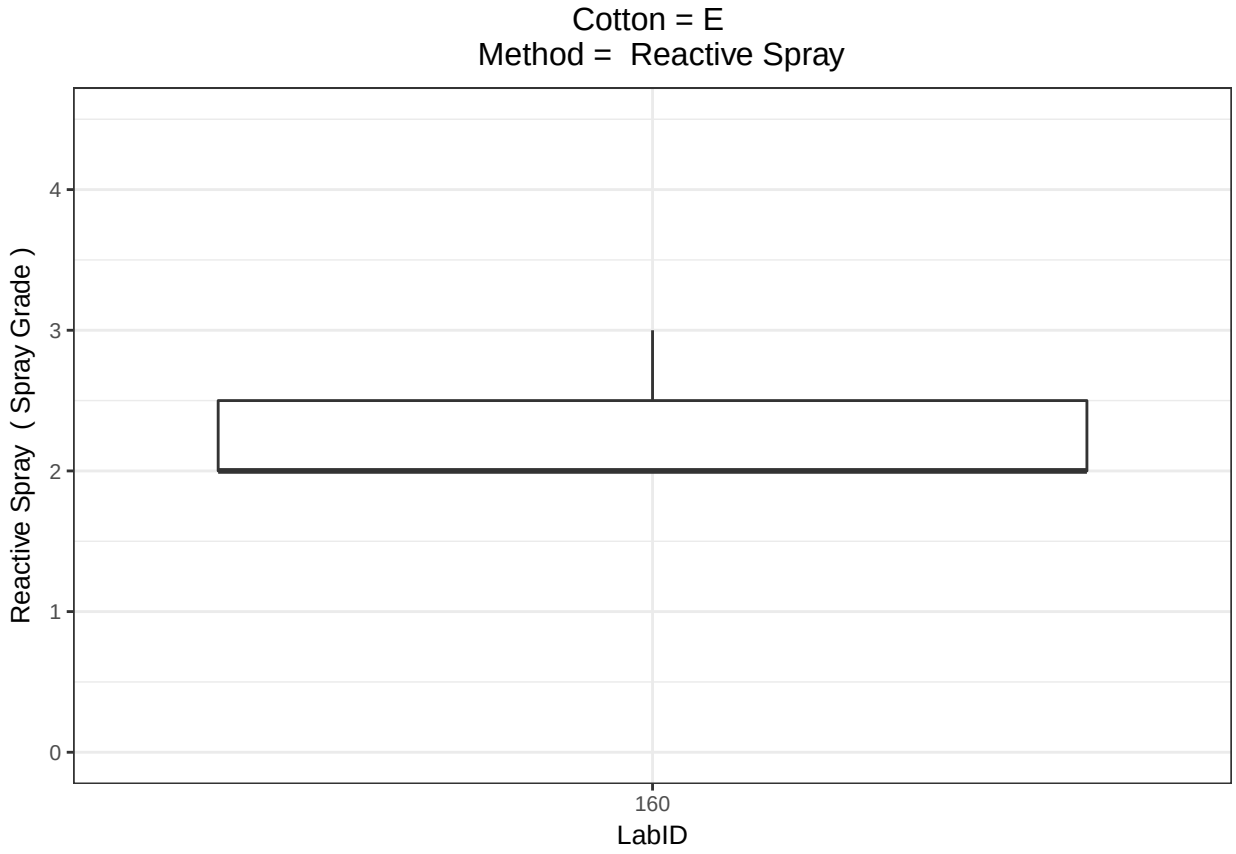

Cotton = E
Method = HSI−NIR
150
100
50
0
HSI−NIR (Sticky points)
55
LabID

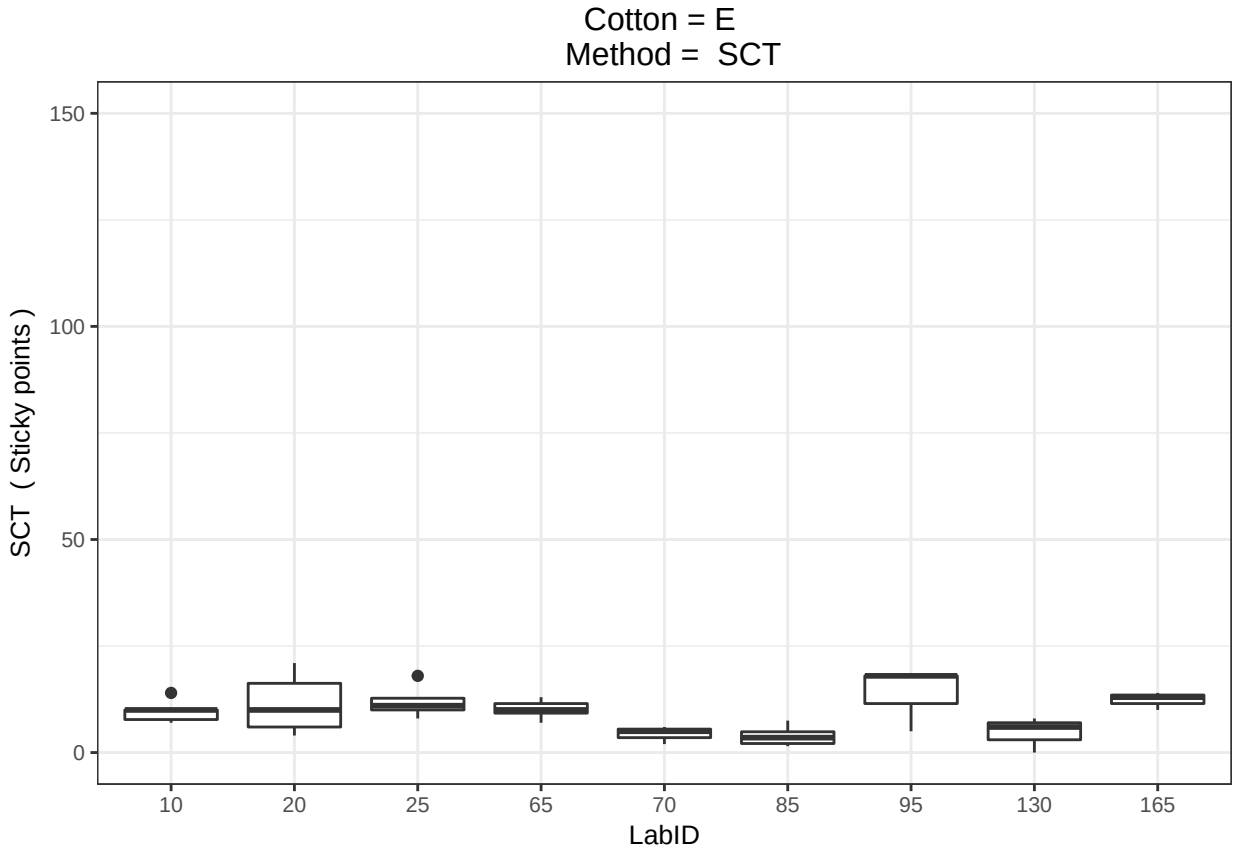

Cotton = E
Method = KOTITI
KOTITI (Sticky points)
7.5
5.0
2.5
0.0
90
LabID

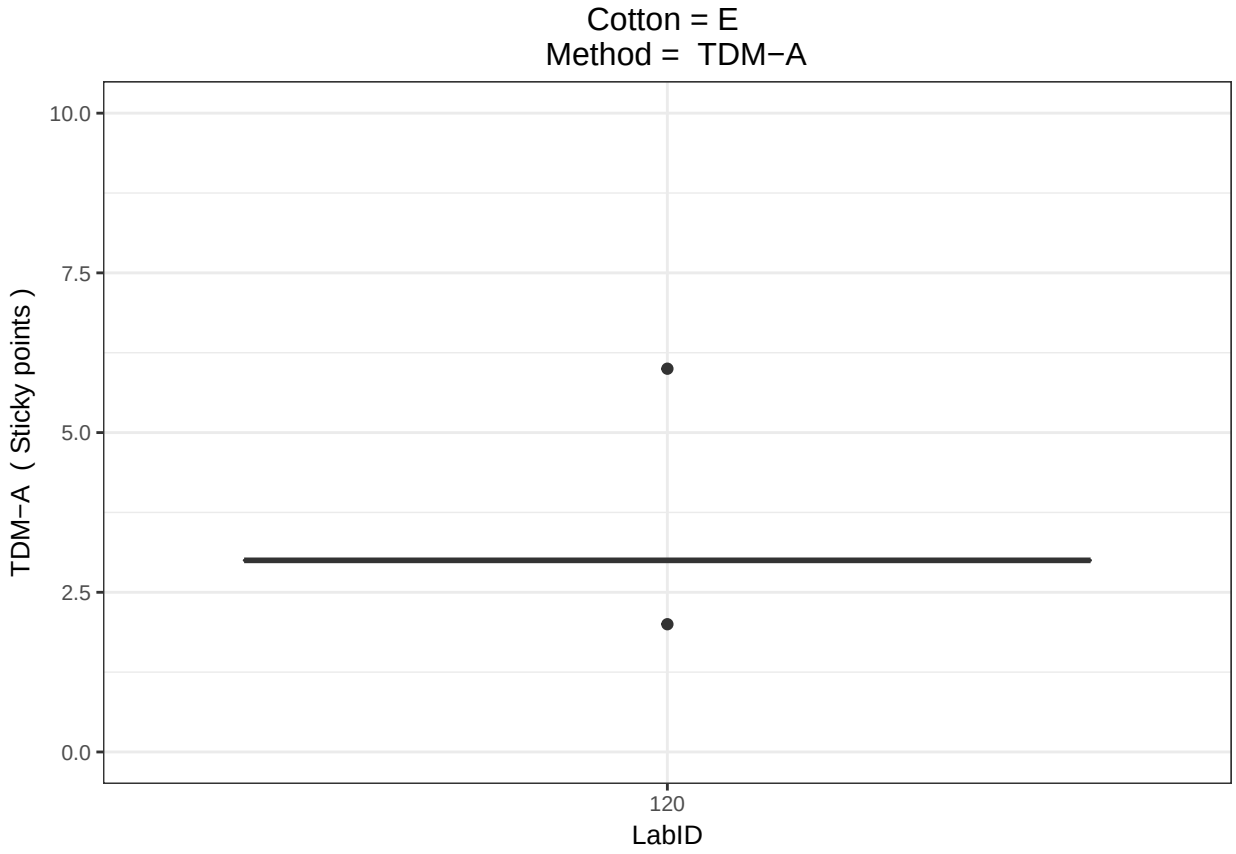

Cotton = E
Method = Minicard
Minicard (ITMF grades)
3
2
1
0
80
125
LabID


Cotton = E
Method = Qualitative method
Qualitative method (Grade)
4
3
2
1
0
45
LabID


Cotton = E
Method = Quantitative method
Quantitative method (Percent)
1.25
1.00
0.75
0.50
0.25
0.00
135
LabID

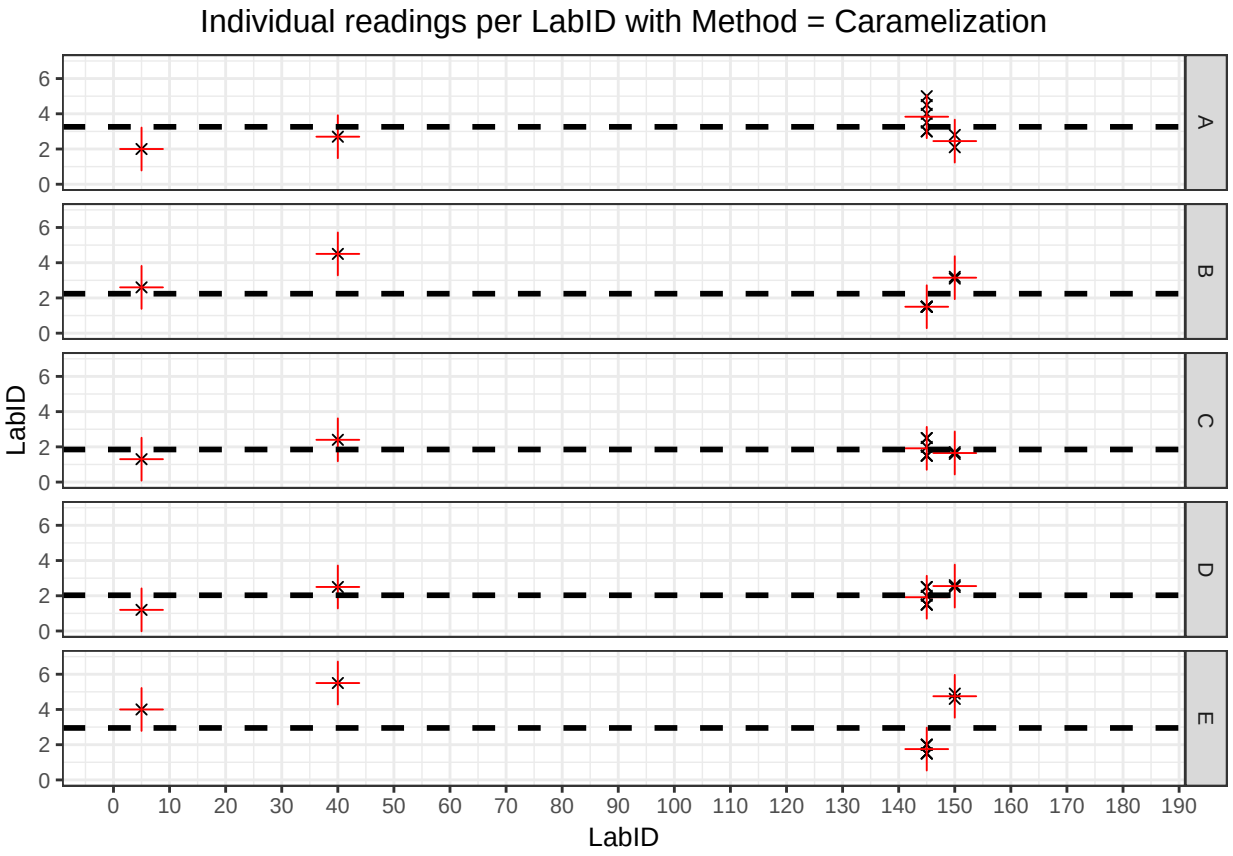

Cotton = E
Method = Reactive Spray
Reactive Spray (Spray Grade)
4
3
2
1
0
160
LabID


Cotton = E
Method = SCT
SCT (Sticky points)
150
100
50
0
10
20
25
65
70
85
95
130
165
LabID


Cotton = E
Method = TDM−A
TDM−A (Sticky points)
10.0
7.5
5.0
2.5
0.0
120
LabID

Charts of individual readings per Method and LabID for all cottons

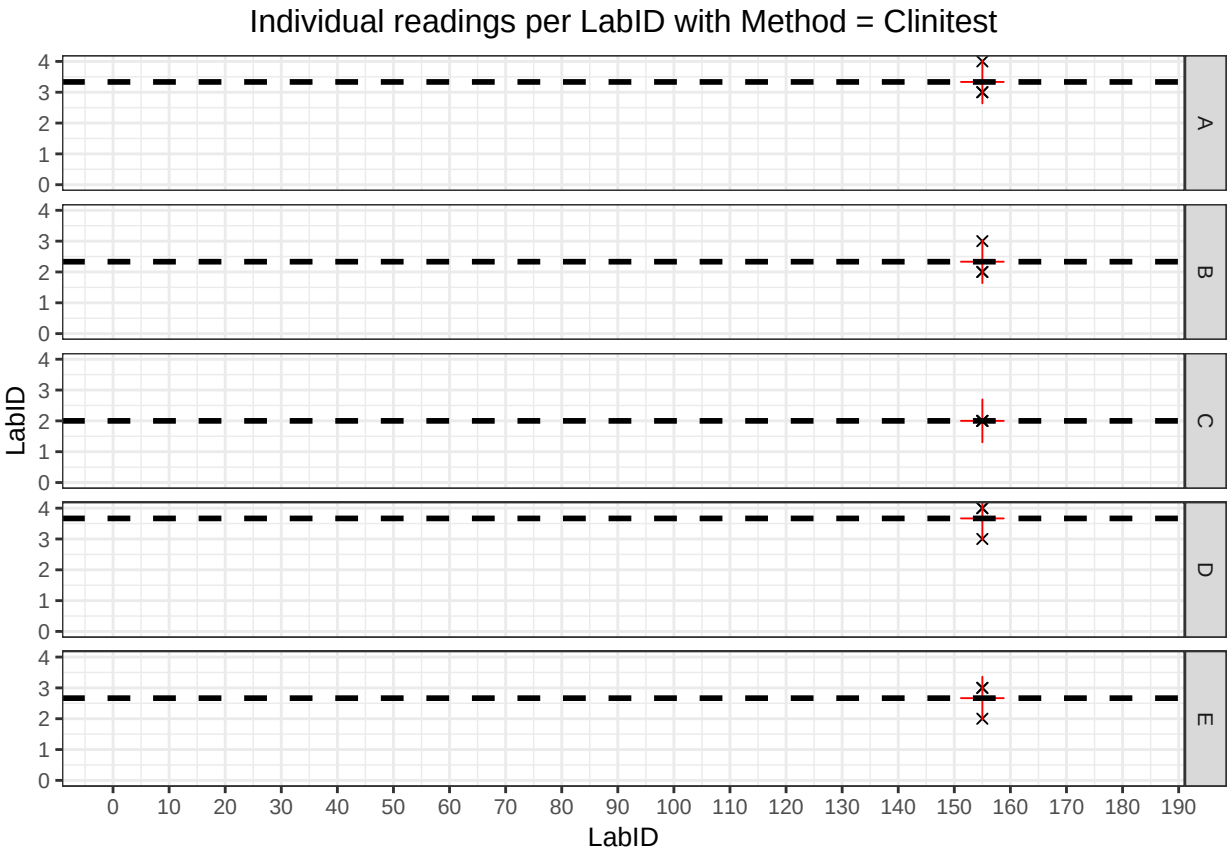
4

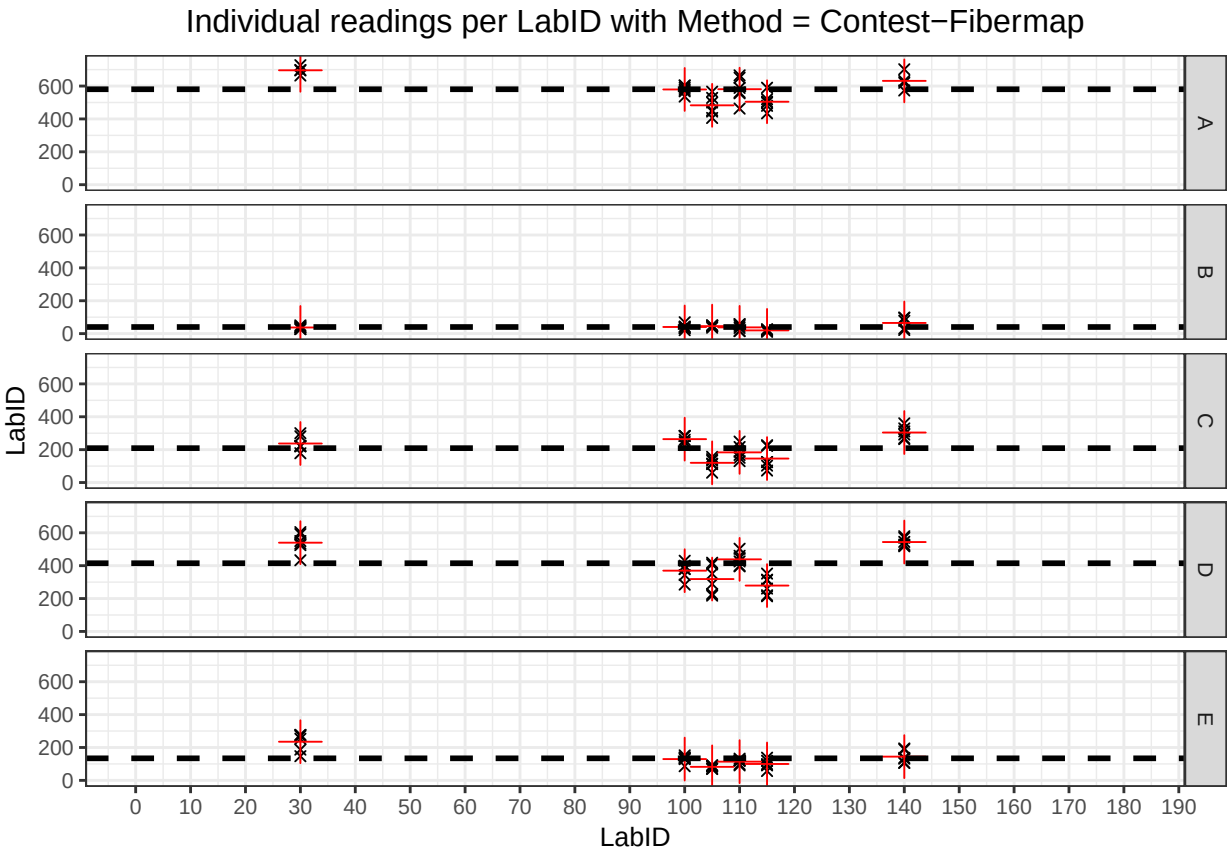


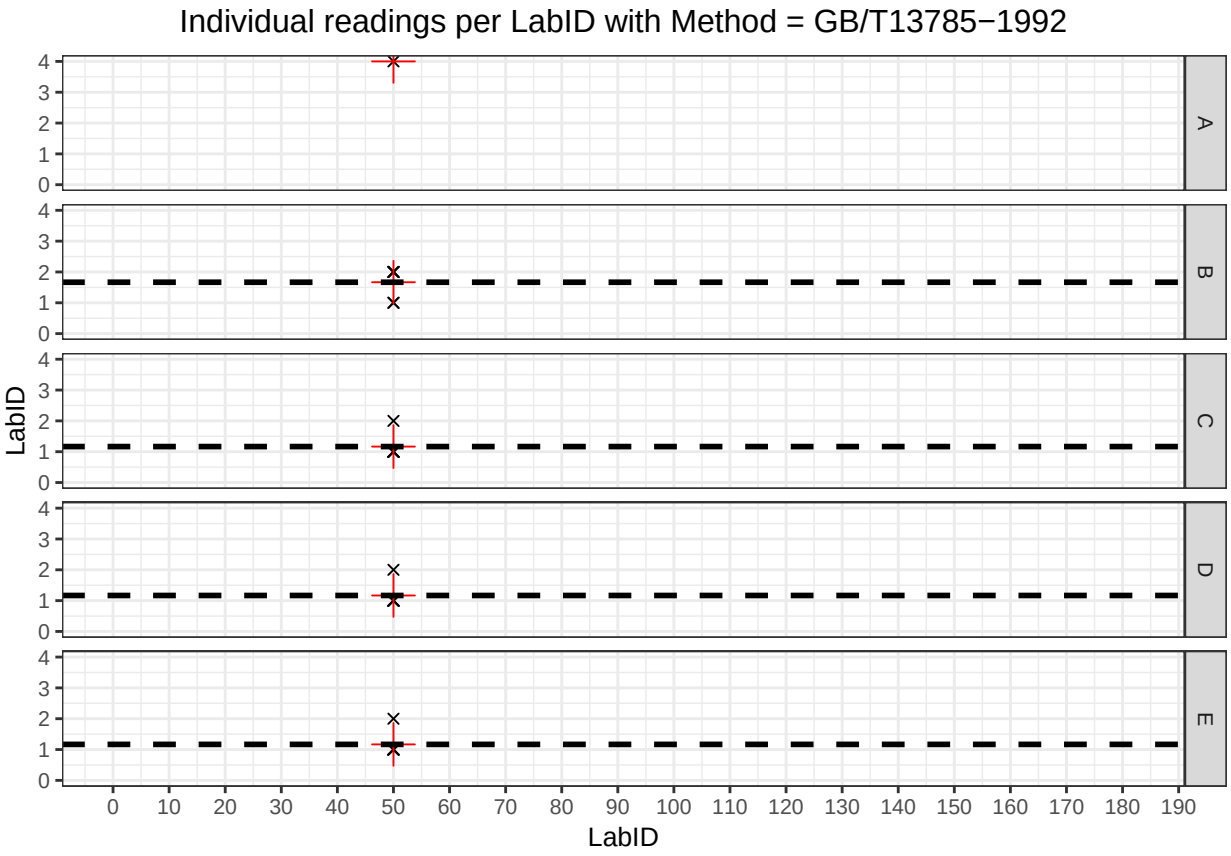
pdf 2

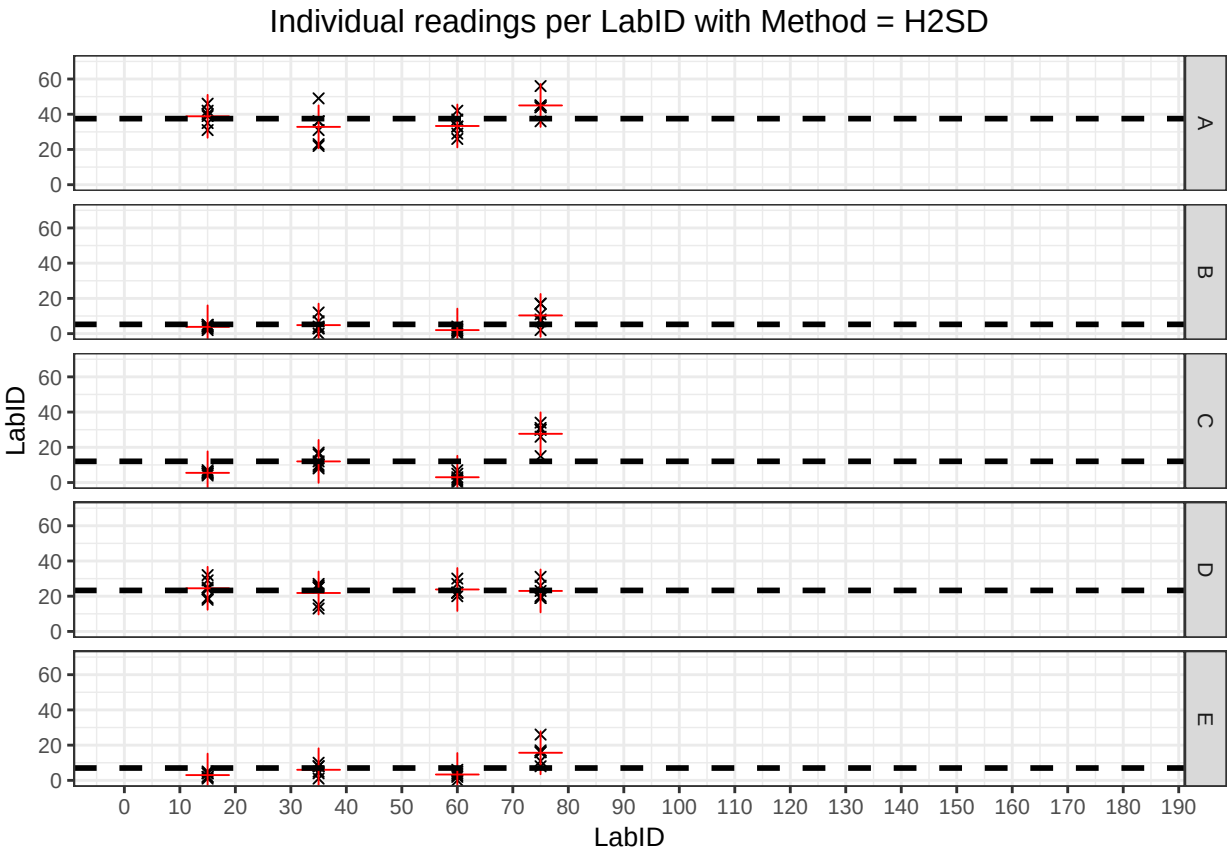
[4]Footnote

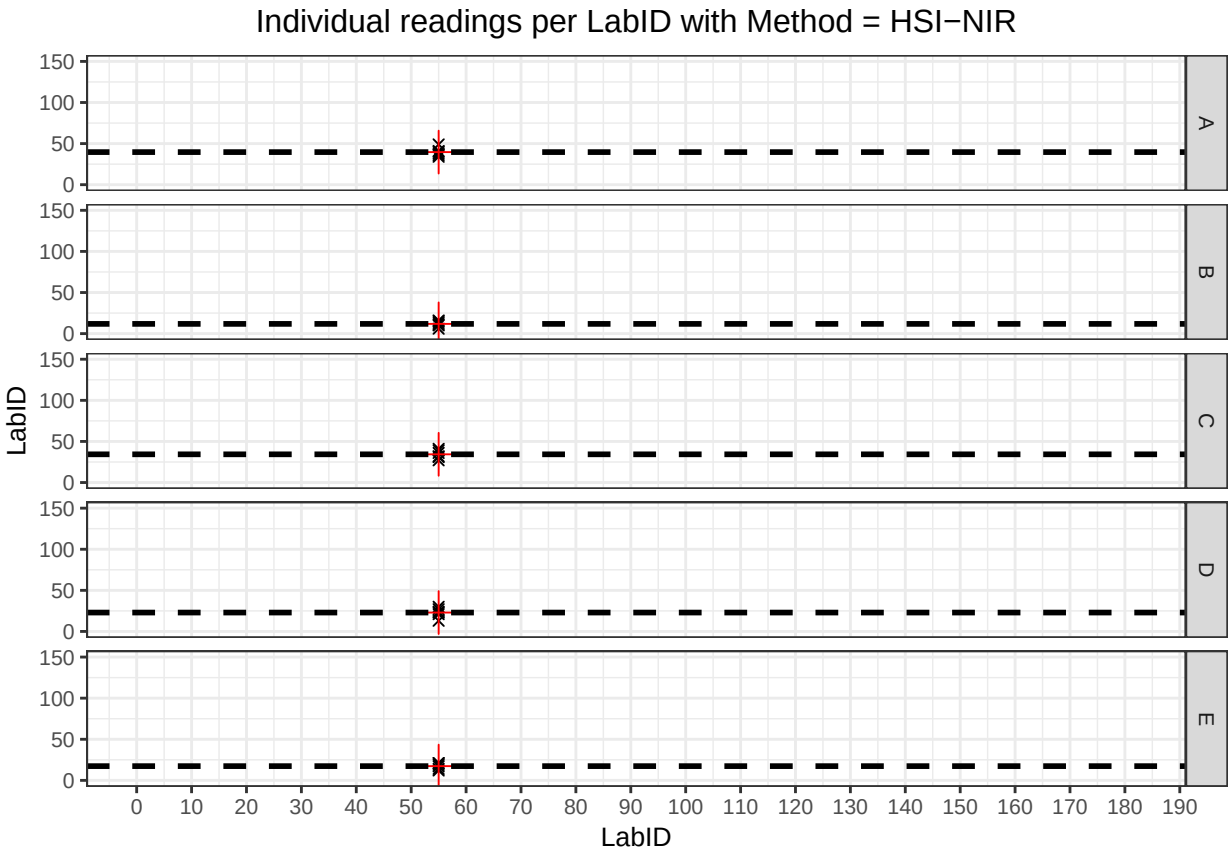
* NA excluded
* LabID are given in the abscissa axis at the bottom of the chart in the following charts.
* Black dashed line = Method GrandMean per cotton.
* Red + = Laboratory mean for the given method and for the given cotton.
* Black x = Laboratory individual reading for the given method and for the given cotton.

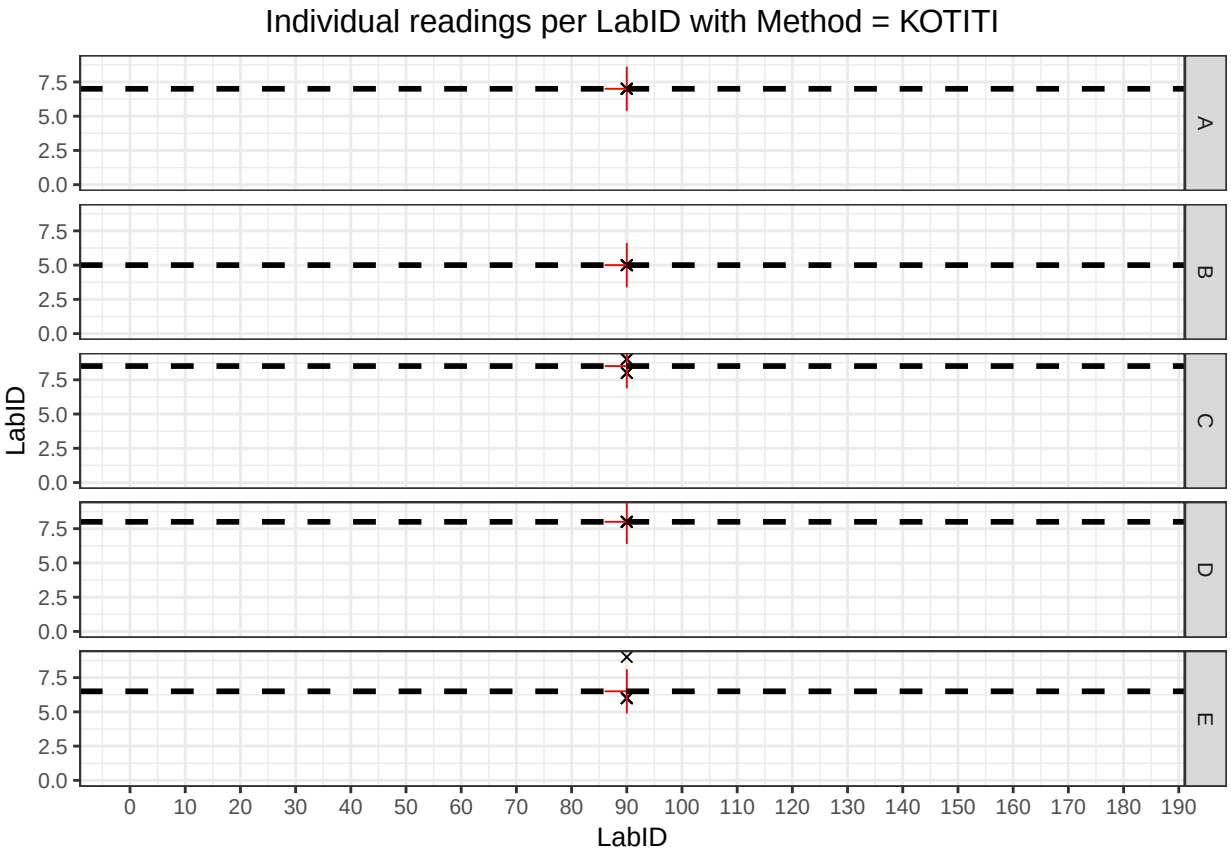

Individual readings per LabID with Method = Clinitest
LabID
LabID
A
B
C
D
E
0
1
2
3
4
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190

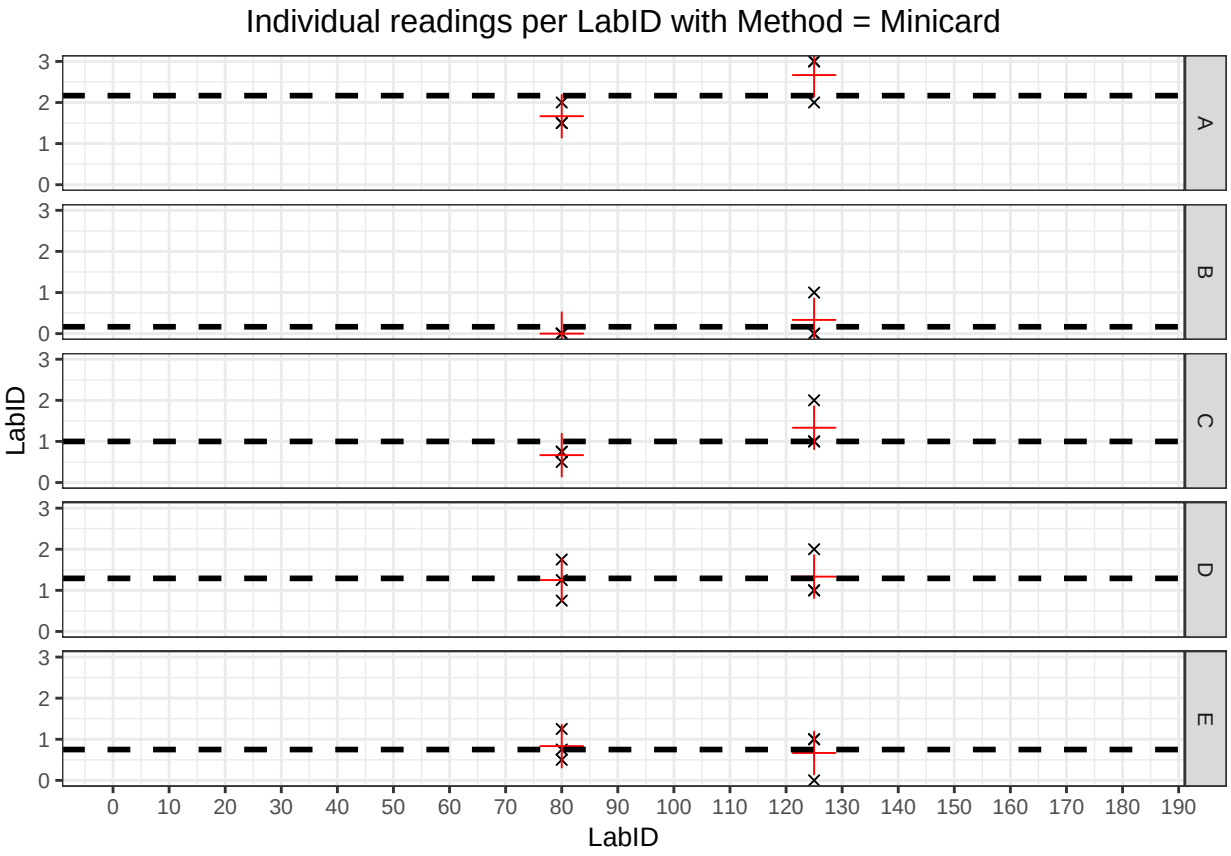

Individual readings per LabID with Method = Contest−Fibermap
LabID
LabID
A
B
C
D
E
0
200
400
600
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190

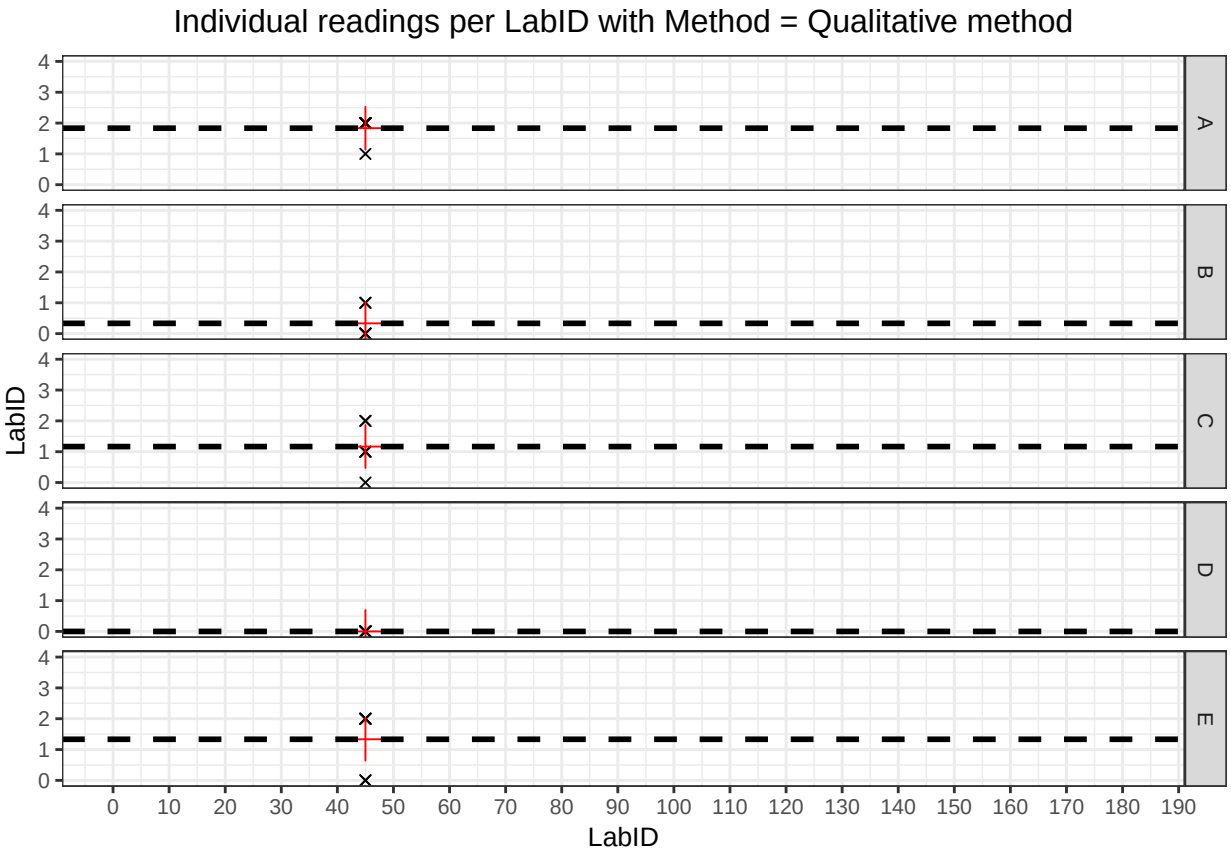

Individual readings per LabID with Method = GB/T13785−1992
LabID
LabID
A
B
C
D
E
0
1
2
3
4
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190

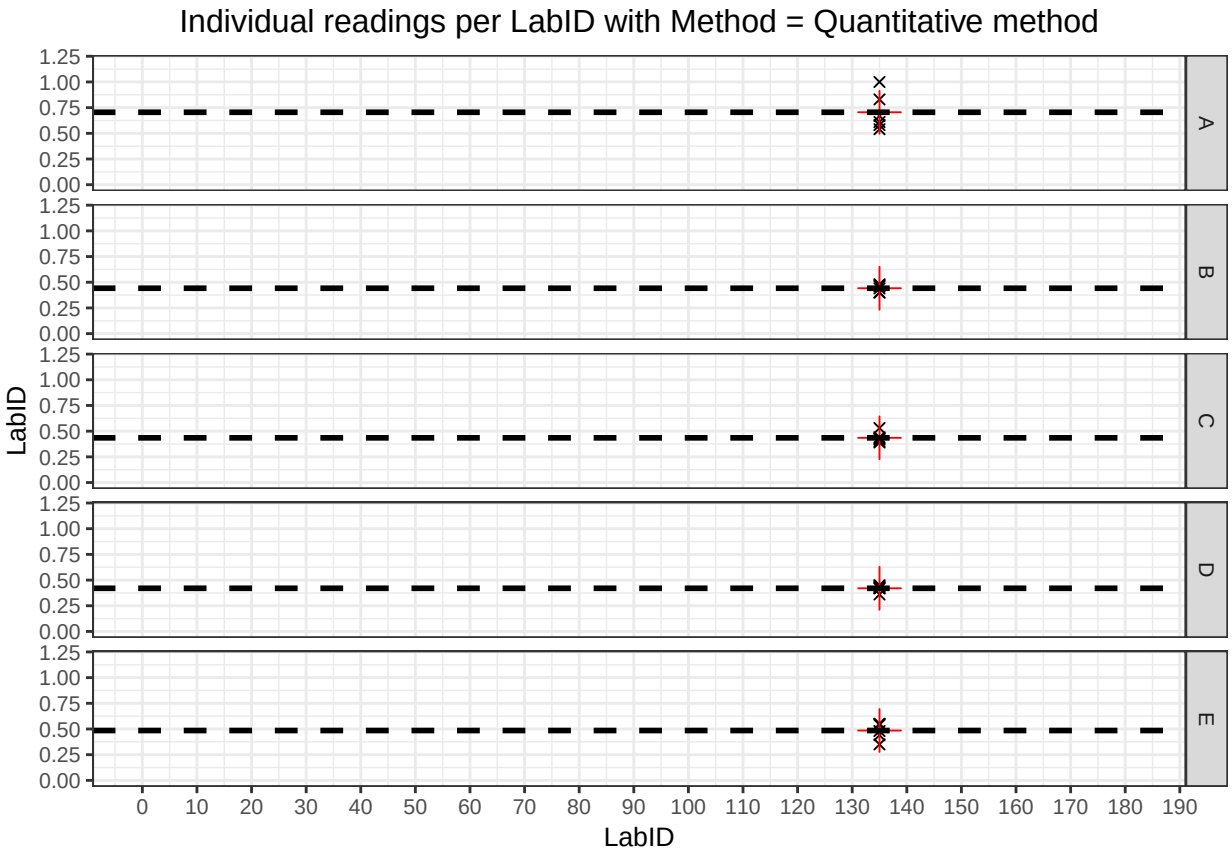

Individual readings per LabID with Method = H2SD
LabID
0
20
40
60
A
B
C
D
E
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
LabID

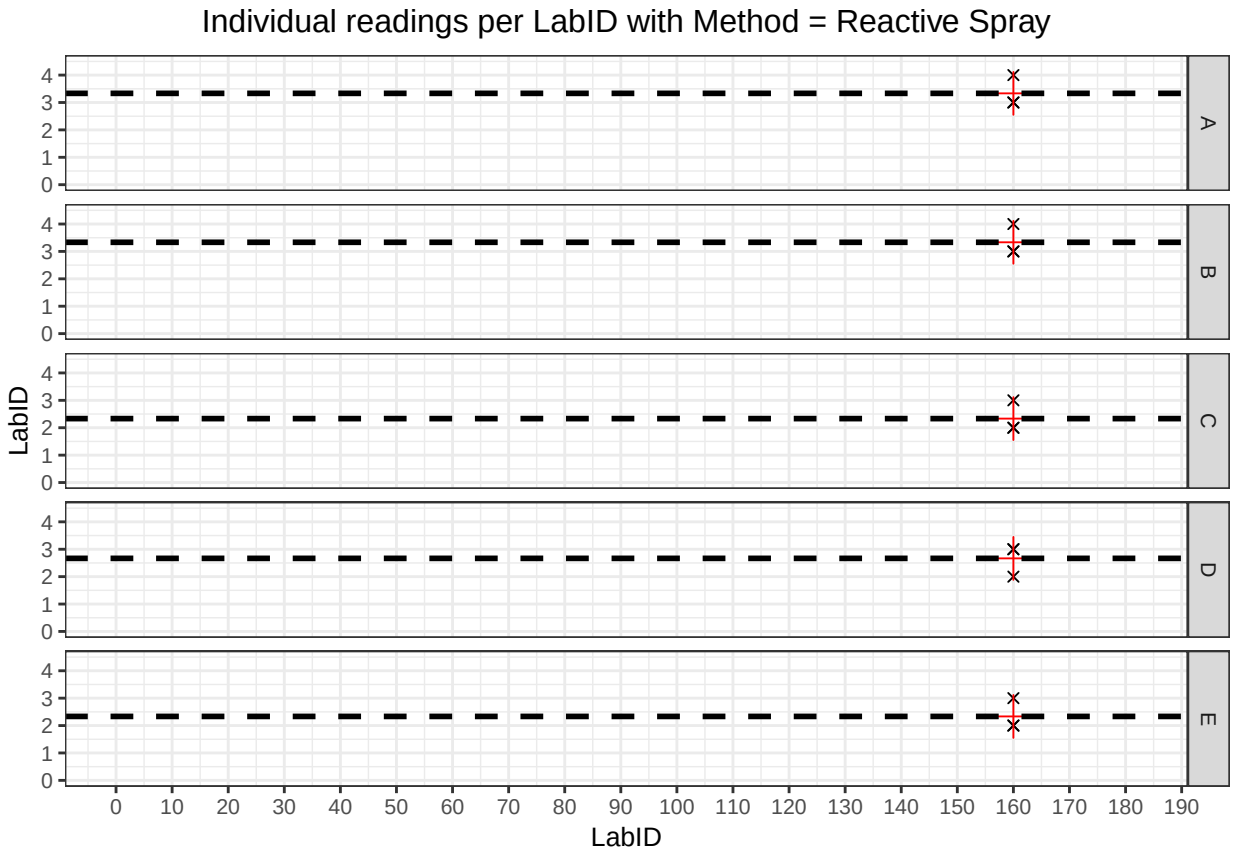

Individual readings per LabID with Method = HSI−NIR
LabID
LabID
A
B
C
D
E
0
50
100
150
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190

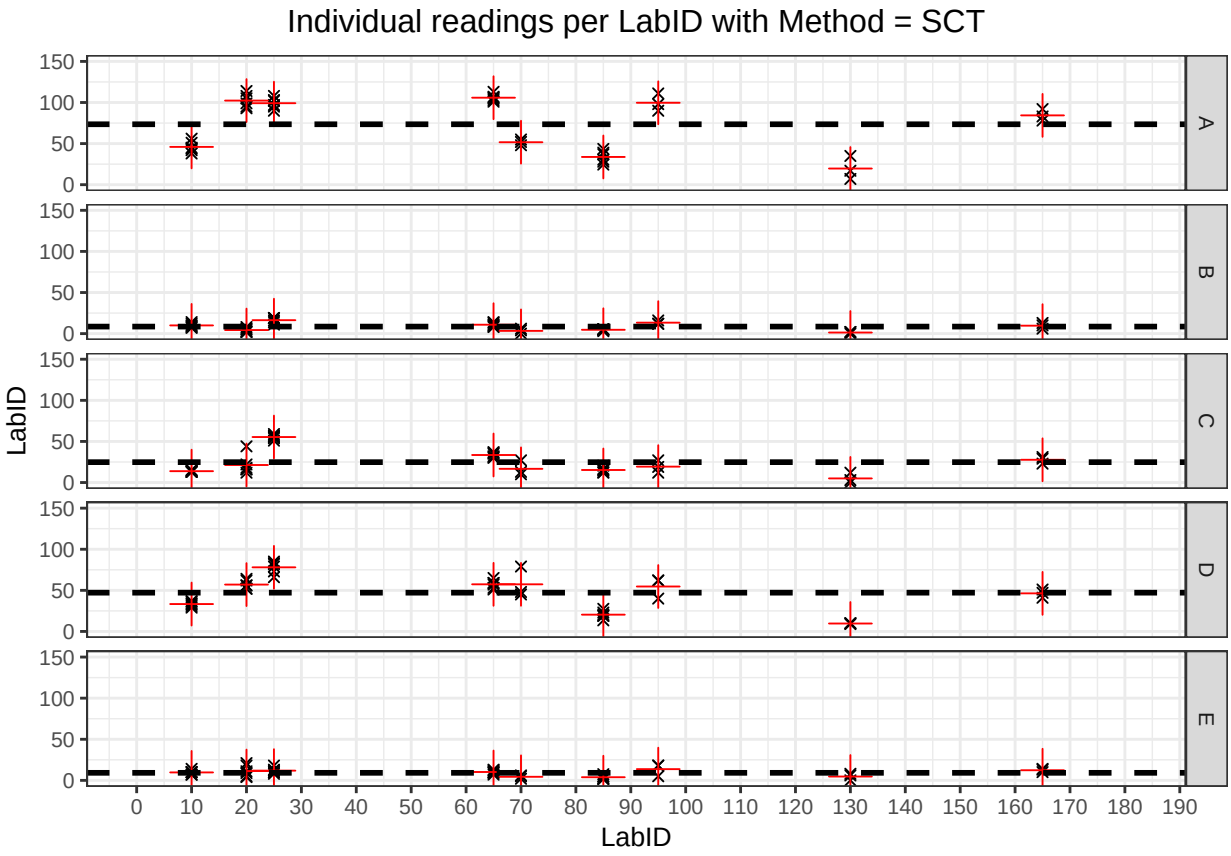

Individual readings per LabID with Method = KOTITI
LabID
7.5
5.0
2.5
0.0
A
B
C
D
E
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
LabID

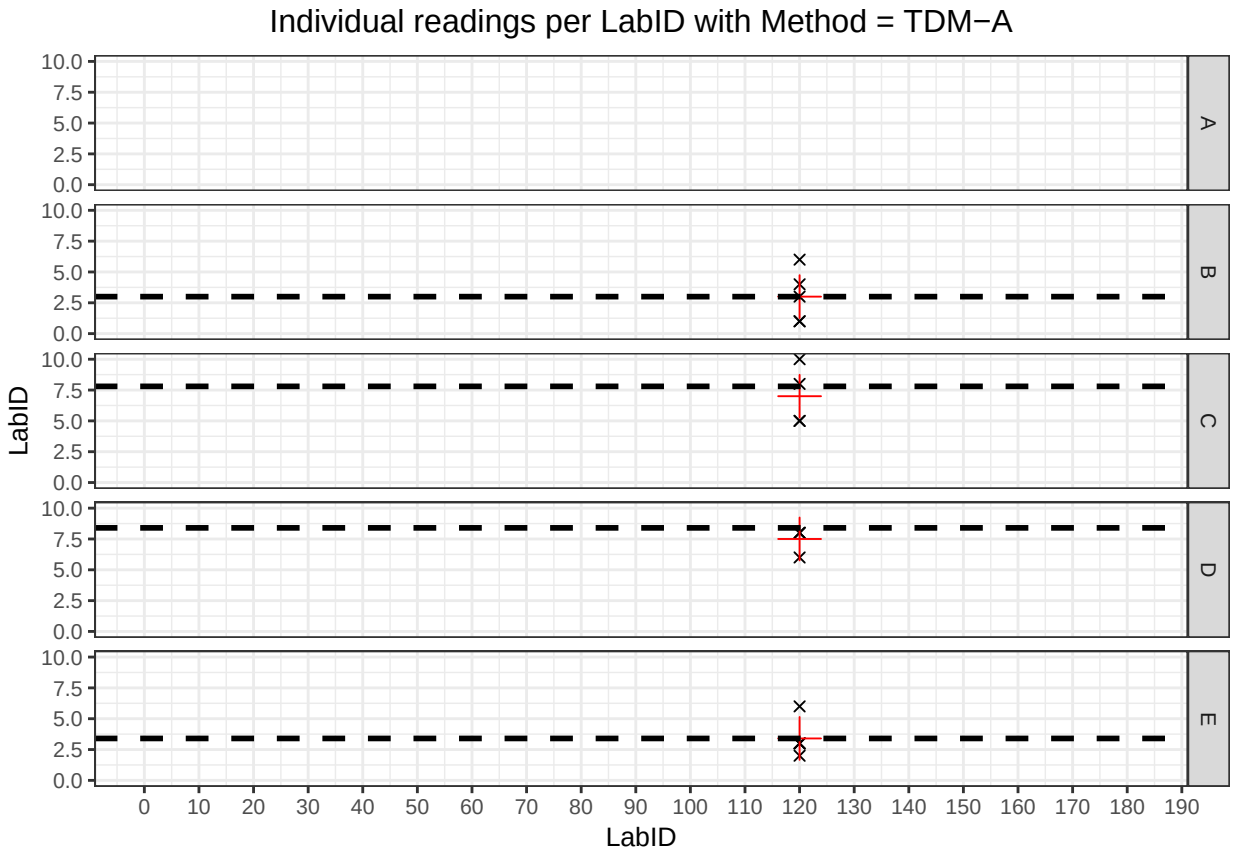

Individual readings per LabID with Method = Minicard
LabID
LabID
A
B
C
D
E
0
1
2
3
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190


Individual readings per LabID with Method = Qualitative method
LabID
LabID
A
B
C
D
E
0
1
2
3
4
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190

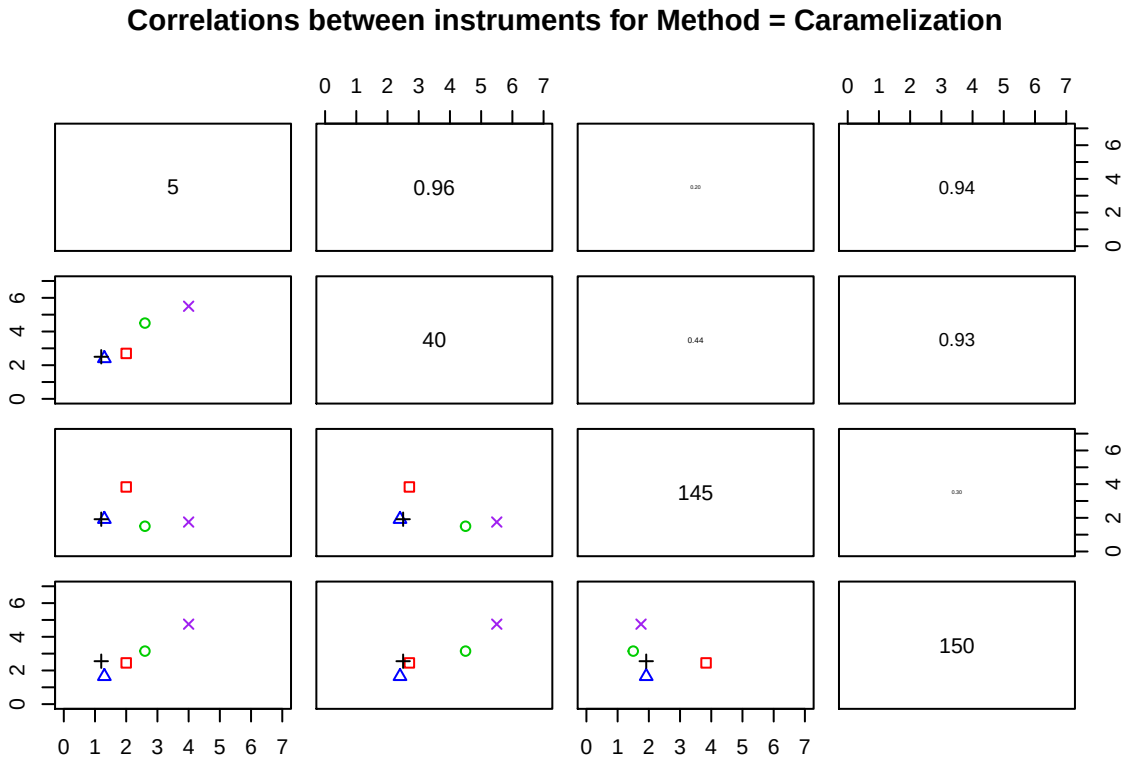

Individual readings per LabID with Method = Quantitative method
LabID
1.25
1.00
0.75
0.50
0.25
0.00
A
B
C
D
E
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
LabID


Individual readings per LabID with Method = Reactive Spray
LabID
LabID
A
B
C
D
E
0
1
2
3
4
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190


Individual readings per LabID with Method = SCT
LabID
150
100
50
0
A
B
C
D
E
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
LabID

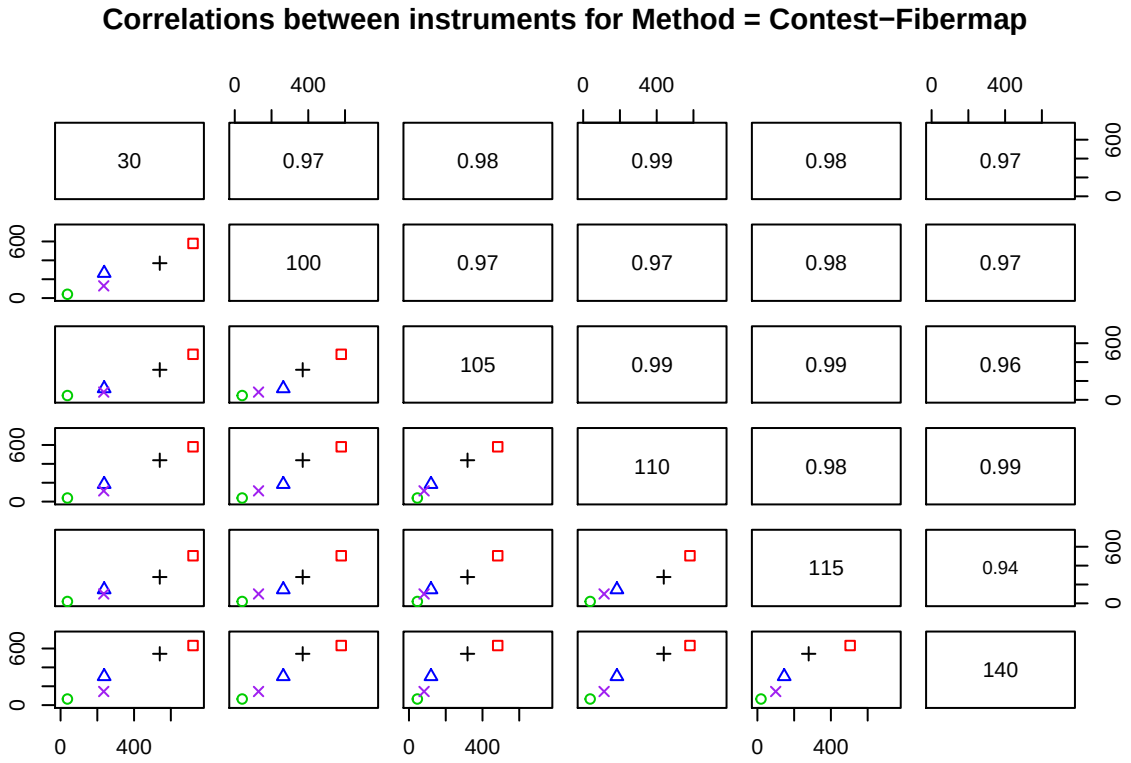

Individual readings per LabID with Method = TDM−A
LabID
LabID
A
B
C
D
E
10.0
7.5
5.0
2.5
0.0
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190

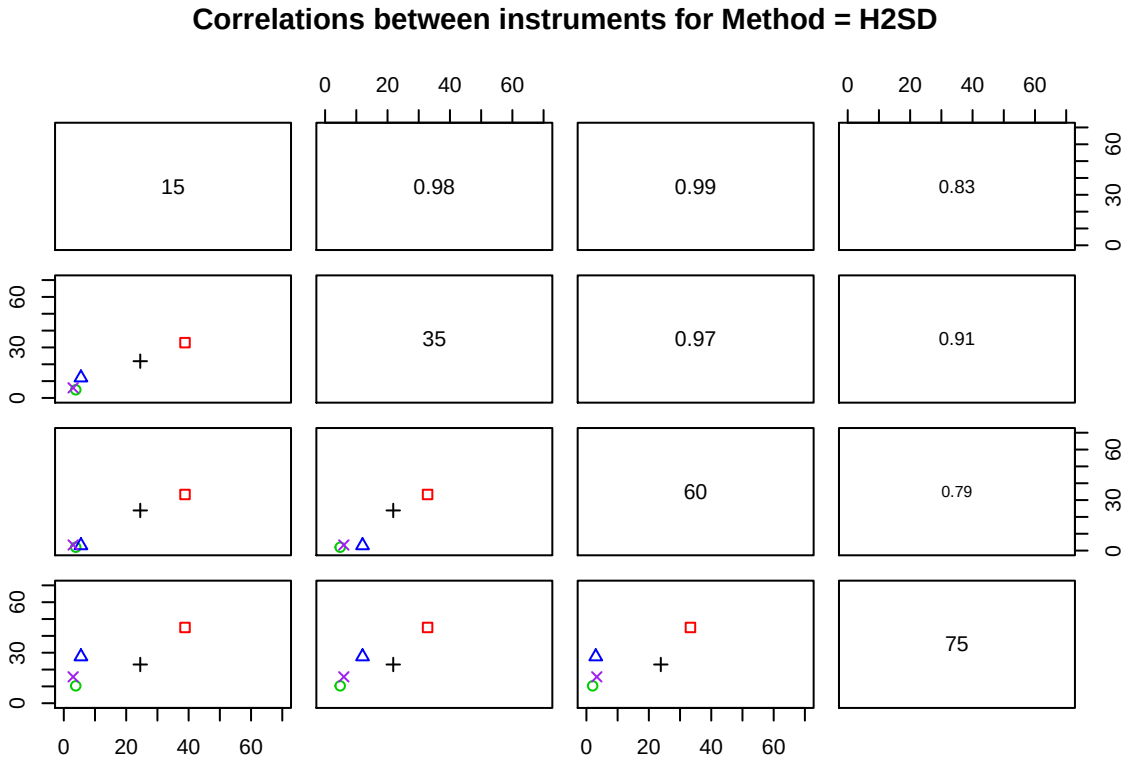
Correlation charts and correlation values between LabID using a same Method for all cottons [5]

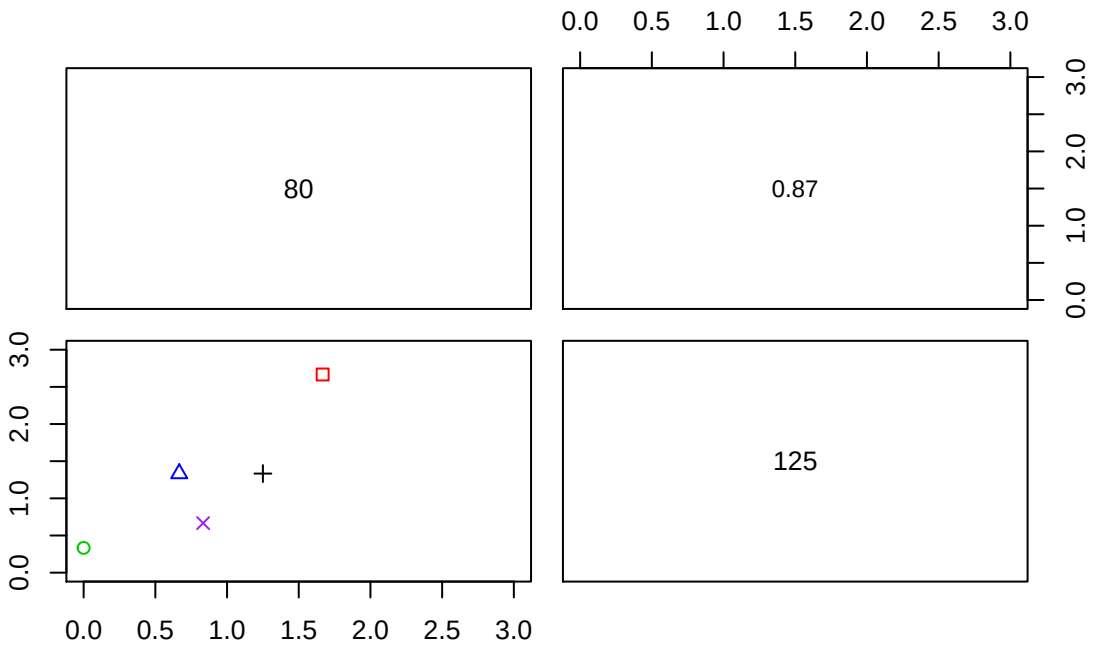


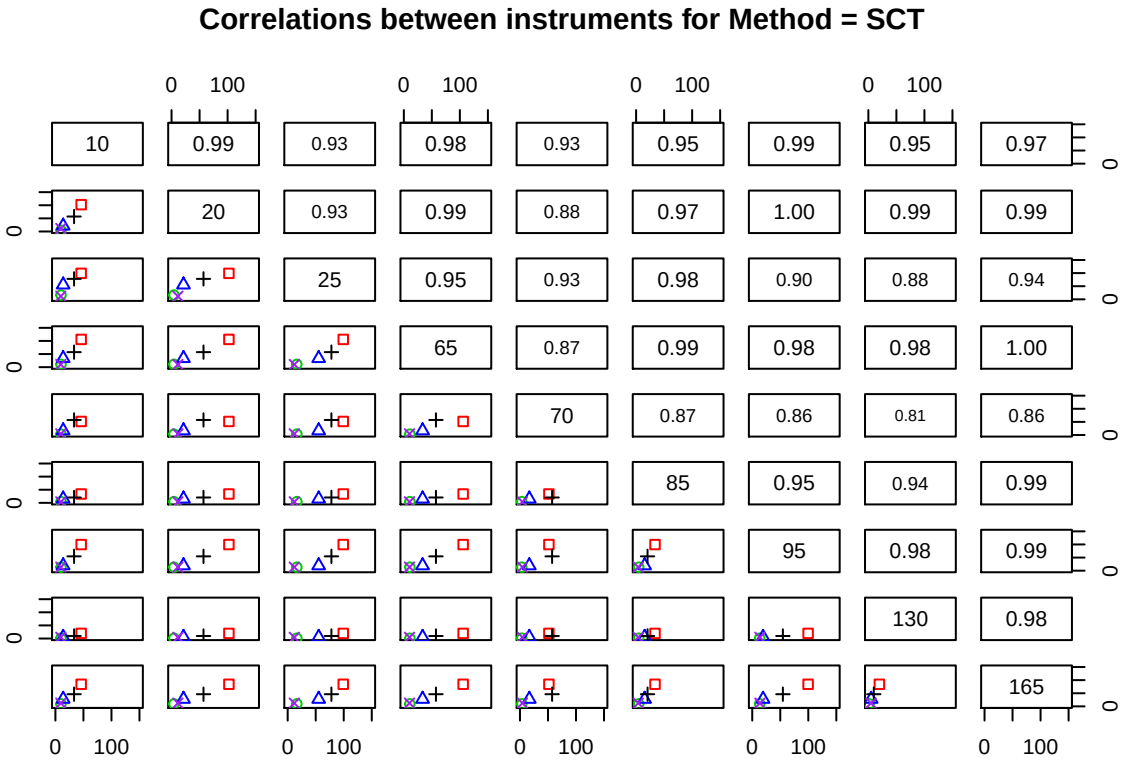
[5]Footnote

* A correlation matrix of charts is provided only when two or more instruments were used for a given method.
* Based on Means of available results (NA excluded)
* LabIds are given in the diagonal of the matrix.
* Squares in red for Cotton A, rounds in green for Cotton B, triangles in blue for Cotton C, + in black for cotton D, and x in purple for cotton E.
* The lower left corner of the matrix provides the correlation charts, while the upper right corner of the matrix provides the corresponding raw correlation coefficients. Higher the correlation coefficient, larger the font size of the corresponding text.


Correlations between instruments for Method = Contest−Fibermap
30
0.97
0.98
0.99
0.98
0.97
100
0.97
0.97
0.98
0.97
105
0.99
0.99
0.96
110
0.98
0.99
115
0.94
140
0
400
600


Correlations between instruments for Method = H2SD
15
0.98
0.99
0.83
35
0.97
0.91
60
0.79
75
0
20
40
60
0
30
60

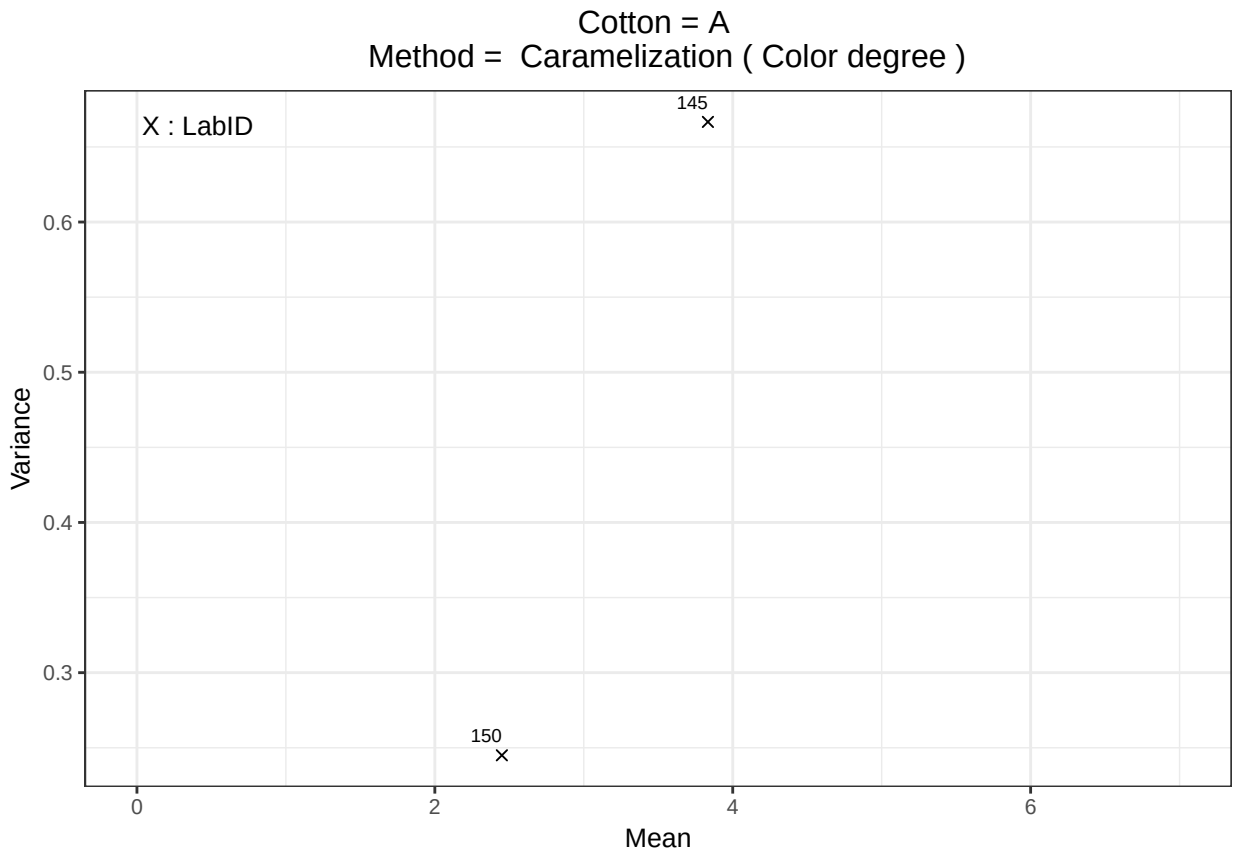

Correlations between instruments for Method = Minicard
80
0.87
125
0.0
0.5
1.0
1.5
2.0
2.5
3.0


Correlations between instruments for Method = SCT
10
0.99
0.93
0.98
0.93
0.95
0.99
0.95
0.97
20
0.93
0.99
0.88
0.97
1.00
0.99
0.99
25
0.95
0.93
0.98
0.90
0.88
0.94
65
0.87
0.99
0.98
0.98
1.00
70
0.87
0.86
0.81
0.86
85
0.95
0.94
0.99
95
0.98
0.99
130
0.98
165
0
100

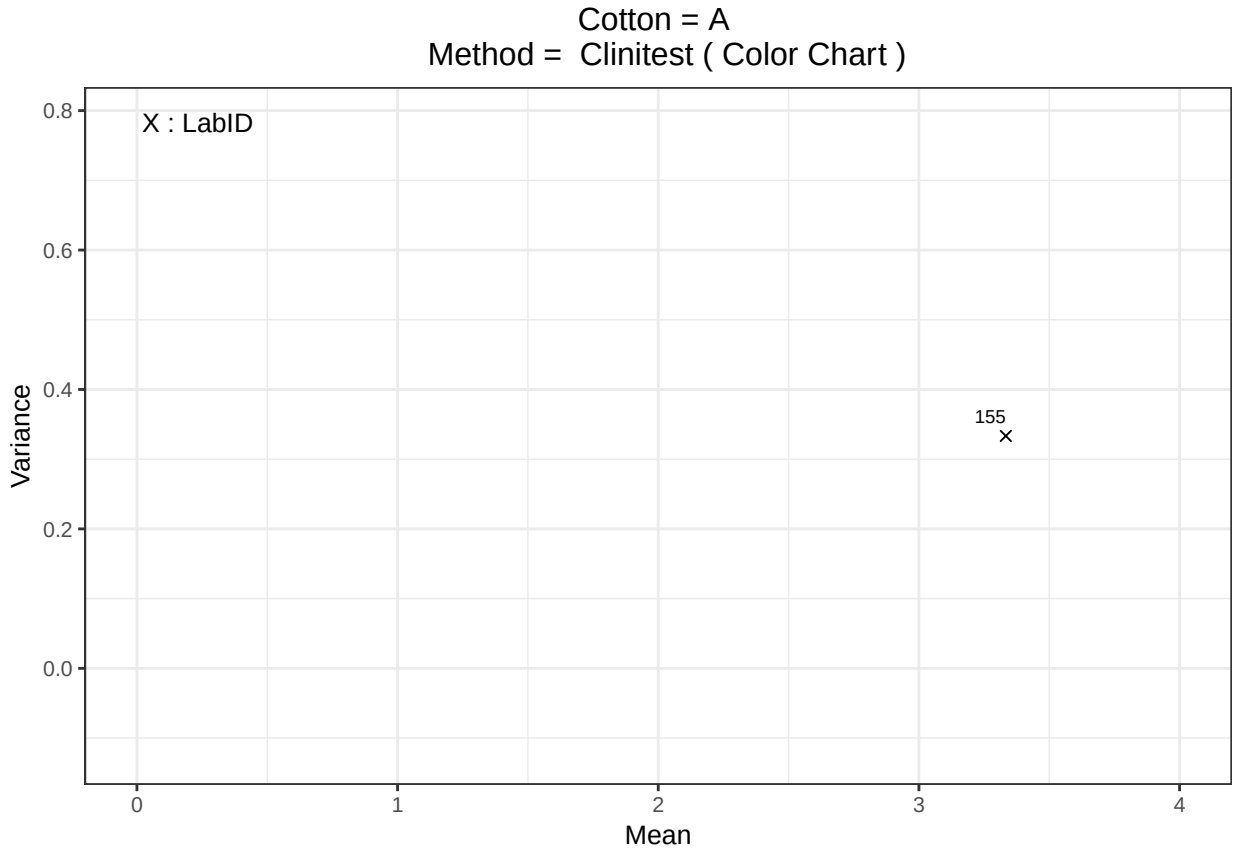
Charts Variance = f(Mean) for each Cotton and Method, taking care of LabIDs

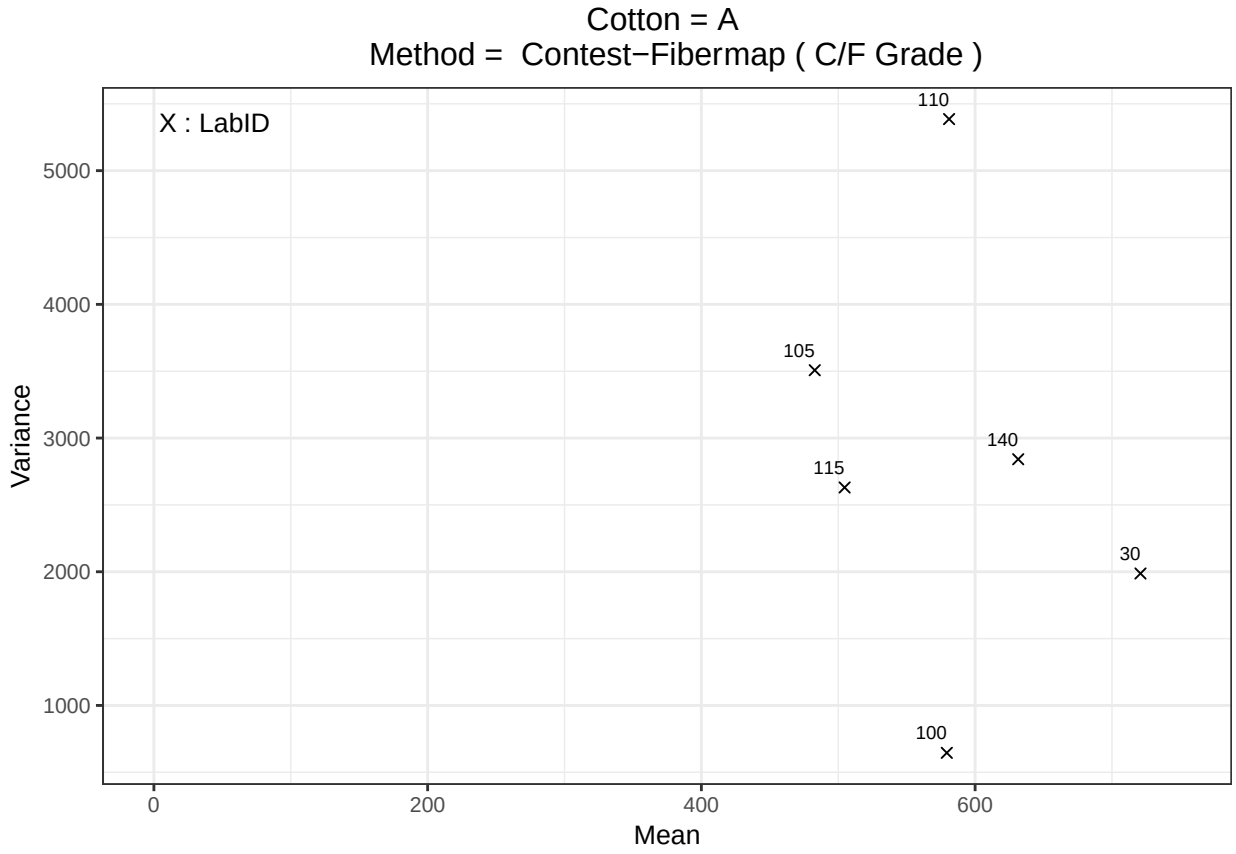
This type of chart is devoted to displaying the ability of laboratories to reproduce themselves for each cotton, based on the n readings (up to six) they provided for each cotton sample. Stickiness has the reputation to be heterogeneously distributed within samples (whatever the efforts we made for homogenizing cotton masses before dispatching representative samples); therefore, if methods are sensitive enough, then a certain level of variance (displayed on the vertical axis in the following charts) is to be seen when the number of measurements exceeds 1 in this test.

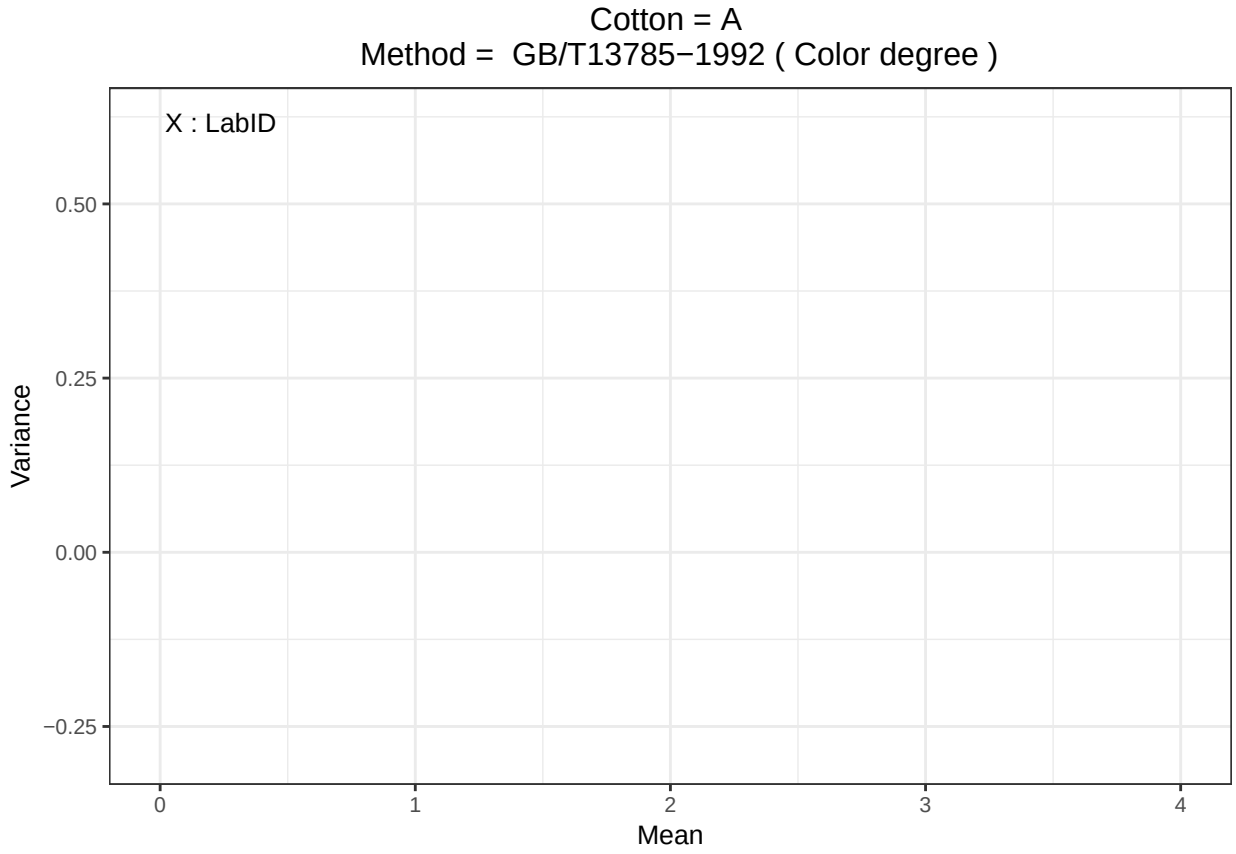
Cotton A : Variance between individual measurements = f(Mean) for all concerned labs

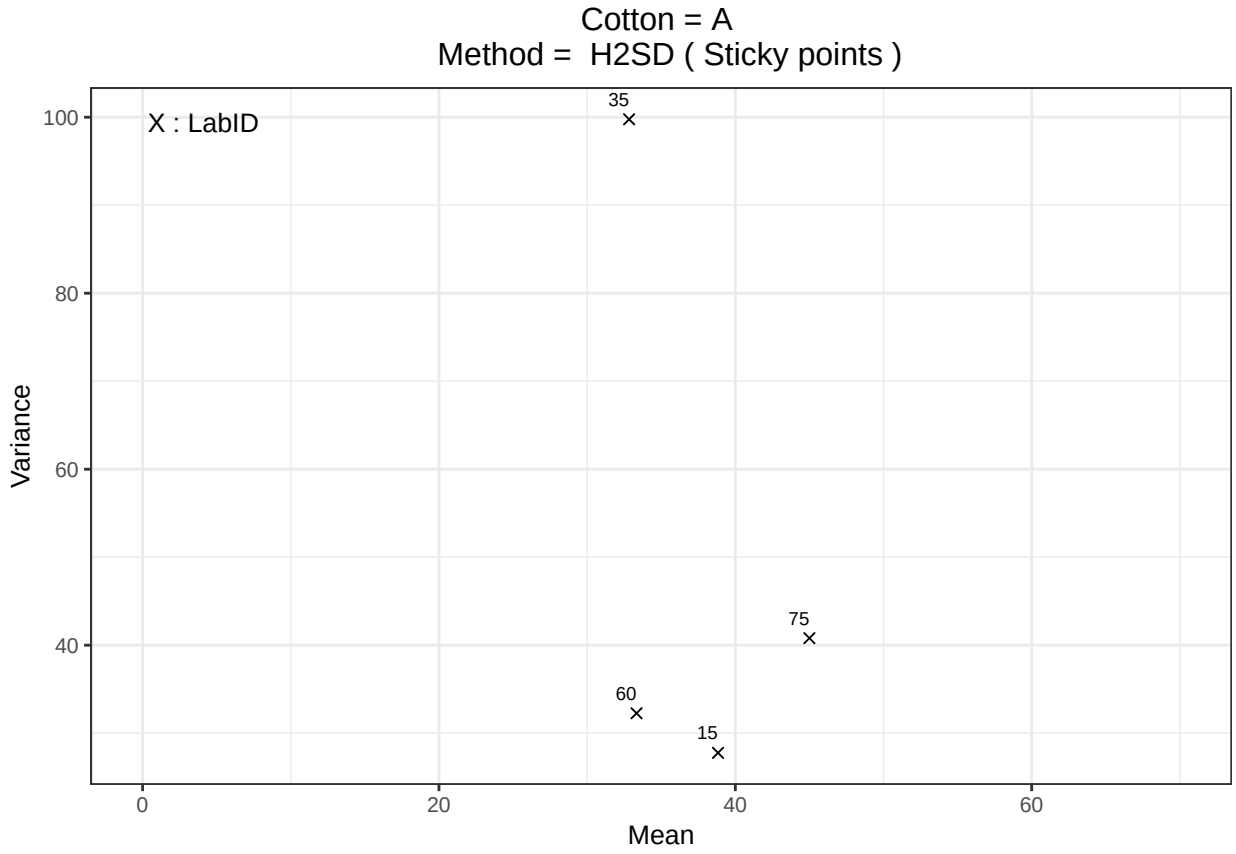


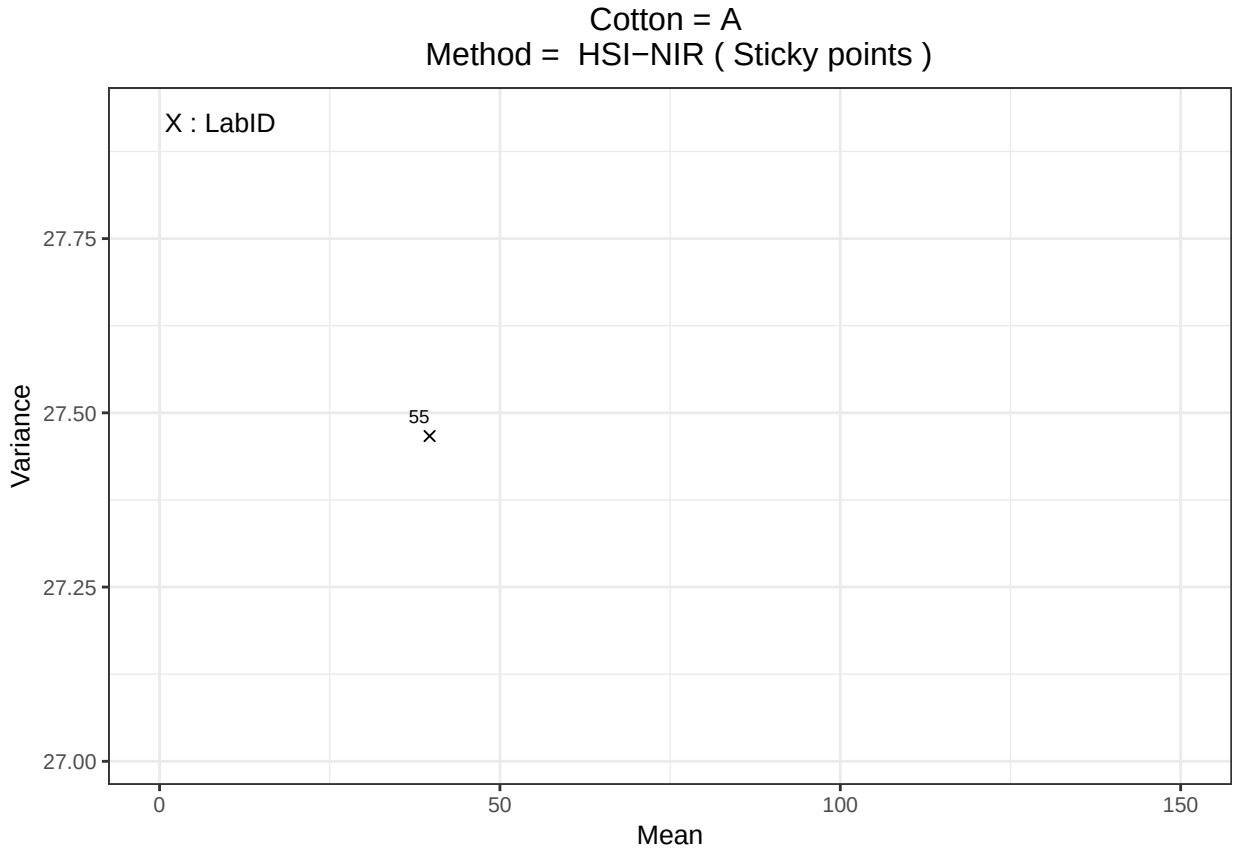
[1] "For Cotton = A and for method = Caramelization , 2 LabID (LabID being 5, 40) cannot be shown on this chart as only one measurement was performed and, therefore, a variance cannot be calculated in this case."

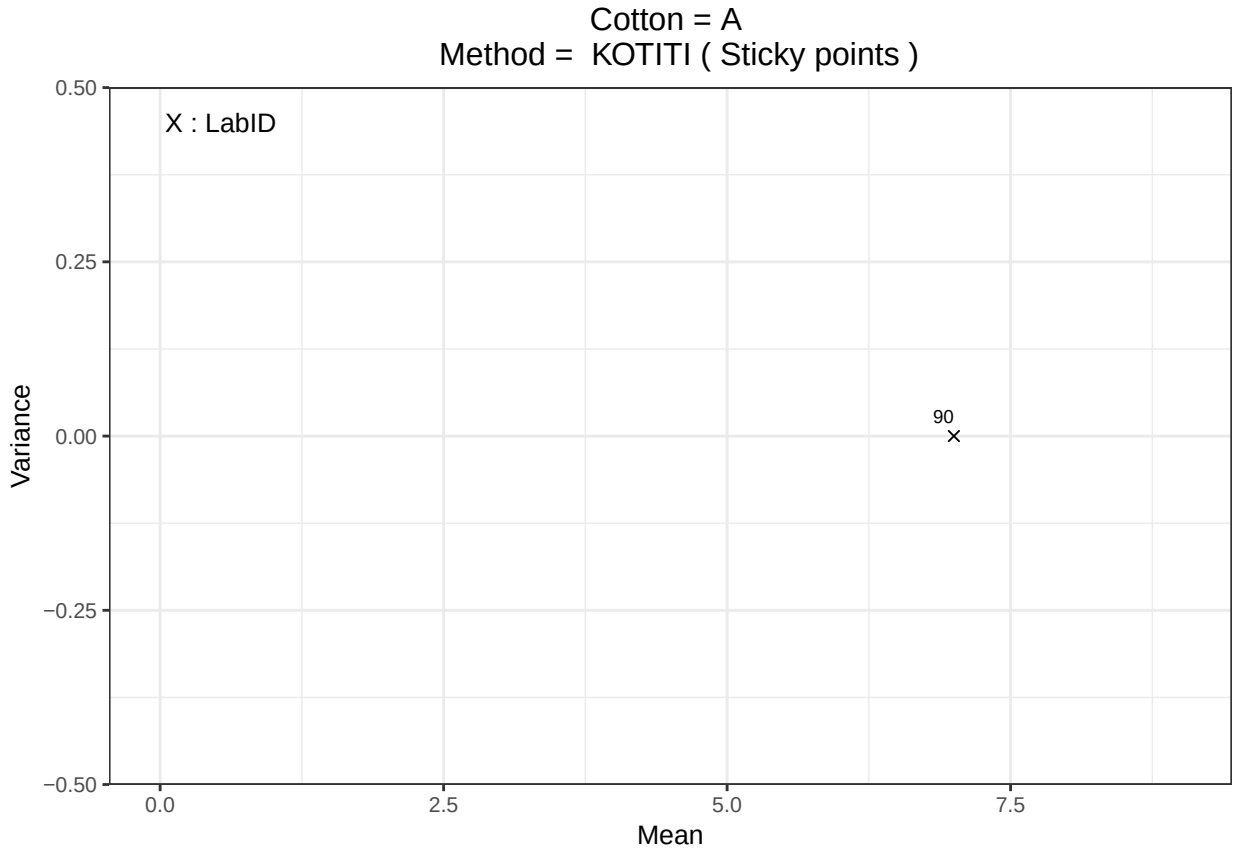

Cotton = A
Method = Clinitest (Color Chart)
X : LabID
155
Variance
Mean
0.0
0.2
0.4
0.6
0.8
0
1
2
3
4

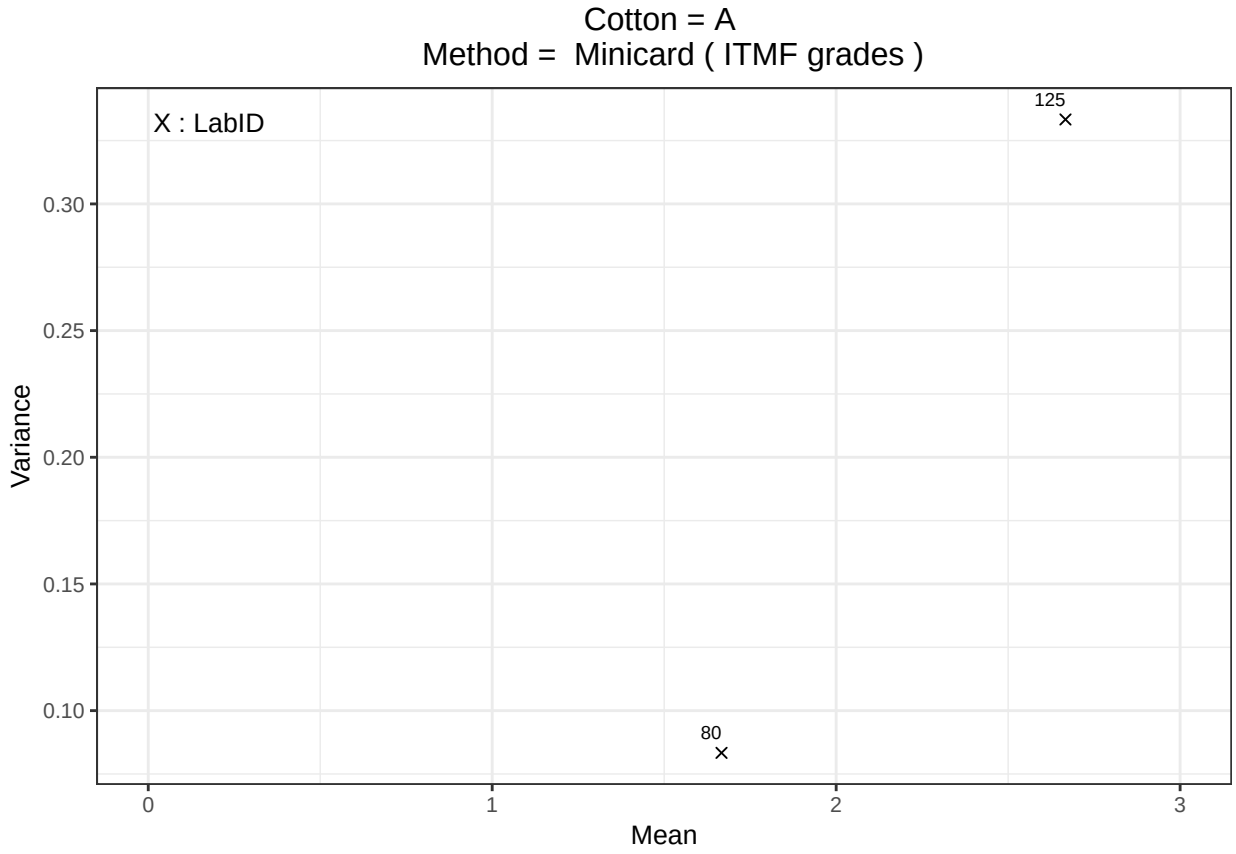

Cotton = A
Method = Contest−Fibermap (C/F Grade)
X : LabID
110
105
140
115
30
100
5000
4000
3000
2000
1000
Variance
0
200
400
600
Mean

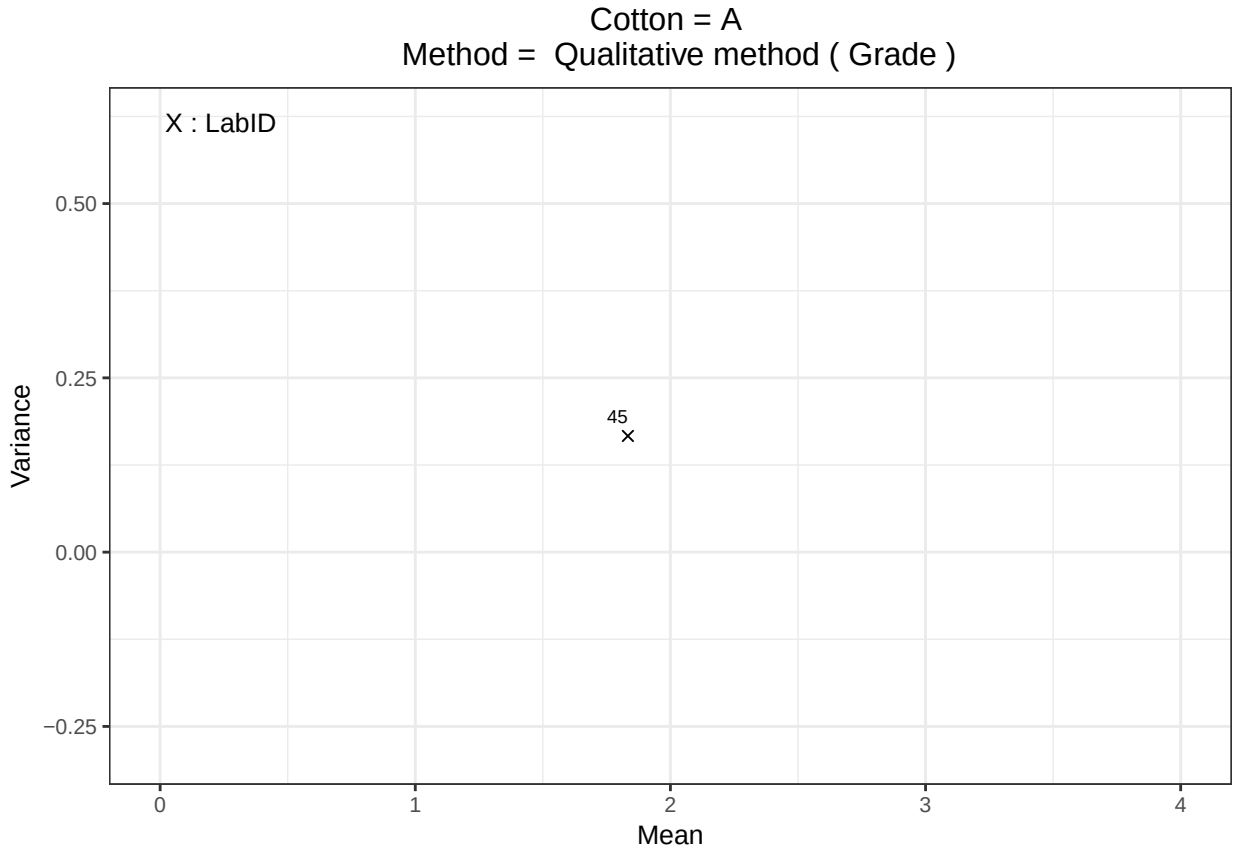

Cotton = A
Method = GB/T13785−1992 (Color degree)
X : LabID
0.50
0.25
0.00
−0.25
Variance
0
1
2
3
4
Mean

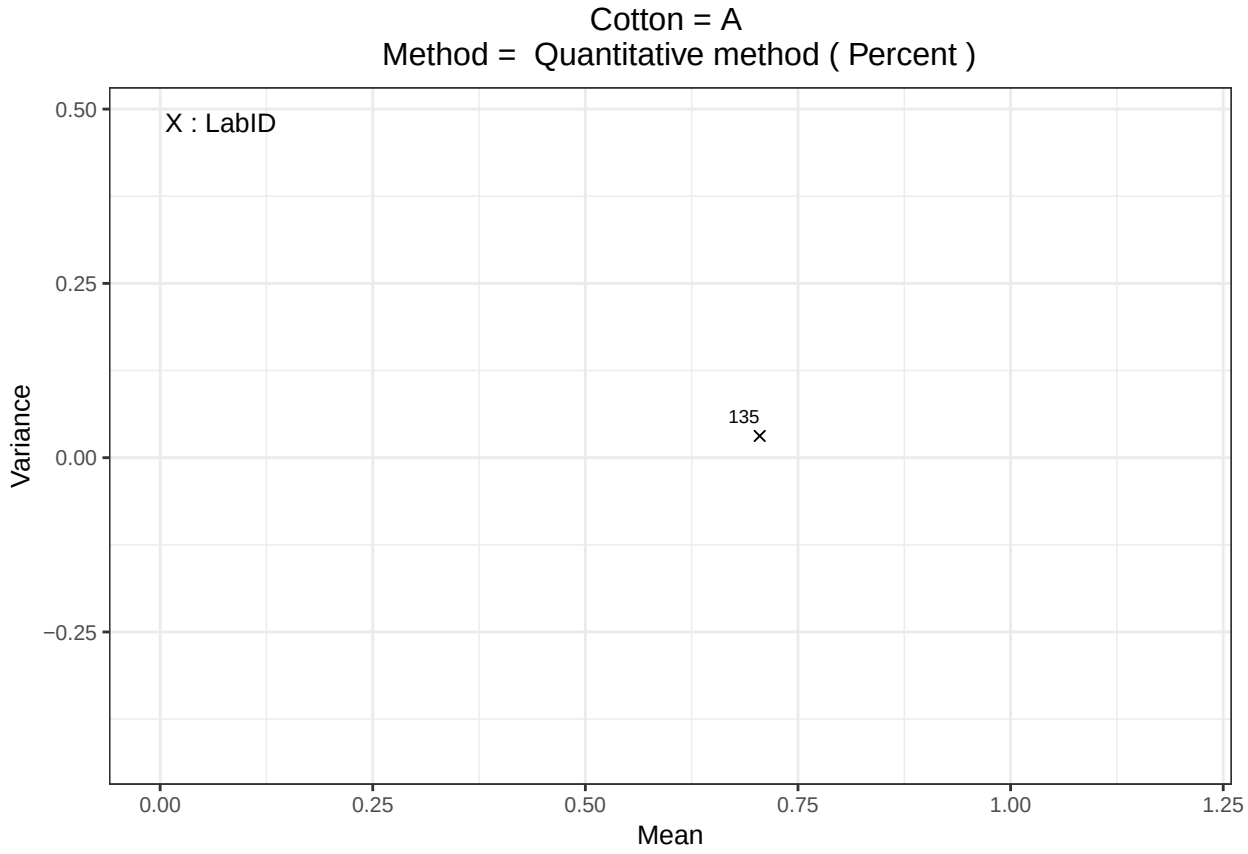

Cotton = A
Method = H2SD (Sticky points)
X : LabID
35
75
60
15
100
80
60
40
Variance
0
20
40
60
Mean

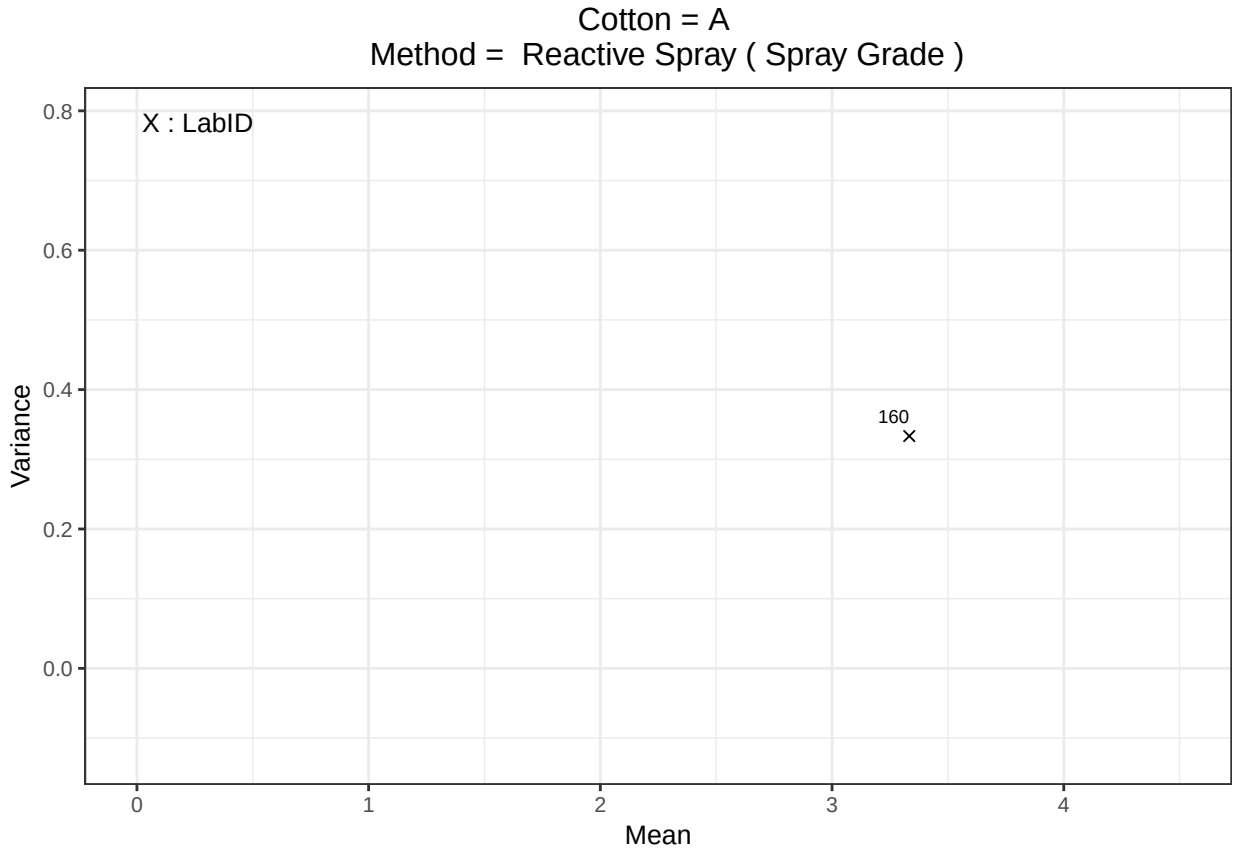

Cotton = A
Method = HSI−NIR (Sticky points)
X : LabID
27.75
27.50
27.25
27.00
Variance
55
0
50
100
150
Mean

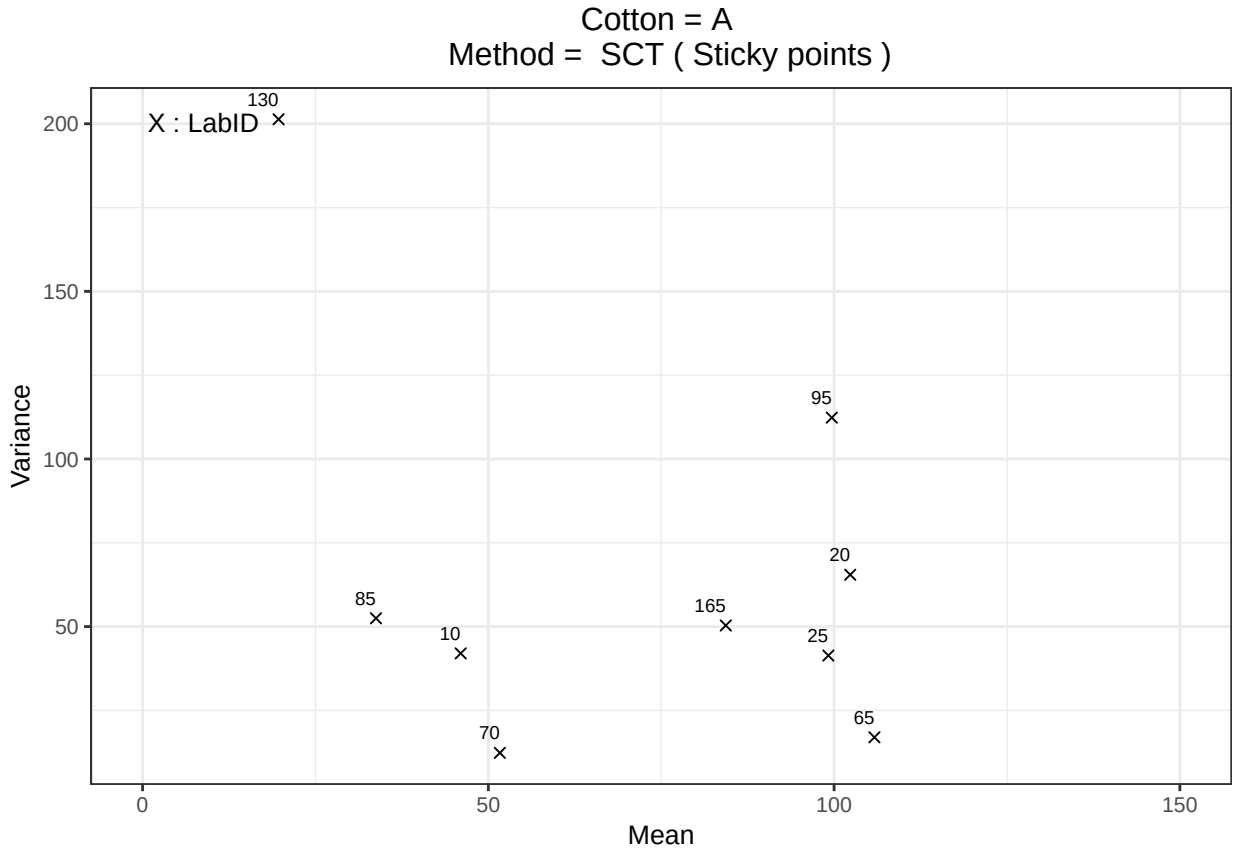

Cotton = A
Method = KOTITI (Sticky points)
X : LabID
90
Variance
Mean
0.50
0.25
0.00
−0.25
−0.50
0.0
2.5
5.0
7.5

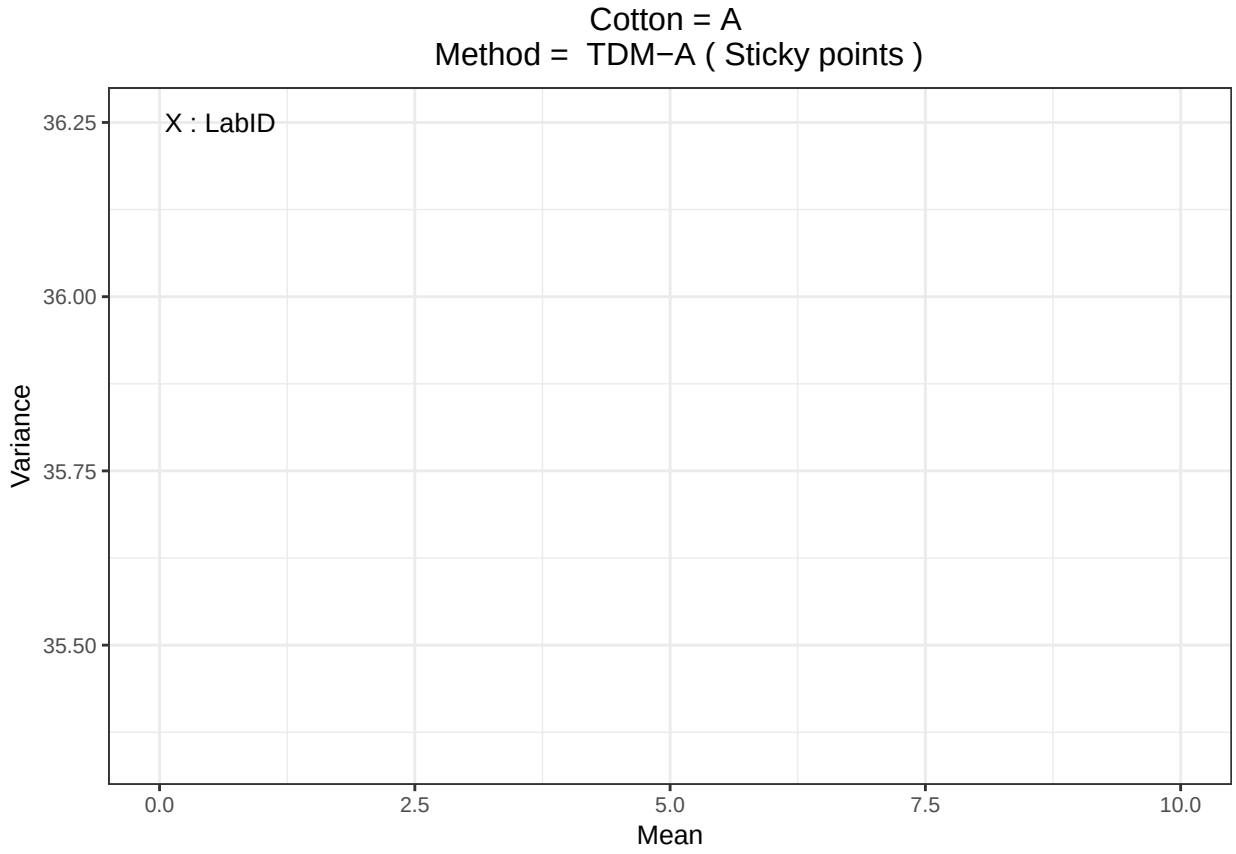

Cotton = A
Method = Minicard (ITMF grades)
X : LabID
125
80
0.30
0.25
0.20
0.15
0.10
Variance
0
1
2
3
Mean


Cotton = A
Method = Qualitative method (Grade)
X : LabID
0.50
0.25
0.00
−0.25
Variance
45
0
1
2
3
4
Mean

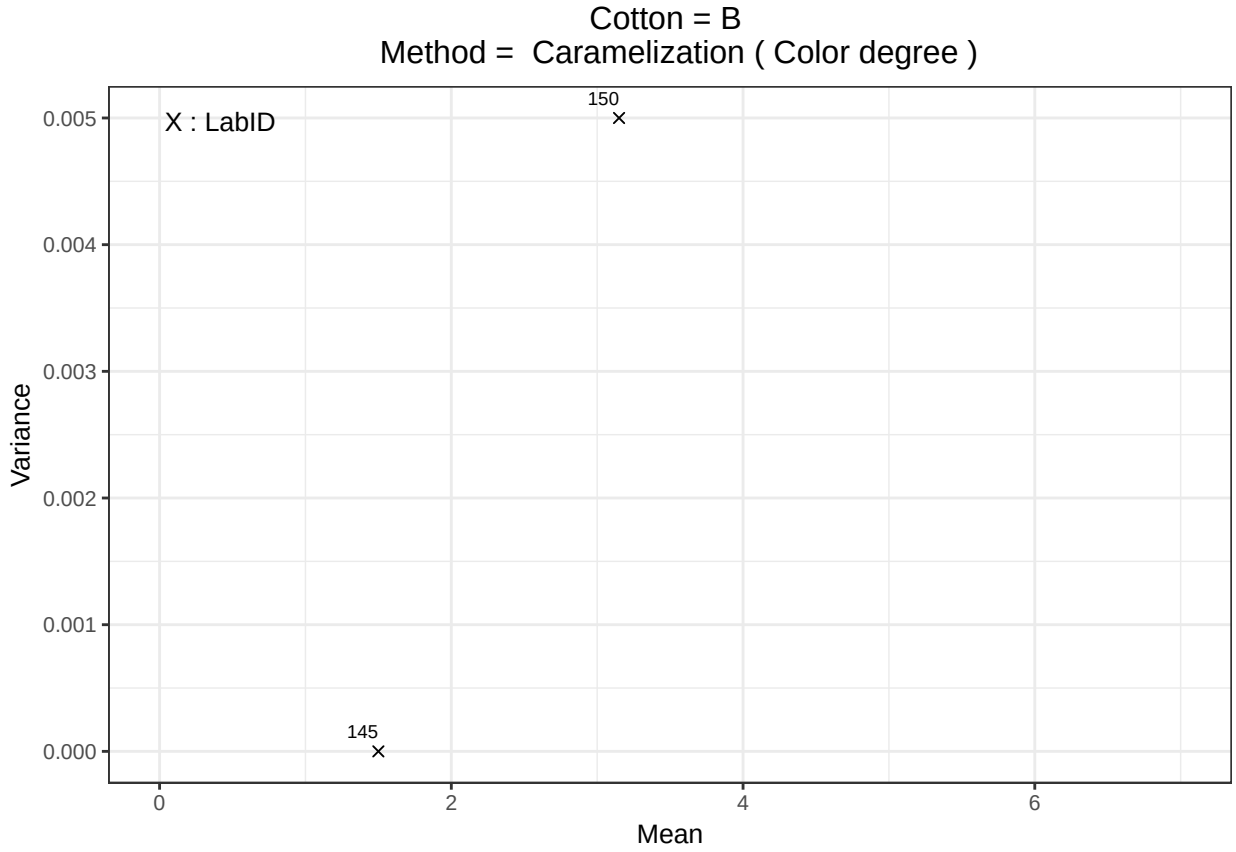

Cotton = A
Method = Quantitative method (Percent)
X : LabID
135
Variance
Mean
0.50
0.25
0.00
−0.25
0.00
0.25
0.50
0.75
1.00
1.25


Cotton = A
Method = Reactive Spray (Spray Grade)
X : LabID
160
Variance
Mean
0.0
0.2
0.4
0.6
0.8
0
1
2
3
4

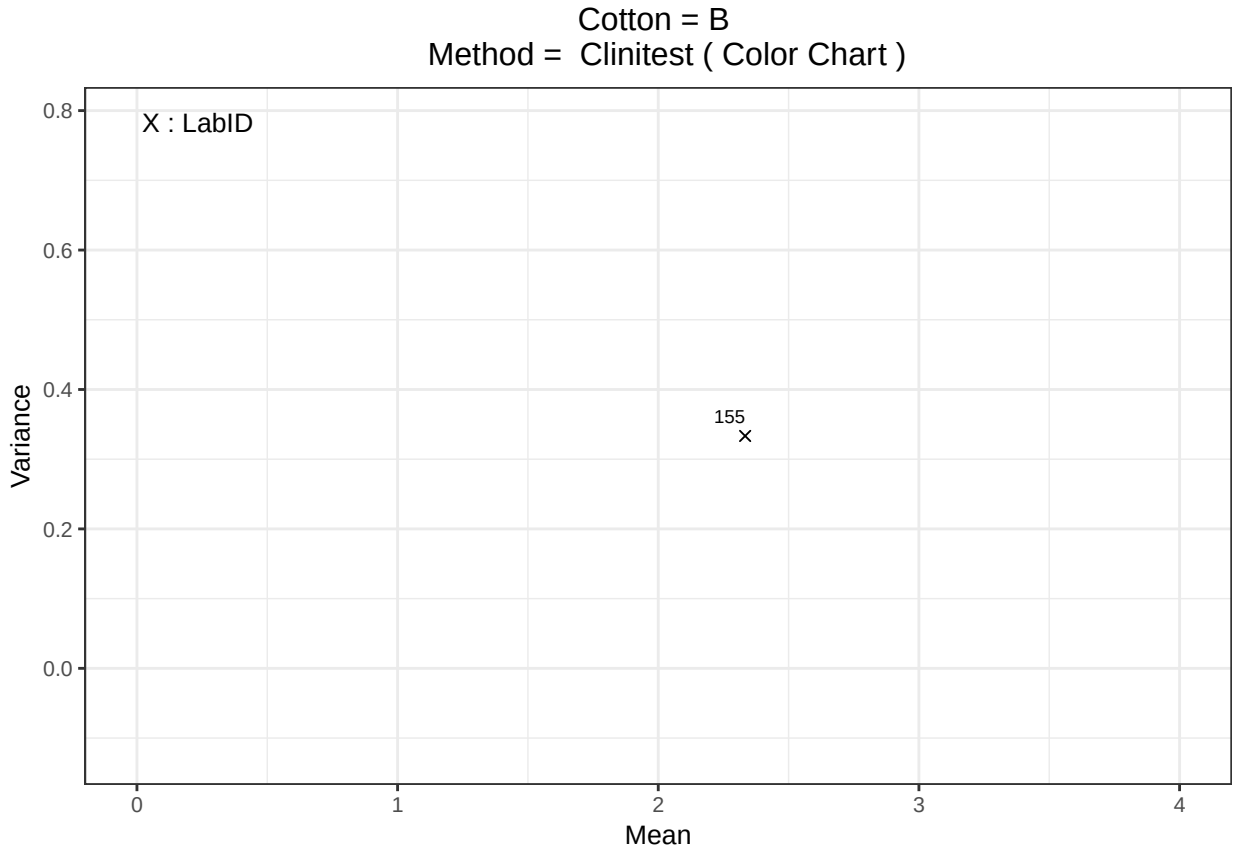

Cotton = A
Method = SCT (Sticky points)
X : LabID
130
95
20
85
165
10
25
65
70
Variance
Mean
200
150
100
50
0
50
100
150

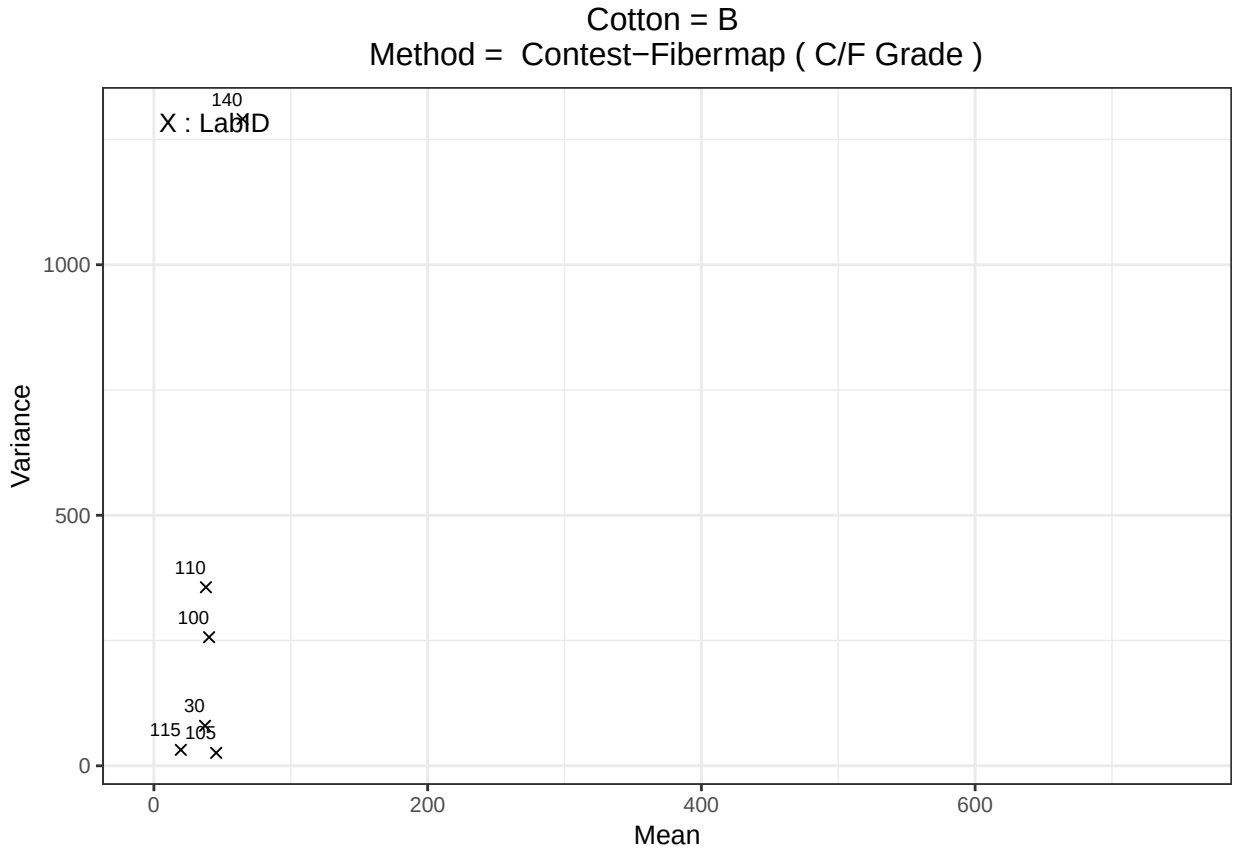

Cotton = A
Method = TDM−A (Sticky points)
X : LabID
36.25
36.00
35.75
35.50
Variance
0.0
2.5
5.0
7.5
10.0
Mean

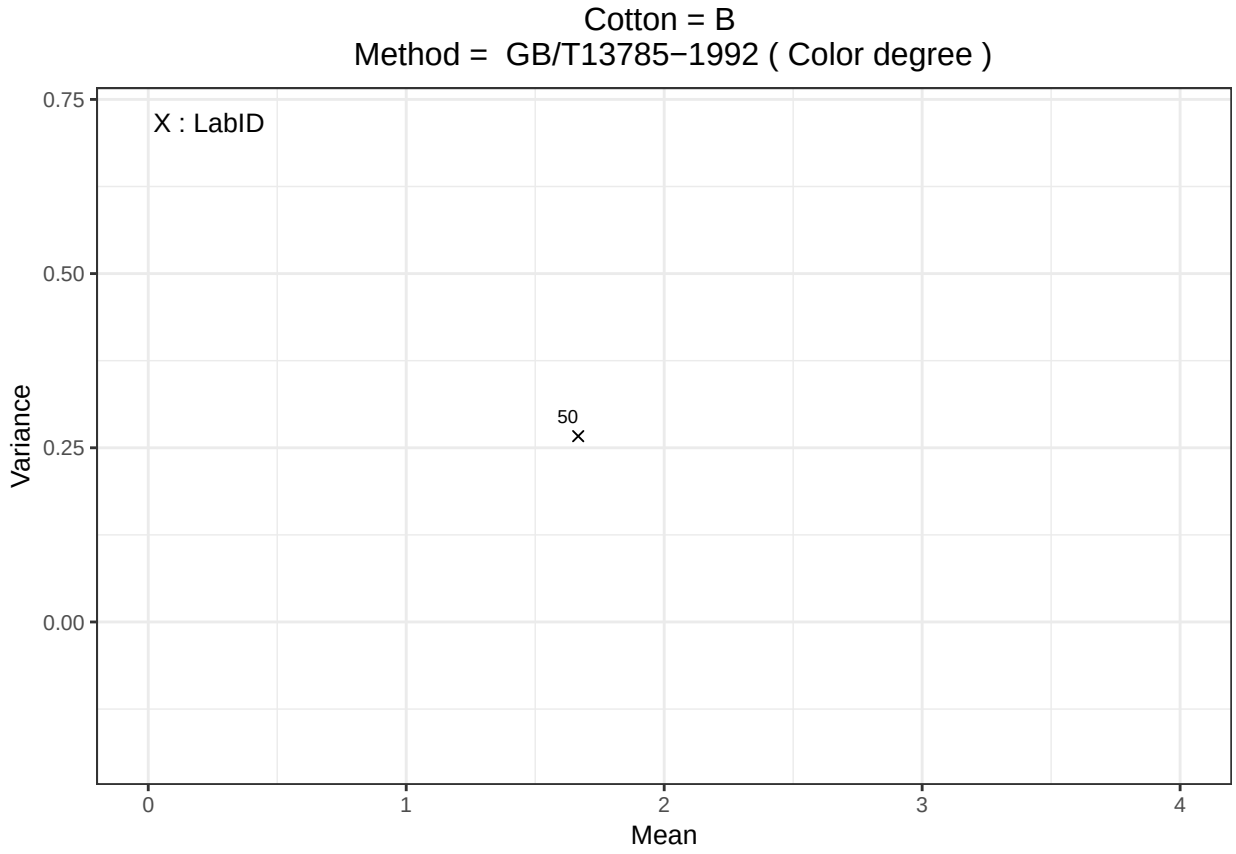
Cotton B : Variance between individual measurements = f(Mean) for all concerned labs

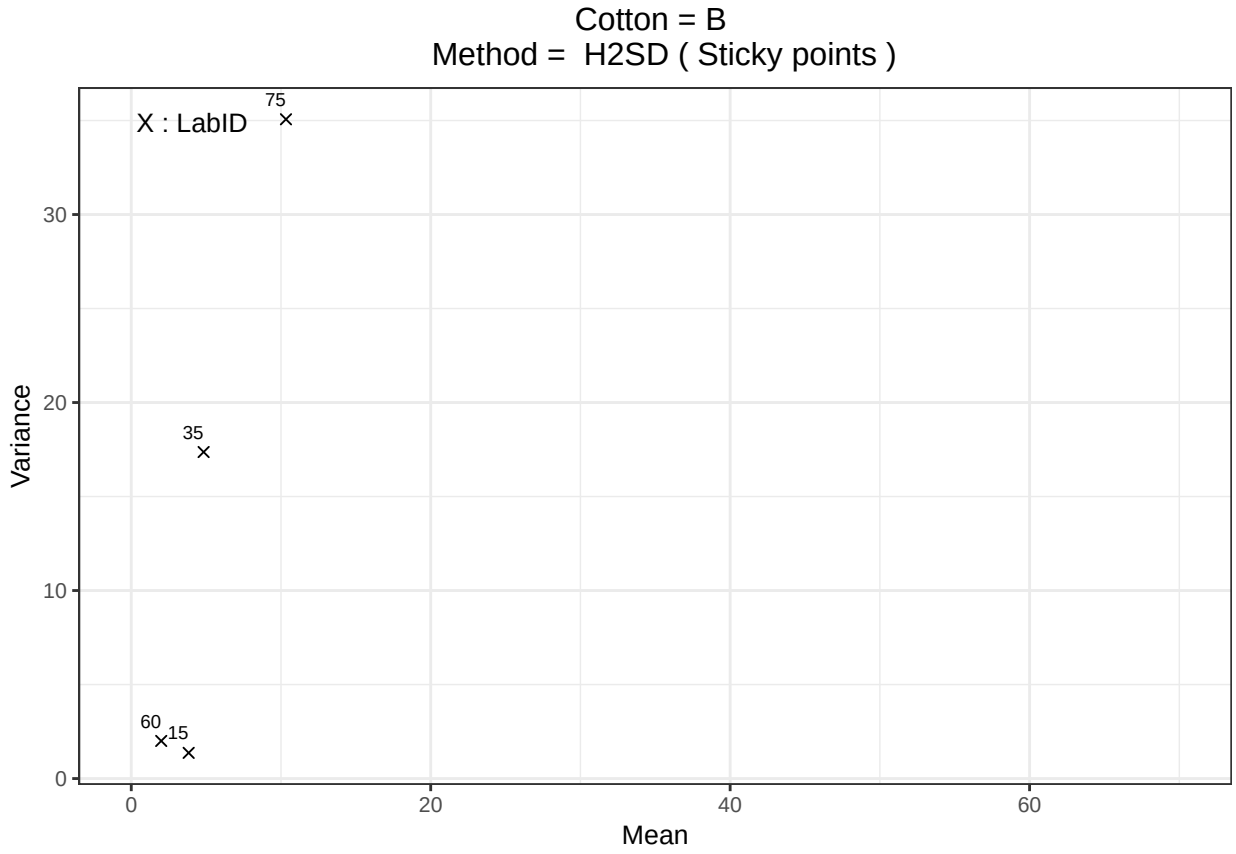


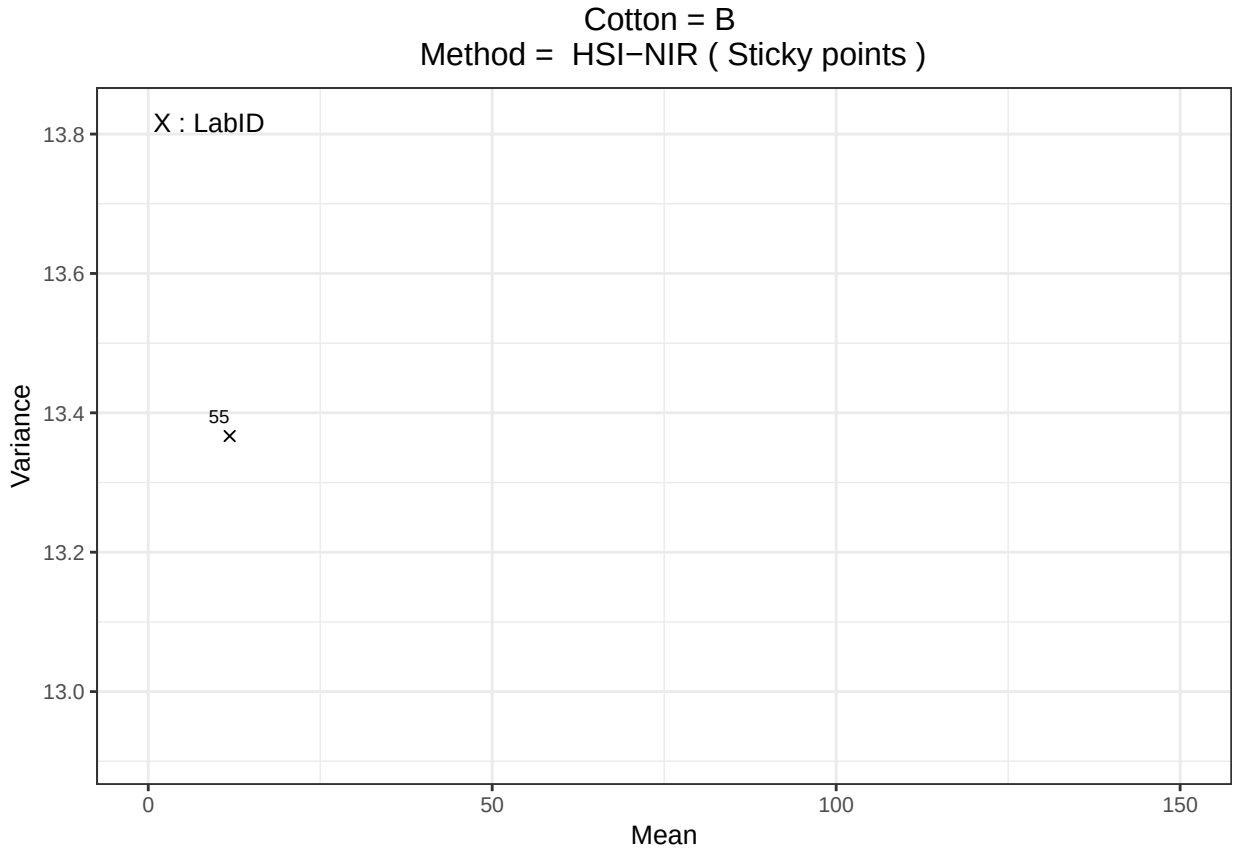
[1] "For Cotton = B and for method = Caramelization , 2 LabID (LabID being 5, 40) cannot be shown on this chart as only one measurement was performed and, therefore, a variance cannot be calculated in this case."

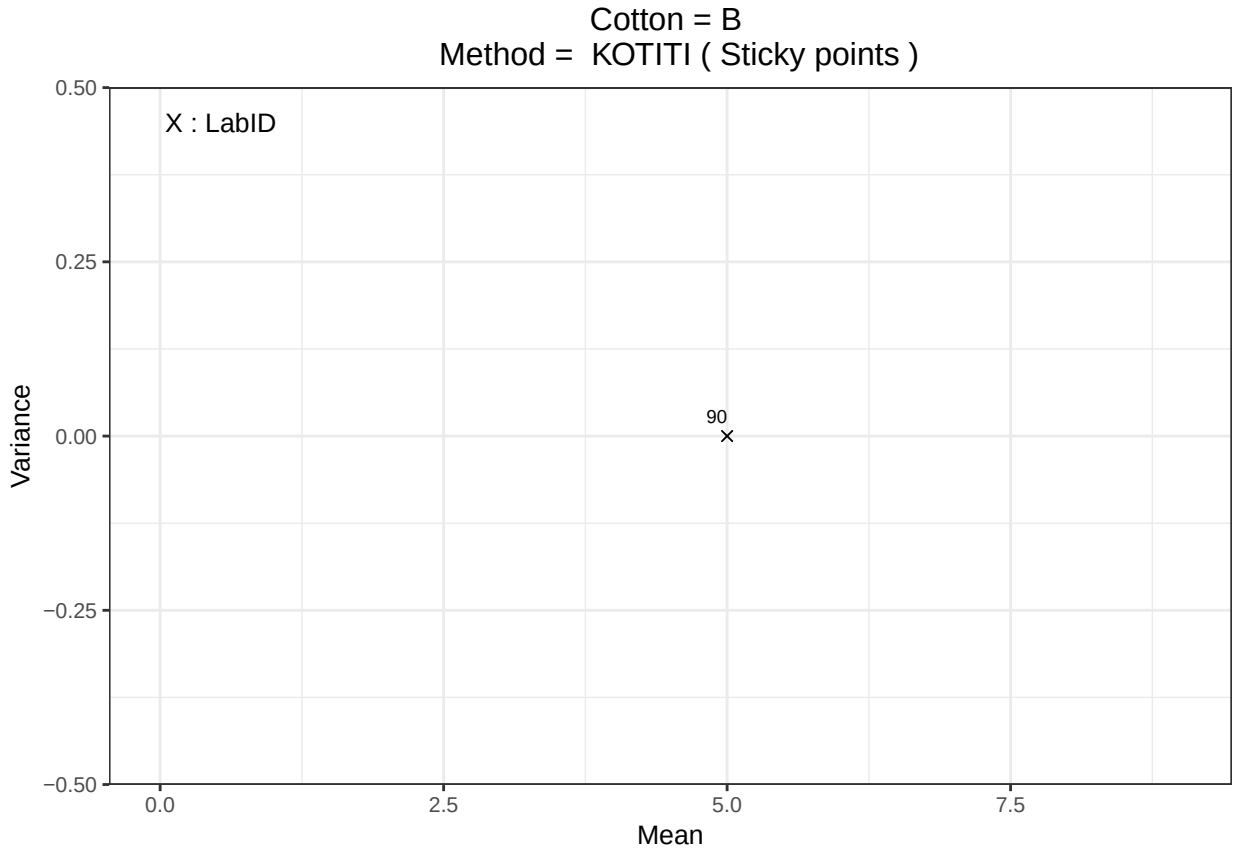

Cotton = B
Method = Clinitest (Color Chart)
X : LabID
155
Variance
Mean
0.0
0.2
0.4
0.6
0.8
0
1
2
3
4

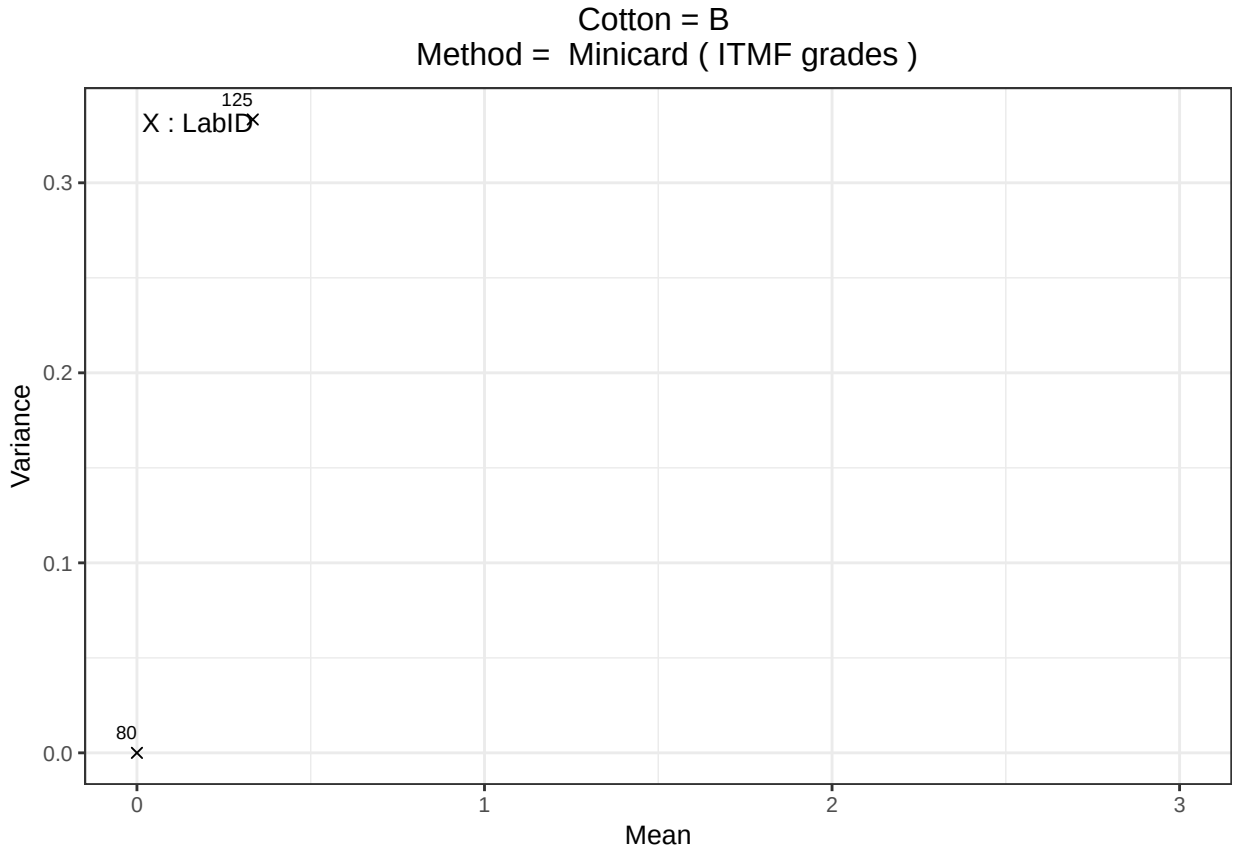

Cotton = B
Method = Contest−Fibermap (C/F Grade)
X : LabID
140
110
100
30
115
105
1000
500
0
Variance
0
200
400
600
Mean

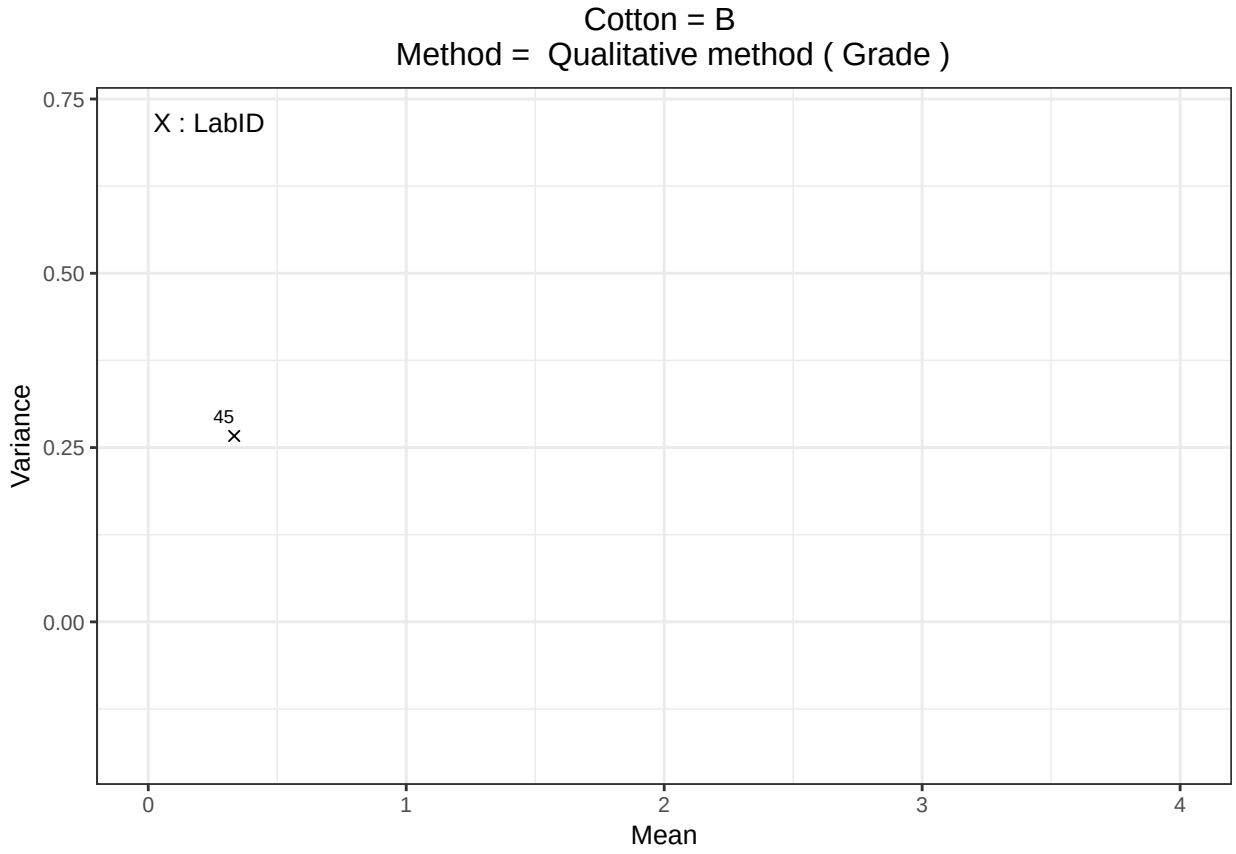

Cotton = B
Method = GB/T13785−1992 (Color degree)
X : LabID
50
Variance
0.75
0.50
0.25
0.00
0
1
2
3
4
Mean

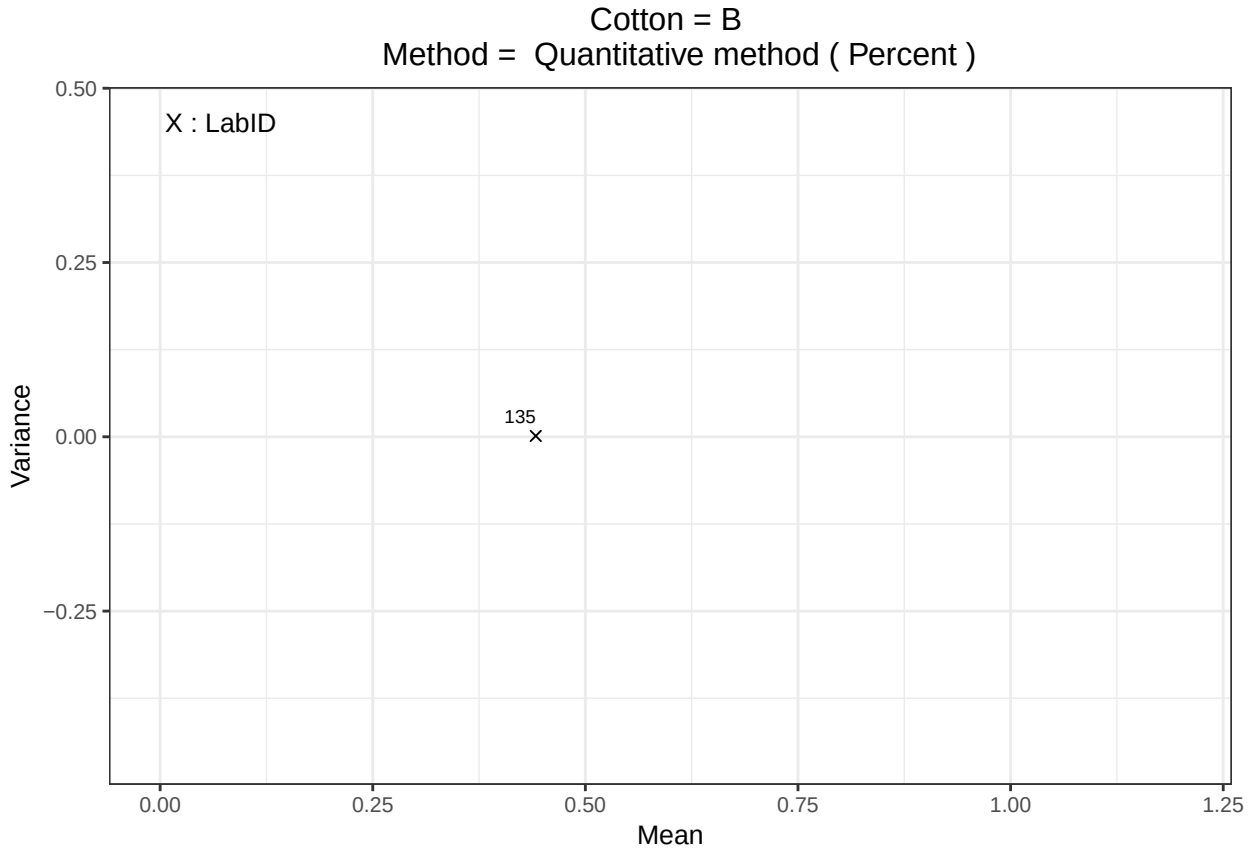

Cotton = B
Method = H2SD (Sticky points)
X : LabID
75
35
60
15
Variance
Mean
0
10
20
30
0
20
40
60

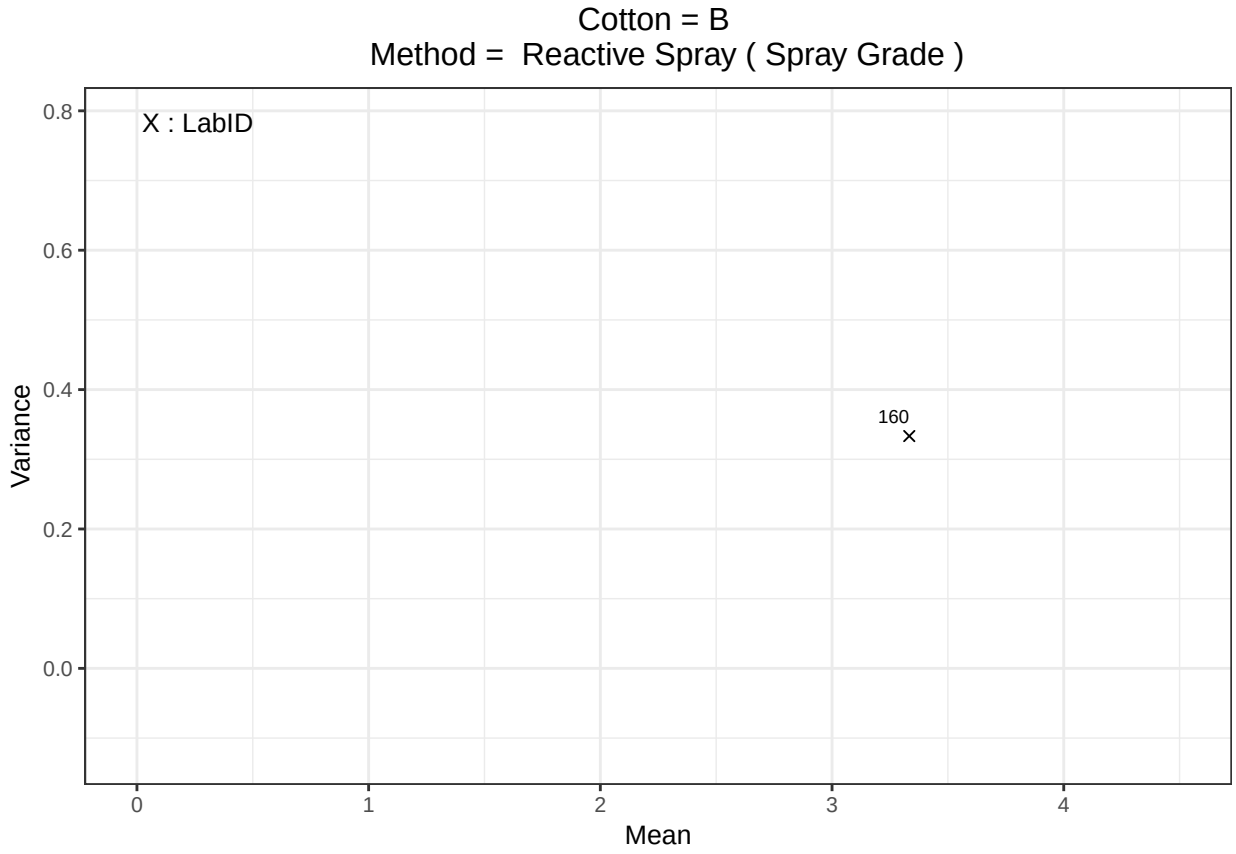

Cotton = B
Method = HSI−NIR (Sticky points)
X : LabID
55
Variance
13.8
13.6
13.4
13.2
13.0
0
50
100
150
Mean

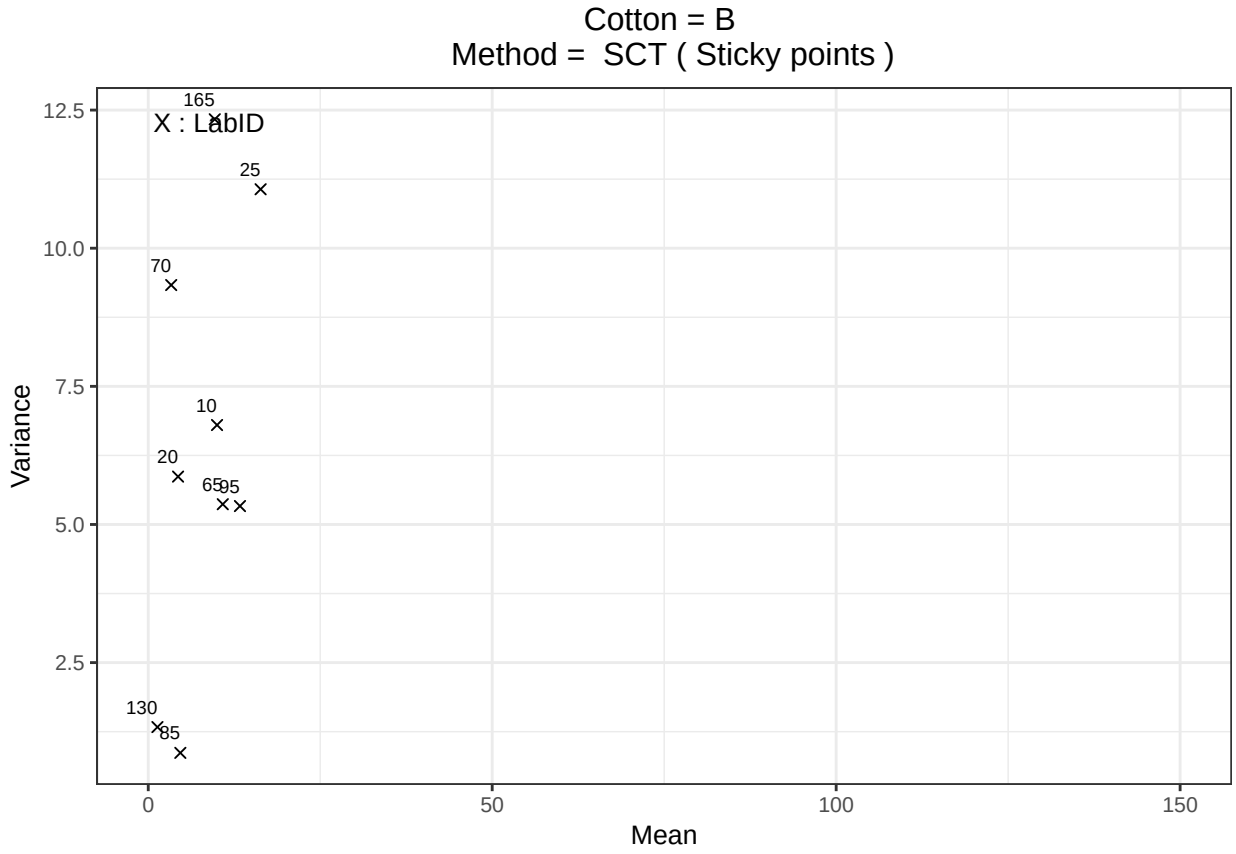

Cotton = B
Method = KOTITI (Sticky points)
X : LabID
90
Variance
Mean
0.50
0.25
0.00
−0.25
−0.50
0.0
2.5
5.0
7.5

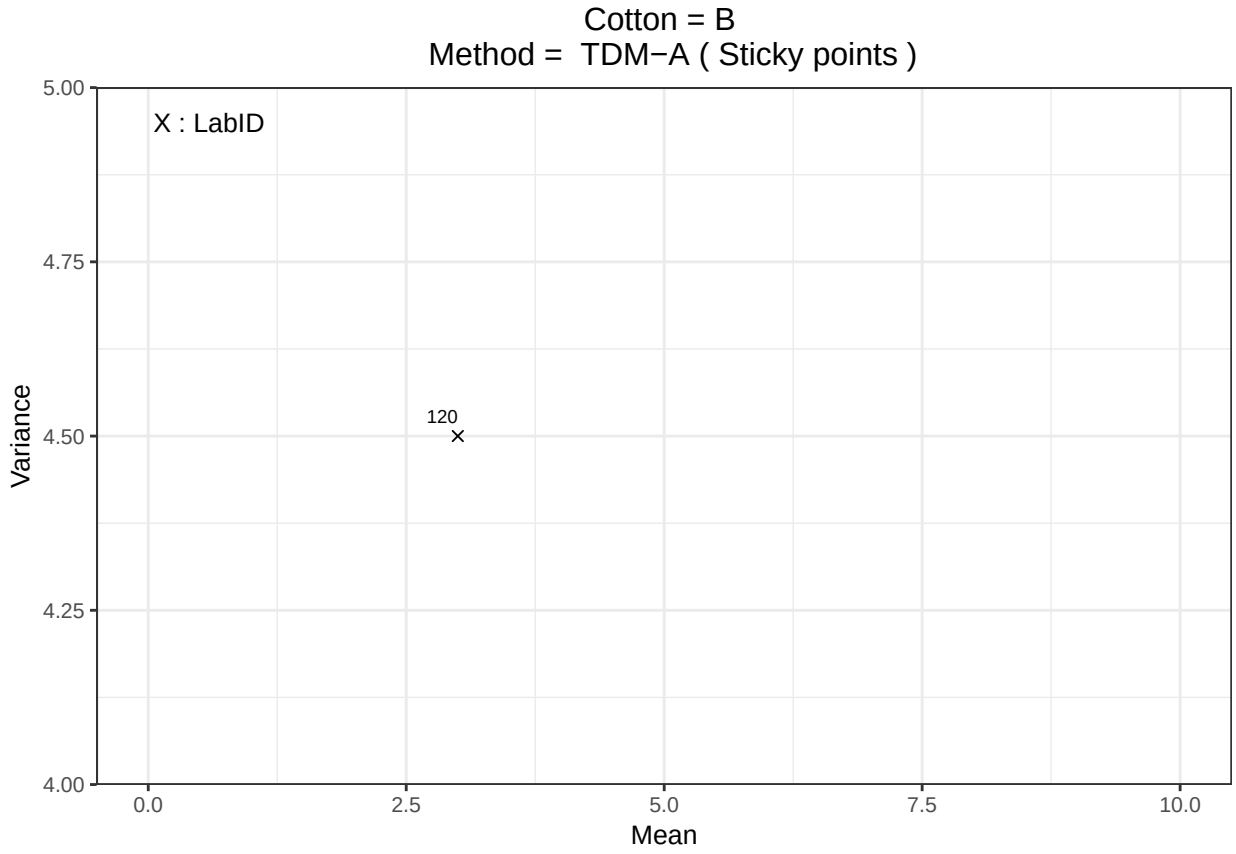

Cotton = B
Method = Minicard (ITMF grades)
125
X : LabID
80
0.3
0.2
0.1
0.0
Variance
0
1
2
3
Mean


Cotton = B
Method = Qualitative method (Grade)
X : LabID
45
Variance
0.75
0.50
0.25
0.00
0
1
2
3
4
Mean

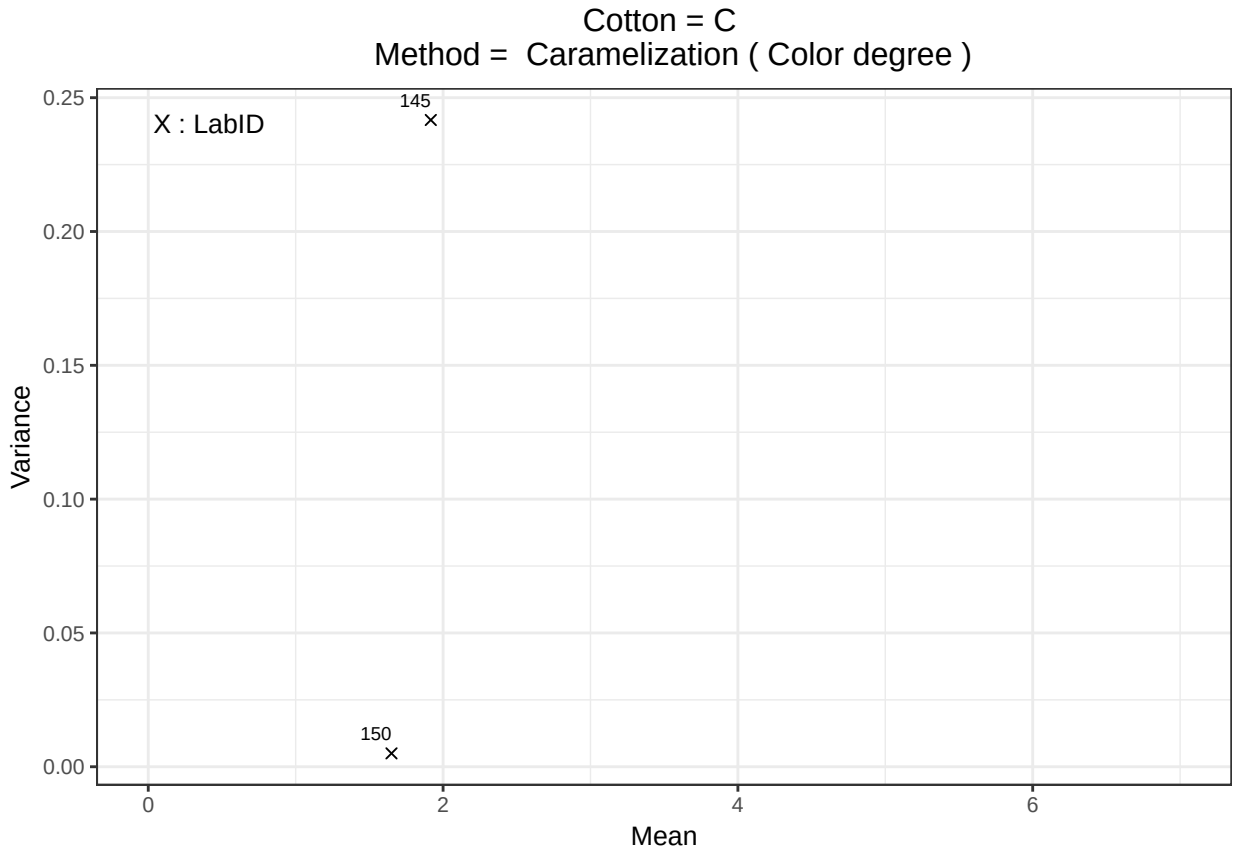

Cotton = B
Method = Quantitative method (Percent)
X : LabID
135
Variance
Mean
0.50
0.25
0.00
−0.25
0.00
0.25
0.50
0.75
1.00
1.25


Cotton = B
Method = Reactive Spray (Spray Grade)
X : LabID
160
Variance
Mean
0.0
0.2
0.4
0.6
0.8
0
1
2
3
4

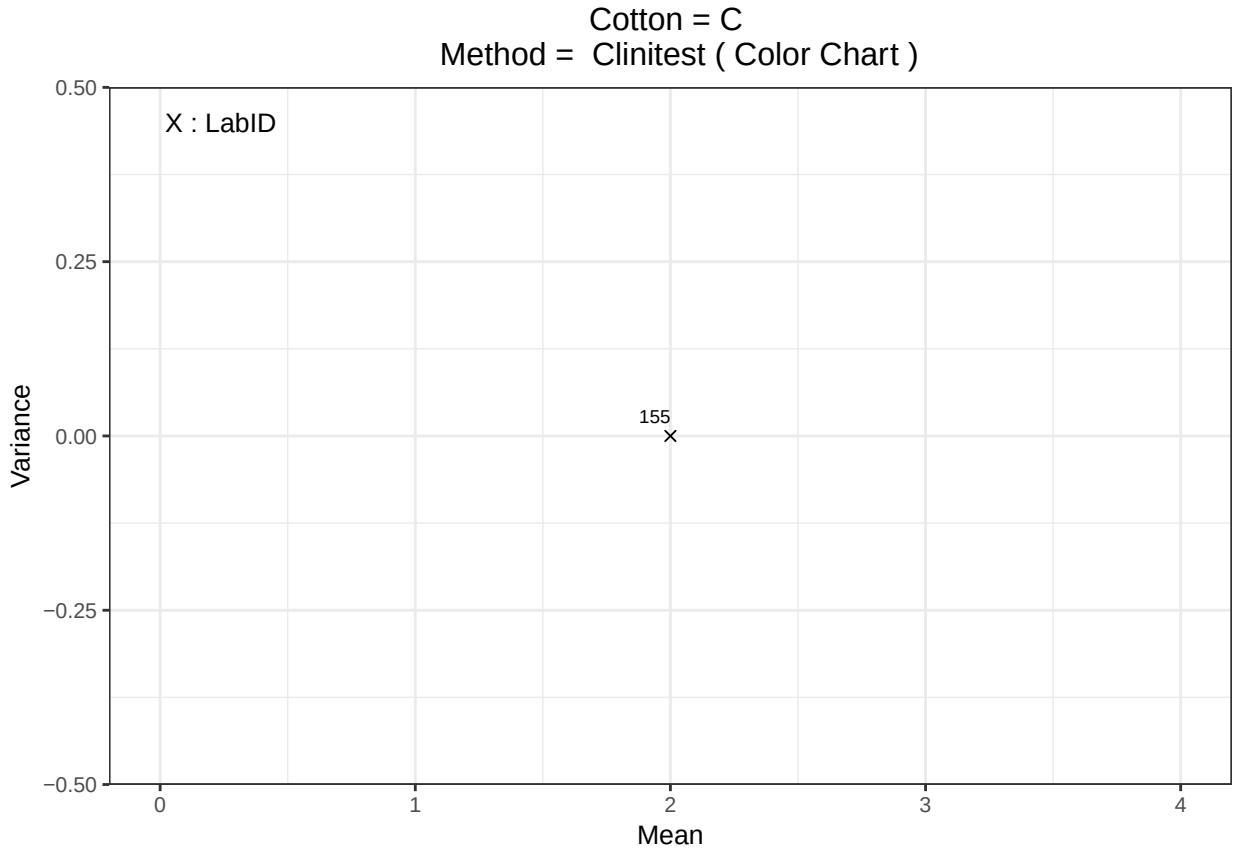

Cotton = B
Method = SCT (Sticky points)
X : LabID
165
25
70
10
20
65
95
130
85
12.5
10.0
7.5
5.0
2.5
Variance
0
50
100
150
Mean

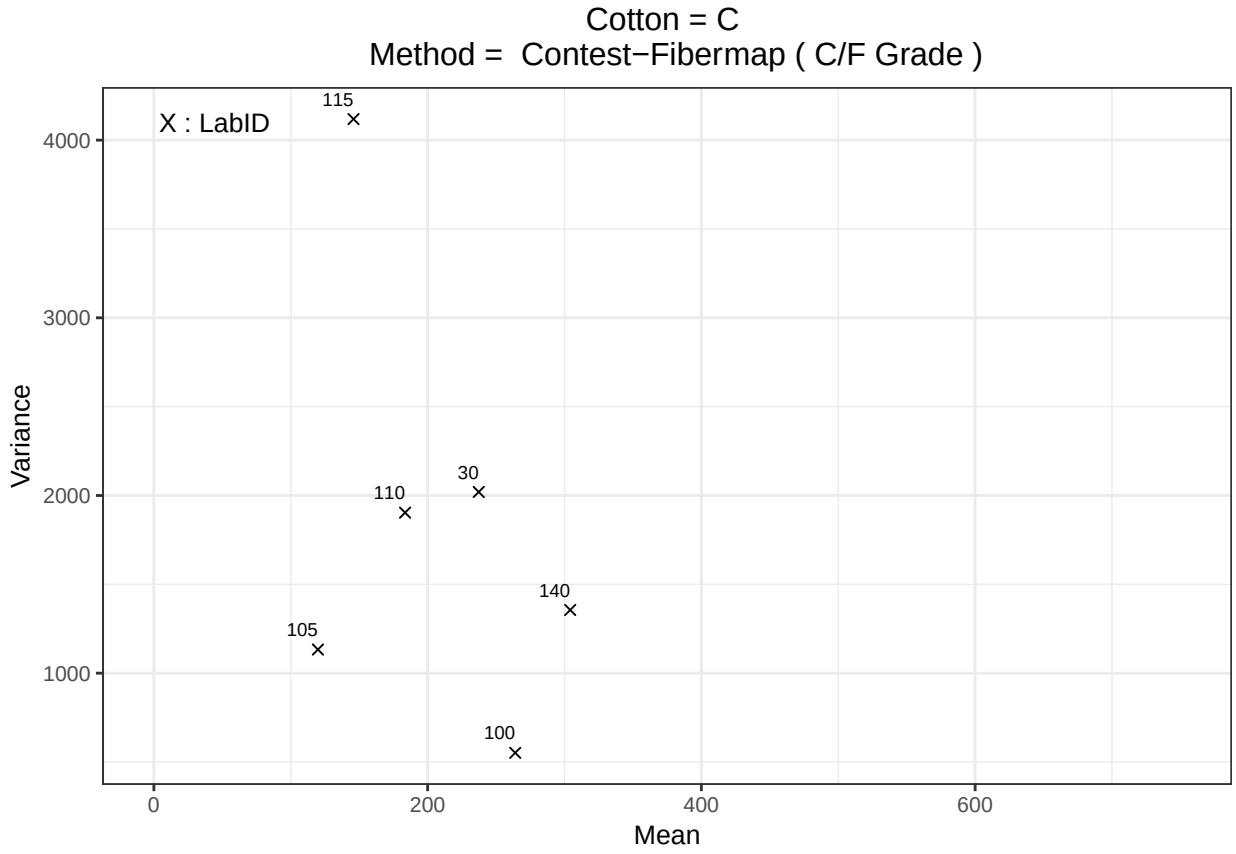

Cotton = B
Method = TDM−A (Sticky points)
X : LabID
120
Variance
Mean
5.00
4.75
4.50
4.25
4.00
0.0
2.5
5.0
7.5
10.0

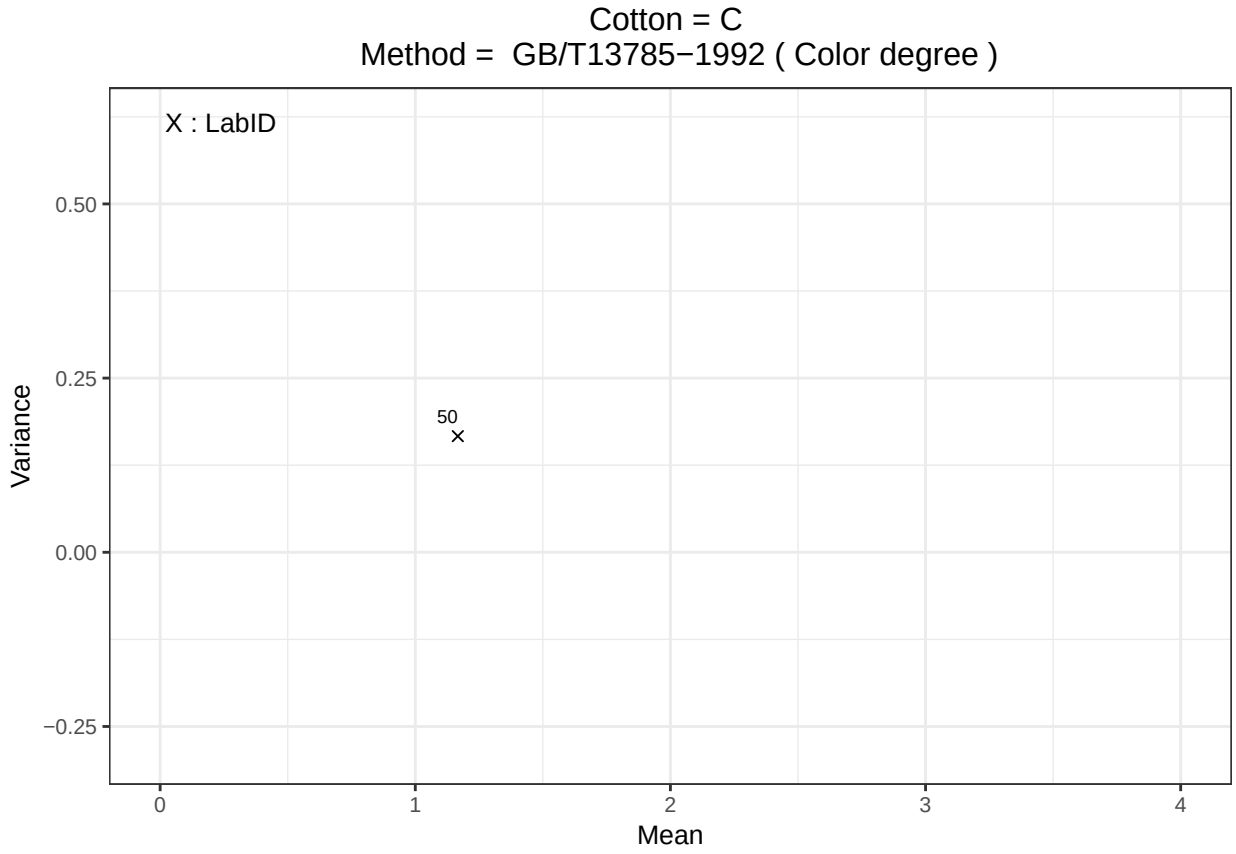
Cotton C : Variance between individual measurements = f(Mean) for all concerned labs

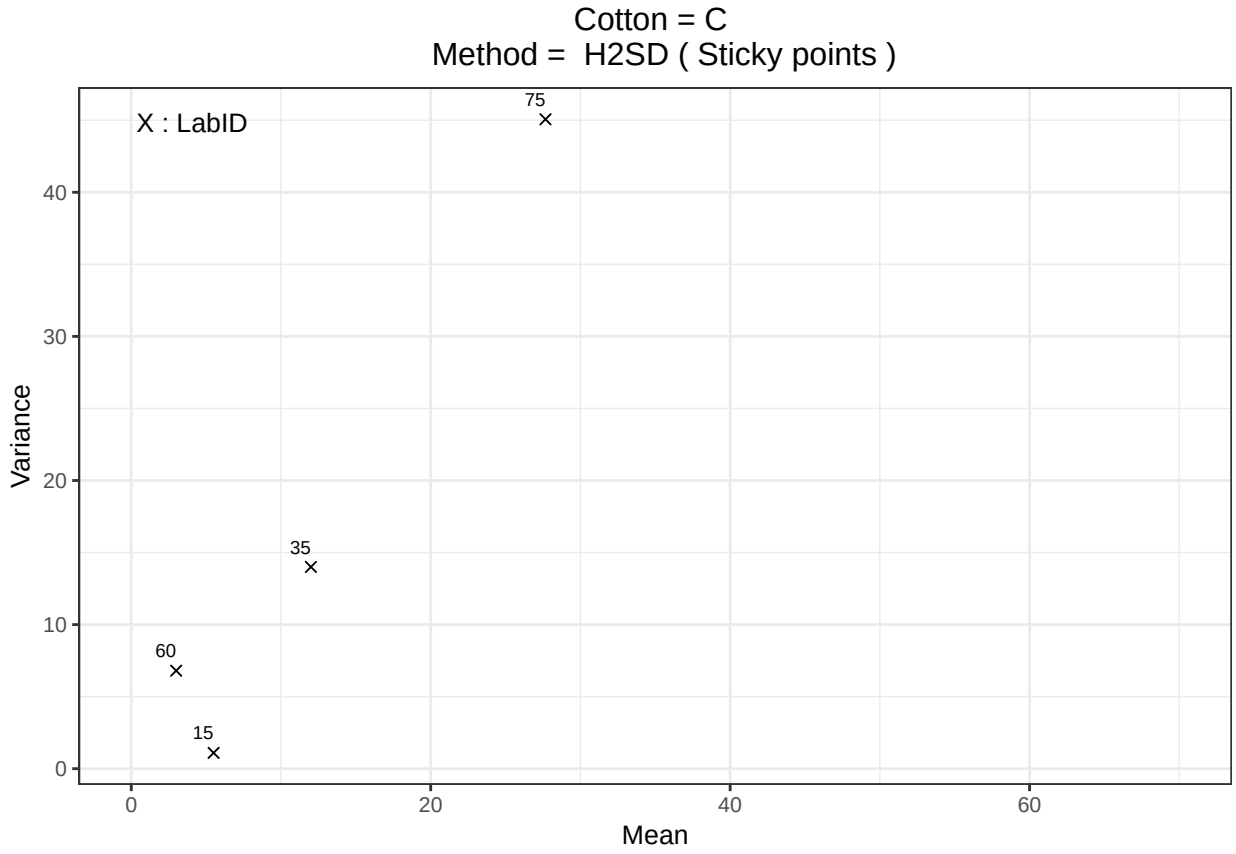


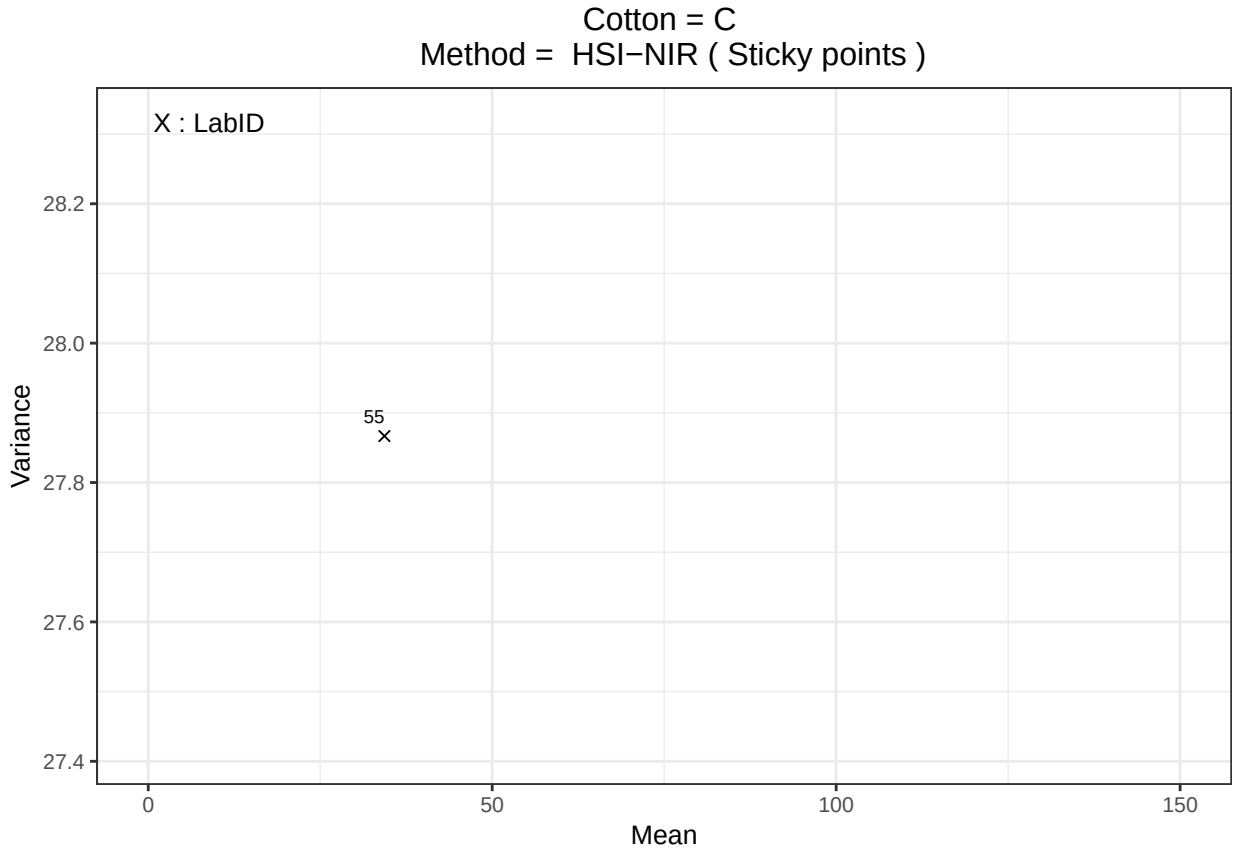
[1] "For Cotton = C and for method = Caramelization , 2 LabID (LabID being 5, 40) cannot be shown on this chart as only one measurement was performed and, therefore, a variance cannot be calculated in this case."

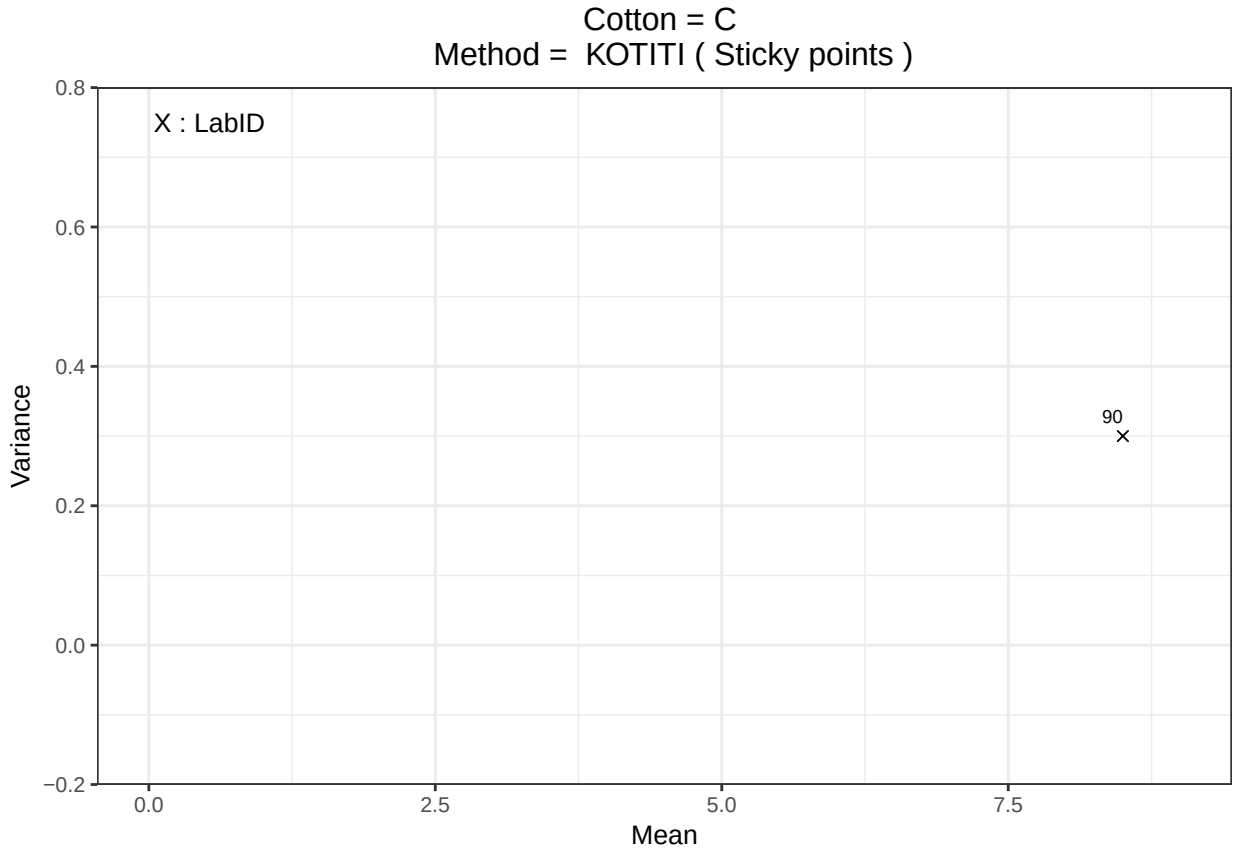

Cotton = C
Method = Clinitest (Color Chart)
X : LabID
155
Variance
Mean
0.50
0.25
0.00
−0.25
−0.50
0
1
2
3
4

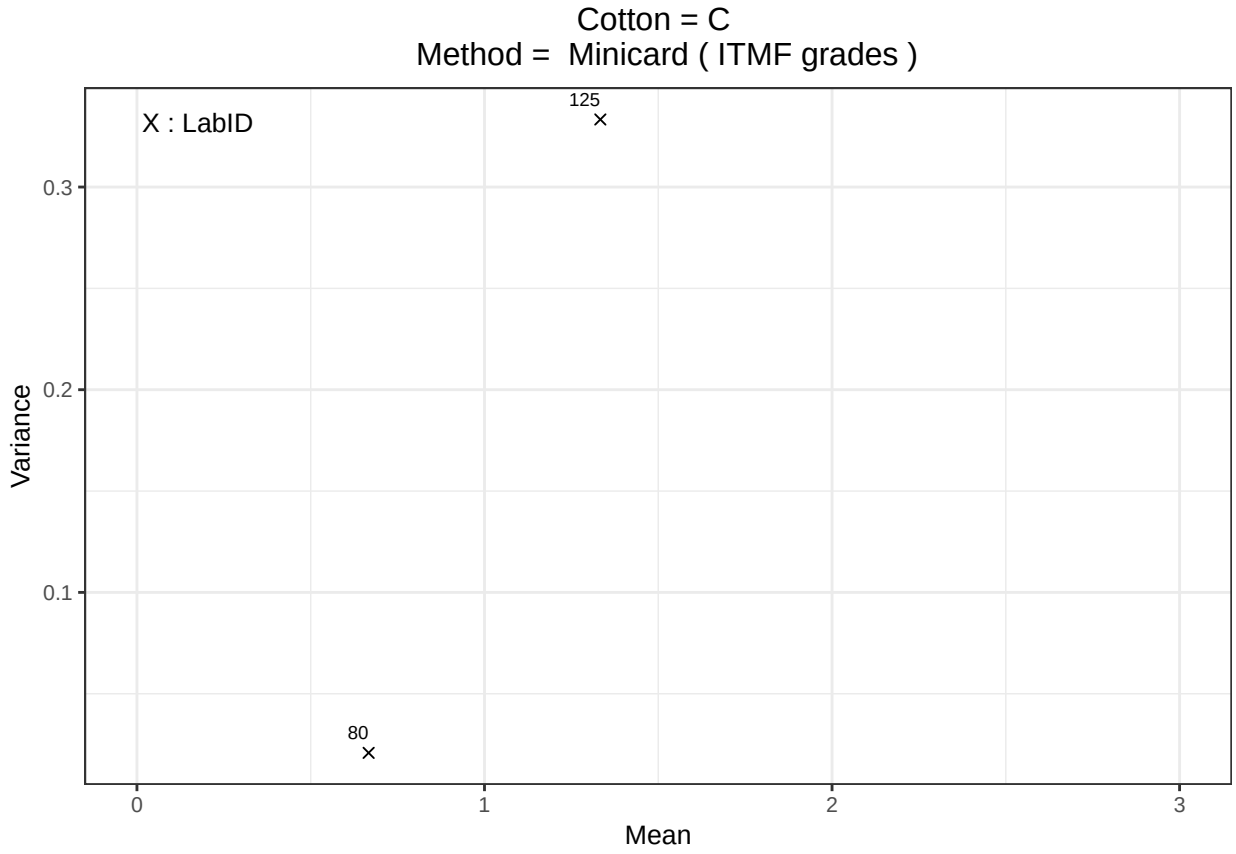

Cotton = C
Method = Contest−Fibermap (C/F Grade)
X : LabID
115
30
110
140
105
100
4000
3000
2000
1000
Variance
0
200
400
600
Mean

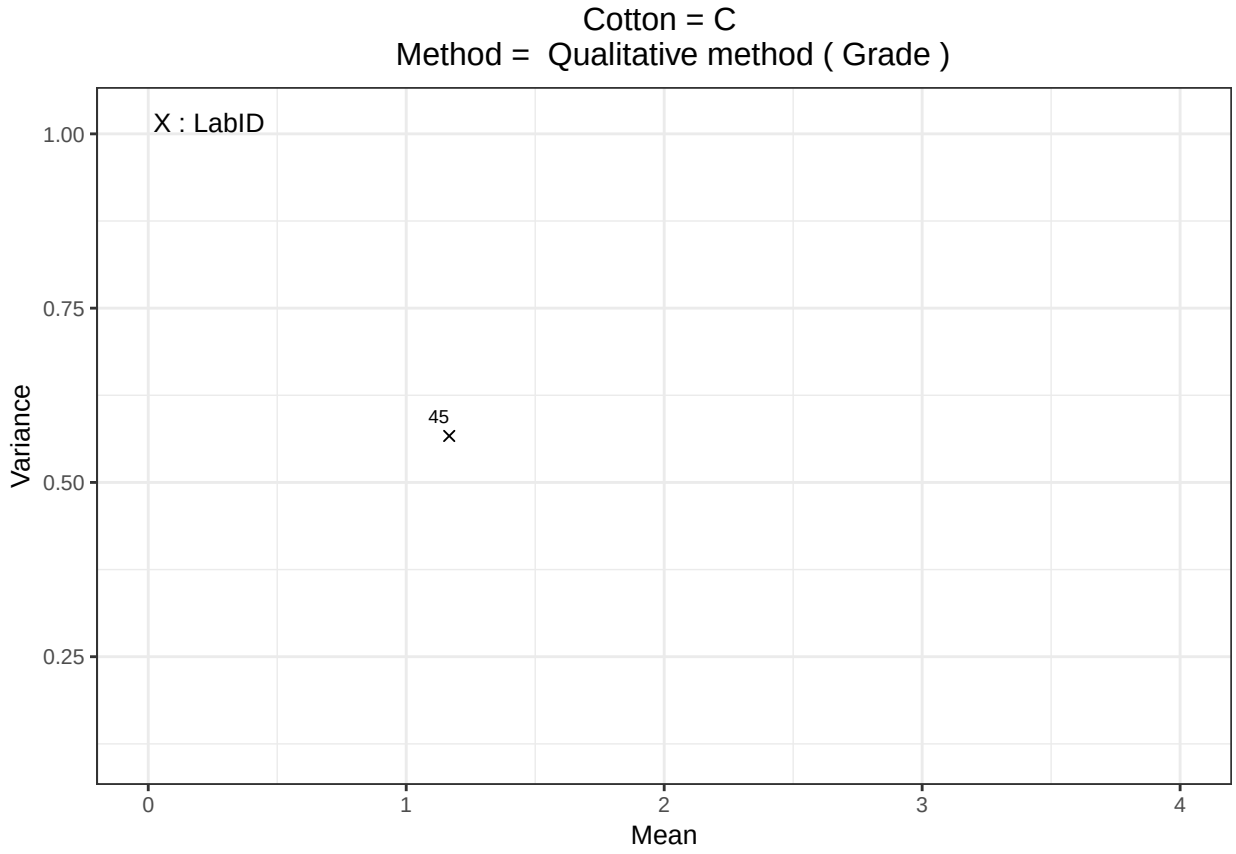

Cotton = C
Method = GB/T13785−1992 (Color degree)
X : LabID
0.50
0.25
0.00
−0.25
Variance
50
0
1
2
3
4
Mean

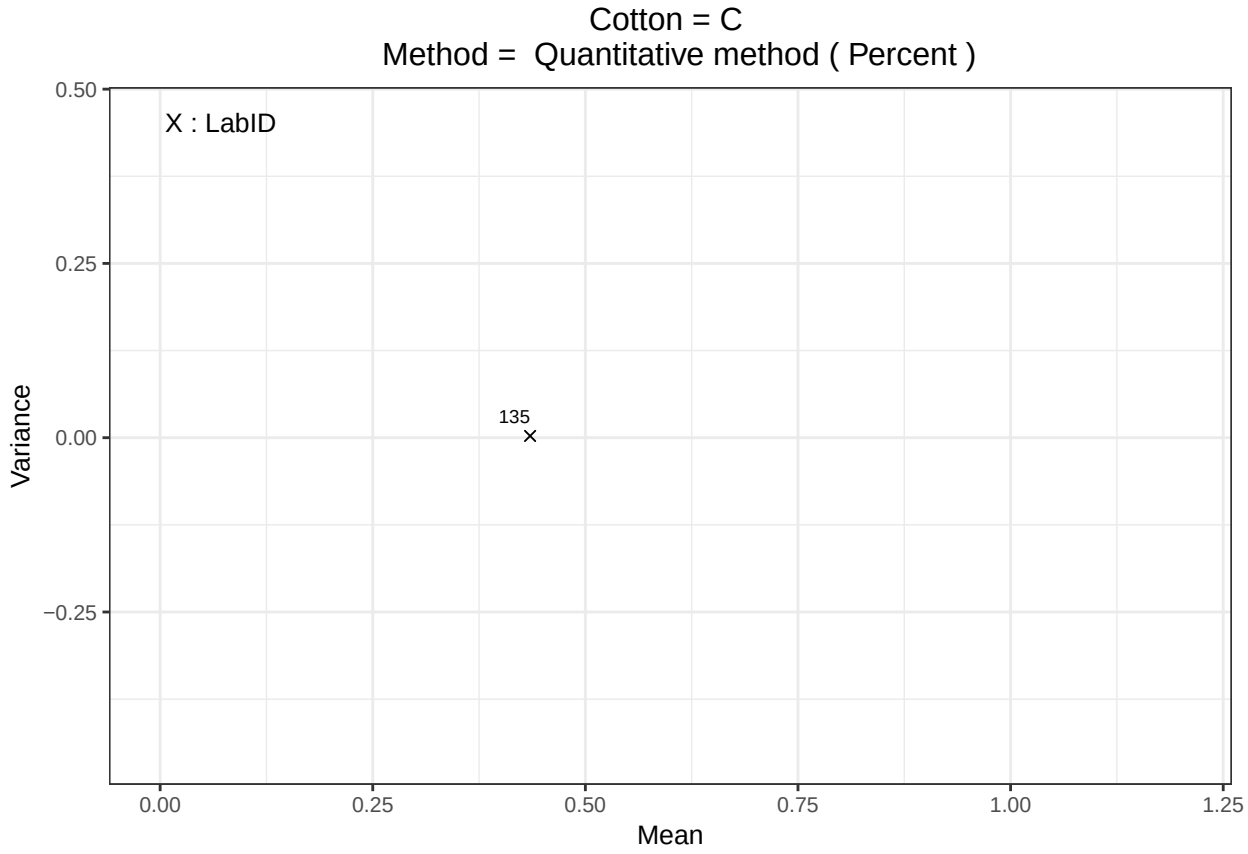

Cotton = C
Method = H2SD (Sticky points)
X : LabID
75
35
60
15
Variance
Mean
0
10
20
30
40
0
20
40
60

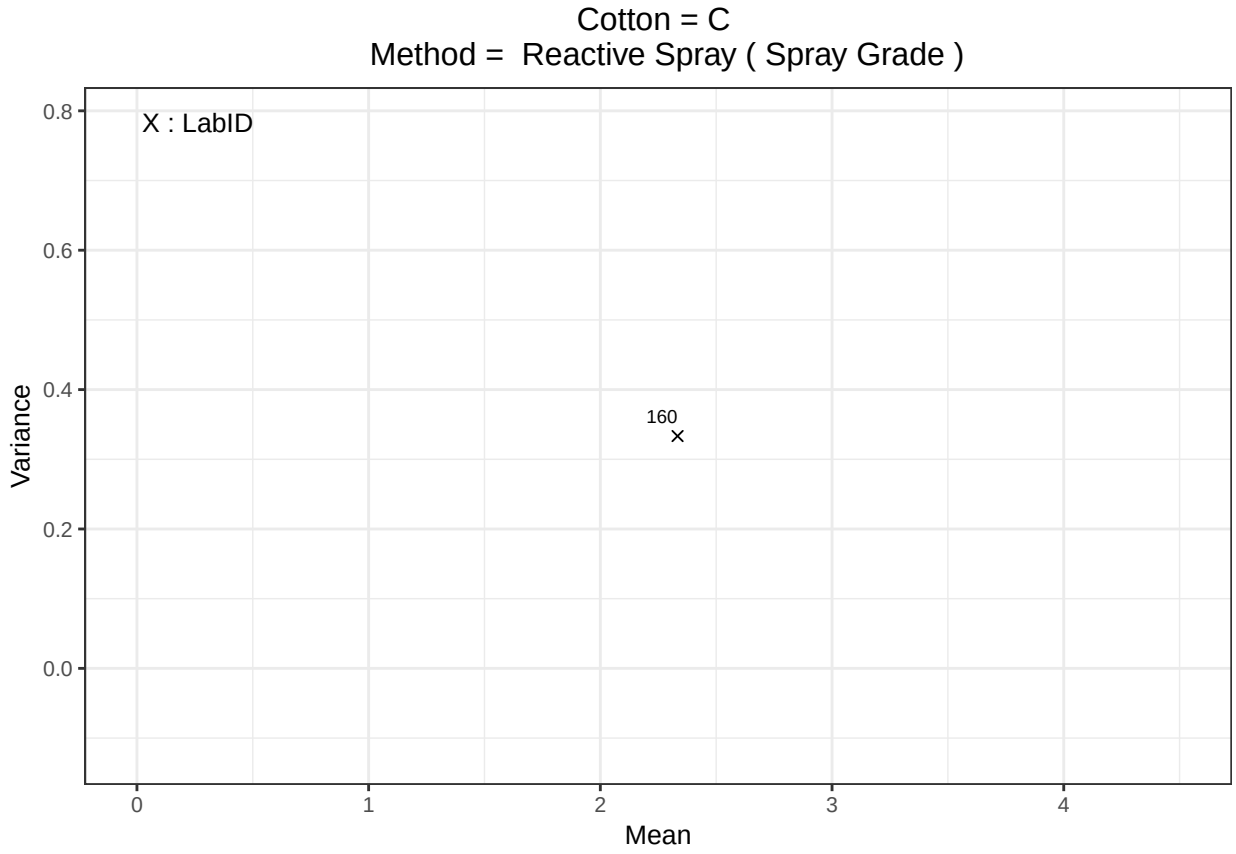

Cotton = C
Method = HSI−NIR (Sticky points)
X : LabID
28.2
28.0
27.8
27.6
27.4
Variance
55
0
50
100
150
Mean

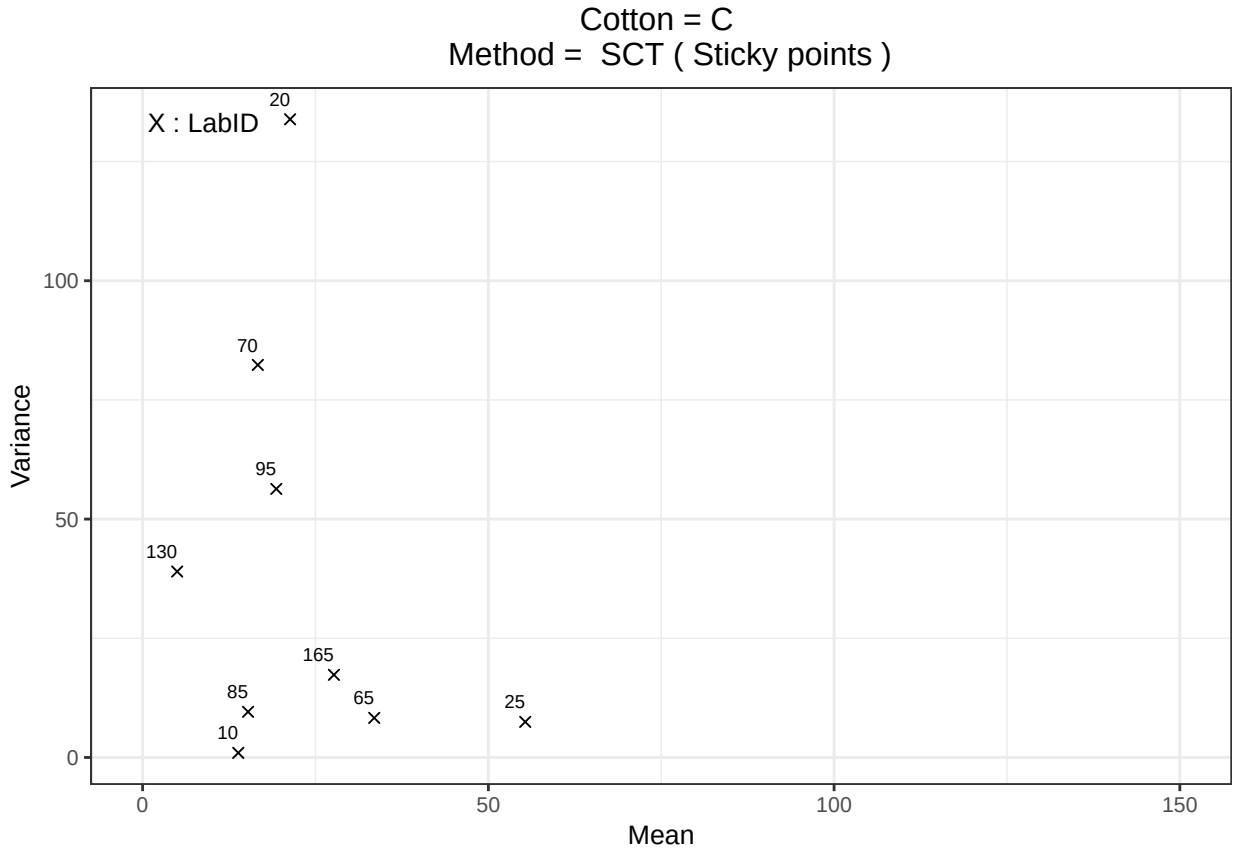

Cotton = C
Method = KOTITI (Sticky points)
X : LabID
90
Variance
Mean
0.8
0.6
0.4
0.2
0.0
−0.2
0.0
2.5
5.0
7.5

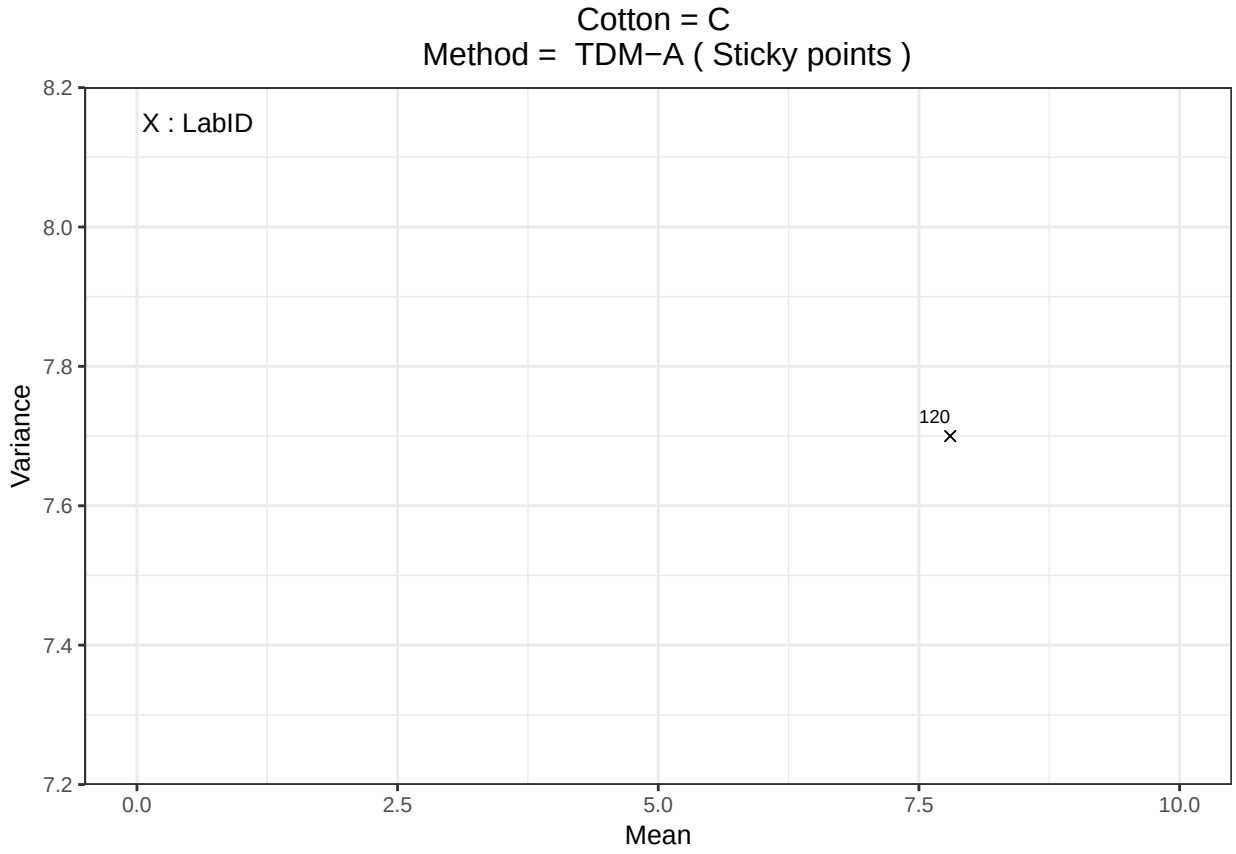

Cotton = C
Method = Minicard (ITMF grades)
X : LabID
125
80
Variance
0.3
0.2
0.1
0
1
2
3
Mean


Cotton = C
Method = Qualitative method (Grade)
X : LabID
1.00
0.75
0.50
0.25
Variance
45
0
1
2
3
4
Mean

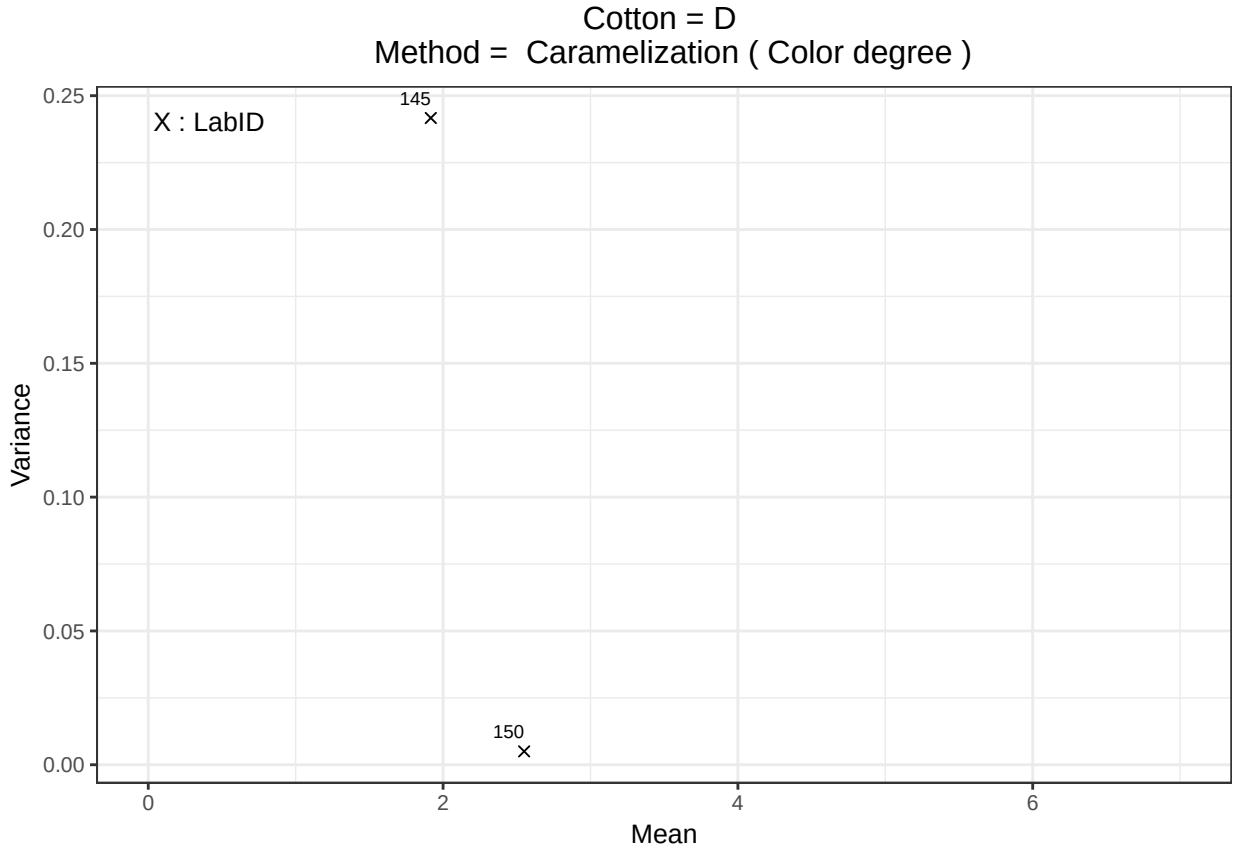

Cotton = C
Method = Quantitative method (Percent)
X : LabID
135
Variance
Mean
0.50
0.25
0.00
−0.25
0.00
0.25
0.50
0.75
1.00
1.25


Cotton = C
Method = Reactive Spray (Spray Grade)
X : LabID
160
Variance
Mean
0.0
0.2
0.4
0.6
0.8
0
1
2
3
4

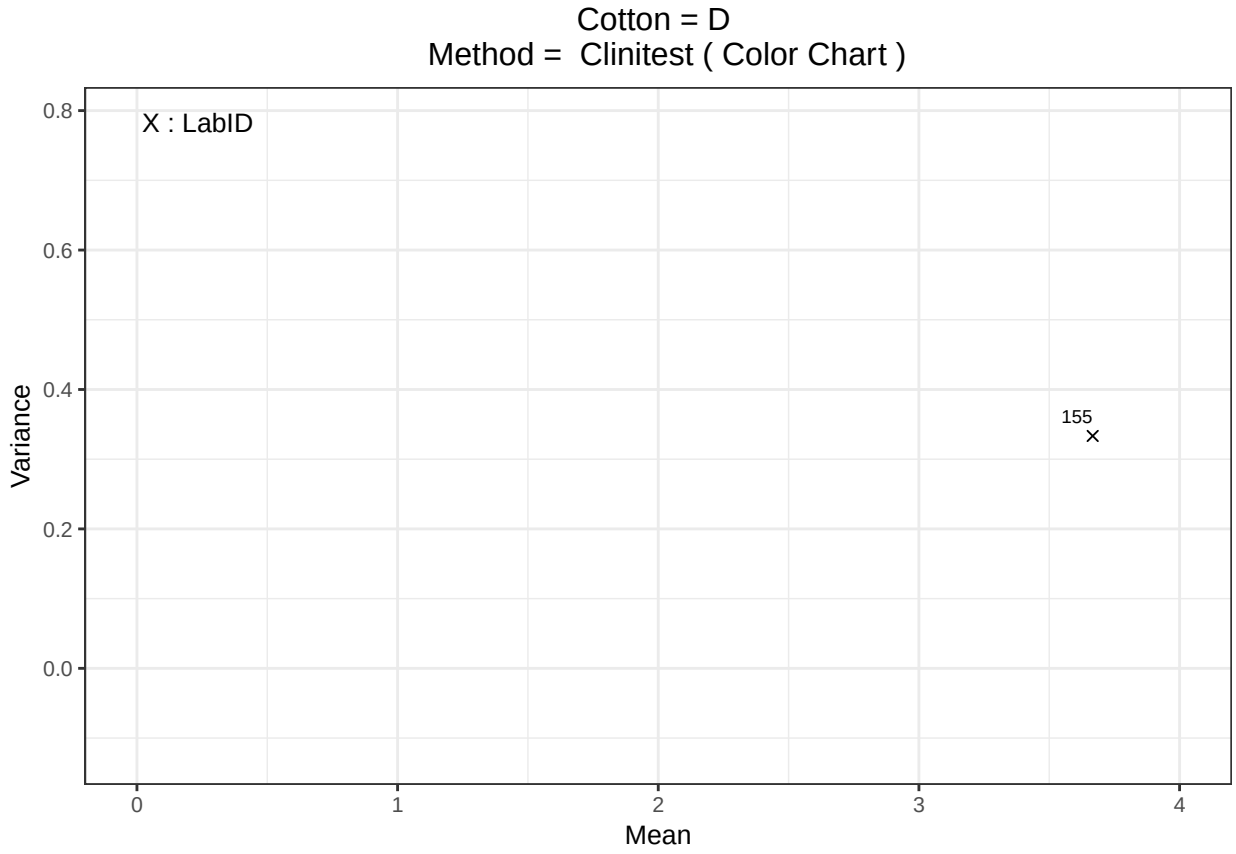

Cotton = C
Method = SCT (Sticky points)
X : LabID
20
70
95
130
165
85
65
25
10
Variance
Mean
0
50
100
150
0
50
100

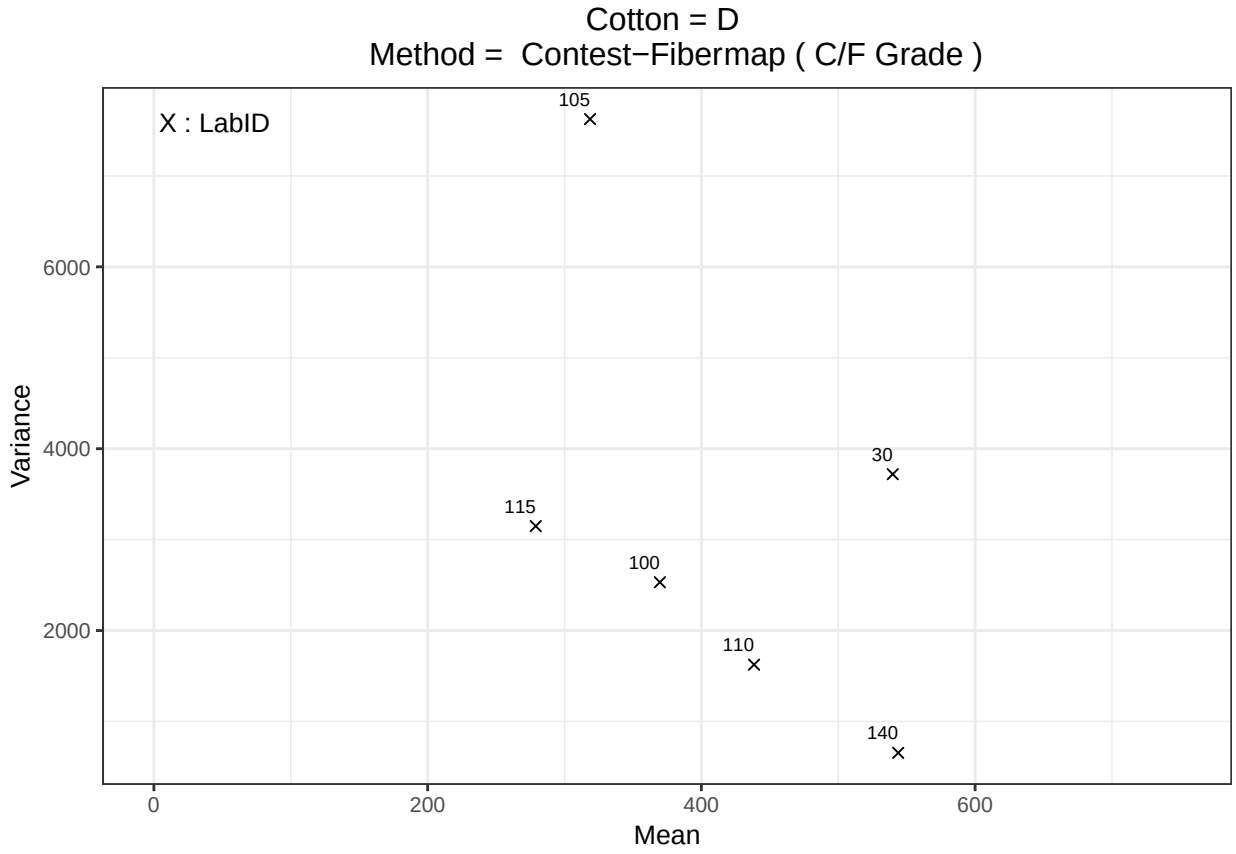

Cotton = C
Method = TDM−A (Sticky points)
X : LabID
120
Variance
Mean
8.2
8.0
7.8
7.6
7.4
7.2
0.0
2.5
5.0
7.5
10.0

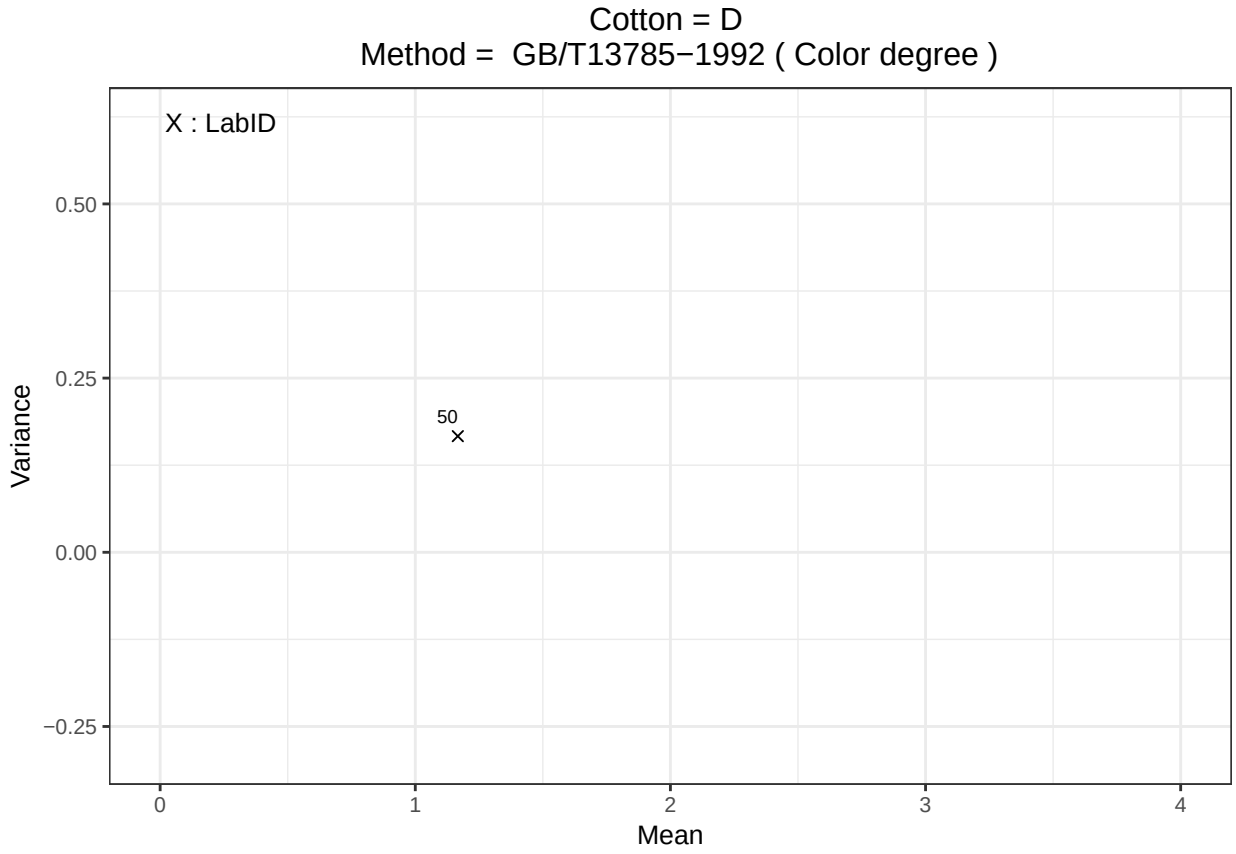
Cotton D : Variance between individual measurements = f(Mean) for all concerned labs

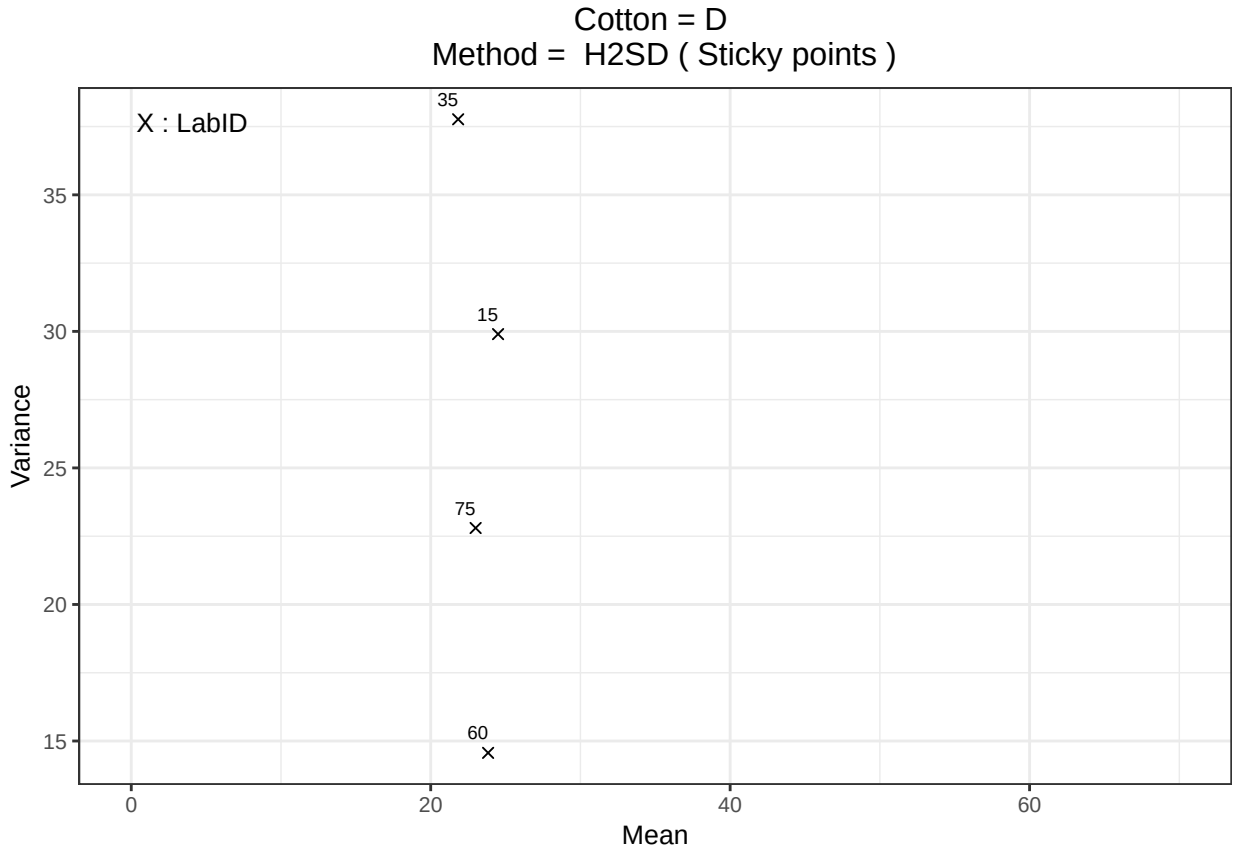


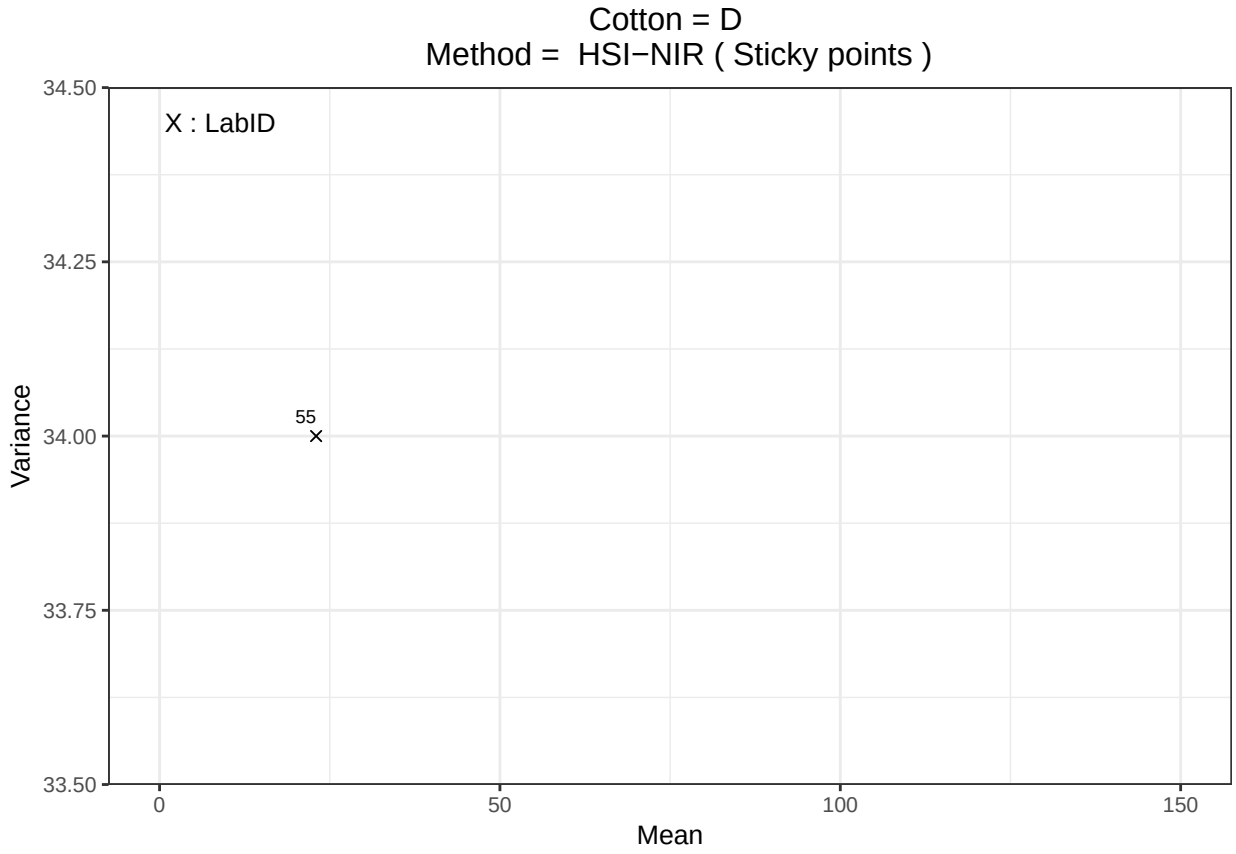
[1] "For Cotton = D and for method = Caramelization , 2 LabID (LabID being 5, 40) cannot be shown on this chart as only one measurement was performed and, therefore, a variance cannot be calculated in this case."

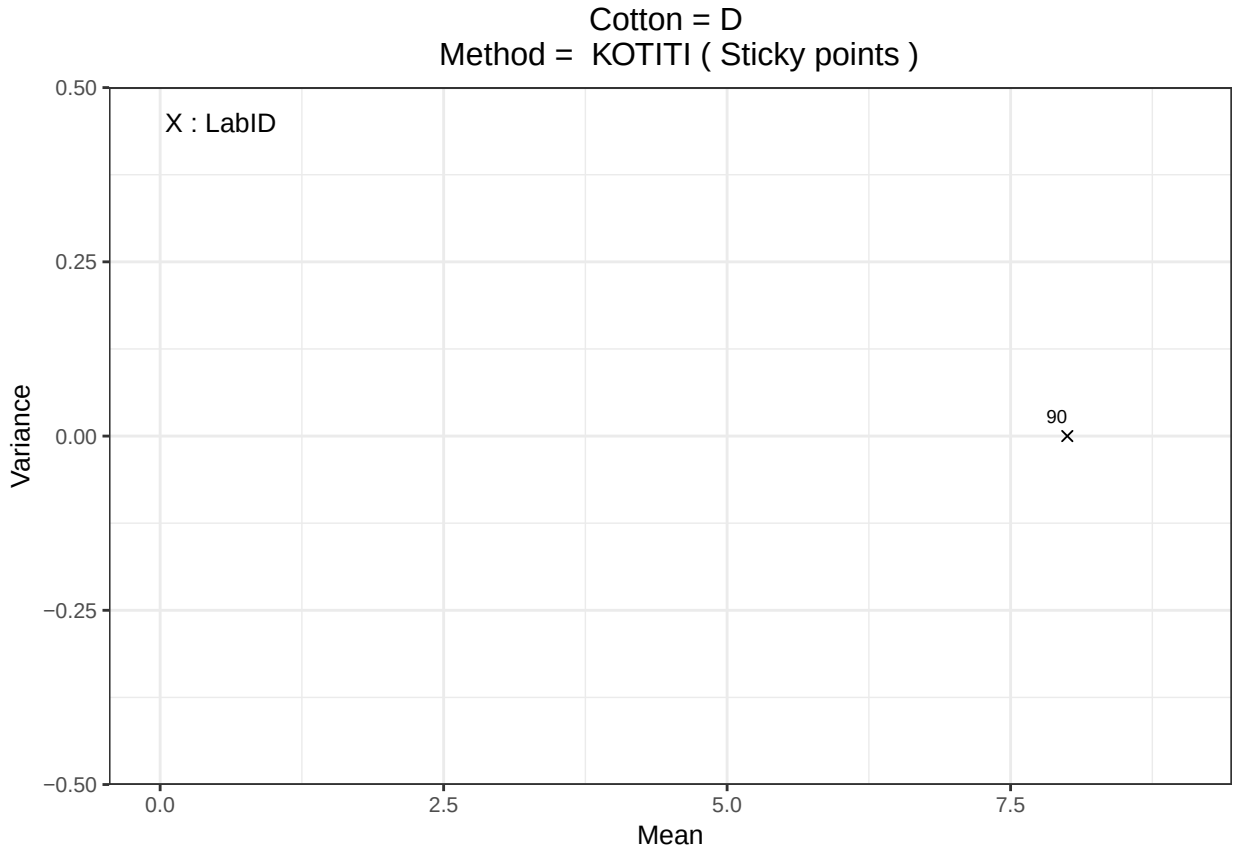

Cotton = D
Method = Clinitest (Color Chart)
X : LabID
155
Variance
Mean
0.0
0.2
0.4
0.6
0.8
0
1
2
3
4

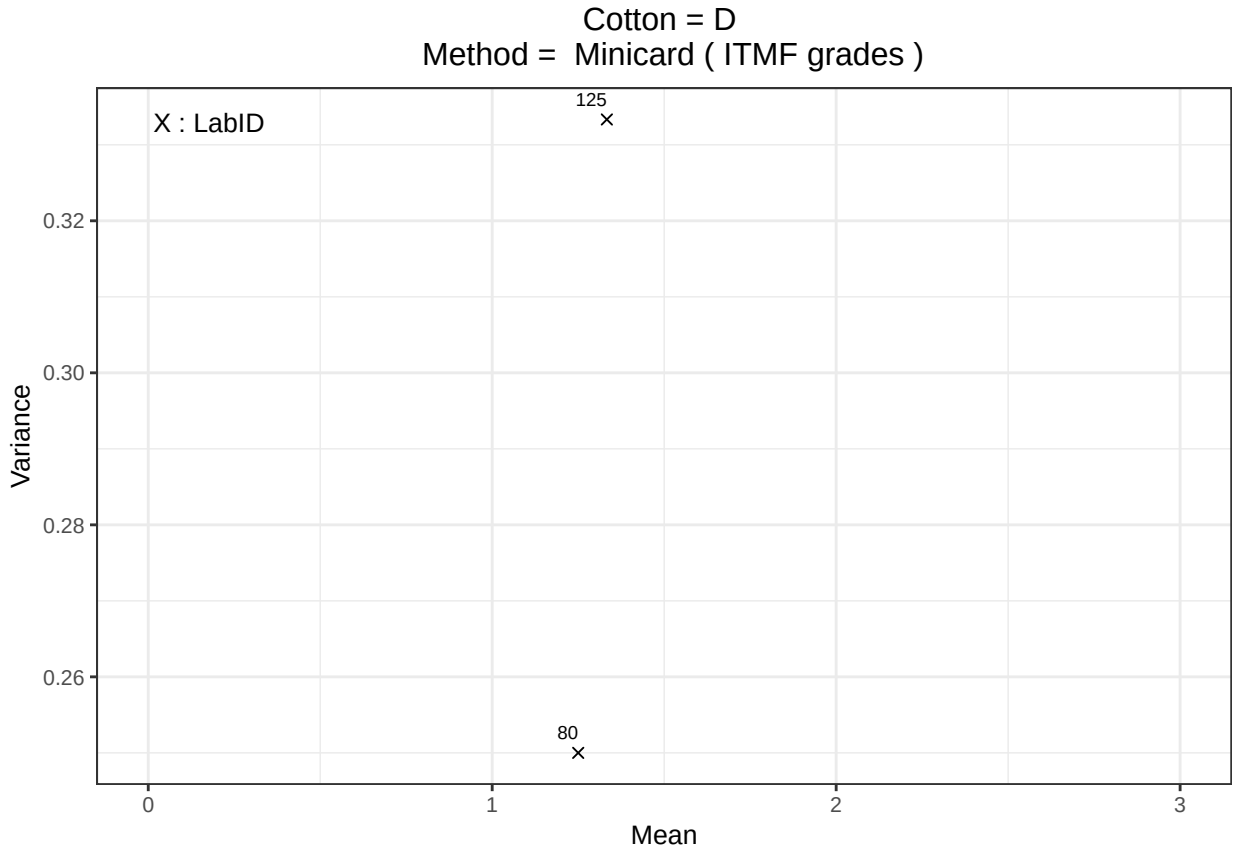

Cotton = D
Method = Contest−Fibermap (C/F Grade)
X : LabID
105
30
115
100
110
140
6000
4000
2000
Variance
0
200
400
600
Mean

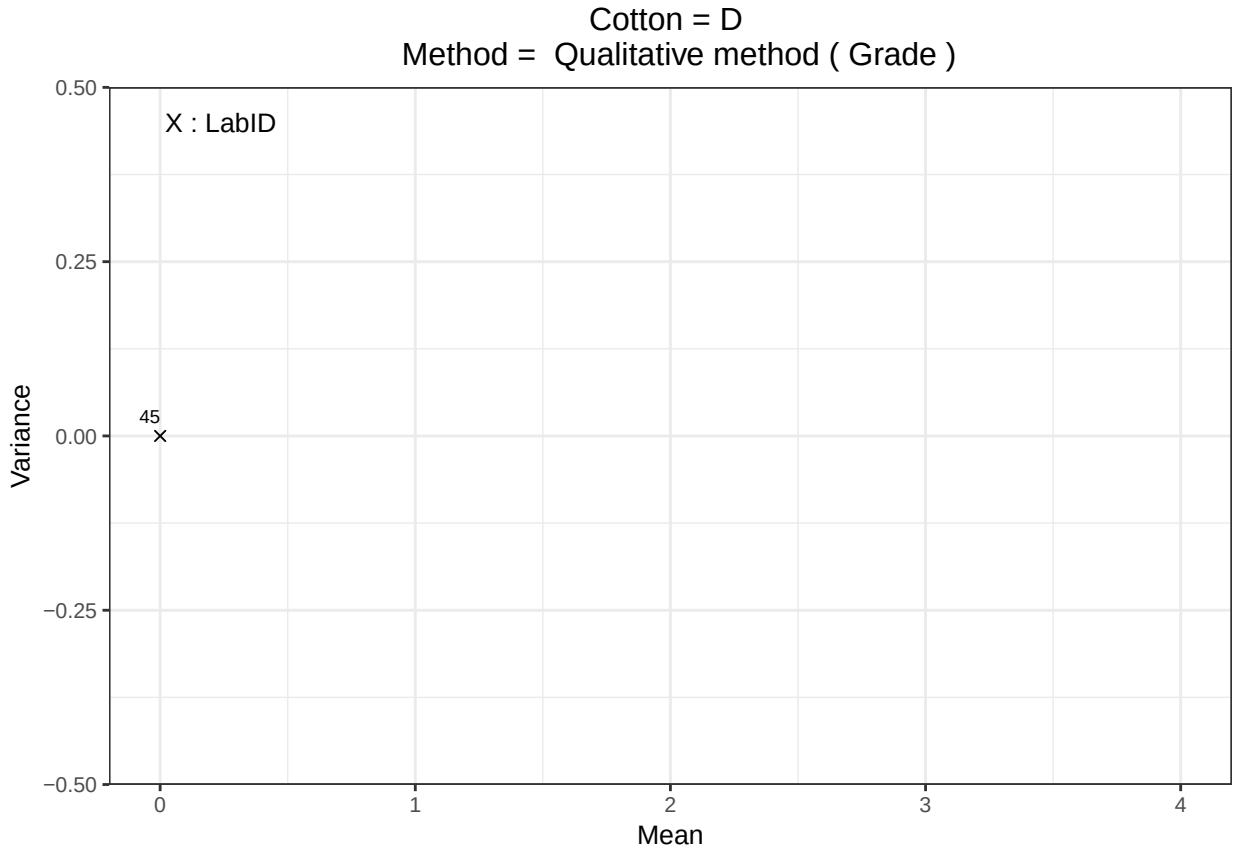

Cotton = D
Method = GB/T13785−1992 (Color degree)
X : LabID
0.50
0.25
0.00
−0.25
Variance
50
0
1
2
3
4
Mean

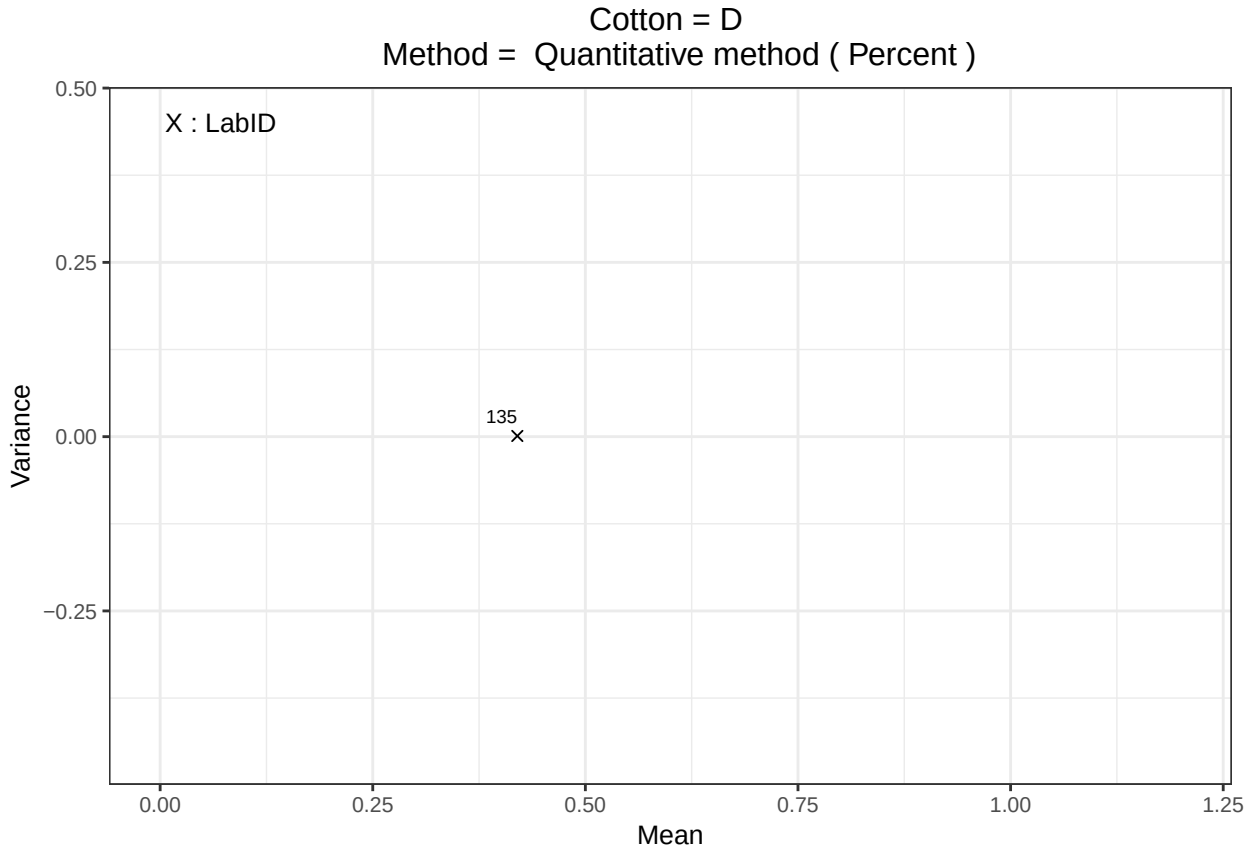

Cotton = D
Method = H2SD (Sticky points)
X : LabID
35
15
75
60
Variance
Mean
35
30
25
20
15
0
20
40
60

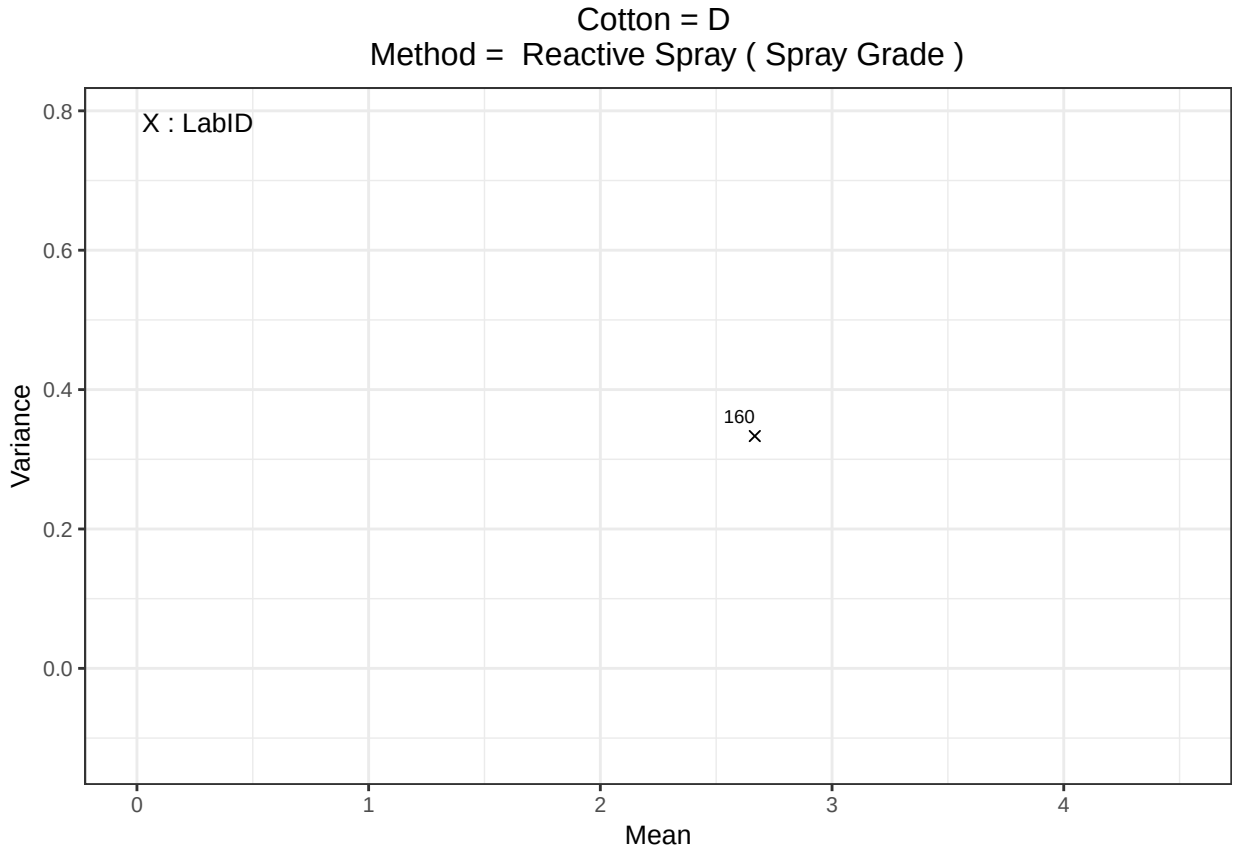

Cotton = D
Method = HSI−NIR (Sticky points)
X : LabID
55
Variance
Mean
34.50
34.25
34.00
33.75
33.50
0
50
100
150

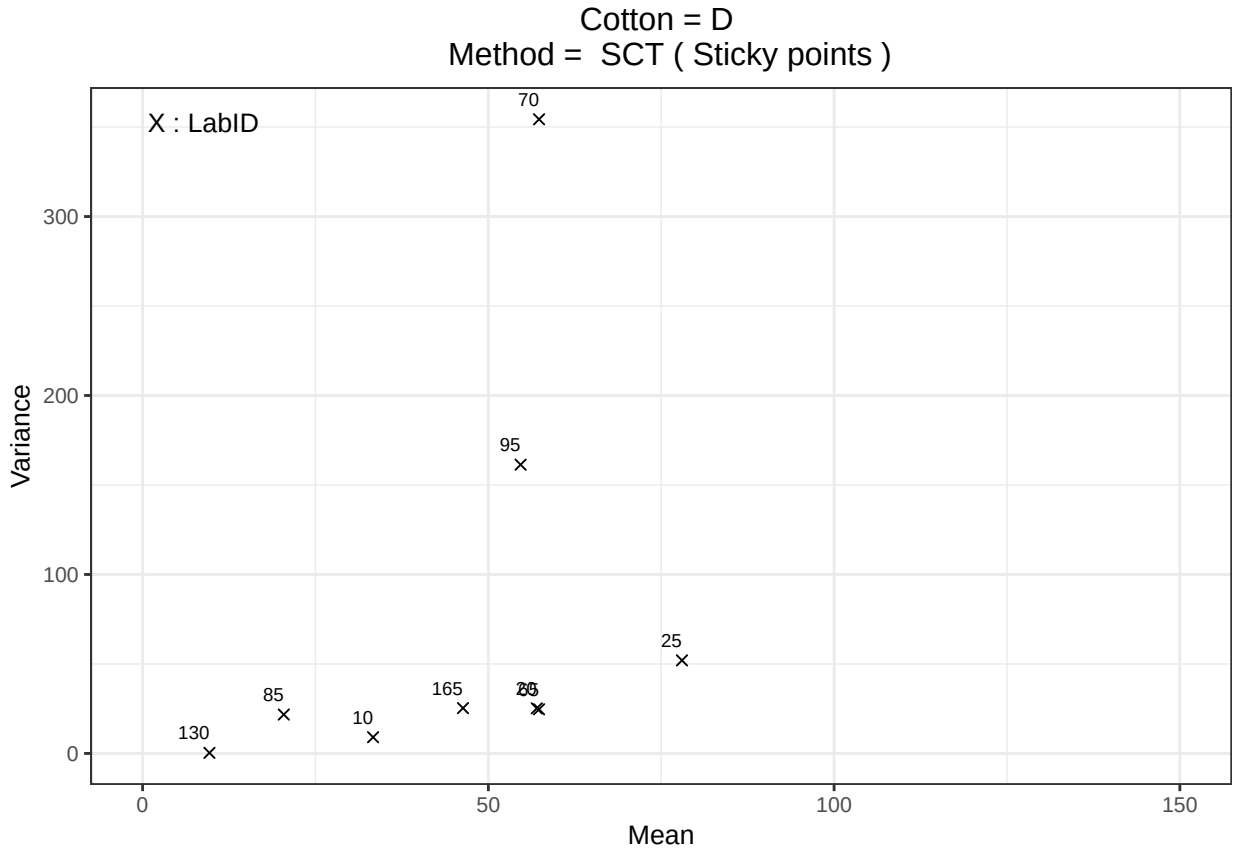

Cotton = D
Method = KOTITI (Sticky points)
X : LabID
90
Variance
Mean
0.50
0.25
0.00
−0.25
−0.50
0.0
2.5
5.0
7.5

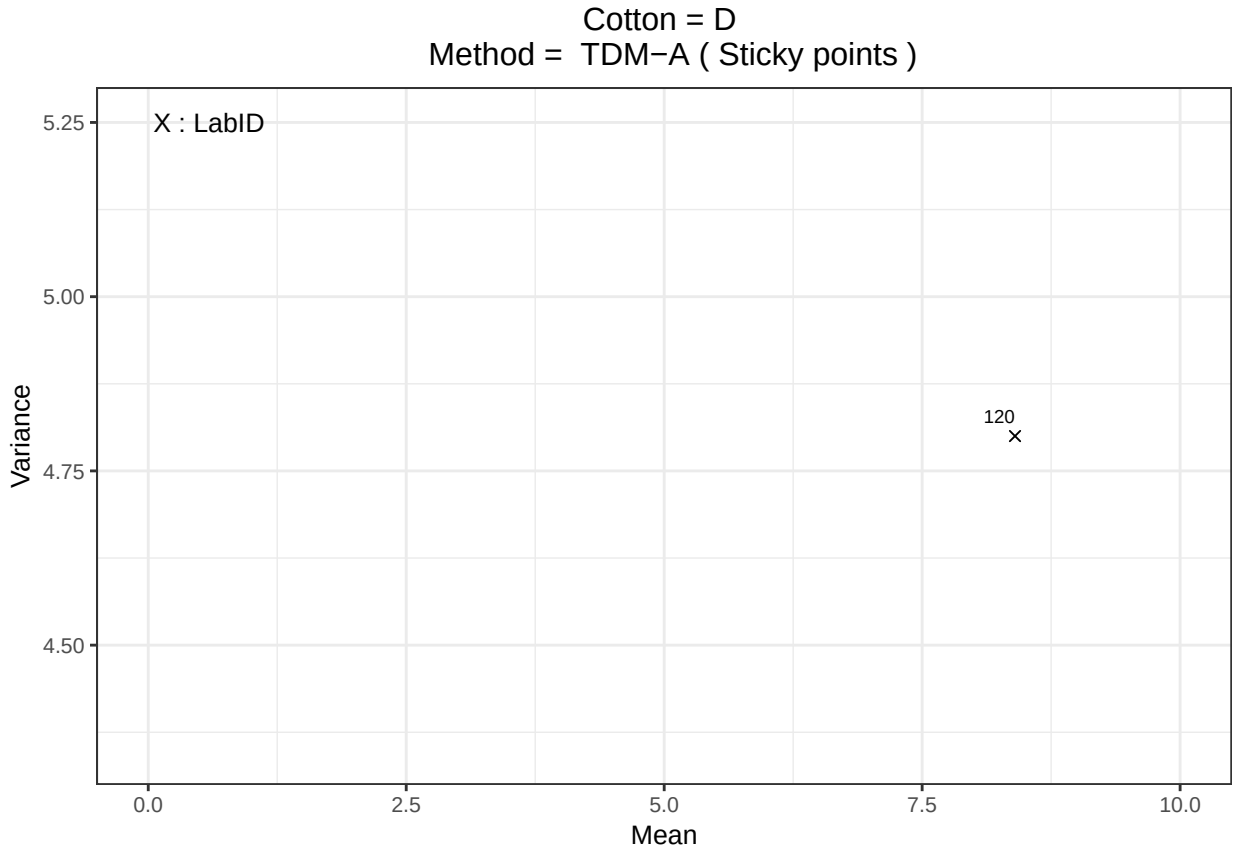

Cotton = D
Method = Minicard (ITMF grades)
X : LabID
125
80
0.32
0.30
0.28
0.26
Variance
0
1
2
3
Mean


Cotton = D
Method = Qualitative method (Grade)
X : LabID
45
Variance
Mean
0.50
0.25
0.00
−0.25
−0.50
0
1
2
3
4

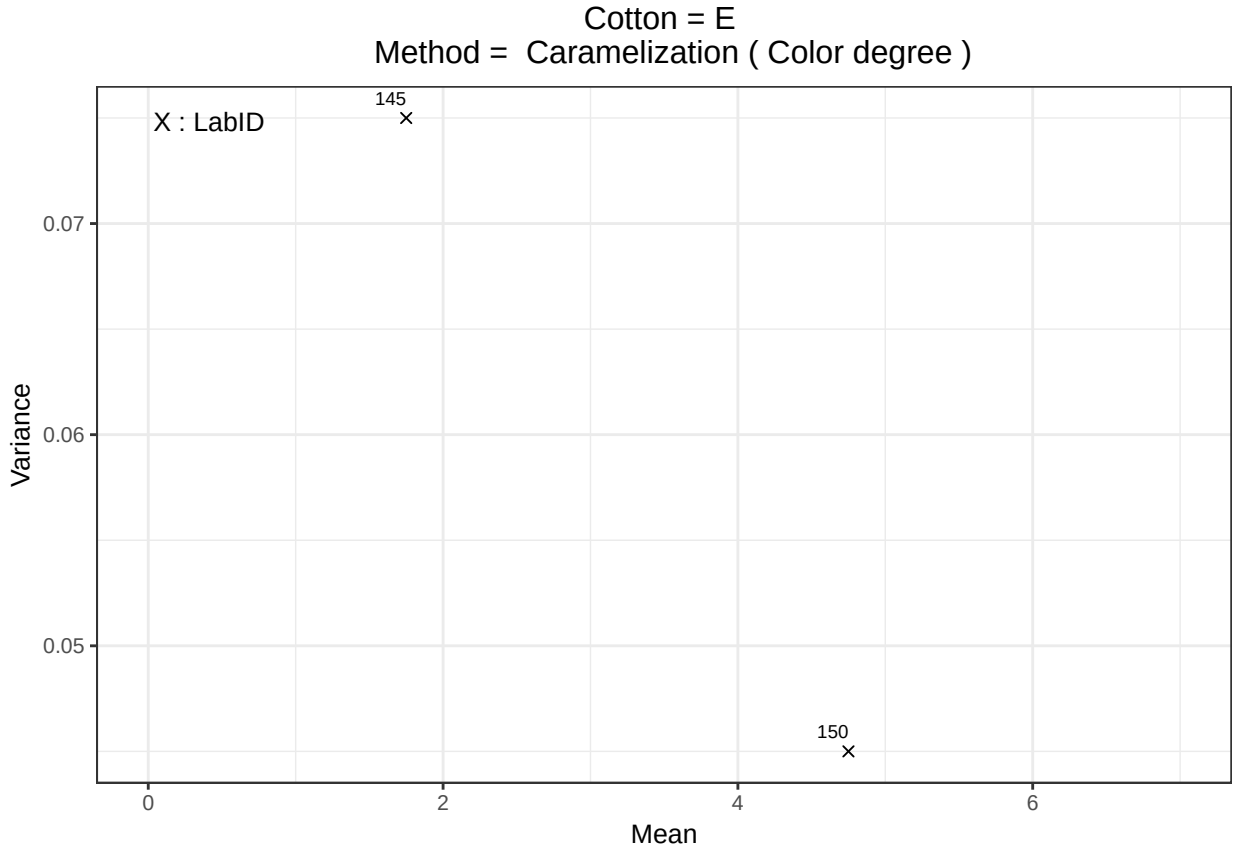

Cotton = D
Method = Quantitative method (Percent)
X : LabID
135
Variance
Mean
0.50
0.25
0.00
−0.25
0.00
0.25
0.50
0.75
1.00
1.25


Cotton = D
Method = Reactive Spray (Spray Grade)
X : LabID
160
Variance
Mean
0.0
0.2
0.4
0.6
0.8
0
1
2
3
4

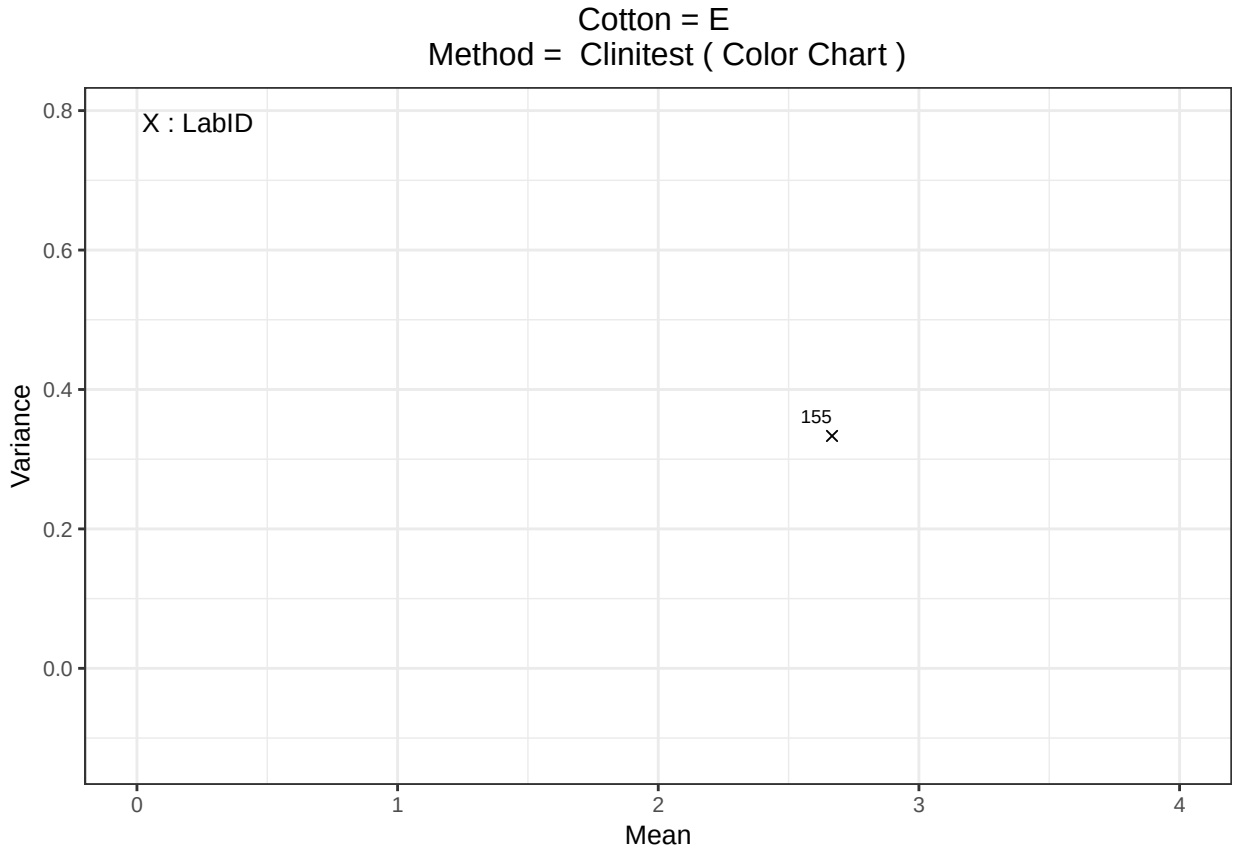

Cotton = D
Method = SCT (Sticky points)
X : LabID
70
95
25
85
165
10
130
Variance
Mean
0
100
200
300
0
50
100
150

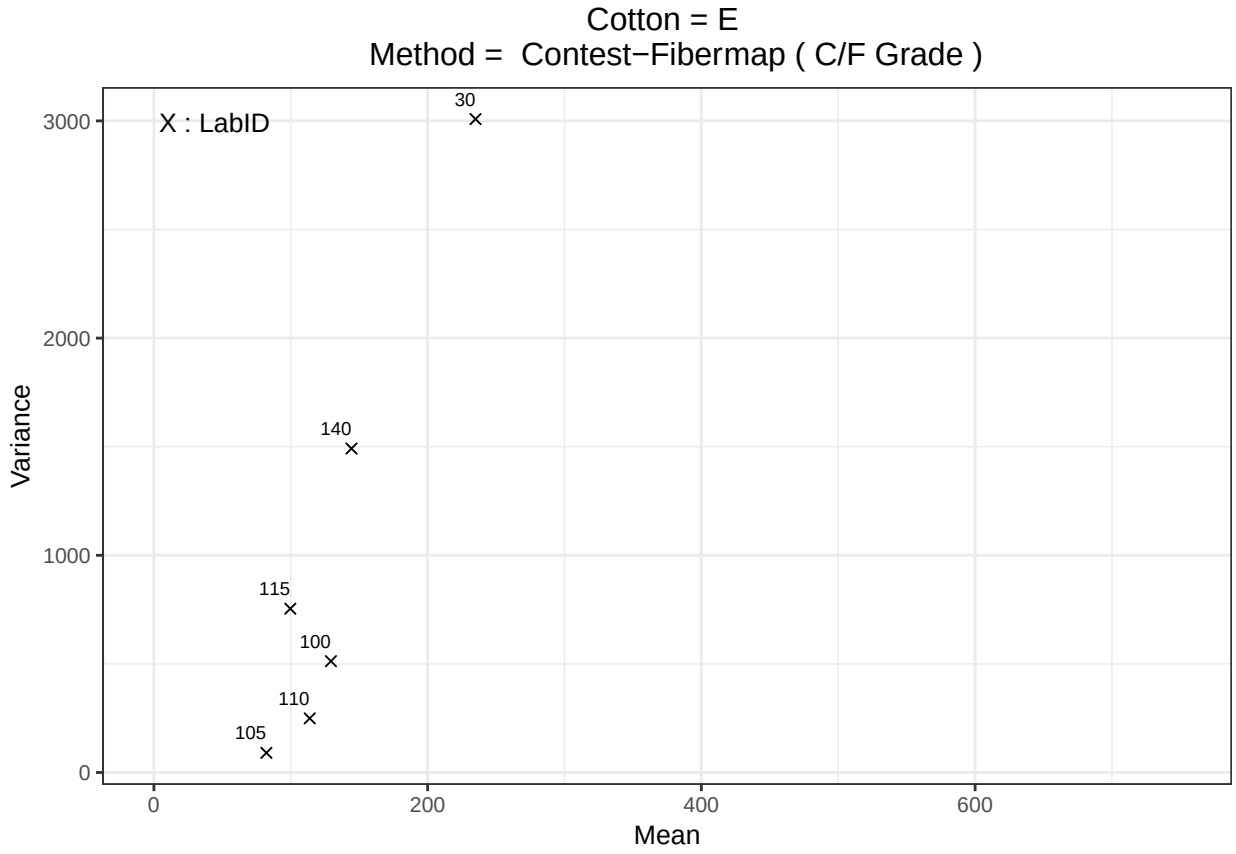

Cotton = D
Method = TDM−A (Sticky points)
X : LabID
5.25
5.00
4.75
4.50
Variance
120
0.0
2.5
5.0
7.5
10.0
Mean

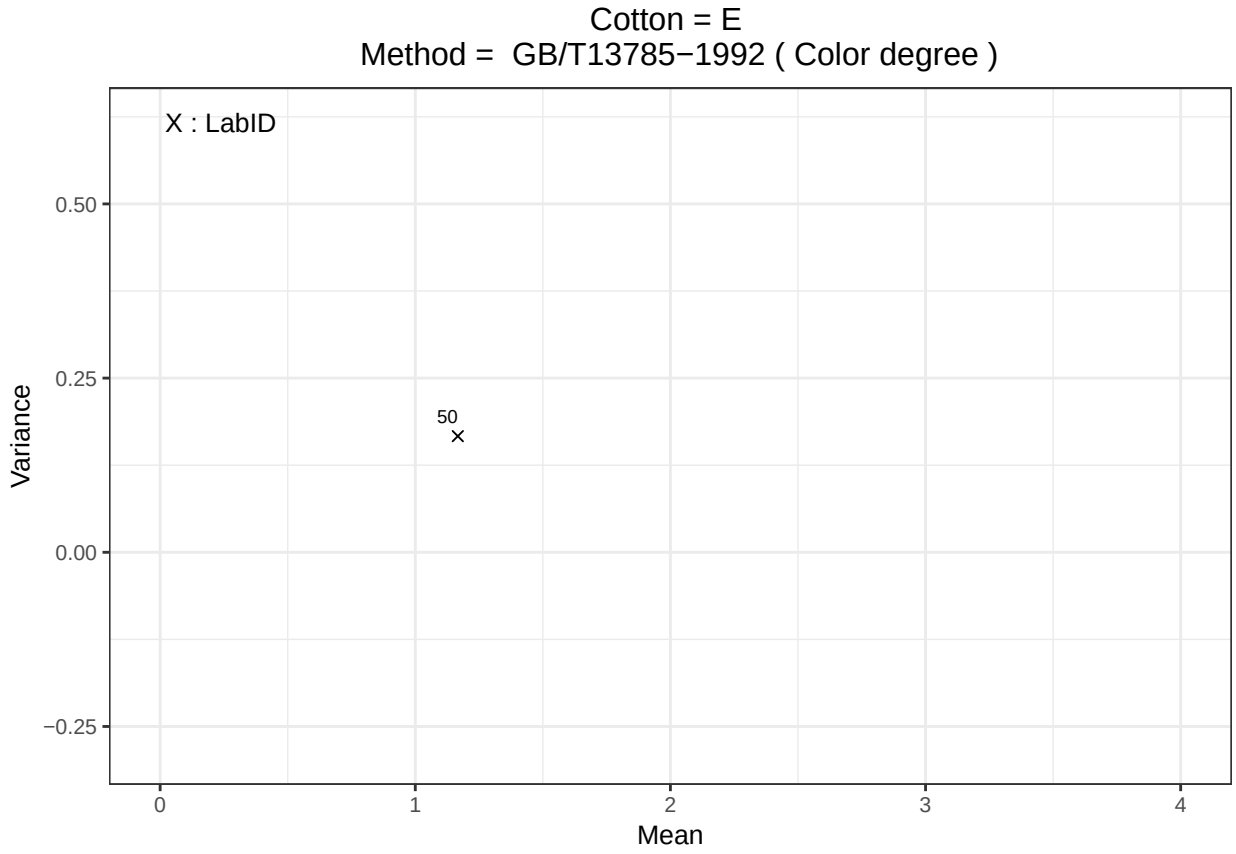
Cotton E : Variance between individual measurements = f(Mean) for all concerned labs

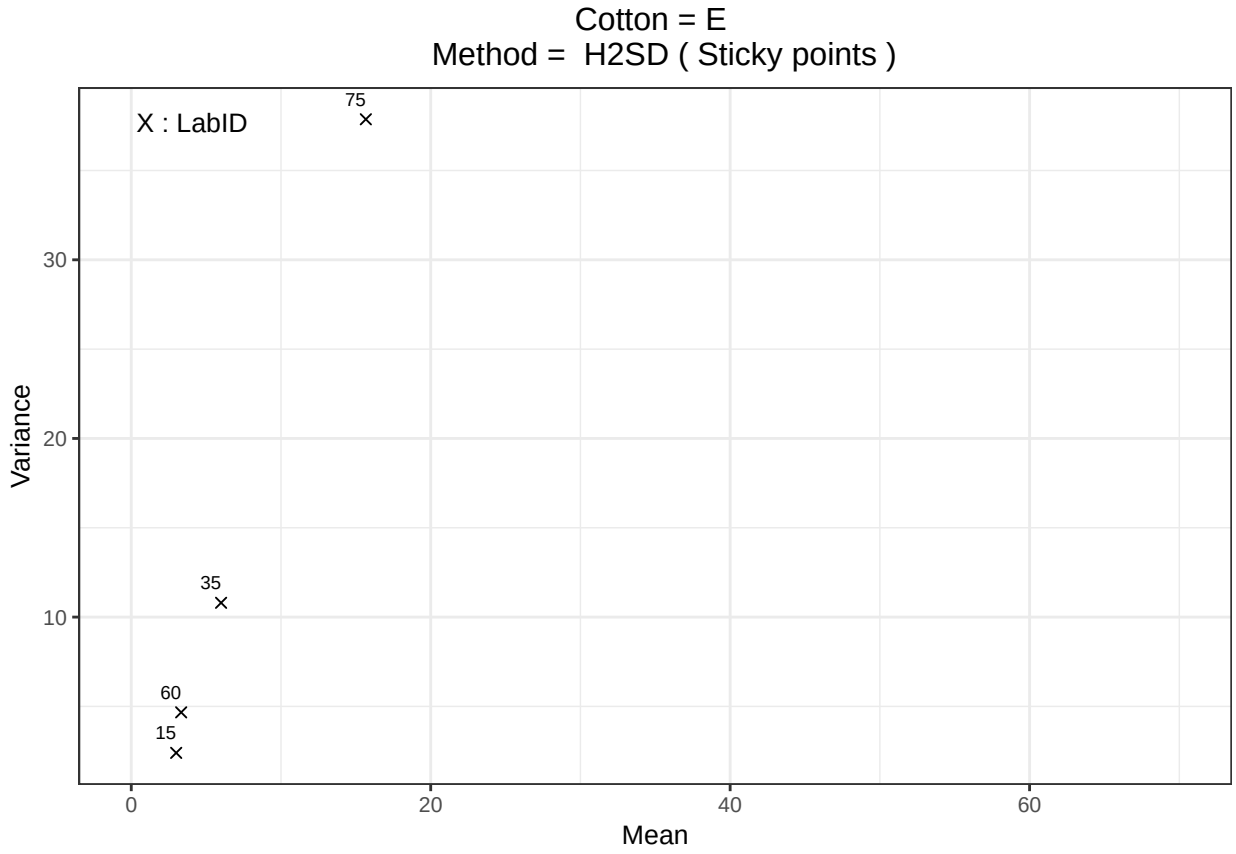


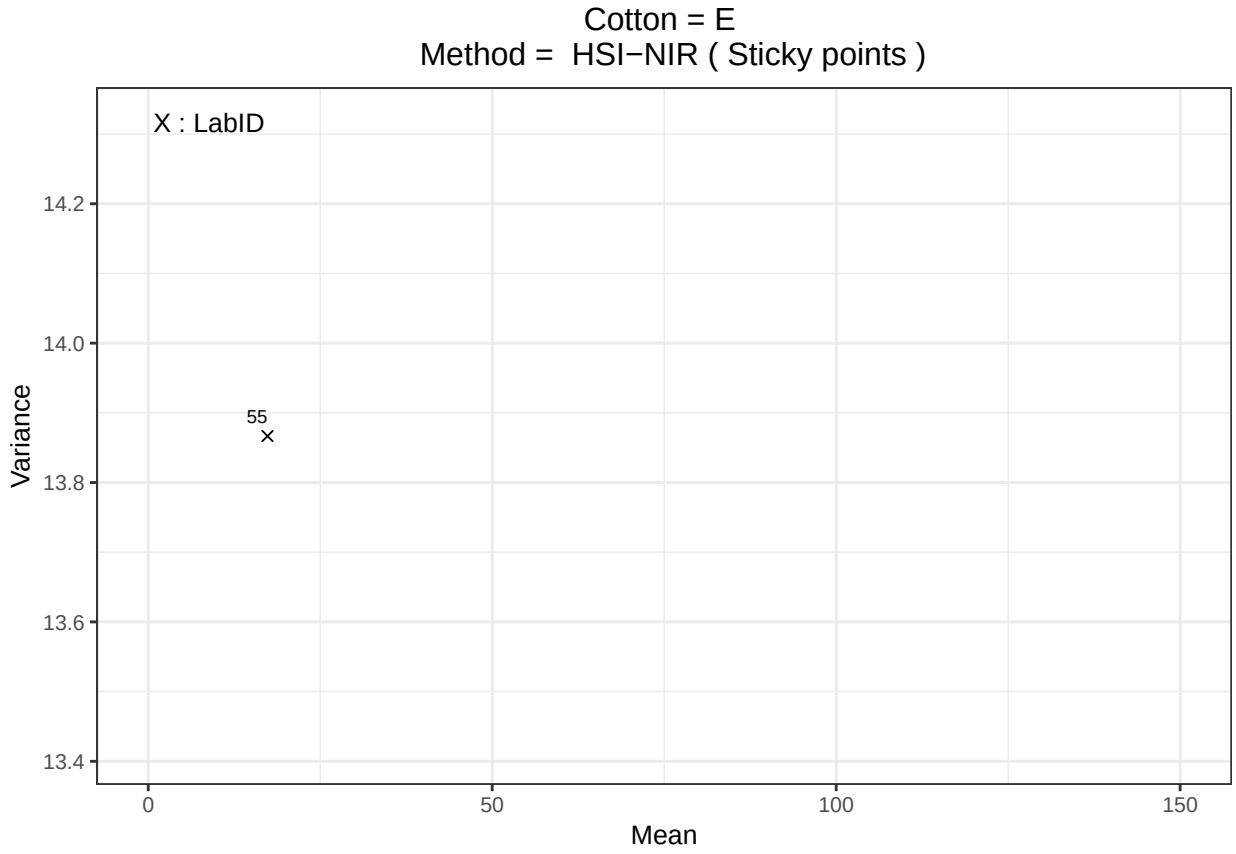
[1] "For Cotton = E and for method = Caramelization , 2 LabID (LabID being 5, 40) cannot be shown on this chart as only one measurement was performed and, therefore, a variance cannot be calculated in this case."

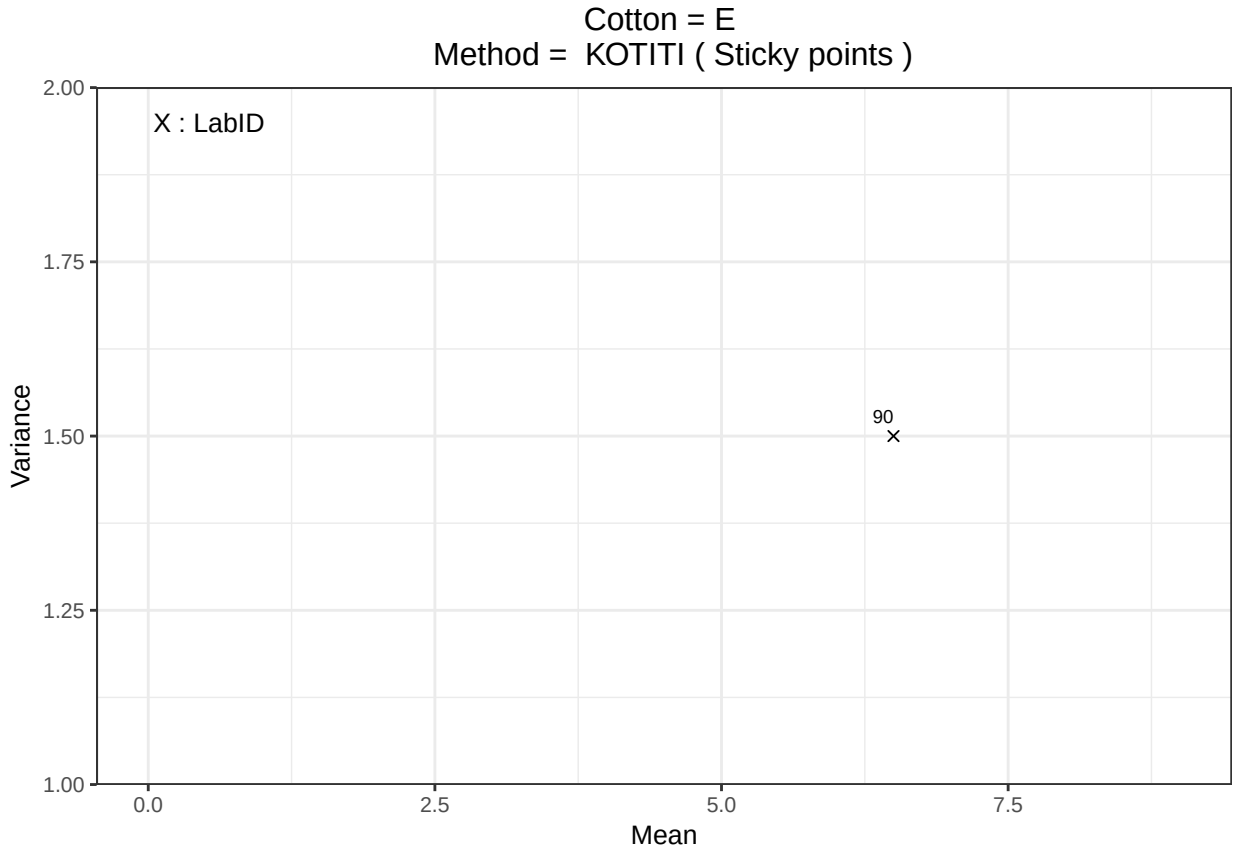

Cotton = E
Method = Clinitest (Color Chart)
X : LabID
155
Variance
Mean
0.0
0.2
0.4
0.6
0.8
0
1
2
3
4

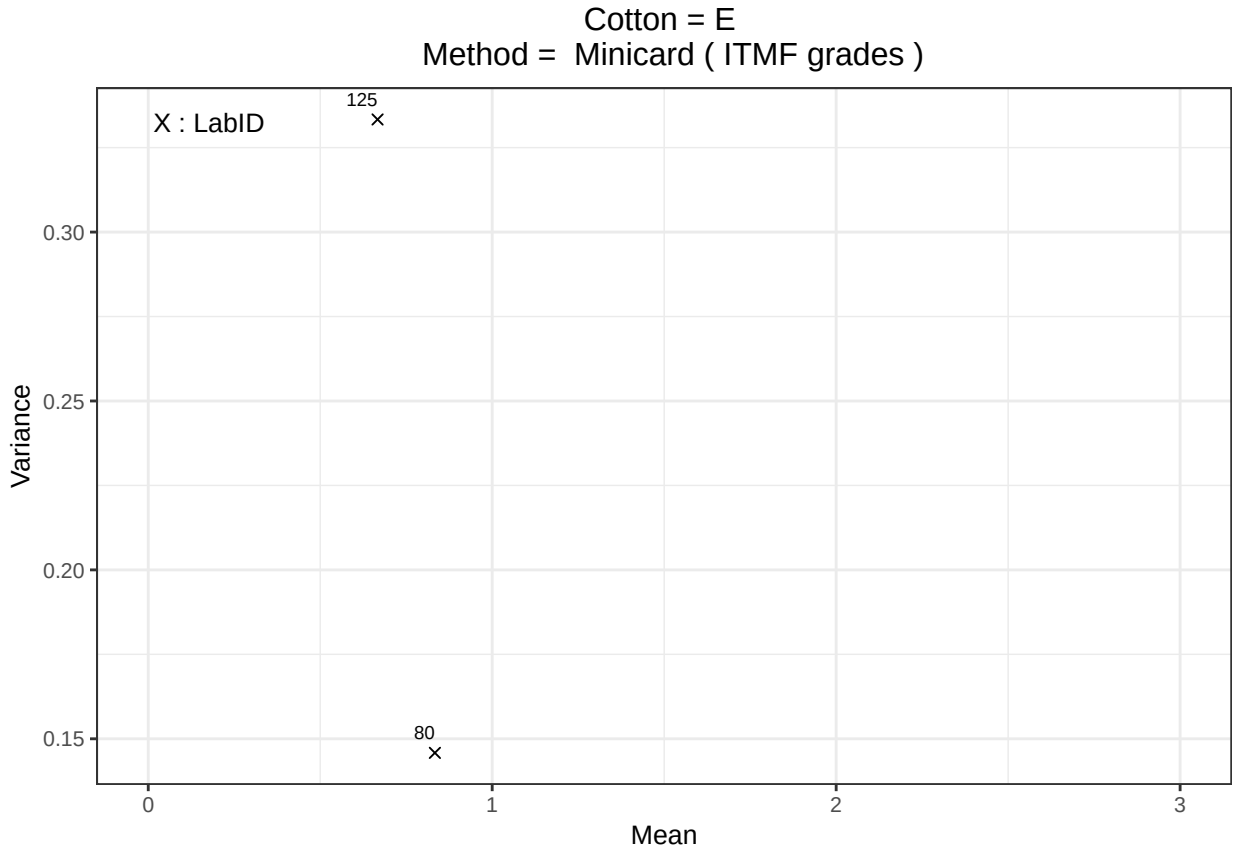

Cotton = E
Method = Contest−Fibermap (C/F Grade)
X : LabID
30
140
115
100
110
105
Variance
Mean
0
1000
2000
3000
0
200
400
600

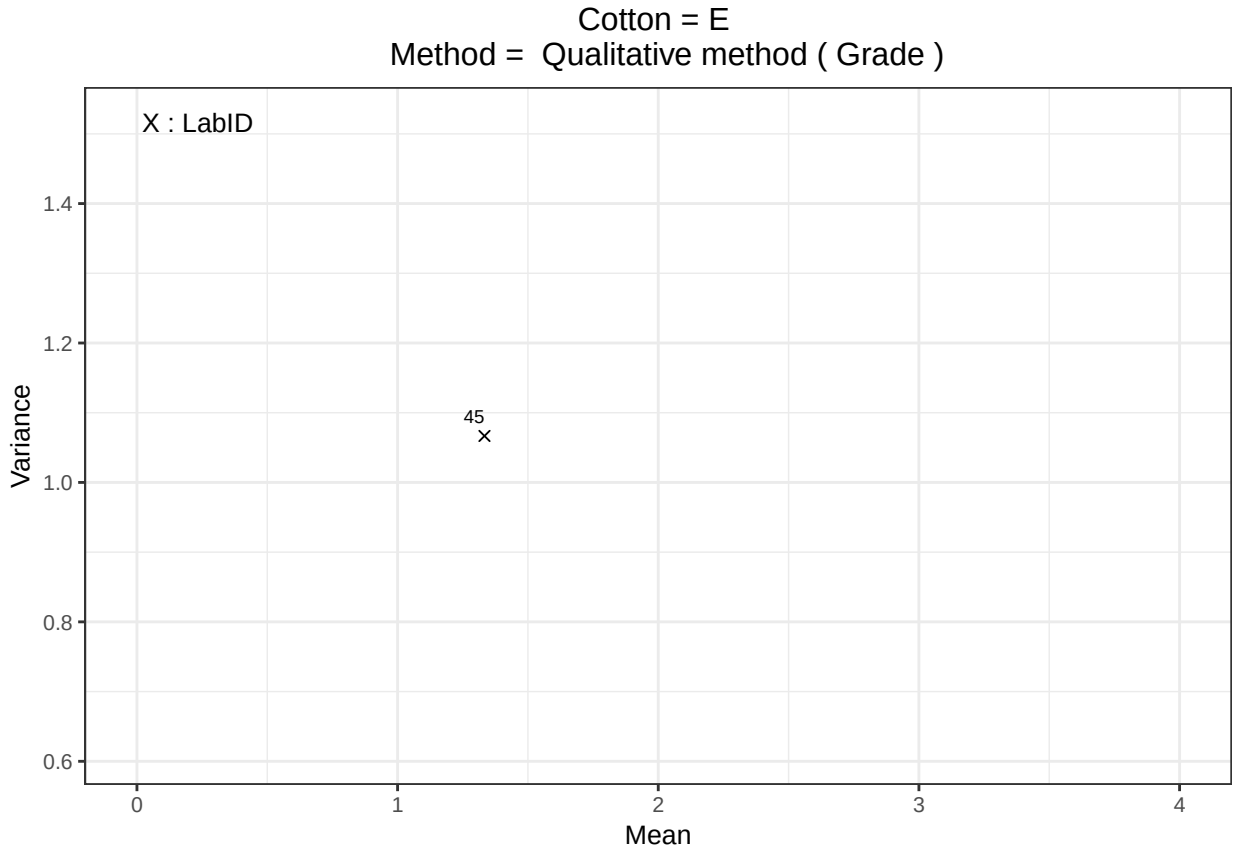

Cotton = E
Method = GB/T13785−1992 (Color degree)
X : LabID
0.50
0.25
0.00
−0.25
Variance
50
0
1
2
3
4
Mean

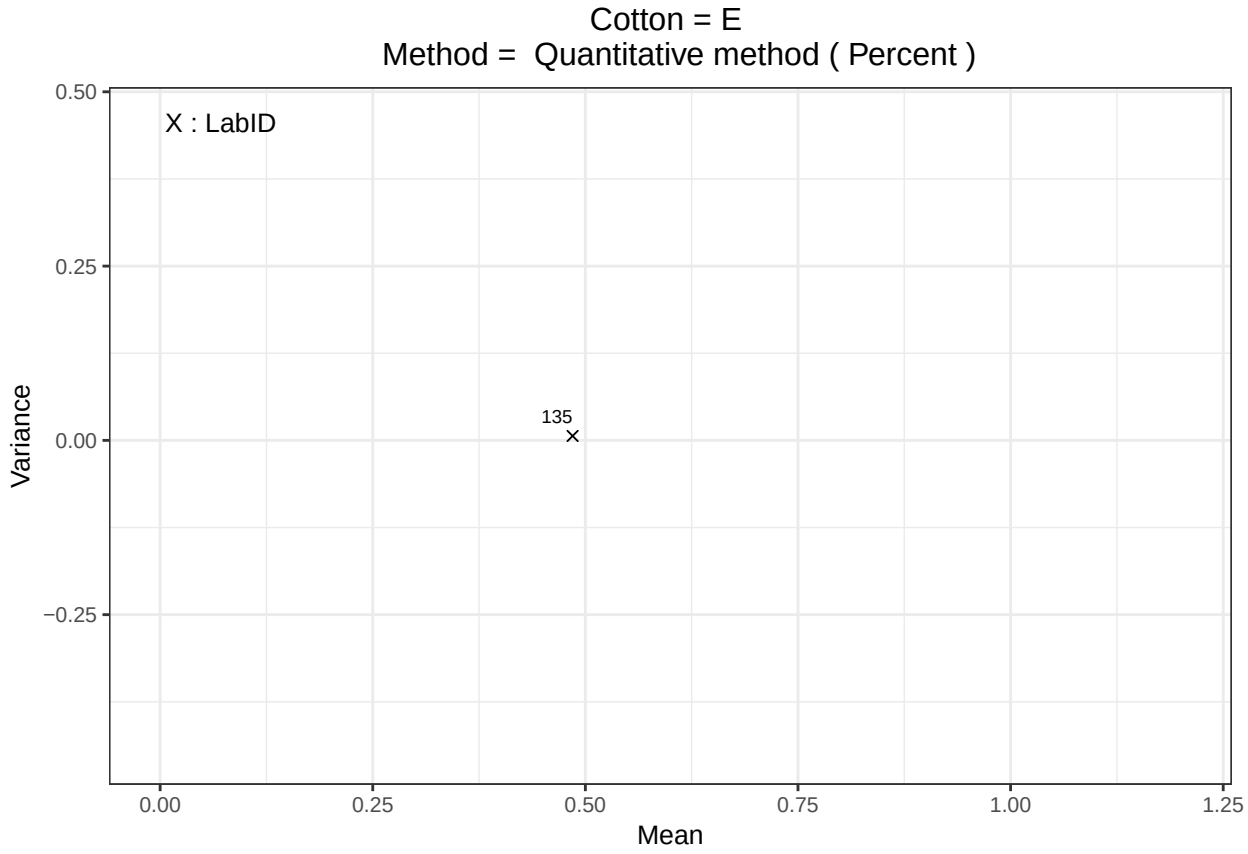

Cotton = E
Method = H2SD (Sticky points)
X : LabID
75
35
60
15
Variance
30
20
10
0
20
40
60
Mean

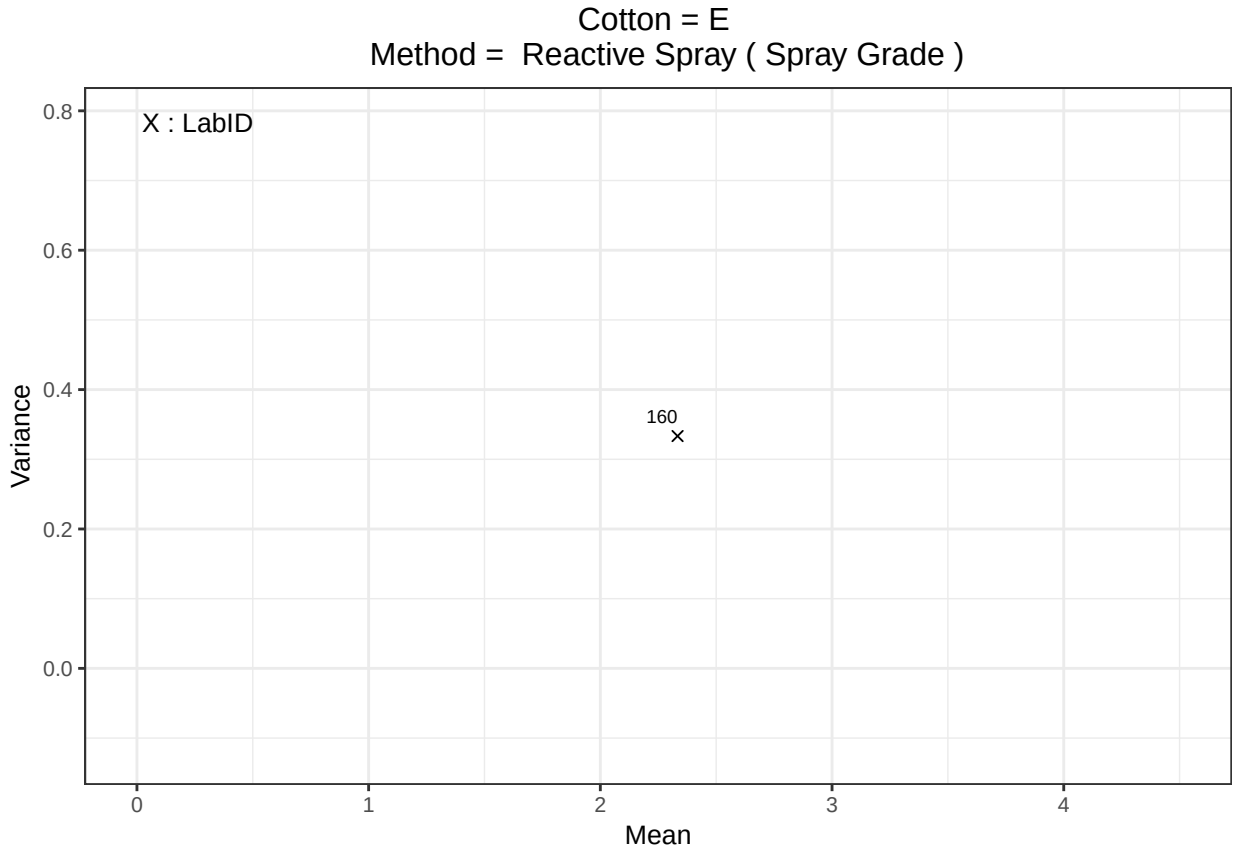

Cotton = E
Method = HSI−NIR (Sticky points)
X : LabID
14.2
14.0
13.8
13.6
13.4
Variance
55
0
50
100
150
Mean

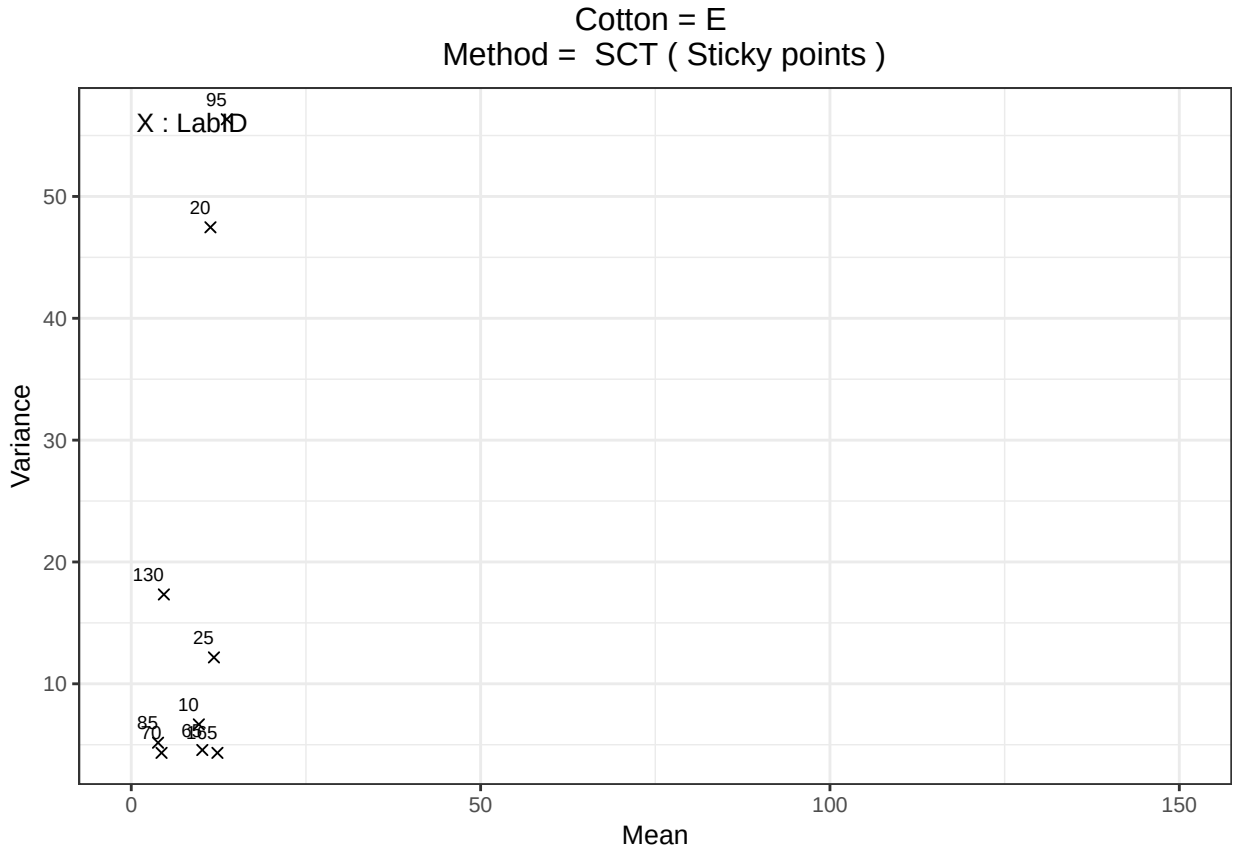

Cotton = E
Method = KOTITI (Sticky points)
X : LabID
90
Variance
Mean
2.00
1.75
1.50
1.25
1.00
0.0
2.5
5.0
7.5

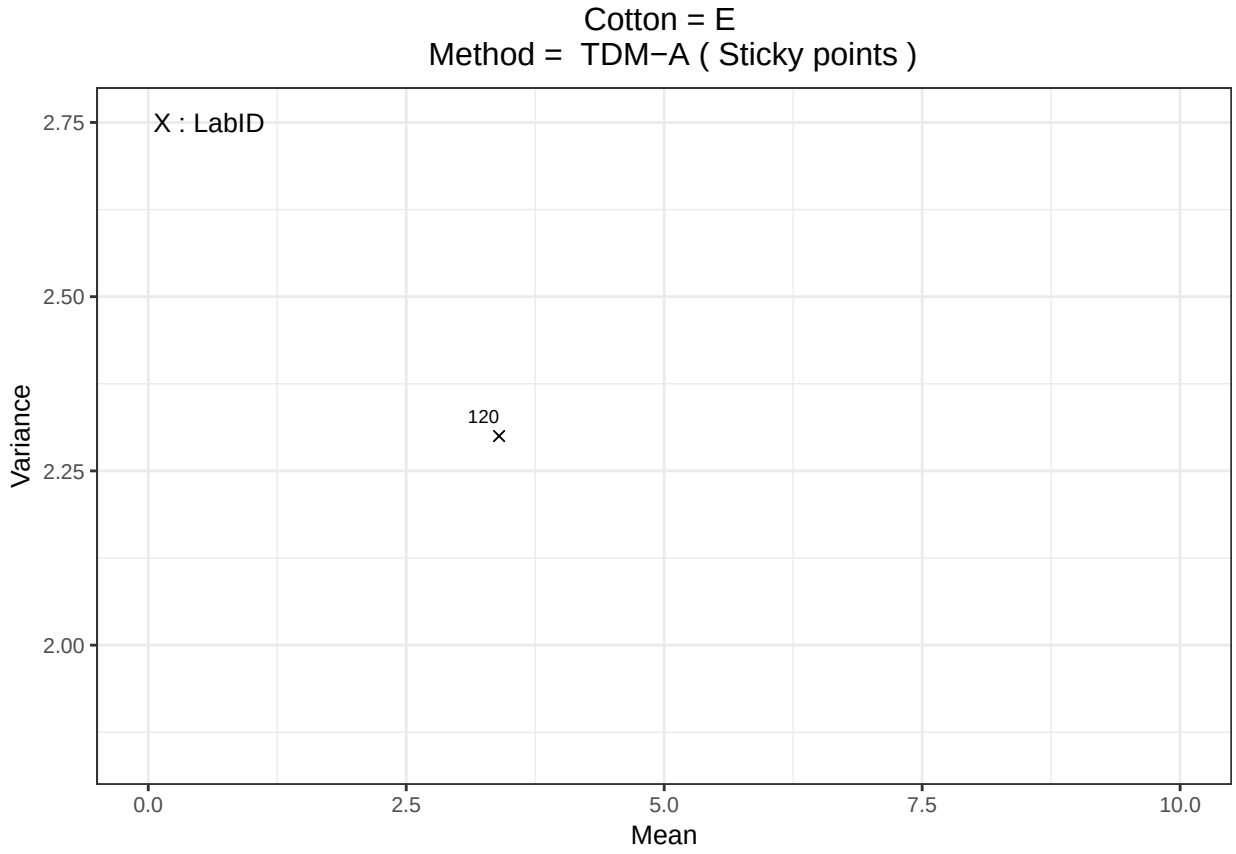

Cotton = E
Method = Minicard (ITMF grades)
X : LabID
125
80
Variance
0.30
0.25
0.20
0.15
0
1
2
3
Mean


Cotton = E
Method = Qualitative method (Grade)
X : LabID
45
Variance
Mean
1.4
1.2
1.0
0.8
0.6
0
1
2
3
4


Cotton = E
Method = Quantitative method (Percent)
X : LabID
135
Variance
Mean
0.50
0.25
0.00
−0.25
0.00
0.25
0.50
0.75
1.00
1.25

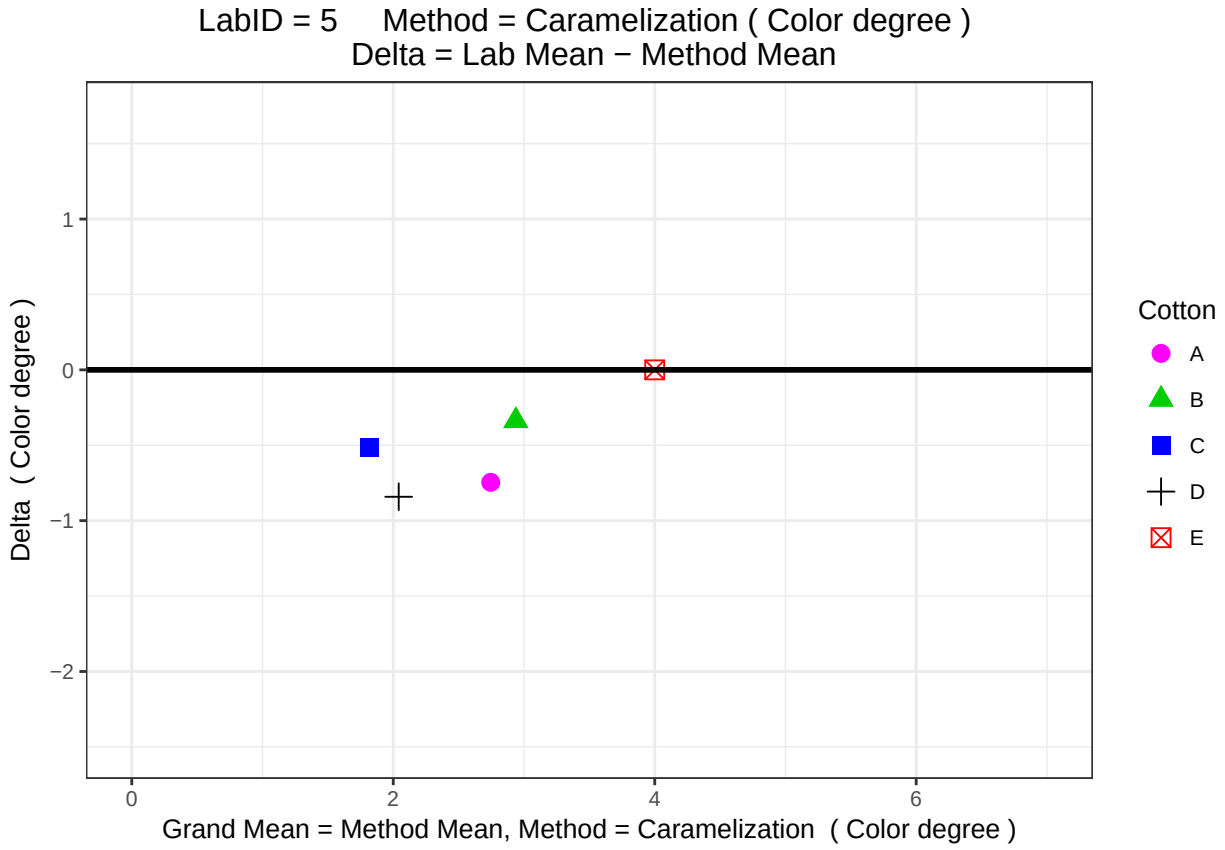

Cotton = E
Method = Reactive Spray (Spray Grade)
X : LabID
160
Variance
Mean
0.0
0.2
0.4
0.6
0.8
0
1
2
3
4


Cotton = E
Method = SCT (Sticky points)
X : LabID
95
20
130
25
10
85
70
65
Variance
Mean
0
50
100
150
10
20
30
40
50


Cotton = E
Method = TDM−A (Sticky points)
X : LabID
120
Variance
Mean
2.75
2.50
2.25
2.00
0.0
2.5
5.0
7.5
10.0

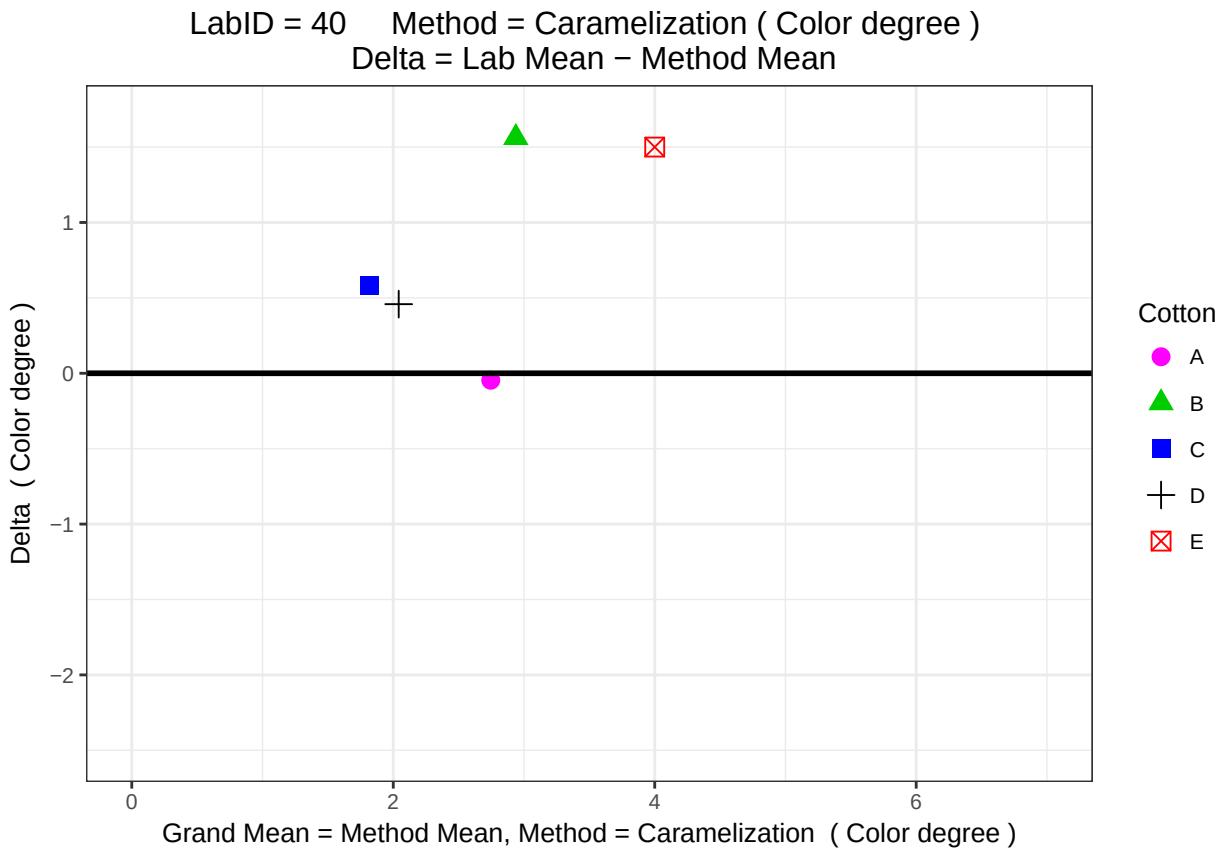
CSITC type charts: distance of Lab readings to the Grand Mean by Method and by LabID [6]

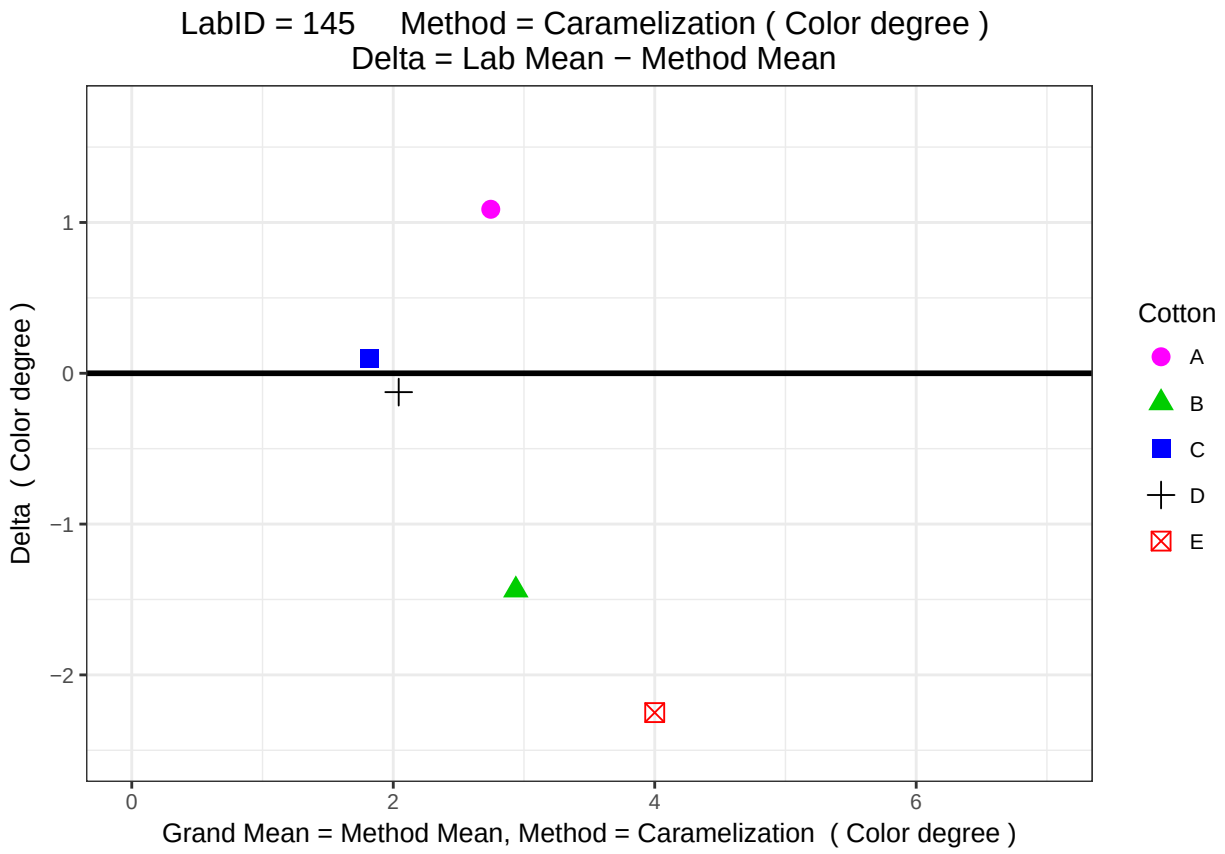
CSITC type chart for Method Caramelization

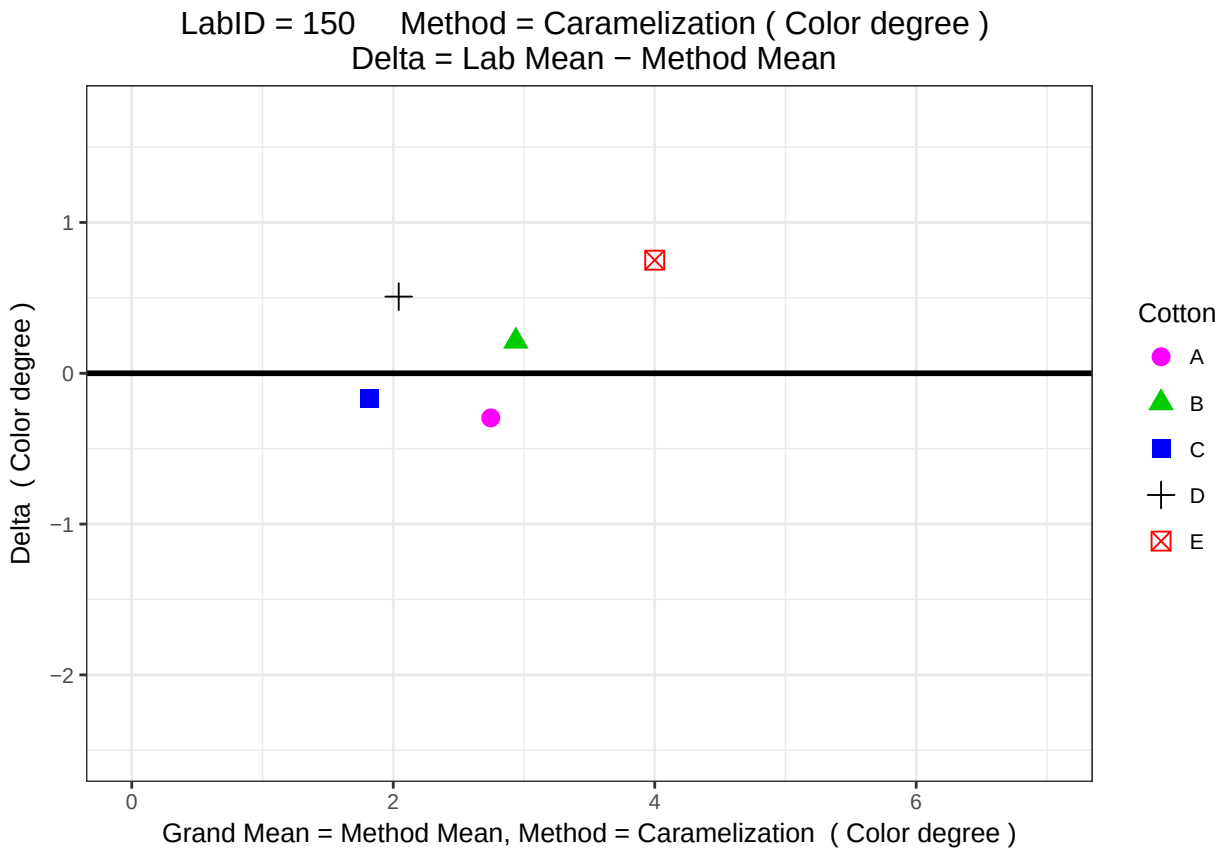


[6]Footnote

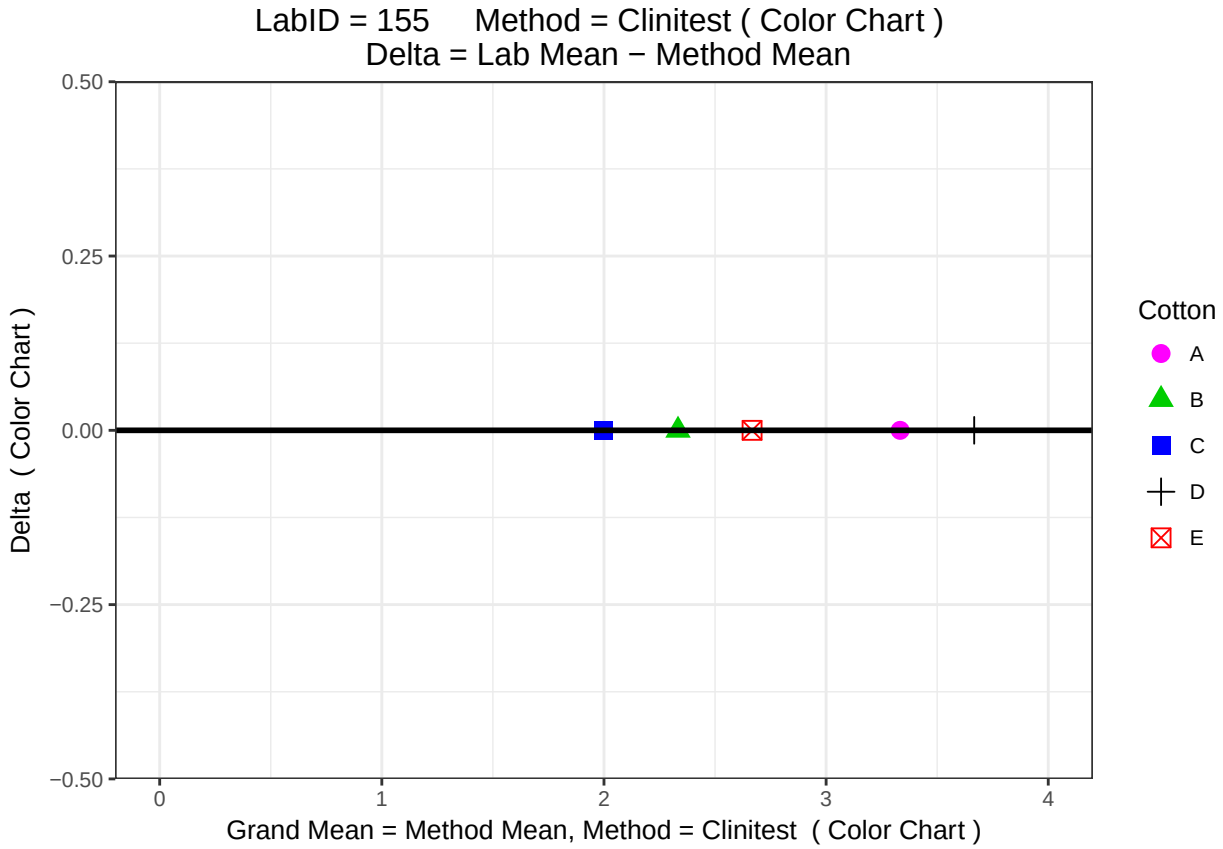
* GMean = Grand Mean of all laboratory means, calculated by Method.
* Chart abscissa axis is given in the original individual readings scale.


LabID = 40 Method = Caramelization (Color degree)
Delta = Lab Mean − Method Mean
Delta (Color degree)
1
0
−1
−2
0
2
4
6
Grand Mean = Method Mean, Method = Caramelization (Color degree)
Cotton
A
B
C
D
E

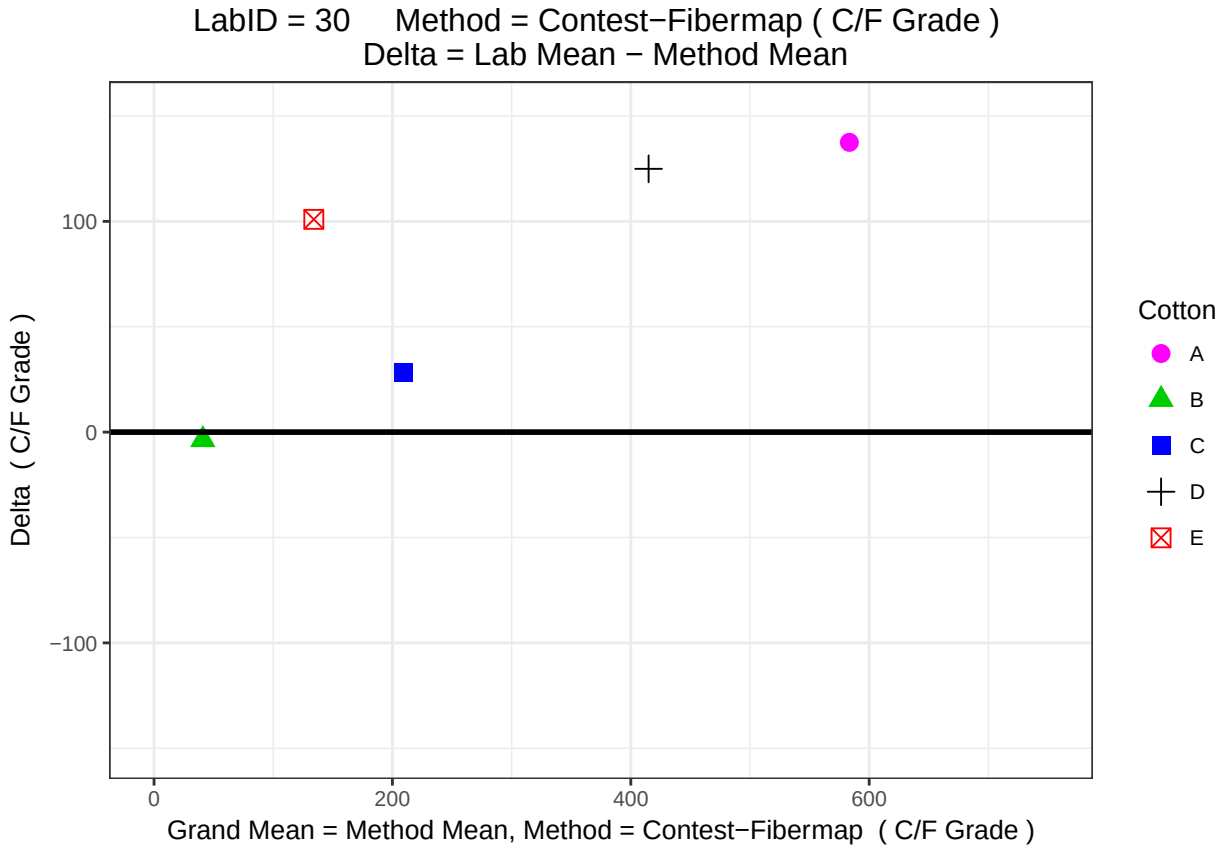

LabID = 145 Method = Caramelization (Color degree)
Delta = Lab Mean − Method Mean
Delta (Color degree)
1
0
−1
−2
0
2
4
6
Grand Mean = Method Mean, Method = Caramelization (Color degree)
Cotton
A
B
C
D
E

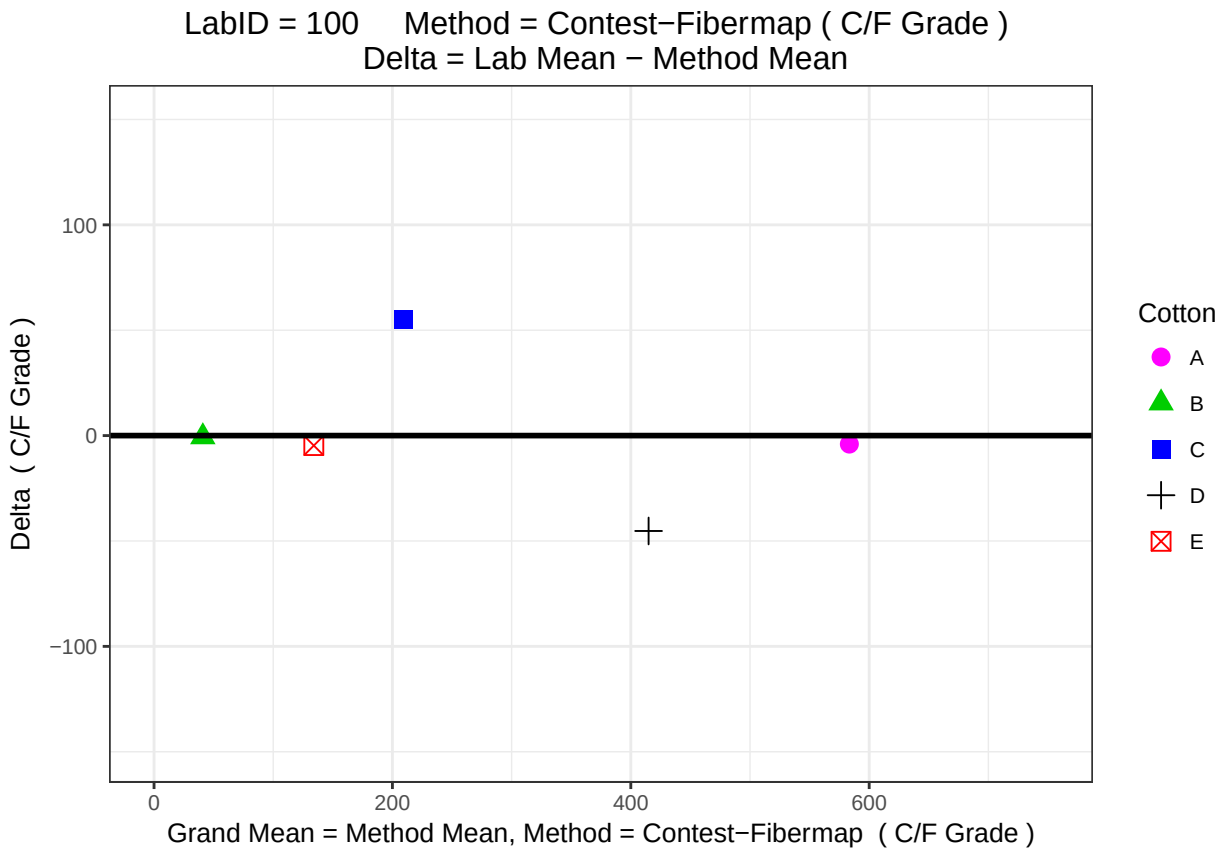

LabID = 150 Method = Caramelization (Color degree)
Delta = Lab Mean − Method Mean
Delta (Color degree)
1
0
−1
−2
0
2
4
6
Grand Mean = Method Mean, Method = Caramelization (Color degree)
Cotton
A
B
C
D
E

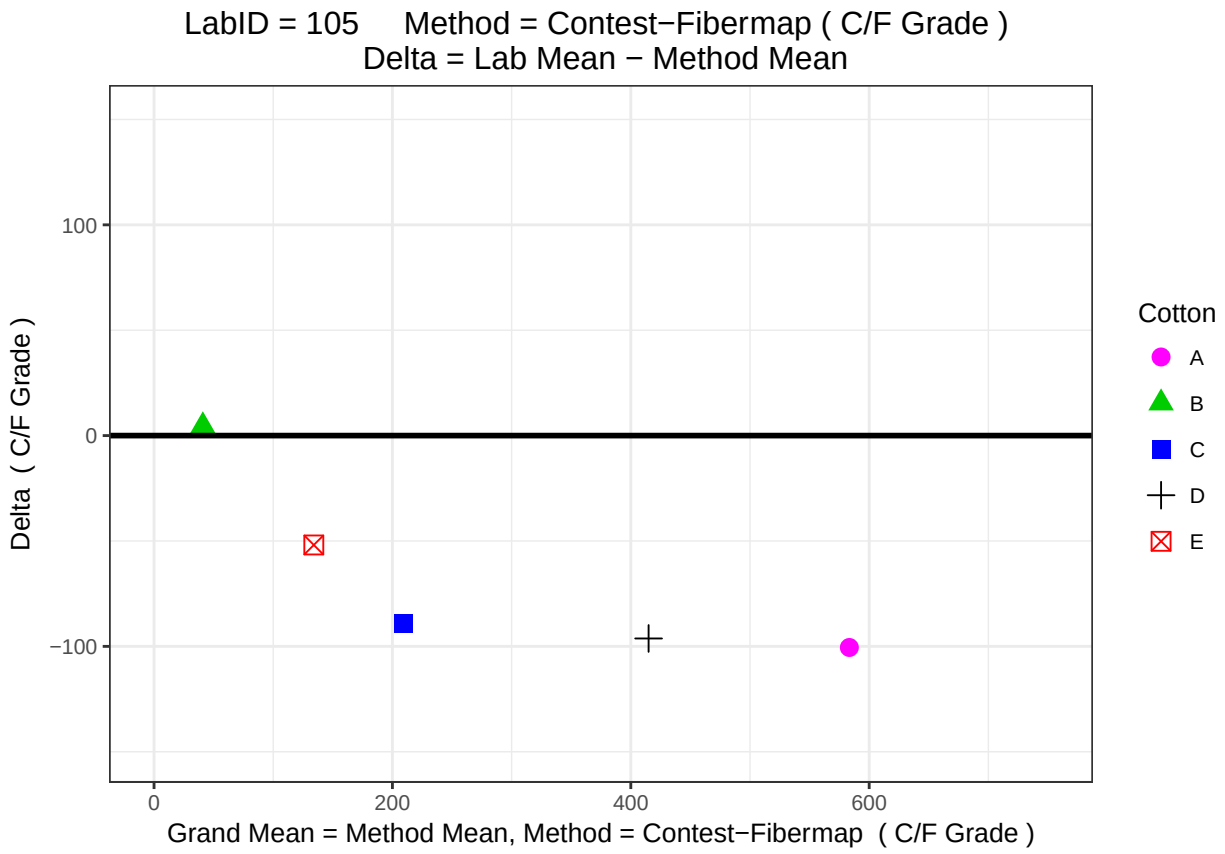
CSITC type chart for Method Clinitest

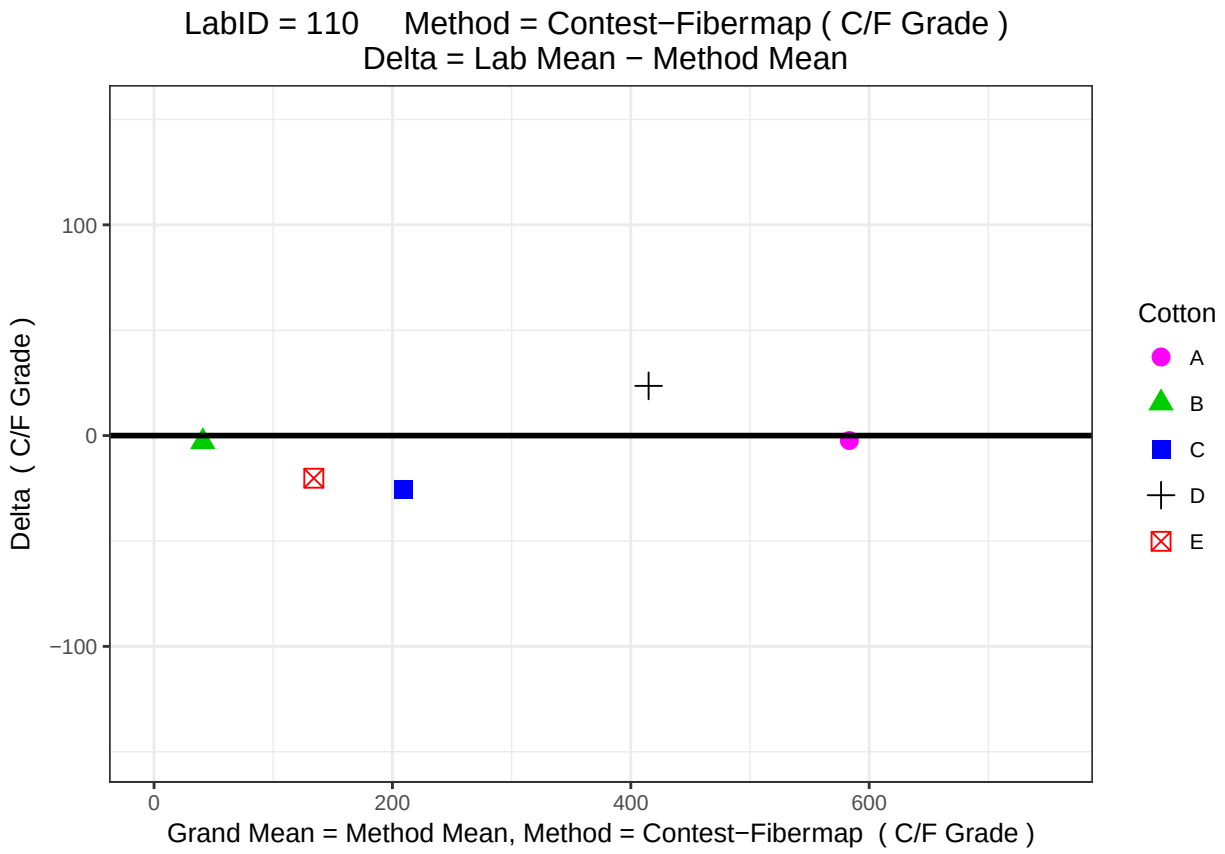


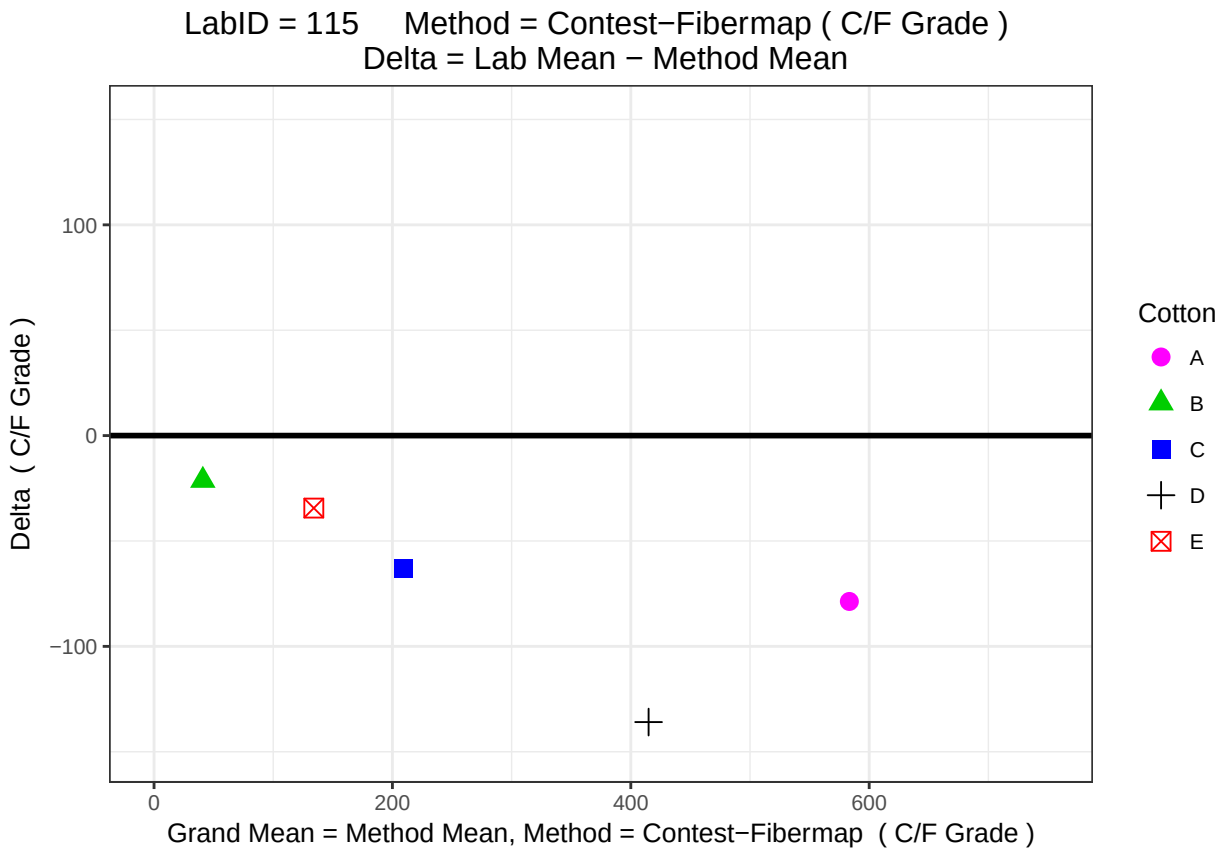
CSITC type chart for Method Contest-Fibermap

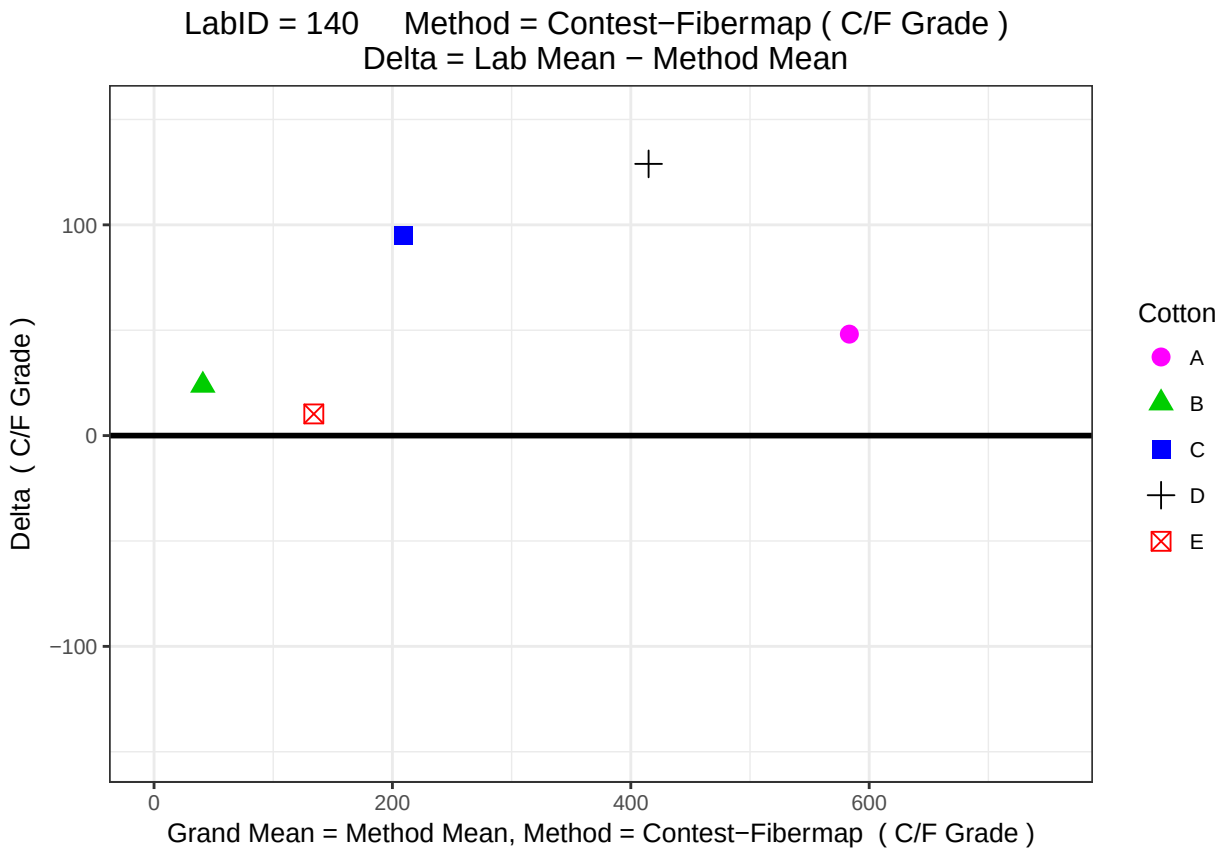



LabID = 100 Method = Contest−Fibermap (C/F Grade)
Delta = Lab Mean − Method Mean
Delta (C/F Grade)
100
0
−100
0
200
400
600
Grand Mean = Method Mean, Method = Contest−Fibermap (C/F Grade)
Cotton
A
B
C
D
E

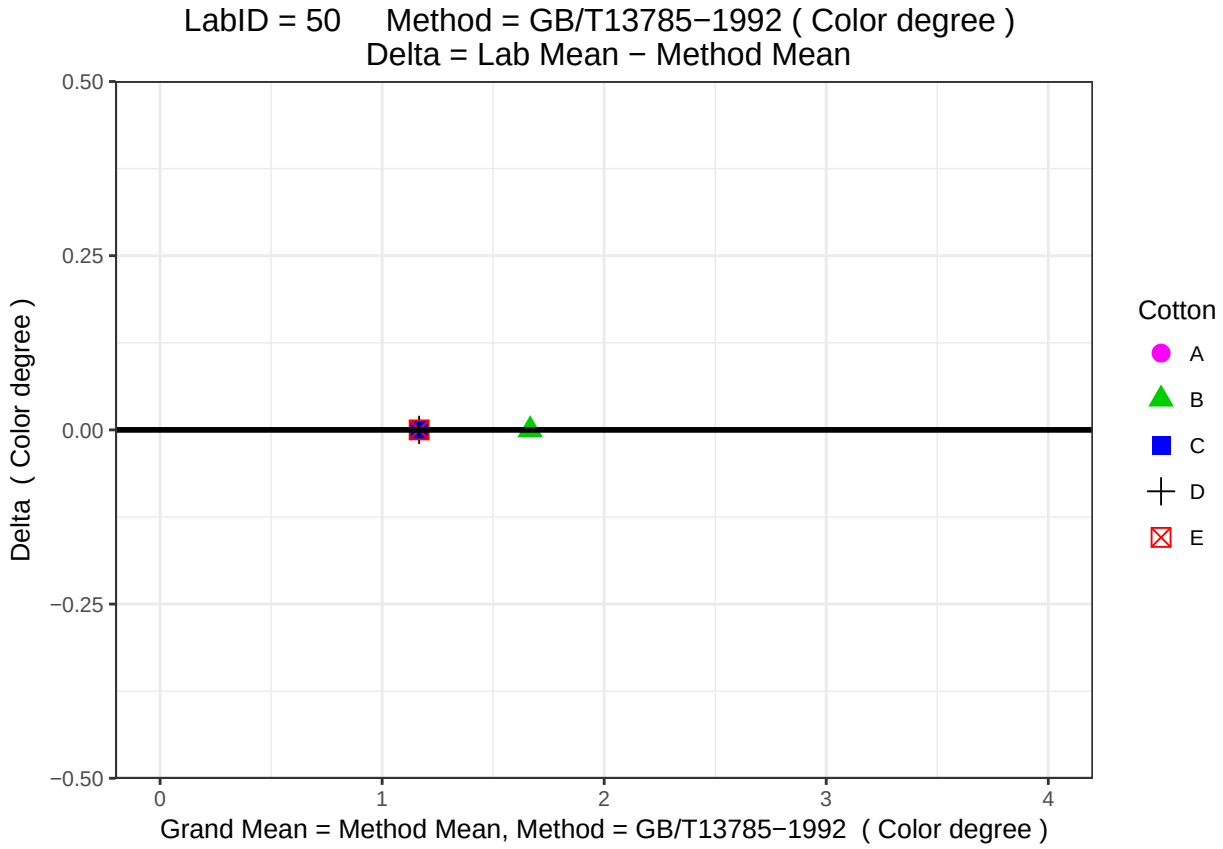

LabID = 105 Method = Contest−Fibermap (C/F Grade)
Delta = Lab Mean − Method Mean
Delta (C/F Grade)
100
0
−100
0
200
400
600
Grand Mean = Method Mean, Method = Contest−Fibermap (C/F Grade)
Cotton
A
B
C
D
E


LabID = 110 Method = Contest−Fibermap (C/F Grade)
Delta = Lab Mean − Method Mean
Delta (C/F Grade)
100
0
−100
0
200
400
600
Grand Mean = Method Mean, Method = Contest−Fibermap (C/F Grade)
Cotton
A
B
C
D
E

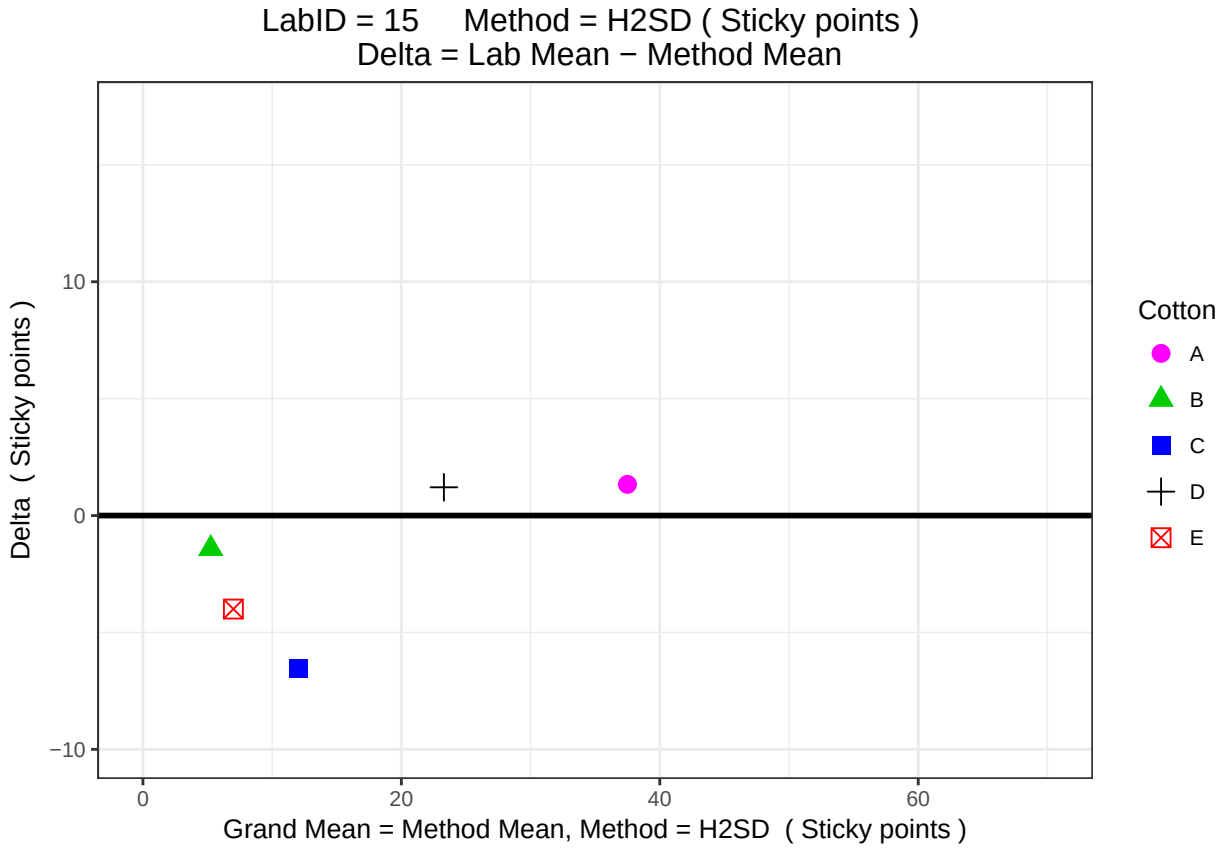

LabID = 115 Method = Contest−Fibermap (C/F Grade)
Delta = Lab Mean − Method Mean
Delta (C/F Grade)
100
0
−100
0
200
400
600
Grand Mean = Method Mean, Method = Contest−Fibermap (C/F Grade)
Cotton
A
B
C
D
E

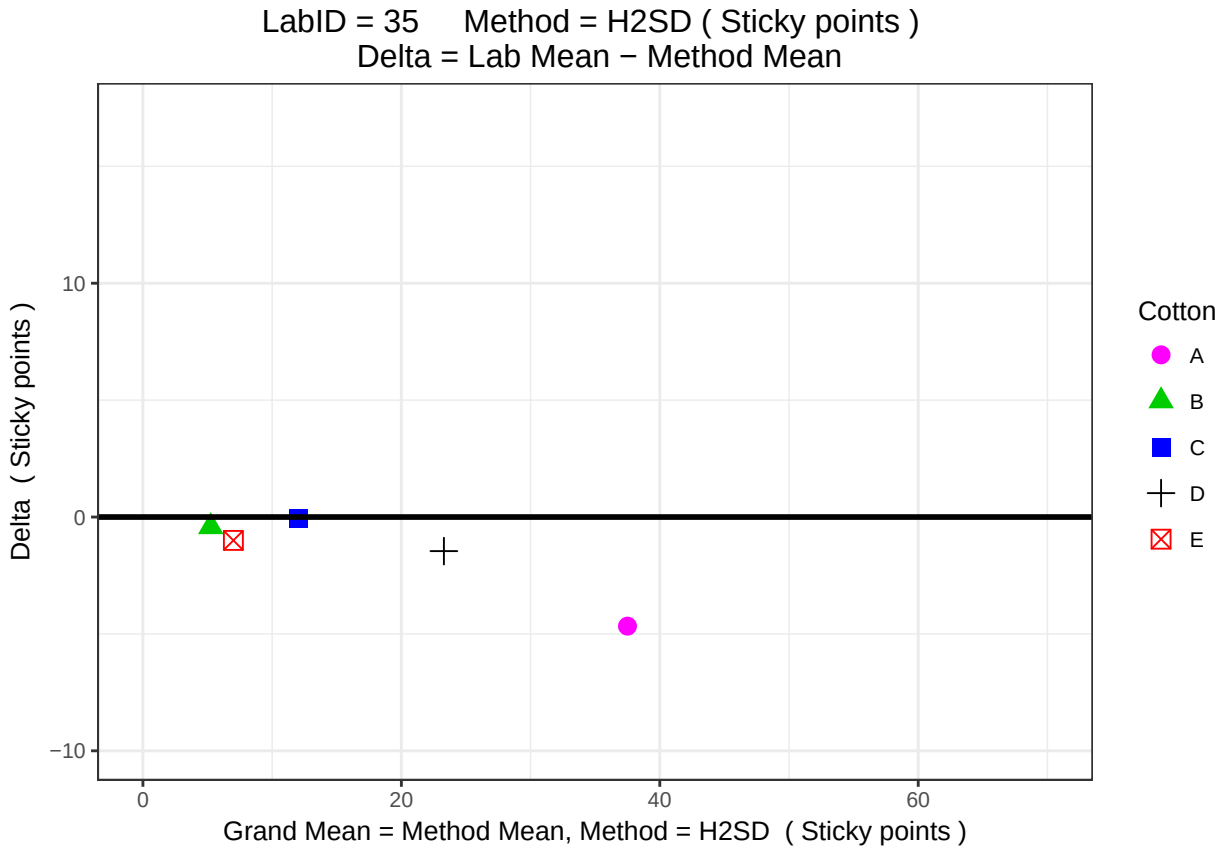

LabID = 140 Method = Contest−Fibermap (C/F Grade)
Delta = Lab Mean − Method Mean
Delta (C/F Grade)
100
0
−100
0
200
400
600
Grand Mean = Method Mean, Method = Contest−Fibermap (C/F Grade)
Cotton
A
B
C
D
E

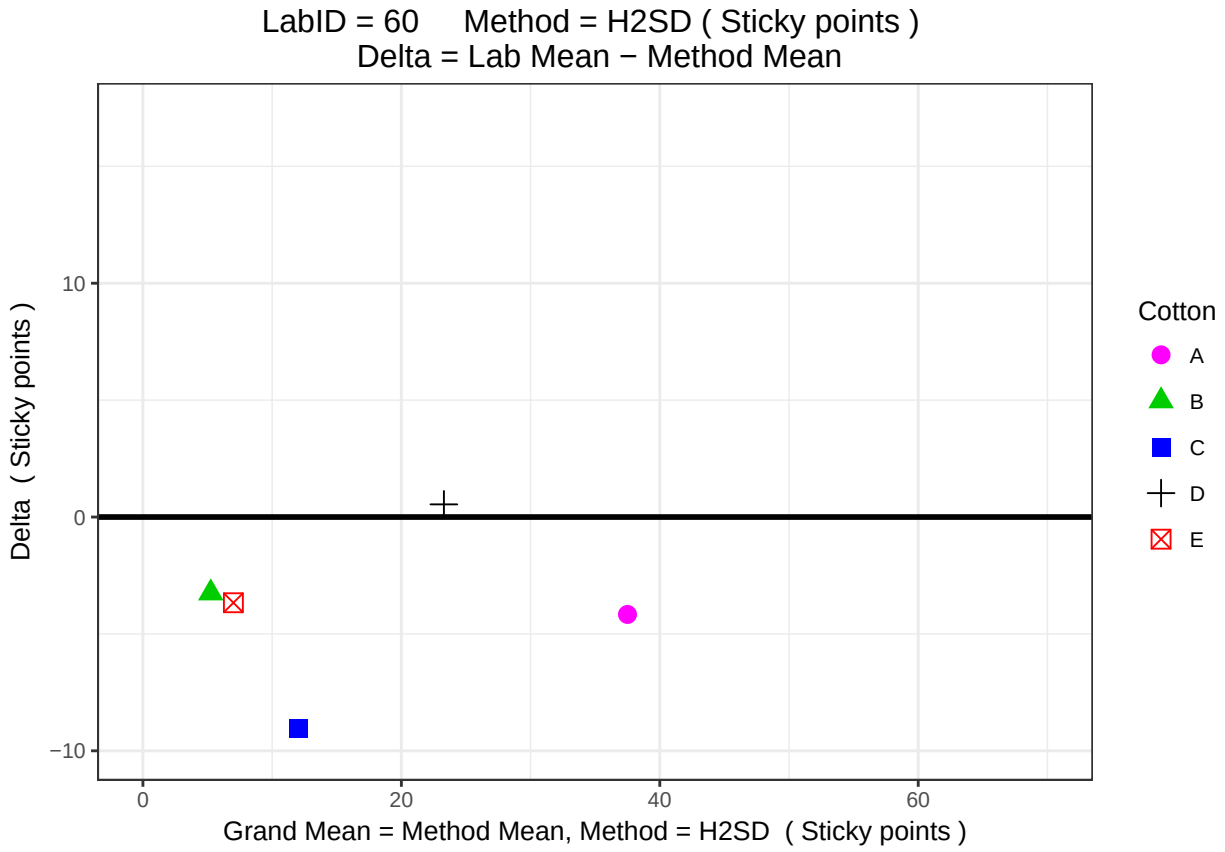
CSITC type chart for Method GB/T13785-1992

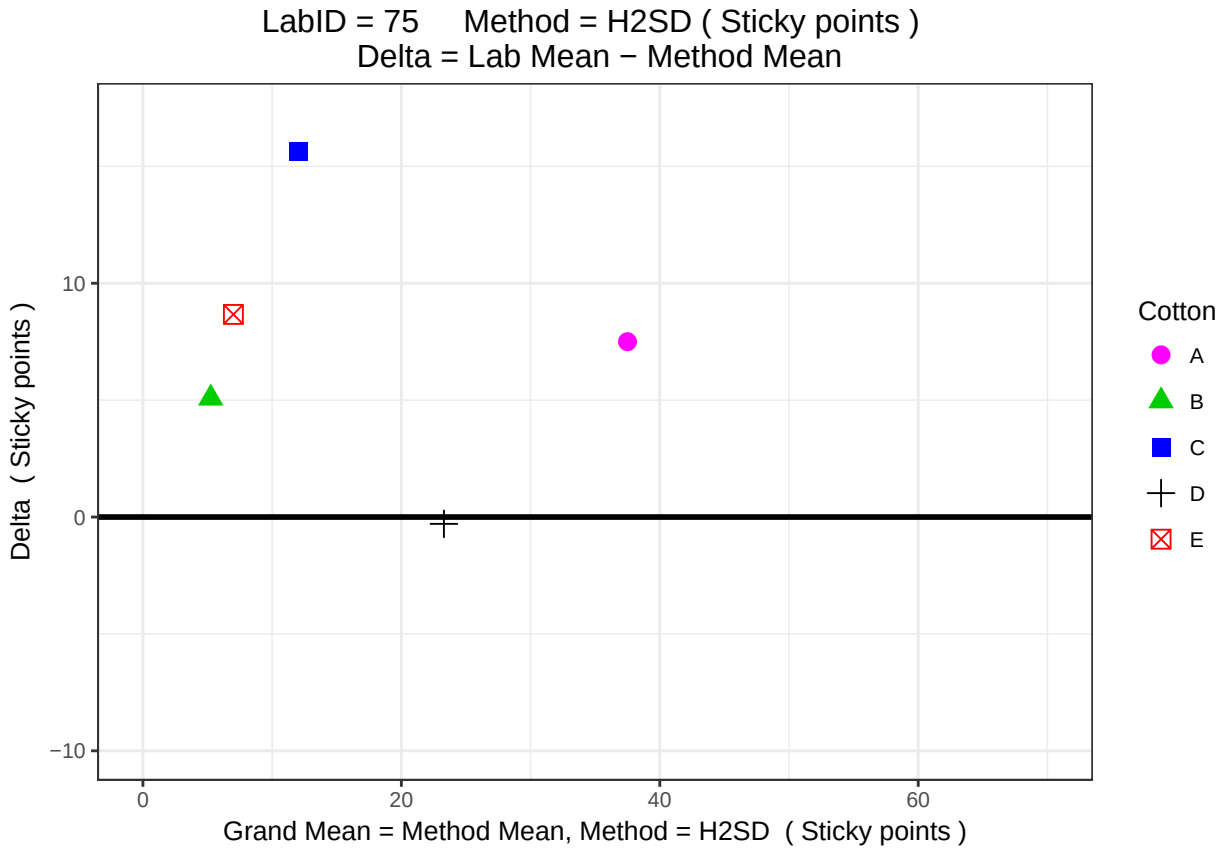


CSITC type chart for Method H2SD

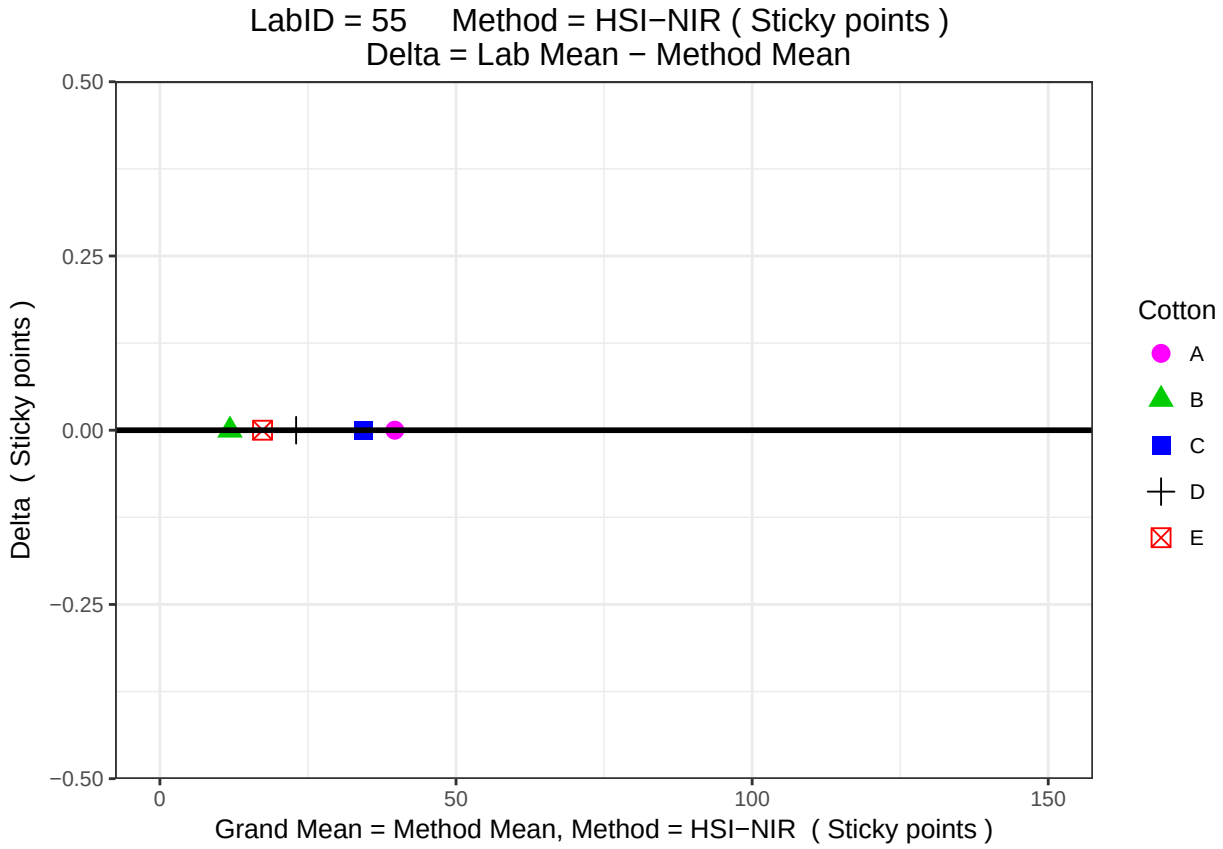



LabID = 35 Method = H2SD (Sticky points)
Delta = Lab Mean − Method Mean
Delta (Sticky points)
10
0
−10
0
20
40
60
Grand Mean = Method Mean, Method = H2SD (Sticky points)
Cotton
A
B
C
D
E

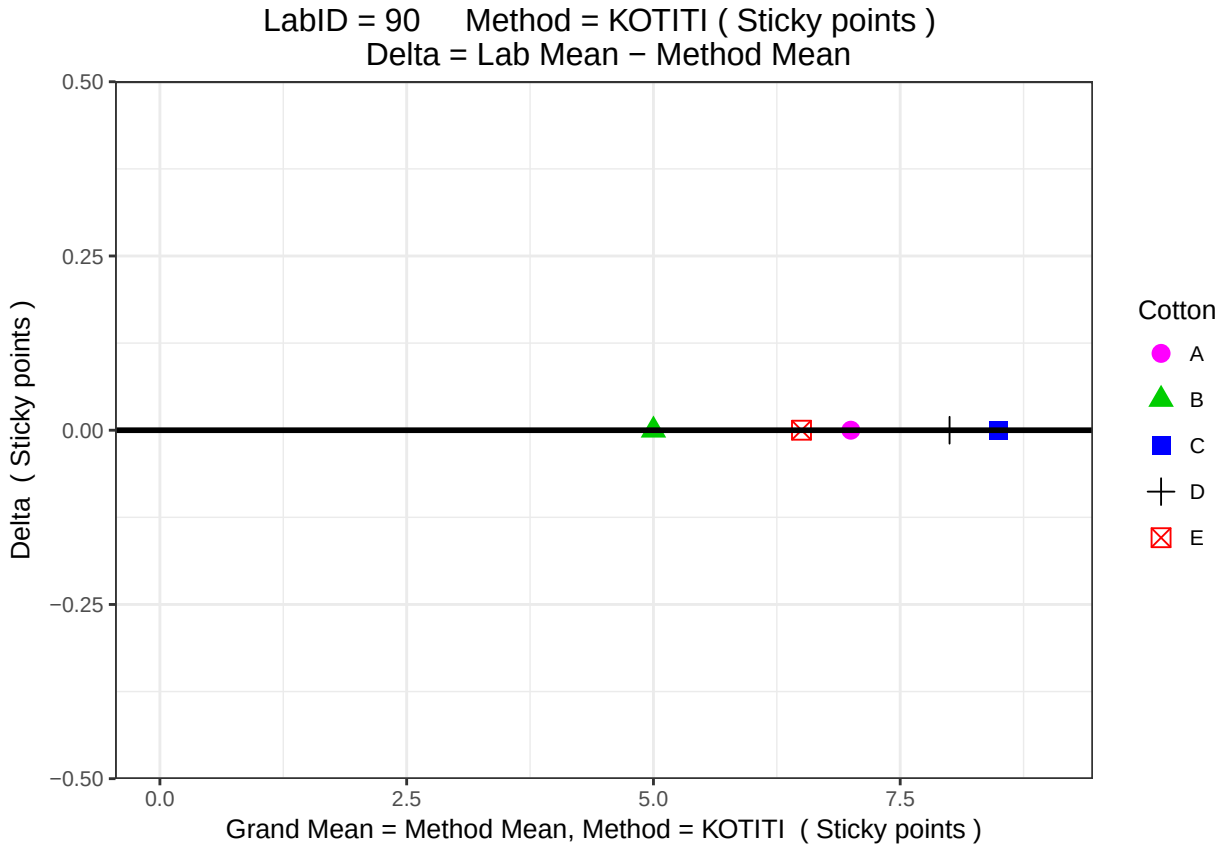

LabID = 60 Method = H2SD (Sticky points)
Delta = Lab Mean − Method Mean
Delta (Sticky points)
10
0
−10
0
20
40
60
Grand Mean = Method Mean, Method = H2SD (Sticky points)
Cotton
A
B
C
D
E


LabID = 75 Method = H2SD (Sticky points)
Delta = Lab Mean − Method Mean
Delta (Sticky points)
10
0
−10
0
20
40
60
Grand Mean = Method Mean, Method = H2SD (Sticky points)
Cotton
A
B
C
D
E

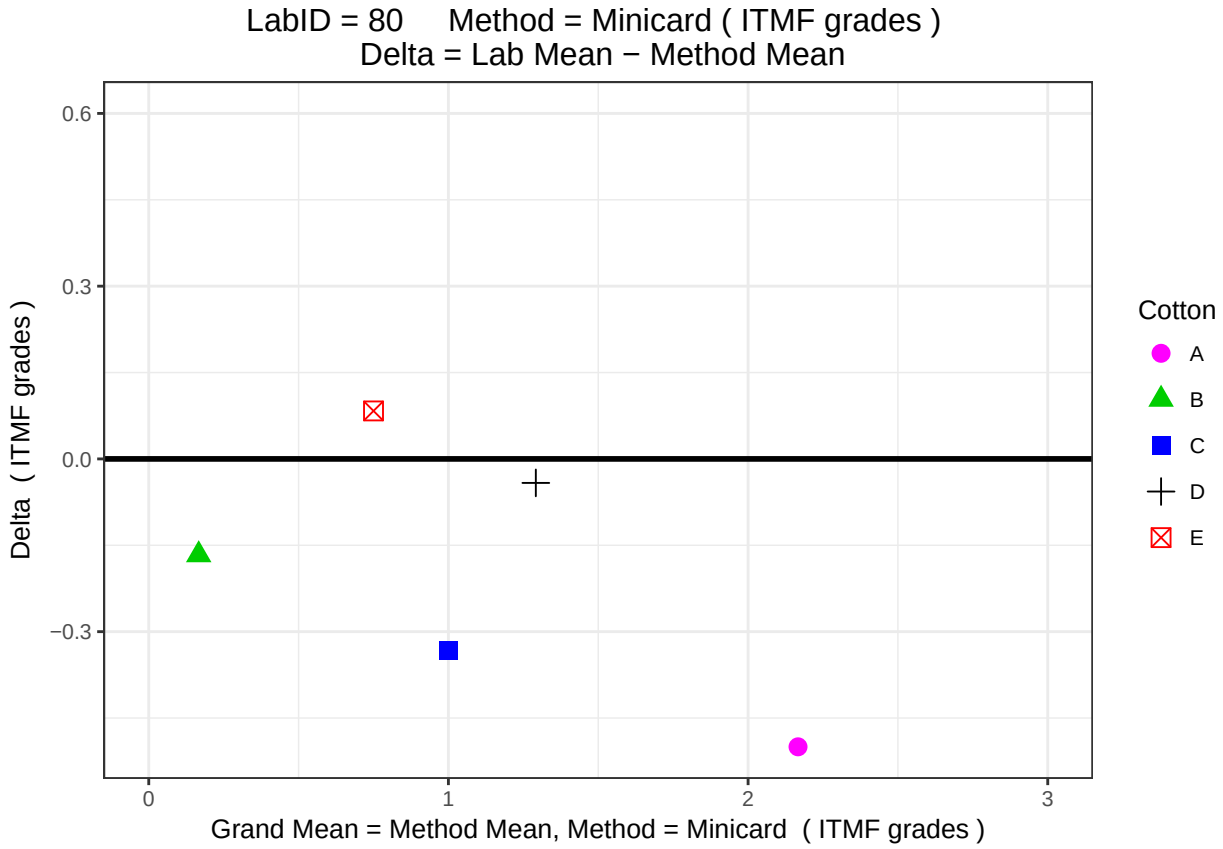
CSITC type chart for Method HSI-NIR

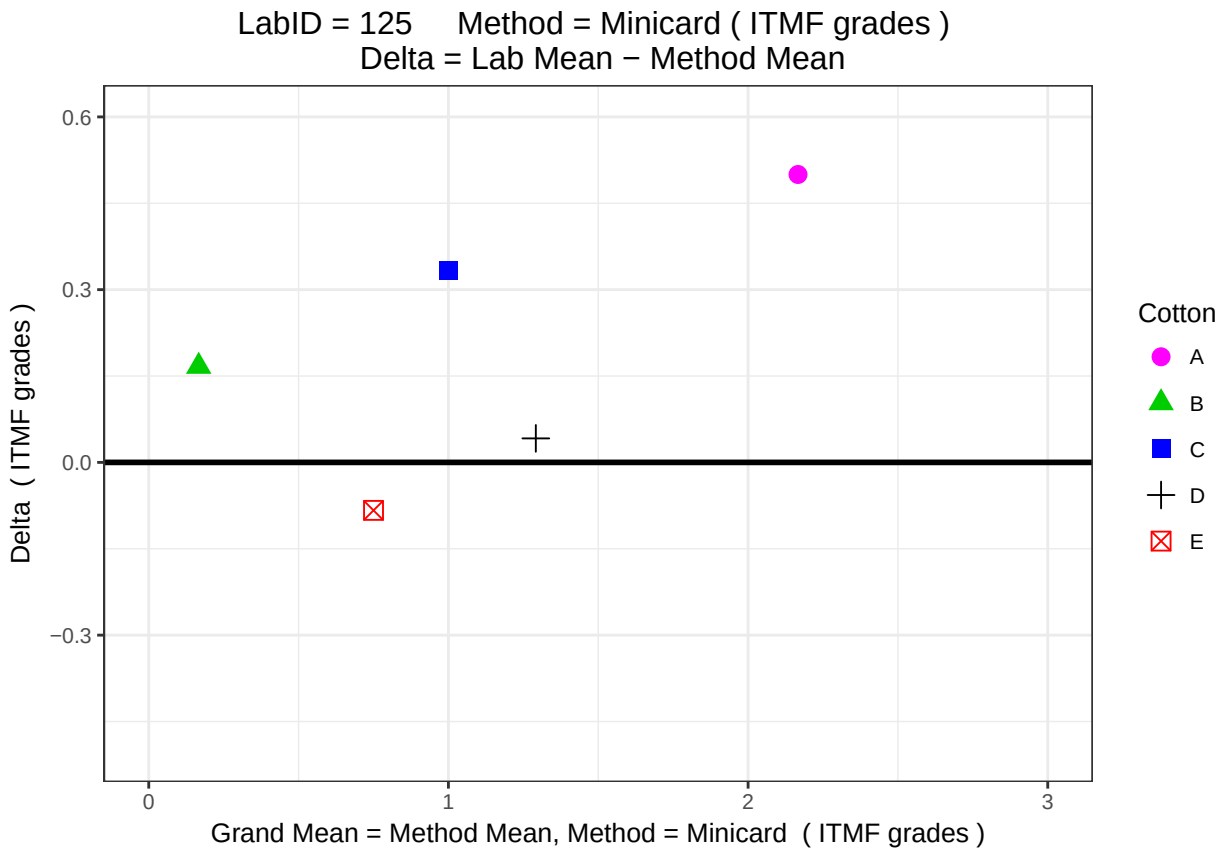


CSITC type chart for Method KOTITI

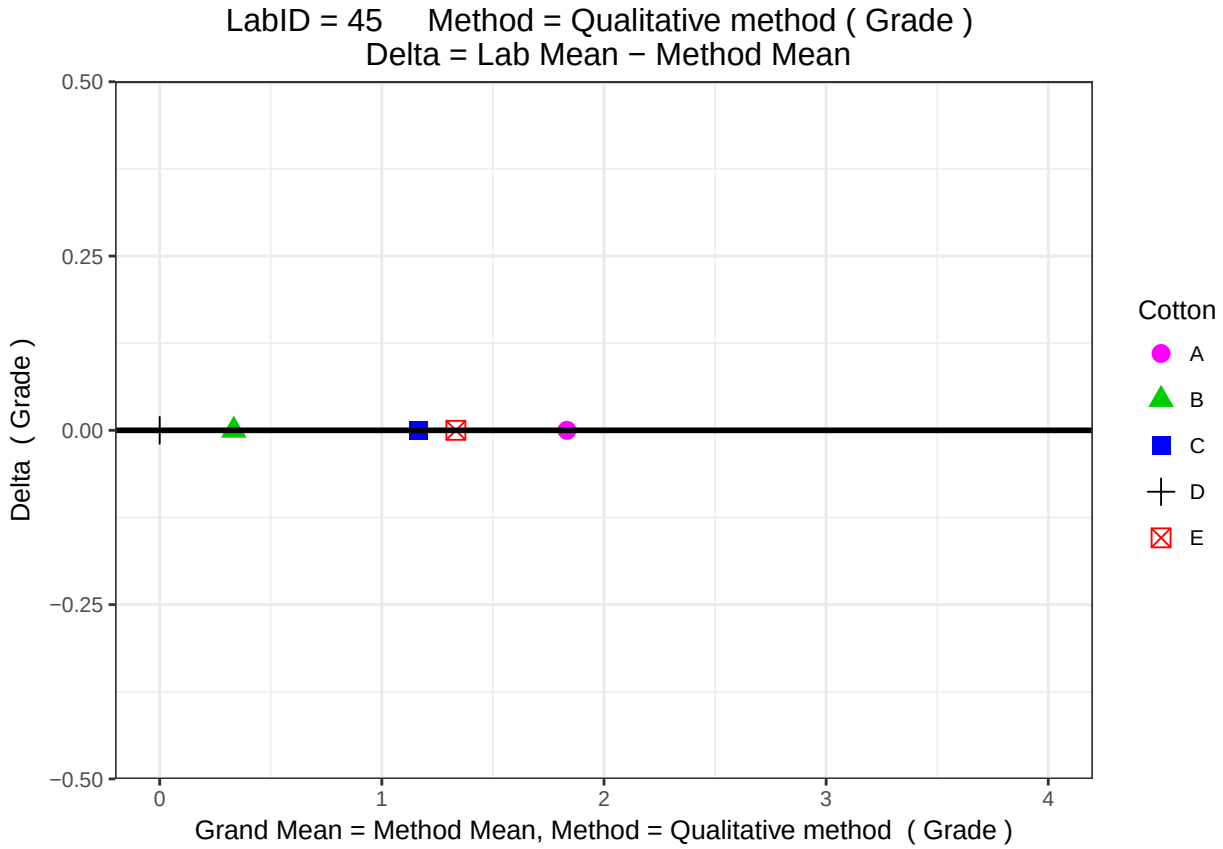


CSITC type chart for Method Minicard

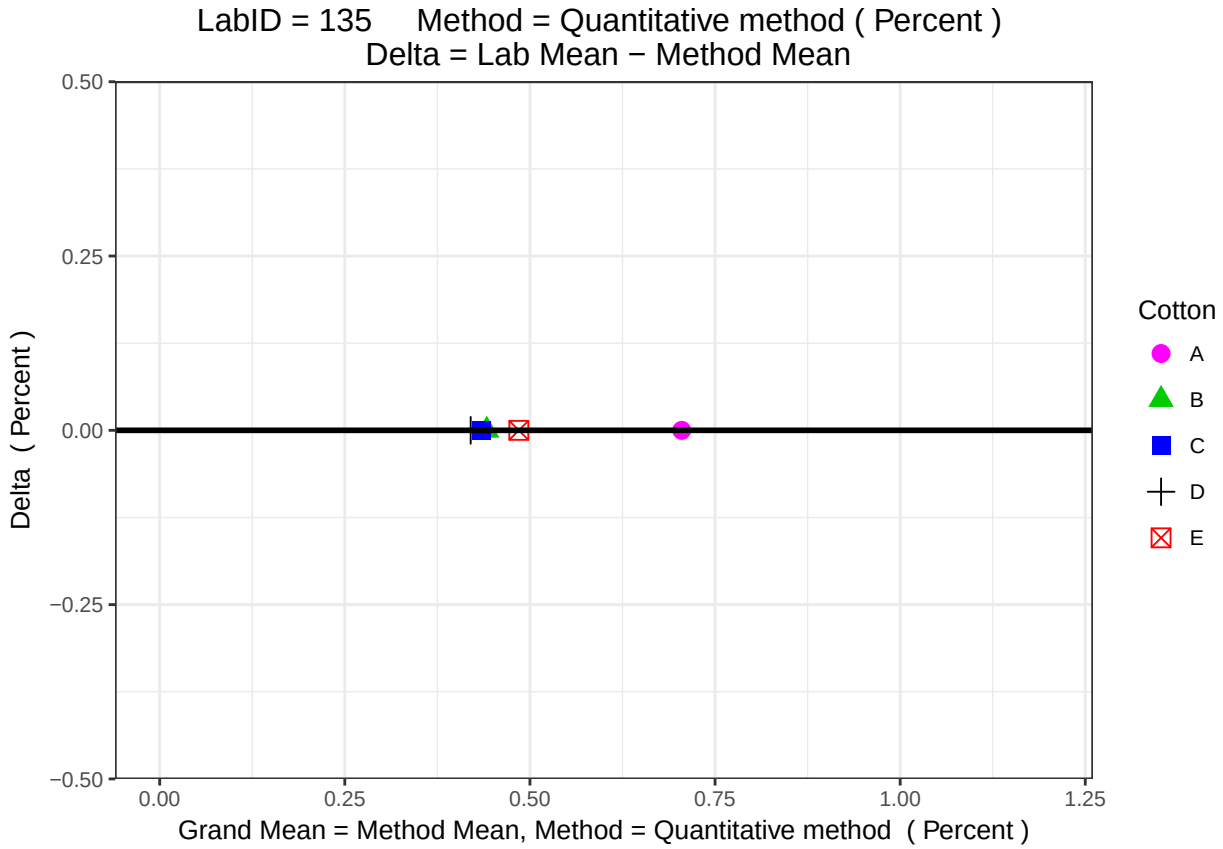



LabID = 125 Method = Minicard (ITMF grades)
Delta = Lab Mean − Method Mean
Delta (ITMF grades)
0.6
0.3
0.0
−0.3
0
1
2
3
Grand Mean = Method Mean, Method = Minicard (ITMF grades)
Cotton
A
B
C
D
E

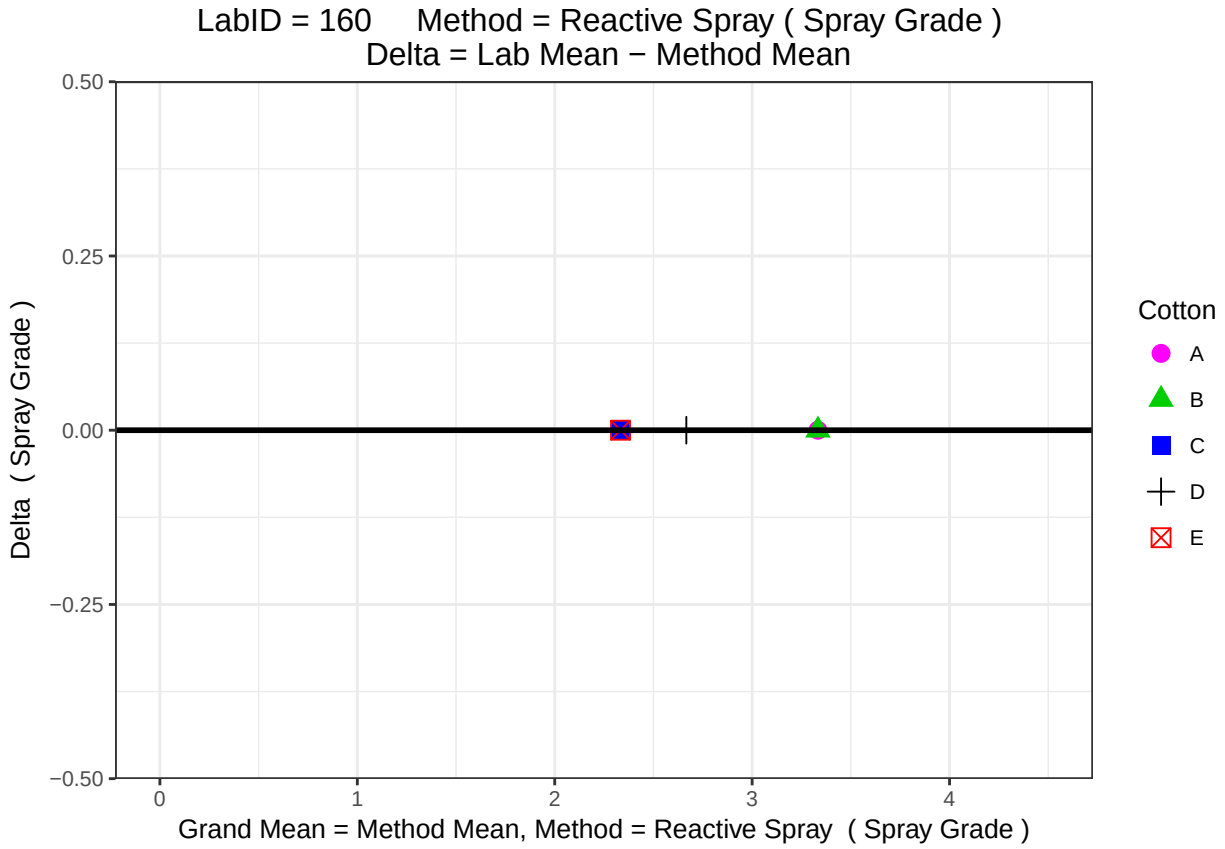
CSITC type chart for Method Qualitative method



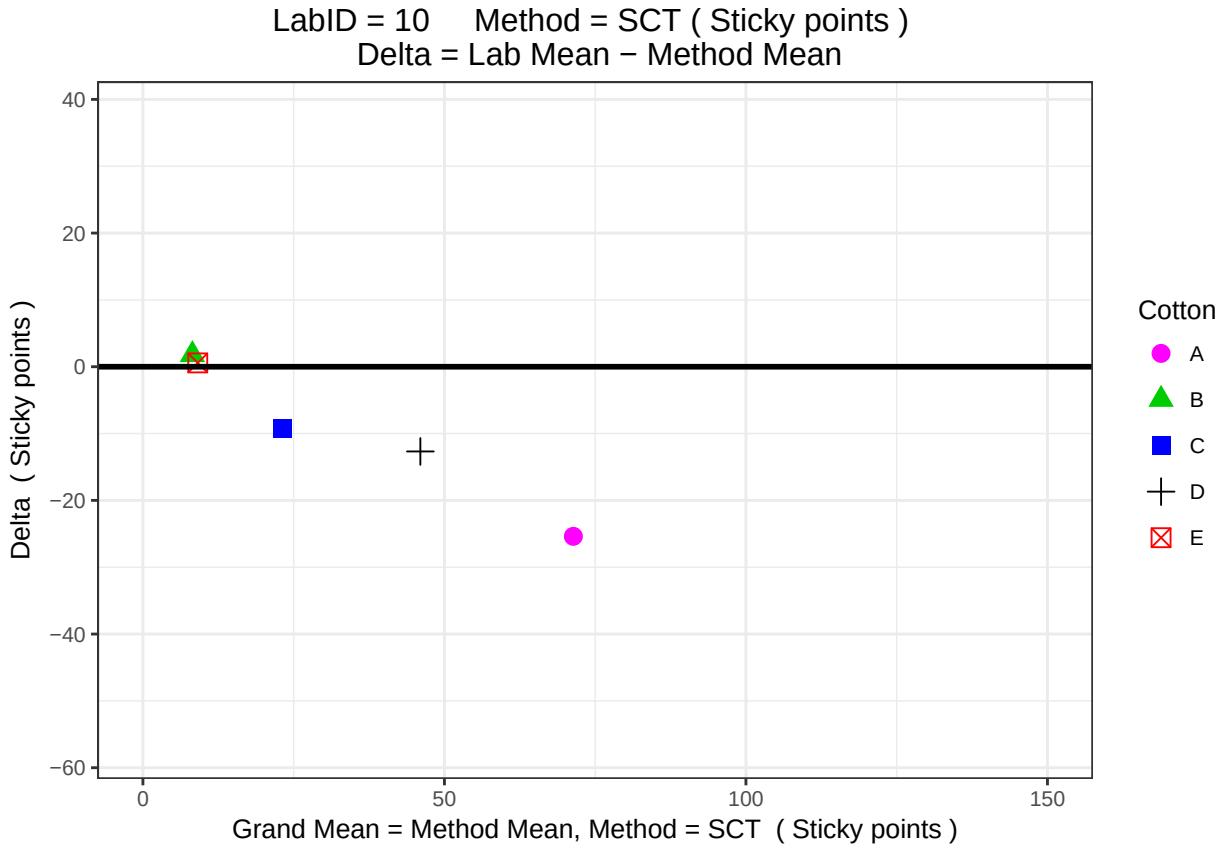
CSITC type chart for Method Quantitative method

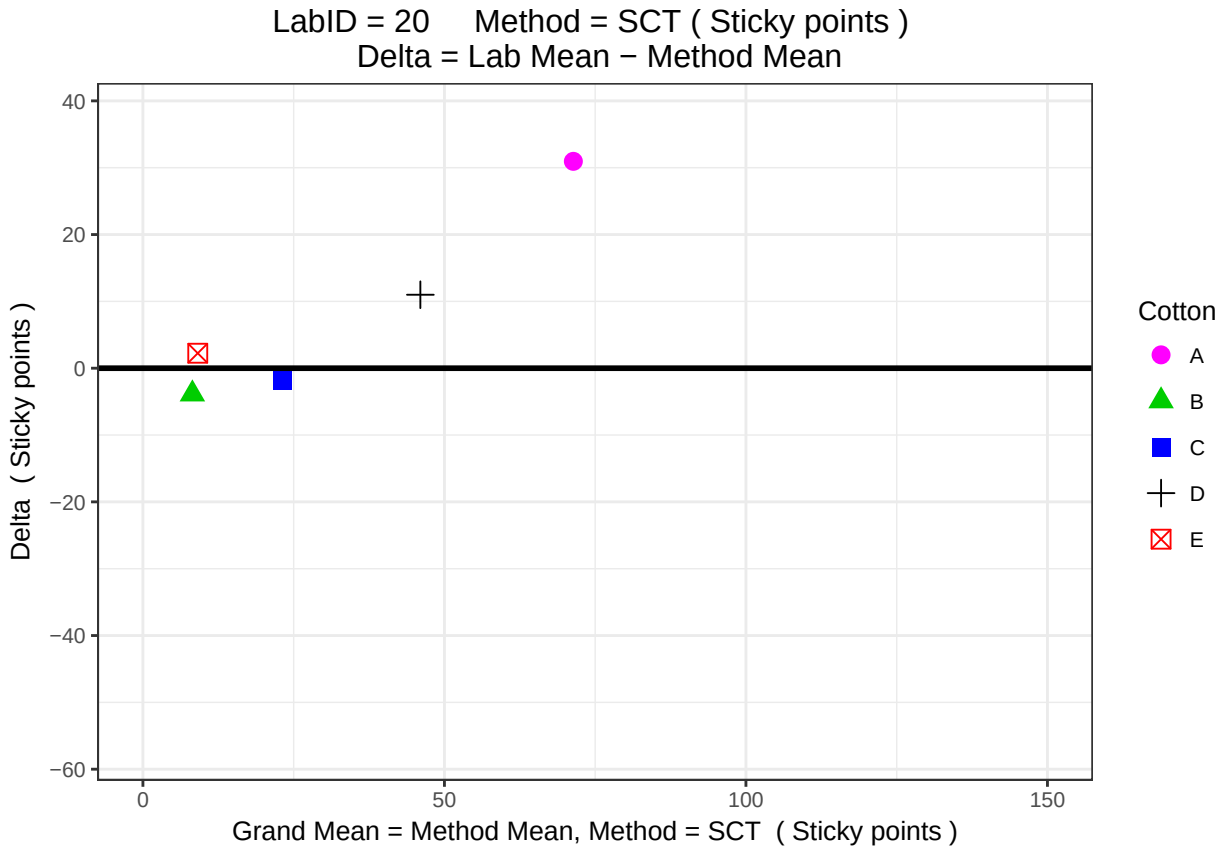


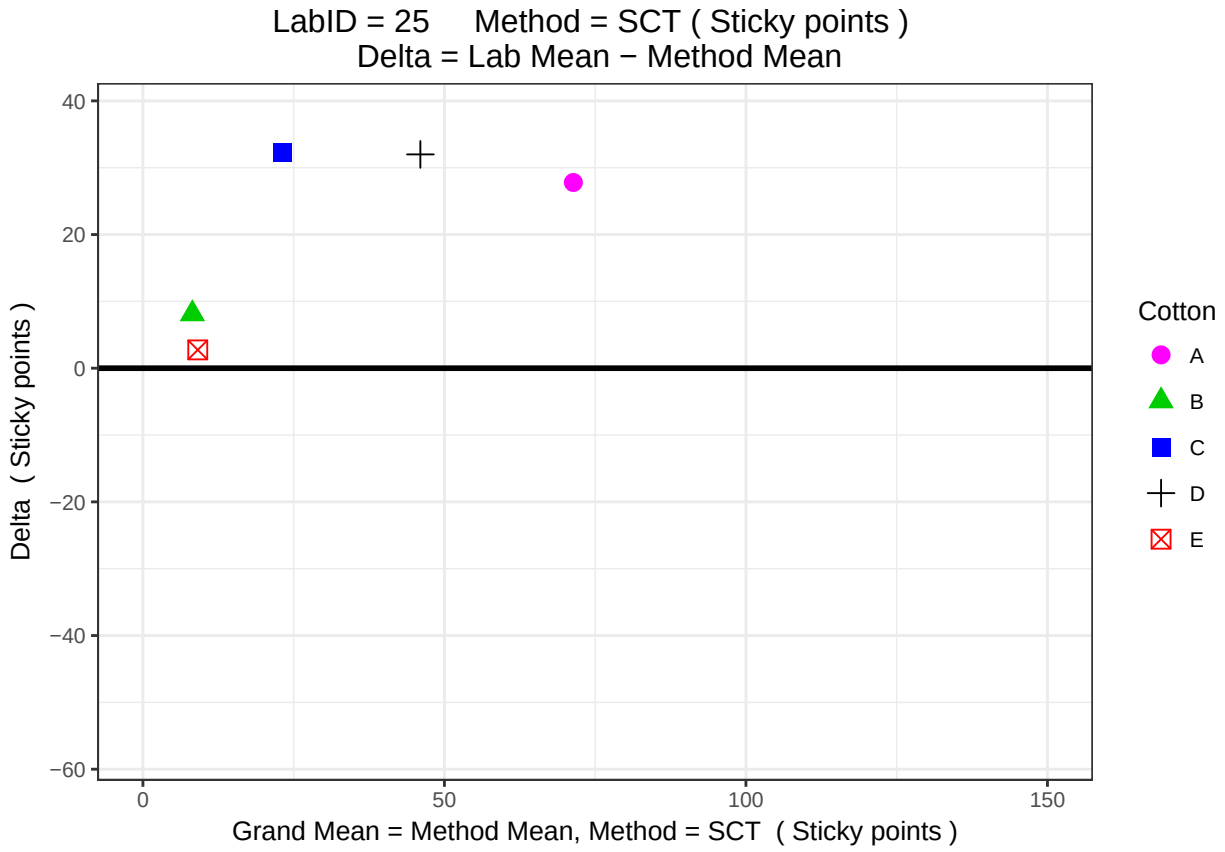
CSITC type chart for Method Reactive Spray

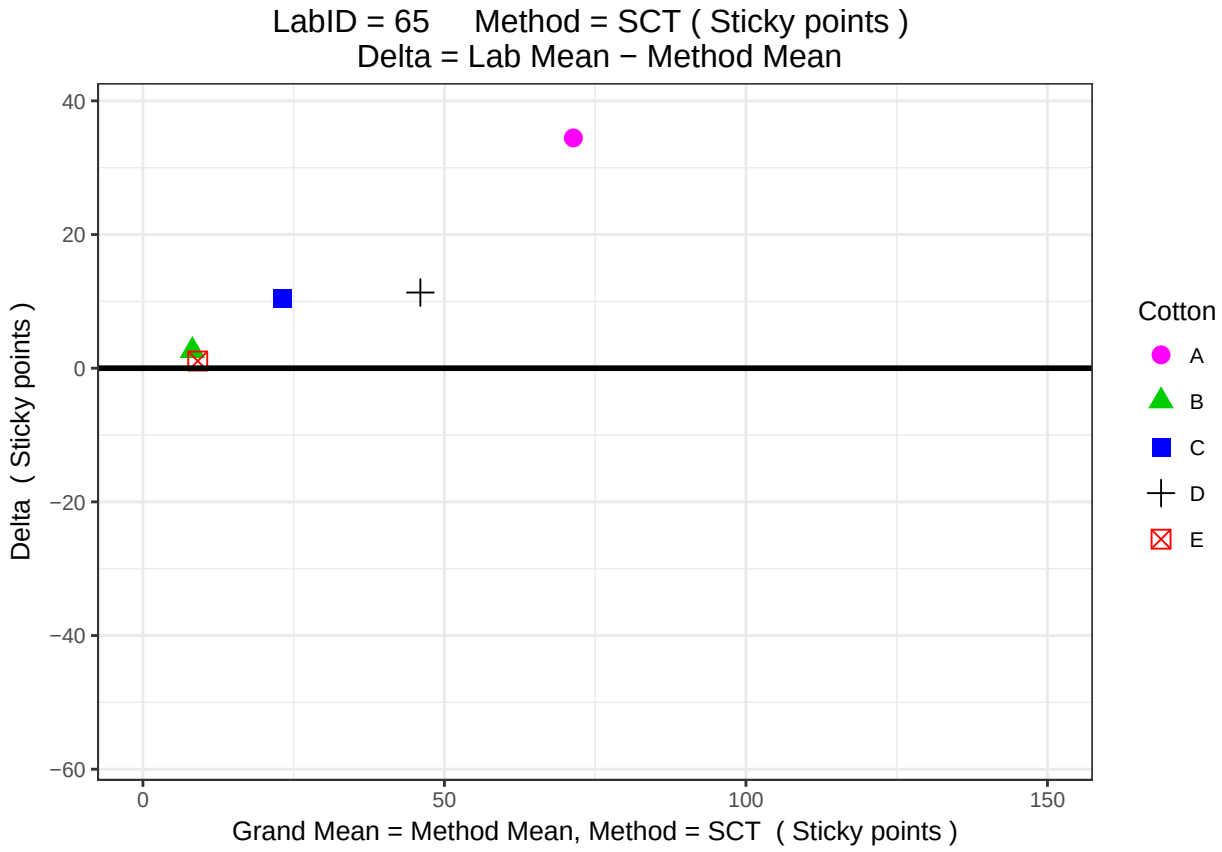


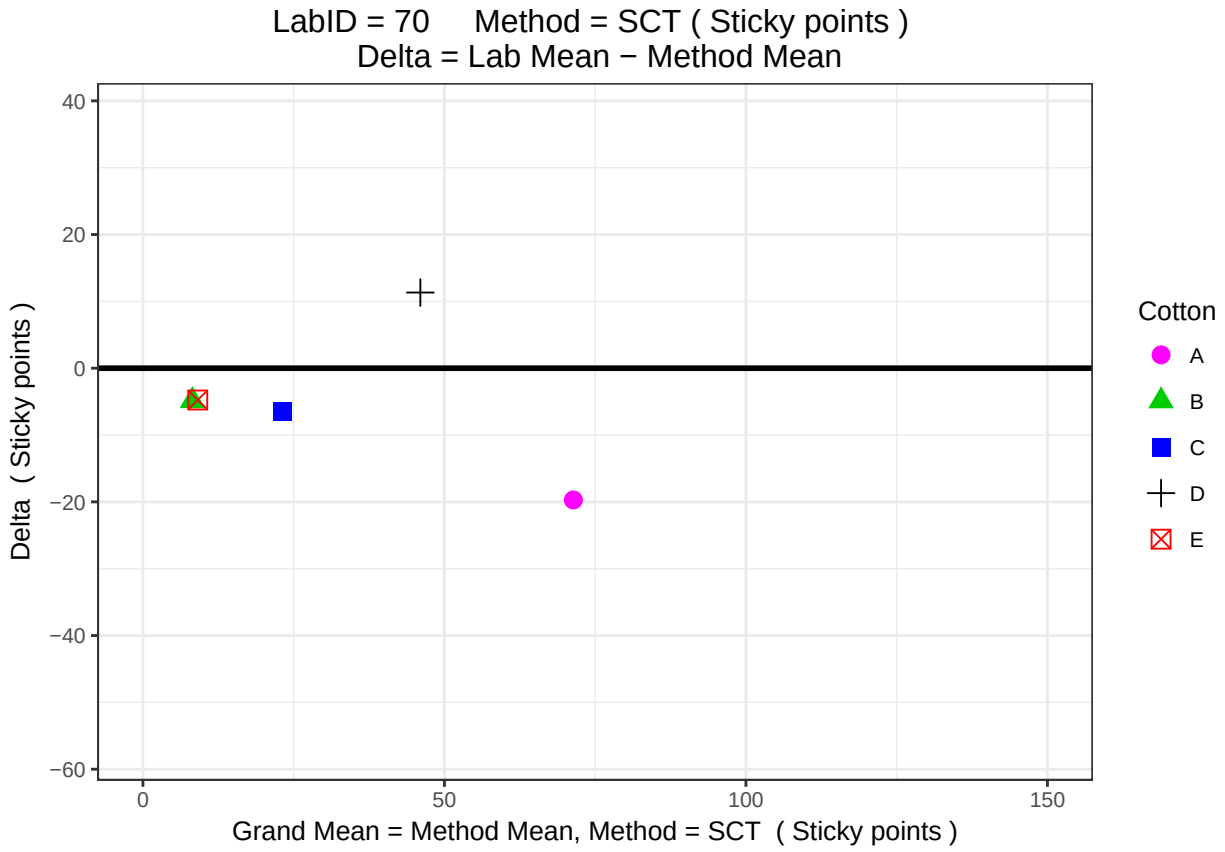
CSITC type chart for Method SCT

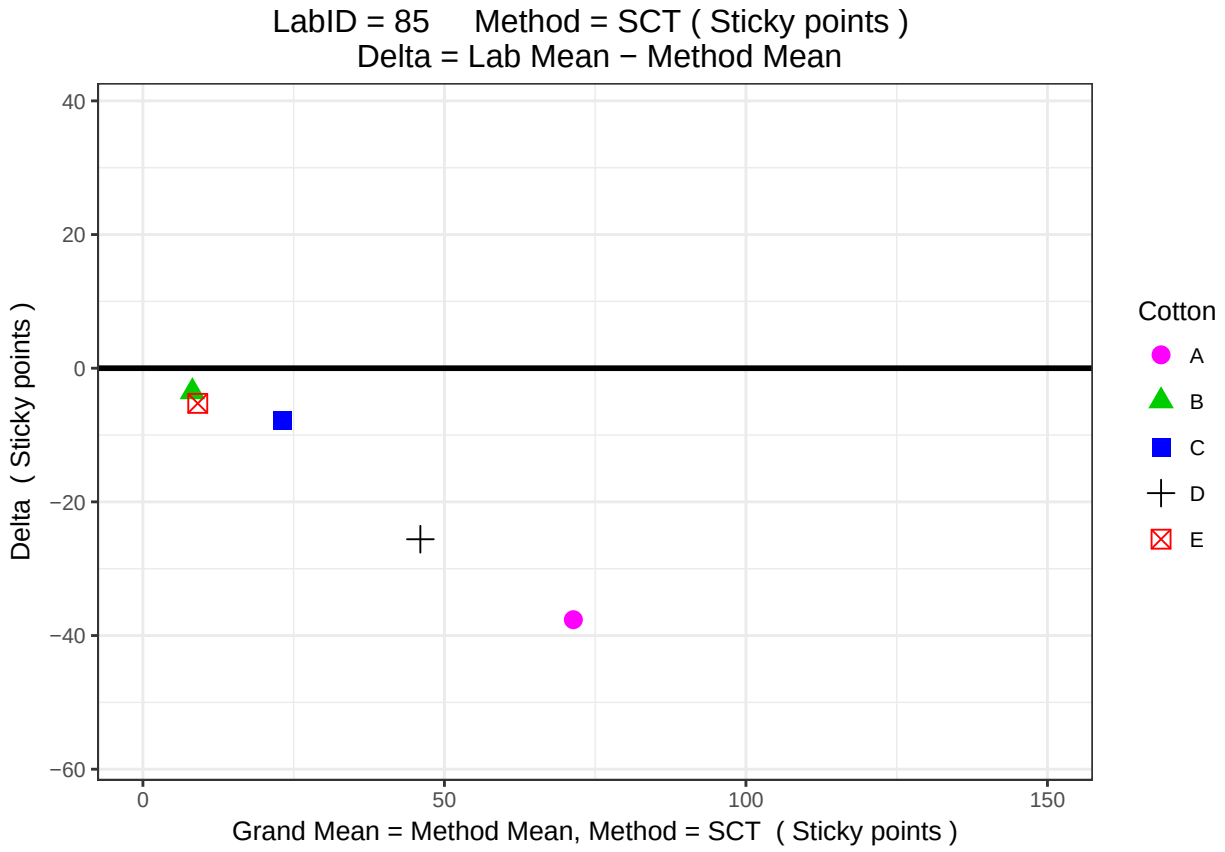


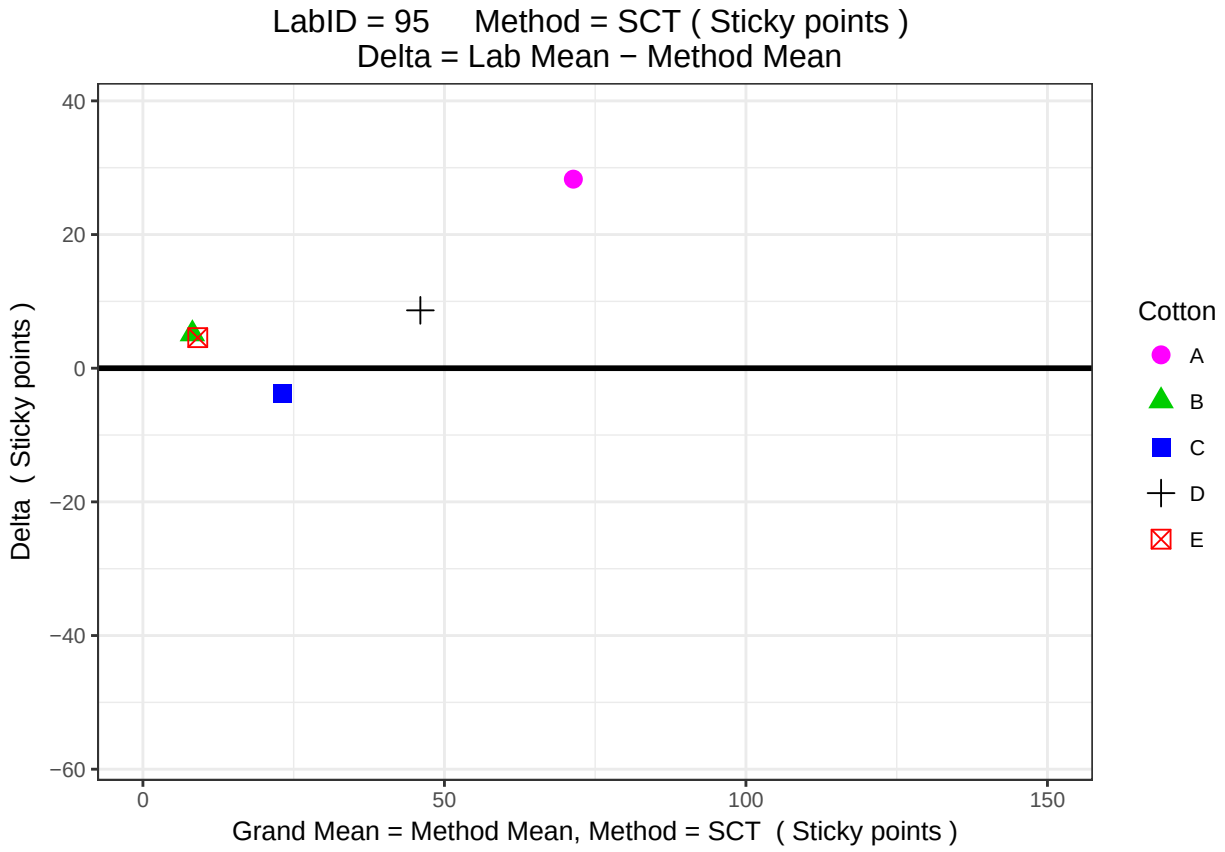

LabID = 20 Method = SCT (Sticky points)
Delta = Lab Mean − Method Mean
Delta (Sticky points)
40
20
0
−20
−40
−60
0
50
100
150
Grand Mean = Method Mean, Method = SCT (Sticky points)
Cotton
A
B
C
D
E

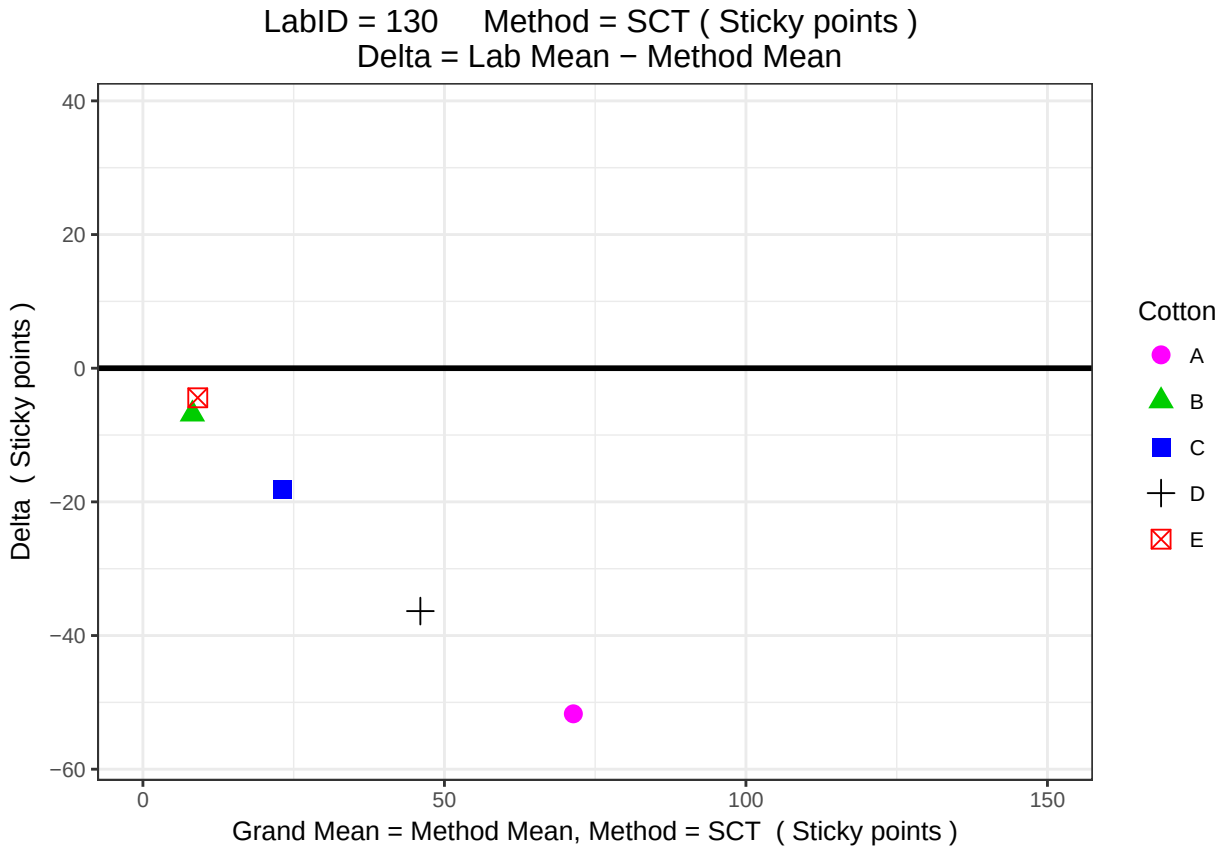

LabID = 25 Method = SCT (Sticky points)
Delta = Lab Mean − Method Mean
Delta (Sticky points)
40
20
0
−20
−40
−60
0
50
100
150
Grand Mean = Method Mean, Method = SCT (Sticky points)
Cotton
A
B
C
D
E

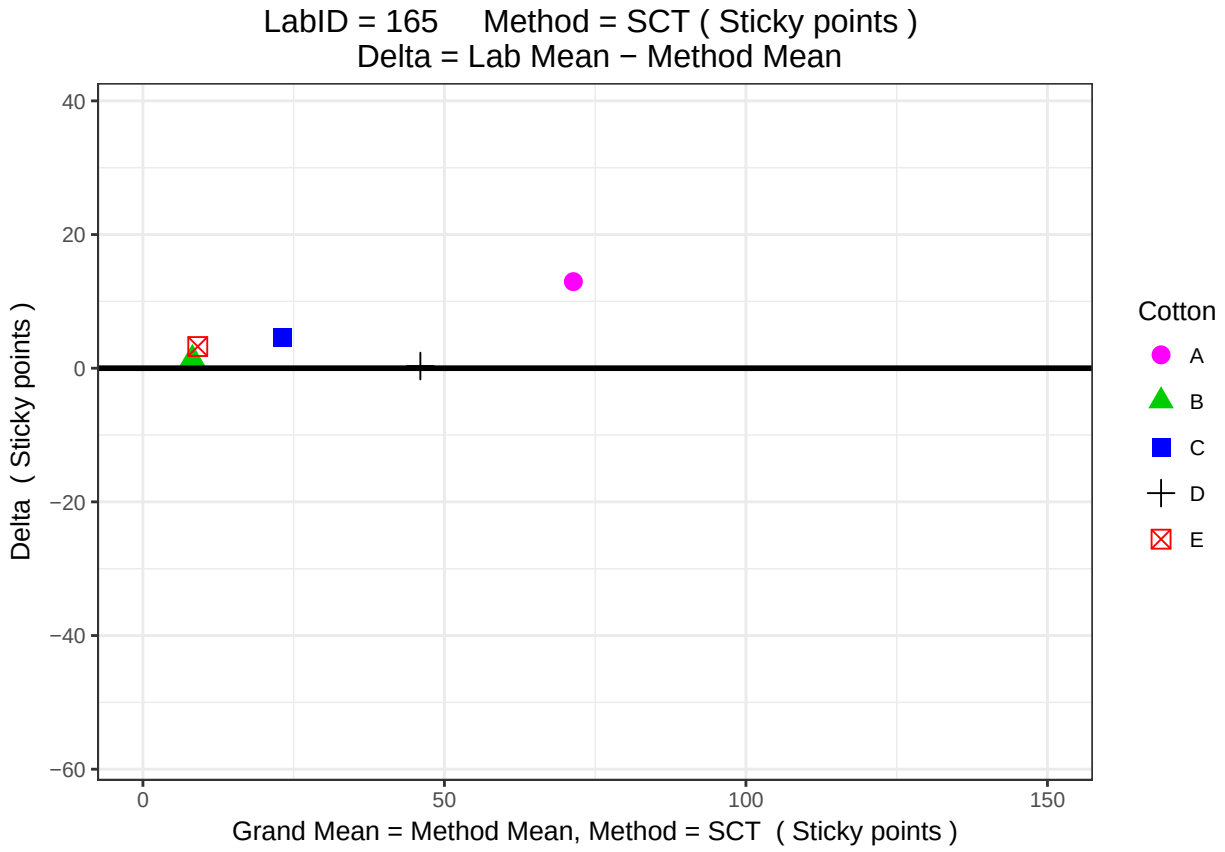

LabID = 65 Method = SCT (Sticky points)
Delta = Lab Mean − Method Mean
Delta (Sticky points)
40
20
0
−20
−40
−60
0
50
100
150
Grand Mean = Method Mean, Method = SCT (Sticky points)
Cotton
A
B
C
D
E


LabID = 70 Method = SCT (Sticky points)
Delta = Lab Mean − Method Mean
Delta (Sticky points)
40
20
0
−20
−40
−60
0
50
100
150
Grand Mean = Method Mean, Method = SCT (Sticky points)
Cotton
A
B
C
D
E

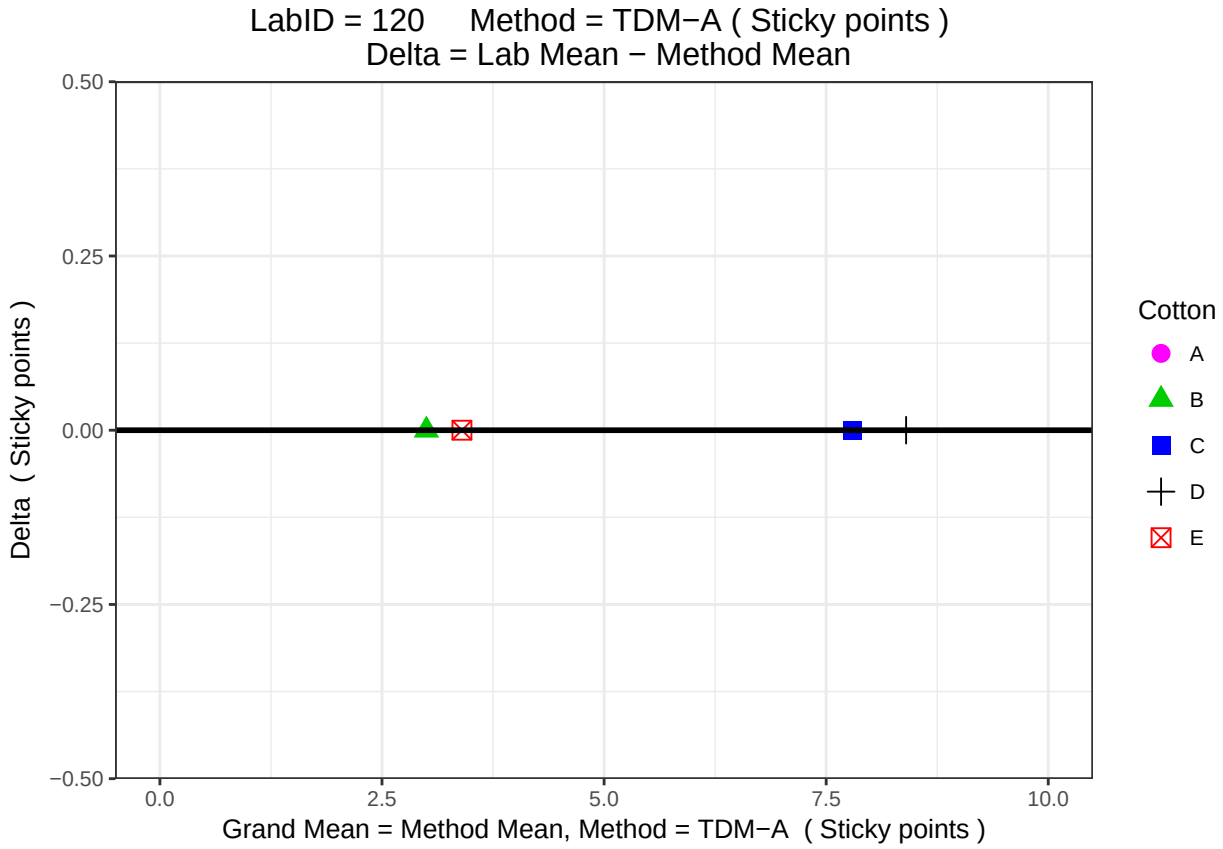

LabID = 85 Method = SCT (Sticky points)
Delta = Lab Mean − Method Mean
Delta (Sticky points)
40
20
0
−20
−40
−60
0
50
100
150
Grand Mean = Method Mean, Method = SCT (Sticky points)
Cotton
A
B
C
D
E


LabID = 95 Method = SCT (Sticky points)
Delta = Lab Mean − Method Mean
Delta (Sticky points)
40
20
0
−20
−40
−60
0
50
100
150
Grand Mean = Method Mean, Method = SCT (Sticky points)
Cotton
A
B
C
D
E


LabID = 130 Method = SCT (Sticky points)
Delta = Lab Mean − Method Mean
Delta (Sticky points)
40
20
0
−20
−40
−60
0
50
100
150
Grand Mean = Method Mean, Method = SCT (Sticky points)
Cotton
A
B
C
D
E


LabID = 165 Method = SCT (Sticky points)
Delta = Lab Mean − Method Mean
Delta (Sticky points)
40
20
0
−20
−40
−60
0
50
100
150
Grand Mean = Method Mean, Method = SCT (Sticky points)
Cotton
A
B
C
D
E

CSITC type chart for Method TDM-A



CommonScale [7]

Principle

In ITMF-ICCTM meeting organized in March 2018 in Bremen, it was envisaged to compare results from various stickiness methods to check how close are the gained results. A proposal using a pro-rata approach was made as one way to achieve this comparison. The following table gives the numeric values to which each and all results from this round-test were calculated whith the following formula: $CommonScale = \frac{LabID\ \ reading\ * \ 100}{MaxEver\ \ for\ \ this\ \ method}$, with MaxEver being the maximum value that any given method could read for the most sticky cotton ever. This will continue as long as necessary.

During this ITMF-ICCTM meeting in March 2018, it was also mentioned that MaxEver may not be the best way to base the provided calculations for COmmonScale. We then expect Participating Laboratories to propose an other calculation method(s), which then would be added to this report in the future.

Method	MaxEver	Unit
Caramelization	7.0	Color degree
Clinitest	4.0	Color Chart
Contest-Fibermap	750.0	C/F Grade
GB/T13785-1992	4.0	Color degree
H2SD	70.0	Sticky points
HSI-NIR	150.0	Sticky points
KOTITI	9.0	Sticky points
Minicard	3.0	ITMF grades
Qualitative method	4.0	Grade
Quantitative method	1.2	Percent
Reactive Spray	4.5	Spray Grade
SCT	150.0	Sticky points
TDM-A	10.0	Sticky points

For instance,

- a reading of 2 at the minicard, with a MaxEver set at 3, will convert into a CommonScale reading of: $67 = \frac{2 \ * \ 100}{3}$.
- a reading of 63 at the SCT, with a MaxEver set at 150, will convert into a CommonScale reading of: $42 = \frac{63 \ * \ 100}{150}$.
- *etc.*

[7] Footnote

* In the following charts, ML stands for the code Method x LabID.
* In the following charts, LM stands for the code LabID x Method.
* NA excluded
* Black dashed line = Method MeanInterLab per cotton and per Method.
* Red + = Laboratory mean for the given method and for the given cotton.
* Black x = Laboratory or CommonScale reading or individual reading for the given method and for the given cotton.

Limitations of the CommonScale approach

This approach has potential limitations:

- The resolution of CommonScale results is not equivalent for methods having a discrete scale, especially when the number of levels is low (for instance, levels for minicard stickiness grading is limited to 4 [0, 1, 2 and 3]) letting the corresponding CommonScale only limited to 0, 33, 67 and 100 results. In the same time, other methods having counts expressed in sticky points on extended scales for instance have lot more possibilities, as well as method being able to measure according to a continuous scale.

- It **only is safe to compare methods that are measuring the same single phenomenon, stickiness, or phenomenons that are related to stickiness.** At this point in time, it is not given that all present methods are measuring 'stickiness' or criterion that are related to stickiness.

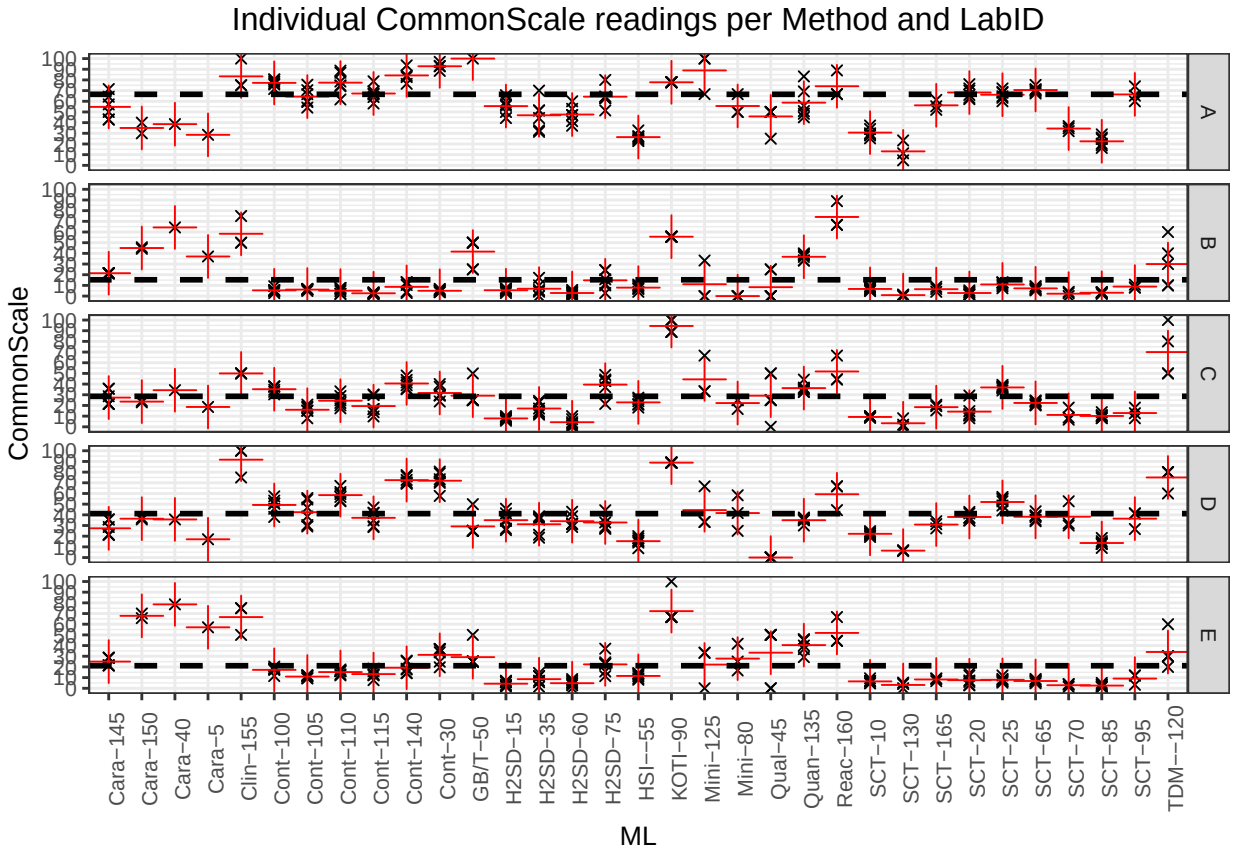
- This CommonScale approach provides results that still are cotton dependent.

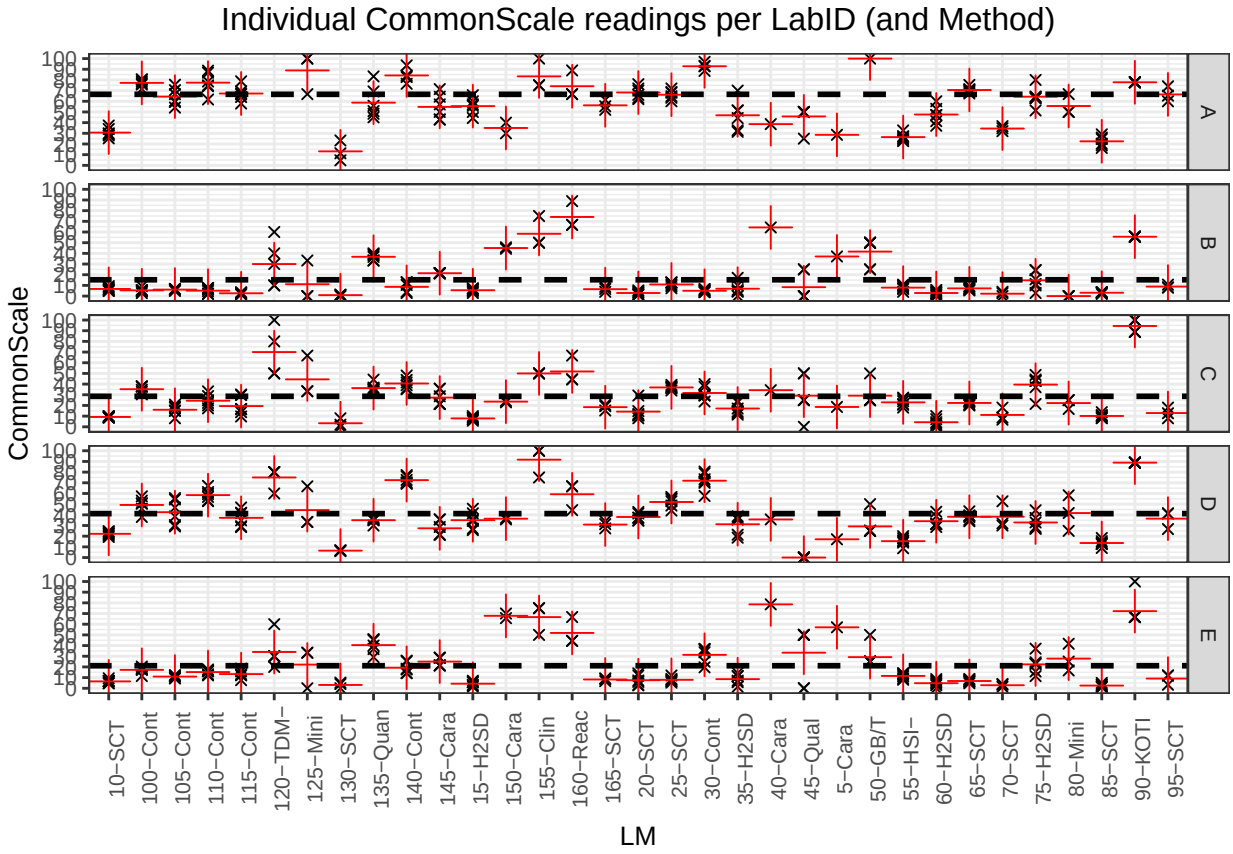
- This CommonScale approach may squeeze the scale for lower or highly stickiness contaminated cottons.

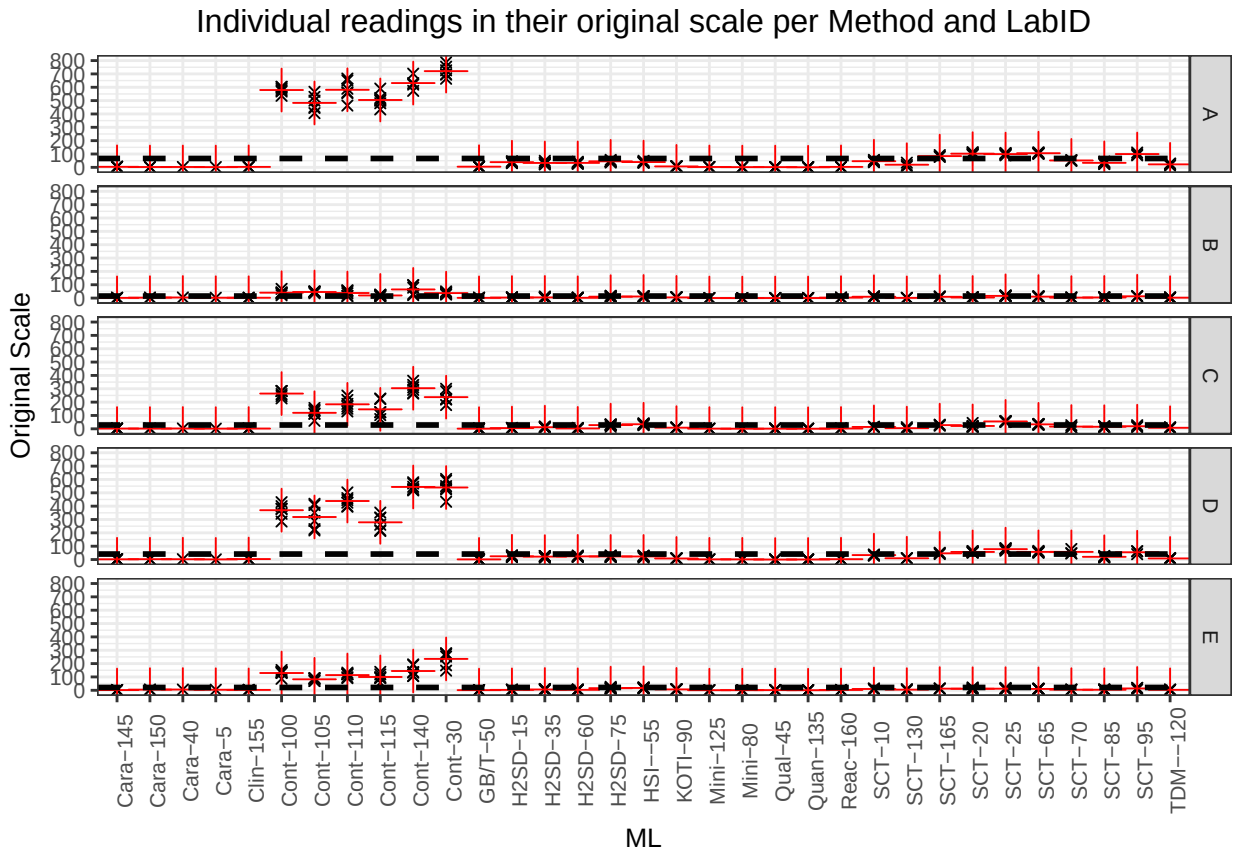
- This CommonScale approach may therefore have incidence on precision and accuracy of gained results.

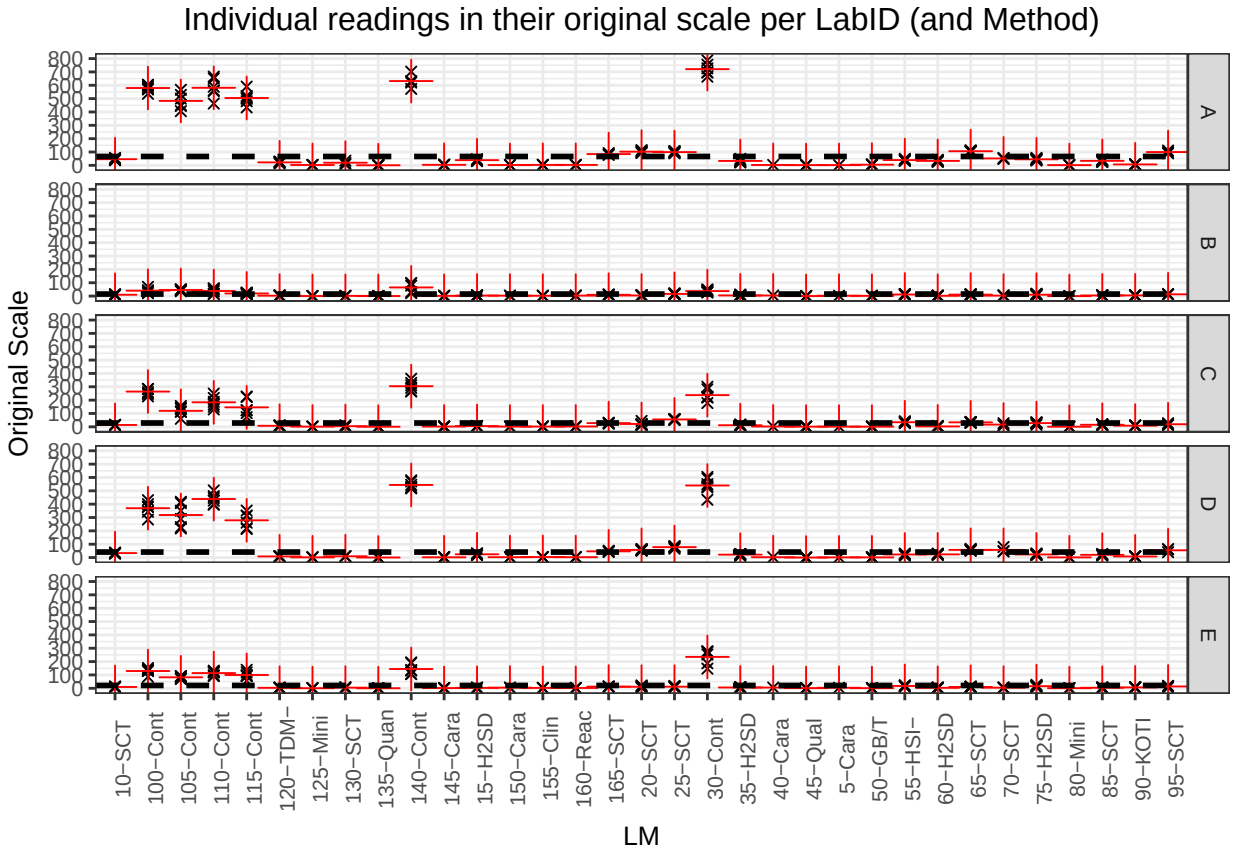
As a conclusion, as said earlier, CommonScale will be experimented at least for some round-tests in order to see if it could help Manufacturers and Users ***to get closer and closer results for each method for the same cottons over time.*** On the long run, the ability of each method to characterize stickiness ***in its strict sense*** will have to be evaluated to go further in the harmonization process (it could be by restricting some method(s) to be present in this round-test if they do not predict well enough stickiness troubles: a procedure has to be developed accordingly).

CommonScale charts


Individual CommonScale readings per Method and LabID
CommonScale
A
B
C
D
E
Cara−145
Cara−150
Cara−40
Cara−5
Clin−155
Cont−100
Cont−105
Cont−110
Cont−115
Cont−140
Cont−30
GB/T−50
H2SD−15
H2SD−35
H2SD−60
H2SD−75
HSI−−55
KOTI−90
Mini−125
Mini−80
Qual−45
Quan−135
Reac−160
SCT−10
SCT−130
SCT−165
SCT−20
SCT−25
SCT−65
SCT−70
SCT−85
SCT−95
TDM−−120
ML


Individual CommonScale readings per LabID (and Method)
CommonScale
LM
A
B
C
D
E
10−SCT
100−Cont
105−Cont
110−Cont
115−Cont
120−TDM−
125−Mini
130−SCT
135−Quan
140−Cont
145−Cara
15−H2SD
150−Cara
155−Clin
160−Reac
165−SCT
20−SCT
25−SCT
30−Cont
35−H2SD
40−Cara
45−Qual
5−Cara
50−GB/T
55−HSI−
60−H2SD
65−SCT
70−SCT
75−H2SD
80−Mini
85−SCT
90−KOTI
95−SCT


Individual readings in their original scale per Method and LabID
Original Scale
ML
A
B
C
D
E
Cara−145
Cara−150
Cara−40
Cara−5
Clin−155
Cont−100
Cont−105
Cont−110
Cont−115
Cont−140
Cont−30
GB/T−50
H2SD−15
H2SD−35
H2SD−60
H2SD−75
HSI−−55
KOTI−90
Mini−125
Mini−80
Qual−45
Quan−135
Reac−160
SCT−10
SCT−130
SCT−165
SCT−20
SCT−25
SCT−65
SCT−70
SCT−85
SCT−95
TDM−−120


Individual readings in their original scale per LabID (and Method)
Original Scale
LM
A
B
C
D
E
10−SCT
100−Cont
105−Cont
110−Cont
115−Cont
120−TDM−
125−Mini
130−SCT
135−Quan
140−Cont
145−Cara
15−H2SD
150−Cara
155−Clin
160−Reac
165−SCT
20−SCT
25−SCT
30−Cont
35−H2SD
40−Cara
45−Qual
5−Cara
50−GB/T
55−HSI−
60−H2SD
65−SCT
70−SCT
75−H2SD
80−Mini
85−SCT
90−KOTI
95−SCT

Overall statistics per Cotton and Method [8]

The following tables provide information about observed variations between results of various instruments within each method, for each of all used methods and for each and all cottons used in this round-test.

- Comparing the CVs between the lines of these tables - meaning comparing methods for each cotton - is not helpfull at all, as units used are very different between methods (so different that it has been necessary to create the CommonScale approach just displayed above to get a way of comparing results).

- However seing the evolution of these CV values over time will inform about the degree of harmonization achieved for stickiness measurement, method by method. A decrease of the CV values between instruments for each method - which is expected over time - will give indications about the degree of care taken by Laboratories and Manufacturers to harmonize results over time for their respective methods.

[8] Footnote

* NA or NaN excluded from the orginal raw data * NA appears in the following tables when less that two laboratories provided data for the given cotton and method

* Mean and Standard Deviation expressed in Unit, CV expressed in %

Mean, standard deviation and CV between instruments by method, Cotton A

Method	MeanInterLab	SdInterLab	CVInterLab	Unit
Caramelization	2.7	0.8	28.4	Color degree
Clinitest	3.3	NA	NA	Color Chart
Contest-Fibermap	583.4	86.6	14.9	C/F Grade
GB/T13785-1992	4.8	NA	NA	Color degree
H2SD	37.5	5.7	15.2	Sticky points
HSI-NIR	39.7	NA	NA	Sticky points
KOTITI	7.0	NA	NA	Sticky points
Minicard	2.2	0.7	32.6	ITMF grades
Qualitative method	1.8	NA	NA	Grade
Quantitative method	0.7	NA	NA	Percent
Reactive Spray	3.3	NA	NA	Spray Grade
SCT	71.4	33.6	47.0	Sticky points
TDM-A	22.4	NA	NA	Sticky points

Mean, standard deviation and CV between instruments by method, Cotton B

Method	MeanInterLab	SdInterLab	CVInterLab	Unit
Caramelization	2.9	1.2	42.5	Color degree
Clinitest	2.3	NA	NA	Color Chart
Contest-Fibermap	40.9	14.6	35.6	C/F Grade
GB/T13785-1992	1.7	NA	NA	Color degree
H2SD	5.2	3.6	68.3	Sticky points
HSI-NIR	11.8	NA	NA	Sticky points
KOTITI	5.0	NA	NA	Sticky points
Minicard	0.2	0.2	141.4	ITMF grades
Qualitative method	0.3	NA	NA	Grade
Quantitative method	0.4	NA	NA	Percent
Reactive Spray	3.3	NA	NA	Spray Grade
SCT	8.2	5.0	61.4	Sticky points
TDM-A	3.0	NA	NA	Sticky points

Mean, standard deviation and CV between instruments by method, Cotton C

Method	MeanInterLab	SdInterLab	CVInterLab	Unit
Caramelization	1.8	0.5	25.5	Color degree
Clinitest	2.0	NA	NA	Color Chart
Contest-Fibermap	209.1	71.4	34.1	C/F Grade
GB/T13785-1992	1.2	NA	NA	Color degree
H2SD	12.0	11.1	92.1	Sticky points
HSI-NIR	34.3	NA	NA	Sticky points
KOTITI	8.5	NA	NA	Sticky points
Minicard	1.0	0.5	47.1	ITMF grades
Qualitative method	1.2	NA	NA	Grade
Quantitative method	0.4	NA	NA	Percent
Reactive Spray	2.3	NA	NA	Spray Grade
SCT	23.1	14.6	63.1	Sticky points
TDM-A	7.8	NA	NA	Sticky points

Mean, standard deviation and CV between instruments by method, Cotton D

Method	MeanInterLab	SdInterLab	CVInterLab	Unit
Caramelization	2.0	0.6	30.9	Color degree
Clinitest	3.7	NA	NA	Color Chart
Contest-Fibermap	414.9	111.9	27.0	C/F Grade
GB/T13785-1992	1.2	NA	NA	Color degree
H2SD	23.3	1.1	4.9	Sticky points
HSI-NIR	23.0	NA	NA	Sticky points
KOTITI	8.0	NA	NA	Sticky points
Minicard	1.3	0.1	4.6	ITMF grades
Qualitative method	0.0	NA	NA	Grade
Quantitative method	0.4	NA	NA	Percent
Reactive Spray	2.7	NA	NA	Spray Grade
SCT	46.0	21.2	46.2	Sticky points
TDM-A	8.4	NA	NA	Sticky points

Mean, standard deviation and CV between instruments by method, Cotton E

Method	MeanInterLab	SdInterLab	CVInterLab	Unit
Caramelization	4.0	1.6	40.5	Color degree
Clinitest	2.7	NA	NA	Color Chart
Contest-Fibermap	134.1	54.0	40.3	C/F Grade
GB/T13785-1992	1.2	NA	NA	Color degree
H2SD	7.0	5.9	84.7	Sticky points
HSI-NIR	17.3	NA	NA	Sticky points
KOTITI	6.5	NA	NA	Sticky points
Minicard	0.8	0.1	15.7	ITMF grades
Qualitative method	1.3	NA	NA	Grade
Quantitative method	0.5	NA	NA	Percent
Reactive Spray	2.3	NA	NA	Spray Grade
SCT	9.1	3.8	41.8	Sticky points
TDM-A	3.4	NA	NA	Sticky points

Frequently asked questions [9]

Q: Correlation matrix are sometimes difficult to read due to formatting; is there any improvement possible?
A: We search for a solution, probably for next RT. Sorry for the inconvenience in the meantime.

Q: For SCT, do we have to report the number of sticky points adhering to the top and the one adhering to the bottom aluminum foils in each cell of the provided Excel sheet, or do we have to report their sum?
A: _ For SCT, please only report the sum of the counts observed on the top and bottom foils _ in each cell of the Excel sheet; thanks.

Q: Why are the cells of the Excel form locked?
A: The cells are locked to avoid modifications in the template to enable our importing system 'to know' where to get each piece of information for placing and pasting it into a devoted cell in the data base system. This saves time and secures the data in its original state (avoiding typing mistakes). So please _ make sure to use the proper Excel template _ (the latest sent together with the announcement of samples dispatch) for sending back you results.

Q: What 'GB/T13785-1992' stands for?
A: GB/T13785-1992 stands for a Chines standards called 'Test method for degree of sugar contains in cotton fibers – Colorimetry'.

Q: What 'H2SD' stands for?
A: H2SD stands for High Speed Stickiness Detector.

Q: What 'HSI-NIR' stands for?
A: HSI-NIR stands for Hyper Spectral Imaging based on Near Infra-red spectra.

Q: What 'SCT' stands for?
A: SCT stands for Stickiness Cotton Thermodetector.

Q: What 'TDM-A' stands for?
A: TDM-A stands for Thermo Detection Method, and A stands for a specific scale for designing the stickiness level.

To be complemented.

[9] Footnote

* Based on all round-tests carried out already.

Software components to realize this report [10]

Software code version: January 28, 2019 by Jean-Paul Gourlot

R version 3.4.3 (2017-11-30) Platform: x86_64-w64-mingw32/x64 (64-bit) Running under: Windows 7 x64 (build 7601) Service Pack 1

Matrix products: default

locale: [1] LC_COLLATE=French_France.1252 LC_CTYPE=French_France.1252
[3] LC_MONETARY=French_France.1252 LC_NUMERIC=C
[5] LC_TIME=French_France.1252

attached base packages: [1] grid stats graphics grDevices utils datasets methods
[8] base

other attached packages: [1] rmarkdown_1.8 markdown_0.8 ggplot2_2.2.1 reshape2_1.4.3 [5] xlsx_0.5.7 xlsxjars_0.6.1 rJava_0.9-9 knitr_1.18
[9] readxl_1.0.0

loaded via a namespace (and not attached): [1] Rcpp_0.12.12 magrittr_1.5 munsell_0.4.3 colorspace_1.3-2
[5] rlang_0.1.2 rematch_1.0.1 highr_0.6 stringr_1.2.0
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[21] compiler_3.4.3 cellranger_1.1.0 backports_1.1.1 scales_0.5.0

[10] Footnote
* List of all R components for processing the data

[1] “RTStick 2018-2_Long_2019-01-29_Raw”