



Varieties, Seed Quality, Extra Long Staple Cotton

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Outline

- Varieties
- Extra Long Staple Cotton in Tennessee
- Increasing the utility of seed testing data



Cotton Variety Trial Results | 2025



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Table OVT1. 2025 Tennessee Official Variety Trial details.

Location	Planting Date	Soil Type	Tillage	Irrigation
Gift	04/30/2025*	Loring Silt Loam	No-Till	None
	*Replanted 6/11/2025			
Grand Junction ¹	05/05/2025	Memphis Silt Loam	No-Till	None
Jackson ²	04/23/2025	Almo Silt Loam	No-Till	None
Jackson ²	06/03/2025	Almo Silt Loam	No-Till	None
Milan ³	05/15/2025	Grenada Silt Loam	No-Till	None
Ridgely	04/29/2025	Reelfoot Silt Loam	No-Till	None

¹Ames Plantation Research and Education Center, Grand Junction, TN

²West Tennessee Research and Education Center, Jackson, TN

³Milan Research and Education Center, Milan, TN



Table OVT2. Average lint yield, gin turnout, and fiber quality of the 40 entries in the 2025 Official Variety Trials conducted in Gift, Grand Junction, Jackson (early and late planted), Milan, and Ridgely locations, listed by yield rank.

Yield Rank	Variety	Lint Yield (lb/ac)	Turnout [†] (%)	Mic	Length (in.)	Strength (g/tex)	Unif (%)
1	PX1140H143-04 W3FE	1011 a [‡]	42.4 i-m	4.5 c-g	1.16 i-m	33.8 abc	83.5 a-e
2	PX1140F330-04 W3FE	1006 ab	43.0 fgh	4.5 e-k	1.15 lmn	32.2 fg	82.9 f-k
3	PX1140H152-04 W3FE	985 abc	42.4 h-m	4.4 e-l	1.17 f-j	34.2 a	83.6 a-d
4	PX1140H150-04 W3FE	950 a-d	42.3 k-n	4.6 b-e	1.16 i-m	34.0 a	83.7 abc
5	DP 2414 B3TXF	945 a-d	42.2 l-o	4.3 k-o	1.16 i-m	30.8 k-o	83.3 b-f
6	AMX 12677 B3XF	942 a-d	43.3 efg	4.9 a	1.17 e-i	33.3 bcd	83.2 b-g
7	AR 25X968 B3TXF	941 a-d	40.8 tu	4.4 f-n	1.10 rs	31.1 j-m	82.3 l-p
8	PX1150H164-04 W3FE	938 a-e	43.5 def	4.6 b-e	1.13 op	31.5 ij	82.6 i-n
9	ST 4650 AXTP	938 a-e	43.9 bcd	4.7 abc	1.10 s	31.1 j-m	82.7 g-l
10	PHY 433 W3FE	931 a-f	42.0 m-p	4.3 i-o	1.19 cd	33.9 ab	83.7 abc
11	NG 4626 B3XF	927 a-g	42.7 g-l	4.6 b-e	1.16 i-m	31.5 hij	83.8 ab
12	PHY 357 W3FE	923 a-g	42.8 g-k	4.5 d-i	1.15 mn	33.1 d	83.5 a-e
13	DP 2333 B3XF	908 b-h	43.1 fg	4.7 abc	1.12 op	30.1 p	81.9 opq
14	PHY 415 W3FE	901 c-i	42.0 m-q	4.3 i-o	1.17 e-h	33.7 a-d	83.3 b-f
15	PX1140H138-04 W3FE	898 c-j	42.0 m-p	4.6 b-e	1.12 pqr	34.0 a	83.1 d-i
16	DG 4565 B3TXF	898 c-j	42.7 g-l	4.3 i-o	1.15 lmn	28.8 q	82.6 j-n
17	DP 2038 B3XF	896 c-j	44.5 ab	4.7 bcd	1.10 s	30.5 m-p	82.1 n-q
18	AR 25X963 B3TXF	896 c-j	43.3 efg	4.2 n-q	1.14 mn	29.2 q	82.6 i-n
19	PX1150H167-04 W3FE	889 c-k	42.9 g-j	4.1 pqr	1.16 h-m	32.2 fgh	82.8 f-l
20	DP 2115 B3XF	868 d-l	41.6 o-s	4.5 c-h	1.15 j-n	31.1 j-m	82.9 f-k
21	ST 5260 AXTP	862 d-l	42.9 f-i	4.3 g-o	1.12 pq	31.8 f-i	82.5 k-o
22	PHY 411 W3FE	858 d-l	42.0 m-p	4.7 ab	1.10 s	32.4 ef	82.6 h-m
23	24R6012 B3TXF	857 d-l	41.4 rst	4.3 j-o	1.12 pq	30.4 nop	81.9 pq
24	AR 9371 B3XF	853 d-l	42.3 j-m	4.4 e-m	1.14 mn	30.3 op	82.9 f-k
25	ST 5931 AXTP	841 e-l	41.9 m-r	3.9 rs	1.18 cde	31.9 f-i	82.9 f-k
26	DGX 25102 B3TXF	839 f-l	45.0 a	4.3 h-o	1.14 mn	30.6 m-p	81.8 pq
27	ST 4833 AXTP	836 f-l	40.8 tu	4.2 opq	1.18 c-f	31.0 j-n	83.0 e-j
28	BX 2665 AXTP	836 f-l	41.7 n-s	4.5 e-j	1.19 bc	33.2 cd	83.6 a-d
29	DG 4434 B3TXF	830 g-l	43.0 fg	3.9 rs	1.16 g-l	30.6 l-p	82.1 nop
30	DG 4530 B3TXF	813 h-l	41.5 p-s	3.9 rs	1.17 e-i	30.7 k-p	83.2 b-g

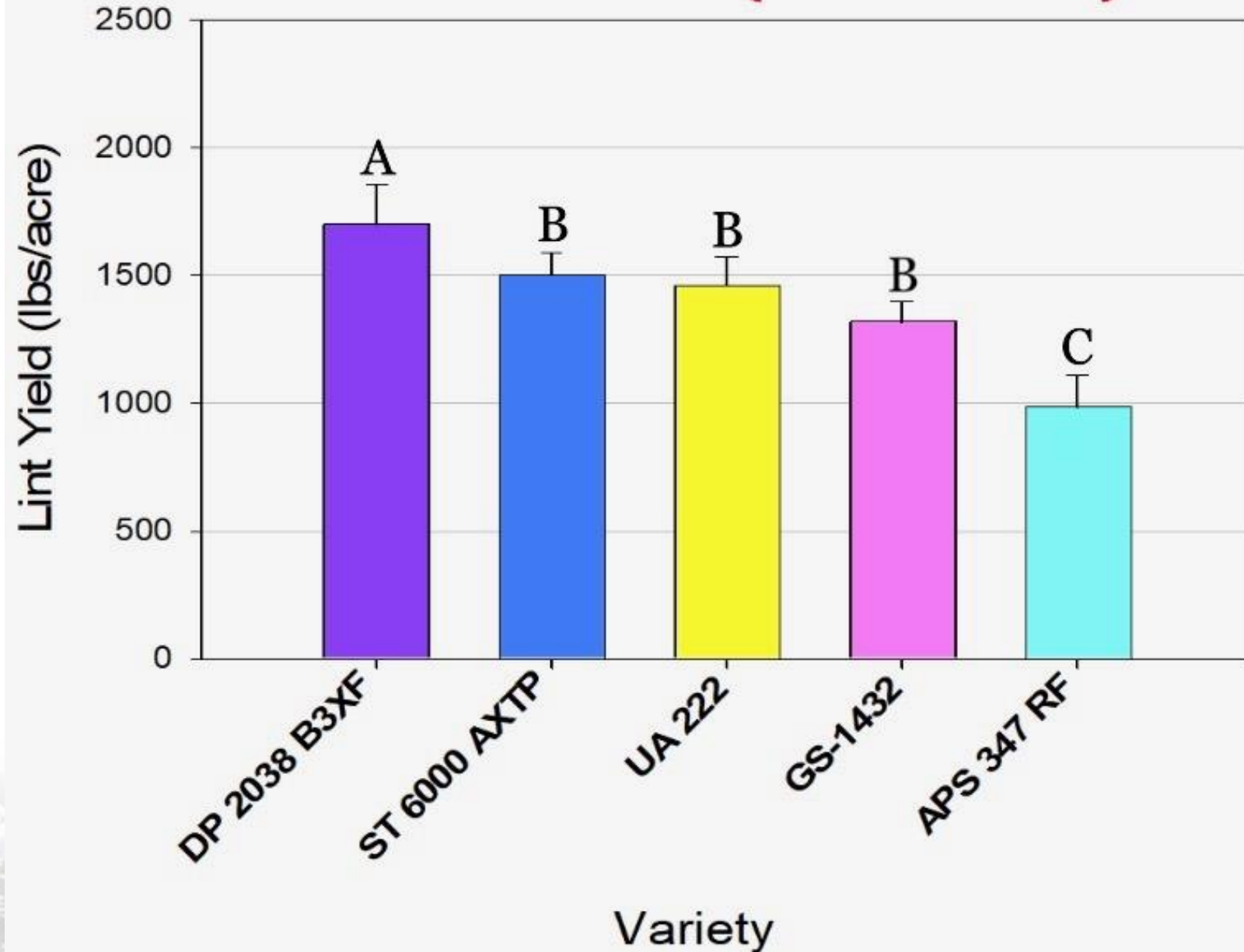
Table CST1. Average lint yield, gin turnout, and fiber quality of the thirteen XtendFlex varieties entered in the 2025 Tennessee County Standard Trial Program across eleven trial locations.

Yield Rank	Variety	Lint Yield (lb/ac)	Turnout (%)	Mic	Length (in.)	Strength (g/tex)	Unif (%)	HVI Color	Leaf	Loan Value
1	DP 2333 B3XF	1075a	43.3ab	4.7a	1.14gh	30.8cd	82.6bc	41	4	51.85
2	DP 2115 B3XF	1041ab	41.7def	4.6ab	1.15fg	30.9cd	83.1ab	41	4	52.91
3	NG 4626 B3XF	1025abc	42.6bcd	4.6ab	1.15fg	30.8cd	83.2ab	41	4	50.55
4	DP 2414 B3TXF	1019abc	41.9de	4.3cd	1.16efg	30.9cd	82.8abc	41	4	51.56
5	DP 2127 B3XF	1017a-d	41.5ef	4.7a	1.14gh	31.0c	83.4a	41	4	50.83
6	DP 2211 B3TXF	996a-e	42.3cde	4.4bc	1.16def	30.0de	82.9abc	41	3	53.18
7	NG 3572 B3TXF	980b-f	42.3cde	4.8a	1.12h	29.8e	83.0ab	41	4	50.85
8	ST 6000 AXTP	960b-g	43.7a	4.1de	1.18abcd	33.7a	83.2ab	41	4	51.23
9	ST 5855 AXTP	938c-g	43.2abc	4.2de	1.17cde	32.6b	83.3ab	41	4	53.03
10	ST 4215 AXTP	930d-g	41.5ef	4.4c	1.20a	31.5c	82.3c	41	4	51.79
11	DG 4434 B3TXF	909efg	41.6ef	4.0ef	1.18bcd	31.1c	82.8abc	41	4	52.36
12	ST 5931 AXTP	907fg	40.9f	3.9f	1.20ab	32.6b	83.3a	41	4	51.89
13	ST 4833 AXTP	887g	39.2g	4.2cd	1.19abc	31.7bc	83.3a	51	5	49.63
	Average	976	42.0	4.4	1.16	31.3	83.0	41	4	51.67
	LSD (p<0.05)	88	1.5	0.2	0.02	1.0	0.7			
	CV (%)	10.7	2.7	5.8	2.2	3.7	1.0			

Table CST2. Average lint yield, gin turnout, and fiber quality of the six Enlist varieties entered in the 2025 Tennessee County Standard Trial Program across seven trial locations.

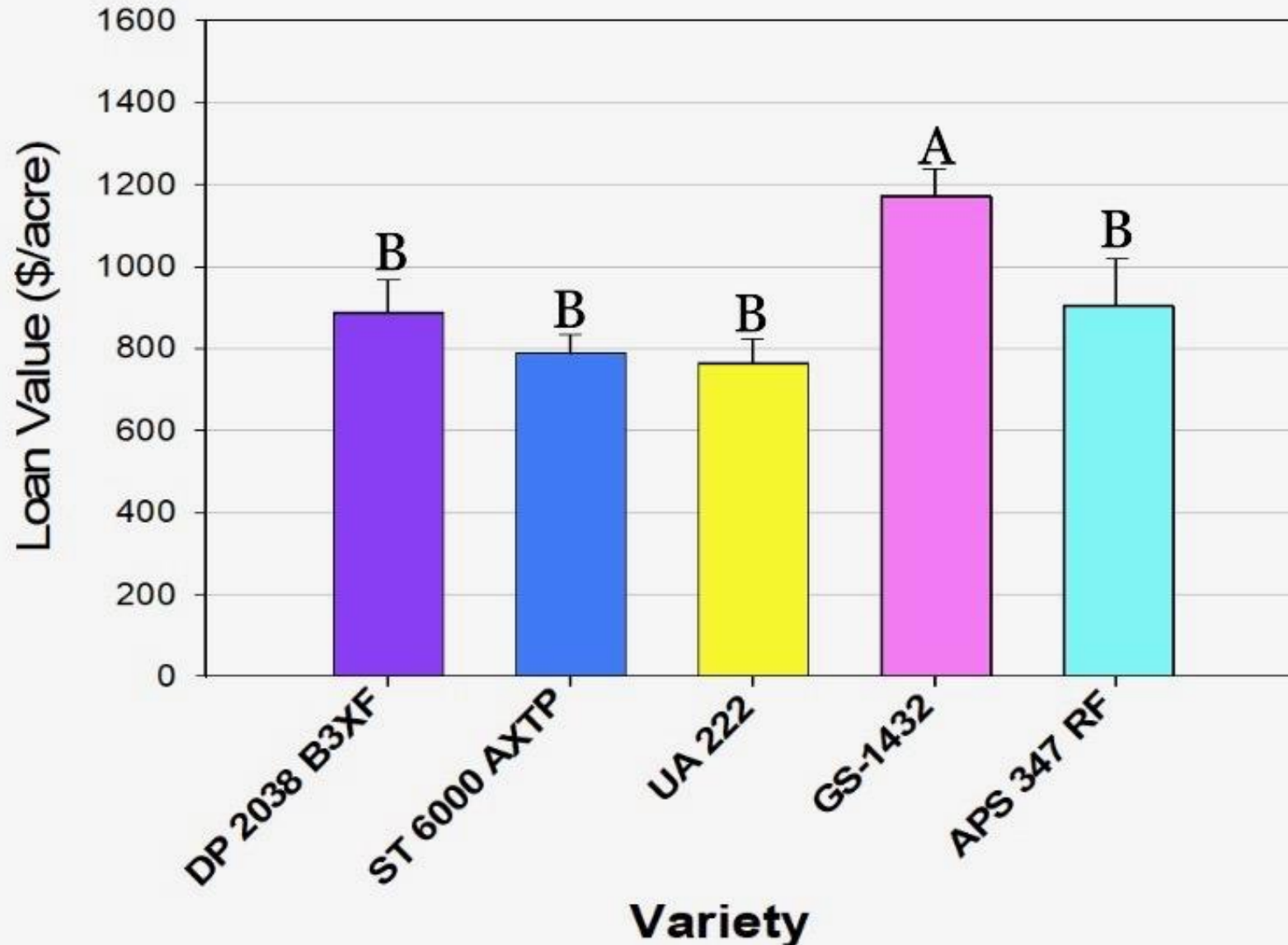
Yield Rank	Variety	Lint Yield (lb/ac)	Turnout (%)	Mic	Length (in.)	Strength (g/tex)	Unif (%)	HVI Color	Leaf	Loan Value
1	PHY 360 W3FE	826a	40.7	4.4ab	1.13cd	31.0cd	82.5b	41	4	52.42
2	PHY 415 W3FE	813a	40.9	4.2b	1.18a	34.0a	83.7a	41	5	50.29
3	PHY 357 W3FE	788ab	40.9ns	4.4ab	1.16abc	33.7abc	83.2ab	41	5	49.79
4	PHY 433 W3FE	785ab	40.8	4.3ab	1.17ab	33.7ab	83.7a	41	5	49.58
5	PHY 443 W3FE	763ab	39.9	4.5a	1.14bcd	33.6bcd	83.6ab	41	4	51.97
6	PHY 411 W3FE	739b	40.4	4.5a	1.12d	32.9d	82.7ab	41	4	52.67
	Average	786	40.6	4.4	1.15	33.1	83.2	41	5	51.12
	LSD (p<0.05)	73	1.0	0.3	0.03	1.9	1.1			
	CV (%)	8.2	2.2	5.1	2.6	4.9	1.2			

Lint Yield (lbs/acre)



- DP 2038 had the highest lint yield of 1694 lbs/acre
- ST 6000 – 1445 lbs/acre
- UA 222 – 1423 lbs/acre
- GS-1432 – 1290 lbs/acre
- APS 347 RF – 909 lbs/acre
- $P < 0.0001$

Loan Value (\$/acre)



- GS-1432 had the greatest loan value of \$1,147/acre
- DP 2038 – \$880/acre
- APS 347 RF - \$835/acre
- ST 6000 - \$759/acre
- UA 222 - \$745/acre
- $P < 0.0001$

Current State of the Industry

- DynaGro DGP224B3XF was introduced in 2023/24
- *G. hirsutism* with some fiber length genes from *G. barbadense*.
- GMO (RF, BG3)
- Initially advertised as “ELS Upland”. Now as “High quality upland variety”.

Fiber Quality Averages		—
% Gin Turnout	.....	27 - 37%
Uniformity %	.....	86.9
Micronaire Value	.....	3.65
Staple (inches)	.....	1.47
Strength (g/tex)	.....	33.75

Current State of the Industry

Federal Register Definitions:

Extra long staple (ELS) cotton (7 CFR 1427.3 “Extra long staple (ELS) cotton”) means any of the following varieties of cotton which is produced in the United States and is ginned on a roller gin:

- (1) American-Pima;
- (2) All other varieties of the Barbados species of cotton, and any hybrid thereof; and
- (3) Any other variety of cotton in which one or more of these varieties predominate.

Upland cotton (7 CFR 1427.3 “Upland cotton”)

means planted and stub cotton which is produced in the United States from other than pure strain varieties of the Barbados species, any hybrid thereof, or any other variety of cotton in which one or more of these varieties predominate.

ELS in Tennessee?

- PRODUCTIVITY: Can we mature the crop in TN?
- QUALITY: Environment is very different than AZ, CA
 - Furrow water
 - Night temps and humidity
- LOGISTICS: Who gins it?
- MARKET: Where does it go? How great is the demand? At what point does price slide?

- Stay tuned . . .  Cotton Incorporated





Cotton
Incorporated

This research was funded by the growers
and importers of upland cotton

Improving Germination Testing and Predictability of Field Emergence

Michael M. Phillips, Guy D. Collins, Darrin Dodds, Jenny Dudak, Keith L. Edmisten, Bill Foote, William Frame, Tim Gutormson, Camp Hand, Jeremy Hendricks, Susan Jaconis, Mike Jones, Shelly Kerns, Ken Lege, Benjamin McKnight, Gaylon Morgan, Randy Norton, Brian Pieralisi, Tyson Raper, Charlie Robertson, Tyler Sandlin, Evan Sayani, Sudeep Sidhu, Logan Simon, James Smith, Lori Unruh Snyder, Bradley Wilson

Materials and Methods – Field Experiments

- **Randomized Complete Block Design with Four Replications**
 - **Minimum of Two Planting Dates Per Site**

64 Total Site Years
Targeting Both Adverse
and Ideal Conditions

Each Site Followed Local Recommendations for:
Seeding Rate, Planting Depth and Row Spacing

Data Collection

- Stand counts at 7, 10, 14, and 21 DAP
 - Dry weight at 21 DAP

Data Analysis

- JMP Pro Version 18
 - Only locations with a significant difference ($\alpha = 0.05$) in emergence are included in results

Relationship Between 5-Day Predicted DD-60s and Planting Conditions

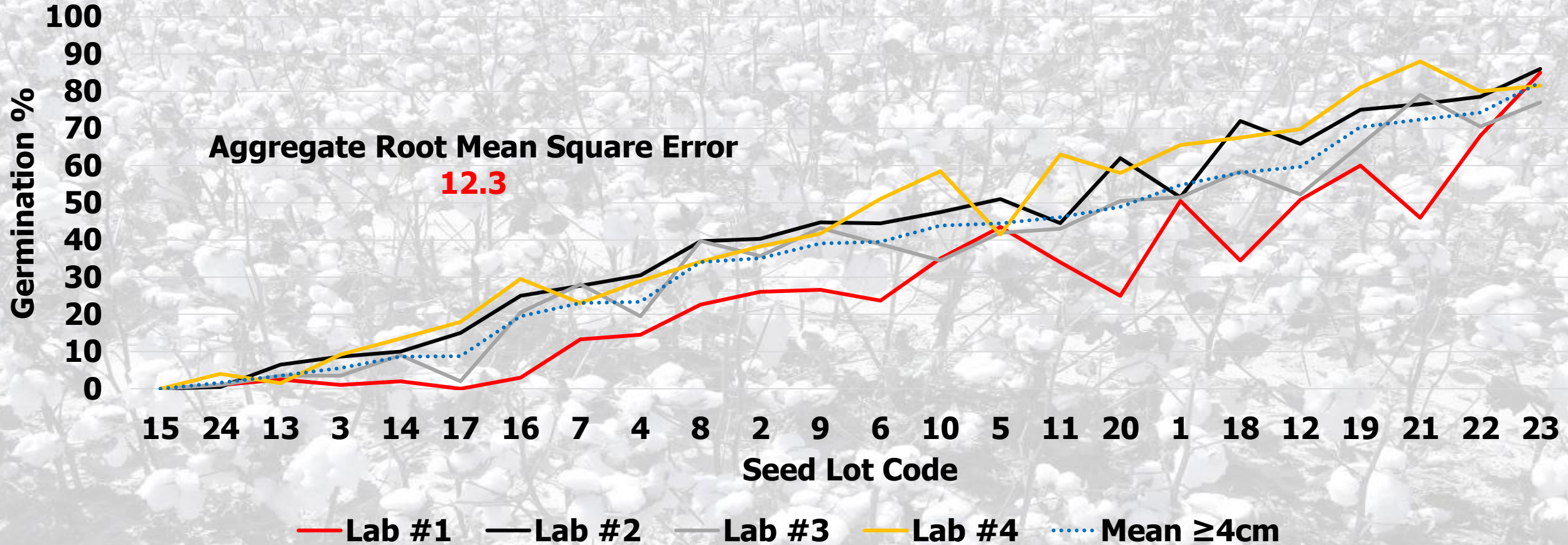
Predicted DD-60 accumulation for five days following planting	Planting Conditions
10 or fewer	Poor
11 to 15	Marginal
16 to 25	Adequate
26 to 35	Good
36 to 45	Very Good
Greater than 45	Excellent

Note: DD-60s are capped at 10 for any one day

NC State Cotton Planting Conditions Calculator
<https://products.climate.ncsu.edu/ag/cotton-planting/>

Results – 2025 Cool Test

2025 AOSA Standard Cotton Cool Vigor Test Germination %
(4-cm Radicle-Hypocotyl Threshold)

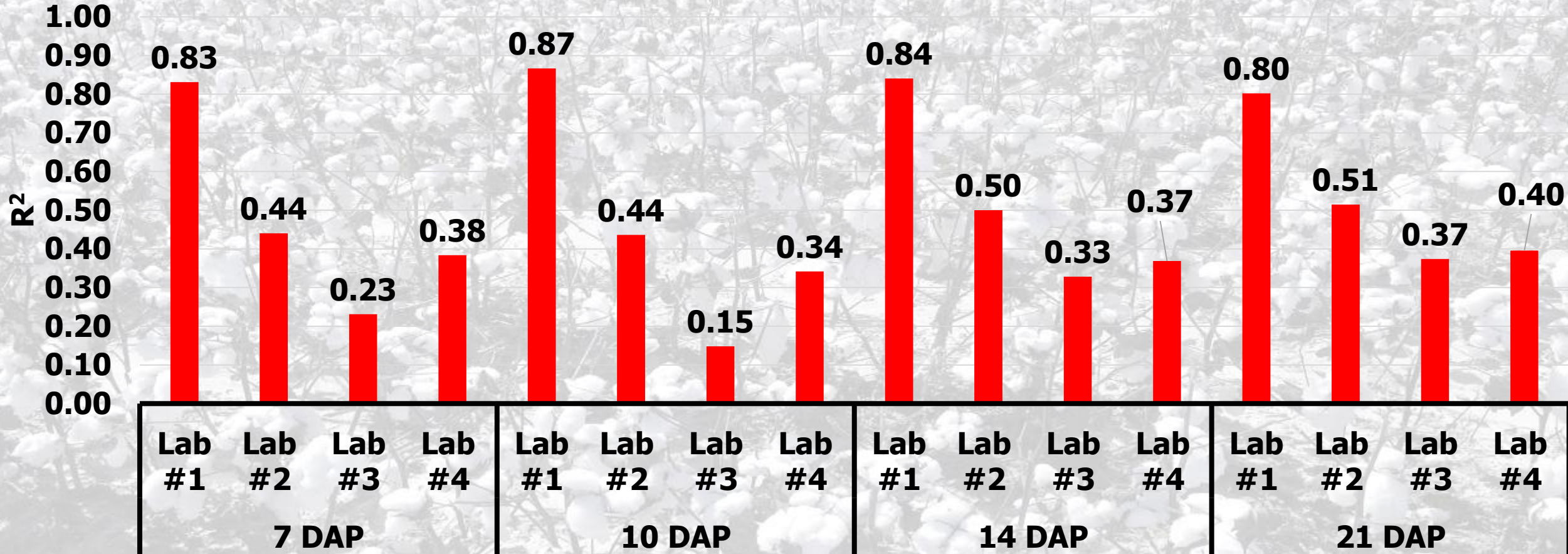


2024 Locations

Year	State	Location	Code	Date	5 DAP	Rating	DD-60's				Mean Emergence				DW
							7 DAP	10 DAP	14 DAP	21 DAP	7 DAP	10 DAP	14 DAP	21 DAP	
2024	North Carolina	Rocky Mount	NC3_24	4/22/2024	4	Poor	21	51	91	141	29	57	62	67	0.18
2024	Tennessee	Jackson	TN1_24	4/22/2024	6	Poor	26	55	95	156	17		77	80	0.87
2024	North Carolina	Lewiston	NC5_24	4/23/2024	9	Poor	29	59	98	138	14	20	22	64	0.10
2024	North Carolina	Rocky Mount	NC4_24	4/23/2024	10	Poor	30	60	100	144	25	63	74	78	0.18
2024	Georgia	Tifton	GA1_24	4/2/2024	14	Marginal	19	33	52	106	0		70	71	0.51
2024	Mississippi	Starkville	MS1_24	4/6/2024	17	Adequate	17	39	76	103	0		44	53	0.06
2024	Virginia	Suffolk	VA1_24	5/10/2024	20	Adequate	37	49	86	154	31	71	78		0.60
2024	Alabama	Madison	AL1_24	4/16/2024	25	Adequate	25	41	77.5	148	6		50	55	1.28
2024	South Carolina	Florence	SC1_24	4/23/2024	25	Adequate	44	74	114	169	22		60	61	0.19
2024	Texas	College Station	TXC1_24	4/2/2024	33	Good	53	72	110	159	36		62	69	1.38
2024	Texas	Lubbock	TXL1_24	5/3/2024	34	Good	52	60	89	156	1		4	52	0.14
2024	Kansas	Garden City	KS1_24	5/23/2024	36	Very Good	54	84	124	190	0	6	14	13	0.08
2024	Oklahoma	Fort Cobb	OK1_24	4/30/2024	38	Very Good	52	75	93	162	12		50	65	1.91
2024	Missouri	Portageville	MO1_24	4/15/2024	40	Very Good	40	49	84	152	0		38	42	0.13
2024	Arizona	Safford	AZ1_24	5/9/2024	41	Very Good	61	91	131	201	23		32	36	0.08
2024	North Carolina	Rocky Mount	NC1_24	4/15/2024	41	Very Good	49	51	69	129	32		66	71	0.14
2024	North Carolina	Rocky Mount	NC2_24	4/15/2024	41	Very Good	49	51	69	129	27		56	59	0.12
2024	Alabama	Madison	AL2_24	5/14/2024	46	Excellent	66	96	136	202	67		71	73	2.60
2024	Arizona	Safford	AZ2_24	5/27/2024	50	Excellent	70	100	140	210	57		61	59	0.35
2024	Oklahoma	Fort Cobb	OK2_24	5/22/2024	50	Excellent	70	100	140	210	48		60	69	2.20
2024	Texas	Lubbock	TXL2_24	5/21/2024	50	Excellent	70	100	140	206	42		48	50	0.21
2024	North Carolina	Rocky Mount	NC6_24	4/29/2024	50	Excellent	70	100	126	178	65		79	81	0.20
2024	Virginia	Suffolk	VA2_24	5/23/2024	50	Excellent	70	89	129	199	81		85	87	0.58
2024	Missouri	Portageville	MO2_24	4/30/2024	50	Excellent	70	96	130	200	56		49		
2024	Georgia	Tifton	GA2_24	5/1/2024	50	Excellent	70	99	132	202	45		48	48	0.22
2024	Florida	Quincy	FL1_24	5/24/2024	50	Excellent	70	100	140	210	55		76	77	0.49
2024	Tennessee	Jackson	TN2_24	5/22/2024	50	Excellent	70	100	140	210	22		35	35	0.78
2024	South Carolina	Florence	SC2_24	5/21/2024	50	Excellent	70	99	132	201	64		66	67	0.35
2024	Mississippi	Starkville	MS2_24	5/24/2024	50	Excellent	70	100	140	210	38		51	62	0.20
2024	Texas	College Station	TXC2_24	4/24/2024	50	Excellent	70	100	140	210	49		65	74	3.03

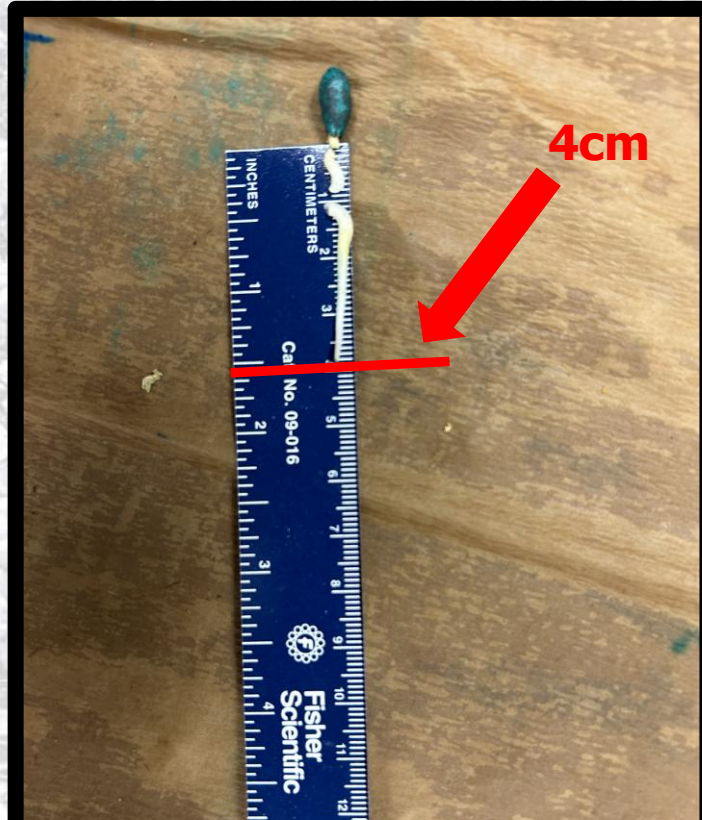
Results - 2024 Warm Test

2024 Warm Germination Test
Coefficient of Determination for Field Emergence

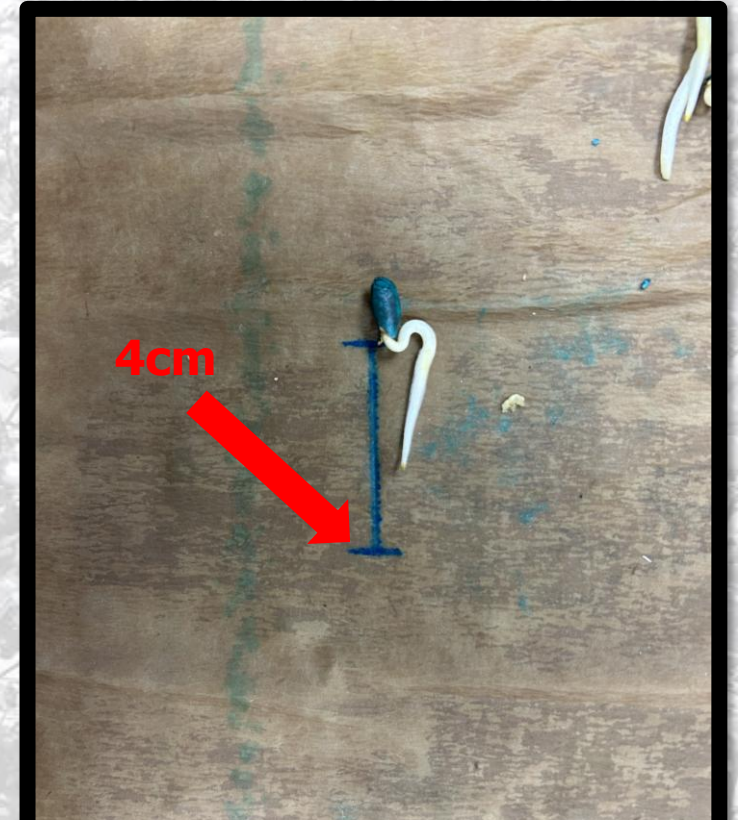


Why Does a Short RHL Work?

With an extremely curved seedling, you essentially must break it apart and ESTIMATE to determine its length using traditional measuring methods



Is this seedling 4cm or not? Depending on the individual measuring, this could go either way. How can we get rid of this subjective measuring?



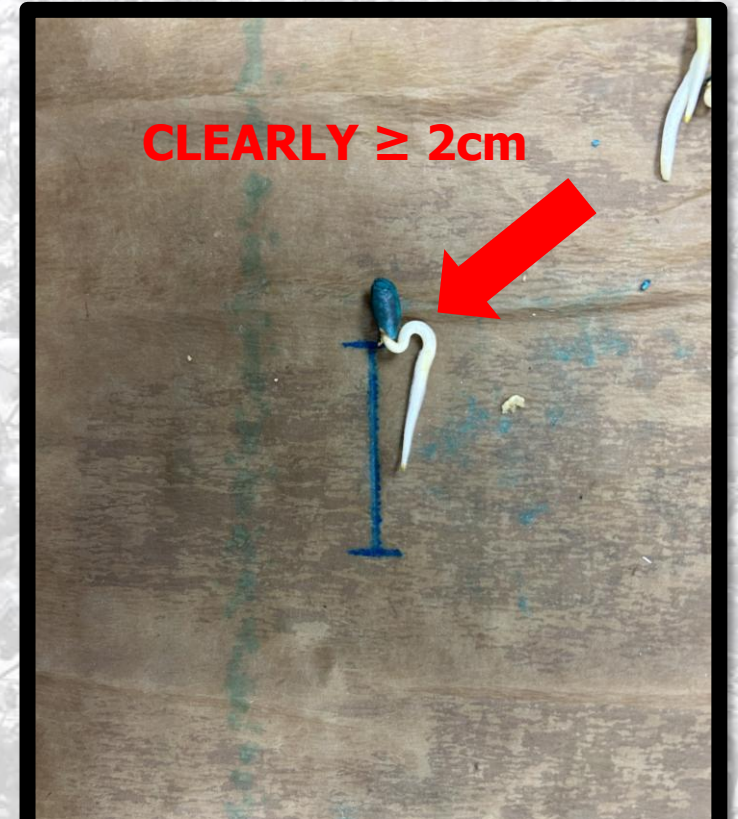
ABSENCE OF PRECISION

Why Does a Short RHL Work?

By using a shorter radicle-hypocotyl length threshold, curved seedlings are no longer a guessing game



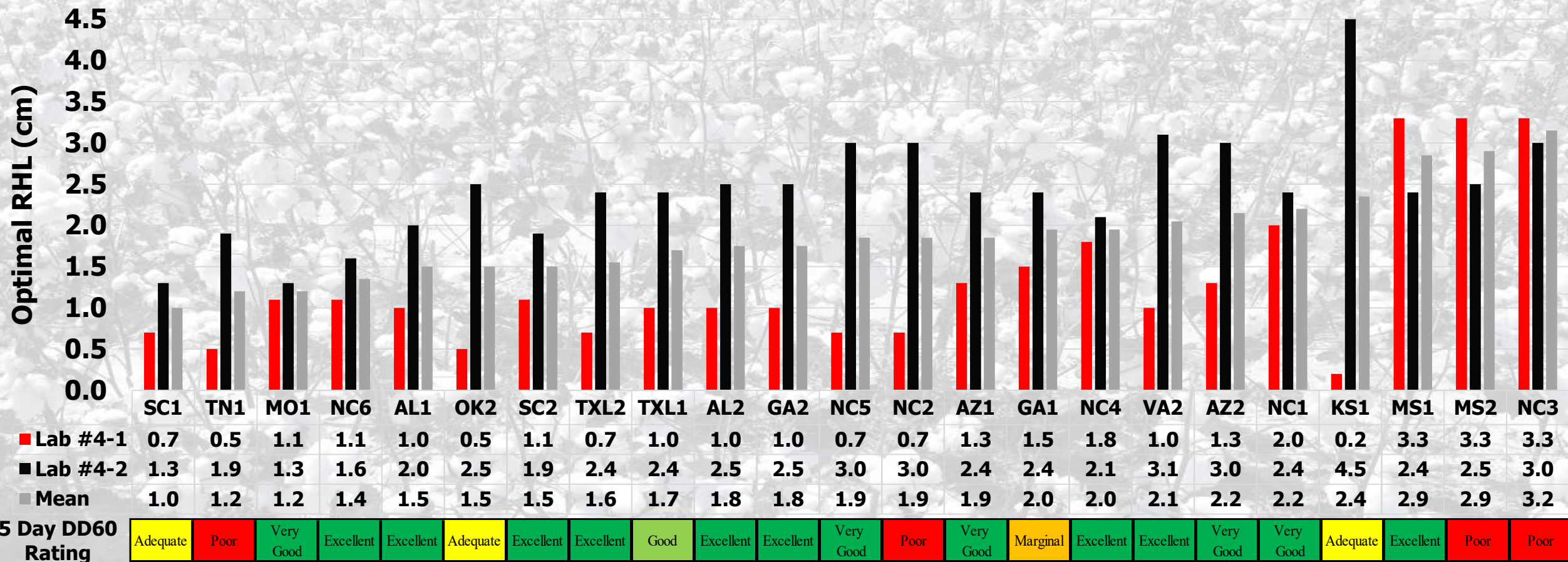
Is this seedling $\geq 2\text{cm}$ or not? Of course it is! Traditional measuring methods can be used while avoiding subjective counts



REDUCES SUBJECTIVITY

Results - 2024

Optimal Radicle-Hypocotyl Length Threshold to Predict Final Stand 2024



Conclusions – Cool Test

- The current AOSA 4-cm radicle-hypocotyl length threshold in the Cotton Cool Vigor Test did not optimize error between and within laboratories as well as shorter thresholds. **A shorter threshold would decrease error substantially.**
- **The 4-cm RHL threshold did not predict field performance as well as shorter radicle lengths** in any year, laboratory, or time frame following planting.
- A radicle-hypocotyl length of ~ 2 cm would **maximize predictability of field performance in all situations, regardless of seed quality or planting conditions.**
- A radicle-hypocotyl length of ~ 1 cm would **maximize predictability of field performance in situations with acceptable final stands and commercially acceptable seed lots.**
- **Modifying the Cotton Cool Vigor Test to utilize a shorter RHL threshold will increase field predictability by ~ 20 percentage points or more.**

Take home

- Sketch out the response curve
 - Estimate the yield intercept
 - Estimate input level for maximum productivity
 - Estimate input level for maximum PROFITABILITY
 -
- Mitigate risk by properly selecting a combination of inputs to achieve a reasonable yield goal.

