



REPLICATED FIELD TRIAL · 2022

AGRICENTER INTERNATIONAL · MEMPHIS, TENNESSEE

Cotton Foliar Nutrition Programs

2022 yield & fiber trial — three AgriTec liquid programs, calcium plus foliar NPK applied at planting and pinhead square, measured against an untreated check on DP 1646B2FX upland cotton.

+98 lb lint/ac
BEST PROGRAM VS. CHECK*

951 lb lint/ac
TOP PROGRAM YIELD (TRT 3)

3 of 3
PROGRAMS ABOVE THE
CHECK

4 × 4
TREATMENTS × REPS (RCB)

*Directional gains — differences within the trial's LSD at P=.05. Full statistical context inside.



Trial at a glance

LOCATION Memphis, TN Shelby Co.	COOPERATOR Agricenter Intl.	VARIETY DP 1646B2FX	SOIL Falaya silt loam pH 6.5 · CEC 7.8
PLANTED May 19, 2022 55k seed/ac	HARVESTED Dec 14, 2022	PLOT SIZE 12.7 × 30 ft 4 rows @ 38 in	CARRIER VOLUME 15 gal/ac CO ₂ backpack

The four treatments

All AgriTec programs anchor on 3 gal/ac liquid Calcium at planting, then vary how N–P–K is split between planting (PRE) and pinhead square (PHS).

Trt 1	Untreated Check	Trt 2	Front-loaded K	Trt 3	Balanced split	Trt 4	Late NPK
No foliar nutrition applied. Baseline for comparison.		AT PLANTING (PRE) Calcium 3 gal/ac 25-0-0 4 gal/ac 3-18-18 2 gal/ac 0-0-30 4 gal/ac PINHEAD SQUARE (PHS) 0-0-30 5 gal/ac		AT PLANTING (PRE) Calcium 3 gal/ac 10-0-10 4 gal/ac 10-20-10 2 gal/ac PINHEAD SQUARE (PHS) 0-0-30 6 gal/ac		AT PLANTING (PRE) Calcium 3 gal/ac 0-0-30 6 gal/ac PINHEAD SQUARE (PHS) 10-0-10 4 gal/ac 10-20-10 2 gal/ac	
Total product 0 gal/ac		Total product 18 gal/ac		Total product 15 gal/ac		Total product 15 gal/ac	

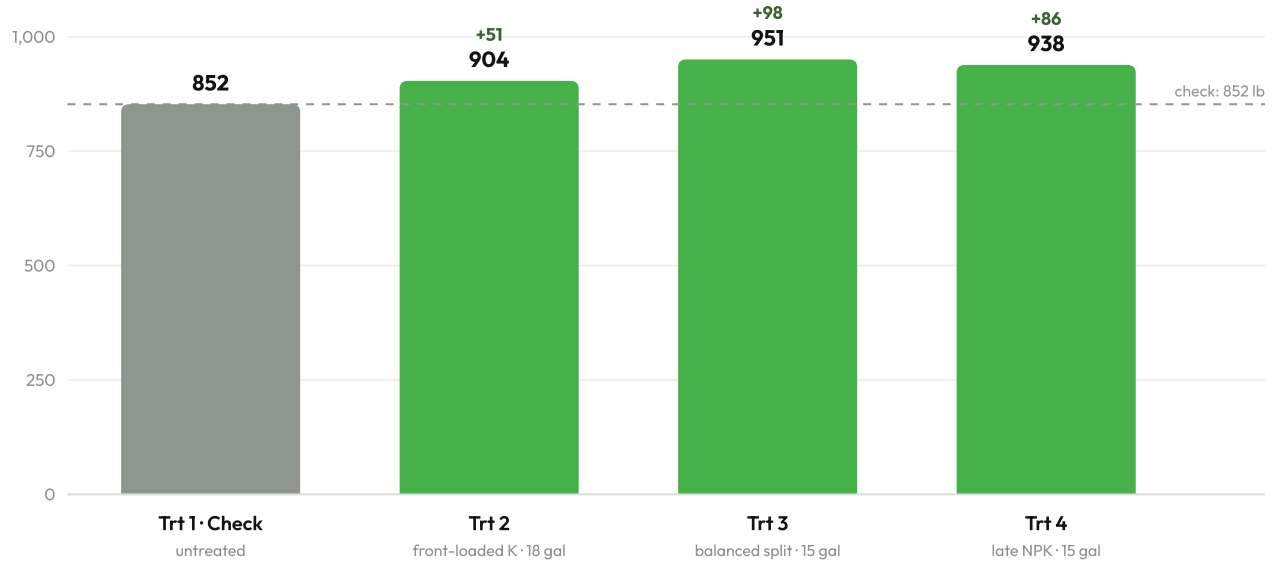
*Yield differences in this single-site, four-rep trial were directional and did not reach statistical significance at $P=.05$ — see "How to read these results" on page 3. Source: ARM 2023.0 trial report, 2022 AgriTec Cotton, Agricenter International.

Every program out-yielded the check

Lint yield at harvest (Dec 14, 2022), machine-picked from 6.3 ft × 30 ft. Means of 4 replications, converted to lb lint per acre.

Lint yield by treatment

lb lint / acre · gains shown vs. untreated check



Seed cotton per plot

lb seed cotton / plot at harvest (mean of 4 reps)



Lint turnout

gin-out, % of seed cotton weight

40.3%

TRT 1 CHECK

41.0%

ALL 3 PROGRAMS

Treated plots ginned out ~0.7 points higher than the check — more of every picked pound was sellable lint.

How to read these results. This is one site-year with 4 replications. The yield spread (+51 to +98 lb/ac) sits inside the trial's LSD at $P=0.05$ (148 lb/ac), so the gains are **directional, not statistically confirmed** — a consistent pattern worth noting (all three programs finished above the check in both seed cotton and lint), but not proof on its own. Micronaire was the measure closest to significance ($P=0.07$, page 4).

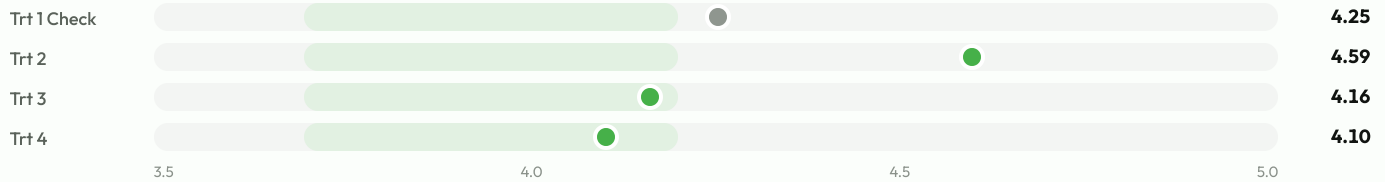


Fiber quality held — and micronaire moved

HVI classing on lint samples, tested Feb 22, 2023. Means of 4 replications. Yield gains mean little if fiber grades slip; here they didn't.

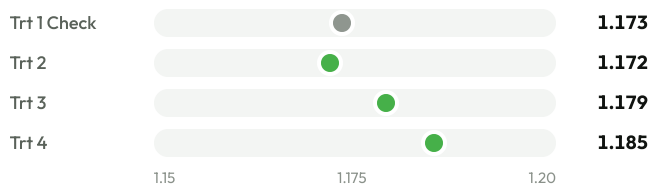
Micronaire · the one to watch (P=0.07)

Shaded band = premium range 3.7–4.2 (no discount). Trts 3 & 4 landed in premium; the check and Trt 2 ran above it.



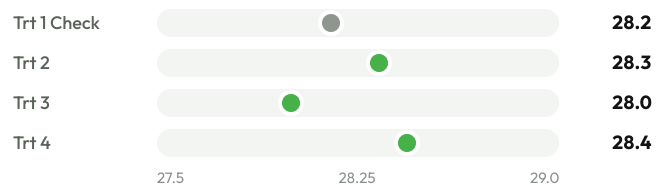
Staple length

upper-half mean, inches



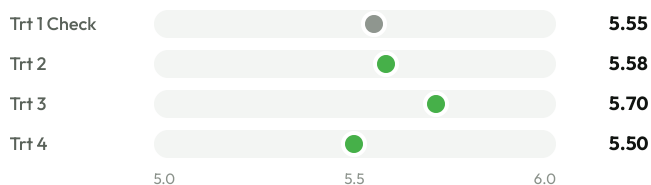
Fiber strength

g/tex



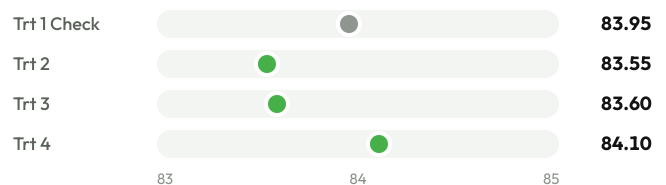
Elongation

% fiber elongation at break



Length uniformity

%



● Untreated check ● AgriTec programs

What this says. Length, strength, elongation and uniformity all stayed within a tight, normal band across treatments — the yield-side programs did not cost fiber grade. The interesting signal is micronaire: the two programs that held potassium or NPK back to pinhead square (Trts 3 & 4) finished in the 3.7–4.2 premium window, while the check and the front-loaded program ran above it. At P=0.07 this is close to, but not past, the conventional significance bar — worth a repeat trial.



The season at a glance



How the trial was run

Design	Randomized complete block, 4 reps, 16 plots
Applications	CO ₂ backpack · 8002 flat-fan · 30 PSI · 15 gal/ac water
Boom	6 ft, 19 in height, 2 nozzles/row @ 20 in, 3 mph
App A conditions	May 19 · 87°F · RH 48% · wind 3 mph S · soil 70°F
App B conditions	Jun 22 · 99°F · RH 31% · wind 2 mph S · soil 81°F
Tillage	Conventional till, friable seedbed

Soil at the site

Series	Falaya silt loam ("2022 Disease Field")
Texture	29.6% sand · 51.6% silt · 18.6% clay
pH	6.5
CEC	7.8 meq/100g
Organic matter	1.8%
Fertility / drainage	Good / good

Full results table

Means of 4 replications. Yield differences not significant at $P=.05$; means within a column sharing the LSD are statistically equivalent.

Treatment	Seed cotton lb/plot	Lint turnout %	Lint yield lb/ac	Length in	Strength g/tex	Micronaire	Elong. %	Uniformity %
1 · Untreated check	9.19	40.3	852	1.173	28.2	4.25	5.55	83.95
2 · Front-loaded K (18 gal/ac)	9.56	41.0	904	1.172	28.3	4.59	5.58	83.55
3 · Balanced split (15 gal/ac)	10.06	41.0	951	1.179	28.0	4.16	5.70	83.60
4 · Late NPK (15 gal/ac)	9.90	41.0	938	1.185	28.4	4.10	5.50	84.10
LSD ($P=.05$)	1.32	1.8	148	0.038	1.54	0.38	0.41	1.05
CV % · Treatment P(F)	8.5 · 0.48	2.8 · 0.73	10.2 · 0.48	2.0 · 0.86	3.4 · 0.93	5.5 · 0.07	4.6 · 0.73	0.8 · 0.60

Stand counts (Jun 3, 7 days after emergence) averaged 20.5–22.3 plants/19 ft of row across treated plots; the check's recorded mean is inflated by an apparent data-entry artifact in plot 301 and is omitted here. Full plot-level data available in the original ARM report.

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