

2024 Potash Crash and Other Issues in Mississippi Cotton Production

U.S.
BATTERY D,
1ST ILLINOIS LIGHT ARTILLERY,
3RD DIV., 17TH CORPS, ARMY OF THE TENNESSEE
CAPT. HENRY A. ROGERS

FORMERLY THE "MALLORY BATTERY" OF THE BATTLE OF GETTYSBURG, THIS BATTERY WAS REORGANIZED AND REEQUIPPED WITH 3-POUNDEER GUNS IN 1862. THE BATTERY FIGHTED THE BATTLE OF CHICKASAW, MISSISSIPPI, WHICH WERE SHOT BY THE ENEMY IN THE NIGHT. THE BATTERY WAS REEQUIPPED WITH 3-POUNDEER GUNS IN 1862. THE BATTERY WAS REEQUIPPED WITH 3-POUNDEER GUNS IN 1862. THE BATTERY WAS REEQUIPPED WITH 3-POUNDEER GUNS IN 1862.

NO CASUALTIES REPORTED

Photo: Will Rutland; Kendall Garraway



**Drought conditions:
December 5, 2024**

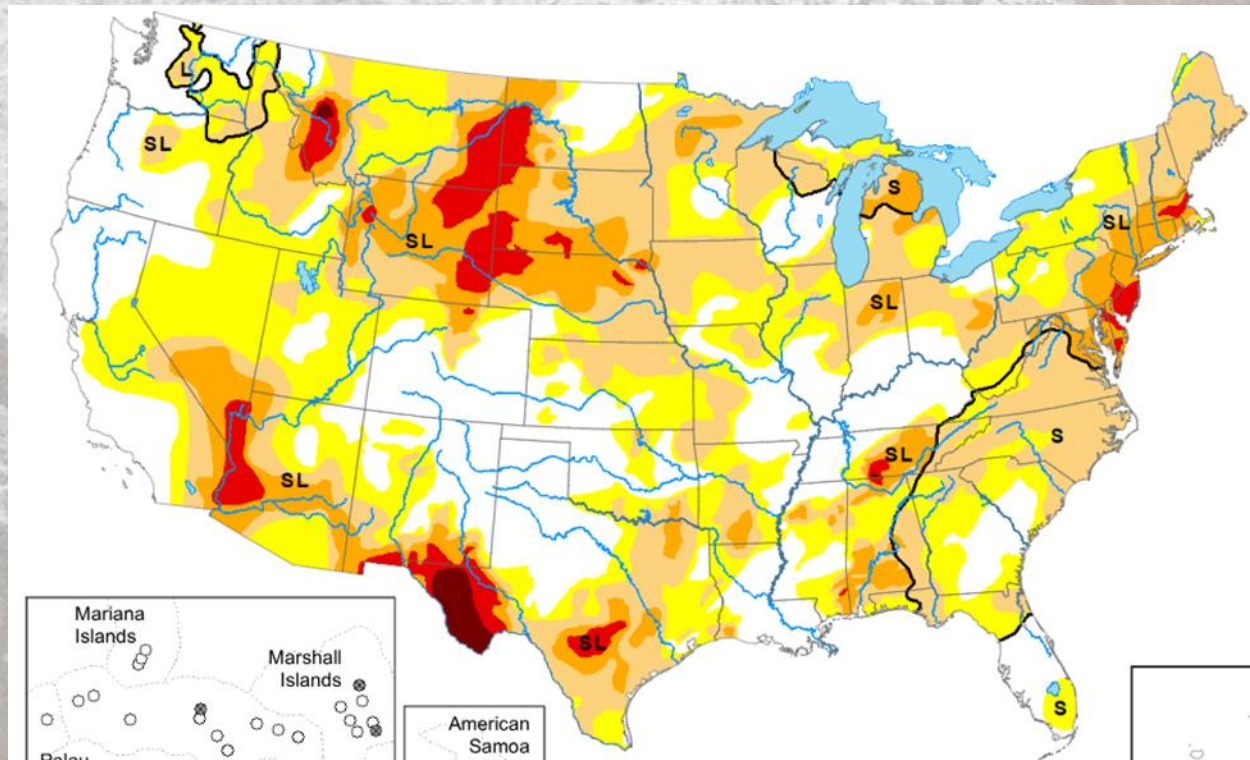
Statewide Outlook

Mississippi 2023: 390,000 acres
Mississippi 2024:
Acres harvested: 520,000
(+25%)

2024 NASS estimate - Yield: 1118
lb./acre (+8.7%)

2023: 1033 lb./acre

<https://quickstats.nass.usda.gov/results>



Statewide Outlook

Mississippi 2024 – Relatively flat?

- December cotton 2021 ~\$1.10
- December cotton 2022 ~\$0.86 (Dec.6, 2022)
- December cotton 2023 ~\$0.80 (Nov. 30, 2023)
- December cotton 2024 ~\$0.73 (Dec. 5, 2024)

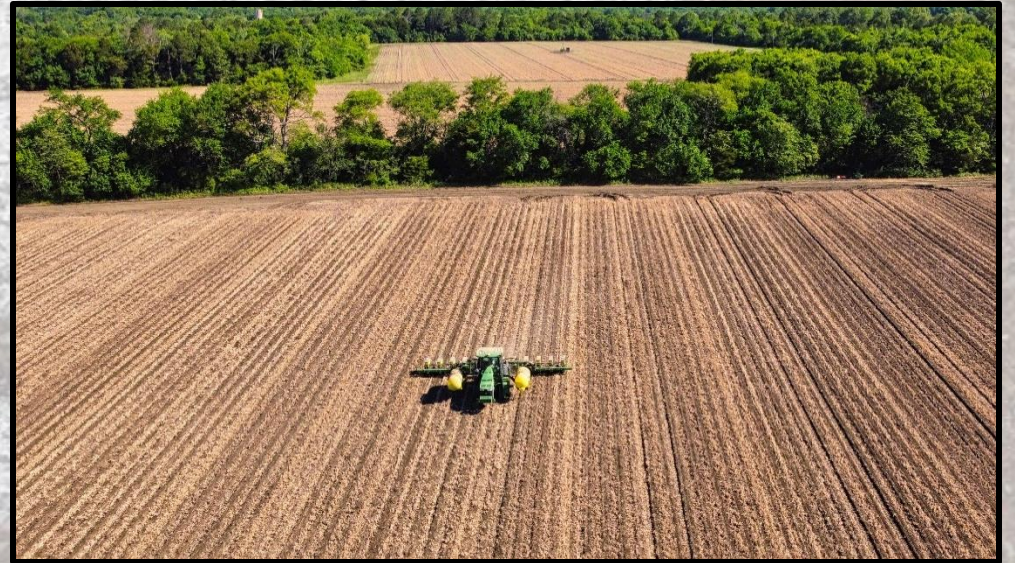




Table 2.B Summary of estimated costs and returns per acre
 Cotton, 12R-38" solid, conserv. tillage, furrow irr.,
 B3XF variety, 10.5 ac-in., Delta Area, Mississippi, 2023

ITEM	UNIT	PRICE	QUANTITY	AMOUNT	YOUR FARM
		dollars		dollars	
INCOME					
Cotton Lint	lb	0.73	1500.0000	1108.35	_____
Cotton Seed	lb	0.11	2025.0000	222.75	_____
TOTAL INCOME				1331.10	_____
DIRECT EXPENSES					
CUSTOM SPRAY	acre	55.80	1.0000	55.80	_____
HARVEST AIDS	acre	17.98	1.0000	17.98	_____
GINNING	acre	165.00	1.0000	165.00	_____
FERTILIZERS	acre	217.64	1.0000	217.64	_____
FUNGICIDES	acre	20.00	1.0000	20.00	_____
HERBICIDES	acre	128.29	1.0000	128.29	_____
INSECTICIDES	acre	104.38	1.0000	104.38	_____
IRRIGATION SUPPLIES	acre	7.92	1.0000	7.92	_____
SEED/PLANTS	acre	105.75	1.0000	105.75	_____
GROWTH REGULATORS	acre	11.22	1.0000	11.22	_____
ADJUVANTS	acre	1.32	1.0000	1.32	_____
CUSTOM FERTILIZE	acre	7.50	1.0000	7.50	_____
ERADICATION FEE	acre	1.00	1.0000	1.00	_____
CUSTOM LIME	acre	38.63	1.0000	38.63	_____
CROP CONSULTANT	acre	8.00	1.0000	8.00	_____
SOIL TEST	acre	3.33	1.0000	3.33	_____
HAND LABOR	hour	9.06	0.3135	2.82	_____
IRRIGATE LABOR	hour	9.06	0.3625	3.30	_____
OPERATOR LABOR	hour	16.54	0.7101	11.74	_____
UNALLOCATED LABOR	hour	16.54	0.5052	8.36	_____
DIESEL FUEL	gal	4.48	20.7109	92.79	_____
REPAIR & MAINTENANCE	acre	48.36	1.0000	48.36	_____
INTEREST ON OP. CAP.	acre	29.10	1.0000	29.10	_____
TOTAL DIRECT EXPENSES				1090.23	_____
RETURNS ABOVE DIRECT EXPENSES				240.87	_____
TOTAL FIXED EXPENSES				232.00	_____
TOTAL SPECIFIED EXPENSES				1322.23	_____
RETURNS ABOVE TOTAL SPECIFIED EXPENSES				8.87	_____



Cotton Seed \$0.09 / ton

Lint 1500 lbs @ \$0.73= \$1095

Seed @ \$0.09 *2025 = \$182

= \$1277

<https://www.agecon.msstate.edu/whatwedo/budgets.php>

Note: Cost of production estimates are based on 2022 input prices.
 Fertilization decisions should be based on soil tests



Table 9.B Summary of estimated costs and returns per acre
 Cotton, 12R-38" solid, no-till
 B3XF variety, Non-Delta Area, Mississippi, 2023

ITEM	UNIT	PRICE	QUANTITY	AMOUNT	YOUR FARM
		dollars		dollars	
INCOME					
Cotton Lint	lb	0.73	900.0000	665.01	_____
Cotton Seed	lb	0.11	1215.0000	133.65	_____

TOTAL INCOME				798.66	_____
DIRECT EXPENSES					
HARVEST AIDS	acre	17.98	1.0000	17.98	_____
GINNING	acre	99.00	1.0000	99.00	_____
FERTILIZERS	acre	149.02	1.0000	149.02	_____
FUNGICIDES	acre	20.00	1.0000	20.00	_____
HERBICIDES	acre	114.43	1.0000	114.43	_____
INSECTICIDES	acre	50.09	1.0000	50.09	_____
SEED/PLANTS	acre	105.75	1.0000	105.75	_____
GROWTH REGULATORS	acre	7.04	1.0000	7.04	_____
ADJUVANTS	acre	1.32	1.0000	1.32	_____
CUSTOM FERTILIZE	acre	7.50	1.0000	7.50	_____
ERADICATION FEE	acre	1.00	1.0000	1.00	_____
CUSTOM LIME	acre	38.63	1.0000	38.63	_____
CROP CONSULTANT	acre	8.00	1.0000	8.00	_____
SOIL TEST	acre	3.33	1.0000	3.33	_____
HAND LABOR	hour	9.06	0.3220	2.89	_____
OPERATOR LABOR	hour	16.54	0.5709	9.41	_____
UNALLOCATED LABOR	hour	16.61	0.4567	7.59	_____
DIESEL FUEL	gal	4.48	10.3205	46.25	_____
REPAIR & MAINTENANCE	acre	36.83	1.0000	36.83	_____
INTEREST ON OP. CAP.	acre	21.23	1.0000	21.23	_____

TOTAL DIRECT EXPENSES				747.29	_____
RETURNS ABOVE DIRECT EXPENSES				51.37	_____

TOTAL FIXED EXPENSES				154.00	_____

TOTAL SPECIFIED EXPENSES				901.29	_____
RETURNS ABOVE TOTAL SPECIFIED EXPENSES				-102.63	_____

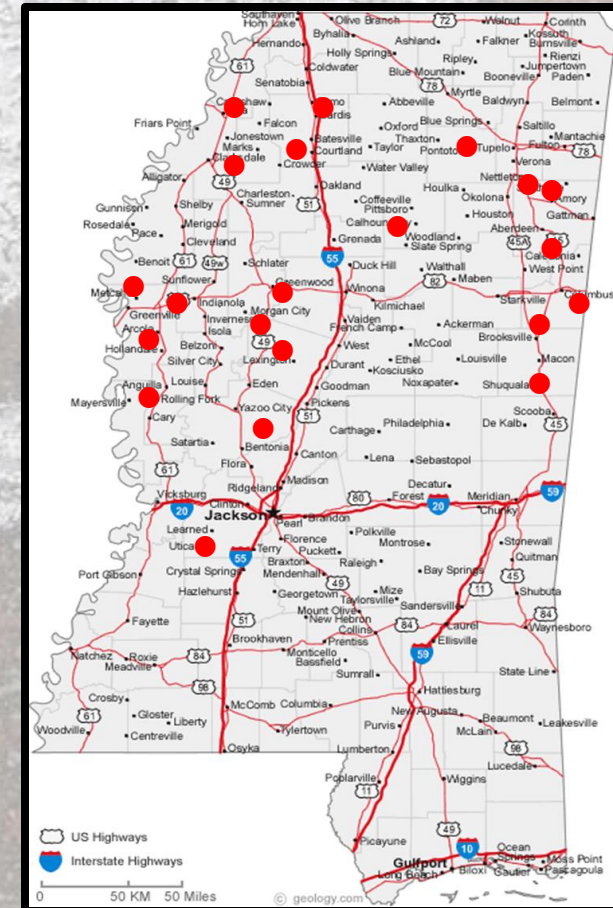
Lint 900 lbs @ \$0.73= \$657
 Seed @ \$0.09 *1215 = \$109
 = **\$766**

<https://www.agecon.msstate.edu/whatwedo/budgets.php>



2024 Cotton Variety Testing

- Mississippi on-farm county demonstration (15)
- Mississippi Official Variety Trials (7)



Cotton Variety Selection

2024 MSU Variety Trial Data (Pieralisi et al., 2024)			
MSU OVT (All Locations)		MS On-Farm Variety Trials (All Locations)	
Variety	Yield (lbs ac ⁻¹)	Variety	Yield (lbs ac ⁻¹)
PX1140F331-04W3FE	1314	DP 2333 B3XF	1262
DP 2127 B3XF	1260	Armor 9371 B3XF	1192
PX1140F329-04W3FE	1227	ST 6000AXTP	1192
PX1150F361-04W3FE	1217	DP 2127 B3XF	1188
DP 2414 B3TXF	1205	DP 2328 B3TXF	1184
AMX 12526 B3XF	1205	PHY 415 W3FE	1167
PHY 415 W3FE	1198	PHY 411 W3FE	1131
PX1150F357-04W3FE	1195	DG 4530 B3TXF	1111
PX1150F360-04W3FE	1180	NG 3457 B3XF	1103
Armor 9371 B3XF	1176	NG 5430 B3XF	1095

LSD (0.05) 92 lbs/A

LSD (0.05) 81 lbs/A



Cotton Variety Selection

2024 MSU Variety Trial Data (Pieralisi et al., 2024)			
MSU OVT (Delta)		MS On-Farm Variety Trials (Delta)	
Variety	Yield (lbs ac ⁻¹)	Variety	Yield (lbs ac ⁻¹)
DP 2127 B3XF	1765	DP 2333 B3XF	1431
PX1140F331-04W3FE	1696	PHY 411 W3FE	1406
AMX 12526 B3XF	1673	DP 2127 B3XF	1381
Armor 9371 B3XF	1623	ARMOR 9371 B3XF	1360
PHY 415 W3FE	1600	DP 2328 B3TXF	1351
PX1140F330-04W3FE	1593	PHY 415 W3FE	1312
PX1140F329-04W3FE	1586	ST 6000AXTP	1309
DP 2414 B3TXF	1580	NG 3457 B3XF	1268
DG 3528 B3XF	1559	DG 4530 B3TXF	1266
PX1150F361-04W3FE	1558	NG 5430 B3XF	1224

LSD (0.05) 183 lbs/A

LSD (0.05) 137 lbs/A



Cotton Variety Selection

2024 MSU Variety Trial Data (Pieralisi et al., 2024)			
MS OVT (Hills)		MS On-Farm Variety Trials (Hills)	
Variety	Yield (lbs ac ⁻¹)	Variety	Yield (lbs ac ⁻¹)
PX1140F331-04W3FE	992	DP 2333 B3XF	1046
PX1140F329-04W3FE	981	ST 6000AXTP	1001
PX1150F360-04W3FE	955	ARMOR 9371 B3XF	976
23R9128B3TXF	955	DP 2328 B3TXF	966
DP 2328 B3TXF	929	PHY 415 W3FE	960
AMX 12526 B3XF	924	DP 2127 B3XF	957
PX1150F361-04W3FE	921	DG 4530 B3TXF	901
DG 4530 B3TXF	920	NG 5430 B3XF	899
DP 2115 B3XF	912	NG 3457 B3XF	888
PHY 443 W3FE	899	PHY 411 W3FE	884

LSD (0.05) 107 lbs./A

LSD (0.05) 101 lbs./A



Cotton Variety Selection

2024 MSU On-Farm Variety Trial Data (Pieralisi et al., 2024)			
Irrigated Locations		Dryland Locations	
Variety	Yield (lbs ac ⁻¹)	Variety	Yield (lbs ac ⁻¹)
DP 2333 B3XF	1441	DP 2333 B3XF	1039
ARMOR 9371 B3XF	1378	DP 2328 B3TXF	994
PHY 411 W3FE	1371	ST 6000AXTP	987
PHY 415 W3FE	1346	DP 2127 B3XF	973
DP 2127 B3XF	1343	ARMOR 9371 B3XF	965
ST 6000AXTP	1325	PHY 415 W3FE	947
DP 2328 B3TXF	1279	NG 5430 B3XF	907
NG 3457 B3XF	1265	DG 4530 B3TXF	904
DG 4530 B3TXF	1246	PHY 411 W3FE	892
NG 5430 B3XF	1186	NG 3457 B3XF	886

LSD (0.05) 191 lbs./A

LSD (0.05) 88 lbs./A





Profitable based on msstate high input economic budgets!

Cotton Variety Selection

2-year Delta top 10 varieties

	Location and Year						Average across location and year
	Stoneville		Sidon		Tunica		
	2023	2024	2023	2024	2023	2024	
	Lint yield (lb lint/acre)						
DP 2127 B3XF	2993	1684	1061	1449	2179	2161	1921
Armor 9371 B3XF	2996	1831	1055	1263	1709	1629	1747
PHY 411 W3FE	2731	1696	1240	1515	1872	1425	1747
PHY 415 W3FE	2736	1811	1003	1396	1837	1371	1692
NG 3195 B3XF	2577	1572	1099	1122	1792	1917	1680
DG 3528 B3XF	2682	1628	927	1349	1905	1466	1659
PHY 400 W3FE	2657	1461	1240	1136	1804	1565	1644
DP 2211 B3TXF	2577	1586	1176	1261	1791	1281	1612
DG 4530 B3TXF	2519	1677	1178	1174	1587	1355	1582
PHY 443 W3FE	2551	1594	1209	1375	1663	1064	1576
PHY 332 W3FE	2572	1578	1166	1201	1772	1158	1575
DP 2115 B3XF	2556	1730	939	1110	1760	1349	1574
PHY 360 W3FE	2309	1512	1087	1101	1892	1495	1566
DP 2141NR B3TXF	2451	1601	895	1176	1648	1539	1552
DP 2328 B3TXF	2123	1419	1119	1189	1813	1428	1515
PHY 475 W3FE	2091	1264	859	1272	1522	1420	1405
DG 3503 B3XF	2220	1517	771	1092	1268	1313	1363

1. DP 2127 B3XF
2. Armor 9371 B3XF
3. PHY 411 W3FE
4. PHY 415 W3FE
5. NG 3195 B3XF
6. DG 3528 B3XF
7. PHY 400 W3FE
8. DP 2211 B3TXF
9. DG 4530 B3TXF
10. PHY 443 W3FE

Lint yields ranged from 1921-1576 lbs./A

**Table is sorted based on average lint yield means across location and year.*





Profitable based on msstate high input economic budgets!

Cotton Variety Selection

2-year Hills top 10 varieties

	Brooksville		Starkville		Senatobia		Average across location and year
	2023	2024	2023	2024	2023	2024	
Lint yield (lb lint/acre)							
PHY 415 W3FE	684	1008	1516	1248	1680	1829	1328
DP 2328 B3TXF	753	890	1000	1079	1909	1708	1223
DG 4530 B3TXF	532	1006	1222	1113	1796	1637	1218
PHY 332 W3FE	598	919	1332	1023	1822	1558	1209
PHY 411 W3FE	495	800	1454	1101	1833	1514	1199
PHY 360 W3FE	709	830	1122	909	1810	1648	1171
PHY 443 W3FE	373	853	1419	1038	1528	1657	1145
Armor 9371 B3XF	508	937	1245	858	1728	1581	1143
DP 2115 B3XF	608	827	1084	1119	1620	1592	1142
NG 3195 B3XF	622	720	1088	862	1716	1775	1130
DP 2127 B3XF	689	881	1159	993	1337	1653	1118
DP 2211 B3TXF	598	887	1095	819	1764	1514	1113
DG 3528 B3XF	495	839	1112	1014	1626	1515	1100
PHY 400 W3FE	655	910	1260	804	1475	1325	1071
PHY 475 W3FE	500	801	1137	1100	1305	1349	1032
DP 2141NR B3TXF	440	673	975	1069	1500	1390	1008
DG 3503 B3XF	574	800	929	706	1393	1387	965

1. PHY 415 W3FE
2. DP 2328 B3TXF
3. DG 4530 B3TXF
4. PHY 332 W3FE
5. PHY 411 W3FE
6. PHY 360 W3FE
7. PHY 443 W3FE
8. Armor 9371 B3XF
9. DP 2115 B3XF
10. NG 3195 B3XF

Top 10 Lint yields ranged from 1328-1130 lbs./A

**Table is sorted based on average lint yield means across location and year.*



Potash Crash!!!!

Planted May 15th



Planted April 26th



Potash Crash!!!!

General questions around cotton prematurely defoliating

What causes it?

K_2O relocating from leaves to fruiting structures

Why? I applied 200 lbs K_2O last fall...

Environmental conditions didn't allow for proper uptake
(dry June, poor root system, nematodes, heavy Thrips)

How can I avoid potash crash?

Enter squaring thru bloom with adequate soil moisture
and enough K_2O in the profile

Can I fix it?

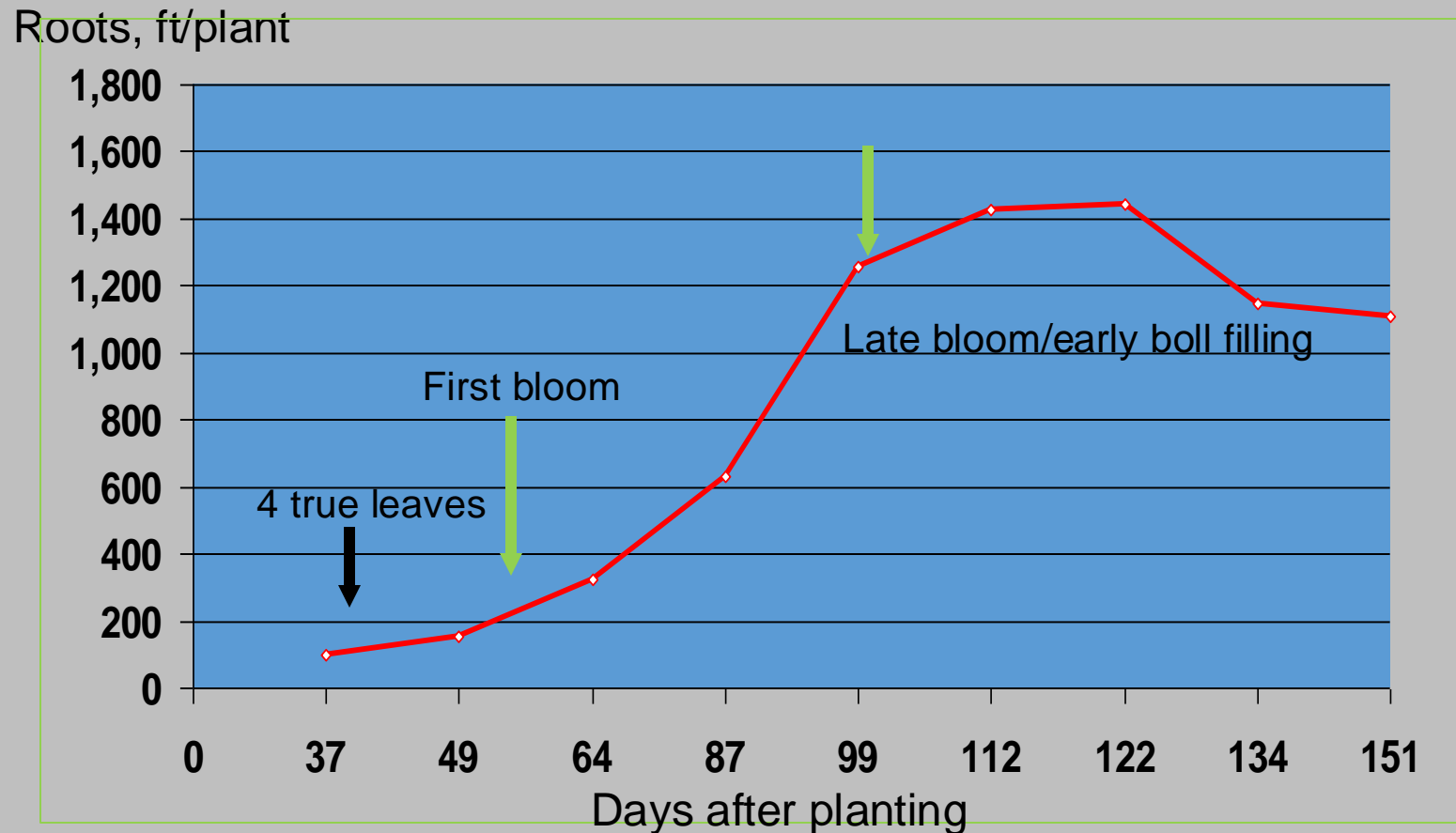


Potash Crash!!!!

What happens in between the green arrow is what influences potash uptake

1. Planting date
2. Rainfall / irrigation
3. Soil K₂O

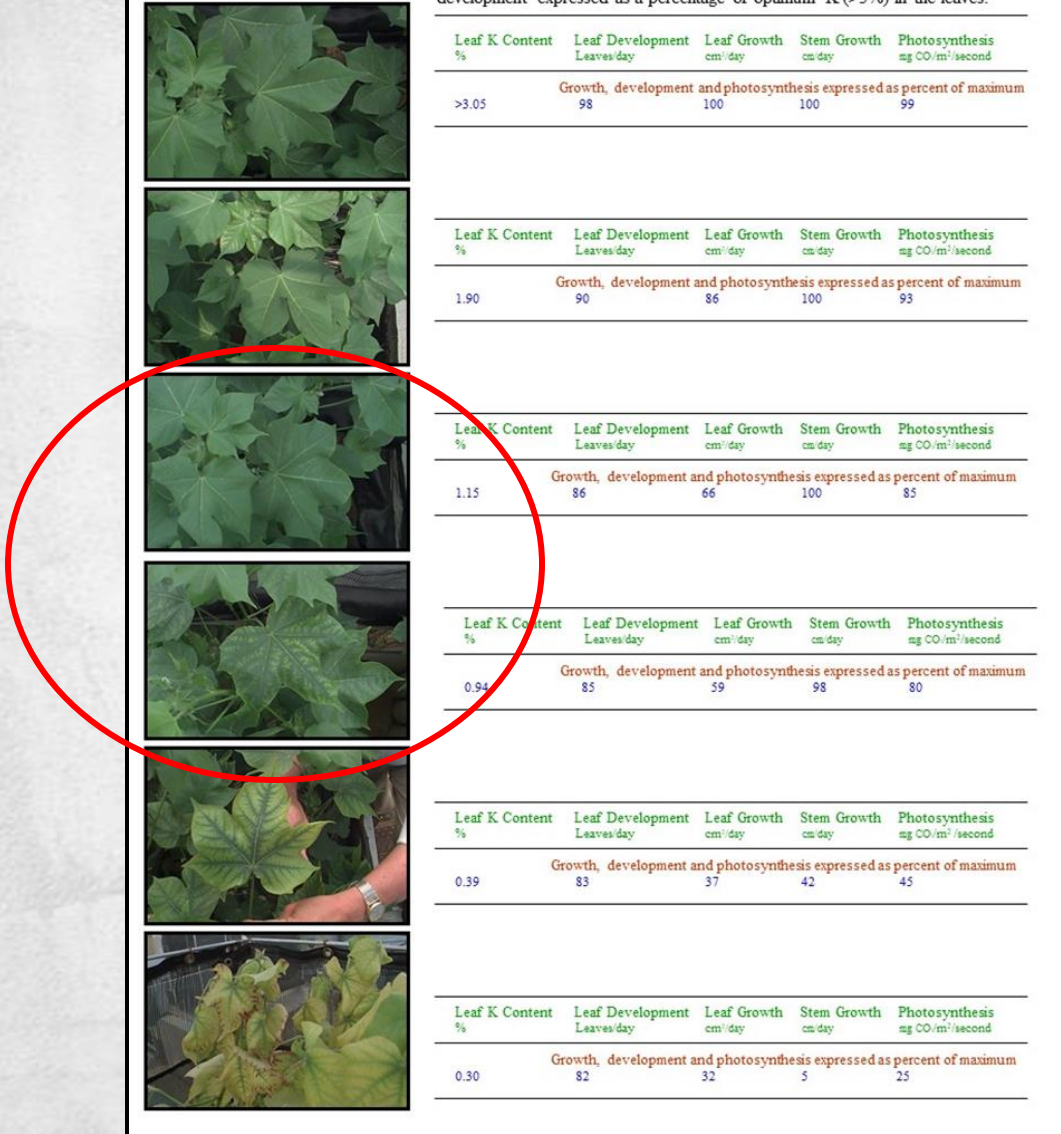
*** Important to keep in mind that K₂O moves in soil solution!!!!!!***



Potash Crash!!!!



Figure 1. Potassium Nutrition and Cotton Growth – Appearance of cotton leaf K deficiency symptoms, related K levels, and relative rates of growth or development expressed as a percentage of optimum K (>3%) in the leaves.

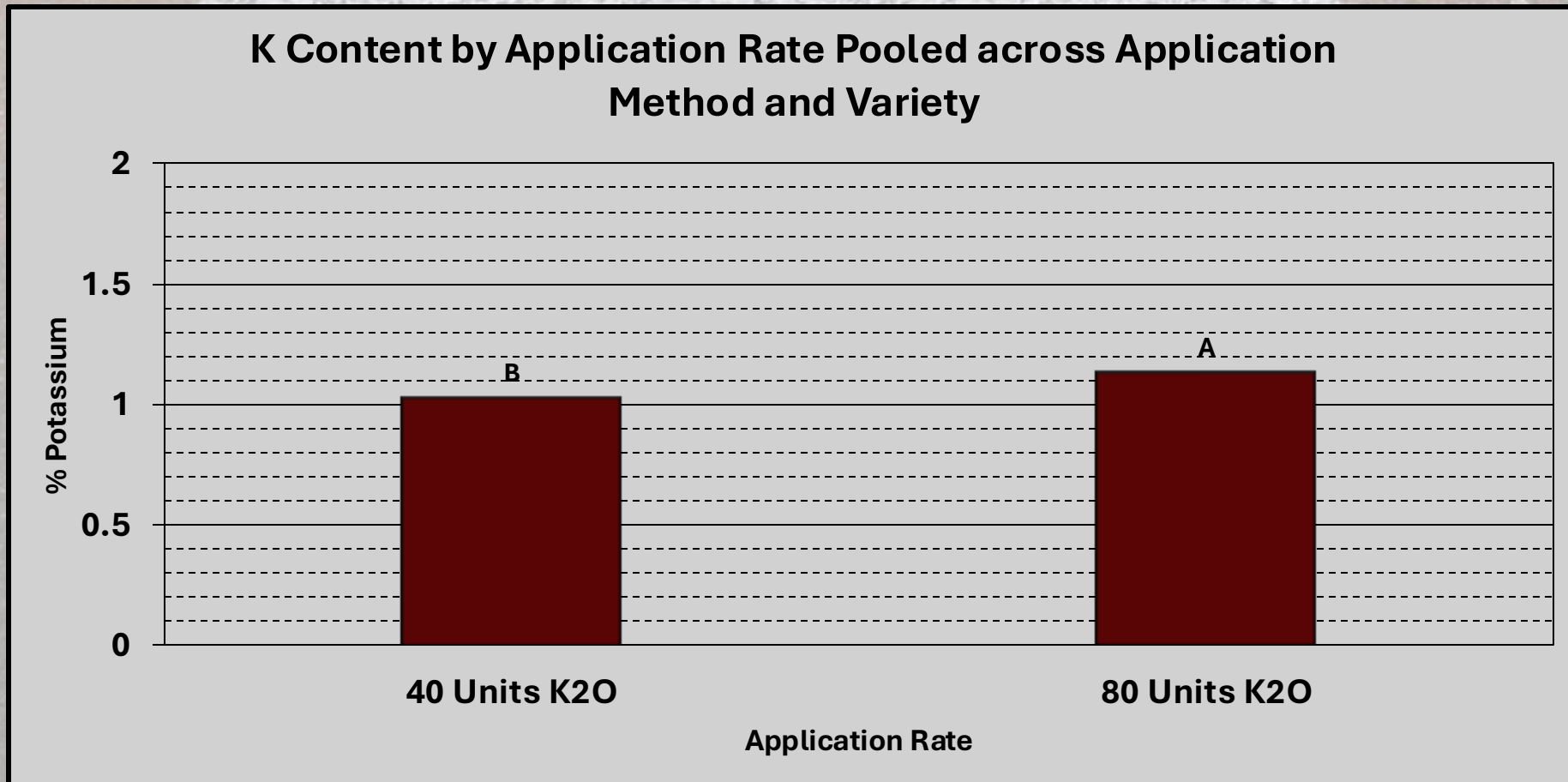


(Reddy et al., 2023)

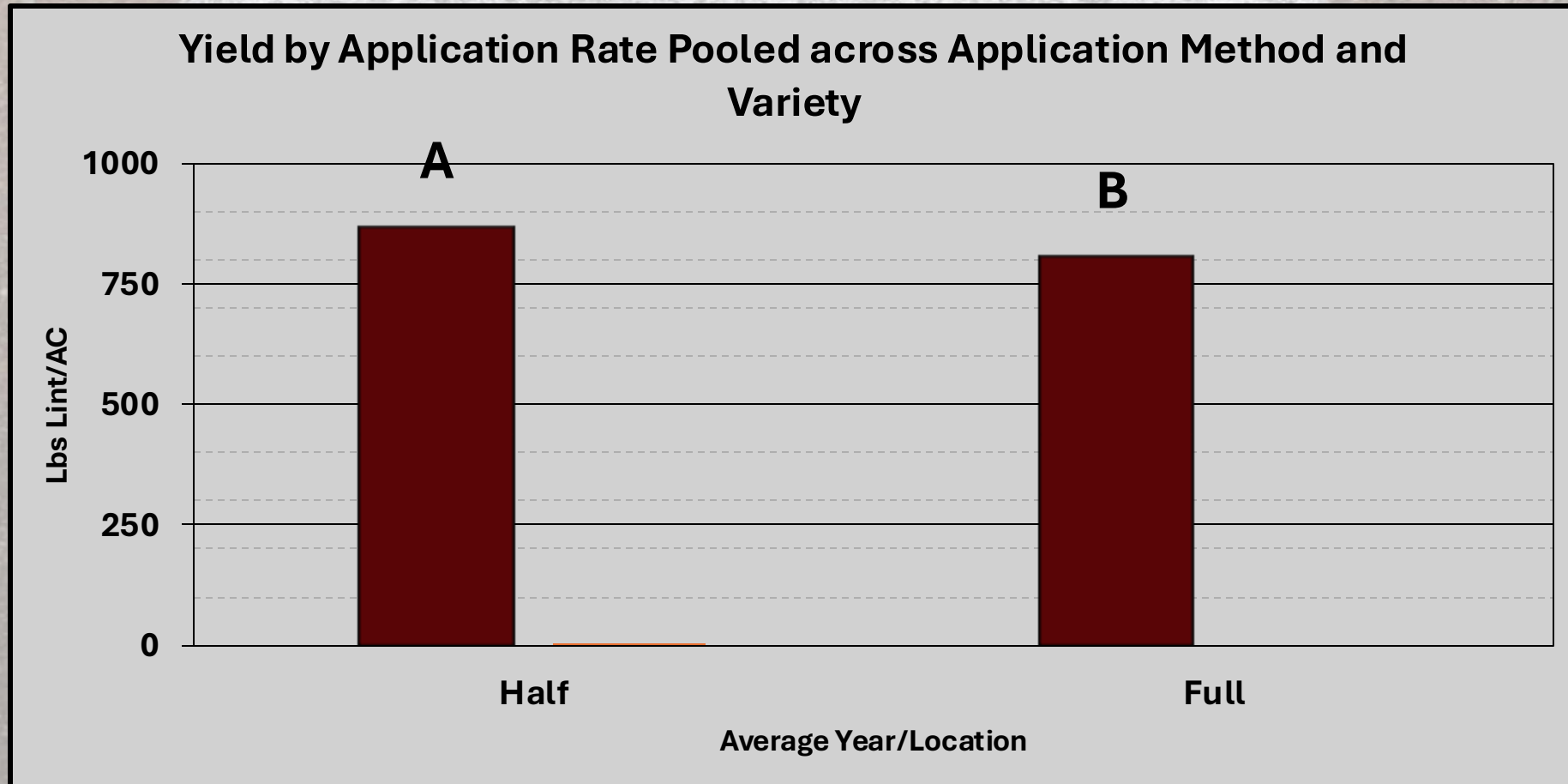


Tissue Sample K Content at Cutout

NAWF = 5



Yield across both locations both years



Hail Damage and Wildlife Feeding





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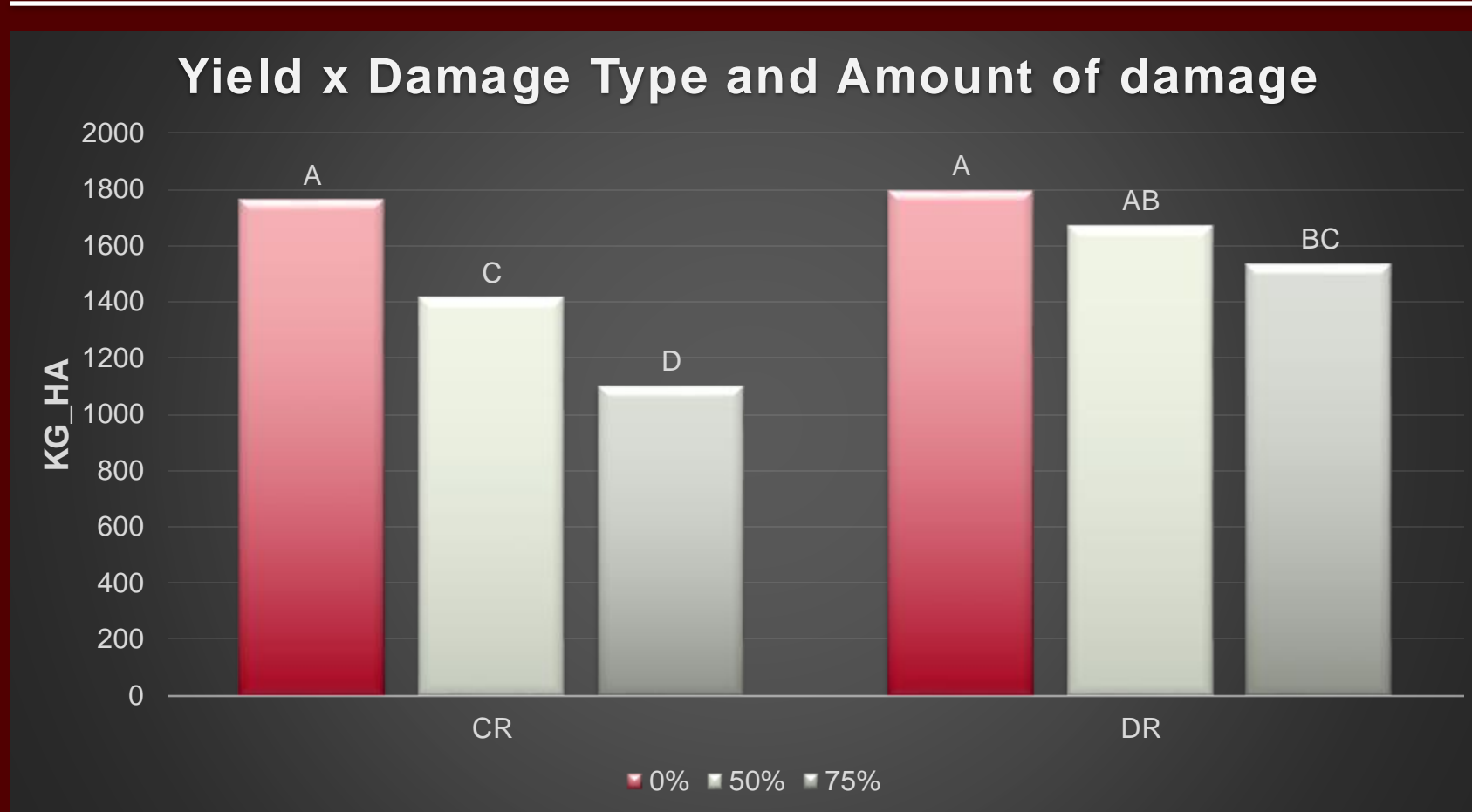
Treatments

Experimental Design: Factorial arrangement of treatments within a randomized complete block design

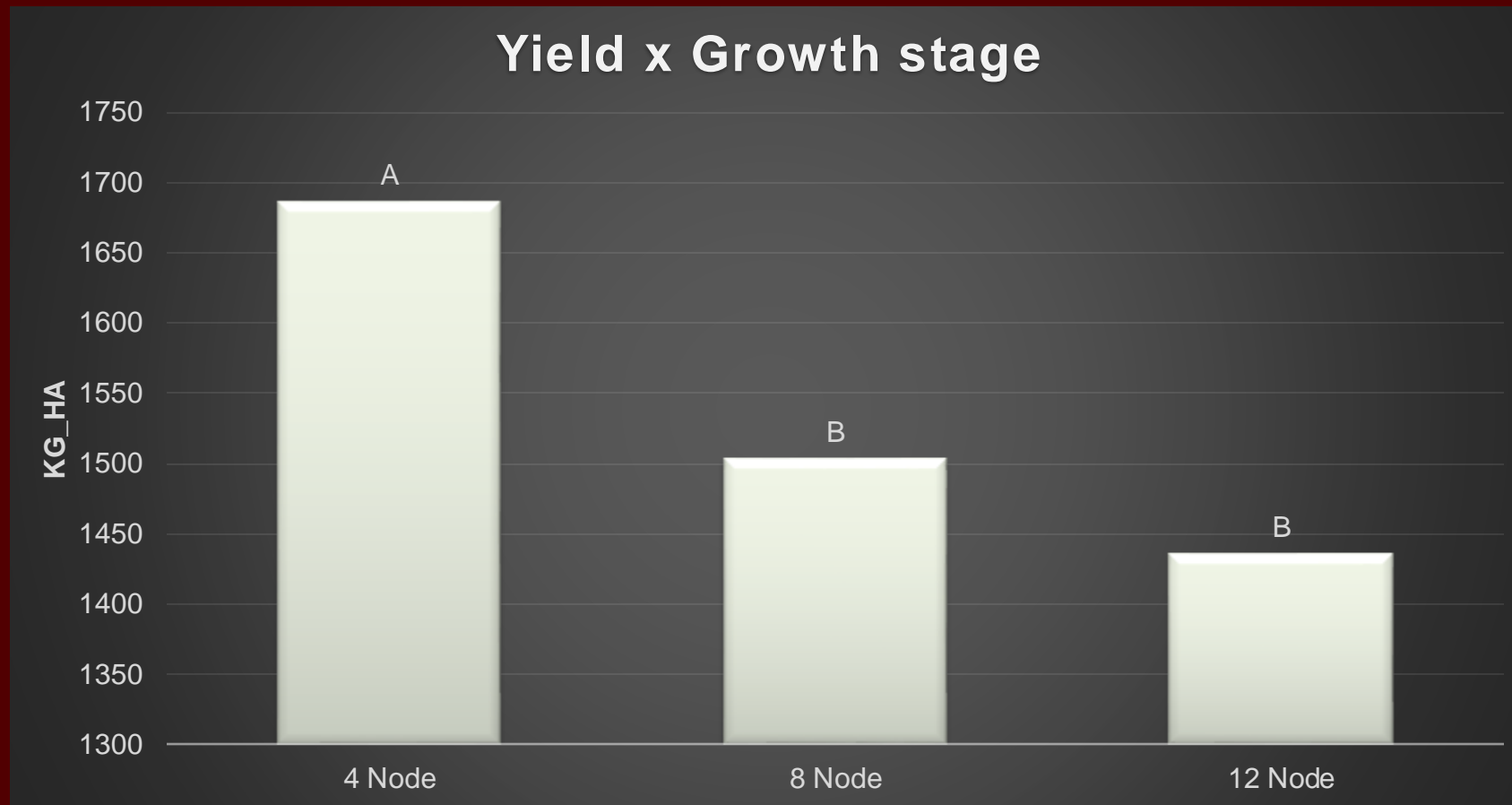
- Factor A: Damage type (Node removal or Leaf removal)
- Factor B: Level of damage (0%, 50%, 75%)
- Factor C: Growth stage (4 node, 8 node, 12 node)



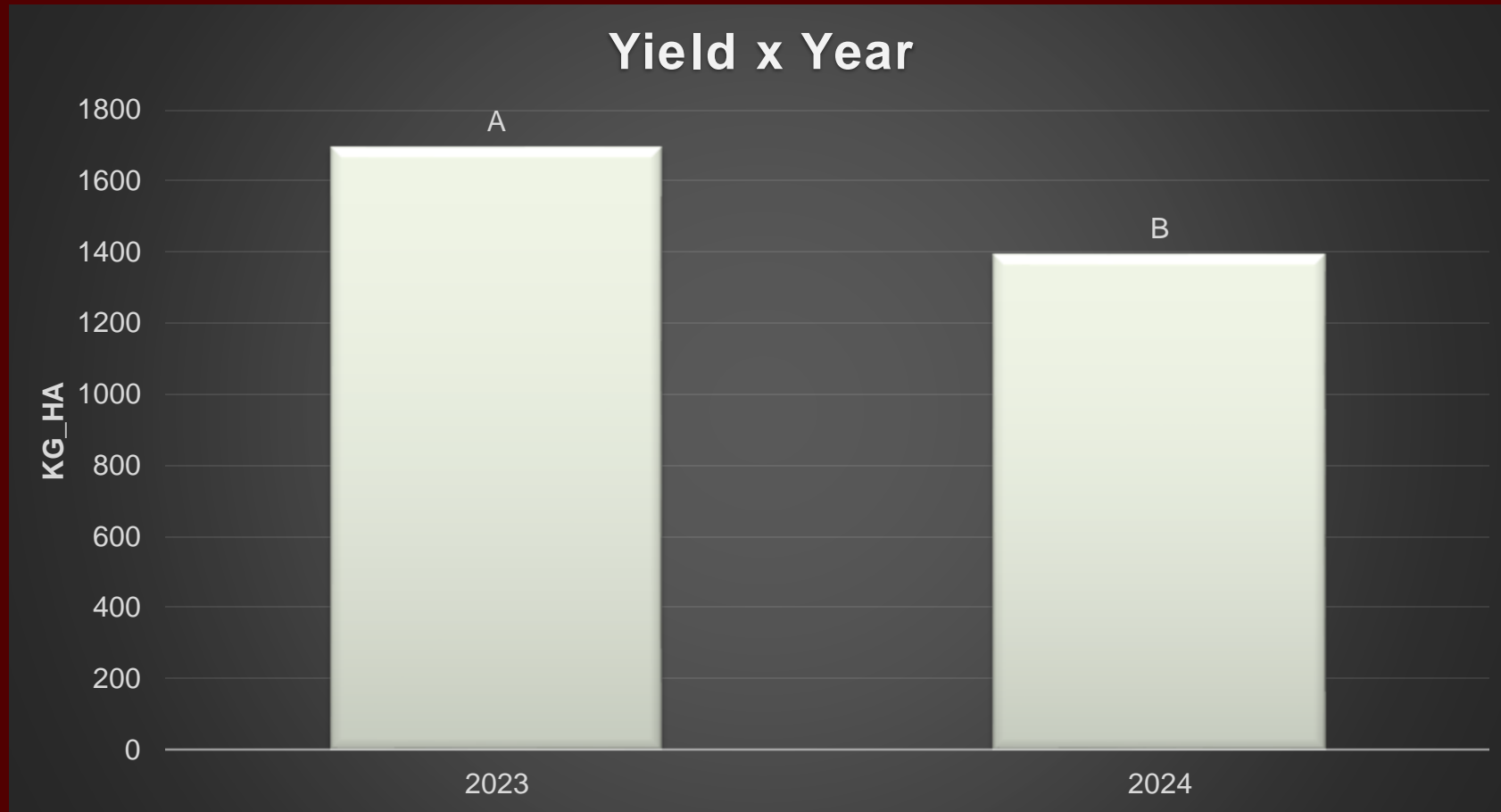
Results



Results



Results



Year two delayed maturity



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Summary

- Significant yield loss is observed as damage occurred at later growth stages
- Damage during reproductive growth stages can decrease yield significantly
- Early growth stages had adequate time to compensate for these types of damage



Summary

- Significant yield loss occurred at growth stages 8 node and 12 node when the plant lost apical dominance
- Environmental factors can reduce the plants' ability to compensate for damage as well as delay the maturity of the crop



Thank You



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