

Replicated Strip-Trial Program

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The University of Georgia

®

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D. Monks, G. Morgan, R. Norton, J. Whitaker, D. Wright**

Introduction: Why are we doing this???

- Very rapid release (and removal) of varieties onto the market
 - expiration of single-gene Bts
 - adoption of newer herbicide technologies due to weed resistance
 - increased competition between seed/tech companies
 - improvements in breeding and yield protection
 - often do not have multi-year data
 - due to seed increase issues, may only have 1 year of data to evaluate varieties, sometimes no data.
- Varieties need to be properly positioned into appropriate environments, and subsequently managed for optimal yields
- Most yield-limiting factors (and grower needs) vary widely
- Program managed by agronomists, data sent to SeedMatrix®

On-Farm Trials vs. Small-Plot OVT

- Focuses on top performing varieties of particular technologies (Glyphosate vs Glufosinate systems managed by growers)
- Compare early and late maturing varieties simultaneously
- Evaluate performance across a broader range of environments (yield potential / rainfall / irrigation, soils, grower management)Evaluate STABILITY very quickly
- Compliments OVT
- Evaluate a larger number of varieties
- Testing ground for many more experimental varieties for future release or for promotion to on-farm testing
- Comparison of yields without regard to technology
- Can separate tests based on technology, maturity, conventionals,

2011 Cost of Improper Variety Selection

Variety Selection Error	Cotton Price \$ / lb.	Highest Cost \$ / A	Lowest Cost \$ / A	Average Cost (15 Trials) \$ / A
Top Variety vs Bottom Variety	\$1	435	81	277
Top 3 Avg. vs Mid 3 Avg.	\$1	174	22	88
Top 3 Avg. vs Bottom 3 Avg.	\$1	311	71	187
Top Variety vs Bottom Variety	\$ 0.75	326	61	208
Top 3 Avg. vs Mid 3 Avg.	\$ 0.75	130	16	66
Top 3 Avg. vs Bottom 3 Avg.	\$ 0.75	233	53	140

Variety selection criteria

- YIELD potential
- YIELD stability
- Technology
- Fiber quality
- Maturity and plant growth characteristics



Variety selection criteria

What is your most limiting factor ???

- Water (soils, irrigation capacity, historical rainfall)
- Weed control (technology options for pigweed control)
- Plant growth (achieving optimal height, droughty soils, PGRs)
- Diseases, nematodes, insects (leaf hairiness)
- Planting date, timeliness of inputs
- Realistic Yield Potential – field x field basis

Stability across factors should be given high priority in variety selection!!!

- Any variety can win a single trial
- Varieties that perform well across several environments, rainfall patterns or degree of irrigation, soil types, planting dates, grower management etc. indicate a high degree of stability

Replicated On-Farm Variety Trial Program



Why Replicate??



Field Uniformity



Wet spot in dryland test

Variation in soils even in uniform fields

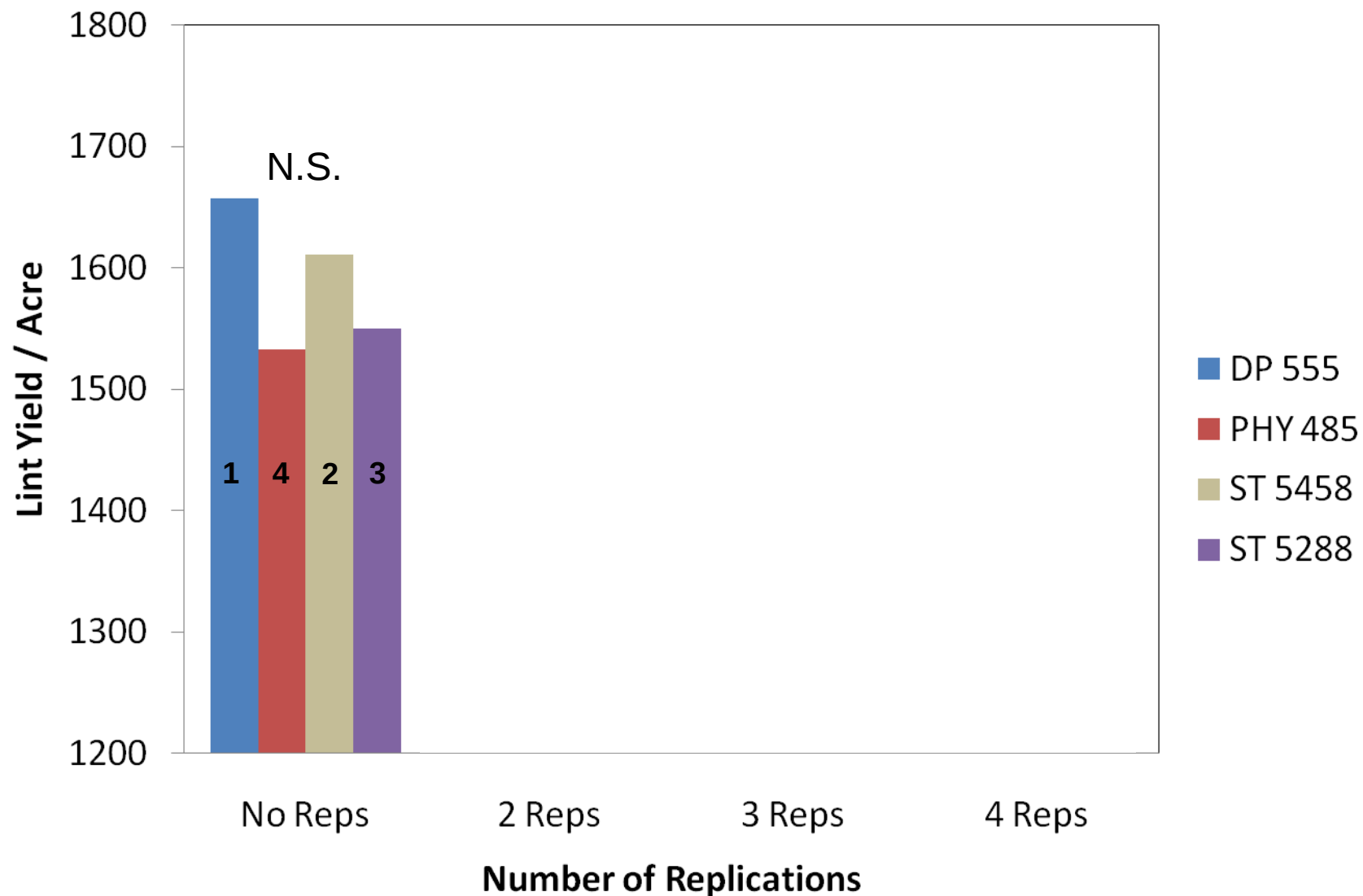
Field Uniformity



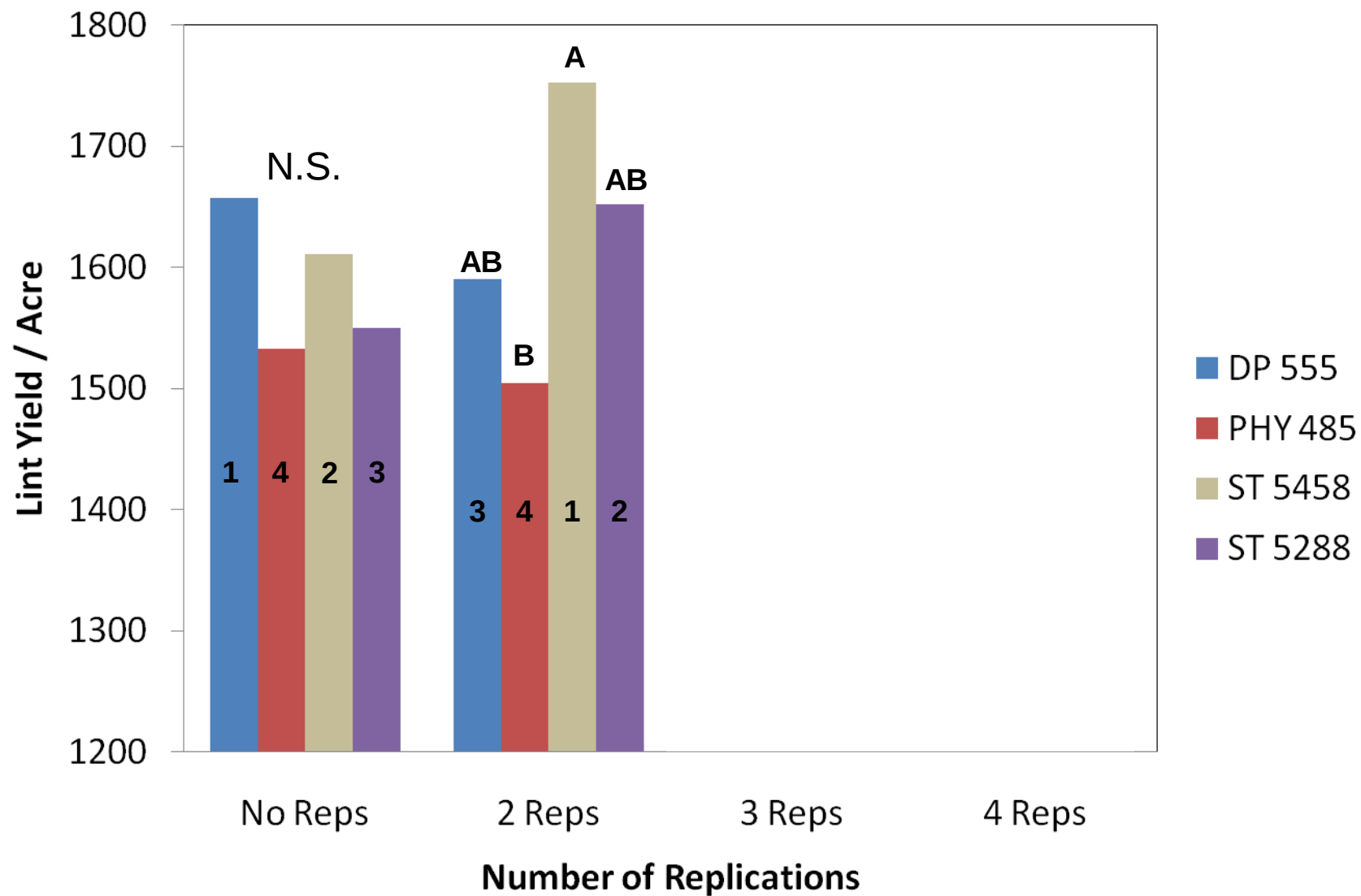
Field Uniformity



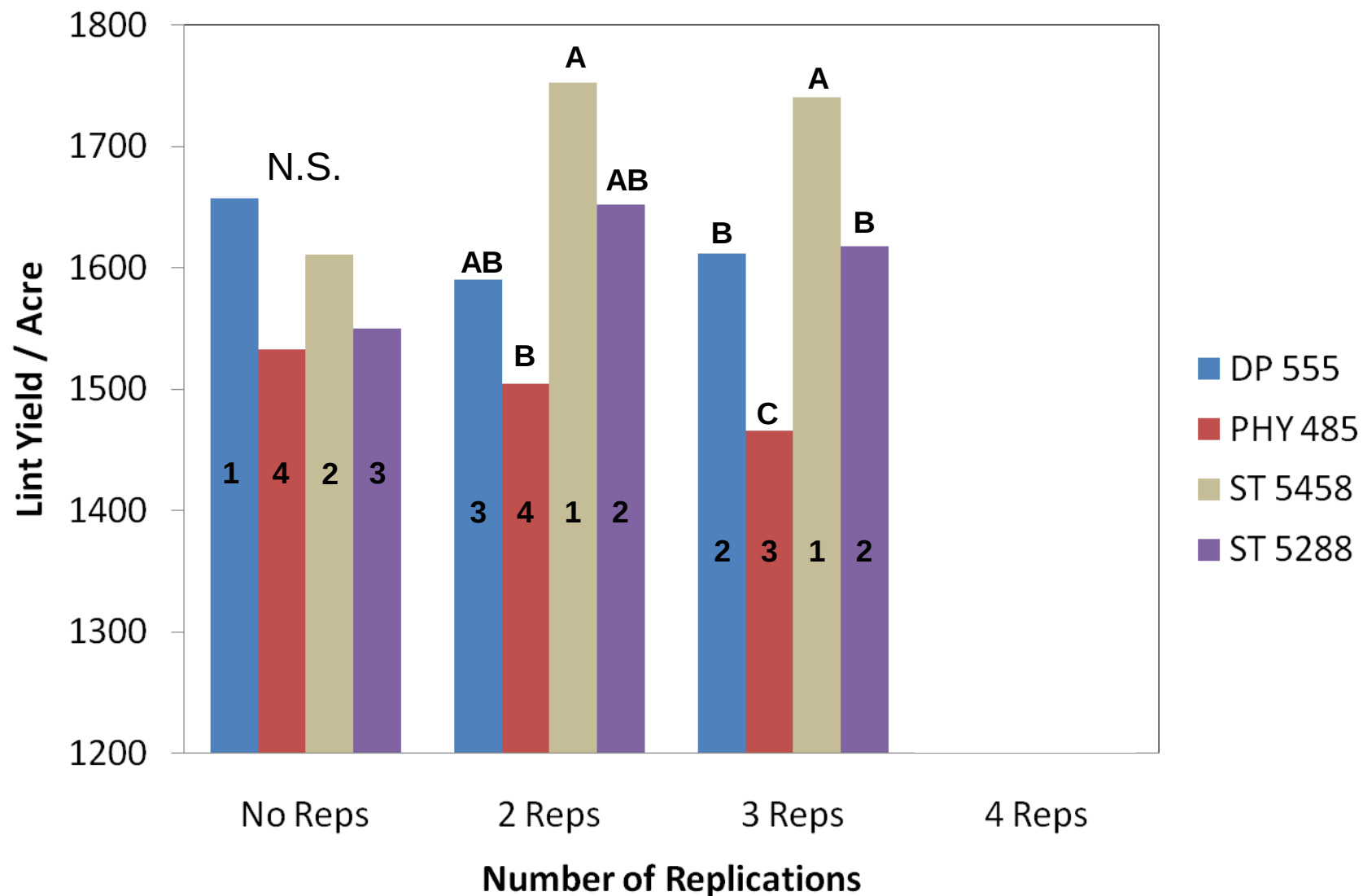
Power of Within Location Replication



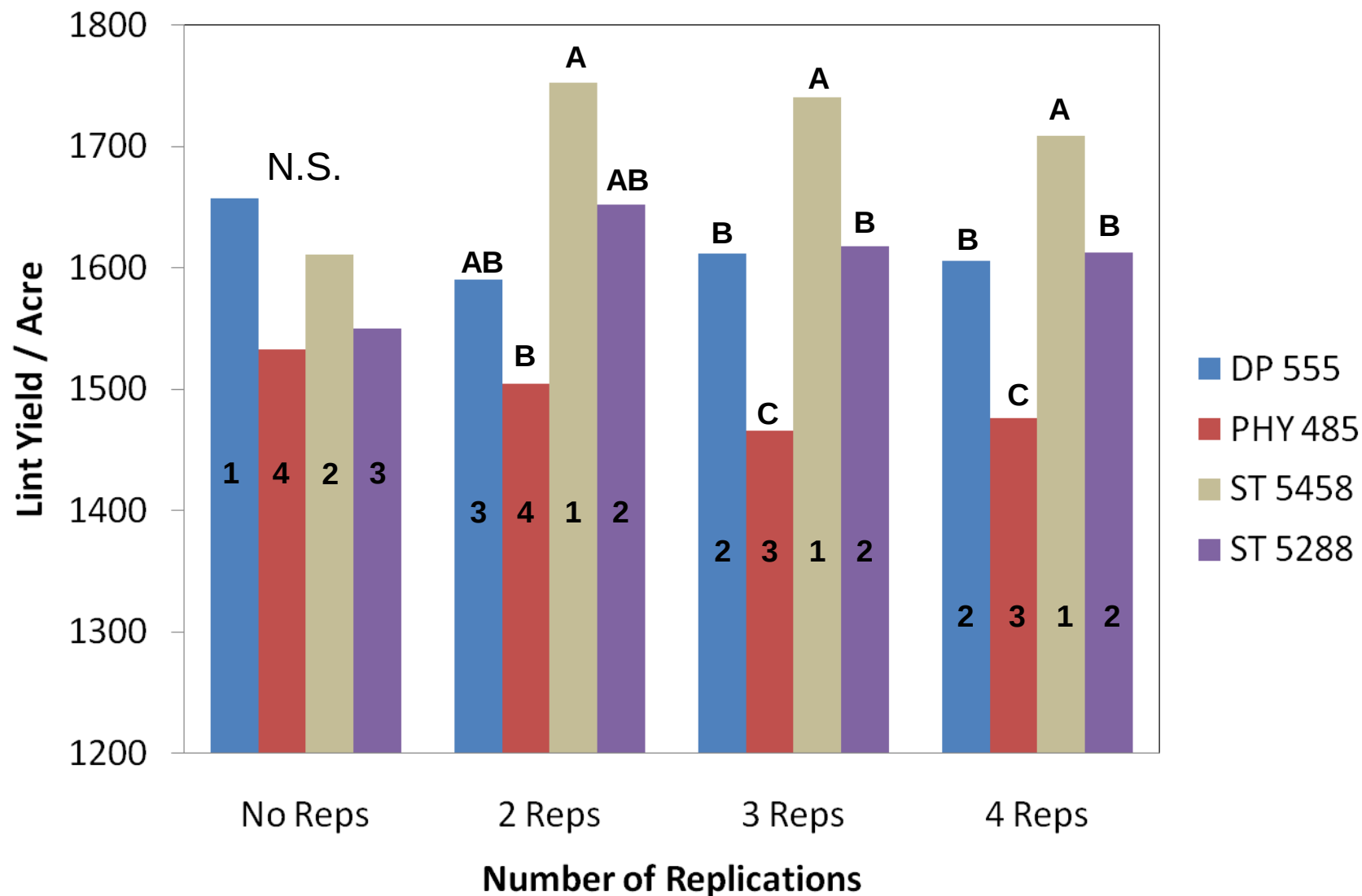
Power of Within Location Replication



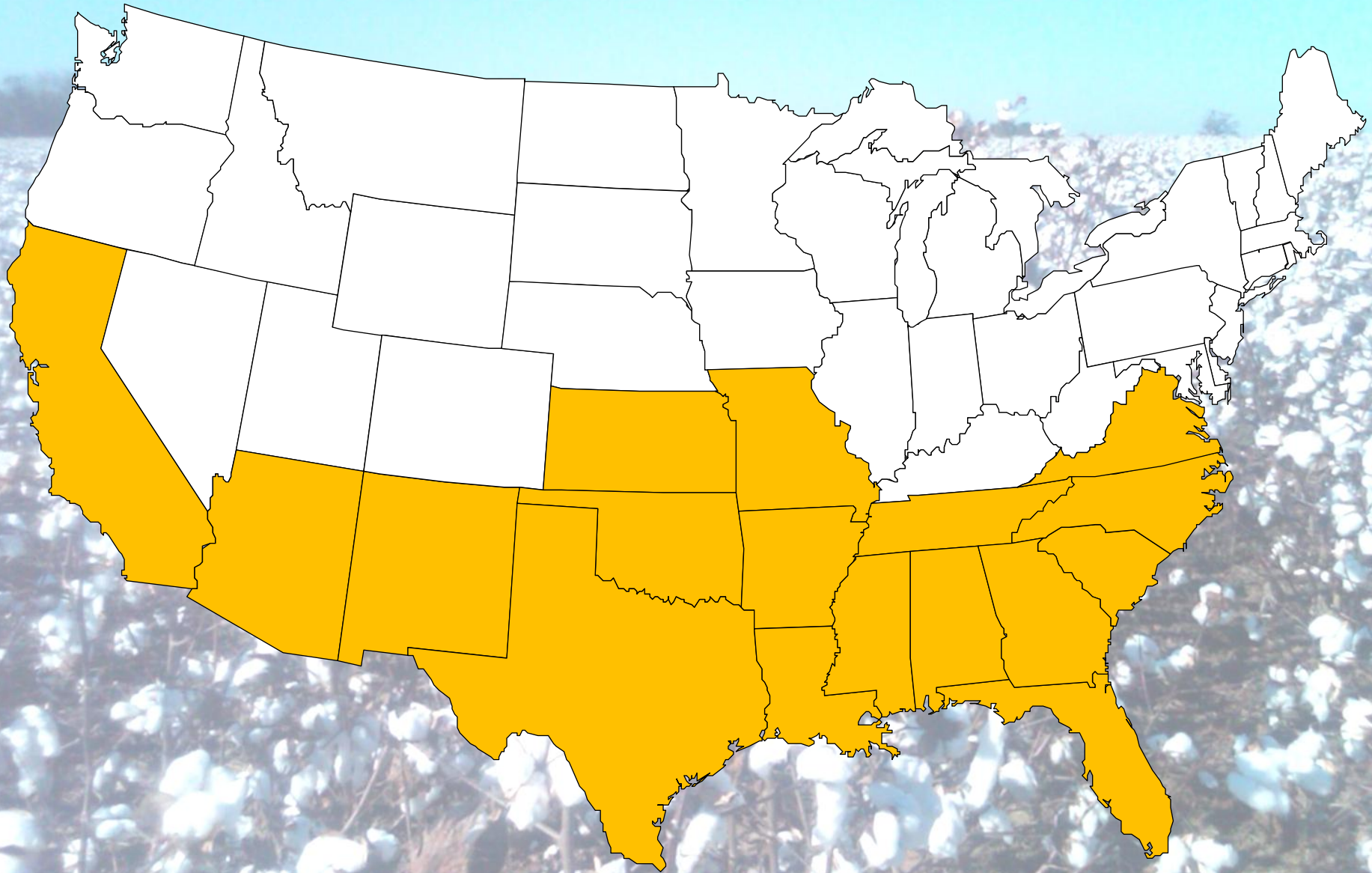
Power of Within Location Replication



Power of Within Location Replication



U.S. Cotton Producing States



Southeast

University Cotton Specialists

Guy Collins – GA

Jared Whitaker – GA

Keith Edmisten – NC

Mike Jones – SC

Dale Monks – AL

Charlie Burmester – AL

David Wright - FL



2,643,000 acres
- USDA NASS

Midsouth

University Cotton Specialists

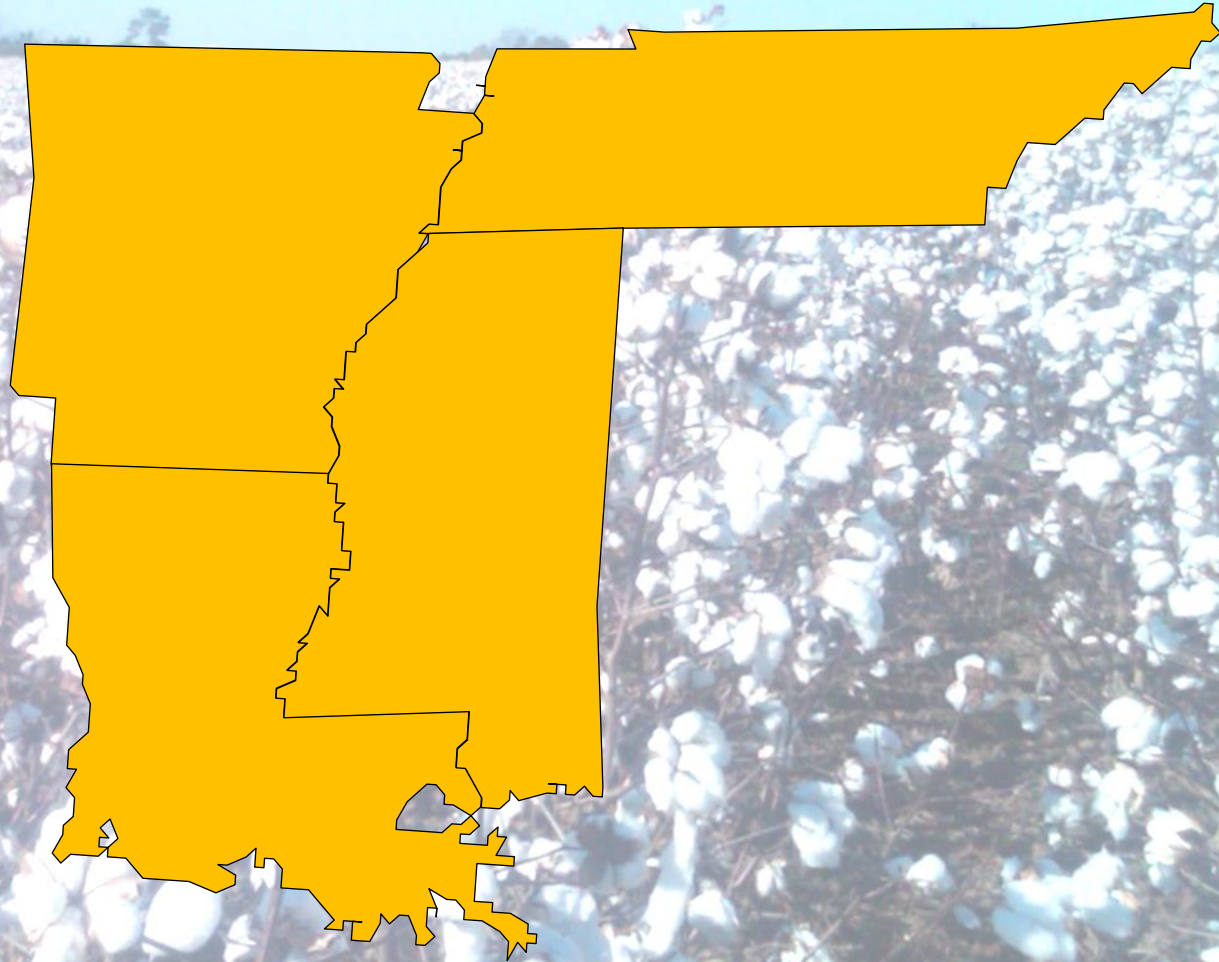
Chris Main – TN

Tom Barber – AR

Darrin Dodds – MS

John Kruse - LA

1,635,000 acres
- USDA NASS



Southwest

University Cotton Specialists

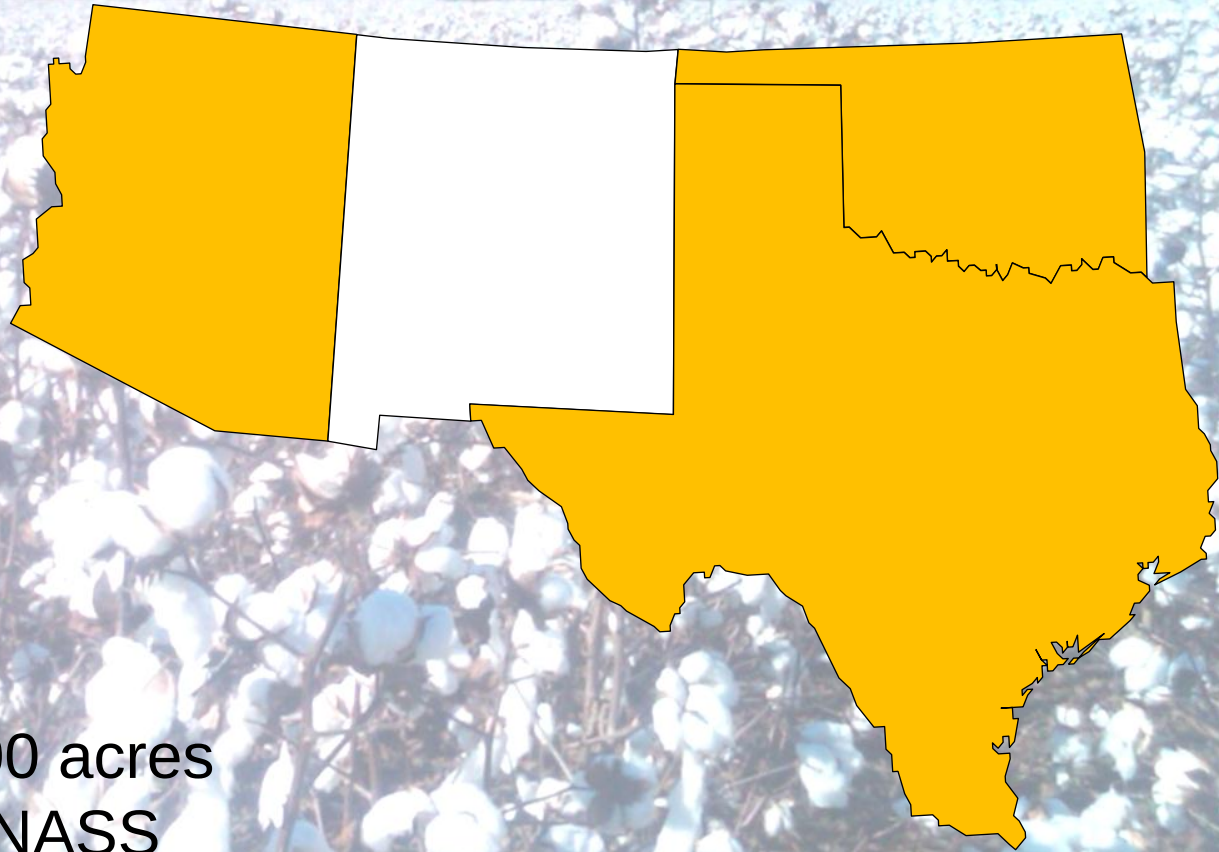
Gaylon Morgan – TX

Dan Fromme – TX

Mark Kelley - TX

Randy Boman - OK

Randy Norton - AZ



5,273,000 acres
- USDA NASS

Southeast Varieties

Common Varieties

DP 1137 B2RF

DP 0912 B2RF

ST 5458 B2RF

FM 1944 GLB2

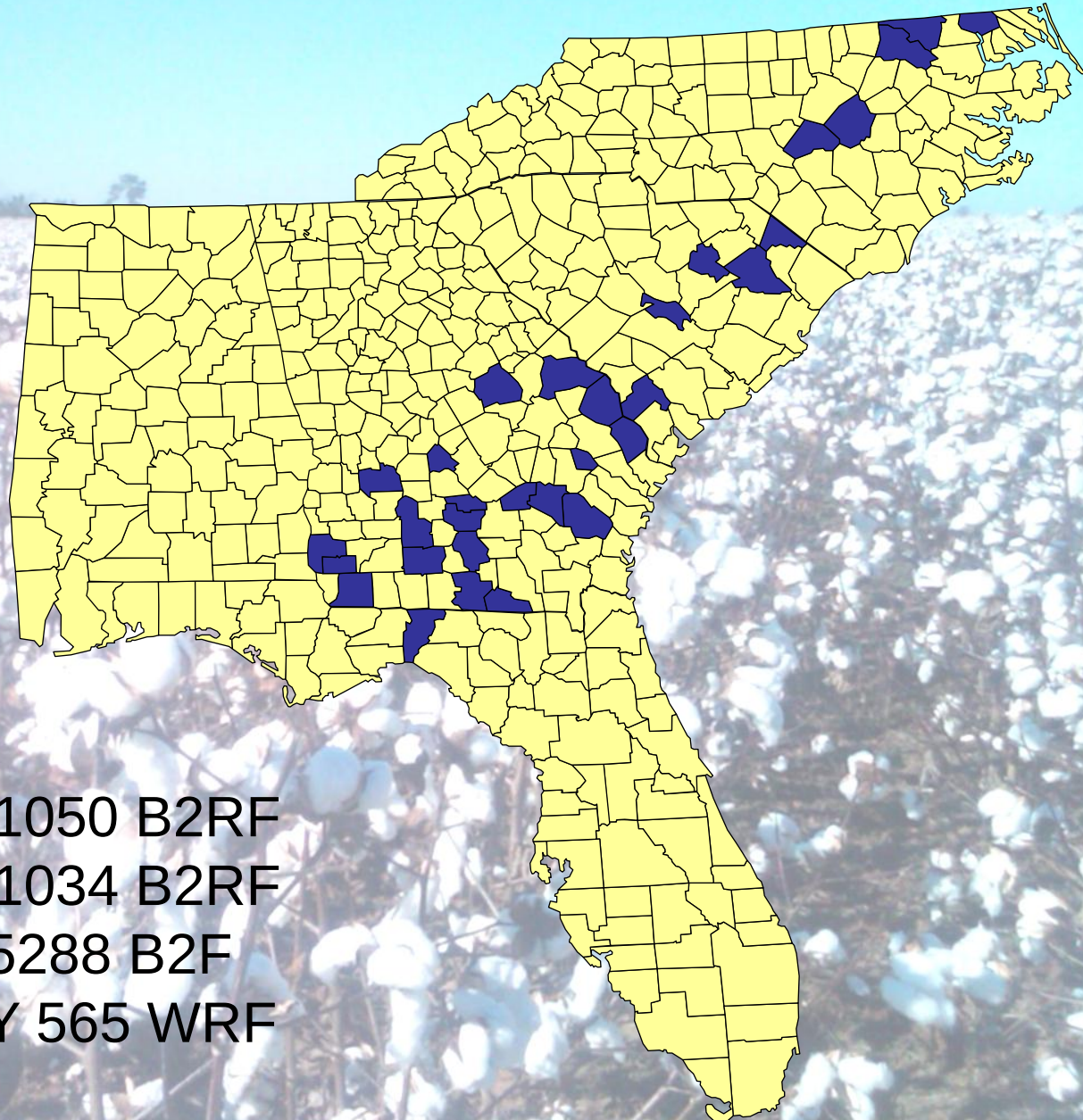
PHY 375 WRF

PHY 499 WRF

ST 5445 LLB2

ST 4145 LLB2

FM 1845 LLB2



Additional Varieties

DP 1252 B2RF DP 1050 B2RF

DP 1028 B2RF DP 1034 B2RF

ST 4288 B2F ST 5288 B2F

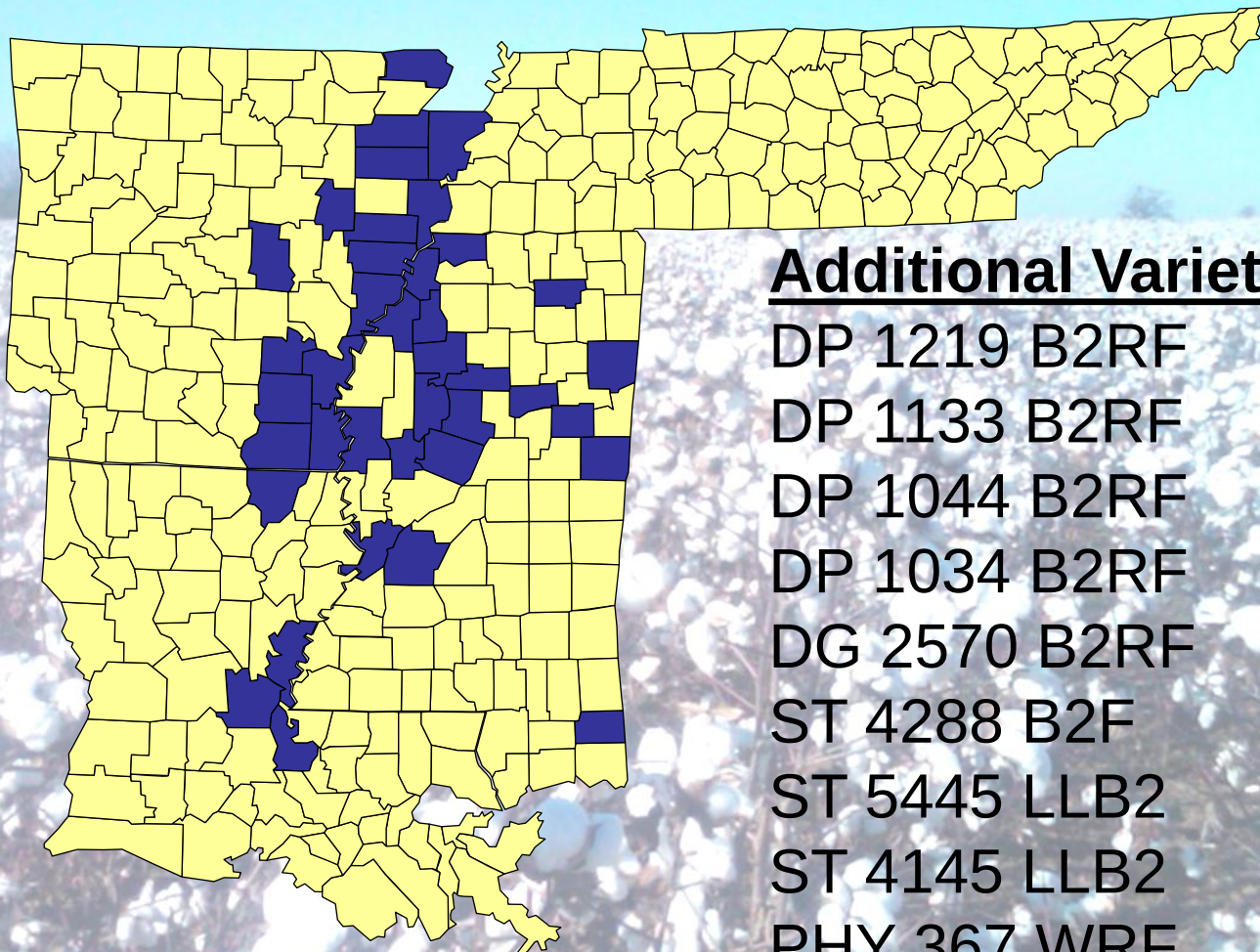
PHY 367 WRF PHY 565 WRF

AM 1511 B2RF

Midsouth Varieties

Common Varieties

DP 0912 B2RF
ST 5458 B2RF
FM 1944 GLB2
PHY 499 WRF
ST 5288 B2F
AM 1511 B2RF



Additional Varieties

DP 1219 B2RF
DP 1133 B2RF
DP 1044 B2RF
DP 1034 B2RF
DG 2570 B2RF
ST 4288 B2F
ST 5445 LLB2
ST 4145 LLB2
PHY 367 WRF
PHY 375 WRF
BX 1346
BX 1348

Southwest Varieties

Varieties

11R159B2R2

All-Tex Edge

All-Tex Nitro

AM 1511 B2RF

CG 3156 B2RF

CG 3787 B2RF

DG 2400 RF

DG 2450 B2RF

DG 2570 B2RF

DG 2595 B2RF

DP 0912 B2RF

DP 1032 B2RF

DP 1044 B2RF

DP 1048 B2RF

DP 1219 B2RF

DP 1252 B2RF

FM 1944 GLB2

FM 2011 GT

FM 2989 GLB2

FM 8270 GLB2

FM 2484 GLB2

PHY 367 WRF

PHY 375 WRF

PHY 499 WRF

PHY 755 WRF

ST 5458 B2RF

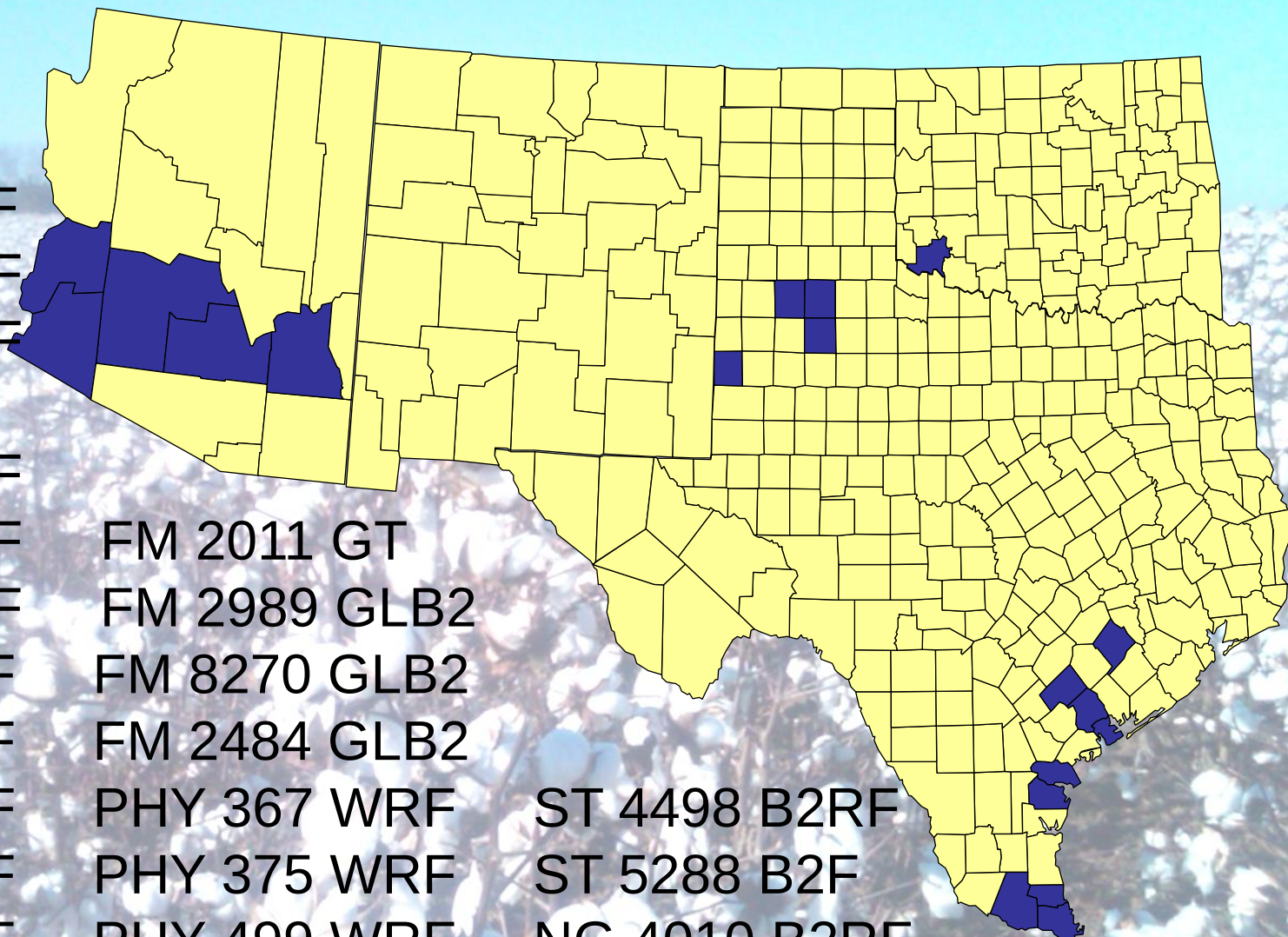
ST 4498 B2RF

ST 5288 B2F

NG 4010 B2RF

NG 4111 RF

NG 4012 B2RF



2009 GA Cotton OVT – Irrigated, Early Maturing

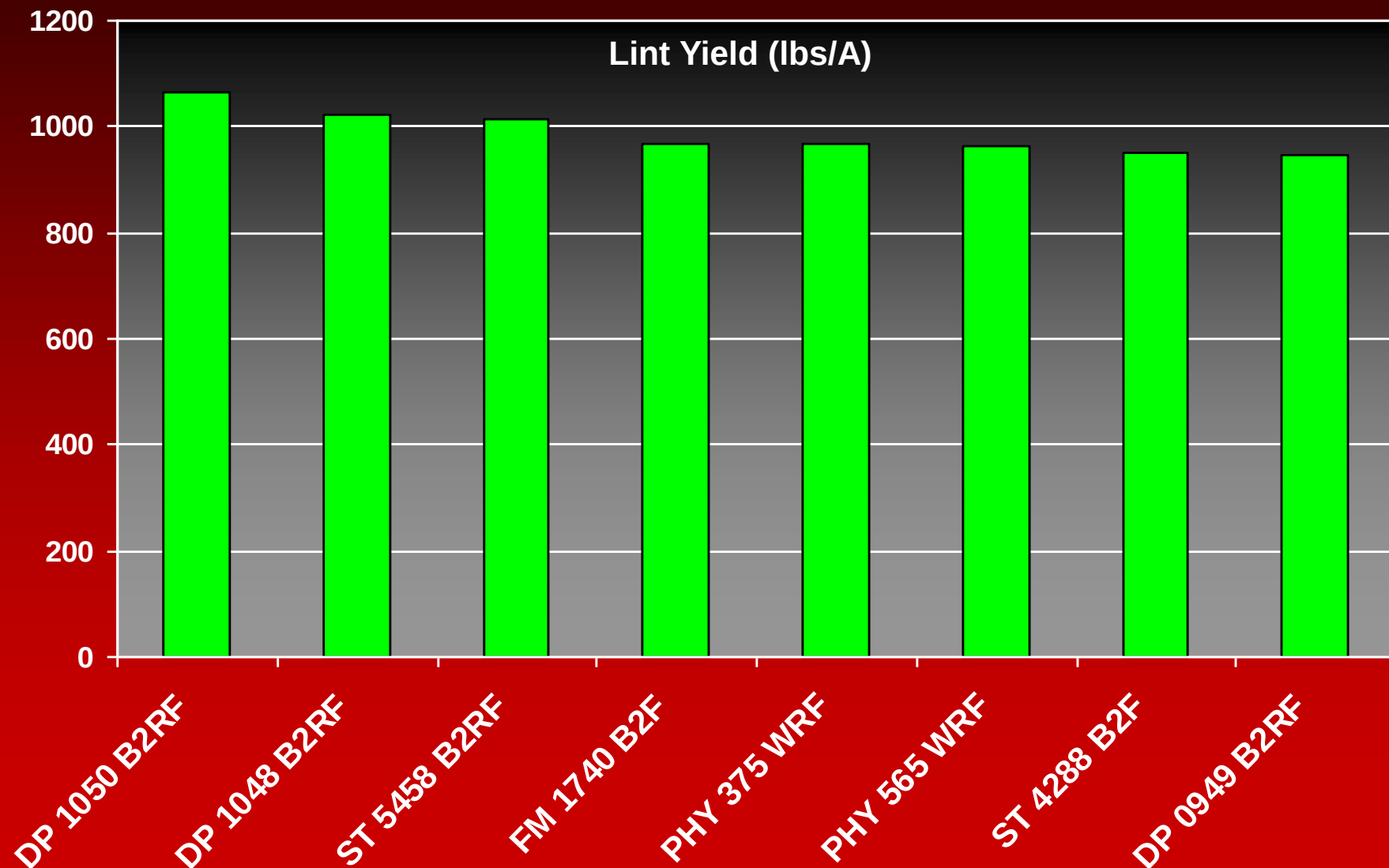
– Top 19 Varieties (Bainbridge, Midville, Plains, Tifton)

Variety	Lint Yield	Lint %	Len	Mic	Str	UI
09R619 B2R2	2041	45.3	1.17	4.5	26.9	84.1
FM 1740 B2RF	2033	44.3	1.17	4.1	27.4	83.7
DP 0920 B2RF	2028	45.0	1.19	4.4	26.5	83.9
DG 2570 B2RF	2001	44.6	1.17	4.4	27.4	83.7
DP 0935 B2RF	1967	44.6	1.16	4.4	26.6	83.9
PHY 370 WR	1923	44.2	1.14	4.4	28.8	83.5
DP 0912 B2RF	1918	43.1	1.16	4.6	29.3	84.0
ST 4498 B2RF	1878	43.3	1.17	4.1	28.7	83.5
ST 5288 B2F	1876	43.6	1.17	4.5	27.3	83.4
SSG CT Linwood	1874	44.0	1.15	4.8	30.2	84.2
PHY 367 WRF	1868	43.7	1.20	4.0	28.4	84.3
DP 0924 B2RF	1846	43.5	1.16	4.5	28.0	84.0
CG 3220 B2RF	1840	43.0	1.19	4.5	26.7	84.1
AM 1550 B2RF	1802	43.9	1.15	4.3	25.4	83.8
ST 4288 B2F	1793	41.2	1.20	4.7	27.5	84.1
BCSX 1035 LLB2	1766	41.9	1.15	4.8	31.1	84.0
All-Tex A102	1761	42.4	1.19	4.0	27.7	83.9
ST 4554 B2RF	1742	43.3	1.19	4.4	28.3	83.3
PHY 375 WRF	1741	44.1	1.17	4.1	27.5	83.6

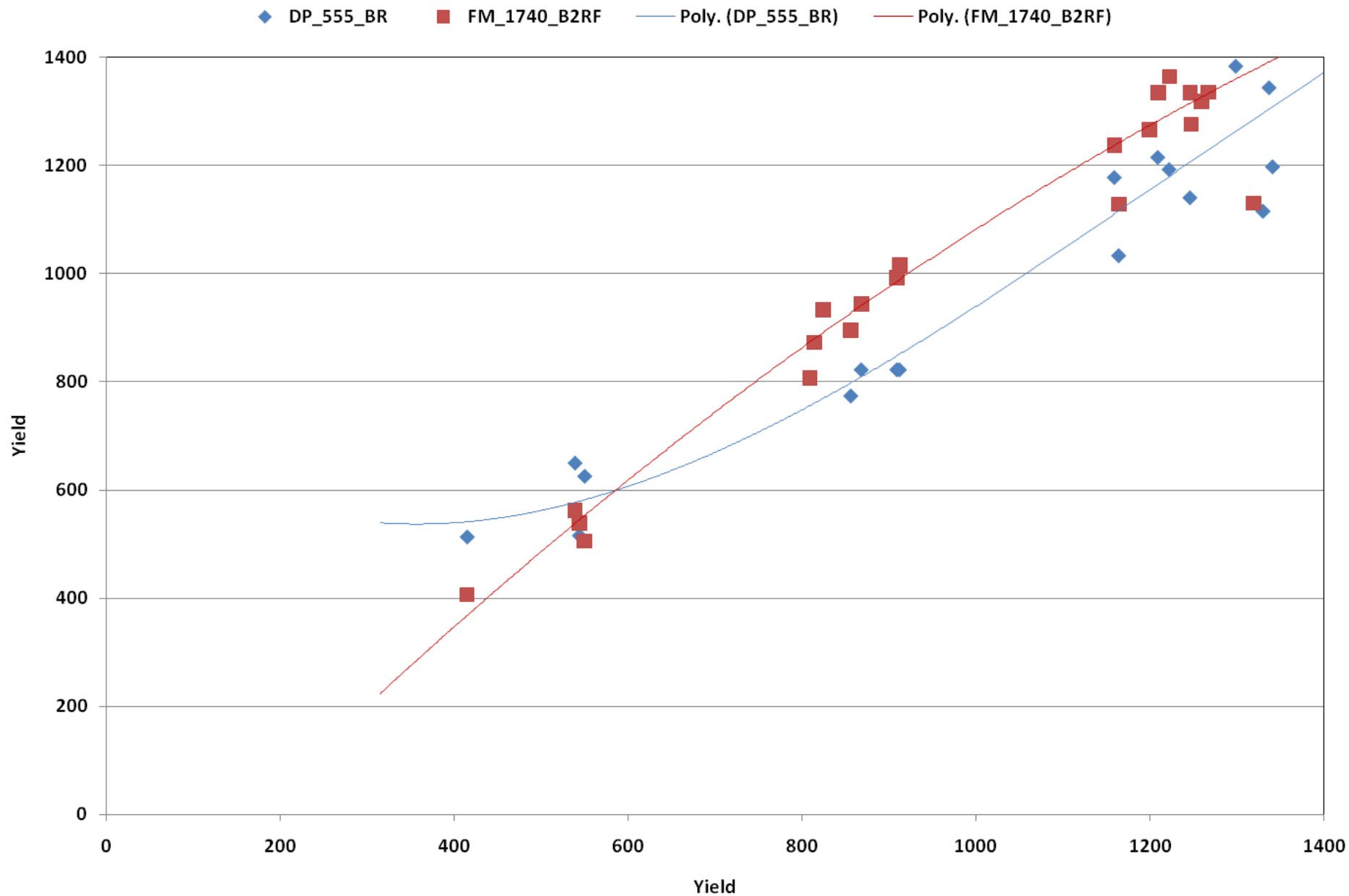
Highlighted: NS from highest yielder – 4 loc. Avg.

2010 UGAUCVPEP– Irrigated & Dry Combined

(23 Cotton Variety Trials)



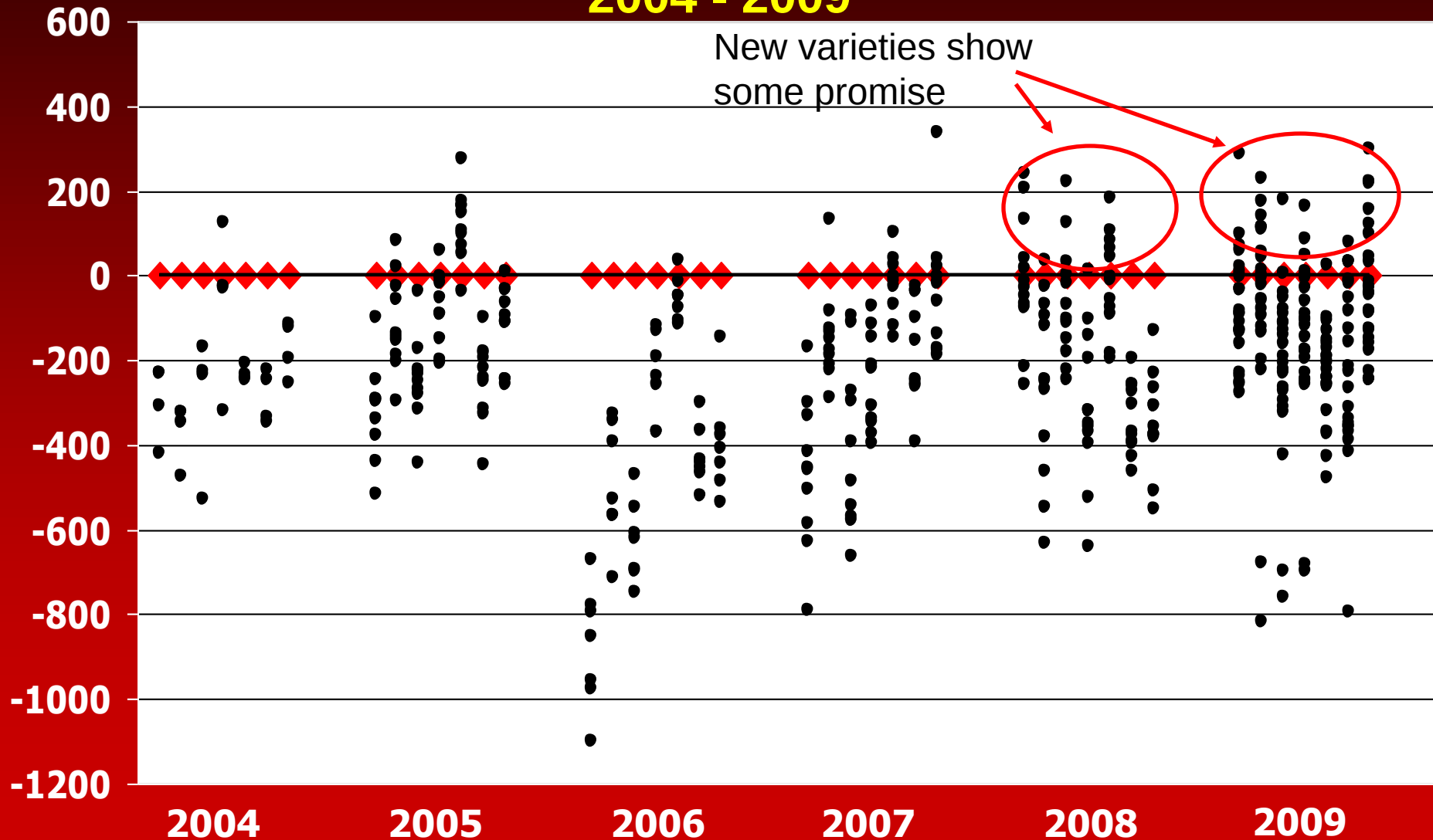
Yield FM 1740 vs. DP 555



DP 555 BG/RR vs Current Late-Maturing Varieties

2004 - 2009

Roberts, 2008



2010 UGAUCVPEP Stability & Consistency (TOP 3)

Variety	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Combined Average
DP 1050	458	421	484	581	705	716	673	924	915	1062	1045	1156	1131	1369	1324	1174	1209	1369	1533	1407	1585	1609	1628	1064
DP 1048	433	383	503	577	692	553	742	919	857	965	1014	1089	1171	1085	1156	1242	1324	1327	1482	1352	1426	1504	1713	1022
ST 5458	409	452	408	516	658	769	689	815	795	1038	956	1013	1189	1231	1169	1188	1323	1425	1325	1367	1526	1507	1553	1014
FM 1740	417	389	434	416	619	598	607	824	766	964	948	1036	1191	1049	1199	1211	1197	1248	1350	1455	1262	1474	1603	968
PHY 375	441	472	471	458	693	644	626	836	839	1064	940	1089	1094	1123	1131	1174	1147	1236	1276	1391	1315	1346	1434	967
PHY 565	405	352	462	504	636	694	601	811	864	787	909	923	1202	1073	1259	1204	1158	1292	1373	1261	1321	1466	1635	965
ST 4288	429	490	486	486	670	709	769	774	847	784	894	1099	956	1000	1110	1211	1163	1387	1195	1256	1388	1297	1481	951
DP 0949	391	452	448	500	512	610	641	761	820	878	1012	1094	1069	1165	1122	1107	1209	1390	1257	1304	1393	1255	1335	945
Loc. Average	423	426	462	505	648	661	668	833	838	943	965	1062	1125	1137	1184	1189	1216	1334	1349	1349	1402	1432	1548	

2010 UGAUCVPEP Stability & Consistency (TOP 2)

Variety	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Combined Average
DP 1050	458	421	484	581	705	716	673	924	915	1062	1045	1156	1131	1369	1324	1174	1209	1369	1533	1407	1585	1609	1628	1064
DP 1048	433	383	503	577	692	553	742	919	857	965	1014	1089	1171	1085	1156	1242	1324	1327	1482	1352	1426	1504	1713	1022
ST 5458	409	452	408	516	658	769	689	815	795	1038	956	1013	1189	1231	1169	1188	1323	1425	1325	1367	1526	1507	1553	1014
FM 1740	417	389	434	416	619	598	607	824	766	964	948	1036	1191	1049	1199	1211	1197	1248	1350	1455	1262	1474	1603	968
PHY 375	441	472	471	458	693	644	626	836	839	1064	940	1089	1094	1123	1131	1174	1147	1236	1276	1391	1315	1346	1434	967
PHY 565	405	352	462	504	636	694	601	811	864	787	909	923	1202	1073	1259	1204	1158	1292	1373	1261	1321	1466	1635	965
ST 4288	429	490	486	486	670	709	769	774	847	784	894	1099	956	1000	1110	1211	1163	1387	1195	1256	1388	1297	1481	951
DP 0949	391	452	448	500	512	610	641	761	820	878	1012	1094	1069	1165	1122	1107	1209	1390	1257	1304	1393	1255	1335	945
Loc. Average	423	426	462	505	648	661	668	833	838	943	965	1062	1125	1137	1184	1189	1216	1334	1349	1349	1402	1432	1548	

2011 UGA Cotton Variety Performance

Evaluation Program *Stability & Consistency*

Variety	Combined Average	% Above Avg.	% Top 3	% Top 2	% Top 1	% Bottom 3	% Bottom 2	% Bottom 1
PHY 499 WRF	1202	93	87	73	47	7	7	0
DP 1137 B2RF	1183	93	80	53	33	0	0	0
DP 1050 B2RF	1150	87	53	27	7	13	0	0
DP 1048 B2RF	1114	60	20	0	0	33	20	7
ST 5458 B2RF	1105	47	20	13	7	20	7	0
FM 1740 B2F	1088	33	13	13	0	40	20	7
ST 4288 B2F	1068	33	13	13	7	47	33	20
PHY 375 WRF	1063	20	13	7	0	53	27	13
PHY 565 WRF	960	0	0	0	0	87	87	60

2011 UGAUCVPEP *Stability & Consistency* (TOP 3)

Variety	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Combined Average
PHY 499	227	430	898	803	835	1012	917	1380	1344	1606	1714	1648	1773	1737	1713	1202
DP 1137	215	344	917	785	823	923	958	1295	1445	1626	1495	1599	1799	1774	1746	1183
DP 1050	228	310	821	792	821	945	927	1160	1369	1564	1529	1593	1775	1677	1733	1150
DP 1048	216	304	705	782	765	810	891	1261	1385	1542	1467	1530	1654	1698	1705	1114
ST 5458	163	371	699	743	743	940	1060	1185	1382	1399	1532	1541	1656	1607	1550	1105
FM 1740	147	305	635	726	715	975	928	1113	1428	1461	1585	1541	1507	1633	1626	1088
ST 4288	202	340	590	671	789	878	995	1188	1453	1367	1495	1437	1489	1568	1558	1068
PHY 375	189	316	729	700	608	820	850	1126	1431	1473	1479	1645	1516	1525	1536	1063
PHY 565	148	318	592	671	641	733	722	1000	1060	1191	1381	1465	1418	1467	1588	960
Loc. Average	193	337	732	741	749	893	916	1190	1366	1470	1520	1555	1621	1632	1639	1104

2011 UGAUCVPEP Stability & Consistency (TOP 1)

Variety	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Combined Average
PHY 499	227	430	898	803	835	1012	917	1380	1344	1606	1714	1648	1773	1737	1713	1202
DP 1137	215	344	917	785	823	923	958	1295	1445	1626	1495	1599	1799	1774	1746	1183
DP 1050	228	310	821	792	821	945	927	1160	1369	1564	1529	1593	1775	1677	1733	1150
DP 1048	216	304	705	782	765	810	891	1261	1385	1542	1467	1530	1654	1698	1705	1114
ST 5458	163	371	699	743	743	940	1060	1185	1382	1399	1532	1541	1656	1607	1550	1105
FM 1740	147	305	635	726	715	975	928	1113	1428	1461	1585	1541	1507	1633	1626	1088
ST 4288	202	340	590	671	789	878	995	1188	1453	1367	1495	1437	1489	1568	1558	1068
PHY 375	189	316	729	700	608	820	850	1126	1431	1473	1479	1645	1516	1525	1536	1063
PHY 565	148	318	592	671	641	733	722	1000	1060	1191	1381	1465	1418	1467	1588	960
Loc. Average	193	337	732	741	749	893	916	1190	1366	1470	1520	1555	1621	1632	1639	1104

2012 South Texas (TOP 2)

Variety	1	2	3	4	5	6	7	8	9	10	% TOP 2	Combined Average
PHY 499 WRF	723	688	900	973	1305	1274	1202	1698	2368	2834	70	1009
DP 1044 B2RF	567	692	760	667	1373	1389	1564	1728	2162	2702	40	1002
AM 1511 B2RF	559	609	881	738	1175	1407	1401	1676	2107	2848	30	967
CL 3787 B2RF	555	605	750	935	1230	1419	1272	1640	2206	2627	20	967
FM 1944 GLB2	563	533	710	783	1311	1404	1432	1540	2084	2605	20	962
Nitro 44 B2RF	554	582	773	813	1188	1221	1272	1457	2317	2800	10	915
FM 8270 GLB2	607	541	708	674	1251	1243	1352	1424	1867	2347	10	911
Loc. Average	590	607	783	798	1262	1337	1356	1595	2159	2680		962

2012 South Texas (TOP 3)

Variety	1	2	3	4	5	6	% TOP 3	Combined Average
PHY 499 WRF	723	688	900	973	1698	2368	100	1225
PHY 375 WRF	754	715	803	725	1653	2166	33	1136
DP 1219 B2RF	570	605	810	916	1654	2145	33	1117
CL 3787 B2RF	555	605	750	935	1640	2206	33	1115
DP 1044 B2RF	567	692	760	667	1728	2162	33	1096
AM 1511 B2RF	559	609	881	738	1676	2107	33	1095
Nitro 44 B2RF	554	582	773	813	1457	2317	17	1083
ST 5458 B2RF	557	571	744	708	1615	2189	0	1064
FM 1944 GLB2	563	533	710	783	1540	2084	0	1036
FM 8270 GLB2	607	541	708	674	1424	1867	17	970
Loc. Average	601	614	784	793	1609	2161		1094

Acknowledgements

Cotton Incorporated
State Commodity Boards
Industry Partners
University Cotton Specialists

Thank You

