

**SURE-GROW 180, SURE-GROW 248, AND SURE-GROW 821**  
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**Abstract**

Sure-Grow Seed, Inc. has developed one new early- to mid-maturity conventional variety, and two new mid- to full-maturity conventional varieties to be introduced in the 1998 season. Sure-Grow 821 is an early- to mid-maturity cotton developed by Dr. Bob Bridge at Leland, MS. Sure-Grow 180 and Sure-Grow 248 are two mid- to full-maturity cottons developed by Dr. Bill Sappenfield, Terry Weesner, and staff at Maricopa, AZ. Sure-Grow 821 is the most widely-adaptable of the three, with a maturity very similar to that of Sure-Grow 501. It has very high seedling vigor, and has performed well in variety trials across the belt. Sure-Grow 180 and Sure-Grow 248 are well-adapted to areas where full-season weather typically translates into higher yield potential. These varieties have performed very well in AZ, TX, LA, AL, FL, GA, and SC.

**Introduction**

Because research throughout the 1980s and 1990s demonstrated some advantages for early maturity and managing for short-season production, most cotton planting seed companies, including Sure-Grow Seed, developed early-maturing varieties that had a fit within the earliness concept. However, recent expansion of cotton acreage in the Southeast has made feasible the development of more full-season types of cotton. These mid- and full-maturity varieties can take better advantage of the full-season weather of the southern tier of the belt.

Sure-Grow Seed will continue to develop high-yielding, top-quality varieties for the early-maturity market, such as Sure-Grow 125, Sure-Grow 404, and Sure-Grow 501, as well as some upcoming transgenic material, SG585B, SG585RR, SG585B/RR, SG125RR, SG125B/RR, SG501RR, and SG501B/RR, SG180RR, SG180B/RR, SG248RR, SG248B/RR, SG821RR, and SG821B/RR. We have also responded to the demands of the mid- to full-season grower by developing Sure-Grow 821, Sure-Grow 180, and Sure-Grow 248, in addition to our current mid-full maturity variety, Sure-Grow 1001.

**Methods**

Yield trials established by Sure-Grow Research at Leland, MS, and at Maricopa, AZ, by Sure-Grow Agronomic Services at on-farm locations throughout the Southeast, and

by university official variety testers were utilized to develop Sure-Grow 821, Sure-Grow 180, and Sure-Grow 248. All trials were small-plot, replicated at least four times, and machine-picked. Laboratory-scale gins were used in all trials.

**Results and Discussion**

Sure-Grow 821 is an early- to mid-maturity variety developed in Leland, MS, by Dr. Bob Bridge. SG 821 originated from a cross between D6-73 and a bulk population designated as C2-9 in 1987. D6-73 is from a cross between DES 119 and DP 50, and is a mixture of F<sub>2</sub> seed from smoothleaf plants. C2-9 is a bulk population that originated from a double cross (DP 90 x DES 422) x (DES 237 x DP 50). SG 821 is a tall-growing variety that has smooth leaves, large seeds, and a normal fruiting habit. Turnout averages 39.2%, while staple length ranges from 1.12-1.16 in., fiber strength (HVI) ranges from 29.9-32.1 g/tex, and micronaire ranges from 4.4-4.7 (Table 1). SG 821 is moderately resistant to *Fusarium* wilt and resistant to *Verticillium* wilt. Seedling vigor of SG 821 is significantly better than other varieties (Table 2).

Sure-Grow 248 is a mid-full-maturity variety developed by Dr. Bill Sappenfield, Terry Weesner, and staff in Maricopa, AZ. First designated as AZ93-248, SG 248 was a single-plant F<sub>2</sub> selection derived from a cross between Mo89-117 x DP 5415. Mo89-117 was an F<sub>6</sub> of the cross Delcot 344, sel. 82-137 x DP 90. This tall-growing, smooth-leaf variety has medium to large seeds, a semi-clustering fruit habit, excellent drought and heat tolerance, and is moderately resistant to *Verticillium* wilt. Turnout averages 40.1%, fiber length ranges from 1.13-1.18 in., fiber strength (HVI) ranges from 33.5-35.6 g/tex, and micronaire ranges from 4.5-4.8 (Table 1).

Sure-Grow 180, also developed by Dr. Bill Sappenfield, Terry Weesner, and staff at Maricopa, AZ, is a mid-full season, intermediate- to tall-growing variety that has smooth leaves, medium-large seeds, and a semi-clustering to clustering fruit habit. It was a single-plant F<sub>2</sub> selection derived from a cross between Delcot 344, sel. AZ 87-75 x DP 5415. Turnout averages 37.9%, fiber length ranges from 1.14-1.17 in., fiber strength (HVI) ranges from 30.9-31.8 g/tex, and micronaire ranges from 4.5-4.8. SG 180 is resistant to bacterial blight, races 1 and 18, resistant to *Fusarium* wilt, and moderately resistant to *Verticillium* wilt (Table 1). This variety has excellent heat tolerance.

**Southeast**

In 1996, SG 821 outyielded DP 5415 by 46 lbs/acre, while SG 248 yielded 111 lbs/acre higher than DP 5415, and SG 180 yielded 90 lbs/acre more than DP 5415 (Table 2). In 1997, yield increases over DP 5415 amounted to 75 lbs/acre for SG 821, 84 lbs/acre for SG 248, and 19 lbs/acre for SG 180 (Table 2). Boll size was highest for SG 821 and SG 501, while DP 5415 had the smallest bolls in 1997 (Table

2). Sure-Grow 821 exhibited excellent seedling vigor in 1997 trials, slightly greater than that for SG 501. Seedling vigor for SG 248 and SG 180 are similar to that of DP 5690. Deltapine 5415 had the lowest seedling vigor rated in 1997 (Table 2). Of the three new Sure-Grow varieties, the highest yields were obtained with SG 248 in both years, while the most stable yield performance was observed for SG 821 (Table 2).

### **Mid-South**

Nineteen trials conducted between 1994 and 1996 indicate that SG 821 performs comparably to SG 125 and SG 501 under Mid-South conditions (Table 3). While SG 821 is well-adapted to all areas of the Mid-South as an early- to mid-maturity variety, SG 248 and SG 180 likely have a fit only in the southern areas of the Mid-South region where full-season weather can help full-maturity varieties reach their highest yield potential. In 1997, five trials in LA demonstrated that SG 821, SG 248, and SG 180 perform as well or better than most other varieties, including some transgenic materials (Table 3). Similarly, 1997 data from five MS Delta trials confirm our findings from 1994-1996 for SG 821, which outyielded DP 33B by 15 lbs/acre (Table 3). Sure-Grow 821 again demonstrates its yield stability in the Mid-South as it did in the Southeast (Table 3).

### **Southwest**

Sure-Grow 821 outperformed SG 125 and SG 501 in 2 South TX trials in 1995 and 1996, and continued to show potential as a well-adapted variety in 1997 trials (Table 4). In 1997, SG 821 and SG 180 outyielded two transgenic varieties (Table 4). Yields of SG 821 and SG 180 were comparable to that of SG 125 in the 1997 trials.

### **West**

Sure-Grow 821 and Sure-Grow 248 performed significantly better than DP 5415, and SG 180 was comparable to SG 501, SG 125, and DP 5415 in 1996 in AZ (Table 5). Seedcotton yields for SG 821 were highest in 1997. Yield increases over DP 5415 in 1997 AZ trials amounted to 293 lbs seedcotton/acre for SG 821, 112 lbs seedcotton/acre for SG 248, and 114 lbs seedcotton/acre for SG 180 (Table 5). All three of the new Sure-Grow varieties are well-adapted to Western growing conditions, and will produce superior fiber properties.

## **Summary**

Sure-Grow 821, Sure-Grow 248, and Sure-Grow 180 are three new conventional varieties being introduced by Sure-Grow Seed, Inc. in the 1998 season. Sure-Grow 821 is the most widely-adaptable of the three varieties, with high yields being reported in all regions of the belt. Sure-Grow 821 has very high seedling vigor and good yield stability. Sure-Grow 248 and Sure-Grow 180 are well-adapted to AZ, South TX, and the mid-full season areas of the Mid-South and Southeast cotton growing regions. Sure-Grow 248 is

very heat and drought tolerant, and has very high fiber strength. Sure-Grow 180 has a very strong disease resistance package, and has excellent heat tolerance. All three new varieties will perform well in the southern tier of the belt that is characterized by full-season weather that allows varieties to express their maximum yield potential.

Table 1. Characteristics of Sure-Grow 821, Sure-Grow 248, and Sure-Grow 180.

Characteristic	Sure-Grow 821	Sure-Grow 248	Sure-Grow 180
Maturity	Early-Mid	Mid-Full	Mid-Full
Leaf hair	Smooth	Smooth	Smooth
Seed size (amount/lb)	Large (4,500-4,800)	Large (4,600-4,900)	Med - Large (4,900-5,200)
Fruiting habit	Normal	Semi-cluster	Semi-cluster to Cluster
Plant height	Tall	Tall	Medium Tall
Turnout	39.2 %	40.1 %	37.9 %
Pest resistance	<i>Fusarium</i> (MR) <i>Verticillium</i> (MR)	<i>Verticillium</i> (MR)	Bacterial blight, races 1 & 18 (R) <i>Fusarium</i> (R) <i>Verticillium</i> (MR)
Fiber length	1.12-1.16 in	1.13-1.18 in	1.14-1.17 in
Fiber strength	29.9-32.1 g/tex	33.5-35.6 g/tex	30.9-31.8 g/tex
Micronaire	4.4-4.7	4.5-4.8	4.5-4.8
Other	Excellent seedling vigor	Excellent drought & heat tolerance	Excellent heat tolerance

MR=moderate resistance; R=resistant

Table 2. Lint yield in 1996-97, and boll size and seedling vigor ratings in 1997 in the Southeast.

Entry	Lint Yield (lb/acre) 1996	Lint Yield (lb/acre) 1997	Boll Size (g lint /boll)	Seedling Vigor (1=poor; 5=excel.)
SG 821	1176	1169	2.30	2.72
SG 248	1241	1178	2.19	2.39
SG 180	1220	1113	2.11	2.58
SG 501	1147	1236	2.28	2.69
DP 5415	1130	1094	2.01	2.22
DP 5690	1182	1139	2.16	2.50

Source: Sure-Grow and university data, 8 trials in each year.

Table 3. Lint yields (lbs/acre) in the Mid-South.

Entry	19 Mid-South Early-Mid trials 1994-96	5 LA Medium Maturity trials 1997	5 MS Medium Maturity Delta trials 1997
SG 821	1260	1263	1245
SG 248	--	1099	--
SG 180	--	1124	--
SG 501	1210	--	--
SG 125	1267	1107	1286
DP 33B	--	1173	1230
ST LA887	--	1098	--
PM 1560	--	1110	1225
DP 5415RR	--	1055	1121
DP 90B	--	1031	1096

Source: 1994-96 data from Sure-Grow Research and university trials; 1997 data from university trials.

Table 4. Lint yields in South Texas in 1995-96 and 1997.

Entry	2 South TX trials 1995-96	5 South TX trials 1997
SG 821	977	711
SG 180	--	698
SG 125	951	709
SG 404	--	668
SG 501	755	654
DP 33B	--	688
ST BXN 47	--	640

Source: Sure-Grow Research for 1995-96 data; Texas A&M Univ. for 1997 data.

Table 5. Yields from 5 Arizona trials in 1996 and 1997, and fiber quality from 5 Arizona trials in 1996.

Entry	Lint Yield (lb/acre) 1996	Fiber Length (in) 1996	Fiber Strength (g/tex) 1996	Mic 1996	Seedcotton Yield (lbs/acre) 1997
SG 821	1480	1.14	29.5	5.0	3975
SG 248	1488	1.18	30.0	4.9	3794
SG 180	1369	1.16	30.1	4.8	3796
SG 501	1351	1.14	32.1	4.8	3557
SG 125	1371	1.14	27.2	4.8	3809
DP 5415	1393	1.16	30.2	5.0	3682

Source: Sure-Grow Research and Univ. of Arizona.