REPORT OF THE VERTICILLIUM WILT AND FUSARIUM WILT COMMITTEE -1999

Peggy M. Thaxton, Chairperson
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Verticillium Wilt

Tennessee

A. Y. Chambers (Verticillium Wilt Situation and Research in 1999). Verticillium wilt was a relatively minor problem for cotton producers in Tennessee in 1999. Losses were estimated at 0.75 percent. A low level of wilt injury appeared in late August and continued throughout the very hot, dry season that we experienced over most of the cotton-growing areas of the State in 1999.

Fourteen cotton cultivars which were suggested for grower use in 1999 or appeared to have promise for production in Tennessee were planted May 12 at The University of Tennessee Milan Experiment Station at Milan in an experiment to evaluate their response to Verticillium wilt. 'Paymaster H1244', a highly-susceptible cultivar, and 'FiberMax 989', a cultivar with a high level of resistance or tolerance to Verticillium wilt, were included in the experiment for comparing the 14 cultivars. Plots were located on an area which has a history of Verticillium wilt injury and which had moderate wilt damage in 1998. The plot area, in a creek bottom, had been planted for over 20 years in a highly-susceptible cultivar every other year, and evaluation of cultivars for wilt susceptibility was made in alternate years. Seed of the cultivars were packaged and planted with a tractor-mounted cone planter. Terraclor Super X and Temik granules were applied to the seed furrow for seedling disease and early-season insect control. Weather conditions were similar to those that occurred in most of the cotton-producing areas of the State, and light symptoms of wilt developed in late August and continued at a fairly low level.

Cultivars were rated August 30 and rechecked September 9 and 29 for extent of wilt symptoms and injury. Wilt ratings and yields are shown in Table 1. On a scale of 0 to 10 with 10 being the most severe wilt damage, 13 cultivars including FiberMax 989 were rated significantly lower than Paymaster H1244. Fourteen cultivars including Paymaster H1244 were rated significantly higher than FiberMax 989. Ratings were all low and ranged from 1.8 for Paymaster H1244 to 0.1 for FiberMax 989. Thirteen cultivars including FiberMax 989 had significantly higher yields than Paymaster H1244. Six cultivars including Paymaster H1244 had lower yields than FiberMax 989. Five cultivars had yields over 900 pounds of lint per acre under extended drought conditions without irrigation. Five others had yields over 800 pounds. Except for Paymaster H1244 and possibly 'Paymaster PM 1218 BG/RR', wilt injury appeared to have little effect on yields of cultivars in 1999.

In an adjoining plot area planted May 12, no-tillage and conventional tillage were evaluated for effect on incidence and severity of Verticillium wilt. As in the cultivar evaluation, symptoms of wilt developed at low levels in late August in the Paymaster H1244 cultivar planted and continued with relatively low levels throughout the season. Disease ratings of wilt made August 30 and rechecked September 16 using the 0 to 10 rating scale were significantly lower in the no-till plots than in the conventional-tillage plots (Table 2). Wilt ratings were higher in the plot area than in the adjoining cultivar evaluation experiment. Yields were significantly higher (249 pounds of lint per acre) in no-tillage plots than in conventional tillage (Table 2).

Table 1. Reaction of Cotton Cultivars to Verticillium Wilt, Milan Experiment Station, Milan, TN - 1999.

Cultivar	Wilt Rating (0-10)	Yield, Lb. Lint/A	
		1st Harvest	Total
FiberMax 989 (ck.)	0.1 f[1]	416 d-h[1]	933 ab[1]
Sure-Grow SG 125 BR	0.5 ef	351 fgh	684 def
Stoneville ST BXN 47	0.6 def	589 ab	969 a
Deltapine DP 388	0.6 def	569 a-d	896 ab
Deltapine DP 5409	0.7 cde	492 a-f	831 a-d
Sure-Grow SG 747	0.8 b-e	490 a-f	881 ab
Stoneville ST 474	0.8 b-e	582 abc	907 ab
Deltapine DP 409 B/RR	1.0 b-e	505 a-f	878 abc
Paymaster PM 1330 BG	1.0 b-e	522 a-e	842 abc
Stoneville ST 373	1.0 b-e	320 gh	722 cde
Deltapine DP 5111	1.0 b-e	615 a	926 ab
Sure-Grow SG 501 BR	1.1 b-e	388 e-h	774 b-e
Paymaster PM 1560 BG	1.2 bcd	438 b-f	975 a
Deltapine DP 436 RR	1.3 abc	422 c-h	785 b-e
Paymaster PM 1218 BG/RR	1.4 ab	265 h	650 ef
Paymaster H1244 (ck.)	1.8 a	279 gh	553 f
LSD 5%	0.5	142	138

Planted 5/12; wilt rated 8/30, 9/9, and 9/29; harvested 10/4 and 25; ck. = check.

[1]Mean figures followed by the same small letter do not differ significantly (P = 0.05, Duncan's New Multiple Range Test).

Table 2. Effects of Tillage on Incidence and Severity of Verticillium Wilt of Cotton, Milan. Experiment Station, Milan, TN - 1999.

Tillage	Wilt Rating (0-10)		Yield, Lb. Lint/A.	
	8/30	9/16	1st Harvest	Total
Conventional	1.25 a[1]	2.85 a[1]	263 b[1]	541 b[1]
No-till	0.90 b	2.30 b	421 a	790 a
LSD 5%	0.24	0.39	95	111

'Paymaster H1244' planted 5/12; wilt rated 8/30 and 9/16; harvested 10/4 and 25.

[1]Mean figures followed by the same small letter do not differ significantly
(P = 0.05, Duncan's New Multiple Range Test).

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Fusarium Wilt

Louisana

P. D. Colyer, W. D. Caldwell, P. R. Vernon, and R. C. Griffin, Louisiana State University Agricultural Center, Red River Research Station, Bossier City, LA. Selected cotton varieties were evaluated for response to the Fusarium wilt/root-knot nematode disease complex on a Norwood very fine sandy loam soil heavily infested with the wilt pathogen (*Fusarium oxysporum* Schlect. f.sp. *vasinfectum* [Atk.] (Snyd. & Hans.))and root-knot nematodes (*Meloidogyne incognita* [Kofoid &White] Chitwood). Experimental design was a randomized complete block with four replications. Plots were single rows, 45 feet long. Disease ratings were taken on ten plants at the end of the season. Wilt ratings were based on the degree of stem discoloration, and root gall ratings were based on the number of nematode galls formed on the roots.

There were significant differences in wilt and root-gall ratings among cultivars. Stoneville LA887 and Acala Nemx had the lowest wilt ratings, both 0.3, and lowest root-gall ratings, 1.4 and 1.6, respectively.

Table 1. Fusarium wilt and root-knot nematode ratings for cotton varieties at the Red River Research Station, Bossier City, LA, 1999.

Variety	Wilt Rating[a]	Gall Rating[b]
Acala Nemx	0.3	1.6
Agripro AP6102	1.0	2.7
Agripro AP7115	1.7	3.2
Deltapine 20B	1.3	2.6
Deltapine 33B	1.3	3.1
Deltapine 388	1.9	3.3
Deltapine 425RR	1.2	2.4
Deltapine 436RR	0.8	2.7
Deltapine 448B	1.0	2.4
Deltapine 450B/RR	0.5	2.4
Deltapine 458B/RR	0.8	3.4
Deltapine 5415RR	1.5	3.4
FiberMax 0052	2.4	4.0
FiberMax 832	1.4	2.7
FiberMax 989	0.6	3.1
Paymaster 0425	0.5	1.9
Paymaster 1440	1.0	3.3
Paymaster 1560BG	0.7	3.5
Paymaster 1560BG/RR	0.3	2.1
PhytoGen PSC355	0.9	3.4
PhytoGen PSC569	1.8	3.1
PhytoGen PSC636	0.4	2.5
PhytoGen PSC952	1.5	3.0
Stoneville 474	2.2	3.4
Stoneville 4691B	1.9	3.0
Stoneville X9902	1.5	2.7
Stoneville X9903	1.4	3.3
Stoneville BXN47	1.6	2.9
Stoneville LA887	0.3	1.4
Sure-Grow 125	0.7	2.7
Sure-Grow 125RR	0.5	2.2
Sure-Grow 125BG/RR	1.9	2.4
Sure-Grow 501	1.2	2.7
Sure-Grow 501B/RR	1.3	2.5
Sure-Grow 747	0.7	2.7
Sure-Grow 821	1.0	3.1
LSD ($P \leq 0.05$)	1.1	0.9

[a]Wilt rating on a scale of 0-5; 0=no stem discoloration, 5=complete stem discoloration.

[b]Root-gall rating on a scale of 0-5; 0=no root galling, 5=severe root galling.

Alabama - 1999 National Fusarium Wilt Cotton Report

K. M. Glass and W. S. Gazaway, Department of Agronomy and Soils, Auburn University. Department of Plant Pathology, Auburn University, Auburn University, AL. This report is a joint contribution between USDA-ARS, Crop Science Research Laboratory, Mississippi State University, Mississippi, and the Alabama Agricultural Experiment Station, Auburn University, Alabama. *Information contained herein is available to all persons regardless of race, color, sex or national origin.*

Cotton cultivars and elite breeding lines submitted by 28 cooperators were evaluated for fusarium wilt resistance under field conditions at the E. V. Smith Research Center, Plant Breeding Unit, Tallassee, Alabama. These entries were grown on an Independence loamy fine sand highly infested with both the fusarium wilt fungus (Fusarium oxysporum) Schlect. f. vasinfectum [Atk.] (Snyd. & Hans.) and root-knot nematodes (Meloidogyne incognita.).

Plots were 40-inch-wide rows, 20 feet in length, separated by 5-foot alleys. Four replications of the test entries and checks, arranged in a block design, were evaluated. Both susceptible (Rowden) and resistant (M-315) cultivars were included as checks. Rowden was planted in row 5 and every tenth row thereafter (15, 25,...,265) and M-315 in row 10 and every tenth row thereafter (20, 30,...,270) throughout the test. Plots were planted May 18. Initial plant counts were made on June 23. Wilted plants were counted and removed on July 8, July 29, and August 19. The remaining live plants were counted and recorded on September 10. Percent wilted plants were then determined and mean wilting for a given entry calculated.

Average wilting of the susceptible Rowden was 31, 33, 21, and 21 percent for the four replications (27 percent average). Corresponding wilt percentages for the resistant check, M-315, were 0.7, 1, 2, and 1 percent (1 percent average). **Critical evaluation of a given entry should be made relative to the checks closest to the entry within each replication.** Evaluation of breeding progress or evaluation of entries over years should be made only between the relative value of this entry and that of the closest susceptible check rows for each year.

In 1994, a soil analysis for nematodes revealed that southern root-knot (Meloidogyne incognita) and lance (Hoplolaimus galeatus) are two predominant nematode species in the test plots. High populations of both species are found throughout the test area. Other nematode genera present are stubby root (Trichodorus sp.) and stunt (Tylenchorhynchus sp.). Root-knot nematodes, however, appear to be causing the major

damage to cotton in the Fusarium Wilt Test as indicated by the high galling indices found on the roots of all cotton lines.

Fusarum wilt was light on all varieties including the susceptible cultivar, Rowden. Early dry conditions caused plants to drop leaves early and made rating wilt difficult.

Entries submitted by Kathryn Glass are commonly grown cultivars or advanced commercial materials and are listed by name. Entries submitted by other cooperators are listed by their coded numbers. Additional information regarding the genetic background of a specific coded entry should be obtained from the named cooperator.

1999 FUSARIUM WILT TEST
E. V. SMITH RESEARCH CENTER, TALLASSEE, ALABAMA

Test entry designation		Percent wilt by replication				
		1	**2**	**3**	**4**	**Mean**
1 Curtis Williams, Paymaster Cottonseed, 2476 Hwy. 130 East, Stuttgart, AR 72160						
001	CW-1	1	0	0	0	0
002	CW-2	0	0	0	6	2
003	CW-3	10	11	6	2	7
004	CW-4	0	10	1	3	4
005	**ROWDEN**	**15**	**24**	**12**	**21**	**18**
006	CW-5	1	0	5	0	2
007	CW-6	0	4	9	0	3
008	CW-7	0	2	2	0	1
009	CW-8	3	2	2	0	2
010	**M-315**	**0**	**7**	**8**	**7**	**6**
2 Roy Creech, USDA-ARS, Mississipi State, MS						
011	1	0	4	8	0	3
012	2	2	3	1	0	2
013	3	1	2	1	4	2
014	4	3	0	10	3	4
015	**ROWDEN**	**49**	**39**	**7**	**6**	**25**
016	5	0	6	0	2	2
017	6	1	2	2	0	1
018	7	0	3	0	9	3
019	8				0	7133
020	**M-315**	**0**	**0**	**0**	**0**	**0**
3 Charles Cook, United Agri Products, P.O. Box 1149, Santa Rosa, TX 78593						
021	CGC-1	2	0	2	13	4
022	CGC-2	8	30	5	14	15
023	CGC-3	9	25	13	14	15
024	CGC-4	1	28	0	15	11
025	**ROWDEN**	**31**	**37**	**16**	**33**	**29**
026	CGC-5	4	18	2	0	6
027	CGC-6	11	0	0	2	3
028	CGC-7	3	4	0	0	3
029	CGC-8	0	0	4	3	1
030	**M-315**	**0**	**0**	**0**	**0**	**0**
4 Laval M. Verhalen, Oklahoma State University, 368 Agricultural Hall, Stillwater, OK 74078-6028						
031	OKLA-1	1	4	0	6	3
032	OKLA-2	9	0	3	9	5
033	OKLA-3	1	0	3	2	1
034	OKLA-4	0	7	1	11	5
035	**ROWDEN**	**44**	**16**	**2**	**11**	**18**
036	OKLA-5	1	3	0	1	1
037	OKLA-6	1	7	0	5	3
038	OKLA-7	0	0	0	3	1
039	OKLA-8	2	3	3	4	3
040	**M-315**	**0**	**0**	**2**	**0**	**1**
5 Terry Weesner, Sure Grow Research, P.O. Box 589, Maricopa, AZ 85239						
041	AZ-1	0	0	2	0	0
042	AZ-2	0	0	2	3	1
043	AZ-3	0	5	4	0	2
044	AZ-4	0	0	3	0	1
045	**ROWDEN**	**20**	**35**	**34**	**12**	**25**
046	AZ-5	6	4	0	0	2
047	AZ-6	0	4	2	0	1
048	AZ-7	0	4	0	3	2
049	AZ-8	2	10	5	3	5
050	**M-315**	**0**	**2**	**0**	**0**	**1**
6 Peggy Thaxton, Dept. of Soil & Crop Sci., Texas A&M Univ., College Station, TX 77843-2474						
051	PMT-1	0	41	44	10	24
052	PMT-2	3	17	11	2	87
053	PMT-3	3	13	11	3	8
054	PMT-4	0	6	0	2	2
055	**ROWDEN**	**21**	**25**	**34**	**23**	**26**
056	PMT-5	3	5	6	13	7
057	PMT-6	1	10	1	4	4
058	PMT-7	39	0	6	0	11
059	PMT-8	23	6	0	2	8
060	**M 315**	**0**	**0**	**5**	**0**	**1**
7 Jim Mitchell, Paymaster Cottonseed, 2476 Hwy. 130 East , Stuttgart, AR 72160						
061	JM-1	6	0	2	0	2
062	JM-2	24	1	2	0	7
063	JM-3	7	0	9	0	4
064	JM-4	17	14	6	0	9
065	**ROWDEN**	**30**	**17**	**20**	**12**	**20**
066	JM-5	2	0	0	1	1
067	JM-6	0	3	15	2	5
068	JM-7	1	4	4	7	4
069	JM-8	3	0	5	2	3
070	**M-315**	**2**	**0**	**0**	**0**	**1**
8 Don Keim, Delta and Pine Land Co., 100 Main Street, Scott, MS 38772						
071	1	0	2	3	6	3
072	2	0	2	2	2	1
073	3	0	1	0	0	0
074	4	0	4	11	4	5
075	**ROWDEN**	**33**	**66**	**35**	**24**	**40**
076	5	4	19	11	15	12
077	6	3	4	2	3	3
078	7	3	1	15	6	6
079	8	0	0	6	0	1
080	**M-315**	**0**	**0**	**0**	**0**	**0**
9 Randall McPherson, Phytogen Seed Co., P.O. Box 27, Leland, MS 38756						
081	PX-1	1	1	3	0	2
082	PX-2	2	0	0	5	2
083	PX-3	2	0	0	1	1
084	PX-4	1	2	5	8	4
085	**ROWDEN**	**44**	**33**	**6**	**22**	**26**
086	PX-5	2	0	0	3	1
087	PX-6	0	1	4	3	2
088	PX-7	3	0	7	5	4
089	PX-8	0	2	3	0	1
090	**M-315**	**0**	**0**	**3**	**0**	**1**
10 John Green, Seed Source Inc., P.O. Box 28, Stoneville, MS 38776						
091	SS-1	0	0	0	0	0
092	SS-2	4	3	0	7	3
093	SS-3	7	0	2	0	2
094	SS-4	2	7	6	16	8
095	**ROWDEN**	**35**	**20**	**8**	**19**	**21**
096	SS-5	0	0	12	5	4
097	SS-6	0	10	2	2	4
098	SS-7	4	2	0	6	3
099	SS-8	3	0	4	0	2
100	**M-315**	**0**	**3**	**0**	**0**	**1**
11 Ed Lubber, Phytogen Seed Co., P.O. Box 27, Leland, MS 38756						
101	PX-9	2	4	40	0	11
102	PX-10	2	7	4	0	3
103	PX-11	0	3	11	32	11
104	PX-12	2	17	3	3	6
105	**ROWDEN**	**10**	**48**	**26**	**20**	**26**
106	PX-13	2	5	8	6	5
107	PX-14	0	2	5	2	2
108	PX-15	2	4	5	0	3

109	PX-16	2	7	2	0	3
110	**M-315**	**0**	**0**	**0**	**0**	**0**

12 Cindy Green, Delta and Pine Land Co., P.O. Box 1529, Hartsville, SC 29551

111	1	0	3	4	4	3
112	2	1	0	0	21	6
113	3	3	5	2	4	3
114	4	2	0	36	4	10
115	**ROWDEN**	**19**	**39**	**40**	**8**	**27**
116	5	22	14	9	12	14
117	6	12	1	0	0	3
118	7	37	1	13	4	14
119	8	34	0	17	0	13
120	**M-315**	**2**	**1**	**3**	**0**	**2**

13 C. Wayne Smith, Dept. of Soil & Crop Sci., Texas A & M Univ., College Station, TX 77843-2474

121	1	88	0	4	0	23
122	2	8	0	0	33	3
123	3	33	14	27	1	19
124	4	42	6	8	13	17
125	**ROWDEN**	**44**	**43**	**19**	**5**	**28**
126	5	2	1	5	2	3
127	6	16	4	2	5	7
128	7	7	0	5	12	6
129	8	0	1	7	4	3
130	**M-315**	**3**	**0**	**4**	**0**	**2**

14 O. Lloyd May, USDA-ARS, 2200 Pocket Road, Florence, SC 29506-9706

131	PD 94056	7	2	3	5	4
132	PD 94063	4	6	6	2	5
133	PD 95034	0	5	0	4	2
134	PD 95079	7	0	2	3	3
135	**ROWDEN**	**33**	**16**	**12**	**40**	**25**
136	PD 96001	5	4	9	9	6
137	PD 96005	1	0	4	8	3
138	PD 96024	1	6	4	2	3
139	PD 96031	2	9	8	5	6
140	**M-315**	**0**	**0**	**3**	**3**	**2**

15 Jack E. Jones, JaJo Genetics, 246 Maxine Drive, Baton Rouge, LA 70808-6831

141	JJ-1	1	0	0	0	0
142	JJ-2	3	2	7	11	6
143	JJ-3	9	6	2	10	7
144	JJ-4	0	0	0	3	1
145	**ROWDEN**	**26**	**14**	**25**	**70**	**34**
146	JJ-5	4	3	6	2	4
147	JJ-6	0	7	2	2	3
148	JJ-7	13	0	13	4	7
149	JJ-8	0	0	0	5	1
150	**M-315**	**0**	**0**	**0**	**0**	**0**

16 Gary Rea, Paymaster Cottonseed, RR 2, Box 60, Hale Center, TX 79041

151	1	0	0	13	7	5
152	2	1	1	6	6	4
153	3	2	3	1	0	1
154	4	1	9	0	3	3
155	**ROWDEN**	**34**	**20**	**22**	**22**	**24**
156	5	8	1	3	0	3
157	6	2	0	0	3	1
158	7	3	2	0	0	1
159	8	5	0	0	3	2
160	**M-315**	**3**	**0**	**3**	**0**	1

17 W. P. Sappenfield, 115 Mango Cove, Leesburg, FL 34748

161	WPS-1	0	0	20	8	7
162	WPS-2	7	0	51	0	15
163	WPS-3	0	0	5	0	1
164	WPS-4	0	2	4	0	1
165	**ROWDEN**	**34**	**31**	**31**	**10**	**27**
166	WPS-5	4	0	0	0	1
167	WPS-6	0	0	3	5	2
168	WPS-7	0	2	0	0	1
169	WPS-8	0	6	6	0	3
170	**M-315**	**0**	**8**	**1**	**0**	**2**

18 Michael Swindle, Paymaster Cottonseed, 2476 Hwy. 130 East , Stuttgart, AR 72160

171	MS-1	4	7	20	3	8
172	MS-2	2	14	12	3	8
173	MS-3	11	20	17	2	12
174	MS-4	19	2	7	3	8
175	**ROWDEN**	**46**	**44**	**22**	**5**	**29**
176	MS-5	2	4	0	0	1
177	MS-6	7	0	16	2	6
178	MS-7	24	6	5	8	11
179	MS-8	4	4	0	0	2
180	**M-315**	**0**	**0**	**0**	**3**	**1**

19 Mark Barefield, Stoneville Pedigreed Seed Co., 2409 Commerce Lane, Albany, GA 31707

181	MB-1	28	0	2	4	9
182	MB-2	21	11	0	2	8
183	MB-3	10	24	7	2	11
184	MB-4	0	6	1	8	4
185	**ROWDEN**	**28**	**64**	**13**	**10**	**29**
186	MB-5	40	16	8	19	21
187	MB-6	0	2	3	0	1

20 Lloyd McCall, Stoneville Pedigreed Seed Co., 2409 Commerce Lane, Albany, GA 31707

188	LM-1	0	27	3	7	9
189	LM-2	4	5	3	5	4
190	**M-315**	**3**	**0**	**0**	**0**	**1**
191	LM-3	0	6	48	3	14
192	LM-4	0	0	11	6	4
193	LM-5	6	3	4	7	5
194	LM-6	7	11	5	0	6

21 Steve Calhoun, Stoneville Pedigreed Seed Co., 2409 Commerce Lane, Albany, GA 31707

195	**ROWDEN**	**21**	**8**	**30**	**37**	**24**
196	SC-1	13	3	3	6	6
197	SC-2	0	2	9	22	8
198	SC-3	3	11	12	3	7
199	SC-4	3	0	7	2	3
200	**M-315**	**2**	**0**	**7**	**1**	**3**
201	SC-5	4	6	0	0	2
202	SC-6	4	13	0	5	5

22 Randy Wood, Stoneville Pedigreed Seed Co., P.O. Box 569, Maricopa, AZ 85239

203	RW-1	2	6	3	2	3
204	RW-2	0	2	0	3	1
205	**ROWDEN**	**29**	**36**	**15**	**45**	**31**
206	RW-3	10	4	5	7	6
207	RW-4	1	0	3	6	3
208	RW-5	14	3	15	2	8
209	RW-6	3	3	2	5	3

23 Mike Robinson, Stoneville Pedigreed Seed Co., 2409 Commerce Lane, Albany, GA 31707

210	**M-315**	**0**	**0**	**2**	**2**	**1**
211	MR-1	2	2	0	2	1
212	MR-2	9	6	6	4	6
213	MR-3	4	10	12	6	8
214	MR-4	5	15	19	0	10
215	**ROWDEN**	**41**	**39**	**35**	**6**	**30**
216	MR-5	8	3	0	2	4
217	MR-6	8	57	15	11	23

24 Jefferson Gwyn, AgrEvo Cotton Seed Inter., 4301-A Highway 82 East, Greenville, MS 38701

218	ACSI EXP0052	7	22	9	1	10
219	ACSI EXP0222	12	3	9	3	7
220	**M-315**	**0**	**0**	**0**	**3**	**1**
221	ACSI EXP0223	0	6	10	0	4
222	ACSI EXP0321	10	4	10	3	7
223	ACSI EXP0781	0	3	13	0	4
224	ACSI EXPIF1000	2	1	0	0	1
225	**ROWDEN**	**19**	**26**	**25**	**9**	**20**

25 Forest Robinson, USDA, Texas A & M University, College Station, TX 77843

226	AFR-1	5	15	5	8	8
227	AFR-2	6	4	3	3	4
228	AFR-3	4	18	9	4	9

229	AFR-4	4	15	6	1	7
230	**M-315**	**0**	**3**	**0**	**3**	**1**
26 Luther Bird, 729 Shady Lane, Bryan, TX 77802-4322						
231	GP-2-37-96	0	0	0	6	2
232	GP-4-37-96	19	5	0	17	10
233	GP-6-19-96	5	7	0	0	3
234	GP 9529-1	15	0	0	0	4
235	**ROWDEN**	**49**	**52**	**22**	**20**	**36**
27 Robert Humphries, Delta and Pine Land Co., 1305 North VIP Blvd., Casa Grande, AZ 85222						
236	DPAZ-1	6	9	7	2	6
237	DPAZ-2	15	3	3	6	7
238	DPAZ-3	6	4	18	6	8
239	DPAZ-4	28	10	4	2	11
240	**M-315**	**0**	**0**	**0**	**2**	**0**
241	DPAZ-5	6	0	0	0	2
28 Kathryn M. Glass, Dept. of Agronomy and Soils, Auburn University, AL 36849-5412						
242	Suregrow 125					
	BR	22	4	6	3	9
243	Suregrow 747	24	8	3	5	10
244	Paymaster PM					
	1560 BG/RR	0	2	2	0	1
245	**ROWDEN**	**29**	**22**	**8**	**10**	**17**
246	Stoneville 474	8	0	17	4	7
247	Deltapine					
	NuCotn 33B	3	0	0	2	1
248	Deltapine DP					
	458 B/RR	4	0	0	3	2
249	Deltapine Acala					
	90	0	0	0	2	1
250	**M-315**	**3**	**0**	**6**	**0**	**2**