

**REPORT OF THE VERTICILLIUM WILT AND
FUSARIUM WILT COMMITTEE — 1996**
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Verticillium Wilt Report

Mississippi - T. P. Wallace - (Screening of Obsolete Variety Collection for Resistance to Verticillium Wilt). A systematic screening of the 1940 entries in the Obsolete Variety Collection was begun during the 1996 growing season. The first 500 entries were evaluated on a private producers farm with a history of severe wilt problems. Additional entries will be evaluated each year until the entire collection has been evaluated. Specifics and progress of the evaluation will be presented each year to the Cotton Disease Council.

Tennessee -- A. Y. Chambers (Verticillium Wilt Occurrence and Research in 1996). Verticillium wilt was not an extremely important problem for cotton producers in Tennessee in 1996. Losses were estimated at 1.5 percent. The wilt appeared in mid to late August after a relatively dry July but was too late to cause serious yield losses.

Sixteen cultivars which were suggested for grower use in 1996 or appeared to have promise for production in Tennessee were planted May 10 at the University of Tennessee Milan Experiment Station at Milan to evaluate their reaction to Verticillium wilt. Plots were located on an area which has a history of Verticillium wilt injury and which had moderate wilt damage in 1995. 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 reaction was made in alternate years. Seed of the cultivars were packaged and planted with a four-row, 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 moderate to severe symptoms of wilt (depending on the cultivar) developed in mid to late August. Cultivars were rated September 6 and rechecked September 25 and October 15 for extent of wilt symptoms and injury. On a scale of 0 to 10 with 10 being the most severe wilt damage, 'Paymaster H1244' and 'Sure-Grow 125' were rated significantly higher than the other cultivars at 7.7. 'Paymaster H1220', 'Sure-Grow 501', 'Americot 1510', 'Stoneville 474', 'Paymaster H1215', 'Sure-Grow 404', 'Stoneville 132', and 'Stoneville 495' had higher ratings than the other six cultivars with 6.8, 6.8, 6.7, 6.7, 6.6, 6.6, 6.4, and 6.3, respectively. 'Deltapine 5409', 'Deltapine 50', and 'Deltapine 20' had lowest ratings of 4.0,

4.2, and 4.5. 'Deltapine 51', 'Terra 292', and 'Paymaster H1277' were rated 4.7, 5.3, and 5.6, respectively. Even with a relatively high wilt rating, Sure-Grow 125 had a yield of 911 pounds of lint per acre (harvested October 16 and November 5). Paymaster H1215, Paymaster H1244, and Paymaster H1220 had lowest yields of 719, 720, and 733 pounds. Sure-Grow 501, Deltapine 51, and Americot 1510 produced 801, 842, and 877 pounds. Yields of Stoneville 132, Stoneville 474, and Terra 292 were 897, 942, and 945 pounds. Deltapine 50, Stoneville 495, Deltapine 5409, Paymaster H1277, Sure-Grow 404, and Deltapine 20 produced 980, 1003, 1010, 1012, 1020, and 1021 pounds, respectively.

In an adjoining plot area planted May 10, no-tillage and conventional-tillage were evaluated for effect on incidence and severity of Verticillium wilt. As in the cultivar evaluation, symptoms of wilt appeared at moderate to severe levels in mid to late August in the Paymaster H1244 cultivar planted. Disease ratings of wilt made September 6 and rechecked September 25 and October 15 were significantly higher in the no-till plots than in the conventional-tillage plots (7.1 compared to 5.3). However, yields were significantly higher in the no-till plots than in the conventional-tillage plots (829 pounds per acre of lint compared to 575 pounds).

Texas - K. M. El-Zik and P. M. Thaxton - (Genetic Improvement and Disease Incidence). Resistance to Verticillium wilt was evaluated in the Verticillium wilt nurseries at Halfway and Chillicothe, Texas. Plants with foliar Verticillium wilt symptoms were counted four weeks prior to maturity. At the Halfway nursery, foliar symptoms ranged from 38.1% for the okra-leaf strain OSIKRHQWIH-2-94 to 97.7% for HGPICG14QH-1-94, with a test mean of 63.1%. At the Chillicothe nursery, foliar Verticillium wilt symptoms ranged from 6.5% for MAR5PD208S-3-90 to 49.7% for Deltapine 50. Improvement in levels of resistance to Verticillium wilt was obtained in 14 MAR-7 strains.

Fusarium Wilt Report

Alabama - W. S. Gazaway and K. M. Glass. Fusarium wilt was unusually light throughout Alabama during the 1996 season. The wilt was particularly light in the heavily infested Fusarium Wilt plots at Tallassee Field Station near Auburn. The low intensity might be traced back to prevailing low temperatures in April and May and later from mid August through September. Root-knot nematode damage was also extremely light in cotton fields over the state. Outbreaks of Verticillium wilt was prevalent on susceptible cotton varieties in North Alabama. Wilt was particularly severe in one of our nematocide rate studies test in Cherokee county where there was an estimated 30% loss in yield.

1996 Regional Cotton Fusarium Wilt Report - K. M. Glass and W. S. Gazaway. This report is a joint contribution

between USDA-ARS, Crop Science Research Laboratory, Mississippi State, Mississippi, and the Alabama Agricultural Experiment Station, Auburn University, Alabama.

Cotton cultivars and elite breeding lines submitted by 21 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, ..., 205) and M-315 in row 10 and every tenth row thereafter (20, 30, ..., 210) throughout the test. Plots were planted May 17. Initial plant counts were made on June 14. Wilted plants were counted and removed on July 12, July 26, and August 21. The remaining live plants were counted and recorded on August 21. Percent wilted plants were then determined and mean wilting for a given entry calculated.

Average wilting of the susceptible Rowden was 8, 3, 7, and 7 percent for the four replications (6 percent average). Corresponding wilt percentages for the resistant check, M-315, were 0, 1, 0, and 1 percent (0.5 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 process 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.

Root-knot nematode damage was unusually light on cotton roots of all varieties including the susceptible cultivar, Rowden. Cooler than normal temperatures in the spring and early fall may have reduced root-knot nematode populations as well as the incidence of Fusarium wilt. Root-knot nematode damage to the cotton in other areas of south and central Alabama was also extremely light.

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.

Information contained herein is available to all persons regardless of race, color, sex or national origin.

1996 Fusarium Wilt Test					
E. V. Smith Research Center, Tallassee, Alabama					
Test entry designation	Percent wilt by replication				
	1	2	3	4	Mean
1 Donald M. Panter, Stoneville Pedigreed Seed Co., Inc., P.O. Box 167, Stoneville, MS 38776					
001	DMP 1	0	0	0	0
002	DMP 2	0	2	0	0.5
003	DMP 3	2	0	0	0.5
004	DMP 4	0	1	0	0.3
005	ROWDEN	2	1	5	0
006	DMP 5	0	0	0	0
007	DMP 6	0	0	0	0
008	DMP 7	0	1	4	4
009	DMP 8	0	0	0	0
010	M-315	0	0	2	0
2 Freddie M. Miller, Terra International, Inc., P.O. Box 171376, Memphis, TN 38187					
011	1	0	0	2	0.4
012	2	0	0	1	0.3
013	3	0	0	0	0
014	4	0	0	0	0
015	ROWDEN	4	6	11	7
016	5	0	0	0	0
017	6	0	0	0	0
018	7	0	0	2	4
019	8	4	1	1	0
020	M-315	0	0	0	0
3 Don Keim, Delta and Pine Land Co., 100 Main Street, Scott, MS 38772					
021	DPX 1111	0	0	0	0
022	DPX 2048	0	0	2	0.4
023	DPX 2166	0	0	1	0.3
024	DPX 2044	0	0	0	0
025	ROWDEN	3	0	2	2
026	DPX 1979	0	0	0	0
027	DPX 6954	0	2	2	0.8
028	DPX 6926	0	0	0	0
029	DPX 0026	0	2	0	1
030	M-315	0	0	0	0
4 C. Wayne Smith, Dept. of Soil & Crop Sci., Texas A&M Univ., College Station, TX 77843-2474					
031	CWS 1	0	0	0	0
032	CWS 2	0	1	1	5
033	CWS 3	0	1	1	0.7
034	CWS 4	0	1	3	0
035	ROWDEN	0	2	2	9
036	CWS 5	2	0	4	0
037	CWS 6	0	0	3	0.8
038	CWS 7	3	2	29	0
039	CWS 8	0	0	6	4
040	M-315	0	2	2	0
5 Terry Weesner, Arizona Processing, Inc., P.O. Box 50609, Phoenix, AZ 85076					
041	AZ-1	0	0	0	0
042	AZ-2	0	0	0	0
043	AZ-3	0	0	0	0
044	AZ-4	2	1	0	0.9
045	ROWDEN	48	8	23	2

046	AZ-5	0	0	2	0	0.4
047	AZ-6	14	0	0	0	3
048	AZ-7	3	0	0	0	0.7
049	AZ-8	11	0	0	0	3
050	M-315	0	0	0	0	0
6	O. Lloyd May, USDA-ARS, Route 1, Box 531, Florence, SC 29501-9603					
051	1	0	3	0	0	0.7
052	2	7	1	3	0	3
053	3	3	0	0	0	0.8
054	4	0	0	4	0	1
055	ROWDEN	5	2	9	0	4
056	5	0	2	3	0	1
057	6	8	0	5	0	3
058	7	4	0	2	0	1
059	8	0	0	7	0	2
060	M-315	0	0	0	0	0
7	Laval M. Verhalen, Dept. of Agronomy, Oklahoma State University, Stillwater, OK 74078					
061	OKLA-1	0	2	0	0	0.4
062	OKLA-2	0	0	0	0	0
063	OKLA-3	0	0	0	0	0
064	OKLA-4	0	2	0	1	0.7
065	ROWDEN	15	0	20	14	12
066	OKLA-5	0	0	0	2	0.5
067	OKLA-6	0	2	0	0	0.4
068	OKLA-7	0	0	0	0	0
069	OKLA-8	0	0	0	0	0
070	M-315	0	0	0	2	0.4
8	A.L. Germany, Stoneville Pedigreed Seed Co. Inc., Box 167, Stoneville, MS 38776					
071	ALG-1	0	1	3	0	1
072	ALG-2	0	0	1	0	0.3
073	ALG-3	2	0	3	0	1
074	ALG-4	0	0	0	0	0
075	ROWDEN	0	2	0	0	0.6
076	ALG-5	0	0	0	0	0
077	ALG-6	0	0	0	3	0.6
078	ALG-7	0	0	10	0	2
079	ALG-8	0	0	0	0	0
080	M-315	0	2	0	11	3
9	Peggy Thaxton, Dept. of Soil & Crop Sci., Texas A&M Univ., College Station, TX 77843-2474					
081	MAR-1	2	1	0	0	0.7
082	MAR-2	0	0	0	0	0
083	MAR-3	0	0	0	0	0
084	MAR-4	4	0	14	7	6
085	ROWDEN	0	11	21	22	14
086	MAR-5	4	1	20	0	6
087	MAR-6	0	0	8	5	3
088	MAR-7	1	1	1	0	1
089	MAR-8	0	0	0	0	0
090	M-315	0	0	0	0	0
10	Richard Sheetz, Paymaster Cottonseed, P.O. Box 8, Aiken, TX 79221					
091	1	0	0	0	0	0
092	2	1	3	0	0	1
093	3	0	0	0	0	0
094	4	0	0	0	0	0
095	ROWDEN	21	5	0	12	9
096	5	0	0	0	0	0
097	6	0	0	0	0	0
098	7	0	0	0	0	0
099	8	0	1	0	0	0.3
E100	M-315	0	0	1	0	0.2
11	Doug Wessel, Delta and Pine Land Co., 1305 N VIP Blvd., Casa Grande, AZ 85222					
101	1	0	0	2	0	0.6
102	2	0	0	3	3	1
103	3	0	0	0	0	0
104	4	0	0	0	0	0
105	ROWDEN	13	2	3	2	5

106	5	0	3	0	0	0.8
107	6	0	0	1	0	0.3
108	7	0	0	1	6	2
109	8	0	0	0	0	0
110	M-315	0	0	0	0	0
12	W. P. Sappenfield, 115 Mango Cove, Leesburg, FL 34748					
111	WPS-1	0	0	1	2	0.7
112	WPS-2	0	0	1	0	0.3
113	WPS-3	0	0	0	0	0
114	WPS-4	2	0	0	0	0.3
115	ROWDEN	4	0	15	16	9
116	WPS-5	0	0	0	8	2
117	WPS-6	0	0	0	0	0
118	WPS-7	0	0	0	0	0
119	WPS-8	0	0	0	0	0
120	M-315	0	0	0	0	0
13	John Green, Seed Source Inc., P.O. Box 28, Stoneville, MS 38776					
121	SS-1	3	2	0	0	1
122	SS-2	0	0	0	0	0
123	SS-3	2	0	0	0	0.4
124	SS-4	0	0	0	0	0
125	ROWDEN	0	6	0	0	1
126	SS-5	0	10	0	0	2
127	SS-6	0	6	0	0	1
128	SS-7	0	0	0	7	2
129	SS-8	0	0	1	0	0.2
130	M-315	2	10	2	0	3
14	Shelby H. Baker, Univ. of Georgia, Coastal Plain Station, P.O. Box 748, Tifton, GA 31793					
131	GA 1	0	1	0	2	0.7
132	GA 2	0	0	5	1	2
133	GA 3	0	0	0	0	0
134	GA 4	2	0	0	0	0.5
135	ROWDEN	0	1	0	3	1
136	GA 5	0	0	0	0	0
137	GA 6	0	0	3	0	0.7
138	GA 7	0	0	0	0	0
139	GA 8	4	2	0	11	4
140	M-315	1	2	2	0	1
15	Cindy Green, Delta and Pine Land Co., P.O. Box 1529, Hartsville, SC 29550					
141	1	8	0	8	0	4
142	2	3	0	0	0	0.7
143	3	0	0	0	2	0.5
144	4	0	0	0	0	0
145	ROWDEN	3	2	8	18	8
146	5	0	0	0	0	0
147	6	0	2	0	0	0.5
148	7	0	0	8	0	2
149	8	0	0	6	0	2
150	M-315	0	3	0	0	0.6
16	Bill Fagala, Terra International Inc., P.O. Box 171376, Memphis, TN 38187					
151	1	0	0	0	0	0
152	2	5	3	2	3	3
153	3	0	0	0	0	0
154	4	0	0	1	2	0.7
155	ROWDEN	9	5	9	5	7
156	5	0	2	0	0	0.4
157	6	0	0	0	0	0
158	7	0	0	0	0	0
159	8	0	0	0	0	0
160	M-315	0	0	0	0	0
17	Curtis Williams, Paymaster Technology Corp., Route 2, Box 57, Stuttgart, AR 72160					
161	1	0	0	0	1	0.3
162	2	0	0	0	0	0
163	3	0	1	0	0	0.3
164	4	0	1	0	1	0.6
165	ROWDEN	0	0	0	0	0
166	5	0	0	0	0	0

167	6	0	0	0	0	0
168	7	0	0	0	0	0
169	8	0	0	0	0	0
170	M-315	1	0	0	0	0.3
18	Jim Mitchell, Paymaster Technology Corp., Route 2, Box 57, Stuttgart, AR 72160					
171	1	0	3	0	3	1
172	2	1	0	0	1	0.7
173	3	1	0	0	9	2
174	4	1	5	0	0	2
175	ROWDEN	0	7	0	1	2
176	5	1	0	0	14	4
177	6	0	0	0	1	0.3
178	7	1	0	0	0	0.3
179	8	0	0	0	3	0.6
180	M-315	0	1	0	0	0.3
19	Jack E. Jones, 246 Maxine Drive, Baton Rouge, LA 70808-6831					
181	JJ-1	0	0	0	0	0
182	JJ-2	0	0	1	0	0.3
183	JJ-3	0	0	0	0	0
184	JJ-4	1	0	0	0	0.3
185	ROWDEN	28	0	10	5	11
186	JJ-5	3	0	1	0	1
187	JJ-6	0	0	0	1	0.3
20	Daryl Bowman, Crop Science Dept., North Carolina State University, Raleigh, NC 27695					
188	NC 1	0	0	0	1	0.3
189	NC 112	0	1	4	0	1
190	M-315	0	2	0	3	1
191	NC 265	0	0	0	0	0
192	NC 258	1	0	0	0	0.3
193	NC 188	13	0	0	0	3
21	Kathryn M. Glass, Dept. of Agronomy and Soils, Auburn University, Auburn University, AL 36849-5412					
194	Hartz H 1277	0	0	0	0	0
195	ROWDEN	4	0	4	10	4
196	Terra 302	0	0	0	0	0
197	Terra 366	0	0	2	3	1
198	Suregrow 125	0	0	0	1	0.3
199	Suregrow 404	0	0	0	0	0
200	M-315	0	2	2	0	1
201	Hartz H 1220	0	0	0	0	0
202	Hartz H 1244	3	0	0	0	0.7
203	Stoneville 474	0	9	2	0	3
204	Stoneville X 47	0	2	0	0	0.4
205	ROWDEN	4	1	12	10	7
206	Deltapine NuCotn 33	0	0	1	0	0.3
207	Deltapine NuCotn 35	0	0	0	4	1
208	Hy Performer HS 23	0	8	0	0	2
209	Hy Performer HS 46	0	0	0	6	1
210	M-315	0	0	0	0	0