

1997 NATIONAL FUSARIUM WILT COTTON REPORT

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1997 NATIONAL FUSARIUM WILT COTTON REPORT¹

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Cotton cultivars and elite breeding lines submitted by 27 cooperators were evaluated for Fusarium wilt resistance under field conditions at the Plant Breeding Unit, E.V. Smith Research Center, Tallassee, Alabama. 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 replicates of 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 14. Initial plant counts were made on June 19. Wilted plants were counted and removed on July 1, July 18, August 6, August 28 and September 16. The remaining live plants were counted and recorded on September 16. Percent wilted plants were then determined and mean wilting for a given entry calculated.

Average wilting of the susceptible Rowden was 80, 90, 85, and 79 percent for the four replicates (84 percent average). Corresponding wilt percentages for the resistant check, M-315, were 22, 25, 26, and 22 percent (24 percent average). **Critical evaluation of a given entry should be made relative to the checks closest to the entry within each replicate.** 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.

A soil analysis for nematodes made in 1994, revealed that southern root-knot (*Meloidogyne incognita*) and lance (*Hoplolaimus galeatus*) are two predominant nematode species in the test plots. Other nematode genera present were 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 heavy on cotton roots of all varieties including the susceptible cultivar, Rowden, this past growing season. Most cotton varieties and cotton lines had a very high root-knot galling indices this year.

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.

¹This report is a joint contribution between USDA-ARS, Crop Science Research Laboratory, Mississippi State, Mississippi, and the Alabama Agricultural Experiment Station, Auburn University, Alabama.

²Glass is a Research Assistant of Auburn University Department of Agronomy and Soils and Gazaway is a Professor of Auburn University Department of Plant Pathology.

1997 FUSARIUM WILT TEST
E. V. SMITH RESEARCH CENTER, TALLASSEE, ALABAMA

Test entry designation	Percent wilt by replication				
	1	2	3	4	Mean
1 W. P. Sappenfield, 115 Mango Cove, Leesburg, FL 34748					
001 WPS 1	9	48	11	17	21
002 WPS 2	6	55	57	22	35
003 WPS 3	8	57	54	28	37
004 WPS 4	35	32	20	29	29
005 ROWDEN	71	88	77	86	81
006 WPS 5	35	45	75	49	51
007 WPS 6	31	57	57	35	45
008 WPS 7	17	19	52	20	27
009 WPS 8	2	10	60	39	27
010 M-315	0	15	48	24	22
2 John Green, Seed Source Inc., P.O. Box 28, Stoneville, MS 38776					
011 SS 1	40	17	96	44	49
012 SS 2	18	27	24	11	20
013 SS 3	49	41	44	18	38
014 SS 4	13	38	32	13	24
015 ROWDEN	90	93	54	60	74
016 SS 5	71	38	66	57	58
017 SS 6	33	39	59	35	42
018 SS 7	15	42	47	76	45
019 SS 8	7	9	31	26	18
020 M-315	15	17	13	25	17
3 Shelby H. Baker, Univ. of Georgia, Coastal Plain Station, P.O. Box 748, Tifton, GA 31793					
021 GA 1	53	33	50	22	39
022 GA 2	57	28	51	41	44
023 GA 3	41	19	20	36	29
024 GA 4	11	22	41	46	30
025 ROWDEN	92	87	73	58	77
026 GA 5	71	34	49	49	51
027 GA 6	39	47	51	51	47
028 GA 7	46	20	65	32	41
029 GA 8	33	33	46	29	36
030 M-315	31	42	32	18	31

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Test entry designation	Percent wilt by replication				
	1	2	3	4	Mean
4 Bob Bridge, Sure Grow Inc., P.O. Box 312, Leland, MS 38756					
031 SG 1	59	78	51	35	56
032 SG 2	69	43	79	68	65
033 SG 3	32	35	55	25	37
034 SG 4	32	25	42	56	39
035 ROWDEN	100	49	74	94	79
036 SG 5	26	32	51	34	36
037 SG 6	17	22	52	42	33
038 SG 7	13	28	56	37	33
039 SG 8	14	39	43	36	33
040 M-315	17	29	29	15	22
5 Don Keim, Delta and Pine Land Co., 100 Main Street, Scott, MS 38772					
041 5863	17	28	43	75	41
042 28429	4	28	34	23	22
043 6314	32	38	58	30	39
044 6065	37	36	62	33	42
045 ROWDEN	78	72	94	84	82
046 6570	48	80	88	59	69
047 15947	35	31	42	34	35
048 5093	45	63	54	35	49
049 5096	25	39	46	20	33
050 M-315	15	27	45	37	31
6 Cindy Green, Delta and Pine Land Co., P.O. Box 1529, Hartsville, SC 29550					
051 1	71	30	92	54	62
052 2	18	22	60	33	33
053 3	79	75	71	47	68
054 4	67	43	56	20	46
055 ROWDEN	100	100	90	94	96
056 5	31	68	52	45	49
057 6	12	48	38	45	36
058 7	42	63	60	43	52
059 8	51	98	82	95	81
060 M-315	18	27	14	15	18

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Test entry designation	Percent wilt by replication				
	1	2	3	4	Mean
7 Richard Sheetz, Paymaster Cottonseed, P.O. Box 8, Aiken, TX 79221					
061 1	25	9	4	60	24
062 2	17	25	47	19	27
063 3	0	37	30	2	17
064 4	8	25	4	7	11
065 ROWDEN	33	100	89	79	76
066 5	16	30	24	16	22
067 6	9	23	21	15	17
068 7	11	36	39	25	28
069 8	7	14	22	27	17
070 M-315	0	33	43	35	28
8 Steve Calhoun, Mississippi State Univ., P.O. Box 197, Stoneville, MS 38776					
071 1	14	69	67	62	53
072 2	9	48	35	33	31
073 3	12	47	43	12	28
074 4	19	51	40	10	30
075 ROWDEN	37	91	94	64	72
076 5	13	31	30	47	30
077 6	2	40	75	40	39
078 7	5	21	21	33	20
079 8	2	33	62	57	39
080 M-315	50	28	35	17	33
9 O. Lloyd May, USDA-ARS, 2200 Pocket Road, Florence, SC 29506-9706					
081 1	58	40	29	45	43
082 2	73	59	57	34	56
083 3	45	37	33	27	36
084 4	56	34	72	58	55
085 ROWDEN	74	87	87	77	81
086 5	75	48	67	67	64
087 6	46	50	57	54	52
088 7	31	69	100	73	68
089 8	42	79	57	75	63
090 M-315	28	41	19	17	26

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Test entry designation	Percent wilt by replication					
	1	2	3	4	Mean	
10 Peggy Thaxton, Dept. of Soil & Crop Sci., Texas A&M Univ., College Station, TX 77843-2474						
091	PMT-1	15	50	24	67	39
092	PMT-2	47	41	61	77	57
093	PMT-3	69	67	93	57	71
094	PMT-4	23	23	41	35	31
095	ROWDEN	91	93	84	87	89
096	PMT-5	16	31	74	41	40
097	PMT-6	34	67	33	56	48
098	PMT-7	34	57	84	57	58
099	PMT-8	19	16	13	50	24
100	M-315	13	38	33	0	21
11 Jim Mitchell, Paymaster Cottonseed , 2476 Hwy. 130 East , Stuttgart, AR 72160						
101	1	50	38	56	44	47
102	2	46	24	84	63	54
103	3	40	83	91	89	76
104	4	13	18	28	50	27
105	ROWDEN	40	93	64	93	72
106	5	11	26	58	39	34
107	6	25	51	44	26	36
108	7	31	72	39	36	45
109	8	3	15	21	16	14
110	M-315	14	26	20	14	19
12 Michael Swindle, Paymaster Cottonseed , 2476 Hwy. 130 East , Stuttgart, AR 72160						
111	1	19	19	28	3	17
112	2	32	21	47	28	32
113	3	25	30	38	35	32
114	4	55	42	65	27	47
115	ROWDEN	65	69	92	95	80
116	5	57	58	77	45	59
117	6	56	91	88	33	67
118	7	52	92	62	41	62
119	8	96	88	95	93	93
120	M-315	33	14	35	28	28

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Test entry designation	Percent wilt by replication				
	1	2	3	4	Mean
13 Laval M. Verhalen, Dept. of Agronomy, Oklahoma State University, Stillwater, OK 74078					
121 OKLA-1	22	34	14	41	28
122 OKLA-2	60	45	57	37	50
123 OKLA-3	13	40	71	18	35
124 OKLA-4	17	33	53	6	27
125 ROWDEN	94	94	96	81	92
126 OKLA-5	29	42	34	28	33
127 OKLA-6	54	33	59	26	43
128 OKLA-7	24	16	29	27	24
129 OKLA-8	6	11	24	12	13
130 M-315	15	5	15	17	13
14 Fred Bourland, University of Arkansas, 115 Plant Science Building, Fayetteville, AR 72701					
131 ARK 1	67	96	80	41	71
132 ARK 2	45	45	50	32	43
133 ARK 3	41	46	15	13	29
134 ARK 4	48	37	59	16	40
135 ROWDEN	87	90	85	66	82
136 ARK 5	38	77	56	33	51
137 ARK 6	21	58	47	42	42
138 ARK 7	33	48	86	45	53
139 ARK 8	7	13	57	51	32
140 M-315	12	23	7	32	18
15 Curtis Williams, Paymaster Cottonseed, 2476 Hwy. 130 South, Stuttgart, AR 72160					
141 CW 1	24	55	40	43	41
142 CW 2	30	79	32	43	46
143 CW 3	27	44	32	45	37
144 CW 4	39	37	26	86	47
145 ROWDEN	91	90	95	90	91
146 CW 5	30	37	77	51	49
147 CW 6	42	18	86	56	51
148 CW 7	48	29	48	63	47
149 CW 8	35	52	49	30	41
150 M-315	28	45	9	39	35

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Test entry designation	Percent wilt by replication				
	1	2	3	4	Mean
16 Jack E. Jones, JaJo Genetics, 246 Maxine Drive, Baton Rouge, LA 70808-6831					
151 JJ 1	21	75	41	40	44
152 JJ 2	38	51	56	58	51
153 JJ 3	33	31	63	36	41
154 JJ 4	56	23	61	31	42
155 ROWDEN	90	95	95	91	93
156 JJ 5	32	40	37	30	35
157 JJ 6	35	50	27	59	43
158 JJ 7	13	16	18	23	18
159 JJ 8	49	28	41	32	38
160 M-315	20	25	0	17	15
17 Freddie M. Miller, Terra International, Inc., P.O. Box 171376, Memphis, TN 38187					
161 1	14	50	80	78	56
162 2	44	43	85	33	51
163 3	25	44	62	30	40
164 4	60	73	53	35	55
165 ROWDEN	87	92	91	53	81
166 5	50	40	79	25	48
167 6	61	51	47	44	51
168 7	41	56	32	16	36
169 8	27	26	17	47	29
170 M-315	23	15	34	44	29
18 Bill Fagala, Terra International Inc., 612 Centre Grove Circle, Jonesboro, AR 72401					
171 1	29	25	24	28	26
172 2	53	31	41	45	42
173 3	14	28	56	26	31
174 4	65	75	90	55	71
175 ROWDEN	100	96	87	64	87
176 5	18	51	20	26	29
177 6	41	49	17	24	33
178 7	64	45	39	52	50
179 8	94	79	42	43	65
180 M-315	50	15	11	0	19

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	1	2	3	4	Mean
19 Doug Wessel, Delta and Pine Land Co., 1305 N VIP Blvd., Casa Grande, AZ 85222					
181 1	26	16	18	19	20
182 2	50	20	25	14	27
183 3	62	23	57	36	45
184 4	88	76	88	89	85
185 ROWDEN	88	96	90	90	91
186 5	69	69	36	15	47
187 6	72	66	38	34	53
20 Daryl Bowman, Crop Science Dept., North Carolina State University, Raleigh, NC 27695					
188 NC 72	56	60	54	36	52
21 Donald M. Panter, Stoneville Pedigreed Seed Co., 2409 Commerce Street, Albany, GA 31707					
189 DP 1	30	12	16	43	25
190 M-315	30	13	37	21	25
191 DP 2	27	61	47	52	47
192 DP 3	64	37	20	23	36
193 DP 4	58	75	57	66	64
194 DP 5	71	85	59	44	65
195 ROWDEN	100	86	83	62	83
196 DP 6	44	85	55	67	63
197 DP 7	17	51	17	13	25
22 Bill Anderson, Stoneville Pedigreed Seed Co., 2409 Commerce Street, Albany, GA 31707					
198 BA 1	68	70	65	7	52
199 BA 2	92	97	97	88	94
200 M-315	34	28	30	17	27
201 BA 3	37	28	19	25	27
202 BA 4	41	50	40	51	46
203 BA 5	17	29	48	68	40
204 BA 6	33	37	56	67	48
205 ROWDEN	76	98	76	79	82
206 BA 7	53	79	100	62	73

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	1	2	3	4	Mean	
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23	Mark Barefield, Stoneville Pedigreed Seed Co., 2409 Commerce Street, Albany, GA 31707					
207	MB 1	40	23	77	48	47
208	MB 2	21	20	60	13	29
209	MB 3	74	74	93	45	72
210	M-315	56	33	34	36	40
211	MB 4	80	79	95	94	87
212	MB 5	64	95	84	79	81
213	MB 6	63	83	56	40	61
214	MB 7	65	78	87	38	67
215	ROWDEN	84	95	96	97	93
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24	Roger Ward, Stoneville Pedigreed Seed Co., 2409 Commerce Street, Albany, GA 31707					
216	RW 1	19	20	46	44	32
217	RW 2	39	43	64	89	59
218	RW 3	40	10	14	65	32
219	RW 4	45	56	27	70	50
220	M-315	6	31	28	16	20
221	RW 5	65	58	69	70	66
222	RW 6	65	96	92	54	77
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25	Timothy Drew, Cotton Seed International, P.O. Box 117, Wee Waa 2388 Australia					
223	IF 1003	22	36	40	34	33
224	IF 1006	50	73	69	68	65
225	ROWDEN	61	100	86	71	80
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	1	2	3	4	Mean
26 Terry Weesner, Arizona Processing, Inc., P.O. Box 50609, Phoenix, AZ 85076					
226 AZ 1	37	68	68	65	59
227 AZ 2	44	43	29	55	43
228 AZ 3	24	59	29	61	43
229 AZ 4	46	70	39	61	54
230 M-315	12	8	17	20	14
231 AZ 5	43	38	33	30	36
232 AZ 6	50	24	40	50	41
233 AZ 7	23	17	29	30	25
234 AZ 8	56	61	74	52	61
235 ROWDEN	90	98	93	81	91
27 Kathryn M. Glass, Dept. of Agronomy and Soils, Auburn University, Auburn University, AL 36849-5412					
236 JAJO 9556	60	36	19	44	40
237 JAJO 9569	24	46	48	33	38
238 Stoneville 3M002	78	42	47	53	55
239 Suregrow 821	22	37	34	43	34
240 M-315	6	10	38	35	22

