

**2000
National
Cotton
Fusarium
Wilt
Report**



*NOVEMBER 2000
AGRONOMY AND SOILS DEPARTMENT SERIES NO. 231
ALABAMA AGRICULTURAL EXPERIMENT STATION
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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

2000 NATIONAL COTTON FUSARIUM WILT REPORT

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Cotton cultivars and elite breeding lines submitted by 25 cooperators were evaluated for Fusarium wilt resistance under field conditions at the E. V. Smith Research Center, Plant Breeding Unit, Tallahassee, Alabama. These entries were grown on an Independence loamy fine sand highly infested with the Fusarium wilt fungus (*Fusarium oxysporum*) Schlect. f. *vasinfectum* [Atk.] (Snyd. & Hans.) and southern root-knot nematodes (*Meloidogyne incognita*).

In 1994, a soil analysis for nematodes revealed that southern root-knot (*Meloidogyne incognita*) and lance (*Hoplolaimus galeatus*) are the 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.

Entries were planted in single 20-foot rows on 40-inch centers, separated by 5-foot alleys. Four replications of the test entries and checks were evaluated in a randomized complete block design with a split plot restriction on randomization. The set of eight test cultivars submitted by a cooperator was always evaluated as a group together with two control plots within each replicate. Both susceptible (Rowden) and resistant (M-315) cultivars were included as check subplots in the two center rows of each main plot (Fig. 1).

Initial plant counts were made on June 21. Wilted plants were counted and removed on June 30 and July 26. The remaining live plants were counted and recorded on August 16. Total percent wilted plants were then determined and mean wilting for a given entry calculated.

The average % wilted plants for the susceptible check **Rowden** was 43%, with a range from 3 to 95% on an individual plot basis (Fig. 1). The resistant check **M-315** had, on the average, 8% wilted plants with a range from 0 to 25% on an individual plot basis. There were, on the average, 5x more wilted plants in **Rowden** plots than in **M-315** plots. **Critical evaluations of breeding lines should be made relative to the two checks listed at the bottom of each group.**

Fig. 1. Field layout, plot distances and % wilt for control plots of Rowden (susceptible) and M-315 (resistant). The numbers in the column marked N-S and in the row marked E-W are the distances from the Northeast corner of the trial to a particular tier or row.

N-S	Rowden M-315	Rowden M-315	Rowden M-315	Rowden M-315	Rowden M-315	Rowden M-315	Rowden M-315	Rowden M-315	Rowden M-315	Rowden M-315
475	B B	67 9	18 6	33 12	23 0	21 14	B B			
450	B B	79 6	7 5	19 9	12 12	15 3	B B			
425	B B	78 1	27 0	11 0	35 6	47 2	B B			
400	B B	69 10	9 1	14 8	8 7	15 4	B B			
375	B B	63 2	29 19	26 25	55 11	23 3	B B			
350	B B	37 12	40 0	30 9	37 5	14 1	B B			
325	B B	51 11	55 0	33 9	50 9	20 1	B B			
300	B B	54 5	36 0	53 15	63 15	17 4	B B			
275	B B	74 0	38 4	41 11	16 4	3 0	B B			
250	B B	65 25	41 1	20 17	63 5	23 10	B B			
225	B B	60 0	44 21	44 17	67 8	24 9	B B			
200	B B	91 15	50 13	42 18	74 18	43 2	B B			
175	B B	95 9	44 1	36 24	70 8	23 1	B B			
150	B B	90 6	12 1	48 11	59 9	69 7	B B			
125	B B	72 6	20 0	50 20	71 9	80 12	B B			
100	B B	53 8	17 11	27 20	75 7	61 8	B B			
75	B B	74 7	30 7	35 15	58 9	32 17	B B			
50	B B	82 17	11 1	50 7	54 0	7 6	B B			
25	B B	81 3	28 11	24 4	74 8	35 6	B B			
0	B B	4 plots	4 plots	4 plots	4 plots	4 plots	B B			
E-W	0	71	4	4 plots	4 plots	4 plots	4 plots	4 plots	4 plots	193
		20	4	4 plots	4 plots	4 plots	4 plots	4 plots	4 plots	
		53	6	4 plots	4 plots	4 plots	4 plots	4 plots	4 plots	
		87	4	4 plots	4 plots	4 plots	4 plots	4 plots	4 plots	
		120	7	4 plots	4 plots	4 plots	4 plots	4 plots	4 plots	
		153	9	4 plots	4 plots	4 plots	4 plots	4 plots	4 plots	

2000 Fusarium Wilt Test, Plant Breeding Unit, EVSRC, Tallassee, Alabama						
Entry	Cultivar/line	Percent wilt per replicate				Avg.
		Rep 1	Rep 2	Rep 3	Rep 4	
Roy C. Creech, USDA-ARS, Mississippi State, MS 39762						
101	1	25	20	27	7	20
102	2	36	7	39	24	27
103	3	23	1	17	1	11
104	4	2	1	61	6	18
105	5	11	10	26	12	15
106	6	33	4	30	9	19
107	7	37	12	6	3	15
108	8	25	18	38	2	21
	Rowden	74	80	20	21	49
	M-315	8	12	17	14	13
Jim Mitchell, Paymaster Cottonseed, 2476 Hwy. 130 South, Stuttgart, AR 72160						
201	JM-1	6	42	45	84	44
202	JM-2	52	14	13	84	41
203	JM-3	69	54	38	48	52
204	JM-4	20	16	11	23	17
205	JM-5	33	20	62	100	54
206	JM-6	55	32	57	11	39
207	JM-7	29	55	19	31	34
208	JM-8	16	30	34	77	39
	Rowden	7	20	40	79	36
	M-315	6	0	0	6	3
Laval M. Verhalen, Oklahoma State University, 368 Agricultural Hall, Stillwater, OK 74078						
301	OKLA-1	7	15	46	15	21
302	OKLA-2	14	29	33	18	23
303	OKLA-3	7	37	27	6	19
304	OKLA-4	4	12	30	11	14
305	OKLA-5	3	8	16	4	8
306	OKLA-6	36	23	5	7	18
307	OKLA-7	20	17	28	4	17
308	OKLA-8	23	18	51	1	23
	Rowden	24	23	41	23	28
	M-315	9	1	11	3	6
Don Keim, Delta and Pine Land Co., 100 Main Street, Scott, MS 38772						
401	DeltaPearl	80	31	1	45	39
402	99X02	2	4	29	3	9
403	99X16	100	24	30	10	41
404	99X35	69	38	9	29	36
405	99X38	96	37	14	16	41
406	99X49	73	2	6	8	22
407	99X36	67	22	8	18	29
408	99X40	21	6	12	27	17
	Rowden	71	12	17	23	31
	M-315	4	1	4	0	2
						<i>continued</i>

2000 Fusarium Wilt Test, Plant Breeding Unit, EVSRC, Tallassee, Alabama						
Entry	Cultivar/line	Percent wilt per replicate				Avg.
		Rep 1	Rep 2	Rep 3	Rep 4	
Charles G. Cook, Novartis, P.O. Box 1149, Santa Rosa, TX 78593						
501	CGC-1	56	27	100	24	52
502	CGC-2	35	91	30	10	41
503	CGC-3	31	76	95	40	61
504	CGC-4	.	44	.	10	27
505	CGC-5	25	.	100	0	42
506	CGC-6	24	89	97	60	68
507	CGC-7
508	CGC-8	23	30	76	54	46
	Rowden	54	95	74	26	62
	M-315	0	9	0	25	8
Randall McPherson, PhytoGen Cottonseed, P.O. Box 27, Leland, MS 38756						
601	PHX-1	32	45	13	8	25
602	PHX-2	72	71	21	3	42
603	PHX-3	52	35	14	13	28
604	PHX-4	85	31	15	9	35
605	PHX-5	62	21	8	3	24
606	PHX-6	100	27	43	25	49
607	PHX-7	19	26	26	18	22
608	PHX-8	100	63	1	5	42
	Rowden	74	48	16	12	37
	M-315	7	11	4	12	9
Gary L. Rea, Delta and Pine Land Co., 1301 East 50th St., Lubbock, TX 79401						
701	00H01	4	36	16	20	19
702	00H02	25	12	2	3	10
703	00H03	14	37	17	25	23
704	00H04	52	26	9	38	31
705	00H05	34	21	10	40	26
706	00H08	31	44	25	1	25
707	00H38	8	14	38	32	23
708	00H39	15	48	16	19	25
	Rowden	58	36	41	7	35
	M-315	9	24	1	5	10
Peggy Thaxton, Texas A&M University, Soil & Crop Sciences, College Station, TX 77843						
801	PMT-1	80	49	8	28	41
802	PMT-2	9	6	19	83	29
803	PMT-3	81	48	33	97	65
804	PMT-4	86	30	31	91	59
805	PMT-5	100	6	13	42	40
806	PMT-6	22	16	10	19	17
807	PMT-7	7	17	17	29	17
808	PMT-8	61	33	2	89	47
	Rowden	81	43	23	67	53
	M-315	3	2	10	9	6
						<i>continued</i>

2000 Fusarium Wilt Test, Plant Breeding Unit, EVSRC, Tallassee, Alabama						
Entry	Cultivar/line	Percent wilt per replicate				Avg.
		Rep 1	Rep 2	Rep 3	Rep 4	
John Green, Seed Source, Inc., P.O. Box 28, Stoneville, MS 38776						
901	FW-1	100	42	18	75	59
902	FW-2	62	18	12	73	41
903	FW-3	29	28	32	48	34
904	FW-4	90	26	40	32	47
905	FW-5	97	14	27	3	35
906	FW-6	86	43	71	31	58
907	FW-7	22	13	35	91	40
908	FW-8	100	7	19	32	40
	Rowden	53	44	53	78	57
	M-315	8	1	15	1	6
Richard Sheetz, Delta and Pine Land Co., RR 2, Box 60, Hale Center, TX 79041						
1001	1	29	5	19	0	13
1002	2	12	18	47	16	23
1003	3	25	10	51	32	29
1004	4	11	10	72	5	24
1005	5	15	21	19	11	16
1006	6	73	7	5	1	21
1007	7	20	54	9	6	22
1008	8	4	0	37	13	13
	Rowden	24	44	37	47	38
	M-315	4	21	12	2	10
Terry Weesner, Delta and Pine Land Co., P.O. Box 589, Maricopa, AZ 85239						
1101	TW-1	3	26	25	26	20
1102	TW-2	22	58	26	20	32
1103	TW-3	18	34	15	6	18
1104	TW-4	19	7	26	15	17
1105	TW-5	13	27	4	14	14
1106	TW-6	8	32	16	25	20
1107	TW-7	38	11	23	27	25
1108	TW-8	20	14	4	5	11
	Rowden	90	67	63	11	58
	M-315	7	8	5	0	5
O. Lloyd May, University of Georgia, P.O. Box 748, Tifton, GA 31793-0748						
1201	PD97006	22	17	16	8	16
1202	PD97019	33	68	38	16	39
1203	PD97021	41	100	10	6	39
1204	PD97047	16	76	43	2	34
1205	PD97072	8	64	17	24	28
1206	PD97100	22	38	45	18	31
1207	PD97101	43	53	22	19	34
1208	GA95200	26	25	6	7	16
	Rowden	35	60	37	15	37
	M-315	15	0	5	4	6
						<i>continued</i>

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Entry	Cultivar/line	Percent wilt per replicate				Avg.
		Rep 1	Rep 2	Rep 3	Rep 4	
Jack E. Jones, Jajo Genetics, 246 Maxine Dr., Baton Rouge, LA 70808-6831						
1301	Jajo 1	21	96	0	23	35
1302	Jajo 2	13	12	27	16	17
1303	Jajo 3	68	75	7	32	46
1304	Jajo 4	78	79	4	32	48
1305	Jajo 5	31	92	29	1	38
1306	Jajo 6	49	38	4	40	32
1307	Jajo 7	12	88	2	68	42
1308	Jajo 8	7	30	11	35	21
	Rowden	75	91	20	55	60
	M-315	7	15	1	11	8
Cindy Green, Delta and Pine Land Co., P.O. Box 1529, Hartsville, SC 29551						
1401	1	36	20	36	26	30
1402	2	28	40	44	41	39
1403	3	35	29	27	82	43
1404	4	31	40	27	35	33
1405	5	48	10	35	48	35
1406	6	49	34	9	33	31
1407	7	8	14	41	45	27
1408	8	67	52	31	27	44
	Rowden	11	59	38	33	35
	M-315	1	9	4	12	7
Douglas Wessel, Delta and Pine Land Co., 1305 N. VIP Blvd., Casa Grande, AR 85222						
1501	DW-1	33	9	41	49	33
1502	DW-2	79	44	47	100	67
1503	DW-3	30	62	34	96	56
1504	DW-4	55	38	7	98	50
1505	DW-5	36	51	70	60	54
1506	DW-6	38	66	30	19	38
1507	DW-7	64	91	91	49	74
1508	DW-8	0	12	21	29	16
	Rowden	29	71	33	69	51
	M-315	4	9	9	10	8
Michael Swindle, AgrEvo Cotton Seed Inter, 4301-A, Hwy 82 East, Greenville, MS 38703						
1601	FM 819	53	19	9	67	37
1602	FM 832	28	28	17	94	42
1603	FM 958	51	22	5	71	37
1604	FM 966	25	11	19	21	19
1605	FM 989	13	31	28	4	19
1606	ACSI EXPIF1000	6	12	14	62	24
1607	ACSI EXP0781	31	0	25	9	16
1608	ACSI EXP0223	0	12	3	93	27
	Rowden	32	24	14	63	33
	M-315	17	9	1	2	7
						<i>continued</i>

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Entry	Cultivar/line	Percent wilt per replicate				Avg.
		Rep 1	Rep 2	Rep 3	Rep 4	
Lloyd McCall, Stoneville Pedigreed Seed, 2409 Commerce Lane, Albany, GA 31707						
1701	LM1	62	45	24	14	36
1702	LM2	100	97	32	25	63
1703	LM3	14	50	47	7	30
1704	LM4	94	35	8	30	42
1705	LM5	6	48	16	29	25
1706	LM6	82	69	23	53	57
1707	LM7	63	15	68	20	42
1708	LM8	8	17	25	9	15
	Rowden	82	44	55	14	48
	M-315	17	17	0	8	11
Mark Barfield, Stoneville Pedigreed Seed, 2409 Commerce Lane, Albany, GA 31707						
1801	MB1	23	38	100	1	40
1802	MB2	22	44	61	1	32
1803	MB3	49	75	100	4	57
1804	MB4	59	77	33	0	42
1805	MB5	24	18	92	17	38
1806	MB6	18	29	51	7	26
1807	MB7	33	18	77	8	34
1808	MB8	12	27	3	8	12
	Rowden	27	74	65	15	45
	M-315	20	18	25	3	16
Mike Robinson, Stoneville Pedigreed Seed, 2409 Commerce Lane, Albany, GA 31707						
1901	MR1	34	90	11	36	43
1902	MR2	35	84	8	45	43
1903	MR3	54	36	18	29	34
1904	MR4	19	4	0	34	15
1905	MR5	22	46	8	40	29
1906	MR6	44	77	21	11	38
1907	MR7	27	100	14	40	45
1908	MR8	23	75	4	0	25
	Rowden	50	72	3	27	38
	M-315	7	6	0	0	3
Steve Calhoun, Stoneville Pedigreed Seed, 2409 Commerce Lane, Albany, GA 31707						
2001	SC1	76	22	24	52	43
2002	SC2	47	11	89	24	43
2003	SC3	40	26	36	22	31
2004	SC4	50	20	33	25	32
2005	SC5	29	8	58	37	33
2006	SC6	33	26	97	64	55
2007	SC7	15	16	83	40	39
2008	SC8	32	26	94	25	44
	Rowden	17	50	51	29	37
	M-315	11	13	11	19	13
						<i>continued</i>

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Entry	Cultivar/line	Percent wilt per replicate				Avg.
		Rep 1	Rep 2	Rep 3	Rep 4	
Randy Wood, Stoneville Pedigreed Seed, 2409 Commerce Lane, Albany, GA 31707						
2101	RW1	29	30	17	19	24
2102	RW2	40	5	3	4	13
2103	RW3	13	54	40	35	36
2104	RW4	35	18	9	21	21
2105	RW5	45	38	0	11	24
2106	RW6	11	40	23	43	29
2107	RW7	42	22	34	57	39
2108	RW8	13	12	14	15	13
	Rowden	30	69	50	9	39
	M-315	7	7	9	1	6
Jody Butler, Stoneville Pedigreed Seed, 2409 Commerce Lane, Albany, GA 31707						
2201	JB1	28	34	89	39	47
2202	JB2	7	32	95	32	41
2203	JB3	30	69	36	36	43
2204	JB4	21	27	90	39	44
2205	JB5	32	38	35	8	28
2206	JB6	33	31	82	32	44
2207	Rowden	25	65	92	50	58
2208	M-315	4	0	0	8	3
	Rowden	35	42	54	19	38
	M-315	6	18	5	9	9
Ted Wallace, Mississippi State University, Starkville, MS 39762						
2301	1	44	23	12	36	29
2302	2	60	55	19	21	39
2303	3	44	25	17	26	28
2304	4	15	27	8	22	18
2305	5	31	22	30	3	22
2306	6	44	46	25	8	31
2307	Rowden	65	79	45	20	52
2308	M-315	0	21	23	6	12
	Rowden	28	70	63	8	42
	M-315	11	8	15	7	10
Curtis Williams, Paymaster Cottonseed, 2476 Hwy. 130 South, Stuttgart, AR 72160						
2401	CW1	14	38	3	14	17
2402	CW2	4	11	62	25	25
2403	CW3	16	8	27	15	17
2404	CW4	4	44	18	8	19
2405	CW5	31	26	63	7	32
2406	CW6	38	16	13	5	18
2407	CW7	22	35	36	13	26
2408	CW8	32	28	34	23	29
	Rowden	61	50	36	35	46
	M-315	8	20	0	6	9
						<i>continued</i>

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Entry	Cultivar/line	Percent wilt per replicate				Avg.
		Rep 1	Rep 2	Rep 3	Rep 4	
Kathryn M. Glass, Dept. of Agronomy & Soils, Auburn University, AL 36849-5412						
2501	Stoneville 474	79	49	41	32	50
2502	AP 7126	36	87	36	10	42
2503	Sure-Grow 747	42	37	15	73	42
2504	Sure-Grow 821	28	65	14	13	30
2505	Deltapine DP 655B/RR	24	16	39	23	26
2506	Deltapine DP 675	20	18	14	24	19
2507	Deltapine NuCotn 33B	14	78	32	6	33
2508	Paymaster PM1218BG/RR	37	83	55	16	48
	Rowden	31	90	30	18	42
	M-315	6	6	9	6	7