

2001
National
Cotton
Fusarium
Wilt
Report



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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

2001 NATIONAL COTTON FUSARIUM WILT REPORT

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Cotton cultivars and elite breeding lines submitted by 24 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 26. Wilted plants were counted and removed on July 13, July 31, August 17, and September 5. The remaining live plants were counted and recorded on September 5. 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 66%, with a range from 4 to 100% on an individual plot basis (Fig. 1). The resistant check **M-315** had, on the average, 6% wilted plants with a range from 0 to 39% on an individual plot basis. There were, on the average, 11x 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 plot layout and % wilt for control plot of Rowden (susceptible) and M-315 (resistant). Distances (ft) from the SE corner of the trial are given in the left hand column and the bottom row.

E-W	6 rows	4	43	8 rows	33	4	8 rows	0	65	8 rows	64	0	6 rows		
		M-315	Rowden		Rowden	M-315		M-315	Rowden		Rowden	M-315		Rowden	M-315
		525	79		4	0		100	78		6	3		68	
		500	Rowden		M-315	M-315		Rowden	Rowden		M-315	M-315		Rowden	
		475	5		87	36		4	1		75	86		2	
		450	M-315		Rowden	Rowden		M-315	M-315		Rowden	Rowden		M-315	
		425	86		0	2		90	48		1	1		47	
		400	Rowden		M-315	M-315		Rowden	M-315		Rowden	M-315		Rowden	
		375	6		76	67		9	0		51	80		3	
		350	M-315		Rowden	Rowden		M-315	M-315		Rowden	Rowden		M-315	
		325	75		6	0		95	36		0	6		75	
		300	Rowden		M-315	M-315		Rowden	Rowden		M-315	M-315		Rowden	
		275	1		90	79		4	3		88	68		5	
		250	M-315		Rowden	Rowden		M-315	M-315		Rowden	Rowden		M-315	
		225	77		0	5		79	26		3	13		97	
		200	Rowden		M-315	M-315		Rowden	Rowden		M-315	M-315		Rowden	
		175	1		97	82		2	4		70	49		0	
		150	M-315		Rowden	Rowden		M-315	M-315		Rowden	Rowden		M-315	
		125	81		2	6		94	66		0	6		38	
		100	Rowden		M-315	M-315		Rowden	Rowden		M-315	M-315		Rowden	
75	7	74	82	1	0	80	4	11							
50	M-315	Rowden	Rowden	M-315	M-315	Rowden	Rowden	M-315							
25	75	2	3	14	19	0	6	41							
0	Rowden	M-315	M-315	Rowden	Rowden	M-315	M-315	Rowden							
	4	69	51	7	4	36	20	10							
	M-315	Rowden	Rowden	M-315	M-315	Rowden	Rowden	M-315							
	75	17	39	46	64	8	0	7							
	Rowden	M-315	M-315	Rowden	Rowden	M-315	M-315	Rowden							
	7	74	35	5	19	55	48	4							
	M-315	Rowden	Rowden	M-315	M-315	Rowden	Rowden	M-315							
	89	3	8	87	45	3	21	70							
	Rowden	M-315	M-315	Rowden	Rowden	M-315	M-315	Rowden							
	0	62	95	9	4	61	89	5							
	M-315	Rowden	Rowden	M-315	M-315	Rowden	Rowden	M-315							
	96	3	4	85	75	16	14	24							
	Rowden	M-315	M-315	Rowden	Rowden	M-315	M-315	Rowden							
	18	82	89	12	3	29	94	8							
	M-315	Rowden	Rowden	M-315	M-315	Rowden	Rowden	M-315							
	69	4	10	94	49	13	18	77							
	Rowden	M-315	M-315	Rowden	Rowden	M-315	M-315	Rowden							
	10	79	91	24	7	66	38	8							
	M-315	Rowden	Rowden	M-315	M-315	Rowden	Rowden	M-315							
	96	1	12	91	72	5	17	61							
	Rowden	M-315	M-315	Rowden	Rowden	M-315	M-315	Rowden							
SE corner	20		53		86		119								



2001 Fusarium Wilt Test, Plant Breeding Unit, EVSRC, Tallassee, AL						
Entry	Cultivar/Line	Percent wilt per replicate				Avg.
		Rep1	Rep2	Rep3	Rep4	
C. Wayne Smith, Texas A&M University, 2474 TAMUS, College Station, TX 77843-2474						
101	1	3	3	8	0	3
102	2	88	51	57	42	60
103	3	45	80	38	83	62
104	4	45	79	61	15	50
105	5	16	7	2	16	10
106	6	26	57	47	68	49
107	7	3	11	55	48	29
108	8	0	7	16	49	18
	Rowden	81	100	49	24	64
	M-315	2	0	13	14	7
Luther Bird, G & P Seed Co., 729 Shady Lane, Bryan, TX 77802						
201	1	13	25	5	8	13
202	2	6	13	50	18	22
203	3	25	4	8	22	14
204	4	20	14	16	22	18
205	5	0	17	24	25	17
206	6	8	25	10	28	18
207	7	12	5	9	29	13
208	8	22	16	8	5	13
	Rowden	87	94	36	61	69
	M-315	5	6	4	17	8
Fred Bourland, University of Arkansas, P.O. Box 48, Keiser, AR 72351						
301	ARK-1	0	14	3	0	4
302	ARK-2	0	9	11	13	8
303	ARK-3	1	14	26	9	12
304	ARK-4	1	22	3	12	10
305	ARK-5	6	53	3	15	19
306	ARK-6	27	38	79	71	54
307	ARK-7	55	69	84	25	58
308	ARK-8	10	18	8	12	12
	Rowden	74	67	36	4	45
	M-315	7	9	0	11	7
Don Keim, Delta and Pine Land Co., 100 Main Street, Scott, MS 38772						
401	1	15	7	6	92	30
402	2	13	4	0	9	7
403	3	46	26	17	27	29
404	4	16	44	12	2	18
405	5	54	24	32	32	36
406	6	8	29	8	9	14
407	7	42	17	28	27	29
408	8	12	19	21	13	16
	Rowden	75	82	66	70	73
	M-315	6	2	0	21	7
						<i>continued</i>

2001 Fusarium Wilt Test, Plant Breeding Unit, EVSRC, Tallassee, AL						
Entry	Cultivar/Line	Percent wilt per replicate				Avg.
		Rep1	Rep2	Rep3	Rep4	
Frank Bordelon, PhytoGen Cottonseed, P.O. Box 27, Leland, MS 38756						
501	PHY-FB1	61	53	17	70	50
502	PHY-FB2	36	7	17	38	25
503	PHY-FB3	9	10	16	10	11
504	PHY-FB4	73	17	46	9	37
505	PHY-FB5	1	6	0	10	4
506	PHY-FB6	20	40	53	43	39
507	PHY-FB7	1	7	6	13	7
508	PHY-FB8	11	3	7	11	8
	Rowden	69	87	75	38	67
	M-315	4	8	1	6	5
Randall McPherson, PhytoGen Cottonseed, P.O. Box 27, Leland, MS 38756						
601	PHY-RM1	0	5	11	6	6
602	PHY-RM2	2	10	9	6	7
603	PHY-RM3	7	22	13	5	12
604	PHY-RM4	16	15	21	9	15
605	PHY-RM5	9	0	9	4	5
606	PHY-RM6	5	9	9	13	9
607	PHY-RM7	8	0	13	17	10
608	PHY-RM8	25	13	8	11	14
	Rowden	82	51	66	41	60
	M-315	18	7	7	6	9
Gary L. Rea, Delta and Pine Land Co., 1303 N. Avenue I, Haskell, TX 79521						
701	GLR 1	16	50	18	15	25
702	GLR 2	9	6	5	10	8
703	GLR 3	36	13	17	15	20
704	GLR 4	6	1	7	2	4
705	GLR 5	7	9	8	9	8
706	GLR 6	3	3	15	12	8
707	GLR 7	56	31	31	28	36
708	GLR 8	26	17	45	13	25
	Rowden	74	89	75	68	77
	M-315	7	12	16	3	9
Peggy Thaxton, Texas A&M University, Soil & Crop Sciences, College Station, TX 77843-2474						
801	PMT-1	14	6	9	6	9
802	PMT-2	56	18	10	16	25
803	PMT-3	29	45	18	16	27
804	PMT-4	6	7	11	2	6
805	PMT-5	17	13	3	19	13
806	PMT-6	5	30	17	26	19
807	PMT-7	3	19	14	22	14
808	PMT-8	17	63	2	11	23
	Rowden	69	95	80	7	63
	M-315	4	9	0	0	3
						<i>continued</i>

2001 Fusarium Wilt Test, Plant Breeding Unit, EVSRC, Tallassee, AL						
Entry	Cultivar/Line	Percent wilt per replicate				Avg.
		Rep1	Rep2	Rep3	Rep4	
John Green, Seed Source, Inc., P.O. Box 28, Stoneville, MS 38776						
901	SSI-1	3	19	13	3	10
902	SSI-2	25	4	24	91	36
903	SSI-3	0	18	0	35	13
904	SSI-4	14	40	17	13	21
905	SSI-5	44	7	27	30	27
906	SSI-6	74	2	50	6	33
907	SSI-7	46	0	56	0	25
908	SSI-8	7	15	0	10	8
	Rowden	76	35	45	20	44
	M-315	6	5	3	10	6
Richard Sheetz, Delta and Pine Land Co., RR 2, Box 60, Hale Center, TX 79041						
1001	RS-1	11	0	7	6	6
1002	RS-2	4	7	24	14	12
1003	RS-3	6	19	8	7	10
1004	RS-4	1	4	7	6	5
1005	RS-5	3	4	6	3	4
1006	RS-6	1	7	14	6	7
1007	RS-7	54	17	20	14	26
1008	RS-8	1	5	11	1	4
	Rowden	75	91	48	47	66
	M-315	2	12	1	1	4
Ted Wallace, Mississippi State University, P.O. Box 9555, Starkville, MS 39762						
1101	TPW1	13	12	0	0	6
1102	TPW2	9	3	21	14	12
1103	TPW3	26	11	10	13	15
1104	TPW4	8	11	0	0	5
1105	TPW5	14	21	0	20	14
1106	TPW6	31	5	0	33	17
1107	TPW7	14	14	6	27	15
1108	TPW8	24	9	24	30	22
	Rowden	97	36	64	38	59
	M-315	1	4	8	8	5
O. Lloyd May, University of Georgia, P.O. Box 748, Tifton, GA 31793-0748						
1201	GA96-54	4	0	8	5	4
1202	GA96-199	9	16	43	38	27
1203	GA96-211	2	11	32	6	13
1204	GA97-5	24	24	16	4	17
1205	GA97-8	38	0	7	26	18
1206	GA97-14	14	12	27	30	21
1207	GA97-23	0	0	26	13	10
1208	GA98084	16	10	14	13	13
	Rowden	62	33	51	97	61
	M-315	0	4	0	13	4
						<i>continued</i>

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Entry	Cultivar/Line	Percent wilt per replicate				Avg.
		Rep1	Rep2	Rep3	Rep4	
Jack E. Jones, Jajo Genetics, 246 Maxine Dr., Baton Rouge, LA 70808-6831						
1301	Jajo 1	22	15	63	12	28
1302	Jajo 2	6	15	8	0	7
1303	Jajo 3	19	16	20	4	15
1304	Jajo 4	1	25	28	22	19
1305	Jajo 5	17	13	20	9	15
1306	Jajo 6	4	21	11	6	11
1307	Jajo 7	44	27	35	5	28
1308	Jajo 8	4	8	59	13	21
	Rowden	79	79	61	64	71
	M-315	4	5	4	0	3
Dawn Fraser, Delta and Pine Land Co., P.O. Box 1529, Hartsville, SC 29551						
1401	1	16	29	55	11	28
1402	2	42	50	16	35	36
1403	3	17	18	23	13	17
1404	4	54	2	3	40	25
1405	5	8	6	20	18	13
1406	6	8	17	10	9	11
1407	7	76	67	85	72	75
1408	8	14	59	54	22	37
	Rowden	86	91	88	75	85
	M-315	0	24	3	6	8
Douglas Wessel, Delta and Pine Land Co., 38768 W. Farrell Rd., Maricopa, AZ 85239						
1501	DW-1	96	100	88	100	96
1502	DW-2	3	10	47	8	17
1503	DW-3	29	12	8	6	14
1504	DW-4	74	97	88	91	87
1505	DW-5	2	5	35	15	14
1506	DW-6	9	32	22	6	17
1507	DW-7	4	10	3	3	5
Daryl Bowman, NC State University, Crop Science Dept, Box 8604, Raleigh, NC 27695-8604						
1508	NC98-34	11	18	63	41	33
	Rowden	77	79	72	80	77
	M-315	0	4	5	3	3
Michael Swindle, Aventis Cotton Seed Inter., 117 Kennedy Flat Road, Leland, MS 38756						
1601	ACSI-1	2	6	0	9	4
1602	ACSI-2	12	0	9	55	19
1603	ACSI-3	16	6	14	50	21
1604	ACSI-4	9	21	9	20	15
1605	ACSI-5	6	22	0	12	10
1606	ACSI-6	53	16	19	22	27
1607	ACSI-7	16	4	11	18	12
1608	ACSI-8	1	0	2	8	3
	Rowden	96	14	19	77	51
	M-315	1	3	0	18	6
						<i>continued</i>

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Entry	Cultivar/Line	Percent wilt per replicate				Avg.
		Rep1	Rep2	Rep3	Rep4	
Lloyd McCall, Stoneville Pedigreed Seed Co., Leland, MS						
1701	LM1	2	0	14	14	7
1702	LM2	0	33	17	19	17
1703	LM3	63	16	36	43	39
1704	LM4	46	6	15	16	21
1705	LM5	14	3	7	76	25
1706	LM6	16	10	22	19	17
1707	LM7	2	21	11	16	12
1708	LM8	0	10	0	19	7
	Rowden	96	46	65	68	69
	M-315	3	39	0	5	12
Mark Barfield, Stoneville Pedigreed Seed Co., 2409 Commerce Lane, Albany, GA 31707						
1801	MB1	4	88	44	58	49
1802	MB2	89	24	31	22	41
1803	MB3	33	58	3	25	30
1804	MB4	36	20	41	55	38
1805	MB5	23	36	55	9	31
1806	MB6	14	23	27	32	24
1807	MB7	34	10	15	27	21
1808	MB8	3	8	11	45	17
	Rowden	79	95	29	94	74
	M-315	10	0	3	8	5
Mike Robinson, Stoneville Pedigreed Seed Co., Leland, MS						
1901	MR1	35	55	66	35	48
1902	MR2	8	7	7	9	8
1903	MR3	7	32	7	11	14
1904	MR4	9	0	9	3	5
1905	MR5	27	27	8	3	16
Paul Fox, Stoneville Pedigreed Seed Co., Memphis, TN						
1906	PF1	39	6	81	57	46
1907	PF2	24	6	13	34	19
1908	PF3	42	0	78	36	39
	Rowden	89	82	78	86	84
	M-315	3	1	6	2	3
Steve Calhoun, Stoneville Pedigreed Seed Co., Idalou, TX						
2001	SC1	20	0	13	0	8
2002	SC2	11	4	16	13	11
2003	SC3	2	0	2	12	4
2004	SC4	19	16	5	14	13
2005	SC5	9	3	13	10	8
2006	SC6	25	19	6	45	24
2007	SC7	6	18	13	27	16
2008	SC8	45	34	50	52	45
	Rowden	90	85	70	49	73
	M-315	1	4	4	0	2
						<i>continued</i>

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Entry	Cultivar/Line	Percent wilt per replicate				Avg.
		Rep1	Rep2	Rep3	Rep4	
Randy Wood, Stoneville Pedigreed Seed Co., Maricopa, AZ						
2101	RW1	6	10	13	16	11
2102	RW2	19	70	87	63	60
2103	RW3	25	87	34	38	46
2104	RW4	1	15	13	18	12
2105	RW5	11	21	23	0	14
2106	RW6	7	11	7	7	8
2107	RW7	30	39	49	63	45
2108	RW8	13	57	71	20	40
	Rowden	43	90	26	48	52
	M-315	4	2	3	4	3
Kathryn M. Glass, Dept. of Agronomy & Soils, Auburn University, AL 36849-5412						
2201	Fiber Max FM 966	44	40	8	29	30
2202	PhytoGen PSC 355	22	17	15	9	16
2203	Stoneville ST 4892BR	31	44	24	34	33
2204	Deltapine DP 565	9	9	0	7	6
2205	Deltapine DP 422 B/RR	6	5	17	15	11
2206	Deltapine DP 655B/RR	0	9	23	0	8
2207	Sure Grow 215 BG/RR	5	6	28	5	11
2208	Paymaster PM 1199RR	7	5	8	41	15
	Rowden	75	94	55	89	78
	M-315	17	10	19	5	13