

2001 NATIONAL COTTON FUSARIUM WILT REPORT

Kathryn M. Glass and Edzard van Santen

Department of Agronomy and Soils

Auburn University, AL

William S. Gazaway

Department of Entomology and Plant Pathology

Auburn University, AL

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, Tallassee, Alabama. These entries were grown on an Independence loamy fine sand highly infested with the Fusarium wilt fungus (*Fusarium oxysporum*) Schlecht. 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.

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. 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.

2001 Fusarium Wilt Test, Plant Breeding Unit, EVSRC, Tallassee, AL

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

501	Frank Bordelon, PhytoGen Cottonseed, P.O. Box 27, Leland, MS 38756						
501	501	PHY-FB1	61	53	17	70	50
502	502	PHY-FB2	36	7	17	38	25
503	503	PHY-FB3	9	10	16	10	11
504	504	PHY-FB4	73	17	46	9	37
505	505	PHY-FB5	1	6	0	10	4
506	506	PHY-FB6	20	40	53	43	39
507	507	PHY-FB7	1	7	6	13	7
508	508	PHY-FB8	11	3	7	11	8
509	Rowden		69	87	75	38	67
510	M-315		4	8	1	6	5
601	Randall McPherson, PhytoGen Cottonseed, P.O. Box 27, Leland, MS 38756						
601	601	PHY-RM1	0	5	11	6	6
602	602	PHY-RM2	2	10	9	6	7
603	603	PHY-RM3	7	22	13	5	12
604	604	PHY-RM4	16	15	21	9	15
605	605	PHY-RM5	9	0	9	4	5
606	606	PHY-RM6	5	9	9	13	9
607	607	PHY-RM7	8	0	13	17	10
608	608	PHY-RM8	25	13	8	11	14
609	Rowden		82	51	66	41	60
610	M-315		18	7	7	6	9
701	Gary L. Rea, Delta and Pine Land Co., 1303 N. Avenue I, Haskell, TX 79521						
701	701	GLR 1	16	50	18	15	25
702	702	GLR 2	9	6	5	10	8
703	703	GLR 3	36	13	17	15	20
704	704	GLR 4	6	1	7	2	4
705	705	GLR 5	7	9	8	9	8
706	706	GLR 6	3	3	15	12	8
707	707	GLR 7	56	31	31	28	36
708	708	GLR 8	26	17	45	13	25
709	Rowden		74	89	75	68	77
710	M-315		7	12	16	3	9
801	Peggy Thaxton, Texas A&M University, Soil & Crop Sciences, College Station, TX 77843-2474						
801	801	PMT-1	14	6	9	6	9
802	802	PMT-2	56	18	10	16	25
803	803	PMT-3	29	45	18	16	27
804	804	PMT-4	6	7	11	2	6
805	805	PMT-5	17	13	3	19	13
806	806	PMT-6	5	30	17	26	19
807	807	PMT-7	3	19	14	22	14
808	808	PMT-8	17	63	2	11	23
809	Rowden		69	95	80	7	63
810	M-315		4	9	0	0	3
901	John Green, Seed Source, Inc., P.O. Box 28, Stoneville, MS 38776						
901	901	SSI-1	3	19	13	3	10
902	902	SSI-2	25	4	24	91	36
903	903	SSI-3	0	18	0	35	13
904	904	SSI-4	14	40	17	13	21
905	905	SSI-5	44	7	27	30	27
906	906	SSI-6	74	2	50	6	33
907	907	SSI-7	46	0	56	0	25
908	908	SSI-8	7	15	0	10	8
909	Rowden		76	35	45	20	44
910	M-315		6	5	3	10	6

1001	Richard Sheetz, Delta and Pine Land Co., RR 2, Box 60, Hale Center, TX 79041						
1001	1001	RS-1	11	0	7	6	6
1002	1002	RS-2	4	7	24	14	12
1003	1003	RS-3	6	19	8	7	10
1004	1004	RS-4	1	4	7	6	5
1005	1005	RS-5	3	4	6	3	4
1006	1006	RS-6	1	7	14	6	7
1007	1007	RS-7	54	17	20	14	26
1008	1008	RS-8	1	5	11	1	4
1009	Rowden		75	91	48	47	66
1010	M-315		2	12	1	1	4
1101	Ted Wallace, Mississippi State University, P.O. Box 9555, Starkville, MS 39762						
1101	1101	TPW1	13	12	0	0	6
1102	1102	TPW2	9	3	21	14	12
1103	1103	TPW3	26	11	10	13	15
1104	1104	TPW4	8	11	0	0	5
1105	1105	TPW5	14	21	0	20	14
1106	1106	TPW6	31	5	0	33	17
1107	1107	TPW7	14	14	6	27	15
1108	1108	TPW8	24	9	24	30	22
1109	Rowden		97	36	64	38	59
1110	M-315		1	4	8	8	5
1201	O. Lloyd May, University of Georgia, P.O. Box 748, Tifton, GA 31793-0748						
1201	1201	GA96-54	4	0	8	5	4
1202	1202	GA96-199	9	16	43	38	27
1203	1203	GA96-211	2	11	32	6	13
1204	1204	GA97-5	24	24	16	4	17
1205	1205	GA97-8	38	0	7	26	18
1206	1206	GA97-14	14	12	27	30	21
1207	1207	GA97-23	0	0	26	13	10
1208	1208	GA98084	16	10	14	13	13
1209	Rowden		62	33	51	97	61
1210	M-315		0	4	0	13	4
1301	Jack E. Jones, Jajo Genetics, 246 Maxine Dr., Baton Rouge, LA 70808-6831						
1301	1301	Jajo 1	22	15	63	12	28
1302	1302	Jajo 2	6	15	8	0	7
1303	1303	Jajo 3	19	16	20	4	15
1304	1304	Jajo 4	1	25	28	22	19
1305	1305	Jajo 5	17	13	20	9	15
1306	1306	Jajo 6	4	21	11	6	11
1307	1307	Jajo 7	44	27	35	5	28
1308	1308	Jajo 8	4	8	59	13	21
1309	Rowden		79	79	61	64	71
1310	M-315		4	5	4	0	3
1401	Dawn Fraser, Delta and Pine Land Co., P.O. Box 1529, Hartsville, SC 29551						
1401	1401	1	16	29	55	11	28
1402	1402	2	42	50	16	35	36
1403	1403	3	17	18	23	13	17
1404	1404	4	54	2	3	40	25
1405	1405	5	8	6	20	18	13
1406	1406	6	8	17	10	9	11
1407	1407	7	76	67	85	72	75
1408	1408	8	14	59	54	22	37
1409	Rowden		86	91	88	75	85
1410	M-315		0	24	3	6	8

1501	Douglas Wessel, Delta and Pine Land Co., 38768 W. Farrell Rd., Maricopa, AZ 85239						
1501	1501	DW-1	96	100	88	100	96
1502	1502	DW-2	3	10	47	8	17
1503	1503	DW-3	29	12	8	6	14
1504	1504	DW-4	74	97	88	91	87
1505	1505	DW-5	2	5	35	15	14
1506	1506	DW-6	9	32	22	6	17
1507	1507	DW-7	4	10	3	3	5
1508	Daryl Bowman, NC State University, Crop Science Dept, Box 8604, Raleigh, NC 27695-8604						
1508	1508	NC98-34	11	18	63	41	33
1509		Rowden	77	79	72	80	77
1510		M-315	0	4	5	3	3
1601	Michael Swindle, Aventis Cotton Seed Inter., 117 Kennedy Flat Road, Leland, MS 38756						
1601	1601	ACSI-1	2	6	0	9	4
1602	1602	ACSI-2	12	0	9	55	19
1603	1603	ACSI-3	16	6	14	50	21
1604	1604	ACSI-4	9	21	9	20	15
1605	1605	ACSI-5	6	22	0	12	10
1606	1606	ACSI-6	53	16	19	22	27
1607	1607	ACSI-7	16	4	11	18	12
1608	1608	ACSI-8	1	0	2	8	3
1609		Rowden	96	14	19	77	51
1610		M-315	1	3	0	18	6
1701	Lloyd McCall, Stoneville Pedigreed Seed Co., Leland, MS						
1701	1701	LM1	2	0	14	14	7
1702	1702	LM2	0	33	17	19	17
1703	1703	LM3	63	16	36	43	39
1704	1704	LM4	46	6	15	16	21
1705	1705	LM5	14	3	7	76	25
1706	1706	LM6	16	10	22	19	17
1707	1707	LM7	2	21	11	16	12
1708	1708	LM8	0	10	0	19	7
1709		Rowden	96	46	65	68	69
1710		M-315	3	39	0	5	12
1801	Mark Barfield, Stoneville Pedigreed Seed Co., 2409 Commerce Lane, Albany, GA 31707						
1801	1801	MB1	4	88	44	58	49
1802	1802	MB2	89	24	31	22	41
1803	1803	MB3	33	58	3	25	30
1804	1804	MB4	36	20	41	55	38
1805	1805	MB5	23	36	55	9	31
1806	1806	MB6	14	23	27	32	24
1807	1807	MB7	34	10	15	27	21
1808	1808	MB8	3	8	11	45	17
1809		Rowden	79	95	29	94	74
1810		M-315	10	0	3	8	5
1901	Mike Robinson, Stoneville Pedigreed Seed Co., Leland, MS						
1901	1901	MR1	35	55	66	35	48
1902	1902	MR2	8	7	7	9	8
1903	1903	MR3	7	32	7	11	14
1904	1904	MR4	9	0	9	3	5
1905	1905	MR5	27	27	8	3	16
1906	Paul Fox, Stoneville Pedigreed Seed Co., Memphis, TN						
1906	1906	PF1	39	6	81	57	46
1907	1907	PF2	24	6	13	34	19
1908	1908	PF3	42	0	78	36	39
1909		Rowden	89	82	78	86	84
1910		M-315	3	1	6	2	3

2001	Steve Calhoun, Stoneville Pedigreed Seed Co., Idalou, TX						
2001	2001	SC1	20	0	13	0	8
2002	2002	SC2	11	4	16	13	11
2003	2003	SC3	2	0	2	12	4
2004	2004	SC4	19	16	5	14	13
2005	2005	SC5	9	3	13	10	8
2006	2006	SC6	25	19	6	45	24
2007	2007	SC7	6	18	13	27	16
2008	2008	SC8	45	34	50	52	45
2009		Rowden	90	85	70	49	73
2010		M-315	1	4	4	0	2
2101	Randy Wood, Stoneville Pedigreed Seed Co., Maricopa, AZ						
2101	2101	RW1	6	10	13	16	11
2102	2102	RW2	19	70	87	63	60
2103	2103	RW3	25	87	34	38	46
2104	2104	RW4	1	15	13	18	12
2105	2105	RW5	11	21	23	0	14
2106	2106	RW6	7	11	7	7	8
2107	2107	RW7	30	39	49	63	45
2108	2108	RW8	13	57	71	20	40
2109		Rowden	43	90	26	48	52
2110		M-315	4	2	3	4	3
2201	Kathryn M. Glass, Department of Agronomy & Soils, Auburn University, AL 36849-5412						
2201	2201	Fiber Max FM 966	44	40	8	29	30
2202	2202	PhytoGen PSC 355	22	17	15	9	16
2203	2203	Stoneville ST 4892BR	31	44	24	34	33
2204	2204	Deltapine DP 565	9	9	0	7	6
2205	2205	Deltapine DP 422 B/RR	6	5	17	15	11
2206	2206	Deltapine DP 655B/RR	0	9	23	0	8
2207	2207	Sure Grow 215 BG/RR	5	6	28	5	11
2208	2208	Paymaster PM 1199RR	7	5	8	41	15
2209		Rowden	75	94	55	89	78
2210		M-315	17	10	19	5	13

Louisiana

P. D. Colyer, W. D. Caldwell, P. R. Vernon, and J. Hayes. 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* Schlecht. 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 crop maturity. 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. Paymaster 1560BR had the lowest wilt rating (0.2) followed by Acala Nemx with a wilt rating of 0.3. Stoneville LA887 had the lowest root gall rating (1.3) followed by Acala Nemx with a rating of 1.5.

Table 1. Fusarium wilt and root-knot nematode ratings for cotton varieties at the Red River Research Station, Bossier City, LA, 2001.

Variety	Wilt Rating ^a	Gall Rating ^b
Acala Nemx	0.3	1.5
Deltapine Delta Pearl	1.3	2.9
Deltapine DP 20B	0.6	2.7
Deltapine NuCOTN 33B	0.8	3.4
Deltapine DP 436RR	1.2	3.2
Deltapine DP 451 BR	0.7	3.4
Deltapine DP 458 BR	1.0	3.4
Deltapine DP565	0.4	2.9
DES 810	2.1	3.4
DES 816	0.9	2.7
FiberMax FM 819	1.3	3.4
FiberMax FM 832	1.2	3.0
FiberMax FM 958	1.7	3.2
FiberMax FM 966	1.1	3.3
Garst/AgriPro 1500RR	1.5	2.8
Garst/AgriPro 4600RR	0.8	2.9
JAJO 8185	1.6	2.5
Miscot 8806	1.1	3.5
Miscot 8839	0.6	2.6
Paymaster PM 1218 BR	2.5	2.6
Paymaster PM 1560 BR	0.2	1.8
PhytoGen PSC355	0.6	2.9
Stoneville BXN47	1.8	2.9
Stoneville ST 474	1.9	3.2
Stoneville ST 580	2.2	3.3
Stoneville ST 4691B	2.6	2.9
Stoneville ST 4793R	1.2	3.2
Stoneville ST 4892BR	2.2	3.3
Stoneville BXN49	2.6	3.3
Stoneville X9905	0.6	2.3
Stoneville LA887	0.4	1.3
Sure-Grow SG 215 BR	0.6	2.4
Sure-Grow SG 501BR	1.6	2.5
Sure-Grow SG 521RR	0.9	2.9
Sure-Grow SG 747	0.8	2.7
Sure-Grow SG 821	0.7	3.2
LSD ($P=0.05$)	0.8	0.8

^aWilt rating on a scale of 0-5; 0=no stem discoloration, 5=complete stem discoloration.

^bRoot-gall rating on a scale of 0-5; 0=no root galling, 5=severe root galling