

*2010
National
Cotton
Fusarium
Wilt
Report*



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WILLIAM BATCHELOR, DIRECTOR
AUBURN UNIVERSITY
AUBURN, AL 36849*

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

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2010 NATIONAL COTTON FUSARIUM WILT REPORT

Kathryn M. Glass¹, William S. Gazaway², Katheryn Lawrence⁴, and Edzard van Santen³,

^{1,3} Advisor III, Natl Res. Programs and Professor, respectively, Dept. of Agronomy and Soils, Auburn University, AL 36849

^{2,4} Professor Emeritus and Extension Pathologist/Nematologist/Associate Professor, Dept. of Entomology and Plant Pathology, Auburn University, 36849

Cotton cultivars and elite breeding lines submitted by 14 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*) Schlecht. f. *vasinfectum* [Atk.] (Snyd. & Hans.) and southern root-knot nematodes (*Meloidogyne incognita*).

In 2008, a soil analysis for nematodes revealed that southern root-knot (*Meloidogyne incognita*) was the predominant nematode species in the test plots. The North Fusarium wilt field plot contains a population of *M. incognita* that ranges from 155 to 1546 J2 per 150 cc of soil with an mean of 711 J2. The populations in the South Fusarium wilt field are lower with a range from 77 to 1004 J2 per 150 cc of soil and a mean population of 378. 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. The root-knot nematode population throughout the entire test area, i.e., even the areas with the lowest root-knot nematode populations, is more than sufficient to cause a high incidence of Fusarium wilt.

Cotton lines submitted to the Fusarium Wilt Trial were examined to determine their response to both pathogens the root-knot nematode (*Meloidogyne incognita* race 3) and *Fusarium oxysporum* f. sp. *vasinfectum*. The field has a long history of root-knot nematode infestation. Plots consisted of 1 row, 20 ft long, with 36 in row spacing and were planted in a randomized complete block design with four replications. All plots were maintained throughout the season using standard herbicide, insecticide, and fertility production practices as recommended by the Alabama Cooperative Extension System. Three plants per plot were removed on July 22. The fresh root weights were recorded and nematodes were extracted from the root system by shaking in 0.6% NaOCl counted under the inverted microscope. Fusarium was aseptically isolated on acidified potato dextrose media from systematic plants removed July. Data was statistically analyzed using Generalized Linear Mixed Models procedures as implemented in SAS[®] PROC GLIMMIX with a negative binomial distribution function for count variables. Percentage data converted to decimal fractions were treated as a pseudo-binomial, whereas seed cotton yield data in the commercial test were analyzed using a normal distribution function. Dunnett's *P*-values were calculated to compare entries to check cultivars. Monthly average maximum temperatures from June to October were 90.1, 86.7, 87.1, 81.2, and 70.1 °F; average minimum temperatures of 66.7, 66.4, 66.9, 64.6 and 50.2 °F. Total rainfall amounts from June to October were 1.1, 5.5, 4.2, 4.6, and 6.5 in. The total rainfall for the growing season was 21.9 in.

The 2010 season, environmentally, was conducive for the root-knot nematode and Fusarium wilt pathogens. The numbers of root-knot nematodes increase in all the cotton samples submitted. The standard susceptible cotton, Rowden, averaged 1150 root-knot J2 and eggs per gram of root while the M-315 resistant cotton supported 460 root-knot J2 and eggs per gram of root. Lonren 1 which was released as a reniform nematode resistant genotype, supported root-knot nematode numbers in between the susceptible Rowden and resistant M-315. Nematode juveniles and eggs extracted from the root systems for all the submission ranged from a high of 12,483 in PHY-MM1 to a low 242 in DJ-5. The reproductive potential observed varied widely from highly susceptible (PHY-MM1, PHY-FB2, PHY-FB7, FB-5, CW-1, FB-2, PHY-MM2) to low susceptibilities (DF-5, DJ-2, PHY-MM3, CW-5) depending on the cotton submission. Re-isolation of the Fusarium wilt fungus *Fusarium oxysporum* f. sp. *vasinfectum* was conducted to confirm the presence of the disease pathogen. The fungal pathogen was not found in the resistant M-315 cotton but was readily isolated from Rowden and Lonren 1. Over all the cotton submissions planted in 2010, 76.25% were colonized by *F. oxysporum* f. sp. *vasinfectum*.

Entries were planted in single 20-foot rows on 36-inch centers, separated by 6-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).

A industry-sponsored cotton test was planted adjacent to the National Fusarium Wilt Trial (NFWT) to compare 10 commercially available cotton cultivars to Rowden and M-315 for wilt response, rootknot nematode reaction, and yield. Trial maintenance was similar to the NFWT. Results are presented in Tables 5-9, starting on page 31 of this report.

Lack of moisture delayed planting on May 14. Initial plant counts were made on June 9. Wilting plants were counted and removed on June 23, July 7, July 21, August 4, and August 19. The remaining live plants were counted and recorded on August 26. 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 21%, with a range from 11 to 42% on an individual plot basis (Fig. 1). Wilt development was low but quite uniform in all blocks with rep averages ranging from 5 to 10%. The resistant check **M-315** had an average of 2% wilted plants, with a range of 0 to 4%. **Critical evaluations of breeding lines should be made relative to the Rowden check 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.

EW	46	2	12	1	0	27	4	21
390	Rowden	M-315	Rowden	M-315	M-315	Rowden	M-315	Rowden
	21	2	17	0	1	35	3	3
364	Rowden	M-315	Rowden	M-315	M-315	Rowden	M-315	Rowden
	0	24	0	16	0	33	18	0
338	M-315	Rowden	M-315	Rowden	M-315	Rowden	Rowden	M-315
	4	22	0	10	15	5	26	0
312	M-315	Rowden	M-315	Rowden	M-315	Rowden	Rowden	M-315
	2	26	3	24	2	16	26	2
286	M-315	Rowden	M-315	Rowden	M-315	Rowden	Rowden	M-315
	0	11	17	0	11	2	0	5
260	M-315	Rowden	Rowden	M-315	Rowden	M-315	M-315	Rowden
	6	0	1	6	2	11	0	0
234	Rowden	M-315	M-315	Rowden	M-315	Rowden	M-315	Rowden
	0	0	0	12	26	4	17	4
208	Rowden	M-315	M-315	Rowden	Rowden	M-315	Rowden	M-315
	0	0	9	19	3	0	38	11
182	M-315	Rowden	M-315	Rowden	Rowden	M-315	Rowden	M-315
	0	8	0	26	0	35	3	3
156	M-315	Rowden	M-315	Rowden	M-315	Rowden	M-315	Rowden
	14	6	0	22	40	0	0	31
130	Rowden	M-315	M-315	Rowden	Rowden	M-315	M-315	Rowden
	14	0	20	0	27	0	17	5
104	Rowden	M-315	Rowden	M-315	Rowden	M-315	Rowden	M-315
	0	2	25	0	2	17	3	25
78	M-315	Rowden	Rowden	M-315	M-315	Rowden	M-315	Rowden
	20	0	0	37	41	2	17	0
52	Rowden	M-315	M-315	Rowden	Rowden	M-315	Rowden	M-315
	1	15	44	6	56	0	0	25
26	M-315	Rowden	Rowden	M-315	Rowden	M-315	M-315	Rowden
	9	0	22	1	0	65	2	50
0	Rowden	M-315	Rowden	M-315	M-315	Rowden	M-315	Rowden
SN	24		54		84		114	

Table 1. Percent wilted plants for entries and check in each replicate, least squares estimate of the average, *P*-value based on Dunnett's versus the resistant check M-315, and initial average number of plants per plot.

Entry	Cultivar/Line	Percent wilted plants				Avg. <i>P</i> -value	Avg. no. of plants	
		Rep1	Rep2	Rep3	Rep4			
O. Lloyd May, Delta and Pine Land Co., 381 William Gibbs Rd, Tifton, GA 31794								
101	LM-1	24	13	11	0	11	0.003	46
102	LM-2	0	8	1	6	3	0.276	58
103	LM-3	13	6	6	0	6	0.049	54
104	LM-4	5	11	3	4	5	0.077	62
105	LM-5	15	6	9	5	8	0.014	54
106	LM-6	15	2	5	3	6	0.056	45
107	LM-7	2	4	0	0	1	0.718	59
108	LM-8	9	4	3	3	4	0.149	49
	Rowden	44	3	17	16	22	< 0.001	54
	M-315	6	3	0	0	2		64
Dawn Fraser, Monsanto Company, 741 Coker Farm Road, Hartsville, SC 29550								
201	DF-1	2	7	0	1	2	0.695	47
202	DF-2	3	4	2	2	3	0.666	48
203	DF-3	1	1	1	2	1	0.842	36
204	DF-4	8	1	5	7	4	0.374	30
205	DF-5	7	1	1	4	4	0.403	40
206	DF-6	2	10	1	1	3	0.578	45
207	DF-7	1	5	1	1	2	0.758	36
208	DF-8	2	4	2	15	6	0.181	47
	Rowden	25	19	24	3	19	< 0.001	53
	M-315	0	9	3	3	4		66
Darren Jones, Monsanto Company, 4600 Old Leyland Road, Leland, MS 38756								
301	DJ-1	9	1	2	0	3	0.028	69
302	DJ-2	6	3	0	0	2	0.050	63
303	DJ-3	0	1	0	1	1	0.295	77
304	DJ-4	3	0	0	0	1	0.294	55
305	DJ-5	14	4	2	3	5	0.007	66
306	DJ-6	6	3	2	4	3	0.026	43
307	DJ-7	14	5	0	2	5	0.007	54
308	DJ-8	4	1	8	3	3	0.022	39
	Rowden	20	20	6	17	15	< 0.001	46
	M-315	0	0	1	0	0		54

† The number listed in the average column is the estimate of the average wilt percentage based on a generalized linear mixed model with the binomial distribution for fixed effects. This estimate will generally be close, but may or may not be identical to the arithmetic average obtained by averaging the numbers in the columns representing the 4 reps.

Table 1. *continued*

Entry	Cultivar/Line	Percent wilted plants					Avg. <i>P</i> -value	Avg. no. of plants
		Rep1	Rep2	Rep3	Rep4			
Dave Albers, Monsanto Company, 800 N Lindbergh Blvd., St. Louis, MO 63167								
401	DA-1	2	3	4	0	2	0.556	57
402	DA-2	3	2	1	5	2	0.494	65
403	DA-3	9	10	1	2	5	0.156	51
404	DA-4	4	5	2	7	4	0.210	63
405	DA-5	9	3	1	4	4	0.242	64
406	DA-6	16	2	2	5	6	0.085	60
407	DA-7	10	1	4	0	3	0.291	59
408	DA-8	4	2	2	4	3	0.413	63
	Rowden	65	38	5	46	42	< 0.001	39
	M-315	0	11	1	2	2		48
Richard Sheetz, Monsanto Company, 1596 IH 27-87, Hale Center, TX 79041								
501	RS-1	5	11	0	1	4	0.158	68
502	RS-2	21	21	1	8	13	0.006	70
503	RS-3	3	9	4	15	8	0.031	62
504	RS-4	1	8	4	1	4	0.196	68
505	RS-5	1	10	7	0	4	0.146	47
506	RS-6	0	0	4	0	1	0.629	59
507	RS-7	6	16	1	0	6	0.076	51
508	RS-8	2	0	3	3	2	0.433	52
	Rowden	17	31	26	24	24	< 0.001	44
	M-315	2	1	4	0	2		53
Daryl Bowman, North Carolina State University, 3709 Hillsborough Street, Raleigh, NC 27607								
601	NC1	82	2	1	7	21	< 0.001	46
602	NC2	2	1	1	2	1	0.448	57
603	NC3	13	1	1	0	2	0.171	51
604	NC4	17	2	2	2	3	0.068	55
Kathryn Glass, Auburn University, 201 Funchess Hall, Auburn, AL 36849-5415								
605	PHY 440W	5	1	1	0	1	0.469	46
David Weaver, Auburn University, 201 Funchess Hall, Auburn, AL 36849-5415								
606	AU 6001	17	3	1	1	3	0.071	43
607	AU 3111	22	1	1	1	3	0.053	42
608	AU 3202	14	4	1	10	4	0.039	38
	Rowden	50	8	16	18	17	< 0.001	43
	M-315	2	1	2	1	1		42

Table 1. *continued*

Entry	Cultivar/Line	Percent wilted plants				Avg. <i>P</i> -value	Avg. no. of plants	
		Rep1	Rep2	Rep3	Rep4			
Mustafa McPherson, PhytoGen Seed Co., LLC, 118 Kennedy Flat Road, Leland, MS 38756								
701	PHY- MM01	11	8	4	3	6	0.097	9
702	PHY- MM02	3	2	4	2	2	0.253	28
703	PHY- MM03	‡	‡	‡	‡			
704	PHY- MM04	18	2	2	0	5	0.054	57
705	PHY- MM05	1	4	1	3	2	0.305	28
706	PHY- MM06	16	1	2	1	5	0.094	23
707	PHY- MM07	‡	‡	‡	‡			
708	PHY- MM08	34	3	6	3	9	0.013	57
	Rowden	25	26	26	35	29	< 0.001	43
	M-315	1	0	2	1	1		55
Fred Bourland, University of Arkansas, P.O. Box 48, Keiser, AR 72351								
801	FB-1	14	0	13	7	8	0.002	55
802	FB-2	14	1	2	4	6	0.010	56
803	FB-3	3	0	4	0	2	0.220	58
804	FB-4	3	1	0	3	2	0.242	45
805	FB-5	7	2	3	4	4	0.033	61
806	FB-6	5	5	2	2	4	0.050	49
807	FB-7	12	8	7	2	7	0.004	54
808	FB-8	11	8	7	8	8	0.002	50
	Rowden	15	22	26	27	23	< 0.001	54
	M-315	1	0	2	0	1		61
Brent Styles, Bayer Crop Science, 4205 Williamson Road, Wilson, NC 27893								
901	CA-1	10	1	0	7	5	0.089	48
902	CA-2	0	0	0	0	0	0.788	65
903	CA-3	3	1	1	2	1	0.472	55
904	CA-4	3	4	1	2	2	0.280	49
905	CA-5	6	5	0	9	5	0.085	60
906	FS-1	0	0	4	18	6	0.054	63
907	FS-2	13	18	0	3	8	0.020	67
908	FS-3	1	12	7	12	8	0.024	73
	Rowden	22	40	1	22	23	< 0.001	48
	M-315	1	0	1	4	1		56

‡ These entries could not be evaluated because < 10 seedlings emerged per plot.

Table 1. *continued*

Entry	Cultivar/Line	Percent wilted plants					Avg.P-value	Avg. no. of plants
		Rep1	Rep2	Rep3	Rep4			
Brent Styles, Bayer Crop Science, 4205 Williamson Road, Wilson, NC 27893								
1001	TP-1	5	15	4	3	6	0.028	74
1002	TP-2	12	5	0	5	5	0.048	57
1003	TP-3	6	10	0	3	5	0.057	67
1004	TP-4	29	11	3	5	11	0.003	79
1005	TP-5	2	7	0	3	3	0.179	76
1006	TP-6	11	11	3	1	6	0.026	75
1007	TP-7	4	14	9	6	7	0.017	63
1008	TP-8	14	8	0	6	6	0.021	81
	Rowden	25	27	11	12	17	< 0.001	50
	M-315	3	0	2	1	1		55
Brent Styles, Bayer Crop Science, 4205 Williamson Road, Wilson, NC 27893								
1101	TS-1	7	6	13	5	7	0.189	67
1102	TS-2	0	0	0	15	2	0.739	59
1103	TS-3	0	4	2	3	2	0.727	78
1104	TS-4	0	3	11	3	4	0.476	66
1105	FS-4	1	2	1	13	4	0.544	51
1106	FS-5	1	1	3	5	2	0.700	71
1107	MS-9	2	1	3	3	2	0.724	66
1108	AU 6202	1	1	3	0	1	0.811	43
	Rowden	2	35	6	5	13	0.047	51
	M-315	0	0	1	15	4		65
Brent Styles, Bayer Crop Science, 4205 Williamson Road, Wilson, NC 27893								
1201	MS-1	17	6	13	1	9	0.014	50
1202	MS-2	4	6	4	2	3	0.110	60
1203	MS-3	7	2	13	4	6	0.036	59
1204	MS-4	4	4	0	0	2	0.253	58
1205	MS-5	32	8	7	0	11	0.007	73
1206	MS-6	3	0	2	1	1	0.336	68
1207	MS-7	4	7	9	0	4	0.087	43
1208	MS-8	4	0	0	3	2	0.237	77
	Rowden	17	3	17	10	11	0.008	49
	M-315	1	0	4	0	1		48

Table I. *continued*

Entry	Cultivar/Line	Percent wilted plants				Avg. <i>P</i> -value	Avg. no. of plants	
		Rep1	Rep2	Rep3	Rep4			
Charlie Cook, All-Tex Seed, 356 Hosek Road, Victoria, TX 77905								
1301	CC-01	3	2	4	2	2	0.179	54
1302	CC-02	10	1	2	1	3	0.099	43
1303	CC-03	16	3	0	1	4	0.036	61
1304	CC-04	11	5	2	1	4	0.041	60
1305	CC-05	14	8	8	9	8	0.005	57
1306	CC-06	17	7	2	3	6	0.011	58
1307	CC-07	6	2	7	1	3	0.077	48
1308	CC-08	16	0	2	3	4	0.034	59
	Rowden	56	14	12	33	29	< 0.001	48
	M-315	0	6	0	0	1		59
Cody Poage, All-Tex Seed, P.O. Box 1057, Levelland, TX 79336								
1401	CP-01	4	14	1	2	5	0.043	57
1402	CP-02	0	4	0	0	1	0.413	65
1403	CP-03	0	3	0	3	2	0.274	70
1404	CP-04	0	1	2	2	1	0.370	52
1405	CP-05	13	2	0	0	4	0.066	74
1406	CP-06	12	9	5	1	7	0.028	46
1407	CP-07	0	4	0	0	1	0.390	61
1408	CP-08	1	9	1	8	5	0.053	42
	Rowden	9	14	11	21	13	0.005	51
	M-315	0	0	1	2	1		55
Tim Dabbert, Monsanto Company, 38768 W. Farrell Road, Maricopa, AZ 85138								
1501	TD-1	5	6	0	0	2	0.354	69
1502	TD-2	6	3	0	1	2	0.349	72
1503	TD-3	6	4	2	0	2	0.345	62
1504	TD-4	10	0	4	29	10	0.008	55
1505	TD-5	7	2	2	4	3	0.221	61
1506	TD-6	11	0	1	1	3	0.268	59
1507	TD-7	4	1	1	3	2	0.420	67
1508	AU 6252	9	3	0	0	3	0.302	56
	Rowden	41	1	1	21	16	0.001	44
	M-315	2	1	1	4	2		49

Table 1. *continued*

Entry	Cultivar/Line	Percent wilted plants				Avg. <i>P</i> -value	Avg. no. of plants	
		Rep1	Rep2	Rep3	Rep4			
Joe Johnson, PhytoGen Seed Co., LLC, 118 Kennedy Flat Road, Leland, MS 38756								
1601	PHY-JJ01	2	6	5	0	3	0.260	53
1602	PHY-JJ03	9	26	3	1	10	0.006	38
1603	PHY-JJ05	6	4	2	3	4	0.146	55
1604	PHY-JJ06	2	5	1	12	5	0.078	45
1605	PHY-JJ07	4	4	0	4	3	0.221	58
1606	PHY-JJ08	4	8	1	7	5	0.067	62
David Weaver, Auburn University, 201 Funchess Hall, Auburn, AL 36849-5415								
1607	AU 1221	8	13	1	3	6	0.042	34
1608	AU 2372	4	3	3	1	3	0.272	36
	Rowden	37	17	11	26	24	< 0.001	44
	M-315	0	5	2	1	2		50

Table 2. Least squares means of root knot J2 infective stage number (counts per g of root fresh weight), lower and upper 95% confidence intervals, and P-value based on Dunnett's test versus the resistant check M-315 and susceptible Rowden.

Entry	Cultivar/Line	Mean	Lower Limit	Upper Limit	Dunnett's <i>P</i> -value		
					M-315	Rowden	
O. Lloyd May, Delta and Pine Land Co., 381 William Gibbs Rd, Tifton, GA 31794							
101	LM-1	0	0	4	0.343	0.715	
102	LM-2	1	0	6	0.030	0.264	
103	LM-3	1	0	6	0.030	0.264	
104	LM-4	8	1	21	0.001	0.001	
105	LM-5	1	0	6	0.030	0.264	
106	LM-6	0	0	4	0.343	0.715	
107	LM-7	1	0	6	0.030	0.264	
108	LM-8	2	0	7	0.009	0.136	
	Rowden	1	0	2	0.023		
	M-315	0	0	1		0.977	
Dawn Fraser, Monsanto Company, 741 Coker Farm Road, Hartsville, SC 29550							
201	DF-1	0	†	†	†	†	
202	DF-2	2	0	7	0.009	0.136	
203	DF-3	0	†	†	†	†	
204	DF-4	0	0	4	0.343	0.715	
205	DF-5	0	†	†	†	†	
206	DF-6	1	0	9	0.171	0.478	
207	DF-7	0	0	4	0.343	0.715	
208	DF-8	1	0	5	0.105	0.470	
	Rowden	1	0	2	0.023		
	M-315	0	0	1		0.977	
Darren Jones, Monsanto Company, 4600 Old Leyland Road, Leland, MS 38756							
301	DJ-1	1	0	6	0.030	0.264	
302	DJ-2	1	0	6	0.030	0.264	
303	DJ-3	0	†	†	†	†	
304	DJ-4	5	1	14	0.001	0.002	
305	DJ-5	2	0	8	0.003	0.066	
306	DJ-6	0	0	4	0.343	0.715	
307	DJ-7	1	0	6	0.030	0.264	
308	DJ-8	0	†	†	†	†	
	Rowden	1	0	2	0.023		
	M-315	0	0	1		0.977	

† No rootknot nematode detected

Table 2. *continued*

Entry	Cultivar/Line	Mean	Lower Limit	Upper Limit	Dunnett's <i>P</i> -value	
					M-315	Rowden
Dave Albers, Monsanto Company, 800 N Lindbergh Blvd., St. Louis, MO 63167						
401	DA-1	0	†	†	†	†
402	DA-2	3	0	9	0.001	0.032
403	DA-3	1	0	5	0.105	0.470
404	DA-4	0	†	†	†	†
405	DA-5	0	†	†	†	†
406	DA-6	0	0	4	0.343	0.715
407	DA-7	0	0	4	0.343	0.715
408	DA-8	0	0	4	0.343	0.715
	Rowden	1	0	2	0.023	
	M-315	0	0	1		0.977
Richard Sheetz, Monsanto Company, 1596 IH 27-87, Hale Center, TX 79041						
501	RS-1	1	0	5	0.105	0.470
502	RS-2	0	†	†	†	†
503	RS-3	0	†	†	†	†
504	RS-4	0	†	†	†	†
505	RS-5	2	0	7	0.009	0.136
506	RS-6	0	0	4	0.343	0.715
507	RS-7	1	0	6	0.030	0.264
508	RS-8	2	0	7	0.009	0.136
	Rowden	1	0	2	0.023	
	M-315	0	0	1		0.977
Daryl Bowman, North Carolina State University, 3709 Hillsborough Street, Raleigh, NC 27607						
601	NC1	2	0	7	0.009	0.136
602	NC2	3	0	9	0.001	0.032
603	NC3	1	0	6	0.030	0.264
604	NC4	1	0	5	0.105	0.470
Kathryn Glass, Auburn University, 201 Funchess Hall, Auburn, AL 36849-5415						
605	PHY 440W	1	0	6	0.030	0.264
David Weaver, Auburn University, 201 Funchess Hall, Auburn, AL 36849-5415						
606	AU 6001	2	0	8	0.003	0.066
607	AU 3111	2	0	7	0.009	0.136
608	AU 3202	1	0	6	0.030	0.264
	Rowden	1	0	2	0.023	
	M-315	0	0	1		0.977

† No rootknot nematode detected

Table 2. *continued*

Entry	Cultivar/Line	Mean	Lower Limit	Upper Limit	Dunnett's <i>P</i> -value	
					M-315	Rowden
Mustafa McPherson, PhytoGen Seed Co., LLC, 118 Kennedy Flat Road, Leland, MS 38756						
701	PHY- MM01	0	†	†	†	†
702	PHY- MM02	0	0	4	0.343	0.715
703	PHY- MM03					
704	PHY- MM04	0	0	4	0.343	0.715
705	PHY- MM05	0	0	4	0.343	0.715
706	PHY- MM06	0	0	4	0.343	0.715
707	PHY- MM07					
708	PHY- MM08	0	†	†	†	†
	Rowden	1	0	2	0.023	
	M-315	0	0	1		0.977
Fred Bourland, University of Arkansas, P.O. Box 48, Keiser, AR 72351						
801	FB-1	2	0	12	0.032	0.207
802	FB-2	7	1	19	0.001	0.001
803	FB-3	3	0	10	0.000	0.015
804	FB-4	1	0	5	0.105	0.470
805	FB-5	2	0	8	0.003	0.066
806	FB-6	1	0	6	0.030	0.264
807	FB-7	9	1	22	0.001	0.001
808	FB-8	5	1	15	0.001	0.001
	Rowden	1	0	2	0.023	
	M-315	0	0	1		0.977
Brent Styles, Bayer Crop Science, 4205 Williamson Road, Wilson, NC 27893						
901	CA-1	9	1	23	0.001	0.001
902	CA-2	1	0	5	0.105	0.470
903	CA-3	3	0	9	0.001	0.032
904	CA-4	3	0	9	0.001	0.032
905	CA-5	0	†	†	†	†
906	FS-1	0	0	4	0.343	0.715
907	FS-2	1	0	6	0.030	0.264
908	FS-3	2	0	7	0.009	0.136
	Rowden	1	0	2	0.023	
	M-315	0	0	1		0.977

† No rootknot nematode detected

Table 2. *continued*

Entry	Cultivar/Line	Mean	Lower Limit	Upper Limit	Dunnett's <i>P</i> -value	
					M-315	Rowden
Brent Styles, Bayer Crop Science, 4205 Williamson Road, Wilson, NC 27893						
1001	TP-1	2	0	7	0.009	0.136
1002	TP-2	0	0	4	0.343	0.715
1003	TP-3	0	†	†	†	†
1004	TP-4	2	0	7	0.009	0.136
1005	TP-5	0	0	4	0.343	0.715
1006	TP-6	0	†	†	†	†
1007	TP-7	0	†	†	†	†
1008	TP-8	0	†	†	†	†
	Rowden	1	0	2	0.023	
	M-315	0	0	1		0.977
Brent Styles, Bayer Crop Science, 4205 Williamson Road, Wilson, NC 27893						
1101	TS-1	2	0	8	0.003	0.066
1102	TS-2	0	0	4	0.343	0.715
1103	TS-3	4	0	11	0.000	0.007
1104	TS-4	2	0	8	0.003	0.066
1105	FS-4	8	1	20	0.001	0.001
1106	FS-5	4	0	11	0.000	0.007
1107	MS-9	1	0	6	0.030	0.264
1108	AU 6202	0	†	†	†	†
	Rowden	1	0	2	0.023	
	M-315	0	0	1		0.977
Brent Styles, Bayer Crop Science, 4205 Williamson Road, Wilson, NC 27893						
1201	MS-1	5	1	14	0.001	0.002
1202	MS-2	1	0	6	0.030	0.264
1203	MS-3	1	0	5	0.105	0.470
1204	MS-4	0	0	4	0.343	0.715
1205	MS-5	0	0	4	0.343	0.715
1206	MS-6	3	0	9	0.001	0.032
1207	MS-7	1	0	5	0.105	0.470
1208	MS-8	0	†	†	†	†
	Rowden	1	0	2	0.023	
	M-315	0	0	1		0.977

† No rootknot nematode detected

Table 2. *continued*

Entry	Cultivar/Line	Mean	Lower Limit	Upper Limit	Dunnett's <i>P</i> -value	
					M-315	Rowden
Charlie Cook, All-Tex Seed, 356 Hosek Road, Victoria, TX 77905						
1301	CC-01	2	0	8	0.003	0.066
1302	CC-02	0	†	†	†	†
1303	CC-03	0	0	4	0.343	0.715
1304	CC-04	1	0	6	0.030	0.264
1305	CC-05	0	0	4	0.343	0.715
1306	CC-06	1	0	6	0.030	0.264
1307	CC-07	0	0	4	0.343	0.715
1308	CC-08	1	0	6	0.030	0.264
	Rowden	1	0	2	0.023	
	M-315	0	0	1		0.977
Cody Poage, All-Tex Seed, P.O. Box 1057, Levelland, TX 79336						
1401	CP-01	2	0	7	0.009	0.136
1402	CP-02	1	0	6	0.030	0.264
1403	CP-03	1	0	5	0.105	0.470
1404	CP-04	2	0	7	0.009	0.136
1405	CP-05	8	1	21	0.001	0.001
1406	CP-06	3	0	9	0.001	0.032
1407	CP-07	1	0	6	0.030	0.264
1408	CP-08	0	†	†	†	†
	Rowden	1	0	2	0.023	
	M-315	0	0	1		0.977
Tim Dabbert, Monsanto Company, 38768 W. Farrell Road, Maricopa, AZ 85138						
1501	TD-1	0	†	†	†	†
1502	TD-2	0	†	†	†	†
1503	TD-3	1	0	5	0.105	0.470
1504	TD-4	1	0	6	0.030	0.264
1505	TD-5	2	0	8	0.003	0.066
1506	TD-6	1	0	5	0.105	0.470
1507	TD-7	0	0	4	0.343	0.715
1508	AU 6252	0	†	†	†	†
	Rowden	1	0	2	0.023	
	M-315	0	0	1		0.977

† No rootknot nematode detected

Table 2. *continued*

Entry	Cultivar/Line	Mean	Lower Limit	Upper Limit	Dunnett's <i>P</i> -value	
					M-315	Rowden
Joe Johnson, PhytoGen Seed Co., LLC, 118 Kennedy Flat Road, Leland, MS 38756						
1601	PHY-JJ01	0	†	†	†	†
1602	PHY-JJ03	1	0	5	0.105	0.470
1603	PHY-JJ05	2	0	7	0.009	0.136
1604	PHY-JJ06	4	0	13	0.001	0.004
1605	PHY-JJ07	1	0	6	0.030	0.264
1606	PHY-JJ08	0	†	†	†	†
David Weaver, Auburn University, 201 Funchess Hall, Auburn, AL 36849-5415						
1607	AU 1221	3	0	9	0.001	0.032
1608	AU 2372	0	†	†	†	†
	Rowden	1	0	2	0.023	
	M-315	0	0	1		0.977

† No rootknot nematode detected

Table 3. Least squares means of root knot nematode egg number (count per g root fresh weight), lower and upper 95% confidence intervals, and *P*-value based on Dunnett's versus the resistant check M-315 and susceptible Rowden.

Entry	Cultivar/Line	Mean	Lower Limit	Upper Limit	Dunnett's <i>P</i> -value	
					M-315	Rowden
O. Lloyd May, Delta and Pine Land Co., 381 William Gibbs Rd, Tifton, GA 31794						
101	LM-1	10	1	31	0.004	0.915
102	LM-2	7	1	24	0.012	0.963
103	LM-3	13	1	42	0.001	0.815
104	LM-4	18	2	56	0.000	0.664
105	LM-5	3	-0	10	0.191	0.998
106	LM-6	14	1	70	0.009	0.733
107	LM-7	17	2	55	0.000	0.675
108	LM-8	8	1	25	0.010	0.956
	Rowden	23	3	35	0.001	
	M-315	2	-0	3		1.000
Dawn Fraser, Monsanto Company, 741 Coker Farm Road, Hartsville, SC 29550						
201	DF-1	31	2	155	0.001	0.352
202	DF-2	24	2	75	0.000	0.467
203	DF-3	3	-0	10	0.201	0.998
204	DF-4	39	3	123	0.001	0.177
205	DF-5	27	2	138	0.001	0.408
206	DF-6	9	1	48	0.026	0.863
207	DF-7	10	1	31	0.004	0.915
208	DF-8	17	2	54	0.000	0.687
	Rowden	23	3	35	0.001	
	M-315	2	-0	3		1.000
Darren Jones, Monsanto Company, 4600 Old Leyland Road, Leland, MS 38756						
301	DJ-1	15	2	49	0.001	0.740
302	DJ-2	6	1	20	0.023	0.979
303	DJ-3	4	0	15	0.067	0.992
304	DJ-4	11	1	37	0.002	0.871
305	DJ-5	3	-0	9	0.243	0.998
306	DJ-6	6	1	19	0.026	0.981
307	DJ-7	11	1	35	0.003	0.889
308	DJ-8	5	0	17	0.043	0.988
	Rowden	23	3	35	0.001	
	M-315	2	-0	3		1.000

Table 3. *continued*

Entry	Cultivar/Line	Mean	Lower Limit	Upper Limit	Dunnett's <i>P</i> -value	
					M-315	Rowden
Dave Albers, Monsanto Company, 800 N Lindbergh Blvd., St. Louis, MO 63167						
401	DA-1	5	0	18	0.034	0.985
402	DA-2	34	2	107	0.001	0.244
403	DA-3	7	0	37	0.051	0.918
404	DA-4	0	-4	7	0.828	0.996
405	DA-5	6	1	19	0.030	0.983
406	DA-6	29	2	90	0.001	0.345
407	DA-7	12	1	38	0.002	0.862
408	DA-8	2	-1	7	0.415	0.999
	Rowden	23	3	35	0.001	
	M-315	2	-0	3		1.000
Richard Sheetz, Monsanto Company, 1596 IH 27-87, Hale Center, TX 79041						
501	RS-1	5	0	16	0.056	0.991
502	RS-2	5	0	18	0.032	0.984
503	RS-3	4	0	15	0.068	0.992
504	RS-4	16	2	50	0.001	0.731
505	RS-5	20	2	63	0.000	0.591
506	RS-6	6	0	19	0.031	0.984
507	RS-7	10	1	31	0.004	0.917
508	RS-8	26	2	81	0.001	0.413
	Rowden	23	3	35	0.001	
	M-315	2	-0	3		1.000
Daryl Bowman, North Carolina State University, 3709 Hillsborough Street, Raleigh, NC 27607						
601	NC1	8	0	45	0.034	0.883
602	NC2	10	1	54	0.021	0.837
603	NC3	18	1	93	0.005	0.620
604	NC4	6	0	33	0.075	0.938
Kathryn Glass, Auburn University, 201 Funchess Hall, Auburn, AL 36849-5415						
605	PHY 440W	30	2	156	0.001	0.365
David Weaver, Auburn University, 201 Funchess Hall, Auburn, AL 36849-5415						
606	AU 6001	32	2	166	0.001	0.336
607	AU 3111	15	1	78	0.007	0.700
608	AU 3202	26	2	135	0.002	0.436
	Rowden	23	3	35	0.001	
	M-315	2	-0	3		1.000

Table 3. *continued*

Entry	Cultivar/Line	Mean	Lower Limit	Upper Limit	Dunnett's <i>P</i> -value	
					M-315	Rowden
Mustafa McPherson, PhytoGen Seed Co., LLC, 118 Kennedy Flat Road, Leland, MS 38756						
701	PHY- MM01	6	0	33	0.069	0.936
702	PHY- MM02	3	-0	10	0.197	0.998
703	PHY- MM03					
704	PHY- MM04	16	2	50	0.001	0.734
705	PHY- MM05	1	-1	5	0.656	1.000
706	PHY- MM06	2	-1	8	0.328	0.999
707	PHY- MM07					
708	PHY- MM08	2	-1	7	0.426	0.999
	Rowden	23	3	35	0.001	
	M-315	2	-0	3		1.000
Fred Bourland, University of Arkansas, P.O. Box 48, Keiser, AR 72351						
801	FB-1	11	1	36	0.002	0.877
802	FB-2	17	2	55	0.000	0.672
803	FB-3	7	1	22	0.016	0.971
804	FB-4	12	1	38	0.002	0.856
805	FB-5	18	2	56	0.000	0.669
806	FB-6	8	1	27	0.007	0.944
807	FB-7	34	2	106	0.001	0.251
808	FB-8	10	1	33	0.003	0.902
	Rowden	23	3	35	0.001	
	M-315	2	-0	3		1.000
Brent Styles, Bayer Crop Science, 4205 Williamson Road, Wilson, NC 27893						
901	CA-1	44	3	137	0.001	0.135
902	CA-2	2	-0	9	0.257	0.999
903	CA-3	26	2	82	0.001	0.404
904	CA-4	20	2	65	0.000	0.569
905	CA-5	9	1	29	0.006	0.933
906	FS-1	9	1	30	0.005	0.928
907	FS-2	15	2	49	0.001	0.743
908	FS-3	14	2	46	0.001	0.774
	Rowden	23	3	35	0.001	
	M-315	2	-0	3		1.000

Table 3. *continued*

Entry	Cultivar/Line	Mean	Lower Limit	Upper Limit	Dunnett's <i>P</i> -value	
					M-315	Rowden
Brent Styles, Bayer Crop Science, 4205 Williamson Road, Wilson, NC 27893						
1001	TP-1	18	2	56	0.000	0.666
1002	TP-2	2	-0	9	0.281	0.999
1003	TP-3	2	-0	9	0.279	0.999
1004	TP-4	5	0	18	0.033	0.985
1005	TP-5	8	1	25	0.010	0.958
1006	TP-6	1	-1	6	0.531	1.000
1007	TP-7	4	0	14	0.085	0.994
1008	TP-8	2	-1	7	0.488	1.000
	Rowden	23	3	35	0.001	
	M-315	2	-0	3		1.000
Brent Styles, Bayer Crop Science, 4205 Williamson Road, Wilson, NC 27893						
1101	TS-1	12	1	38	0.002	0.862
1102	TS-2	19	2	61	0.000	0.614
1103	TS-3	5	0	16	0.047	0.989
1104	TS-4	18	2	57	0.000	0.654
1105	FS-4	22	2	69	0.000	0.526
1106	FS-5	35	2	111	0.001	0.227
1107	MS-9	10	1	33	0.003	0.902
1108	AU 6202	6	1	21	0.018	0.974
	Rowden	23	3	35	0.001	
	M-315	2	-0	3		1.000
Brent Styles, Bayer Crop Science, 4205 Williamson Road, Wilson, NC 27893						
1201	MS-1	52	3	161	0.001	0.086
1202	MS-2	20	2	62	0.000	0.601
1203	MS-3	12	1	37	0.002	0.865
1204	MS-4	3	-0	11	0.167	0.997
1205	MS-5	5	0	18	0.032	0.984
1206	MS-6	16	2	51	0.001	0.718
1207	MS-7	6	0	19	0.031	0.984
1208	MS-8	12	1	40	0.001	0.837
	Rowden	23	3	35	0.001	
	M-315	2	-0	3		1.000

Table 3. *continued*

Entry	Cultivar/Line	Mean	Lower Limit	Upper Limit	Dunnett's <i>P</i> -value	
					M-315	Rowden
Charlie Cook, All-Tex Seed, 356 Hosek Road, Victoria, TX 77905						
1301	CC-01	13	1	41	0.001	0.831
1302	CC-02	3	-0	12	0.126	0.996
1303	CC-03	10	1	31	0.004	0.919
1304	CC-04	11	1	36	0.002	0.879
1305	CC-05	17	2	53	0.000	0.697
1306	CC-06	32	2	101	0.001	0.279
1307	CC-07	1	-1	5	0.650	1.000
1308	CC-08	17	2	55	0.000	0.673
	Rowden	23	3	35	0.001	
	M-315	2	-0	3		1.000
Cody Poage, All-Tex Seed, P.O. Box 1057, Levelland, TX 79336						
1401	CP-01	29	2	90	0.001	0.349
1402	CP-02	12	1	40	0.002	0.843
1403	CP-03	6	1	20	0.023	0.979
1404	CP-04	12	1	38	0.002	0.858
1405	CP-05	29	2	90	0.001	0.349
1406	CP-06	11	1	36	0.002	0.876
1407	CP-07	4	0	13	0.095	0.995
1408	CP-08	2	-1	6	0.512	1.000
	Rowden	23	3	35	0.001	
	M-315	2	-0	3		1.000
Tim Dabbert, Monsanto Company, 38768 W. Farrell Road, Maricopa, AZ 85138						
1501	TD-1	6	1	21	0.019	0.975
1502	TD-2	5	0	16	0.048	0.989
1503	TD-3	3	-0	11	0.182	0.998
1504	TD-4	10	1	33	0.003	0.901
1505	TD-5	15	2	48	0.001	0.754
1506	TD-6	11	1	35	0.003	0.883
1507	TD-7	12	1	38	0.002	0.859
1508	AU 6252	4	0	14	0.087	0.994
	Rowden	23	3	35	0.001	
	M-315	2	-0	3		1.000

Table 3. *continued*

Entry	Cultivar/Line	Mean	Lower Limit	Upper Limit	Dunnett's <i>P</i> -value	
					M-315	Rowden
Joe Johnson, PhytoGen Seed Co., LLC, 118 Kennedy Flat Road, Leland, MS 38756						
1601	PHY-JJ01	4	-0	26	0.131	0.963
1602	PHY-JJ03	20	1	103	0.003	0.570
1603	PHY-JJ05	14	1	77	0.008	0.708
1604	PHY-JJ06	25	2	131	0.002	0.449
1605	PHY-JJ07	7	0	41	0.043	0.902
1606	PHY-JJ08	9	0	48	0.028	0.866
David Weaver, Auburn University, 201 Funchess Hall, Auburn, AL 36849-5415						
1607	AU 1221	9	0	48	0.028	0.866
1608	AU 2372	12	0	128	0.049	0.712
	Rowden	23	3	35	0.001	
	M-315	2	-0	3		1.000

Table 4. Least squares means of total root knot nematode number (count per plant), lower and upper 95% confidence intervals, and *P*-value based on Dunnett's versus the resistant check M-315 and susceptible Rowden.

Entry	Cultivar/Line	Mean	Lower Limit	Upper Limit	Dunnett's <i>P</i> -value	
					M-315	Rowden
O. Lloyd May, Delta and Pine Land Co., 381 William Gibbs Rd, Tifton, GA 31794						
101	LM-1	43	2	292	0.068	0.888
102	LM-2	75	2	508	0.024	0.743
103	LM-3	123	3	828	0.009	0.554
104	LM-4	203	3	1360	0.003	0.345
105	LM-5	36	2	249	0.091	0.914
106	LM-6	57	2	389	0.040	0.824
107	LM-7	59	2	399	0.038	0.817
108	LM-8	117	3	788	0.010	0.575
	Rowden	140	4	261	0.001	
	M-315	10	2	19		1.000
Dawn Fraser, Monsanto Company, 741 Coker Farm Road, Hartsville, SC 29550						
201	DF-1	144	4	509	0.001	0.482
202	DF-2	67	3	164	0.001	0.926
203	DF-3	4	1	12	0.922	1.000
204	DF-4	113	4	277	0.000	0.668
205	DF-5	109	3	386	0.002	0.658
206	DF-6	43	2	153	0.019	0.959
207	DF-7	39	3	97	0.008	0.989
208	DF-8	70	3	173	0.001	0.913
	Rowden	140	4	261	0.001	
	M-315					
Darren Jones, Monsanto Company, 4600 Old Leyland Road, Leland, MS 38756						
301	DJ-1	103	3	695	0.013	0.627
302	DJ-2	31	2	216	0.116	0.933
303	DJ-3	31	2	216	0.116	0.933
304	DJ-4	126	3	848	0.008	0.543
305	DJ-5	33	2	229	0.105	0.926
306	DJ-6	38	2	262	0.083	0.906
307	DJ-7	53	2	359	0.046	0.844
308	DJ-8	11	0	80	0.452	0.990
	Rowden	140	4	261	0.001	
	M-315	10	2	19		1.000

Table 4. *continued*

Entry	Cultivar/Line	Mean	Lower Limit	Upper Limit	Dunnett's <i>P</i> -value	
					M-315	Rowden
Dave Albers, Monsanto Company, 800 N Lindbergh Blvd., St. Louis, MO 63167						
401	DA-1	36	2	249	0.091	0.914
402	DA-2	197	3	1317	0.003	0.358
403	DA-3	28	1	196	0.137	0.944
404	DA-4	5	-1	94	0.683	0.984
405	DA-5	23	1	159	0.189	0.962
406	DA-6	173	3	1157	0.004	0.411
407	DA-7	45	2	306	0.063	0.879
408	DA-8	11	0	80	0.452	0.990
	Rowden	140	4	261	0.001	
	M-315	10	2	19		1.000
Richard Sheetz, Monsanto Company, 1596 IH 27-87, Hale Center, TX 79041						
501	RS-1	31	2	216	0.116	0.933
502	RS-2	25	1	176	0.162	0.954
503	RS-3	21	1	149	0.208	0.966
504	RS-4	31	2	213	0.119	0.935
505	RS-5	133	3	894	0.008	0.520
506	RS-6	24	1	169	0.172	0.957
507	RS-7	42	2	289	0.070	0.890
508	RS-8	63	2	425	0.033	0.799
	Rowden	140	4	261	0.001	
	M-315	10	2	19		1.000
Daryl Bowman, North Carolina State University, 3709 Hillsborough Street, Raleigh, NC 27607						
601	NC1	48	2	329	0.055	0.864
602	NC2	72	2	489	0.026	0.757
603	NC3	36	2	246	0.093	0.916
604	NC4	13	1	96	0.370	0.985
Kathryn Glass, Auburn University, 201 Funchess Hall, Auburn, AL 36849-5415						
605	PHY 440W	107	3	718	0.012	0.613
David Weaver, Auburn University, 201 Funchess Hall, Auburn, AL 36849-5415						
606	AU 6001	89	3	602	0.017	0.683
607	AU 3111	83	3	558	0.020	0.711
608	AU 3202	122	3	818	0.009	0.559
	Rowden	140	4	261	0.001	
	M-315	10	2	19		1.000

Table 4. *continued*

Entry	Cultivar/Line	Mean	Lower Limit	Upper Limit	Dunnett's <i>P</i> -value	
					M-315	Rowden
Mustafa McPherson, PhytoGen Seed Co., LLC, 118 Kennedy Flat Road, Leland, MS 38756						
701	PHY- MM01	47	1	705	0.121	0.797
702	PHY- MM02	18	1	126	0.264	0.975
703	PHY- MM03					
704	PHY- MM04	60	2	405	0.037	0.813
705	PHY- MM05	7	-0	53	0.632	0.995
706	PHY- MM06	14	1	103	0.342	0.983
707	PHY- MM07					
708	PHY- MM08	9	0	70	0.512	0.992
	Rowden	140	4	261	0.001	
	M-315	10	2	19		1.000
Fred Bourland, University of Arkansas, P.O. Box 48, Keiser, AR 72351						
801	FB-1	127	4	311	0.000	0.577
802	FB-2	245	5	597	0.001	0.130
803	FB-3	68	3	167	0.001	0.922
804	FB-4	113	4	277	0.000	0.668
805	FB-5	249	5	608	0.001	0.123
806	FB-6	95	4	232	0.000	0.786
807	FB-7	416	5	1014	0.001	0.021
808	FB-8	121	4	296	0.000	0.619
	Rowden	140	4	261	0.001	
	M-315	10	2	19		1.000
Brent Styles, Bayer Crop Science, 4205 Williamson Road, Wilson, NC 27893						
901	CA-1	599	4	3994	0.000	0.069
902	CA-2	24	1	169	0.172	0.957
903	CA-3	210	3	1403	0.003	0.333
904	CA-4	160	3	1074	0.005	0.442
905	CA-5	122	3	821	0.009	0.557
906	FS-1	28	1	196	0.137	0.944
907	FS-2	206	3	1380	0.003	0.339
908	FS-3	97	3	655	0.014	0.650
	Rowden	140	4	261	0.001	
	M-315	10	2	19		1.000

Table 4. *continued*

Entry	Cultivar/Line	Mean	Lower Limit	Upper Limit	Dunnett's <i>P</i> -value	
					M-315	Rowden
Brent Styles, Bayer Crop Science, 4205 Williamson Road, Wilson, NC 27893						
1001	TP-1	111	3	748	0.011	0.596
1002	TP-2	11	0	80	0.452	0.990
1003	TP-3	17	1	123	0.274	0.977
1004	TP-4	45	2	309	0.062	0.877
1005	TP-5	25	1	176	0.162	0.954
1006	TP-6	10	0	76	0.471	0.991
1007	TP-7	6	-0	50	0.659	0.996
1008	TP-8	12	1	90	0.400	0.987
	Rowden	140	4	261	0.001	
	M-315	10	2	19		1.000
Brent Styles, Bayer Crop Science, 4205 Williamson Road, Wilson, NC 27893						
1101	TS-1	158	3	1061	0.005	0.447
1102	TS-2	85	3	572	0.019	0.702
1103	TS-3	57	2	389	0.040	0.824
1104	TS-4	186	3	1247	0.004	0.380
1105	FS-4	198	3	1323	0.003	0.356
1106	FS-5	260	4	1736	0.002	0.255
1107	MS-9	88	3	595	0.017	0.687
1108	AU 6202	42	2	289	0.070	0.890
	Rowden	140	4	261	0.001	
	M-315	10	2	19		1.000
Brent Styles, Bayer Crop Science, 4205 Williamson Road, Wilson, NC 27893						
1201	MS-1	360	4	2404	0.001	0.160
1202	MS-2	90	3	608	0.016	0.679
1203	MS-3	121	3	811	0.009	0.562
1204	MS-4	22	1	156	0.195	0.963
1205	MS-5	16	1	113	0.305	0.980
1206	MS-6	108	3	728	0.011	0.608
1207	MS-7	29	1	203	0.129	0.941
1208	MS-8	72	2	489	0.026	0.757
	Rowden	140	4	261	0.001	
	M-315	10	2	19		1.000

Table 4. *continued*

Entry	Cultivar/Line	Mean	Lower Limit	Upper Limit	Dunnett's <i>P</i> -value	
					M-315	Rowden
Charlie Cook, All-Tex Seed, 356 Hosek Road, Victoria, TX 77905						
1301	CC-01	59	2	399	0.038	0.817
1302	CC-02	39	2	269	0.079	0.902
1303	CC-03	58	2	395	0.039	0.820
1304	CC-04	26	1	179	0.158	0.953
1305	CC-05	58	2	395	0.039	0.820
1306	CC-06	152	3	1021	0.006	0.464
1307	CC-07	4	-1	30	0.832	0.998
1308	CC-08	173	3	1160	0.004	0.409
	Rowden	140	4	261	0.001	
	M-315	10	2	19		1.000
Cody Poage, All-Tex Seed, P.O. Box 1057, Levelland, TX 79336						
1401	CP-01	560	4	3734	0.000	0.077
1402	CP-02	117	3	788	0.010	0.575
1403	CP-03	57	2	389	0.040	0.824
1404	CP-04	117	3	781	0.010	0.578
1405	CP-05	404	4	2690	0.001	0.135
1406	CP-06	208	3	1390	0.003	0.336
1407	CP-07	39	2	266	0.081	0.904
1408	CP-08	18	1	123	0.274	0.977
	Rowden	140	4	261	0.001	
	M-315	10	2	19		1.000
Tim Dabbert, Monsanto Company, 38768 W. Farrell Road, Maricopa, AZ 85138						
1501	TD-1	23	1	159	0.189	0.962
1502	TD-2	12	0	83	0.434	0.989
1503	TD-3	26	1	176	0.162	0.954
1504	TD-4	51	2	346	0.050	0.853
1505	TD-5	53	2	359	0.046	0.844
1506	TD-6	21	1	146	0.215	0.968
1507	TD-7	37	2	249	0.091	0.914
1508	AU 6252	14	1	100	0.356	0.984
	Rowden	140	4	261	0.001	
	M-315	10	2	19		1.000

Table 4. *continued*

Entry	Cultivar/Line	Mean	Lower Limit	Upper Limit	Dunnett's <i>P</i> -value	
					M-315	Rowden
Joe Johnson, PhytoGen Seed Co., LLC, 118 Kennedy Flat Road, Leland, MS 38756						
1601	PHY-JJ01	16	1	113	0.305	0.980
1602	PHY-JJ03	72	2	485	0.026	0.759
1603	PHY-JJ05	106	3	708	0.012	0.619
1604	PHY-JJ06	94	3	628	0.015	0.667
1605	PHY-JJ07	47	2	316	0.059	0.873
1606	PHY-JJ08	30	1	203	0.129	0.941
David Weaver, Auburn University, 201 Funchess Hall, Auburn, AL 36849-5415						
1607	AU 1221	118	3	791	0.010	0.573
1608	AU 2372	48	2	326	0.056	0.866
	Rowden	140	4	261	0.001	
	M-315	10	2	19		1.000

Commercial Cotton Wilt Trial

Table 5. Least squares estimates of the average percent wilted plants for entries and checks, confidence intervals, and *P*-values based on Dunnett's versus the susceptible check Rowden and the resistant check

Cultivar	95 % Confidence Limit			Dunnett's P-value vs.	
	Mean	Lower	Upper	Rowden	M-315
DP 0949	7.6	3.7	15.1	0.378	0.044
DP 1028	2.6	0.9	7.2	0.013	0.326
DP 1050	3.7	1.6	8.1	0.011	0.172
FM 1740	5.4	2.9	9.7	0.019	0.080
PHY 367	1.1	0.3	3.6	0.001	0.790
PHY 375	2.5	0.9	7.1	0.011	0.335
PHY 485	3.3	1.4	7.4	0.006	0.207
PHY 565	6.9	4.1	11.5	0.065	0.046
STV 4288	3.4	1.6	7.2	0.004	0.188
STV 5458	1.6	0.6	4.6	0.001	0.560
Rowden	16.3	11.4	23.0		0.005
M-315	0.4	0.0	3.6	0.013	

Table 6. Least squares estimate of root knot J2 infective stage number (counts per g of root fresh weight) for entries and checks, confidence intervals, and P-values based on Dunnett's test versus the susceptible check Rowden and the resistant check M-315.

Cultivar	Mean	95 % Confidence Limit		Dunnett's P-value vs.	
		Lower	Upper	Rowden	M-315
DP 0949	1176	486	1866	1.000	0.020
DP 1028	1768	1078	2458	0.793	0.272
DP 1050	2316	1626	3006	0.150	0.951
FM 1740	1804	1114	2494	0.743	0.309
PHY 367	3467	2776	4157	0.000	0.691
PHY 375	1808	1118	2498	0.738	0.313
PHY 485	1535	845	2226	0.985	0.109
PHY 565	3133	2442	3823	0.003	0.991
STV 4288	2603	1912	3293	0.042	1.000
STV 5458	2784	2094	3474	0.017	1.000
Rowden	1151	460	1841		0.017
M-315	2777	2087	3467	0.017	

Table 7. Least squares estimate of root knot number (counts per 150 cc) for entries and checks, confidence intervals, and *P*-values based on Dunnett's versus the susceptible check Rowden and the resistant check M-315.

Cultivar	Mean	95 % Confidence Limit		Dunnett's P-value vs.	
		Lower	Upper	Rowden	M-315
DP 0949	174	52	578	0.973	0.973
DP 1028	97	19	484	1.000	1.000
DP 1050	116	27	504	1.000	1.000
FM 1740	290	114	734	0.680	0.680
PHY 367	251	92	682	0.791	0.791
PHY 375	97	19	484	1.000	1.000
PHY 485†	695	47	10386	0.376	0.376
PHY 565	773	437	1366	0.112	0.112
STV 4288	77	13	468	1.000	1.000
STV 5458	77	13	468	1.000	1.000
Rowden	77	13	468		1.000
M-315	77	13	468	1.000	

† Observations for PHY 485 were highly variable across the test, hence the large upper confidence limit..

Table 8. Least squares estimate of root knot egg number (counts per g of root fresh weight) for entries and checks, confidence intervals, and *P*-values based on Dunnett's versus the susceptible check Rowden and the resistant check M-315.

Cultivar	Mean	95 % Confidence Limit		Dunnett's P-value vs.	
		Lower	Upper	Rowden	M-315
DP 0949	775	347	1732	0.318	0.003
DP 1028	1092	488	2440	0.734	0.001
DP 1050	693	310	1550	0.225	0.005
FM 1740	1852	1176	2916	1.000	0.001
PHY 367	382	171	853	0.023	0.067
PHY 375	1187	531	2652	0.835	0.001
PHY 485	1170	524	2616	0.819	0.001
PHY 565	1585	1006	2495	0.980	0.001
STV 4288	893	567	1406	0.217	0.001
STV 5458	901	403	2013	0.484	0.002
Rowden	2149	962	4801		0.001
M-315	88	39	197	<.0001	

Table 9. Least squares estimate of seed cotton yield (lbs per acre) for entries and checks, confidence intervals, and *P*-values based on Dunnett's versus the susceptible check Rowden and the resistant check M-315.

Cultivar	95 % Confidence Limit			Dunnett's P-value vs.	
	Mean	Lower	Upper	Rowden	M-315
DP 0949	1176	486	1866	1.000	0.020
DP 1028	1768	1078	2458	0.793	0.272
DP 1050	2316	1626	3006	0.150	0.951
FM 1740	1804	1114	2494	0.743	0.309
PHY 367	3467	2776	4157	0.000	0.691
PHY 375	1808	1118	2498	0.738	0.313
PHY 485	1535	845	2226	0.985	0.109
PHY 565	3133	2442	3823	0.003	0.991
STV 4288	2603	1912	3293	0.042	1.000
STV 5458	2784	2094	3474	0.017	1.000
Rowden	1151	460	1841		0.017
M-315	2777	2087	3467	0.017	