

**2003**  
***National***  
***Cotton***  
***Fusarium***  
***Wilt***  
***Report***



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*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

## 2003 NATIONAL COTTON FUSARIUM WILT REPORT

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Cotton cultivars and elite breeding lines submitted by 22 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*) 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.

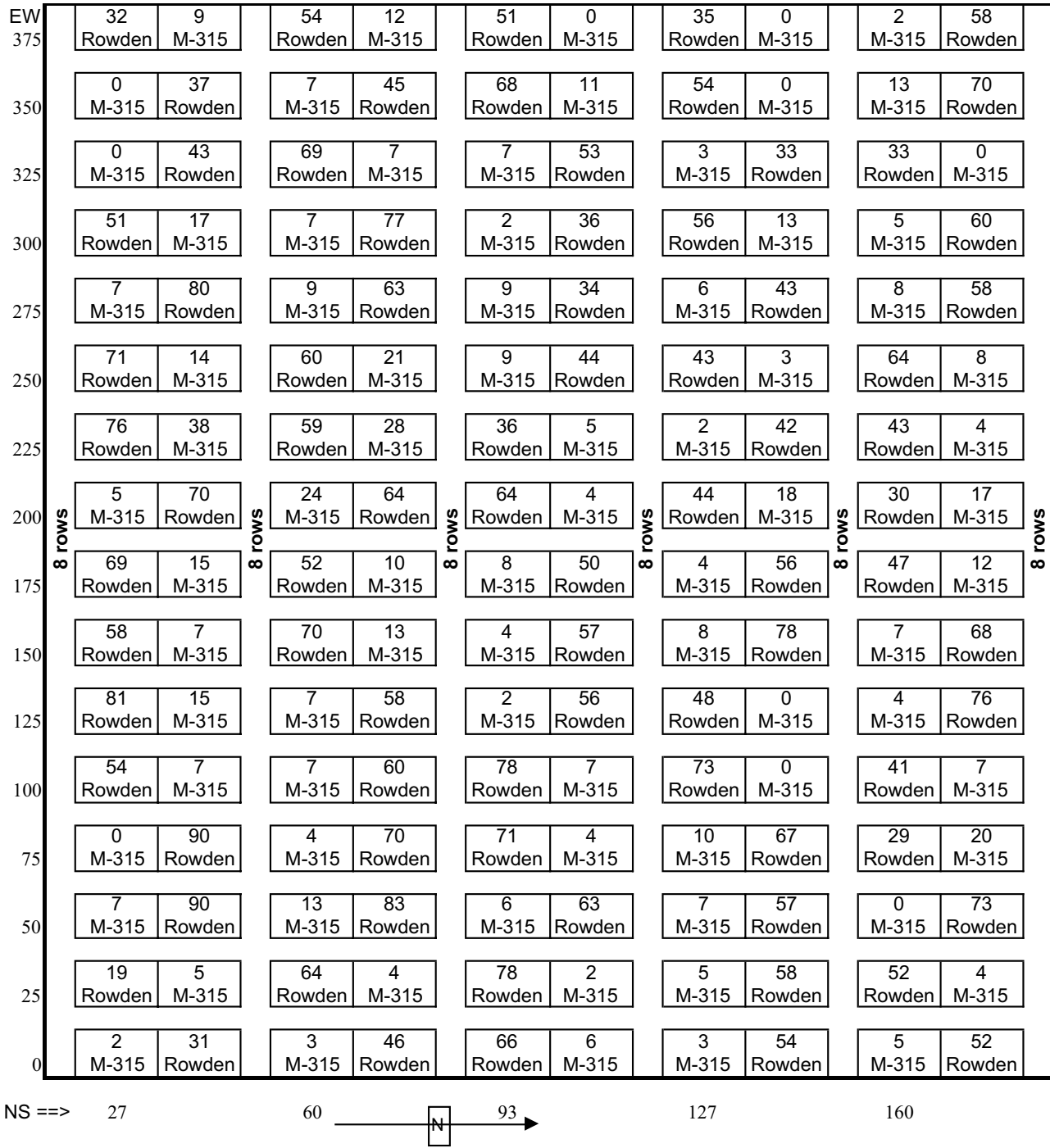
Entries were planted in single 20-foot rows on 40-inch centers, separated by 5-foot alleys. Four replications of the test entries and checks were evaluated in a randomized complete block design with a split plot restriction on randomization. The set of eight test cultivars submitted by a cooperator was 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).

Plots were planted May 21. Initial plant counts were made on June 24. Wilted plants were counted and removed on July 15, July 29, August 15, and August 29. The remaining live plants were counted and recorded on September 12. 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 56%, with a range from 19 to 90% 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 38% on an individual plot basis. There were, on the average, 7x 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.**

It was a very wet spring. Just after planting, there was excessive rainfall with water standing in the field for several days. This caused late emergence and poor stands throughout most of the test area. For this reason, there has been an extra column added labeled "Avg. no. of plants". These numbers indicate the average number of plants per 25-foot row over four replicates for a given entry.

**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.



## 2003 Fusarium Wilt Test, Plant Breeding Unit, EVSRC, Tallassee, AL

Entry	Cultivar/Line	Percent wilted plants					Avg. P-value	Avg. no. of plants
		Rep1	Rep2	Rep3	Rep4	Avg.		
Fred Bourland, University of Arkansas, P.O. Box 48, Keiser, AR 72351								
	101 FB-1	32	7	14	6	15	0.114	31
	102 FB-2	23	39	8	5	19	0.047	41
	103 FB-3	15	5	40	4	16	0.094	55
	104 FB-4	15	21	18	19	18	0.051	36
	105 FB-5	61	17	19	23	30	0.001	43
	106 FB-6	9	73	17	58	39	<.0001	24
	107 FB-7	28	45	24	16	28	0.003	44
	108 FB-8	12	44	33	6	24	0.012	51
	Rowden	66	81	80	54	70	<.0001	56
	M-315	6	15	7	12	10	0.285	59
Don Keim, Delta and Pine Land Co., P.O. Box 157, Scott, MS 38772								
	201 LMSCR-1	52	46	13	33	36	0.000	30
	202 LMSCR-2	49	10	30	7	24	0.010	45
	203 LMSCR-3	5	42	46	15	27	0.004	46
	204 LMSCR-4	63	32	35	9	35	0.000	22
	205 LMSCR-5	18	35	35	25	28	0.003	32
	206 LMSCR-6	59	11	70	12	38	<.0001	26
	207 LMSCR-7	48	29	11	5	23	0.014	42
	208 LMSCR-8	16	19	37	5	19	0.041	19
	Rowden	70	69	59	58	64	<.0001	53
	M-315	4	15	28	2	12	0.188	50
Frank Bordelon, PhytoGen Seed Company, P.O. Box 27, Leland, MS 38756								
	301 PHY-FB1	10	30	16	55	28	0.003	56
	302 PHY-FB2	4	66	5	5	20	0.033	57
	303 PHY-FB3	6	50	45	17	29	0.002	65
	304 PHY-FB4	12	26	44	19	25	0.007	57
	305 PHY-FB5	6	39	42	16	26	0.006	38
	306 PHY-FB6	5	0	11	11	7	0.455	70
	307 PHY-FB7	14	21	9	16	15	0.111	58
	308 PHY-FB8	21	6	10	16	13	0.160	57
	Rowden	46	47	64	36	48	<.0001	42
	M-315	3	12	8	2	6	0.498	51

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THE P-VALUE INDICATES THE PROBABILITY THAT THE AVERAGE WILT PERCENTAGE DIFFERS FROM ZERO.

**2003 Fusarium Wilt Test, Plant Breeding Unit, EVSRC, Tallassee, AL**

Entry	Cultivar/Line	Percent wilted plants				Avg. P-value	Avg. no. of plants	
		Rep1	Rep2	Rep3	Rep4			
Randall McPherson, PhytoGen Seed Company, P.O. Box 27, Leland, MS 38756								
401	PHY-RM1	5	20	9	19	13	0.159	48
402	PHY-RM2	11	44	7	20	20	0.029	99
403	PHY-RM3	39	39	52	15	36	0.000	96
404	PHY-RM4	24	28	15	14	20	0.030	100
405	PHY-RM5	4	24	14	24	16	0.078	102
406	PHY-RM6	17	38	8	1	16	0.087	103
407	PHY-RM7	4	64	36	35	35	0.000	71
408	PHY-RM8	8	18	26	29	20	0.031	96
	Rowden	64	41	44	51	50	<.0001	59
	M-315	4	7	9	17	9	0.327	54
Gary L. Rea, Delta and Pine Land Co., 247 US HWY 380 W, Haskell, TX 79521								
501	GLR-1	33	52	46	10	35	0.000	48
502	GLR-2	83	67	45	13	52	<.0001	52
503	GLR-3	56	53	27	2	35	0.000	62
504	GLR-4	16	32	32	7	22	0.019	42
505	GLR-5	55	28	74	8	42	<.0001	71
506	GLR-6	67	14	13	1	24	0.011	67
507	GLR-7	28	31	15	0	18	0.049	59
508	GLR-8	15	17	12	8	13	0.162	62
	Rowden	90	70	58	51	67	<.0001	61
	M-315	7	13	8	0	7	0.454	57
John Green, Seed Source, Inc., P.O. Box 28, Stoneville, MS 38776								
601	SSI-1	36	30	62	53	45	<.0001	19
602	SSI-2	56	11	32	18	29	0.002	28
603	SSI-3	48	24	21	39	33	0.001	46
604	SSI-4	71	42	43	27	46	<.0001	26
605	SSI-5	40	38	21	23	30	0.001	53
606	SSI-6	9	20	11	39	20	0.037	41
607	SSI-7	75	26	23	24	37	0.000	17
608	SSI-8	63	24	44	37	42	<.0001	27
	Rowden	67	48	60	56	58	<.0001	43
	M-315	10	0	21	13	11	0.239	48

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## 2003 Fusarium Wilt Test, Plant Breeding Unit, EVSRC, Tallassee, AL

Entry	Cultivar/Line	Percent wilted plants					Avg. P-value	Avg. no. of plants
		Rep1	Rep2	Rep3	Rep4			
Richard Sheetz, Delta and Pine Land Co., RR 2, Box 60, Hale Center, TX 79041								
	701 RHS-1	45	49	32	2	32	0.001	42
	702 RHS-2	22	43	32	4	25	0.007	54
	703 RHS-3	8	33	18	12	18	0.055	65
	704 RHS-4	37	49	22	0	27	0.004	36
	705 RHS-6	38	50	12	4	26	0.006	50
	706 RHS-7	60	47	50	10	42	<.0001	41
	707 RHS-8	58	30	29	2	30	0.002	46
	708 RHS-8	38	33	8	36	29	0.002	44
	Rowden	57	73	36	32	50	<.0001	62
	M-315	7	0	5	9	5	0.558	65
Curtis Williams, Delta and Pine Land Co., 381 William Gibbs Rd, Tifton, GA 31794								
	801 CW-1	29	36	12	18	24	0.011	49
	802 CW-2	37	13	9	27	22	0.021	48
	803 CW-3	4	11	11	13	10	0.291	62
	804 CW-4	72	33	46	7	40	<.0001	56
	805 CW-5	9	13	38	5	16	0.078	57
	806 CW-6	2	61	59	87	52	<.0001	77
	807 CW-7	2	34	24	20	20	0.031	65
	808 CW-8	7	39	32	65	36	0.000	46
	Rowden	31	78	63	43	54	<.0001	56
	M-315	2	8	9	0	5	0.604	46
Steve Calhoun, Stoneville Pedigreed Seed Co., Rt. 2, Box 233, Hwy 82 East, Idalou, TX 79239								
	901 SC1	35	39	32	15	31	0.001	39
	902 SC2	37	54	11	18	30	0.002	28
	903 SC3	71	31	16	0	29	0.002	29
	904 SC4	76	82	13	5	44	<.0001	57
	905 SC5	72	57	73	2	51	<.0001	58
	906 SC6	20	10	5	17	13	0.163	58
Kathryn M. Glass, Dept. of Agronomy & Soils, Auburn University, AL 36849-5412								
	907 Stoneville ST 4892BR	7	22	52	3	21	0.026	38
	908 Stoneville ST 4793R	15	24	35	8	20	0.031	40
	Rowden	73	68	64	54	65	<.0001	52
	M-315	0	7	4	0	3	0.779	52

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## 2003 Fusarium Wilt Test, Plant Breeding Unit, EVSRC, Tallassee, AL

Entry	Cultivar/Line	Percent wilted plants					Avg. P-value	Avg. no. of plants
		Rep1	Rep2	Rep3	Rep4			
Jack E. Jones, Jajo Genetics, 246 Maxine Dr., Baton Rouge, LA 70808-6831								
1001	Jajo 1	51	38	26	54	42	<.0001	39
1002	Jajo 2	16	37	24	10	22	0.021	49
1003	Jajo 3	64	10	57	22	38	<.0001	32
1004	Jajo 4	80	32	17	26	39	<.0001	38
1005	Jajo 5	56	33	40	37	41	<.0001	41
1006	Jajo 6	8	14	10	33	16	0.079	36
1007	Jajo 7	36	45		11	30	0.003	47
1008	Jajo 8	27	35	63	34	40	<.0001	35
	Rowden	29	76	64	33	51	<.0001	33
	M-315	20	4	24	0	12	0.200	56
Dawn Fraser, Delta and Pine Land Co., P.O. Box 1529, Hartsville, SC 29550								
1101	DF-1	31	43	18	2	24	0.012	48
1102	DF-2	6	7	20	9	10	0.261	34
1103	DF-3	27	40	7	8	20	0.029	39
1104	DF-4	33	24	63	22	36	0.000	27
1105	DF-5	22	17	75	2	29	0.002	42
1106	DF-6	11	10	11	7	10	0.307	45
1107	DF-7	7	19	13	8	12	0.214	37
1108	DF-8	8	30	39	23	25	0.008	43
	Rowden	63	54	42	53	53	<.0001	51
	M-315	6	7	2	7	5	0.566	57
Doug Wessel, Delta and Pine Land Co., 38768 W. Farrell Rd, Maricopa, AZ 85239								
1201	DW-1	27	19	18	10	18	0.052	52
1202	DW-2	20	21	38	19	24	0.010	27
1203	DW-3	7	27	22	35	23	0.015	43
1204	DW-4	93	16	14	64	47	<.0001	50
1205	DW-5	85	18	3	55	40	<.0001	49
1206	DW-6	14	17	13	1	11	0.221	69
1207	DW-7	26	11	20	3	15	0.113	74
Johnie Jenkins, USDA-ARS, Mississippi State, MS 39762								
1208	JJ-5	24	20	49	8	25	0.007	53
	Rowden	58	56	43	70	57	<.0001	50
	M-315	5	2	4	13	6	0.530	54

*continued*



## 2003 Fusarium Wilt Test, Plant Breeding Unit, EVSRC, Tallassee, AL

Entry	Cultivar/Line	Percent wilted plants					Avg. P-value	Avg. no. of plants
		Rep1	Rep2	Rep3	Rep4	Avg.		
Chris Tinius, Stoneville Pedigreed Seed Co., 7622 Moore Road, Memphis, TN 38120								
1301	CT1	31	30	4	15	20	0.032	26
1302	CT2	75	71	40	30	54	<.0001	23
1303	CT3	29	57	15	83	46	<.0001	6
1304	CT4	23	48	8	10	22	0.018	42
1305	CT5	33	74	14	42	41	<.0001	24
1306	CT6	19	24	9	39	23	0.015	33
1307	CT7	15	28	21	25	22	0.018	36
1308	CT8	20	25	13	17	18	0.050	30
	Rowden	83	58	34	60	59	<.0001	43
	M-315	13	7	9	5	8	0.370	43
Mark Barfield, Stoneville Pedigreed Seed Co., 2409 Commerce Lane, Albany, GA 31707								
1401	MB1	19	6	39	10	18	0.049	31
1402	MB2	29	7	58	5	25	0.008	40
1403	MB3	58	21	48	34	41	<.0001	29
1404	MB4	16	28	53	8	26	0.005	36
1405	MB5	30	26	20	10	22	0.022	48
1406	MB6	20	31	62	10	31	0.001	42
Kathryn M. Glass, Dept. of Agronomy & Soils, Auburn University, AL 36849-5412								
1407	Stoneville ST 5599BR	18	6	43	2	17	0.068	56
1408	Stoneville ST 5303R	7	33	32	0	18	0.052	48
	Rowden	71	60	44	68	61	<.0001	65
	M-315	4	7	18	11	10	0.280	54
Al Balducci, Stoneville Pedigreed Seed Co., 7622 Moore Rd, Memphis, TN 38120								
1501	AB1	13	59	3	0	19	0.045	38
1502	AB2	32	9	30	17	22	0.021	36
1503	AB3	39	45	23	17	31	0.001	24
1504	AB4	14	61	7	11	24	0.012	35
1505	AB5	18	57	28	25	32	0.001	8
1506	AB6	9	83	22	18	33	0.001	40
Kathryn M. Glass, Dept. of Agronomy & Soils, Auburn University, AL 36849-5412								
1507	Sure Grow 215BG/RR	29	54	50	24	39	<.0001	45
1508	Sure Grow 521R	44	9	22	18	23	0.013	38
	Rowden	52	52	43	77	56	<.0001	44
	M-315	4	10	3	7	6	0.534	61

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## 2003 Fusarium Wilt Test, Plant Breeding Unit, EVSRC, Tallassee, AL

Entry	Cultivar/Line	Percent wilted plants					Avg. P-value	Avg. no. of plants
		Rep1	Rep2	Rep3	Rep4			
Randy Wood, Stoneville Pedigreed Seed Co., P.O. Box 569, Maricopa, AZ 85239								
1601	RW1	13	21	55	41	32	0.001	39
1602	RW2	15	37	59	32	36	0.000	34
1603	RW3	43	52	25	25	36	0.000	32
1604	RW4	21	21	52	9	26	0.006	33
1605	RW5	0	19	30	0	12	0.183	28
1606	RW6	34	22	70	33	40	<.0001	58
Kathryn M. Glass, Dept. of Agronomy & Soils, Auburn University, AL 36849-5412								
1607	Fiber Max FM 989BR	61	15	73	25	43	<.0001	53
1608	Fiber Max FM 960BR	20	17	88	30	39	<.0001	56
	Rowden	19	58	76	45	49	<.0001	56
	M-315	5	7	38	7	14	0.128	44
Lloyd McCall, Stoneville Pedigreed Seed Co., 7622 Moore Rd, Memphis, TN 38120								
1701	LM1	34	23	22	15	24	0.012	40
1702	LM2	40	11	23	23	25	0.009	73
1703	LM3	49	73	55	10	47	<.0001	50
1704	LM4	38	28	19	6	23	0.016	54
1705	LM5	11	23	32	18	21	0.026	57
1706	LM6	55	17	24	11	27	0.004	55
Kathryn M. Glass, Dept. of Agronomy & Soils, Auburn University, AL 36849-5412								
1707	Deltapine DP 448B	61	2	29	0	23	0.014	37
1708	Deltapine DP 444BG/RR	86	21	8	2	29	0.002	63
	Rowden	54	57	70	37	54	<.0001	76
	M-315	3	4	5	0	3	0.743	62
Mike Robinson, Stoneville Pedigreed Seed Co., 4852 Old Leland Rd, Leland, MS 38776								
1801	MR1	36	16	12	39	26	0.006	23
1802	MR2	12	18	14	21	16	0.078	52
1803	MR3	22	18	31	17	22	0.019	47
1804	MR4	10	0	44	11	16	0.081	35
1805	MR5	13	53	43	6	29	0.002	54
1806	MR6	19	8	4	2	8	0.370	42
Kathryn M. Glass, Dept. of Agronomy & Soils, Auburn University, AL 36849-5412								
1807	Deltapine DP 458BG/RR	22	0	51	4	19	0.039	47
1808	Deltapine DP 451B/RR	40	13	38	5	24	0.010	38
	Rowden	90	50	43	69	63	<.0001	49
	M-315	0	8	6	7	5	0.561	67

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## 2003 Fusarium Wilt Test, Plant Breeding Unit, EVSRC, Tallassee, AL

Entry	Cultivar/Line	Percent wilted plants				Avg. P-value	Avg. no. of plants	
		Rep1	Rep2	Rep3	Rep4			
Charlie Cook, Syngenta Seeds, Inc., 356 Hosek Rd., Victoria, TX 77905-5636								
1901	SYN-CC1	44	67	74	16	50	<.0001	43
1902	SYN-CC2	70	10	67	0	37	<.0001	42
1903	SYN-CC3	38	18	77	15	37	<.0001	46
1904	SYN-CC4	24	24	61	55	41	<.0001	55
1905	SYN-CC5	16	23	45	56	35	0.000	43
1906	SYN-CC6	12	20	77	9	30	0.002	33
1907	SYN-CC7	46	43	17	2	27	0.004	51
1908	SYN-CC8	16	17	31	43	27	0.004	53
	Rowden	52	78	71	33	59	<.0001	21
	M-315	5	7	14	3	7	0.443	58
Bon Prince, Syngenta Seeds, Inc., 356 Hosek Rd., Victoria, TX 77905-5636								
2001	SYN-BP1	19	30	33	21	26	0.006	67
2002	SYN-BP2	38	72	59	10	45	<.0001	67
2003	SYN-BP3	17	61	40	7	31	0.001	74
2004	SYN-BP4	38	57	38	14	37	0.000	63
Johnie Jenkins, USDA-ARS, Mississippi State, MS 39762								
2005	JJ-1	3	59	39	26	32	0.001	43
2006	JJ-2	42	2	41	4	22	0.017	47
2007	JJ-3	20	56	33	31	35	0.000	58
2008	JJ-4	13	59	50	8	33	0.001	61
	Rowden	78	56	30	35	50	<.0001	57
	M-315	2	4	17	0	6	0.533	52