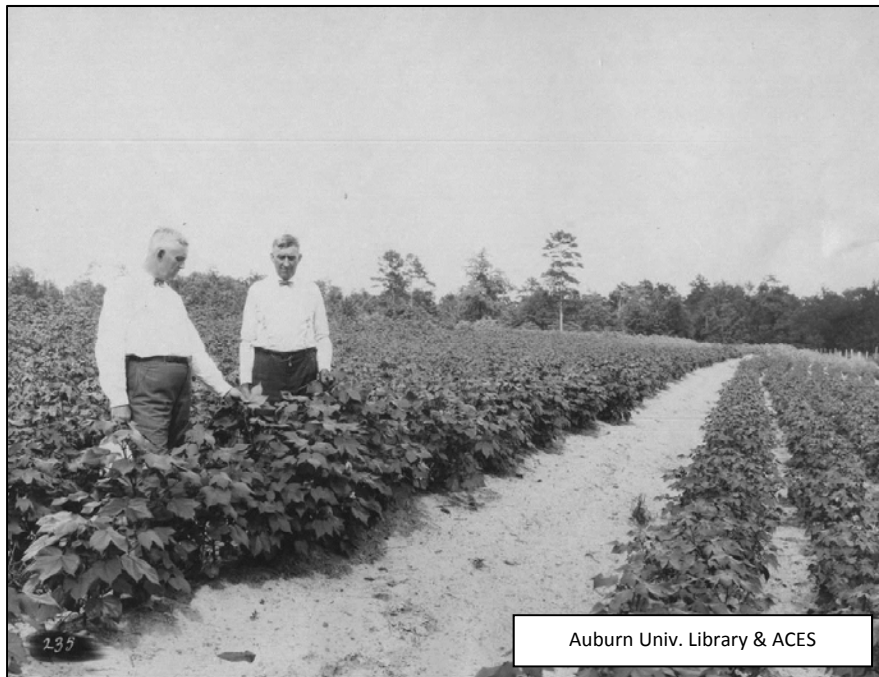


2015 National Cotton Fusarium Wilt Report



Dept. Series No. CSES2015:WILT
Dr. John Beasley, Dept. Head
Crop, Soil and Environmental Sciences
Dr. Art Appel, Director Ala. Agric. Exp. Station
Auburn University, Auburn AL
November 2015

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. Information contained herein is available to all persons regardless of race, color, sex, or national origin.

2015 National Cotton Fusarium Wilt Report

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Cotton cultivars and elite breeding lines submitted by seven 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 2014, a soil analysis for nematodes revealed that southern root-knot was the predominant nematode species in the test plots. The south Fusarium wilt area contains a population of *M. incognita* that ranges from 28 to 1694 eggs and J2's per gram of root with a mean of 409. Other nematode genera present are stubby root (*Trichodorus sp.*) stunt (*Tylenchorhynchus sp.*), and spiral (*Helicotylenchus sp.*). Root-knot nematodes, however, appear to be causing the crop 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.

Methods.

For the National Fusarium Wilt Trial, 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 experimental design. Each test cultivar group submitted by the breeder was evaluated as a separate trial. Both susceptible ('Rowden') and resistant ('M-315') cultivars were included as check plots and were randomized independently with each group.

Initial plant stand was recorded on June 23, 2015. The number of wilted plants were recorded and subsequently removed on July 8, July 22, August 4, August 19, and September 2. Final plant-stand was recorded on September 15. Percent remaining plants was then determined by comparing the final stand to that recorded on June 23.

Results.

Tables 1 through 9 reflect the effect that Fusarium wilt had on the varieties included in the trial. Cotton breeders that had entries in the trials included: Bourland (Table 1); Cook (Tables 2, 3, and 4), Fraser (Table 5, 6, and 7); Johnson (Table 8); and McPherson (Table 9).

E.V. Smith Research and Extension Center, Plant Breeding Unit, Tallassee

Greg Pate, Director

Jason Burkett, Associate Director



Table 1. Cotton Fusarium wilt trial results, Alabama 2015.								
Investigator: Fred Bourland, Univ. of Arkansas								
Cultivar	Plant sampling date							Disease
	June23	July8	July22	Aug4	Aug19	Sep2	Sep15	incidence
	Initial stand	Affected plants/plot					Final stand	%
FB-1	84.3	0.5	0.5	0	0	0	80.5	1.2
FB-2	84.5	1	0.25	0.25	0	0.25	81.75	2.1
FB-3	84.3	0.25	0.5	0.25	0.25	0.25	79.5	1.8
FB-4	88.5	1.5	0.25	0.25	0.5	1.75	84.75	4.8
FB-5	88.5	2.5	0.25	0.25	0.25	0	83.5	3.7
FB-6	86	1.75	0.25	0.25	1	0.25	81.25	4.1
FB-7	86.3	0	0	0	0	0	83.75	0.0
FB-8	90	0.25	0	1.25	0	0.25	86.25	1.9
Rowden	96.3	3	0.5	1.75	5.5	17.25	68.75	29.1
M-315	82.3	0.25	0	0	0	0.25	81	0.6
C.V. (%)	4.5	105.8	216.4	135.7	239.3	228.3	8.9	-
Pr>F	0.0016	0.0085	0.8097	0.0018	0.0048	0.0003	0.115	-
LSD (5%)	5.6	1.7	0.78	0.84	2.6	6.7	10.4	-

*Planted on June 1, 2015 on an Independence loamy fine sand.



Table 2. Cotton Fusarium wilt trial results, Alabama 2015.								
Investigator: C. Cook, set 1								
Cultivar	Plant sampling date							Disease
	June23	July8	July22	Aug4	Aug19	Sep2	Sep15	incidence
	Initial stand	Affected plants/plot					Final stand	%
CGC-01	88.25	0	0.25	0	0	0	86.25	0.3
CGC-02	89.5	0.75	0.5	0.25	0	0.25	86	2.0
CGC-03	91.25	1.5	0.25	0.25	0	0	86.5	2.2
CGC-04	93.75	0.5	0.25	0	0	0.5	90.75	1.3
CGC-05	86.5	0.25	0	0	0	0	84.5	0.3
CGC-06	87.75	1.25	0.5	0.25	0.5	1.75	81.5	4.8
CGC-07	91.5	1.5	0.25	0.25	0	0.75	87.75	3.0
CGC-08	90	0	0.5	0	0	0	89	0.6
Rowden	91.5	2.75	0.75	5.25	8.5	15.5	58	35.8
M-315	82	0.5	0	0.25	0.25	0	80.75	1.2
C.V. (%)	4.7	126.9	191.7	332.9	342.7	120.2	7.3	-
Pr>F	0.0345	0.0485	0.8016	0.0505	0.0001	0.0001	0.0001	-
LSD (5%)	6.1	1.7	0.9	3.1	4.6	3.3	8.7	-

*Planted on June 1, 2015 on an Independence loamy fine sand.

Table 3. Cotton Fusarium wilt trial results, Alabama 2015.								
Investigator: C. Cook, set 2								
Cultivar	Plant sampling date							Disease
	June23	July8	July22	Aug4	Aug19	Sep2	Sep15	incidence
	Initial stand	Affected plants/plot					Final stand	%
CP-01	81.5	0	0.25	0	0	0	82.5	0.3
CP-02	87	1.75	0.75	0.5	0.5	0.25	82.75	4.3
CP-03	87.25	1.25	1	0.25	0	0	85	2.9
CP-04	90	2.25	0.75	0.25	0	0	85.25	3.6
CP-05	88	0.25	0.5	0	0	0	87	0.9
CP-06	76	0.5	1	0.5	0	1.25	72	4.3
CP-07	59.75	0.5	5.5	1	0.5	0.25	52.25	13.0
CP-08	90.25	0.75	0.5	1	1	3.25	80	7.2
Rowden	89.75	2.25	1.25	3.25	18.25	10.25	52.5	39.3
M-315	81.5	0	0.25	0.25	0	0	80.75	0.6
C.V. (%)	6.4	100.9	286.1	226	138.5	118.3	11.5	-
Pr>F	0.0001	0.0075	0.5739	0.2046	0.0001	0.0001	0.0001	-
LSD (5%)	7.7	1.4	4.9	2.3	4.1	2.6	12.7	-

*Planted on June 1, 2015 on an Independence loamy fine sand.



Table 4. Cotton Fusarium wilt trial results, Alabama 2015.								
Investigator: C. Cook, set 3								
Cultivar	Plant sampling date							Disease
	June23	July8	July22	Aug4	Aug19	Sep2	Sep15	incidence
	Initial stand	Affected plants/plot					Final stand	%
JQ-01	78.75	0.75	0	0.5	0.5	2.25	71.25	5.1
JQ-02	89.25	0.5	0.75	0	0	0	87.25	1.4
JQ-03	91.75	2	1	0.5	0.75	0.5	85.75	5.2
JQ-04	89.5	0	0	0	0	0.5	87.75	0.6
JQ-05	89.75	1.25	1	0.25	1	0.5	86.5	4.5
JQ-06	88.25	0.25	0.25	0.5	0	0	85.75	1.1
JQ-07	67.5	0.5	0.25	0	0	0.25	66.5	1.5
JQ-08	72.75	1	0	0.25	0	0.25	70.25	2.1
Rowden	91.75	3.25	1.75	5	16.25	15	48.75	45.0
M-315	77.5	0.75	0	0	0	0.25	76.25	1.3
C.V. (%)	5.8	99.1	209.4	259.8	122.3	154	7.9	-
Pr>F	0,0001	0.0048	0.2738	0.0179	0.0001	0.0001	0.0001	-
LSD (5%)	7	1.5	1.5	2.6	3.3	4.4	8.8	-

*Planted on June 1, 2015 on an Independence loamy fine sand.

Table 5. Cotton Fusarium wilt trial results, Alabama 2015.

Investigator: D. Frazer, set 1

Cultivar	Plant sampling date							Disease
	June23	July8	July22	Aug4	Aug19	Sep2	Sep15	incidence
	Initial stand	Affected plants/plot					Final stand	%
DA-1	83.75	1.5	0	0	0	0	81.25	1.8
DA-3	94	2.25	0.25	0.5	0.75	3.25	86.5	7.4
DA-4	88	2.25	0.25	0	2.25	0	83.25	5.4
DA-2	93.5	2.25	2	2.5	0.75	5	78	13.4
DA-8	82.5	2	0	0	0.25	0	79	2.7
DA-7	87.75	0.75	0	0	1.75	0	85.25	2.8
DA-5	96	0.5	0	0	0	0	94.75	0.5
DA-6	84.75	1	0	0	0	0	83	1.2
Rowden	92.5	3.75	3	5.75	7.5	17.5	52.25	40.5
M-315	84.5	0.25	0.25	2.25	0	0	79	3.3
C.V. (%)	5.1	99.3	275.5	165.1	268.3	158.8	6.6	-
Pr>F	0.0008	0.0948	0.1258	0.0013	0.1409	0.0001	0.0001	-
LSD (5%)	6.6	2.2	2.3	2.6	5.2	5.9	7.6	-

*Planted on June 1, 2015 on an Independence loamy fine sand.

**Table 6. Cotton Fusarium wilt trial results, Alabama 2015.**

Investigator: D. Frazer, set 2

Cultivar	Plant sampling date							Disease
	June23	July8	July22	Aug4	Aug19	Sep2	Sep15	incidence
	Initial stand	Affected plants/plot					Final stand	%
DA-10	88.5	0.25	0	0	0.25	0	85.75	0.6
DA-11	80	0.25	0.25	0	0	0	77.75	0.6
DA-12	80	1	0.5	0	1.25	0.5	77.25	4.1
DA-13	80.75	2	0.5	0.5	0	1	74.75	5.0
DA-14	83	0.75	0	0	0	0	81.75	0.9
DA-15	84.25	0.5	0	0	0	0	83	0.6
DA-16	93	0	0.5	0	0	0	92.75	0.5
DA-09	85.75	1.25	0.25	0.25	0	0.25	83.5	2.3
Rowden	90	2.5	1	0.5	7.25	15	62.5	29.2
M-315	78.5	0	0.25	0	0	0	76.75	0.3
C.V. (%)	7.1	104.5	177.4	295.2	201.3	167.6	8.5	-
Pr>F	0.0252	0.0041	0.3475	0.2696	0.0001	0.0001	0.0002	-
LSD (5%)	8.7	1.3	0.84	0.54	2.6	4.1	9.8	-

*Planted on June 1, 2015 on an Independence loamy fine sand.

Table 7. Cotton Fusarium wilt trial results, Alabama 2015.

Investigator: D. Frazer, set 3

Cultivar	Plant sampling date							Disease
	June23	July8	July22	Aug4	Aug19	Sep2	Sep15	incidence
	Initial stand	Affected plants/plot					Final stand	%
DA-17	77	1.25	0	0	0	0	73.5	1.6
DA-18	85.5	0	0.25	0.25	0	0	82.5	0.6
DA-19	89	1	0.5	0	0	0.75	87.75	2.5
DA-20	81.5	0.25	0.25	0	0	0	80.25	0.6
DA-21	69.5	0.5	0.25	0.25	0	0	68.75	1.4
Croplan 3885 B2XF	83	0	0.25	0.5	0	0.25	80.25	1.2
DynaGro 15426 B2XF	85.25	0.75	0	0.25	0	2.25	80.5	3.8
NG 3405 B2XF	84.75	1.25	0	0	0	0	81.75	1.5
Rowden	93.5	3.5	0.25	0.75	11.75	8.5	69.25	26.5
M-315	82.75	0	0.25	0	0	0	82.25	0.3
C.V. (%)	6.4	123.8	221.5	268.7	263.1	283.8	11.4	-
Pr>F	0.0001	0.0023	0.8547	0.5208	0.0002	0.0282	0.0963	-
LSD (5%)	7.7	1.5	0.64	0.78	4.5	4.8	11.9	-

*Planted on June 1, 2015 on an Independence loamy fine sand.



Table 8. Cotton Fusarium wilt trial results, Alabama 2015.

Investigator: J. Johnson

Cultivar	Plant sampling date							Disease
	June23	July8	July22	Aug4	Aug19	Sep2	Sep15	incidence
	Initial stand	Affected plants/plot					Final stand	%
PHY-JJ1	89	1	0	0	0.25	0	86.25	1.4
PHY-JJ2	89	0.75	0.25	0.25	0	0.25	87	1.7
PHY-JJ3	93.25	2	0.5	0.25	0	0.75	88	3.8
PHY-JJ4	90	1.25	0.25	0	0	0	87.5	1.7
PHY-JJ5	88	1	0	0	0.25	0	86	1.4
PHY-JJ6	92.5	2.5	0	0	0.25	0	86	3.0
PHY-JJ7	85.5	0.25	0.25	0.25	0	0	83.75	0.9
PHY-JJ8	91	1.25	0.25	0	0	0	87.5	1.6
Rowden	94.25	3.25	0.5	0.75	13	20.75	57.25	40.6
M-315	82.25	1	0	0	0	0	81	1.2
C.V. (%)	4.4	125	210.8	346.7	215.3	71.9	6.6	-
Pr>F	0.0062	0.4519	0.5585	0.5681	0.0001	0.0001	0.0001	-
LSD (5%)	5.7	2.6	0.6	0.8	4.3	2.3	7.9	-

*Planted on June 1, 2015 on an Independence loamy fine sand.

Table 9. Cotton Fusarium wilt trial results, Alabama 2015.

Investigator: M. McPherson

Cultivar	Plant sampling date							Disease
	June23	July8	July22	Aug4	Aug19	Sep2	Sep15	incidence
	Initial stand	Affected plants/plot					Final stand	%
PHY- MM1	87.5	0.5	0.25	0.25	0	0.25	85.25	1.4
PHY- MM2	89	2.25	0.25	0.25	0.25	0.25	83	3.7
PHY- MM3	93.25	2.75	0	0.25	0.25	2.25	86.25	5.9
PHY- MM4	89	0	0.5	0	0	0	86.5	0.6
PHY- MM5	88	0.25	0.25	0	0	0	85.75	0.6
PHY- MM6	92.5	1	0	0	0	0.25	89.5	1.4
PHY- MM7	90.5	0.5	0	0	0	0.5	88.75	1.1
PHY- MM8	86.5	0.5	0	0	0	0	83.5	0.6
Rowden	87.5	2	2.25	1.5	11.25	17	51.25	38.9
M-315	85.25	0	0.5	0.25	0	0	85.25	0.9
C.V. (%)	6.2	152.6	330.5	327.5	293.4	227.5	11.2	-
Pr>F	0.5781	0.1162	0.4251	0.3114	0.0017	0.0004	0.0004	-
LSD (5%)	8	2.2	1.9	1.2	5	6.8	14.2	-

*Planted on June 1, 2015 on an Independence loamy fine sand.



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