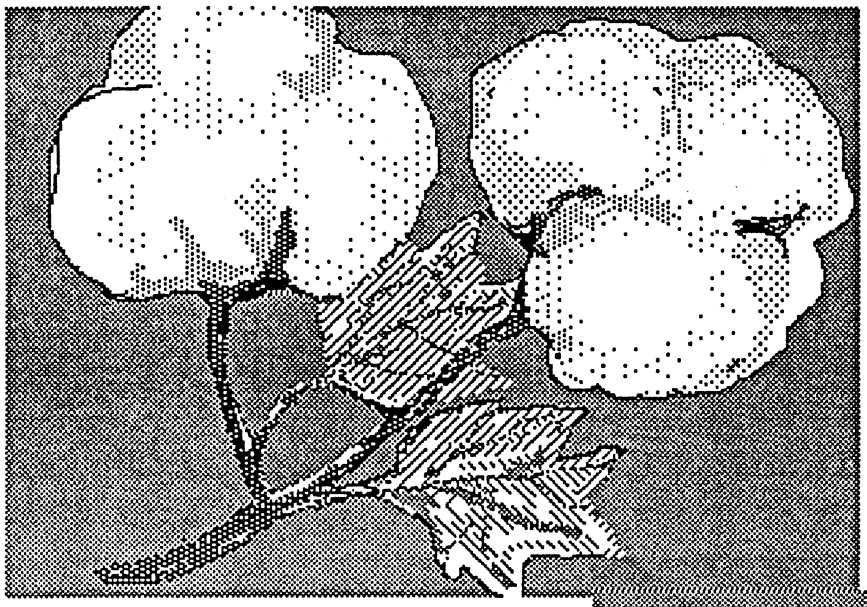
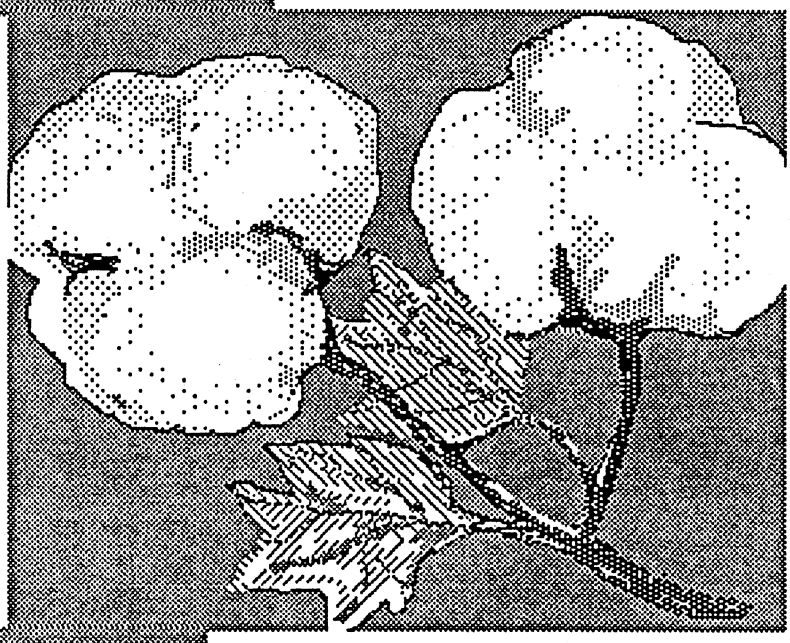
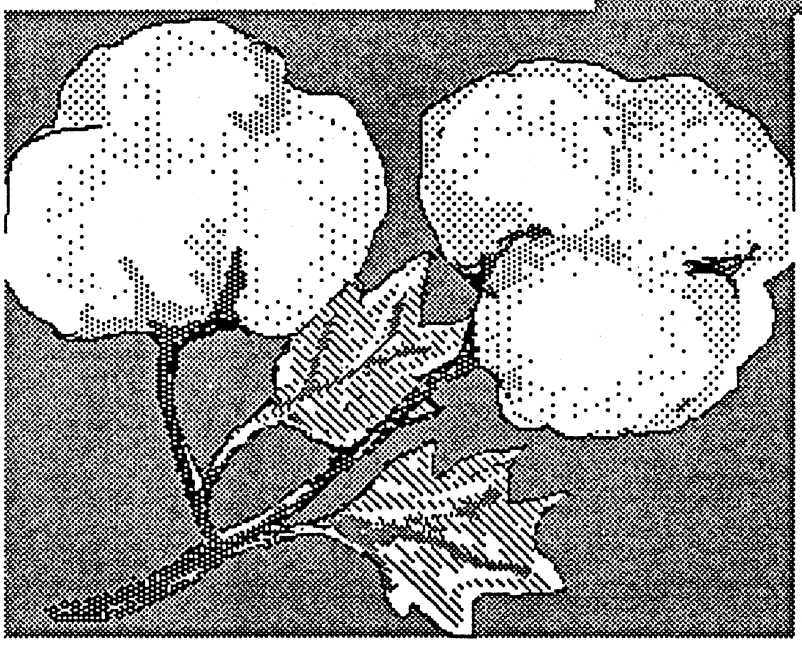


1987 Regional Cotton Fusarium Wilt Report





Agronomy and Soils
Departmental Series No. 119

Alabama Agricultural Experiment Station
Lowell T. Frobish, Director
Auburn University
Auburn University, Alabama
in cooperation with
Crop Science Research Laboratory,
USDA - ARS,
Mississippi State, Mississippi

1987 REGIONAL COTTON FUSARIUM WILT REPORT [1]

W. C. Johnson [2]

Cotton cultivars and elite breeding lines submitted by 22 cooperators were evaluated for fusarium wilt resistance under field conditions at the Plant Breeding Unit, Tallassee, Alabama. These entries were grown on an Independence loamy fine sand highly infested with both the fusarium wilt fungus (Fusarium oxysporum) Schlect. f. vasinfectum [Atk.] Snyd. & Hans.) and root-knot nematodes (Meloidogyne spp.).

Plots were 40-inch-wide bedded rows, 30 feet in length, separated by 6-foot alleys. Four replications of the test entries and checks, arranged in a block design, were evaluated. Both susceptible (Rowden) and resistant (McNair 235) cultivars were included as checks. Rowden was planted in row 5 and every tenth row thereafter (15, 25,..., 235) and McNair 235 in row 10 and every tenth row thereafter (20, 30,..., 240) throughout the test. Plots were planted May 12. Missing plots were replanted on June 9. Initial plant counts were made on June 24. Wilted plants were also counted and removed on that date. Later, wilted plants were counted and removed on July 15, July 31, and August 14. The remaining live plants were also counted and recorded on August 14.

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[1] This report is a joint contribution between USDA-ARS, Crop Science Research Laboratory, Mississippi State, Mississippi, and the Alabama Agricultural Experiment Station, Auburn University, Alabama.

[2] Professor of Agronomy and Soils.

Percent wilted plants per plot was then determined and mean wilting for a given entry calculated. Even with replanting certain plots, poor stands were obtained more frequently than usual. This was especially evident for Rowden. The fusarium wilting percentages for these plots were estimated by the method outlined by Kappelman [3].

The incidence of wilt was the highest ever recorded within the experimental area and was not excessively variable, appearing to be more or less randomly distributed. Average wilting of the susceptible Rowden was 87.8, 92.4, 90.6, and 92.2 percent for each of the four replications. The mean incidence of wilting in the resistant check, McNair 235, was 46.7, 49.9, 54.2, and 60.7 percent in the corresponding replications. The long term average for McNair is 12.7 percent wilting. Critical evaluation of a given entry should be made relative to the checks closest to the entry within each replication. Evaluation of breeding progress or evaluation of entries over years should be made only between the relative value of this entry and that of the closest susceptible check rows for each year.

Entries submitted by W. C. Johnson are commonly grown cultivars or advanced commercial materials. Thus, these entries are listed by name. Entries submitted by other cooperators are listed by their coded numbers. Additional information regarding the genetic background of a specific coded entry should be obtained from the named cooperator.

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[3] Kappelman, A. J., 1976. Estimating fusarium wilt reaction of cotton genotypes. Crop Sci. 16: 734-736.

ACKNOWLEDGMENT

The author expresses appreciation to A. J. Kappelman, Jr., retired, for advice and technical assistance in conducting the test and preparing this report.

1987 Regional Cotton Fusarium Wilt Test,
Plant Breeding Unit, Tallassee, Alabama

Test entry designation	Percent wilt by replication 1	2	3	4	Mean
Robert R. Bridge, MSU, DES, P.O. Box 197, Stoneville, MS 38776					
RRB-1	18	52	83	84	59
RRB-2	8	56	82	64	52
RRB-3	8	94	100	94	96
RRB-4	43	84	95	98	80
Rowden	96	100	98	100	98
RRB-5	52	81	82	85	75
RRB-6	21	54	86	94	64
RRB-7	30	62	60	63	54
RRB-8	28	75	76	44	56
McNair 235	17	66	61	81	56
Richard Sheetz, Cargill Seed Div., Box 1630, Plainview, TX 79072					
1	50	52	56	96	64
2	23	29	57	72	45
3	74	82	94	91	85
4	56	87	58	69	68
Rowden	93	100	100	92	96
5	85	90	80	45	75
6	24	69	68	18	45
7	36	51	62	55	51
8	82	63	96	78	80
McNair 235	44	48	35	63	48
Lynn McDonald, Stoneville Pedigreed Seed Co., P.O. Box 167 Stoneville, MS 38776					
1	99	86	87	95	92
2	95	100	98	99	98
3	71	87	71	90	80
4	83	78	19	91	68
Rowden	80	100	91	96	92
5	84	89	13	100	72
6	65	90	34	90	70
7	82	95	15	99	73
8	70	66	4	72	53
McNair 235	51	52	13	57	43

1987 Regional Cotton Fusarium Wilt Test,
Plant Breeding Unit, Tallassee, Alabama

Test entry designation	Percent wilt by replication 1	2	3	4	Mean
Keith Jones, Delta & Pine Land Co., P.O. Box 157, Scott, MS 38772					
1	71	51	21	74	54
2	39	44	8	48	35
3	45	33	6	53	34
4	84	59	23	45	53
Rowden	95	97	97	99	97
5	63	80	30	74	62
6	48	59	17	70	48
7	17	46	66	79	52
8	74	87	76	89	82
McNair 235	29	55	71	91	62
Mason Hawkins, Ranger Seed Co., Box 1288, Tahoka, TX 79373					
RSC-1	50	40	46	37	43
RSC-2	80	63	84	54	70
RSC-3	84	83	75	63	76
RSC-4	45	65	31	34	44
Rowden	84	100	80	50	78
RSC-5	73	72	94	80	80
RSC-6	95	100	99	71	91
RSC-7	53	70	53	80	64
RSC-8	68	74	52	74	67
McNair 235	56	38	57	97	62
Laval M. Verhalen, Dept. Agronomy, Oklahoma State University, Stillwater, OK 74078					
OKLA-1	88	30	88	75	70
OKLA-2	73	38	84	58	63
OKLA-3	11	10	23	14	14
OKLA-4	32	15	35	25	27
Rowden	94	100	86	72	88
OKLA-5	32	33	43	10	30
OKLA-6	46	23	20	67	39
OKLA-7	53	12	19	14	24
OKLA-8	40	53	60	29	46
McNair 235	73	37	52	53	54

1987 Regional Cotton Fusarium Wilt Test,
Plant Breeding Unit, Tallassee, Alabama

Test entry designation	Percent wilt by replication 1	2	3	4	Mean
W. P. Sappenfield, P.O. Box 160, Portageville, MO 63873					
MO-1	58	11	39	32	35
MO-2	64	44	83	83	68
MO-3	68	21	61	37	47
MO-4	49	18	59	50	44
Rowden	97	78	98	77	88
MO-5	48	29	38	48	41
MO-6	65	39	68	59	58
MO-7	82	37	52	70	60
MO-8	31	52	44	51	44
McNair 235	71	77	73	78	75
P. M. Thaxton, Dept. Plant Path., Texas A & M University, College Station, TX 77843-2132					
PT-1	94	74	82	99	87
PT-2	82	74	73	95	81
PT-3	85	83	91	86	86
PT-4	35	74	75	96	70
Rowden	90	99	83	100	93
PT-5	61	57	60	86	66
PT-6	69	73	74	89	76
PT-7	97	92	93	95	94
PT-8	99	96	89	76	90
McNair 235	37	88	50	47	56
Kamal M. El-Zik, Dept. Plant Path., Texas A & M University, College Station, TX 77843-2132					
KME-1	88	96	98	92	94
KME-2	16	82	68	42	52
KME-3	79	92	96	81	87
KME-4	59	55	20	16	38
Rowden	97	97	85	88	92
KME-5	79	69	73	35	64
KME-6	62	79	54	16	53
KME-7	77	30	39	70	54
KME-8	90	71	89	57	77
McNair 235	43	10	31	74	40

1987 Regional Cotton Fusarium Wilt Test,
Plant Breeding Unit, Tallassee, Alabama

Test entry designation	Percent wilt by replication 1	2	3	4	Mean
Fred M. Bourland, Dept. Agronomy, P.O. Box 5248, Mississippi State, MS 39762					
FB-1	89	68	55	78	72
FB-2	11	48	89	20	42
FB-3	33	39	66	96	58
FB-4	75	75	93	77	80
Rowden	88	87	83	97	89
FB-5	32	40	30	45	37
FB-6	27	37	45	64	43
FB-7	70	79	87	91	82
FB-8	67	80	78	98	81
McNair 235	42	52	14	66	44
Henry W. Webb, Coker's Pedigreed Seed Co., Hartsville, SC 29505					
C-1	28	80	67	63	60
C-2	67	92	58	81	74
C-3	29	63	32	35	40
C-4	62	97	52	66	69
Rowden	90	100	100	90	95
C-5	52	36	75	48	53
C-6	76	79	77	87	80
C-7	54	83	44	60	60
C-8	76	78	43	48	61
McNair 235	60	48	55	92	64
Shelby H. Baker, Georgia Coastal Plain Exp. Station, P.O. Box 748, Tifton, GA 31793-0748					
GaT-1	34	38	41	87	50
GaT-2	30	84	54	53	55
GaT-3	77	81	62	77	74
GaT-4	86	62	63	100	78
Rowden	71	93	88	100	88
GaT-5	87	82	80	56	76
GaT-6	67	89	98	55	77
GaT-7	50	77	82	73	71
GaT-8	35	75	85	45	60
McNair 235	45	44	75	48	53

1987 Regional Cotton Fusarium Wilt Test,
Plant Breeding Unit, Tallassee, Alabama

Test entry designation	Percent wilt by replication 1	2	3	4	Mean
Joel F. Mahill, GroAgri Seed Co., P.O. Box 1656, Lubbock, TX 79408					
1	69	31	21	43	41
2	81	68	79	95	81
3	54	45	41	85	56
4	41	38	44	58	45
Rowden	96	95	100	93	96
5	92	85	99	100	94
6	99	96	99	99	98
7	15	17	11	31	18
8	59	19	91	67	59
McNair 235	25	17	42	39	31
Lloyd McCall, Summit Seed Co., P.O. Box 10121, Lubbock, TX 79408					
1	71	78	69	9	57
2	51	77	82	56	66
3	77	79	78	43	69
4	96	84	93	92	91
Rowden	91	86	92	93	90
5	90	70	57	77	73
6	83	74	61	95	78
7	62	86	73	82	76
8	86	71	92	94	86
McNair 235	33	57	56	40	46
Gene Douglas, Hollandale Agr. Service, P.O. Box 397, Hollandale, MS 38748					
1702	99	95	100	100	98
1703	96	99	99	98	98
1708	97	90	90	96	93
1704	73	83	84	86	82
Rowden	65	92	88	100	85
1705	99	47	100	99	86
1707	97	100	100	100	99
1701	98	98	86	92	94
1706	99	100	97	94	98
McNair 235	39	40	52	74	51

1987 Regional Cotton Fusarium Wilt Test,
Plant Breeding Unit, Tallassee, Alabama

Test entry designation	Percent wilt by replication 1	2	3	4	Mean
Jack E. Jones, Dept. Agronomy, LSU, Baton Rouge, LA 70803-2110					
JJ-1	16	17	32	73	34
JJ-2	35	11	19	19	21
JJ-3	41	19	31	24	29
JJ-4	14	11	14	12	13
Rowden	93	92	97	98	95
JJ-5	14	7	14	12	12
JJ-6	70	50	46	44	52
JJ-7	34	46	42	21	36
JJ-8	82	82	93	74	83
McNair 235.....	21	45	21	37	31
Cynthia C. Green, Cotton Production Research Unit, P.O. Box 2131, Florence, SC 29503					
PD-5227.....	58	36	72	45	53
PD-5256.....	67	14	69	56	52
PD-5285.....	74	46	72	93	71
PD-5286.....	61	78	40	75	64
Rowden	60	89	60	100	77
PD-5358.....	28	29	31	34	30
PD-5663.....	33	36	50	76	49
PD-5485.....	66	66	62	79	68
PD-5563.....	60	74	61	77	68
McNair 235.....	44	53	94	20	53
PD-5576.....	72	67	76	85	75
PD04623-8.....	74	42	57	52	56
Rex Dunn, Dunn Seed Co., Rt. 4 Box 437, Seminole, TX 79360					
1	71	73	66	53	66
2	59	64	85	62	68
Rowden	92	92	96	100	95
3	44	97	41	50	46
4	39	60	45	25	42
5	46	44	40	96	56

1987 Regional Cotton Fusarium Wilt Test,
Plant Breeding Unit, Tallassee, Alabama

Test entry designation	Percent wilt by replication 1	2	3	4	Mean
James Olvey, Penwalt Corp., 4201 Broadway, Phoenix, AZ 81040					
1	99	98	94	99	98
McNair 235.....	55	56	81	57	62
2	65	58	95	42	65
3	88	90	92	81	88
4	95	83	73	74	81
5	95	93	90	99	94
Rowden	97	76	100	89	90
6	75	74	89	92	81
7	89	85	94	47	79
8	57	84	83	70	74
Kara A. Pearce, Campbell, West & Associates, P.O. Box 9656, Bakersfield, CA 93389					
GC-601H.....	96	69	65	62	73
GC-603H.....	87	82	86	81	84
McNair 235.....	53	64	73	92	70
R. L. Shepherd, P.O. Box 5367, Mississippi State, MS 39762					
81-29	19	47	19	26	28
83-19	42	35	40	23	35
83-500	56	44	35	30	41
83-277	28	22	21	17	22
Rowden	94	75	93	100	90
Auburn 634.....	11	9	15	13	12
83-725	50	59	23	33	41
81-92	53	41	45	49	47
83-315	11	13	12	34	18
McNair 235.....	47	46	74	60	57

1987 Regional Cotton Fusarium Wilt Test,
Plant Breeding Unit, Tallassee, Alabama

Test entry designation	Percent wilt by replication 1	2	3	4	Mean
W. C. Johnson, Dept. Agronomy and Soils, Auburn University, AL 36849					
Coker 315	88	66	83	60	74
McNair 235	74	49	60	65	62
Coker 139	88	26	55	73	60
Delcot 311	59	16	15	31	30
Tifcot 56	73	54	60	59	62
Coker 208	71	66	91	74	76
Rowden	99	82	96	88	91
Coker 118-6903	94	34	81	59	67
Delcot 344	57	63	49	25	48
Stoneville 825	98	98	98	94	97
Deltapine 20	83	36	91	70	70
McNair 235	70	45	54	45	54
Deltapine 50	49	49	75	35	52
Coker 130-6905	72	73	71	50	66
GAT 81-225	85	59	82	44	68
Deltapine 41	69	12	100	53	58
Rowden	97	96	90	94	94
Arkot 518	91	29	90	66	69
Coker 81-613	94	40	88	38	65
Stoneville 506	93	25	79	40	59
KC 380	75	79	97	33	71
McNair 235	33	50	72	29	46
Terra C-30	95	85	98	29	77
Stoneville 112	81	64	58	87	72
Delcot 390	59	61	38	85	61
DES 422	83	59	55	89	72
Rowden	69	100	100	98	92
DES 119	81	45	73	42	60
Stoneville 453	87	76	91	75	82
SV 93	46	76	15	73	52
Dunn 1002	72	76	75	82	76
McNair 235	58	61	34	52	51
PD 3	57	46	33	36	43
Sisco 772	28	81	46	13	42
McNair 220	21	26	67	52	42
Terra C-40	68	43	72	69	63
Rowden	81	91	74	100	86
SV 13	71	27	100	86	71
BR 110	73	81	97	98	87