

**BRONZE WILT COMPLEX OBSERVATIONS IN
THE 1998 AND 1999 MISSISSIPPI COTTON
VARIETY TRIALS**

J. B. Creech and J. C. Fieber

Delta Research and Extension Center

Mississippi Agricultural and Forestry Experiment

Station

Stoneville, MS

Abstract

In 1995, some cotton cultivars exhibited symptoms of a sudden wilt complex on a wide scale across the Midsouth cotton producing area. This complex was termed “bronze wilt” or “copper top” by producers and publicized in the popular farm press. Some cultivars were found to be more susceptible or exhibited more damage than others and it appeared that the short-season cultivars, that fruit early, were more susceptible to the complex. In 1998, the “bronze wilt complex” (BWC) was again observed throughout the Midsouth and was observed in cultivars that were not thought originally to be susceptible. The 1998 and 1999 Mississippi Cotton Variety Trials were rated for susceptibility to BWC. Ratings of the susceptibility were taken at multiple locations across the state. The results indicated that cultivars from several seed companies were susceptible.

Introduction

In 1995, some commercial cotton cultivars exhibited symptoms of a sudden wilt complex on a wide scale across the Midsouth. The symptoms included wilting, reddening of stems and leaves, leaf and fruit shed, and a higher temperature of the leaf tissues. This complex was termed “bronze wilt” or “copper top” by producers and publicized in the popular farm press. Some cultivars were found to be more susceptible than others and it appeared that the short-season cultivars which fruit early, were more susceptible to the “bronze wilt complex” (BWC). Apparent differences in susceptibility have been associated with soil type, fertility, and temperature (Bell, 1998; Tupper et. al., 1996). The symptoms appeared earlier and were more severe on lighter textured soils. This complex has been observed across the Southeast and Midsouth cotton producing area. The exact cause of the complex has yet to be determined.

In 1998 the BWC was again observed throughout the Midsouth and was observed in cultivars that were not previously thought to be susceptible. During the 1998 growing season, BWC was again seen in the Mississippi Cotton Variety Trials (MCVT) appearing in early July. In 1999, the first signs of BWC did not appear until August.

The 1998 and 1999 Mississippi Cotton Variety Trials, at multiple locations across the state, were rated for BWC susceptibility. The objectives of this study was to determine the severity and susceptibility of the cotton cultivars in the Mississippi Cotton Variety Trials.

Materials and Methods

Ratings of susceptibility were taken at both the Stoneville and Tribbett locations in 1998. During the 1999 season three location (Stoneville, Clarksdale, and Rolling Fork) were rated for BWC susceptibility. Each plot was rated on a scale from “0” to “5” with 0 indicating no symptoms, 3 indicating at least one wilted plant, and 5 indicating wide spread wilted plants within the plot. At all locations, the plot size was two 40-foot rows on 38- or 40-inch row spacing. The soil type at the Stoneville location was a Bosket very fine sandy loam and this site was irrigated. All other sites were grown without irrigation. The Tribbett soil type was a Forestdale/Dundee silty clay loam. The soil type at Rolling Fork was Commerce silty clay loam. The Clarksdale location was a Bosket very fine sandy loam soil type.

The first plant exhibiting BWC symptoms was observed on 10 July 1998 in a ‘Paymaster 1220 RR®’ plot at Stoneville, MS. In the following weeks, symptoms appeared in other cultivars with differing levels severity. Ratings were taken during the second week of August at both locations in 1998. In 1999 the first signs of BWC were not observed until 3 August. Ratings for all locations were taken late August to early September.

Results and Discussion

Table 1 shows the mean ratings and lint yields of the twenty cultivars with the highest bronze wilt ratings. The shaded cultivars are those determined to have BWC. A total of 85 cultivars were rated in 1998 with 70 cultivars rated in 1999. Each variety determined to be susceptible did have ‘TAMCOT SP-37’ in it’s genetic background. Some of the susceptible cultivars still yielded well. The yield range of susceptible cultivars was 649 to 1102 lbs. lint/A. Paymaster 1218 BG®/RR® led the variety trials in the 1998 Mississippi test even though it did show symptoms of the “bronze wilt complex”. In 1999, fewer cultivars exhibited the BWC symptoms compared to 1998. It is also imported to note that some cultivars that did not rate as “susceptible” did have plants exhibiting BWC symptoms but not enough to be called “susceptible”. Until a more definite cause is known and screening methods are developed, producers should be aware of the potential effects of “bronze wilt complex” in the cultivars they choose to plant.

References

Bell, A. A. 1998. Agrobacterium Bronzing and Wilt of Cotton: Epidemiology and Control. p. 268. *In* Abstracts World Cotton Research Conference-2. 6-12 Sep 1998. Hellenic Cotton Board, Athens, Greece.

Tupper, G. R., D. S. Calhoun, and M. W. Ebelhar. 1996. Sensitivity of Early-Maturing Cultivars to Potassium Deficiency. p. 625-628. *In* Proc. Beltwide Cotton Conf., Nashville, TN. 9-12 Jan. 1996. Natl. Cotton Council, Memphis, TN.

Table 1. Highest rated cultivars for “Bronze wilt complex” (BWC) in the 1998 Mississippi Cotton Variety Trials. (Creech, Stoneville, MS)

Variety	BWC rating (0-5)	Lint Yield (lb/A)
Texas 141	4.42	654
Paymaster (PM) 1215 BG	4.17	877
Stoneville 373	3.75	739
Dyna-Gro 205	3.67	649
PM 1210	3.58	906
PM 1220 BG/RR	3.17	746
PM 1220 RR	3.17	817
DPX 8C27	3.08	906
PM 1244 RR	3.00	849
PM H1215	3.00	834
PM 1218 BG/RR	2.75	1102
PM 1266	2.67	808
PM 1560 BG	2.58	1010
Fibermax 963	2.42	760
PM 1330BG	2.33	968
AgriPro AP 7114	2.17	833
Texas 300	1.92	668
SS 9802	1.83	821
SGX 890	1.58	1009
PSC 556	1.58	887
*shaded cultivars determined susceptible		
C.V. (%)	77.76	14.7
R-squared	0.67	0.7
LSD (0.05)	0.77	89

Table 2. Highest rated cultivars for “Bronze wilt complex” (BWC) in the 1999 Mississippi Cotton Variety Trials. (Creech, Stoneville, MS)

Variety	BWC rating (0-5)	Lint Yield (lb/A)
Paymaster 1218 BG/RR	3.33	1697
Paymaster 1220 BG/RR	3.11	1501
Paymaster 1220 RR	3.00	1470
HCR 7114-46	2.33	1259
Paymaster 1560 BG	1.78	1400
Seed Source 9801	1.78	1116
All-Tex Atlas	1.67	885
RGC-9811	1.22	1165
MISCOT 8806-3-2-19	1.22	1599
Deltapine 428B	1.22	1402
*shaded cultivars determined susceptible		
C.V. (%)	73.03	15.83
R-squared	0.74	0.79
LSD (0.05)	0.7	194