

COTTON VARIETY RESPONSE TO BRONZE WILT IN MISSOURI AND NORTHERN TENNESSEE

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Abstract

In 1995 bronze wilt appeared in a small number of fields in Missouri. In 1998 it appeared in many fields. In 1999 it was found only in rare instances late in the growing season. It appeared in Tennessee late in the growing season of 1999. In 1998 the predominant symptoms were bronze leaves, absence of squares, red stems, reduced plant size, rugose leaves, wilting and finally death. In 1999 the disease appeared later in the season. The predominant symptoms were red stems and leaves. Some plants had very bright red leaves. Usually the plants had squares. It was very difficult to distinguish the symptoms from drought stress. Drought stressed plants were also stunted, had red stems and wilted. Spider mites also caused reddening of the leaves giving the appearance of bronze wilt. These late appearing symptoms appear to have had little effect on the lint yield.

Varieties that contain TAMCOT SP-37 in their ancestry appear to be the most susceptible to the disease. However some other lines appear to have some susceptibility to the disease.

Introduction

In 1995 bronze wilt appeared in a small number of fields in Missouri and caused little economic damage. Bronze wilt was found in Louisiana in 1997. In 1998 many fields in Missouri and the Southeast had severe infestations of bronze wilt in mid-July. In 1999 it was found late in the season in Tennessee and only in a few fields in Missouri. Symptoms appear to vary considerably between years and locations. Damage late in the season had much less affect upon the yield than that incurred in July. Certain varieties are much more susceptible than others are. Usually, but not always the susceptible varieties are descendents of TAMCOT SP-37.

Discussion

Year to Year Comparison

In 1998 an early symptom was a bronze tint on the fully expanded leaves in the upper part of the plant; however, this is not always present. The upper leaves sometimes had a rugose appearance, which is a raised rough appearance to the areas between the midribs of the leaf. Squares were totally absent and sometimes full-sized bolls would abort. Usually

plants that do not have squares are taller than neighboring plants since there is no sink for the photosynthate produced and it is diverted to the stems. This is the case with insect damage. However, the bronze wilt plants are smaller than the neighboring plants. The stems were abnormally red. They resembled the stems of plants that had been sprayed with MSMA or DSMA. Death of some of the infected plants would occur in severely infested fields shortly after flowering. Wilting would occur but the stem would be white in the center unlike plants infested with verticillium wilt where a brown stem is found.

In 1999 symptoms were very different than in 1998. The symptoms appeared later in the season, in September instead of July. The diseased plants were severely wilted and had reddened leaves. Some plants had very bright red leaves, however squares were present. The leaves were warm to the touch. Stems were red in color. In Tennessee it was difficult to distinguish between drought stressed plants and the bronze infested plants. Plants with spider mites had reddened leaves very similar to those with bronze wilt. Some infested plants had a darkened area just below the epidermis at the juncture of the branch and main stalk. It could be found by very carefully cutting away the bark to reveal the darkened layer.

Bronze leaves are not always a good indicator of the disease. One field was showing most plants with the bronze color in late July and a fortnight later the bronze color had disappeared and no bronze symptoms were found later in the growing season.

Variety Response

Usually varieties that are affected by bronze wilt are those that are descendents of TAMCOT SP-37, an early maturing Texas variety. This is particularly important in Missouri and northern Tennessee where early maturity is needed. TAMCOT SP-37 was a very important source of genes for incorporating earliness into breeding programs. Five of the top eight varieties in the 1997 Missouri variety trials are susceptible varieties. In the 1999 Tennessee variety trials, wilt susceptible varieties performed very well in spite of the disease, which appeared late in the growing season. In Tables 1 the bronze ratings are on a scale of zero to nine with nine being a total infestation and a five having only slight economic damage. A zero is free of the disease. Table 2 is a listing of varieties that did not show any positive bronze wilt symptoms in 1998 in Missouri. Table 3 shows the bronze wilt expression in Owen Gwathmey's trials in Tennessee in 1999.

References

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Table 1. Bronze Wilt in Missouri, 1998.

Variety	Rep 1	Rep 2	Rep 3	Rep 4	Means
AgriPro 7115	0	0	0	2	0.5
Dyna-Gro 201	4	5	4	4	4.25
Stoneville 373	0	0	0	4	1
Terra 292	4	0	0	0	1
Sure-Grow X890	4	0	0	0	1
TX 300	0	4	0	0	1
TX 141	6	6	4	4	5
TX 224	0	4	0	6	2.5
Paymaster 1220RR	0	0	0	4	1
Paymaster 1220B/R	0	0	4	0	1
Paymaster 1242RR	4	0	0	2	1.5
Paymaster X9307	0	0	6	2	2
Paymaster 1218B/R	4	4	0	0	2
Paymaster 1266	4	4	0	2	2.5
Paymaster 1210	0	4	0	0	1
Paymaster 1440	0	0	4	0	1
Paymaster 1215BG	0	0	0	4	1
Paymaster 1330BG	0	0	0	4	1
Deltapine 50B	0	0	0	6	1.5

Table 2. Varieties with no bronze with symptoms.

AgriPro 6101	Stoneville 474	FiberMax 963
AgriPro6102	Stoneville 4740BG	FiberMax 819
Sure-Grow 501	Stoneville 47BXN	FiberMax 989
Sure-Grow 125	Deltapine 425RR	FiberMax 832
Sure-Grow 747	Deltapine 32B	TX 121
Sure-Grow X105	Deltapine 428B	Paymaster 1560BG
PSC 636	Deltapine 5409	Americot 2314
PSC 952	Deltapine 436RR	Terra 366
PSC 569	Deltapine 5111	Seed Source 9801
PSC 556	Deltapine 20B	
PSC 355	Deltapine X9758	

Table 3. Bronze Wilt and Lint Yields in Tennessee, 1999.

Variety	Lint (lbs/a)	Bronze Plants (mean/60' row)
Paymaster 1218B/R	1033	10.25
Sure-Grow 747	922	0.73
Sure-Grow 125B/R	890	1.61
Deltapine 20BG	888	0.75
Sure-Grow 501 B/R	871	0.86
Paymaster 1220RR	868	14.25
Sure-Grow 105	853	0.25
Deltapine 409B/R	842	1.50
Paymaster 1220B/R	840	13.25
Deltapine 428BG	833	3.25
AgriPro 7115	828	0.25
Deltapine 422B/R	828	3.25
PSC 355	827	0.50
Deltapine 388	825	0.50
Deltapine 451B/R	811	0.50
Paymaster 1560BG	799	2.25
Stoneville 474	795	1.25
Deltapine 5111	766	2.00
Deltapine 20	762	0.25
Sure-Grow 125	762	1.09
Deltapine 5409	756	0.25
Deltapine 425RR	731	2.25
Deltapine 426RR	728	4.00
Paymaster 1330BG	722	1.25
Stoneville BXN47	718	0.25
Stoneville 373	680	7.75
Terra 292	671	0.91
FiberMax 819	615	0