

**Annual Report of Progress**  
**to the**  
**MISSISSIPPI SOYBEAN PROMOTION BOARD**  
**for 1999**

**Project Title:** Evaluation of Private and Public Soybean Varieties and Breeding Lines for Resistance to Stem Canker, *Phytophthora* Root Rot, Frogeye Leaf Spot, and Other Diseases Present in the Varietal Trials.

**Project Leader:** G. L. Sciumbato

**Other Participant:**

**Objectives & Significant Accomplishments:**

1. *Determine the virulence of stem canker isolates collected in Mississippi in 1999.*

Weather conditions in most of Mississippi were not favorable for stem canker development in 1999. However, in the East Central part of the state there was a severe stem canker outbreak on several susceptible varieties and several isolates of stem canker were recovered. The recovered isolates do not appear to be more virulent than current isolates. Stem canker was observed in the susceptible line J77-339 in a few plants from several of the variety trials. None of these isolates we recovered in 1999 were from varieties resistant to stem canker. Stem canker continues to be present in many soybean fields and could become a serious problem if a susceptible variety is grown and weather conditions are favorable for disease development.

2. *To evaluate varieties submitted for testing in the Mississippi soybean variety trials in 1999 and breeding lines near release for resistance to stem canker.*

Results for the Maturity Group III are given in Table 1. In the trial, 47% of the entries were resistant, 47% of the entries were Moderately Resistant and only 6% of the entries were Moderately Susceptible to Susceptible. Some of the resistant entries may be escapes because Maturity Group III varieties may mature before stem canker has time to develop. The Maturity Group IV early and Group IV early Roundup Ready entries are given in Table 2. In this trial, 59.4% of the entries were resistant, 25% were moderately resistant, and 15.6% were moderately susceptible to very susceptible or were still segregating for resistance. Results for the Maturity Group IV late and Group IV late Roundup Ready entries are given in Table 3. In the field trial, 7.5% of the entries were resistant, 55% were Moderately Resistant, and 37.5% were moderately susceptible to very susceptible or were still segregating for

resistance. Results for the Maturity Group V early and Group V early Roundup Ready entries are given in Table 4. In the field trial, 14% of the entries were resistant, 43.9% were Moderately Resistant, and 42.1 % were moderately susceptible to very susceptible or were still segregating for resistance. Results for the Maturity Group V late and Group V late Roundup Ready entries are given in Table 5. In the field trial, 6.2% of the entries were resistant, 47.7% were Moderately Resistant, and 46.1 % were moderately susceptible to very susceptible or were still segregating for resistance. Results for the Maturity Group VI and Group VI Roundup Ready entries are given in Table 6. In the field trial, 36.8% of the entries were resistant, 26.4% were Moderately Resistant, and 36.8 % were moderately susceptible to very susceptible or were still segregating for resistance. This means that a significant number of entries especially in Maturity Groups IV-VI are moderately susceptible to susceptible and could have significant yield losses to stem canker if weather conditions were favorable for disease development. Results in second toothpick trial and in the greenhouse were similar.

4. *To evaluate varieties and advanced breeding lines submitted for testing in the Mississippi varietal trials for resistance to *Cercospora sojina*, (frog-eye leaf spot), and other disease present in the plots.*

Field and greenhouse trials were initiated to evaluate varieties for frog-eye leaf spot resistance. Plots were inoculated with the fungus. Weather conditions were favorable for disease development.

Results of the Group IV early frog-eye trial are given in Table 12. A7604 was the only entry resistant to frog-eye. Disease pressure was high in the trial and several entries rated MR. Results of the Group IV late frog-eye trial are given in Table 13. One entry, Manoken, tested resistant. Most entries were susceptible or intermediate in these trials.

Results of the Group V early frog-eye trial are given in Table 14. Only one entry, APX 567rr was resistant. Results of the Group V late frog-eye trial are given in Table 15. Only two entries, CX 580CRR and TS5879RR were resistant to frog-eye .

Results of the Group VI frog-eye trial are given in Table 15. HB 6600 and P 9692 were resistant to frog-eye leaf spot. There appears to be more resistance to frog-eye in the Maturity Group V and VI soybeans than in the Group IV soybeans. However, in all Maturity groups there is a wide range of reaction between the entries.

5. *Evaluate varieties and advanced breeding lines submitted for testing in the Mississippi varietal trials for resistance or field tolerance to the southern races of *Phytophthora soja*.*

Results of the 1999 hydroponic trials are given in Table 16 or were reported in the 1998 results. These trials conducted after the field work is finished are still in progress. A large percentage of the varieties are either mixed or still segregating. Resistance and susceptibility varied with the race evaluated.

No new *Phytophthora* isolates were made in 1999. Weather conditions were not favorable for disease development. To date, 38 isolates have been classified for race. Seven isolates were Race One, from Leflore and Washington Co. Four isolates of Race 2 came from Coahoma Co. One isolate of Race 3 came from Sunflower Co. Thirteen isolates of Race 4 were from Sunflower and Coahoma Co. Seven isolates of Race 10 were from Coahoma, Leflore, and Washington Co. One isolate of Race 7 was from Coahoma Co., and one isolate of Race 17 from Noxubee Co. In addition to the identified races, 23 isolates did not fit any race and may be new races or mixtures. We have not run a large number of the isolates. Further testing is needed to identify the unknown races.

Personnel periodically visited the state variety trials established by MAFES to look for disease development. There was a severe drought and weather conditions were not favorable to disease development except for charcoal rot in 1999. Stem canker, Frogeye leaf spot, late season *Cercospora*, and brown spot were sporadic at several locations but the disease intensity was not sufficient to obtain meaningful ratings.

The results of the Phomopsis greenhouse trials are given in Table 17. There were several entries which were 100 percent resistant to this disease.

A number of Soybean Mosaic Trials were conducted in the field in 1999. However, the weather after inoculation was very hot and no disease symptoms developed. Therefore, we conducted greenhouse trials to determine SMV resistance. The results of the greenhouse trials are given in Table 18. We are in the process of screening the entries in the 1999 Variety Trials. There are a number of entries which are resistant to SMV. However, most entries were Moderately Resistant to Intermediate.

## TEST PARAMETERS

Planting date: May 13, 1999

Location: Field 10

Cultivar: See Table

Irrigation: A needed

Plot size:

Soil type: Bosket fine sandy loam

Seeding rate: 10 seed per foot

Plot length: 15 ft

Plot width: 3.4 ft

Row spacing: 40 in

Amount harvested: None

Plot design: Randomized complete block with four replications.

Number, timing, and rates of fertilizer applications: Potash, 200 lb/A 11/15/96

Pesticide treatments: None

Timing and method of fungicide application: None

Inoculum preparation and inoculum procedure: Toothpicks were boiled three times in distilled water to remove tannins, etc; and dried. The toothpicks were placed in bottles with potato dextrose broth added to one-half the height of the toothpicks. The bottles were capped and autoclaved. After autoclaving, a plug of the fungus was aseptically placed on the top of the toothpicks. The bottles were incubated for two weeks. The toothpicks + fungus were removed from the bottle and a single toothpick was inserted into the first or second internode of the test plants. Plants were inoculated four to six weeks after planting. A total of twelve plants per replication were inoculated (48 per entry). Plants were rated eight to twelve weeks after planting. Results are the average of four replications.

Inoculation dates: Maturity group IV early, IV early Roundup Ready, IV late and IV late Roundup Ready = June 2. Maturity group V early, V early Roundup Ready, V late and V late Roundup ready = June 2 and 4. Maturity Group VI = June 5.

Rating Scale: 1 or R= No symptoms, 2 or MR= stem lesion up to 2 inches, 3 or MS= stem lesion up to 8 inches, 4 or S= stem lesion covering entire length of stem, severe leaf symptoms, 5 or VS= plant dead.

Rating Dates: Maturity Group IV early, IV early Roundup Ready, and IV late= Aug. 12, Maturity Group IV late Roundup Ready= Aug. 18. Maturity Group V early, V early Roundup Ready, V late, and V late Roundup ready= Aug. 20. Maturity group VI= Sept. 2.

Test parameters for greenhouse trials: For the greenhouse trials, soybean stems were cut and

placed in bottles and potato dextrose broth was added half way up the stems. The bottles were stoppered and autoclaved. A plug of the stem canker fungus was aseptically added and the bottles were incubated for 1-3 months. Spores were harvested by blending the perithecia in water. The spore suspension was sprayed on 3-4 week old soybean seedlings. Inoculated seedlings were incubated for 3-4 weeks and lesion development was determined using the scale described above.

Table 1. *1999 Group III Soybean Stem Canker Toothpick Trial One.* Reaction of maturity Group III soybean cultivars or breeding lines to stem canker. MAFES, Delta Research and Extension Center, Stoneville, MS.

Variety or breeding line	Numeric Rating	Letter Rating
J77-339 CK	5.0 a	VS
Eisenhower	1.0 g	R
Truman	1.4 c-f	R-S (R)
KS3494	1.6 c	R-S (R)
Asgrow 3701RR	1.1 fg	R
McKiney RR	1.2 d-g	R
Saline	1.0 g	R
Merschman Phoenix RR	1.0 g	R
CX 364 C	1.2 e-g	R
CX 339 C	2.1 b	R-S
CX 367C RR	1.0 g	R
CX 393C	1.0 g	R
AG 3901 RR	1.0 g	R
ES 3901	1.0 g	R
A 3469	1.5 cd	R-S (R)
Williams	1.4 c-e	R-S (R)
M.S.D.	0.3	
C.V.	12.9	
F Value	148.2	

Table 2. 1999 Group IV Early Soybean Stem Canker Toothpick Trial One. Reaction of maturity Group IV early soybean cultivars or breeding lines to stem canker. MAFES, Delta Research and Extension Center, Stoneville, MS.

Variety or breeding line	Numeric rating	Letter rating
J77-339 CK	5.0 a	VS
D56-1492	1.6 d	R-S
HB. 4600	2.7 b	R-S (S)
AP 4880	1.0 e	R
APX 94882 (E)	1.0 e	R
A 4604	1.0 e	R
DIXIE 478	1.0 e	R
DK 4860	2.8 b	R-S (MS)
DK XTJ684 (E)	1.0 e	R
DKXTJ784 (E)	1.0 e	R
DKXTJ974 (E)	1.3 de	R-MR (R)
DP 3478	1.1 e	R
DP 4909	1.0 e	R
TN 4-86	1.2 e	R-S (R)
TV 4770	1.0 e	R
TS466RR	1.0 e	R
H4252RR	1.1 e	R
HB. R4660	1.0 e	R
AG4602	1.0 e	R
AG4702	1.0 e	R
AG4402	1.0 e	R
DG4650RR	1.1 e	R
DPX 8S47RR (E)		
DP 4690RR	1.0 e	R
TVX 4589RR (E)	1.1 e	R

Table 2 Continued

Variety or breeding line	Numeric Rating	Letter Rating
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AP4602RR	1.1 e	R
APX 94888RR (E)	1.0 e	R
DP 4750RR	1.0 e	R
AG 4601RR	2.5 bc	R-S (S)
M.S.D.	0.4	
C.V.	17.5	
F Value	78.8	

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Table 3. 1999 Group IV Late Soybean Stem Canker Toothpick Trial One. Reaction of maturity Group IV late soybean cultivars or breeding lines to stem canker. MAFES, Delta Research and Extension Center, Stoneville, MS.

Variety or breeding line	Numeric Rating	Letter Rating
J77-339 CK	5.0 a	VS
TS4792	2.1 g-k	R-S
TS490	1.2 m-p	R&S (R)
RVS499	1.3 l-p	R&S (R)
H4994	3.0 cd	R-S (S)
HBK4890	1.2 n-p	R&S (R)
HBK4891	1.2 m-p	R&S (R)
P9482	1.2 m-p	R&S (R)
R95-3235 (E)	1.7 i-o	R-S
A4922	2.2 e-i	R-S
DK4762RR	2.3 e-i	R-S
DK XTJ894RR (E)	2.3 e-i	R-S
FFR HT4985	1.8 h-m	R-S
FFR 495	1.4 l-p	R&S (R)
FFR 514	1.1 n-p	R
MANOKIN	1.7 h-o	R&S (R)
S51-00	1.5 k-p	R-S (R)
TN 4-94	3.3 c	R-S (S)
TV 4975	1.5 j-p	R-S (R)
USG 7499	1.1 op	R
DT97-4290 (E)	1.3 l-p	R&S (R)
DT97-4318 (E)	1.8 h-n	R-S (R)
E-K XP4900 (E)	2.6 d-g	R-S (S)
SG498RR	1.3 l-p	R&S (R)
H4994RR	3.3 c	R-S (S)
H4998RR	2.8 c-f	R-S (S)

Table 3 Continued

Variety or breeding line	Numeric Rating	Letter Rating
HB. R4855	2.8 c-e	R-S (S)

P94B81	1.0 p	R
P9492	1.8 h-m	R-S
AG4902	1.5 j-p	R-S
DK 4965RR	2.6 d-g	R-S (S)
DK XTJ584RR (E)	4.0 b	S
FFR RT517	1.0 p	R
S51-T1	2.4 e-h	R-S (S)
TV 4890RR (E)	1.0 p	R
USG 7478nRR	2.1 g-k	R-S
WF 480RR	2.2 e-i	R-S
USG 7489RR	2.2 e-i	R-S
USG 7499 RR	1.9 h-l	R-S
TS4979RR	1.4 l-p	R-S (R)
A 4901RR	2.1 f-k	R-S
M.S.D.	0.7	
C.V.	23.8	
F Value	20.4	

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Table 4. 1999 Group V Early Soybean Toothpick Trial One. Reaction of Maturity Group V early soybean cultivars or breeding lines to stem canker. MAFES, Delta Research and Extension Center, Stoneville, MS.

Variety or breeding line	Numeric Rating	Letter Rating
J77-339 CK	5.0 a	VS
TS 520	2.1 h-k	R-S
RVS 529	1.0 o	R
RVS 549	2.7 g-i	R-S (S)
RVS ROBIN 5	3.6 c-e	R-S (S)
H 5050	1.0 o	R
HBK 5770	1.1 no	R
P 95B33	2.1 i-l	R-S
APX 9563 (E)	3.1 e-g	R-S (S)
HY 574	2.8 f-h	R-S (S)
A 5547	1.0 o	R
A 5704	1.4 k-o	R&S (R)
A 5404	3.3 e-g	R-S (S)
DK 5664RR	1.3 m-o	R&S (R)
DK 5850	3.4 c-f	R-S (S)
DELSOY 5500	1.7 j-o	R-S
TN5-95	3.0 e-g	R-S (S)
TV 5495	1.0 o	R
DP 5354	1.0 o	R
NK X9952 (E)	1.3 m-o	R&S (R)
NK X9955R (E)	1.0 o	R
E-K XP5400 (E)	3.6 c-e	R-S (S)
E-K XP5120N (E)	1.0 o	R
ESSEX	3.7 c-e	S
ESSEX RSVI (E)	2.6 g-i	R-S (S)
ESSEX RSV4 (E)	3.3 e-g	R-S (S)

Table 4 Continued

Variety or breeding line	Numeric Rating	Letter Rating
ACCOMAC	3.5 c-f	R-S (S)

P 9511	1.6 j-o	R&S (R)
HUTCHENSON	1.0 o	R
TS556RR	1.6 j-o	R-S (R)
TS558RR	1.3 l-o	R-S (R)
H5350RR	3.3 e-g	R-S (S)
HX506187RR (E)	4.0 b-d	S
HB. R5588	1.3 m-o	R&S (R)
P95B41	3.6 c-e	R-S (S)
P95B53	1.8 j-m	R-S (R)
AG5001	1.8 j-n	R-S (R)
AG5401	1.1 m-o	R
AG5602	3.3 d-g	R-S (S)
DP5644RR	1.6 j-o	R-S (R)
WILLCROSS 2517N	1.2 m-o	R
DG5550RR	1.4 l-o	R&S (R)
DK 5263RR	1.5 k-o	R&S (R)
FFR RT5485	4.0 b-d	S
FFR RT557	2.2 h-j	R-S
GENESIS M541RR	1.7 j-o	R-S (R)
TV5466RR	1.1 no	R
TV5666RR	1.2 m-o	R
DG 3541NRR (E)	1.2 m-o	R
USG 7528RR	2.8 f-i	R-S (S)
USG 7548nRR	3.0 e-g	R-S (S)
USG 7547RR	1.6 j-o	R&S (R)

Table 4. Continued

Variety or breeding line	Numeric Rating	Letter Rating
SF567RR	1.1 m-o	R
USG 7509RR	1.5 k-o	R-S (R)
APX9519RR (E)	1.4 l-o	R-S (R)
APX567RR	3.7 b-e	S
WILLCROSS 2549nRR	3.1 e-g	R-S (S)

M.S.D.	0.7
C.V.	24.4
F Value	19.0

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Table 5. *1999 Group V Late Soybean Stem Canker Toothpick Trial*. Reaction of maturity Group V late soybean cultivars or breeding lines to stem canker. MAFES, Delta Research and Extension Center, Stoneville, MS.

Variety or breeding line	Numeric Rating	Letter Rating
J77-339	5.0 a	VS
RVS 77	2.6 f-i	R-S (S)
HLA 572	1.0 q	R
HB. 5990	1.3 n-q	R
HB. 5991	1.5 m-q	R-MS (R)
P9594	2.2 i-l	R-S
UARK 5798	1.4 n-q	R&S (R)
UARK 5896	2.4 g-j	R-S
R95-798 (E)	1.7 k-o	R-MS
R95-2210 (E)	1.5 n-q	R-S (R)
A 5843	1.1 pq	R
A 5944	1.3 n-q	R-S (R)
A 5959	2.7 e-i	R-S (S)
DG 5810	2.7 e-i	R-MS (MS)
DK 5961	1.6 l-q	R-S (R)
DK 5995	2.2 i-l	R-MS
DK XTJ675RR (E)	2.9 d-h	R-MS (MS)
FFR 594	3.0 c-h	R-S (S)
DP 3588	1.5 m-q	R-MS
DP 5655	1.7 k-o	R-MS
FFR 597	1.2 o-q	R
DELISOY 5710	1.7 k-o	R-MS
S59-60	3.4 b-d	R-S (S)
NK X9855 (E)	1.5 m-q	R-MS (R)
TV 5893	1.2 o-q	R
TV 5926	1.6 l-q	R-S (R)

Table 5. Continued

Variety of breeding line	Numerical rating	Letter rating
DT95-15091 (E)	1.7 l-p	R-MS

DT96-6840 (E)	1.1 o-q	R
DT96-16809 (E)	1.4 n-q	R-S (R)
E-K XP5700 (E)	3.2 b-e	R-S (S)
V91-3036 (E)	1.3 n-q	R-S (R)
D60-12058	3.5 bc	R-S (S)
D92-3267	3.8 b	S
R93-171	1.5 m-q	R-MS
SG597RR	1.2 o-q	R&MS (R)
H5999RR	1.3 n-q	R&S (R)
HX 5060167RR	1.2 o-q	R&MS (R)
HB. R5884	1.9 j-n	R-S
HB. R5920	2.4 g-j	R-S
HB. XR6020 (E)	1.5 m-q	R-S (R)
P96B01	3.0 c-g	R-S (S)
AG 5801	2.1 i-m	R-S
AG 5802	1.3 n-q	R-S (R)
AG 5901	1.4 n-q	R-S (R)
AP588RR	1.4 n-q	R-S (R)
DG5950RR	3.0 c-g	MS
DK5961RR	1.0 q	R
DK XTJ665RR (E)	2.7 e-i	R-S
DPX 5718 RR(E)	3.1 c-f	R-S (S)
DPX 5915RR (E)	2.4 g-j	R-S
AG 5701	2.7 e-i	R-S
DP 5806RR	1.5 m-q	R-S (R)
DP 5960RR	2.2 i-l	R-S

Table 5. Continued

Variety or breeding line	Numeric Rating	Letter Rating
USG 7577RR	2.4 h-k	R-S
FFR RT587	1.6 l-q	R-S (R)
WF590RR	2.9 d-h	R-S (MS)
CX550RR	1.0 q	R
CX556CRR	1.0 q	R

CX580CRR	3.1 c-f	R-S (S)
NK S59-V6	3.1 c-f	R-S (S)
NK X9857R (E)	3.0 c-g	MS
USG 7599nRR (E)	2.6 e-i	R-S (S)
TS5879RR	1.5 m-q	R-MS (R)
USG 7539	2.6 f-i	R-S
M.S.D.	0.6	
C.V.	21.4	
F Value	23.3	

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Table 6. .1999 Group VI Soybean Stem Canker Toothpick Trial One. Reaction of maturity Group VI soybean cultivars or breeding lines to stem canker. MAFES, Delta Research and Extension Center, Stoneville, MS.

Variety or breeding line	Numeric Rating	Letter Rating
J77-339	5.0 a	VS
TS608RR	2.0 e	R-MS
RVS 678	1.3 f	R-MS (R)
HB. 6600	1.0 f	R
P9631	3.8 b	S
P9692	1.0 f	R
R92-1258 (E)	2.2 e	R-S
AG6101	1.1 f	R
AG6701	1.1 f	R
A6961	1.0 f	R
FFR 665	3.6 bc	R-S (S)
ANAND	2.9 d	R-S (MS)
S62-62	1.0 f	R
DILLON	3.3 b-d	R-S (S)
MUSEN	1.0 f	R
SC89-147 (E)	1.0 f	R
SC91-2007 (E)	1.0 f	R
TN93-142-17 (E)	2.0 e	R-MS
DPX 8S62RR (E)	3.1 cd	R-S (S)
M.S.D.	0.6	
C.V.	22.0	
F Value	34.1	

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*1999 Soybean Group IV-VI Toothpick Trial Two*

G. L. Sciumbato

TEST PARAMETERS

Planting date: June 4, 1999

Location: Field 10

Cultivar: See Table

Irrigation: As needed

Plot size: \_\_\_\_\_

Soil type: Bosket fine sandy loam

Seeding rate: 10 seed per foot

Plot length: 15 ft

Plot width: 3.4 ft

Row spacing: 40 in

Amount harvested: None

Plot design: Randomized complete block with four replications.

Number, timing, and rates of fertilizer applications: Potash, 200 lb/A 11/15/96

Pesticide treatments: None

Timing and method of fungicide application: None

Inoculum preparation and inoculum procedure: Toothpicks were boiled three times in distilled water to remove tannins, etc; and dried. The toothpicks were placed in bottles with potato dextrose broth added to one-half the height of the toothpicks. The bottles were capped and autoclaved. After autoclaving, a plug of the fungus was aseptically placed on the top of the toothpicks. The bottles were incubated for two weeks. The toothpicks + fungus were removed from the bottle and a single toothpick was inserted into the first or second internode from the top of the test plants. Plants were inoculated four to six weeks after planting. A total of twelve plants per replication were inoculated (48 per entry). Plants were rated eight to twelve weeks after planting. Results are the average of four replications.

Inoculation dates: Maturity group IV early, IV early Roundup Ready, IV late and IV late Roundup Ready = June 2. Maturity group V early, V early Roundup Ready, V late and V late Roundup ready = June 2 and 4. Maturity Group VI = June 5.

Rating Scale: 1 or R= No symptoms, 2 or MR= stem lesion up to 2 inches, 3 or MS= stem lesion up to 8 inches, 4 or S= stem lesion covering entire length of stem, severe leaf symptoms, 5 or VS= plant dead.

Rating Dates: Maturity Group IV early, IV early Roundup Ready, and IV late= Aug. 12, Maturity Group IV late Roundup Ready= Aug. 18. Maturity Group V early, V early Roundup Ready, V late, and V late Roundup ready= Aug. 20. Maturity group VI= Sept. 2.

Test parameters for greenhouse trials: For the greenhouse trials, soybean stems were cut and placed in bottles and potato dextrose broth was added half way up the stems. The bottles were stoppered and autoclaved. A plug of the stem canker fungus was aseptically added and the bottles were incubated for 1-3 months. Spores were harvested by gently blending the perithecia in water. The spore suspension was sprayed on 3-4 week old soybean seedlings. Inoculated seedlings were incubated for 3-4 weeks and lesion development was determined using the scale described above.

Table 7. 1999 Group IV Early Soybean Stem Canker Toothpick Trial Two. Reaction of maturity Group IV early soybean cultivars or breeding lines to stem canker. MAFES, Delta Research and Extension Center, Stoneville, MS.

Variety or breeding line	Numeric rating	Letter rating
J77-339 CK	5.0 a	VS
D56-1492	2.3 d-f	R-S (S)
HB. 4600	2.6 b-d	R-S (S)
AP 4880	1.1 kl	R
APX 94882 (E)	1.0 l	R
A 4604	1.4 i-l	R-S (R)
DIXIE 478	1.0 l	R
DK 4860	3.0 b	R-S (S)
DK XTJ684 (E)	1.3 j-l	R&S (R)
DKXTJ784 (E)	1.0 l	R
DKXTJ974 (E)	1.4 i-l	R-S (R)
DP 3478	1.2 j-l	R&S (R)
DP 4909	1.0 l	R
TN 4-86	1.3 j-l	R&S (R)
TV 4770	1.2 j-l	R&S (R)
TS466RR	1.2 j-l	R&S (R)
H4252RR	1.0 l	R
HB. R4660	1.1 kl	R
AG4602	1.3 j-l	R&S (R)
AG4702	1.2 j-l	R&S (R)
AG4402	2.2 d-f	R-S
DG4650RR	1.6 h-j	R-S (R)
DPX 8S47RR (E)	1.1 kl	R
DP 4690RR	1.0 l	R
GENESIS M473RR	1.8 g-i	R-S
TV 4466RR	2.9 bc	R-S (S)

Table 7. Continued

Variety or breeding line	Numeric Rating	Letter Rating
TVX 4589RR (E)	1.9 f-h	R-S

DG 3463NRR	1.5 i-k	R-S (R)
SF477RR	2.0 e-g	R-S
AP4602RR	1.1 kl	R
APX 94888RR (E)	1.3 j-l	R-S (R)
DP 4750RR	1.0 l	R
AG 4601RR	2.4 c-e	R-S (S)
M.S.D.	0.4	
C.V.	17.4	
F Value	59.7	

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Table 8. 1999 *Group IV Late Soybean Stem Canker Toothpick Trial Two*. Reaction of maturity Group IV late soybean cultivars or breeding lines to stem canker. MAFES, Delta Research and Extension Center, Stoneville, MS.

Variety or breeding line	Numeric Rating	Letter Rating
J77-339 CK	5.0 a	VS
TS4792	1.4 k-o	R-S (R)
TS490	1.2 no	R&S
RVS499	1.0 o	R
H4994	2.5 d-f	R-S (S)
HBK4890	1.0 o	R
HBK4891	2.1 f-i	R-S
P9482	1.8 h-l	R-S (R)
R95-3235 (E)	1.5 j-o	R-S (R)
A4922	1.9 h-k	R-S
DK4762RR	2.3 e-h	R-S (S)
DK XTJ894RR (E)	1.5 j-o	R-S (R)
FFR HT4985	1.2 no	R
FFR 495	1.6 i-n	R&S (R)
FFR 514	1.0 o	R
MANOKIN	1.2 m-o	R&S (R)
S51-00	1.0 o	R
TN 4-94	3.1 b	R-S (S)
TV 4975	1.0 o	R
USG 7499	1.1 no	R
DT97-4290 (E)	1.0 o	R
DT97-4318 (E)	1.1 no	R
E-K XP4900 (E)	1.8 h-l	R&S (R)
SG498RR	1.1 no	R
H4994RR	3.0 bc	R-S (S)
H4998RR	3.0 bc	R-S (S)

Table 8. Continued

Variety or breeding line	Numeric Rating	Letter Rating
HB. R4855	2.5 c-f	R-S (S)

P94B81	2.9 b-d	R-S (S)
P9492	2.4 d-g	R-S
AG4902	1.2 no	R
DK 4965RR	2.1 f-i	R-S (R)
DK XTJ584RR (E)	2.7 b-e	R-S (S)
FFR RT517	1.0 a	R
S51-T1	2.4 d-g	R-S
TV 4890RR (E)	1.8 i-m	R-S (R)
USG 7478nRR	2.0 f-j	R-S
WF 480RR	1.2 m-o	R&S (R)
USG 7489RR	1.9 g-k	R-S (R)
USG 7499 RR	1.3 l-o	R&S (R)
TS4979RR	1.0 o	R
A 4901RR	2.0 f-j	R-S (R)
M.S.D.	0.5	
C.V.	21.2	
F Value	30.9	

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Table 9. 1999 *Group V Early Soybean Toothpick Trial Two*. Reaction of maturity Group V early soybean cultivars or breeding lines to stem canker. MAFES, Delta Research and Extension Center, Stoneville, MS.

Variety or breeding line	Numeric Rating	Letter Rating
J77-339	5.0 a	VS
TS 520	1.2 u-w	R&MS (R)
RVS 529	1.8 m-t	R-MS (R)
RVS 549	2.6 e-j	R-MS (MS)
RVS ROBIN 5	3.7 bc	S
H 5050	2.0 l-q	R-S
HB. 5770	1.1 vw	R
P 95B33	2.3 i-n	R-MS
APX 9563 (E)	2.3 i-n	R-MS
HY 574	2.6 f-j	R-S (S)
A 5547	2.0 k-p	R-S (MS)
A 5704	1.5 q-w	R-S (R)
A 5404	2.9 d-g	R-S (MS)
DK 5664RR	1.0 w	R
DK 5850	2.0 l-r	R-MS
DELISOY 5500	2.2 i-n	R-MS
TN5-95	2.0 k-p	R-MS
TV 5495	1.4 s-w	R-MS (R)
DP 5354	1.9 l-t	R-MS
NK X9952 (E)	1.7 o-u	R-S
NK X9955R (E)	1.7 o-u	R-S
E-K XP5400 (E)	2.8 d-g	R-S (MS)
E-K XP5120N (E)	1.2 u-w	R&S (R)
ESSEX	3.0 d-f	MS
ESSEX RSVI (E)	2.8 d-h	MS
ESSEX RSV4 (E)	3.0 d-f	MS

Table 9. Continued

Variety or breeding line	Numeric Rating	Letter Rating
ACCOMAC	3.1 de	R-MS (MS)

P 9511	2.3 i-n	R-MS (MS)
HUTCHENSON	1.5 r-w	R&MS (R)
TS556RR	1.9 l-t	R-MS (MS)
TS558RR	2.3 i-m	R-MS
H5350RR	4.0 b	S
HX506187RR (E)	2.2 i-n	R-MS
HB. R5588	1.1 vw	R
P95B41	2.4 g-l	R-MS (MS)
P95B53	1.9 l-s	R-MS (R)
AG5001	1.8 m-t	R-MS (R)
AG5401	1.6 p-u	R-MS (R)
AG5602	1.2 u-w	R&MS (R)
DP5644RR	2.2 j-n	R-MS
WILLCROSS 2517N	2.2 j-o	R-MS
DG5550RR	1.8 n-t	R-MS
DK 5263RR	2.5 f-k	R-MS (MS)
FFR RT5485	3.3 cd	R-S (S)
FFR RT557	1.9 l-t	R-MS (R)
GENESIS M541RR	2.2 i-n	R-MS
TV5466RR	1.4 t-w	R&S (R)
TV5666RR	1.0 w	R
DG 3541NRR (E)	2.3 i-n	R-MS
USG 7528RR	2.7 e-i	R-S (S)
USG 7548nRR	1.6 p-v	R-MS (R)
USG 7547RR	1.2 u-w	R
USG 7557RR	1.2 u-w	R

Table 9. Continued

Variety or breeding line	Numeric Rating	Letter Rating
SF567RR	1.4 t-w	R-MS (R)
USG 7509RR	1.0 w	R
APX9519RR (E)	2.2 i-n	R-MS
APX567RR	3.6 bc	S
WILLCROSS 2549nRR	1.8 m-t	R-MS

M.S.D.	0.5
C.V.	17.1
F Value	32.4

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Table 10. *1999 Group V Late Soybean Stem Canker Toothpick Trial Two.* Reaction of maturity Group V Late soybean cultivars or breeding lines to stem canker. MAFES, Delta Research and Extension Center, Stoneville, MS.

Variety or breeding line	Numeric Rating	Letter Rating
J77-339 CK	5.0 a	VS
RVS 77	1.8 j-r	R-S
HLA 572	1.1 q-s	R
HB. 5990	1.3 p-s	R&S (R)
HB. 5991	1.3 p-s	R&MS (R)
P9594	2.9 c-g	R-S (S)
UARK 5798	1.2 q-s	R
UARK 5896	2.4 f-l	R-MS
R95-798 (E)	1.8 j-r	R-MS (R)
R95-2210 (E)	3.0 c-f	R-S (S)
A 5843	1.2 q-s	R
A 5944	2.2 g-n	R-MS
A 5959	2.5 f-j	R-MS
DG 5810	3.8 b	S
DK 5961	1.1 rs	R
DK 5995	2.6 e-i	R-S (S)
DK XTJ675RR (E)	3.0 c-f	R-MS (MS)
FFR 594	2.8 c-g	R-S (S)
DP 3588	1.4 o-s	R-MS (R)
DP 5655	1.8 j-q	R-MS
FFR 597	1.7 l-s	R-MS
DELISOY 5710	3.3 b-e	R-S (S)
S59-60	3.4 b-d	R-S (S)
NK X9855 (E)	1.4 o-s	R&MS (R)
TV 5893	1.1 q-s	R
TV 5926	1.3 p-s	R&MS (R)

Table 10. Continued

Variety or breeding line	Numeric rating	Letter Rating
DT95-15091 (E)	2.8 c-h	R-S (MS)

DT96-6840 (E)	1.7 l-s	R-MS (R)
DT96-16809 (E)	1.0 s	R
E-K XP5700 (E)	3.4 b-d	R-S (S)
V91-3036 (E)	2.2 g-n	R-S
D60-12058	3.0 c-f	R-S (S)
D92-3267	4.0 b	S
R93-171	1.7 l-s	R-S (R)
SG597RR	1.2 q-s	R
H5999RR	2.1 h-o	R-S
HX 5060167RR	1.7 l-s	R-S
HB. R5884	3.0 c-f	R-S (S)
HB. R5920	3.5 bc	R-S (S)
HB. XR6020 (E)	1.8 j-r	R-S (R)
P96B01	3.4 b-d	R-S (S)
AG 5801	3.8 b	S
AG 5802	1.0 s	R
AG 5901	1.5 n-s	R-S (R)
AP588RR	1.1 q-s	R
DG5950RR	4.0 b	S
DK5961RR	1.1 q-s	R
DK XTJ665RR (E)	2.3 f-m	R-S
DPX 5718 RR(E)	2.7 d-i	R-S (S)
DPX 5915RR (E)	2.0 i-p	R-S
AG 5701	3.3 b-e	R-S (S)
DP 5806RR	1.6 m-s	R-S (R)
DP 5960RR	2.2 g-n	R-S

Table 10. Continued

Variety or breeding line	Numeric Rating	Letter Rating
USG 7577RR	2.6 f-i	R-S (S)
FFR RT587	1.1 rs	R
WF590RR	2.6 f-i	R-S (S)
CX550RR	2.4 f-k	R-S
CX556CRR	1.6 m-s	R-S (R)

CX580CRR	2.7 d-h	R-S (S)
NK S59-V6	2.6 e-i	R-S
NK X9857R (E)	2.6 f-i	R-MS
USG 7599nRR (E)	2.2 g-m	R-S
TS5879RR	1.2 q-s	R
USG 7539	3.4 b-d	R-S (S)
M.S.D.	0.7	
C.V.	23.3	
F Value	17.2	

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Table 11. *1999 Group VI Soybean Stem Canker Toothpick Trial Two*. Reaction of maturity Group VI soybean cultivars or breeding lines to stem canker. MAFES, Delta Research and Extension Center, Stoneville, MS.

Variety or breeding line	Numeric Rating	Letter Rating
J77-339	5.0 a	VS
TS608RR	1.9 e	R-S
RVS 678	1.0 f	R
HB. 6600	1.0 f	R
P9631	4.0 d	S
P9692	1.0 f	R
R92-1258 (E)	1.8 e	R-MS
AG6101	1.2 f	R
AG6701	1.0 f	R
A6961	1.0 f	R
FFR 665	3.7 bc	R-S (S)
ANAND	3.3 c	R-S (S)
S62-62	1.0 f	R
DILLON	2.7 d	R-S
MUSEN	1.0 f	R
SC89-147 (E)	1.0 f	R
SC91-2007 (E)	1.0 f	R
TN93-142-17 (E)	1.1 f	R
DPX 8S62RR (E)	3.5 c	R-S (S)
M.S.D.	0.4	
C.V.	15.3	
F Value	80.2	

DELTA RESEARCH AND EXTENSION CENTER  
*1998 Soybean Group IV-VI Frogeye Trials*  
G. L. Sciumbato

TEST PARAMETERS

Planting date: May 19, 1999

Location: Field 16

Cultivar: See Table

Irrigation: As needed

Plot size:

Soil type: Sharkey Clay

Seeding rate: 100 seed/plot

Plot length: 20 ft

Plot width: 3.4 ft

Row spacing: 40 in

Amount harvested: None

Plot design: Randomized complete block with four replications.

Number, timing, and rates of fertilizer applications: None

Pesticide treatments: Broadstrike-Treflan 1 qt/A; Command 4 EC, 1 qt/A; and Scepter 70 DG, 2.8 oz/A PPI

Method and timing of inoculation: Field trial: Spores were sprayed on plants on June 17, June 27, and July 15. Greenhouse trials: The fungus was cultured on Emerson Yeast media for 10 days at room temperature. The fridge spores were gently dislodged with water and adjusted to a concentration of 100,000 spores per ml. Four ml of Tween 80 were added per gallon of inoculum. Plots were sprayed in later afternoon with a hand-carried pump-up sprayer. The upper two-thirds of the plants were sprayed. Greenhouse: Spores were prepared in the same way and were sprayed on 3-4 week old plants. Sprayed plants were transferred into a dew chamber for 3 days after inoculation and transferred to the greenhouse. Ratings were done 2-3 weeks inoculation.

Date of disease evaluation: The field trial was rated on July 31. Greenhouse trials were rated 2-3 weeks after inoculation.

Table 12. 1999 Group IV Early Soybean Frogeye Trial . Reaction of maturity Group IV Early soybean cultivars or breeding lines to frogeye leaf spot.. MAFES, Delta Research and Extension Center, Stoneville, MS.

Variety or breeding line	Numeric rating	Letter rating
CENTENNIAL CK	3.8 a-f	MS
D56-1492	1.8 f-h	MR
HB. 4600	4.0 a-e	MS
AP 4880	3.5 a-g	MS
APX 94882 (E)	2.3 d-h	MR
A 4604	1.3 h	R
DIXIE 478	3.8 a-f	MS
DK 4860	4.3 a-d	MS
DK XTJ684 (E)	1.8 f-h	MR
DKXTJ784 (E)	1.5 gh	MR
DKXTJ974 (E)	2.0 e-h	MR
DP 3478	3.3 a-h	I
DP 4909	3.5 a-g	MS
TN 4-86	1.3 h	R
TV 4770	5.0 a	S
TS466RR	2.5 d-h	I
H4252RR	3.3 a-h	I
HB. R4660	3.3 a-h	I
AG4602	4.8 ab	S
AG4702	1.8 f-h	MR
AG4402	1.5 gh	MR
DG4650RR	2.0 e-h	MR
DPX 8S47RR (E)	3.0 a-h	I
DP 4690RR	3.0 a-h	I
GENESIS M473RR	1.3 h	R
TV 4466RR	3.5 a-g	MS

Table 12. Continued

Variety or breeding line	Numeric Rating	Letter Rating
TVX 4589RR (E)	2.3 d-h	MR

DG 3463NRR	3.8 a-f	MS
SF477RR	2.8 b-h	I
AP4602RR	3.0 a-h	I
APX 94888RR (E)	3.3 a-h	I
DP 4750RR	4.8 ab	S
AG 4601RR	4.3 a-d	MS
M.S.D.	2.0	
C.V.	43.3	
F Value	2.9	

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Table 13. *1999 Group IV Late Soybean Frogeye Trial*. Reaction of maturity Group IV Late soybean cultivars or breeding lines to frogeye leaf spot.. MAFES, Delta Research and Extension Center, Stoneville, MS.

Variety or breeding line	Numeric rating	Letter rating
CENTENNIAL CK	3.0 a-e	I
TS4792	1.8 c-e	MR

TS490	3.5 a-e	MS
RVS499	4.8 a	S
H4994	1.8 c-e	MR
HBK4890	1.8 c-e	MR
HBK4891	2.5 a-e	I
P9482	2.5 a-e	I
R95-3235 (E)	1.8 c-e	MR
A4922	3.8 a-d	MS
DK4762RR	3.3 a-e	I
DK XTJ894RR (E)	2.3 a-e	MR
FFR HT4985	1.8 c-e	MR
FFR 495	2.3 a-e	MR
FFR 514	2.8 a-e	I
MANOKIN	1.0 e	R
S51-00	2.0 b-e	MR
TN 4-94	4.0 a-d	MS
TV 4975	1.5 de	MR
USG 7499	2.8 a-e	I
DT97-4290 (E)	4.5 ab	S
DT97-4318 (E)	4.5 ab	S
E-K XP4900 (E)	3.3 a-e	I
SG498RR	2.0 b-e	MR
H4994RR	1.8 c-e	MR
H4998RR	2.5 a-e	I

Table 13. Continued

Variety or breeding line	Numerical Rating	Letter Rating
HB. R4855	4.0 a-d	MS
P94B81	4.0 a-d	MS
P9492	3.3 a-e	I
AG4902	3.3 a-e	I
DK 4965RR	3.3 a-e	I
DK XTJ584RR (E)	4.0 a-d	MS
FFR RT517	2.3 a-e	MR

S51-T1	4.0 a-d	MS
TV 4890RR (E)	3.5 a-e	MS
USG 7478nRR	4.0 a-d	MS
WF 480RR	3.3 a-e	I
USG 7489RR	3.8 a-d	MS
USG 7499 RR	3.8 a-d	MS
TS4979RR	2.3 a-e	MR
A 4901RR	4.3 a-c	MS
M.S.D.	2.5	
C.V.	46.1	
F Value	2.0	

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Table 14. *1999 Group V Early Soybean Frogeye Trial*. Reaction of maturity Group V Early soybean cultivars or breeding lines to frogeye leaf spot.. MAFES, Delta Research and Extension Center, Stoneville, MS.

Variety or breeding line	Numeric rating	Letter rating
CENTENNIAL CK	4.5 a-c	S
TS 520	2.3 d-g	MR
RVS 529	4.0 a-d	MS
RVS 549	4.3 a-d	MS
RVS ROBIN 5	3.8 a-e	MS
H 5050	4.0 a-d	MS
HB. 5770	4.3 a-d	MS
P 95B33	3.0 a-g	I
APX 9563 (E)	2.8 b-g	I

HY 574	4.8 ab	S
A 5547	4.3 a-d	MS
A 5704	1.5 fg	MR
A 5404	1.8 e-g	MR
DK 5664RR	1.8 e-g	MR
DK 5850	3.0 a-g	I
DELSOY 5500	2.5 c-g	I
TN5-95	3.8 a-e	MS
TV 5495	3.3 a-f	I
DP 5354	2.5 c-g	I
NK X9952 (E)	4.3 a-d	MS
NK X9955R (E)	4.3 a-d	MS
E-K XP5400 (E)	4.3 a-d	MS
E-K XP5120N (E)	4.0 a-d	MS
ESSEX	4.0 a-d	MS
ESSEX RSVI (E)	3.8 a-e	MS
ESSEX RSV4 (E)	2.3 d-g	MR

Table 14. Continued

Variety or breeding line	Numeric Rating	Letter Rating
ACCOMAC	2.3 d-g	MR
P 9511	4.0 a-c	MS
HUTCHENSON	1.8 e-g	MR
TS556RR	3.5 a-f	MS
TS558RR	4.0 a-d	MS
H5350RR	4.3 a-d	MS
HX506187RR (E)	2.3 d-g	MR
HB. R5588	2.3 d-g	MR
P95B41	2.5 c-g	I
P95B53	4.3 a-d	MS
AG5001	3.0 a-g	I
AG5401	5.0 a	S
AG5602	4.3 a-d	MS
DP5644RR	4.0 a-d	MS

WILLCROSS 2517N	2.5 c-g	I
DG5550RR	2.8 c-g	I
DK 5263RR	4.3 a-d	MS
FFR RT5485	2.5 c-g	I
FFR RT557	3.0 a-g	I
GENESIS M541RR	3.3 a-f	I
TV5466RR	4.0 a-d	MS
TV5666RR	4.0 a-d	MS
DG 3541NRR (E)	3.8 a-e	MS
USG 7528RR	3.8 a-e	MS
USG 7548nRR	3.8 a-e	MS
USG 7547RR	2.3 d-g	MR
USG 7557RR	3.0 a-g	I

Table 14. Continued

Variety or breeding line	Numeric Rating	Letter Rating
SF567RR	4.0 a-d	MS
USG 7509RR	5.0 a	S
APX9519RR (E)	1.8 e-g	MR
APX567RR	1.0 g	R
WILLCROSS 2549nRR	2.8 b-g	I
M.S.D.	2.0	
C.V.	36.4	
F Value	2.4	

Table 15. *1999 Group V Late Soybean Frogeye Trial*. Reaction of maturity Group V Late soybean cultivars or breeding lines to frogeye leaf spot.. MAFES, Delta Research and Extension Center, Stoneville, MS.

Variety or breeding line	Numeric Rating	Letter Rating
CENTENNIAL CK	4.3 a-d	MS
RVS 77	4.3 a-d	MS
HLA 572	4.0 a-e	MS
HB. 5990	1.8 i-l	MR
HB. 5991	4.0 a-e	MS
P9594	4.0 a-e	MS
UARK 5798	2.5 f-k	I
UARK 5896	4.3 a-d	MS
R95-798 (E)	1.8 i-l	MR
R95-2210 (E)	4.0 a-e	MS
A 5843	3.3 c-h	I
A 5944	4.0 a-e	MS
A 5959	2.0 h-l	MR
DG 5810	2.0 h-l	MR
DK 5961	1.0 l	R
DK 5995	2.0 h-l	MR
DK XTJ675RR (E)	2.5 h-k	I
FFR 594	1.0 l	R

DP 3588	1.0 l	R
DP 5655	4.3 a-d	MS
FFR 597	2.3 g-l	MR
DELSOY 5710	4.0 a-e	MS
S59-60	5.0 a	S
NK X9855 (E)	1.3 kl	R
TV 5893	4.8 ab	S
TV 5926	5.0 a	S

Table 15. Continued

Variety or breeding line	Numerical Rating	Letter Rating
DT95-15091 (E)	5.0 a	S
DT96-6840 (E)	1.3 kl	R
DT96-16809 (E)	1.3 kl	R
E-K XP5700 (E)	2.5 f-k	I
V91-3036 (E)	4.0 a-e	MS
D60-12058	1.8 i-l	MR
D92-3267	2.8 f-j	I
J77-339	3.3 c-h	I
R93-171	3.3 c-h	I
SG597RR	1.8 i-l	MR
H5999RR	1.0 l	R
HX 5060167RR	2.0 h-l	MR
HB. R5884	4.8 ab	S
HB. R5920	2.5 f-k	I
HB. XR6020 (E)	1.5 j-l	MR
P96B01	4.8 ab	S
AG 5801	4.5 a-c	S
AG 5802	1.0 l	R
AG 5901	1.5 j-l	MR
AP588RR	2.3 g-l	MR
DG5950RR	2.0 h-l	MR
DK5961RR	2.0 h-l	MR
DK XTJ665RR (E)	1.0 l	R

DPX 5718 RR(E)	4.3 a-d	MS
DPX 5915RR (E)	1.3 kl	R
AG 5701	1.3 kl	R
DP 5806RR	4.5 a-c	S

Table 15. Continued

Variety or breeding line	Numeric Rating	Letter Rating
DP 5960RR	3.8 a-f	MS
USG 7577RR	1.8 i-l	MR
FFR RT587	4.8 ab	S
WF590RR	1.5 j-l	MR
CX550RR	2.3 g-l	MR
CX556CRR	3.0 d-i	I
CX580CRR	1.3 kl	R
NK S59-V6	4.3 a-d	MS
NK X9857R (E)	3.3 c-h	I
USG 7599nRR (E)	2.0 h-l	MR
TS5879RR	1.3 kl	R
USG 7539	2.5 f-k	I
M.S.D.	1.4	
C.V.	36.6	
F Value	6.1	

Table 16. *1999 Group VI Soybean Frogeye Trial*. Reaction of maturity Group VI Late soybean cultivars or breeding lines to frogeye leaf spot.. MAFES, Delta Research and Extension Center, Stoneville, MS.

Variety or breeding line	Numeric Rating	Letter Rating
CENTENNIAL CK	5.0 a	S
TS608RR	3.3 a-e	I
RVS 678	1.8 ef	MR
HB. 6600	1.3 f	R
P9631	2.0 d-f	MR
P9692	1.3 f	R
R92-1258 (E)	2.8 c-f	I
AG6101	3.0 b-f	I
AG6701	3.0 b-f	I
A6961	3.0 b-f	I
FFR 665	2.3 d-f	MR
ANAND	2.5 d-f	I
S62-62	4.8 ab	S
DILLON	1.8 ef	MR
MUSEN	2.8 c-f	I
SC89-147 (E)	2.8 c-f	I
SC91-2007 (E)	3.8 a-d	MS
TN93-142-17 (E)	2.5 d-f	I
DPX 8S62RR (E)	4.5 a-c	S
M.S.D.	1.8	
C.V.	40.9	
F Value	3.3	

G. L. Sciumbato

## RESULTS AND DISCUSSION OF EXPERIMENT

Results of the 1999 hydroponic trials are given in Table 17 or were reported in the 1998 results. These trials are conducted after the field work is finished and are still in progress. A large percentage of the varieties are either mixed or still segregating. Resistance and susceptibility varied with the race evaluated.

### TEST PARAMETERS

Planting date: Varied with trial

Cultivar: See table

Location: Growth chamber

Experimental Design: Varieties to be evaluated were germinated in vermiculite and five-day-old seedlings were washed and placed through holes in styrofoam sheets. The seedlings were suspended by their leaves. The sheets + seedlings were placed in trays containing one-fourth strength Hoagland's solution. Ten seed were used per variety. The trays were inoculated with the fungus to be evaluated. The seedlings were incubated for one week at 22<sup>0</sup>C.

Table 17. 1999 Soybean *Phytophthora* Growth Chamber Trials. Reaction of soybean cultivars to different *Phytophthora* races. MAFES, Delta Research and Extension Center, Stoneville, MS

Cultivar or breeding line	Race 4	Race 2	Race 10	Race 3
HB. 4600	R	R	S	MIX
TS 4792 RR	R	R	S	S
SG 468 RR	MIX	S	R	S
TS 466 RR	R	S	S	S
HB. 4891	R	R	R	MIX
HB. 4890	R	R	R	MIX
P 9492	R	R	S	R
P 9482	R	S	S	R
RVS 499	S	MIX	R	MIX
TS 490	MIX	R	R	MIX
HBKR 4855 RR	R	MIX	R	R
SG 498 RR	R	MIX	MIX	R
P 94 B 81 RR	R	R	R	MIX
TS 520	R	R	S	MIX
RVS 549	R	R	R	MIX
RVS 529I	R	S	S	S
RVS ROBIN 5	R	R	S	MIX
RVS 77	R	MIX	MIX	R
DELLOY 5500	R	S	S	R
P95B33	R	MIX	S	R
X 9855	MIX	MIX	R	S
HBKR 5588 RR	R	MIX	R	S
TS 558 RR	R	S	MIX	MIX
TS 556 RR	MIX	MIX	S	R
X 9857 RR	R	R	MIX	MIX



TV 5666 RR	R	MIX	MIX	MIX
TV 5926	R	MIX	MIX	R
TV 4466 RR	R	MIX	S	R
TV 5975	R	MIX	R	R
TV 4770	S	MIX	MIX	R
DG 3541	S	R	R	R
DK 5961	MIX	R	R	R
WILLCROSS 2549 RR	S	R	R	R
DK 5995	MIX	R	MIX	R
GNM 541 RR	S	R	R	MIX
DP 5354	MIX	MIX	MIX	R
DPX 8562 RR	MIX	R	R	R
DPX 8547 RR	MIX	R	R	R
FFR RT 597	R	R	MIX	R
M 473 RR	S	MIX	MIX	R
8888P 9511	S	MIX	MIX	S
P 96 B 01 RR	R	R	R	R
ES 3901	MIX	MIX	R	R
USG 7539	MIX	MIX	R	S
DKXTJ 675 RR	R	MIX	MIX	R
FFR 665	R	R	R	R
FFR RT 5485 RR	R	R	R	R
P 9594	R	R	R	R
CX 367c RR	MIX	R	R	R
CX 364c	S	MIX	MIX	MIX
AG 3901 RR	S	S	MIX	S

Table 17. Continued

Cultivar or breeding line	Race 4	Race 2	Race 10	Race 3
A 3469	R	R	R	R
DP 5655	R	R	R	R
WE 590 RR	MIX	R	R	R
DK 5263 RR	MIX	MIX	MIX	R

DP 5915 RR	R	R	R	R
FFR 4985	S	S	MIX	MIX
FFR RT 587 RR	S	R	MIX	MIX
CX 393c	R	R	S	R
CX 339c	R	R	R	R
DP 5806 RR	R	MIX	R	R
DP 5960 RR	R	R	R	R
HUTCHESON	R	R	S	---
USG 7509N RR	MIX	MIX	MIX	R
WF 480 RR	MIX	MIX	MIX	MIX
HBKXR 6020 RR	MIX	R	MIX	R
UARK 5798	R	R	R	R
FFR RT 514	MIX	R	MIX	R
DKXTJ 684	MIX	R	R	MIX
ESSEX RSV1	MIX	MIX	R	R
DG 3463 RR	MIX	R	MIX	R
DG 4650 RR	S	MIX	R	R
AG 5001 RR	MIX	R	R	R
R 95-3235	S	R	R	MIX
TS 5879 RR	MIX	R	R	R
DK 5961 RR	R	R	R	R
V 91-3036	S	R	R	R

Table 17. Continued

Cultivar or breeding line	Race 4	Race 2	Race 10	Race 3
UARK 5896	S	R	R	MIX
EKXP 5700	S	MIX	R	MIX
DP 5644 RR	S	MIX	R	MIX
XTJ 794	MIX	R	R	R
ESSEX RSV4	S	S	S	S
R 93-171	MIX	MIX	MIX	MIX
USG 7599 RR	S	MIX	R	R
R 95-798	R	R	R	R

DG 5950 RR	MIX	R	MIX	R
TS 4979 RR	MIX	MIX	R	S
AG 5602 RR	S	R	S	
AG 5801 RR	MIX	R	S	
A 5547	S	R	S	
AG 5802 RR	S	R	MIX	
AG 6101 RR	MIX	R	S	
A 4604	S	MIX	S	
SC 89-147	S	R	MIX	
MUSEN	S	R	S	
AG 5901 RR	S	R	S	
DILLON	S	MIX	MIX	
A 4402	R	R	R	
AG 4902 RR	MIX	R	R	
AG 4602 RR	S	R	S	
AP 4880	MIX	R	R	
TV 5466 RR	S	MIX	R	
A 6961	S	R	S	

Table 17. Continued

Cultivar or breeding line	Race 4	Race 2	Race 10	Race 3
A 5944	MIX	R	MIX	
AP 588 RR	MIX	R	MIX	
AG 5401 RR	MIX	R	MIX	
FFR RT 517 RR	MIX	MIX	R	
FFR 495	MIX	R	MIX	
DT 95-15091	R	R	MIX	
TN4-86	S	R	MIX	
A 5843	MIX	R	S	
A 5959	MIX	R	S	
FFR RT 557 RR	MIX	R	MIX	
FFR 594	MIX	R	S	
TN 4-94	MIX	R	R	

DIXIE 478	S	MIX	R
TN 5-95	S	R	MIX
KS 3494	S	S	MIX
EISENHOWER	S	MIX	MIX
HY 574	MIX	R	R
A 5704	S	MIX	R
A 3904 STS	S	MIX	S
A 3701 RR	MIX	R	MIX
MERSCHMAN PHOENIX RR	MIX	R	R
MCKINNEY RR	S	MIX	MIX
TRUMAN	MIX	R	R
SALINE	S	MIX	R
ESSEX	S	S	S
USG 7499	S	R	S

Table 17. Continued

Cultivar or breeding line	Race 4	Race 2	Race 10	Race 3
SF 477 RR	MIX	MIX	S	
R 95-2210	MIX	MIX	MIX	
A 5404	MIX	R	S	
DKXTJ 784	MIX	R	R	
DK 4860	MIX	R	MIX	
AG 4702 RR	S	R	S	
DK 5664	MIX	R	S	
EKXP 5400	MIX	MIX	S	
USG 7499N RR	MIX	R	S	
ACCOMAC	R	R	R	
DK 4762 RR	S	R	S	
DK 4965 RR	S	R	MIX	
DP 4750 RR	MIX	R	R	
R 92-1258	MIX	R	S	
AG 5701 RR	MIX	R	S	
DKXTJ 584	MIX	MIX	R	

A 4922	R	R	R
H 5050	MIX	R	R
H 5999 RR	R	MIX	R
H 4998	R	MIX	R
H 4994	R	R	R
H 4258	R	R	R
USG 7577	R	R	MIX
DG 5550	MIX	MIX	MIX
EKXP 4900	S	S	MIX
A 4901	R	R	R

Table 17. Continued

Cultivar or breeding line	Race 4	Race 2	Race 10	Race 3
DK 5850	R	R	R	
EKXP 5120N	R	S	R	
SF 567	MIX	S	MIX	
DG 5810	R	R	R	
DT 96-6840	MIX	MIX	R	
DKXTJ 894	R	R	R	
HLA 572	S	R	R	
HX 5060167	MIX	R	R	
DP 578	MIX	R	R	
APX 94888	MIX	R	R	
2517N	S	R	R	
AG 6201	R	MIX	MIX	
AG 6701	MIX	R	S	
DT 96-16809	R	R	R	
DT 97-4290	R	R	R	
HBKR 5920	R	MIX	R	
X 9955	MIX	R	R	
APX 567	MIX	MIX	R	
APX 9563	R	R	R	
USG 7528	MIX	R	R	

USG 7557	S	R	R
AP 4602	R	MIX	MIX
DT 97-4318	R	R	S
USG 7478N	R	S	S
AG 4601	R	S	R
HX 5061870	S	R	R

Table 17. Continued

Cultivar or breeding line	Race 4	Race 2	Race 10	Race 3
USG 7548 RR	MIX	R	MIX	
H 4994	MIX	R	S	
H 5350	R	R	R	
DKXTJ 665	R	R	S	
DP 4690	R	R	R	
MANOKIN	S	R	R	
DP 3478	MIX	R	R	
DP 4909	R	MIX	S	
DP 3588	R	R	S	
APX 94882	MIX	R	R	
USG 7489	MIX	R	R	
SC 91-2007	R	R	S	
APX 9519	MIX	R	S	
X 9952	MIX	R	R	
TVX 4589	R	R	R	
USG 7547	MIX	MIX	S	

DELTA RESEARCH AND EXTENSION CENTER  
***1999 GREENHOUSE PHOMOPHSIS RESISTANCE TRIALS***  
G. L. Sciumbato

RESULTS AND DISCUSSION OF EXPERIMENT

Results of the 1999 *Phomopsis* trial on selected soybean varieties are given in Table 18. The percent of resistant and susceptible plants was recorded. Disease reaction varied from no effect (Resistant) to very large lesions or plant death.

TEST PARAMETERS

Planting date: Varied with trial

Cultivar: See table

Location: Greenhouse

Experimental Design: Thirty day old plants were inoculated by inserting a toothpick overgrown with the pathogen into the 2<sup>nd</sup> or 3<sup>rd</sup> internode of each plant. Disease reaction was recorded 30 days after inoculation. Six plants were inoculated per replication and three replications were used per variety.

Table 18. 1999 Soybean Greenhouse *Phomopsis* Trial. Percent of resistant and susceptible to *Phomopsis* plants in selected varieties or breeding lines to stem canker. MAFES, Delta Research and Extension Center, Stoneville, MS.

Variety or breeding line	Percent resistant	Percent susceptible
A 5901RR	64	36
H 5545 RR	100	0
DPL 3588	73	27
RVS 499	85	15
J77-339	72	28
HILL	---	---
H 5999 RR	78	12
HY 574	97	3
P 9592	89	11
P 9594	81	19
DT 95-15091	57	43
H 5855 RR	75	25
AG 5602 RR	41	59
HUTCHINSON	---	---
DP 5354	56	44
H 5050	100	0
DK 5995	100	0
A 5959	---	---
DG 858	100	0
P 95 B 41 RR	66	34
P 95 B 33	100	0
HBK 5770	100	0
DK 5961	35	65
SG 468	60	40
AG 4602	79	21
HBK 4600	96	4

DELTA RESEARCH AND EXTENSION CENTER  
*1999 GREENHOUSE SOYBEAN MOSAIC VIRUS TRIALS*  
G. L. Sciumbato

## RESULTS AND DISCUSSION OF EXPERIMENT

Results of the 1999 *Soybean Mosaic Virus* trials on selected soybean varieties are given in Table 19. Several of the varieties including were resistant to SMV.

### TEST PARAMETERS

Planting date: Varied with trial

Cultivar: See table

Location: Greenhouse

Experimental Design: The Soybean Mosaic Virus (SMV) pathogen used in these trials was obtained from plants infected with the virus by seed transmission. The inoculum was maintained and increased on the 'Hill' soybean variety.

Inoculum was prepared by blending leaves showing severe symptoms in a phosphate buffer at pH 6.8. The blended leaf tissue solution was strained through three layers of cheese cloth to remove leaf tissue. An abrasive (Diatomaceous earth) was mixed with the virus inoculum solution before use. The primary leaves of ten to twelve day old plants were inoculated by spraying them at close range using an airbrush until water soaking of the leaves occurred.

Disease symptoms appeared in newly developing trifoliate leaves. Disease symptoms were recorded on a 1-5 scale. 1= no disease and 5= severe mottling and epinasty. Intermediate disease severity was also observed.

Table 19. *1999 Soybean Mosaic Virus Trials*. Disease reaction of soybean varieties to Soybean Mosaic Virus. MAFES Delta Research and Extension Center, Stoneville, MS.

Variety or breeding line	Numeric Rating	Letter Rating
HBK 4600	2.7	MR-I

HBK R 4515	3	I
CX 460 RR	2.3	MR
SG 468 RR	3.3	I
DK 4762 RR	2.3	MR
TS 466 RR	2.7	MR-I
A 4604	2.3	MR
AG 4602 RR	2.3	MR
X 9240	2.7	MR-I
TS 4792	3	I
H 3090 RR	2.7	MR-I
H 4252 RR	2.7	MR-I
AP 4602 RR	2.3	MR
FFR 467 RR	2	MR
A 4401 RR	3	I
TV 4466 RR	3	I
AP 4980 RR	2.3	MR
HBKX 9749	3	I
P 9492	2	MR
P 94B 81 RR	2.3	MR
SG 498 RR	2	MR
DPX 8549	2	MR
DP 4750 RR	2.7	MR-I
AG 4901 RR	2.3	MR
FFR 495	1.7	R-MR

Table 19. Continued

Variety or breeding line	Numeric Rating	Letter Rating
GN 9482	2.7	MR-I
X 9851	2	MR
X 9855	2	MR
P 95 B 33	4	MS
X 9856 RR	2	MR
P 95 B 41 RR	2	MR

RVS 520	3.7	I-MS
DG 500 A	2	MR
DG 531	3	I
DK 5263 RR	2	MR
H 5855 RR	3.3	I
H 5013 RR	4.3	MS-S
H 5057 RR	2.3	MR
H 5350 RR	3.7	I-MS
TS 556 RR	3.7	I-MS
X 9450	4	MS
A 5704	1	R
DK 5664 RR	3	I
AG 5401 RR	1	R
AG 5602 RR	1	R
V90-1012	1.3	R
HBKX 571-98	3.3	I
DT 95-15091	3	I
DT 95-15550	1	R
DT 95-17556	1	R
R 93-171	1	R

Table 19. Continued

Variety or breeding line	Numeric Rating	Letter Rating
X 9857 RR	3	I
P 95 B 71 RR	2.3	MR
P 96 B 01 RR	2	MR
CX 550 RR	1	R
DP 6200 RR	1	R
DG 858	1	R
DK 5961 RR	1.5	R-MR
H 5181 RR	2.7	MR-I
UPAX 0038 RR	2.5	MR-I
V91-3036	1	R

H 6255 RR	1	R
RVSX 037 RR	1.5	R-MR
RVSX 024 RR	1	R
S 61-T1	4	MS
FFR 597	1	R
V89-805	1	R
ESSEX	1	R
ESSEX RSV1	1	R
GENESIS 9951	---	
FFR RT 517 RR	2	MR
FFR RT 557 RR	1	R
RVSX 08 RR	1	R
FFR RT 487	1	R
DK 5850	2	MR
AP 572 STS	1	R
ARKSOY	1.5	R-MR
FFR 665	1	R

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<sup>†</sup> 1= Resistant, 2=Moderately Resistant, 3=Intermediate, 4=Moderately Susceptible,  
5=Susceptible

