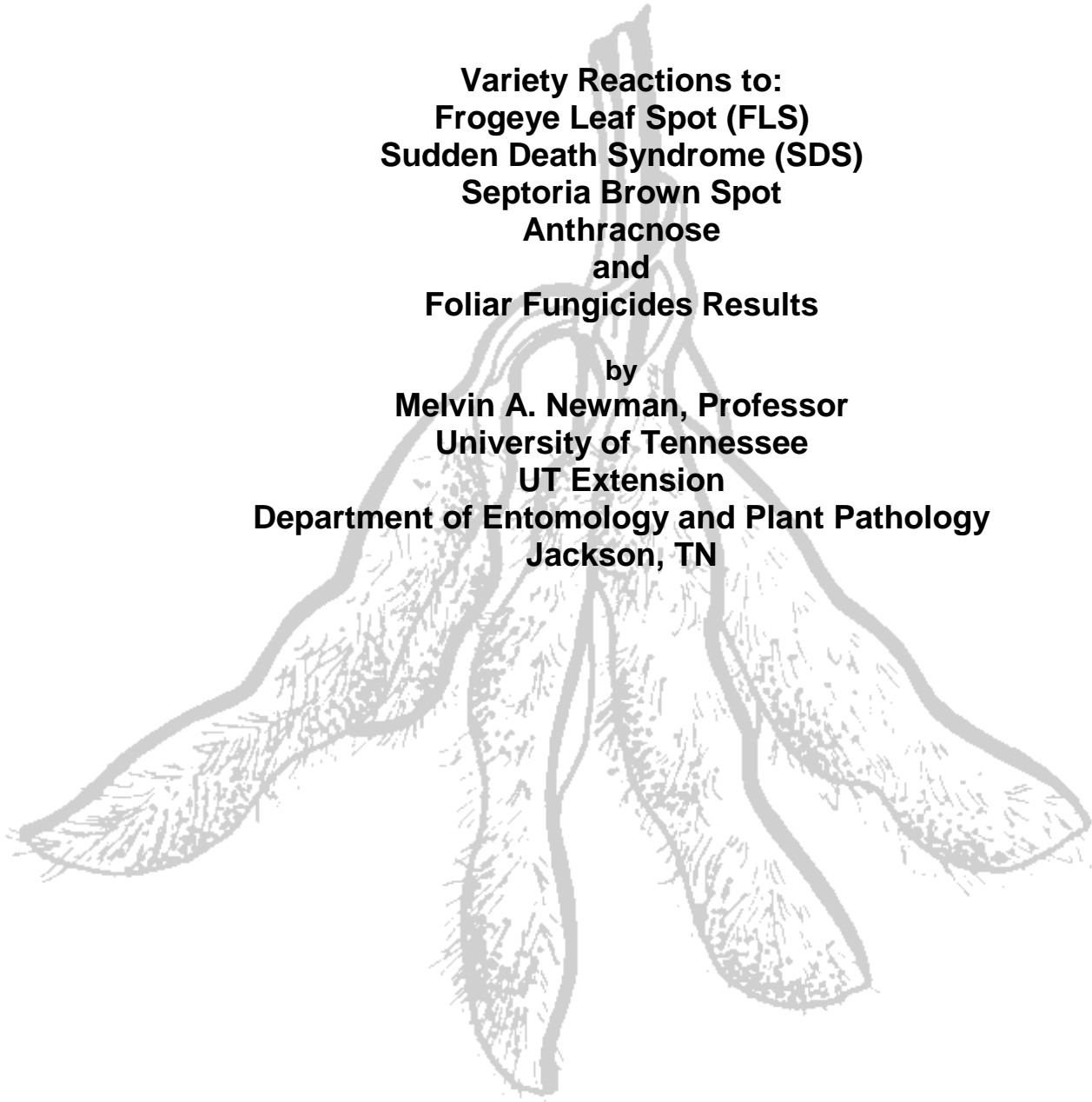


# **Soybean Disease Ratings and Yields 2008 Test Summaries**

**Variety Reactions to:  
Frogeye Leaf Spot (FLS)  
Sudden Death Syndrome (SDS)  
Septoria Brown Spot  
Anthracnose  
and  
Foliar Fungicides Results**

**by  
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**Report for 2008**  
**Melvin A. Newman, Professor**  
**University of Tennessee**

**Title:** Evaluation of Soybean Cultivars for Resistance to Frogeye Leaf Spot (FLS), Septoria Brown Spot and Anthracnose.

**Personnel:**

Melvin A. Newman, Professor and PI.

Bob Williams, Extension Area Specialist

Blake Brown, Superintendent-Research and Education Center at Milan (RECM)

**Objectives:**

Evaluate the effect of natural infections of (*Cercospora sojina*) **Frogeye Leaf Spot**, (*Septoria glycines*) **Septoria Brown Spot**, (*Colletotrichum truncatum*) **Anthracnose**, and (*Cercospora kikuchii*) **Cercospora Leaf Blight** on available commercial soybean cultivars.

**Procedures:**

Equipment: A 1.9-acre soybean plot was planted no-till at the RECM on May 21, 2008, with a four-row Case I.H. 900 planter with cone seed-box attachments.

Plot information: The **72 varieties** were planted in four-row plots with 36" centers and 22' long. Each plot was randomized and replicated three times. Irrigation was provided with a center pivot system. Each plot was split (side-by-side) with 2 rows being sprayed with **Headline at 6 oz/a** and 2 rows left unsprayed.

Disease ratings: Ratings were taken on Sept. 9 = MG III; Sept. 12 = MG IVE; Sept.15 = IVL; Sept.19 = MG VE. The rating scale was 0 to 10 with 0 = no detectable disease and 10 = extremely heavy leaf spot or complete defoliation. FLS occurrence was moderate and not as severe as in 2007.

**Justification:**

Frogeye leaf spot (FLS) caused by the fungus *Cercospora sojina* has been observed in Tennessee for over thirty years, but until recently, it has caused only limited yield loss. However, for 5 years (2002-2006) this foliar disease reduced soybean yields state wide by an average 7.8% of the annual crop. It is possible that lack of crop rotation and planting of susceptible varieties have been responsible for some of the increase in severity of FLS. An increase in the number of reported races of this fungus may also play a role in the increased yield loss. In 2007 FLS was at it's lowest damaging level and only caused a 2% loss state wide due mainly to the extremely dry weather. In 2008, FLS was still less severe than usual because infection of soybean plants was later than usual and then late season dry weather further reduced the spread and damage from this disease.

**Observations and Conclusions: (See Chart 1 and Tables 1-5)**

**Maturity Group V (Early):** FLS ratings for the early MG V early varieties ranged from 0 to 1.7 for the sprayed and 0 to 10.0 for the unsprayed. Average yield was 43.3 bu/a for the sprayed and 40.1bu/a for the unsprayed. Spraying increased the yield an average of **3.2 bu/a.** for the 21varieties. The sprayed varieties were all in the zero or low rating groups. In the unsprayed, there were nine varieties that rated (0) for FLS, five varieties that rated (1-3), three varieties that rated (4-6), and 2 varieties that rated severe (7-10).

**Maturity Group IV (Late):** FLS ratings for the 30 varieties in the late MG IV test ranged from 0 to 2.3 for the sprayed varieties and 0 to 8 in the unsprayed ones. Average yield for the sprayed varieties was 61.1 bu/a and was 58.5 bu/a for the unsprayed. Spraying increased the yield an average **2.6 bu/a.** across all varieties.

All the sprayed varieties were in the zero or low ratings groups. Eleven sprayed varieties rated (0), 19 varieties rated low (1-3) and there were no varieties in the moderate to severe category. There were 8 varieties in the unsprayed that rated (0), 6 that rated low (1-3), 10 that rated (4-6) and 6 were severe (7-10).

**Maturity Group IV (Early):** There were 15 varieties tested in this group, and their average FLS ratings ranged from 0 to 2.3 for the sprayed ones and 0 to 6.7 for the unsprayed ones. There were 4 sprayed varieties that were in the zero category. All the remaining sprayed varieties rated low from 0.3 to 2.3. There were 2 unsprayed varieties that rated (0), 6 varieties rated low (1-3), 7 varieties rated moderate (4-6), and 1 variety that rated severe (7-10).The average yield for the sprayed varieties was 58.5 bu/a and it was 52.1 bu/a for the unsprayed. Spraying increased yields an average **6.4 bu/a.**

**Maturity Group III:** FLS ratings for 5 varieties in this group ranged from 1.7 to 2.3 for the sprayed ones and 3.3 to 4.3 for the unsprayed ones. The average yield for the sprayed varieties was 50.9 bu/a and 47.0 bu/a

for the unsprayed. Spraying increased yields by an average of **3.9 Bu/A**. The sprayed varieties were all in the low rating of (1-3). There were no sprayed varieties in the moderate to severe range. In the unsprayed varieties, there were no varieties in the (0) rating, but there was two in the low (1-3) range, 3 in the moderate rating and none in the severe category.

It is clear that there are many varieties that have some or complete resistance to FLS. However, spraying susceptible varieties with a foliar fungicide may reduce the severity of FLS but it does not always increase the yield. On the other hand, spraying a FLS resistant variety may increase the yield because of other diseases that may be present.

**Chart 1**

<b>Foliar Fungicide Spray Tests on Soybean varieties</b> <b>Average Frogeye Leaf Spot Ratings (0-10) and Yields</b> <b>Research and Education Center at Milan – 2008</b> <b>Melvin Newman, U T Extension</b>								
Average FLS Rating	MG III (5 varieties)		MG IV E (15 varieties)		MG IV L (30 varieties)		MG V E (21 varieties)	
	Unsprayed	Sprayed	Unsprayed	Sprayed	Unsprayed	Sprayed	Unsprayed	Sprayed
None (0)	0	0	2	4	8	11	9	13
Low (1-3)	2	5	6	11	6	19	5	8
Mod. (4-6)	3	0	7	0	10	0	3	0
Severe (7-10)	0	0	1	0	6	0	2	0
Aver. bu/a	47.2	50.4	52.1	58.5	58.5	61.1	40.1	43.3
(increase) bu/a		3.9		6.4		2.6		3.2
Aver. FLS Rating	3.4	1.7	3.2	1.0	3.6	0.8	2.3	0.3
Highest yielding variety	50.0	52.5	57.8	66.0	64.7	68.3	44.3	47.2
FLS rating for highest yielding variety	3.3	1.7	3.7	1.0	3.3	0.7	0.0	0.3
Lowest yielding variety	43.7	47.8	41.0	49.6	55.0	55.8	35.7	40.3
FLS rating for lowest yielding variety	4.0	2.3	2.7	2.3	0.7	0.0	0.0	0.0

Table 1

## University of Tennessee

## Frogeye Leaf Spot Variety Test, Maturity Group 5E, 2008

Trial ID: 08FE5E

Location: MILAN (A-2)

Investigator: Dr. Melvin Newman

Treatment	SPRAY	UNSPRAY	DIFFER.	SPRAY	UNSPRAY	SPRAY	UNSPRAY.	SPRAY	UNSPRAY	SPRAY	UNSPRAY	SPRAY	UNSPRAY
Disease Name	SPR.	UNSP.	Diff.	FLS	FLS	BR. SPOT	BR. SPOT	SDS	SDS	ANTRAC	ANTRAC	GR. STEM	GR.STEM
Rating Data Type	BU/AC	BU/AC	BU/AC	0-10	0-10	0-10	0-10	0-10	0-10	0-10	0-10	0-10	0-10
Trt Variety Name													
1 DP 5335	41.1	38.1	3.1	1.7	7.3	1.0	2.7	0.3	0.3	1.0	2.7	0.0	0.0
2 GREAT HEART 502	45.5	42.1	3.4	1.0	6.0	1.7	4.7	0.0	0.0	2.7	5.0	0.0	0.0
3 DYNA GRO 33B52	43.5	40.9	2.6	0.0	0.0	0.7	3.0	0.3	1.0	1.3	2.3	0.0	0.0
4 DELTA KING 52K6	41.9	38.2	3.6	0.0	0.0	1.0	2.7	0.3	0.3	1.0	2.7	0.0	0.0
5 FFR 5663	42.7	36.5	6.2	0.0	0.0	1.3	2.3	0.3	0.0	1.0	2.0	0.0	0.0
6 DP 5634	40.8	37.9	2.9	0.0	0.7	1.0	3.0	0.0	0.0	1.3	2.3	0.0	0.0
7 SCHILLINGER 557	42.9	37.8	5.1	0.7	3.3	1.0	3.0	2.0	1.0	1.0	2.3	0.0	0.0
8 ARMOR 53-25	41.3	40.7	0.5	0.0	0.0	1.3	2.3	0.0	0.0	1.0	2.3	0.0	0.0
9 ARMOR 55-A5	44.0	44.3	-0.3	0.0	0.0	1.0	4.0	0.7	0.0	1.0	2.3	2.3	0.3
10 STINE 5482-4	43.3	39.6	3.7	0.0	0.0	1.0	3.3	0.7	0.3	1.3	2.7	0.0	0.0
11 DAIRYLAND 8512	43.2	41.0	2.2	0.0	0.0	0.7	2.7	0.3	0.7	1.3	2.7	0.0	0.0
12 DAIRYLAND 8509	47.2	44.2	2.9	0.0	1.7	1.3	4.3	0.3	0.0	1.7	3.7	0.0	0.0
13 DELTA KING 5068	44.6	39.7	4.9	1.7	10.0	1.0	2.0	0.0	0.0	2.0	4.3	0.0	0.0
14 DYNAGRO 33X55	40.3	35.7	4.6	0.0	0.0	0.7	2.7	1.0	0.7	1.0	2.3	0.0	0.0
15 AG-SOUTH GEN.568	41.3	40.6	0.7	0.0	0.0	1.0	2.0	0.0	0.3	1.3	3.3	0.0	0.0
16 NORTHRUP KING 56-D7	43.8	41.4	2.4	0.3	4.7	1.0	2.0	0.7	1.0	1.7	3.3	0.0	0.0
17 USG ALLEN	42.5	39.4	3.1	0.3	3.0	1.0	2.7	1.3	1.0	1.0	2.3	0.0	0.0
18 PIONEER 95Y20	44.1	41.1	3.0	0.7	3.7	1.0	3.7	1.0	1.0	1.0	3.0	0.0	0.0
19 PIONEER 95Y40	46.8	42.5	4.4	0.7	4.0	1.0	3.0	0.3	0.7	1.0	2.7	0.0	0.0
20 PIONEER 95Y41	45.3	43.5	1.8	0.0	1.3	1.0	3.7	0.3	0.7	1.0	2.0	0.0	0.0
21 USG Allen	42.9	37.6	5.3	0.0	3.0	1.0	2.3	1.7	1.3	1.0	2.0	0.0	0.0
LSD (P=.05)	6.14	5.27	5.71	0.56	1.42	0.56	1.08	1.04	1.28	0.54	1.09	0.75	0.21
Grand Mean	43.28	40.12	3.16	0.33	2.32	1.03	2.95	0.56	0.49	1.27	2.78	0.11	0.02

DISEASE RATING SCALE and green stem rating: 0 – 10, where 0 = no detectable disease and 10 = most disease possible before defoliation.

Table 2

## University of Tennessee

## Frogeye Leaf Spot Variety Test, Maturity Group 4L, 2008

DISEASE RATING SCALE: 0 – 10, where 0 = no detectable disease and 10 = most disease possible before defoliation.

Trial ID: 08FE4L											
Location: MILAN (A-2)				Investigator: Dr. Melvin Newman							
Treatment	SPRAYED	UNSPRAY	DIFF.	SPRAYED	UNSPRAY	SPRAYED	UNSPRAY	SPRAYED	UNSPRAY	SPRAYED	UNSPRAY
Disease Name				FLS	FLS	BR.SPOT	BR.SPOT	SDS	SDS	ANTRAC	ANTRAC
Rating Data Type	BU/AC	BU/AC	BU/AC	0-10	0-10	0-10	0-10	0-10	0-10	0-10	0-10
NORTHROP KING 46-U6	57.1	51.1	6.00	0.0	0.0	3.0	8.3	0.3	0.3	2.7	6.0
NORTHROP KING 49-H7	58.5	52.3	6.11	2.0	5.3	2.3	4.7	0.3	0.0	1.0	2.3
STINE 4782-4	60.7	62.4	-1.72	0.0	0.0	3.7	7.7	0.0	0.0	1.0	3.0
SCHILLINGER 495RC	61.1	60.4	0.73	0.0	0.3	1.7	5.0	0.3	0.7	1.7	3.0
DAIRYLAND 8482	62.7	57.8	4.94	0.7	5.0	2.0	4.0	0.3	0.3	1.0	3.0
DP 488	61.6	59.8	1.75	0.7	4.7	2.7	6.3	0.0	0.0	1.7	4.0
DP 4724	55.8	55.0	0.76	0.0	0.7	3.3	7.0	0.0	0.0	1.0	2.7
TRISOY 4760	64.7	60.1	4.58	0.0	0.0	2.7	7.7	0.0	0.0	1.3	3.7
DYNA- GRO 37P49	65.3	60.2	5.08	1.0	7.7	1.7	3.0	0.0	0.0	1.3	3.3
DELTA KING 4866	62.9	56.6	6.30	1.0	7.0	2.7	5.0	0.0	0.0	1.0	3.0
DAIRYLAND 8474	58.3	58.0	0.29	0.7	3.3	1.7	6.3	0.3	0.0	1.3	2.7
DELTA KING 4651	68.3	64.7	3.60	1.3	5.3	2.3	5.7	0.3	0.0	1.0	2.7
USG 74T98	57.4	59.0	-1.59	0.0	0.0	2.0	6.0	0.0	0.0	1.0	2.0
PROGENY 4606	56.1	56.2	-0.10	0.0	0.3	3.0	7.0	0.0	0.0	1.0	2.7
PROGENY 4906	64.2	63.0	1.17	1.0	4.3	2.0	4.0	0.0	0.0	1.0	2.0
USG 74A76	67.0	66.3	0.69	0.3	3.0	2.3	6.3	0.3	0.0	2.0	4.3
MORSOY 4955	57.3	55.6	1.67	1.3	7.0	2.0	2.7	0.0	0.0	1.3	3.3
DYNA -GRO 36Y48	61.4	60.5	0.89	1.7	6.0	1.7	3.3	0.0	0.0	1.3	3.3
ASGROW 4703	62.8	59.7	3.10	1.7	7.7	2.3	3.3	0.3	0.0	1.3	3.0
VIGORO 49N6	61.7	60.8	0.87	0.0	0.0	1.7	4.7	0.3	0.3	1.7	4.0
DK (ARMOR) 48J3	61.0	58.6	2.39	0.3	2.3	2.7	5.7	0.3	0.7	1.3	2.7
ASGROW 4903	57.8	53.3	4.45	1.3	5.3	1.7	4.3	0.3	0.0	1.0	2.7
ARMOR 47-F8	59.3	61.6	-2.27	0.0	0.0	3.3	7.0	0.0	0.0	1.0	3.0
GREAT HEART 467 CRR	57.3	55.4	1.85	2.3	8.0	2.0	4.3	0.0	0.0	1.0	3.0
FFR 4886	64.6	57.4	7.21	1.3	6.3	1.3	3.3	0.0	0.0	1.0	2.7
ASGROW 4605	59.7	61.3	-1.60	0.3	5.0	3.0	6.7	0.0	0.0	1.7	4.0
CROPLAN (FFR) 4877	61.5	55.8	5.75	0.0	0.0	3.0	7.0	0.0	0.0	1.0	2.0
PIONEER 94Y60	60.4	57.2	3.15	2.3	7.3	2.3	5.7	0.0	0.0	1.3	3.3
PIONEER 94Y70	63.1	57.6	5.51	0.0	0.0	2.0	6.0	0.0	0.3	1.0	2.7
PIONEER 94Y90	64.3	56.2	8.15	1.3	6.3	2.3	4.3	0.0	0.0	1.7	3.7
LSD (P=.05)	7.06	8.43	7.695	1.17	1.68	1.21	2.12	0.57	0.42	0.65	1.06
Grand Mean	61.13	58.47	2.66	0.76	3.61	2.34	5.41	0.12	0.09	1.29	3.12

Table 3

University of Tennessee

## Frogeye Leaf Spot Variety Test, Maturity Group 4E, 2008

Trial ID: 08FE4E

Location: Milan (A-2)

Investigator: Dr. Melvin Newman

Treatment	SPRAYED	UNSPRAY	DIFF.	SPRAYED	UNSPRAY	SPRAYED	UNSPRAY	SPR & UN	SPRAYED	UNSPRAY
Disease Name	HARVEST	HARVEST	HARVEST	FLS	FLS	BR. SPOT	BR. SPOT	SDS	ANTHRAC	ANTHRAC
Rating Data Type	BU/AC	BU/AC	BU/AC	0-10	0-10	0-10	0-10	0-10	0-10	0-10
Trt Treatment No. Name										
1 MOR SOY 4556	57.2	49.9	7.33	1.0	4.0	1.3	5.7	0.0	1.7	3.7
2 FFR 4526	60.6	65.8	-5.22	0.3	1.7	1.0	4.0	0.0	1.7	3.7
3 DEKALB 42-51	51.1	41.0	10.09	1.0	2.7	2.7	7.3	0.0	2.0	3.7
4 STEYER 4040	49.6	44.3	5.21	2.3	6.7	2.3	6.7	0.0	2.3	3.7
5 STEYER 4030	55.0	49.4	5.58	0.0	0.0	2.7	7.0	0.0	1.3	3.0
6 DAIRYLAND 4300	52.4	51.4	1.01	1.7	6.0	2.3	5.0	0.0	2.7	4.7
7 DYNA-GRO 37A44	63.7	56.9	6.81	1.0	3.7	2.0	5.7	1.3	2.7	5.3
8 ASGROW 4005	54.0	51.5	2.46	0.0	1.0	2.0	8.3	0.0	2.0	3.0
9 TRISOY 4475	66.0	57.8	8.13	1.0	3.7	1.3	4.3	0.3	2.0	4.0
10 TRISOY 4275	59.9	57.3	2.64	2.3	6.7	1.7	7.3	0.0	1.3	2.7
11 ARMOR 42-M1	59.3	55.7	3.51	0.0	0.0	3.7	7.7	0.3	1.3	2.7
12 USG 74A45	65.8	57.0	12.94	1.0	2.3	2.0	6.7	1.7	2.3	5.0
13 SCHILLINGER 457 RC	58.9	46.9	10.89	0.0	0.3	2.3	8.0	0.3	2.0	3.7
14 PIONEER 94Y20	63.9	56.7	7.19	1.3	3.0	3.0	7.7	0.0	1.7	3.7
15 MOR SOY 4556	59.4	53.7	5.77	2.0	5.7	2.7	5.0	0.0	1.7	3.3
LSD (P=.05)	10.11	11.91	11.835	0.90	1.50	1.07	1.73	0.85	0.89	1.25
Grand Mean	58.45	53.03	5.62	1.0	3.16	2.2	6.42	0.27	1.91	3.71

DISEASE RATING SCALE: 0 – 10, where 0 = no detectable disease and 10 = most disease possible before defoliation.

**Table 4**

**University of Tennessee**

**Frogeye Leaf Spot Variety Test, Maturity Group 3, 2008,**

**Trial ID: 08FE3**

**Location: MILAN (A-4)**

**Investigator: Dr. Melvin Newman**

Treatment	SPRAYED	UNSPRAYE	DIFF.	SPRAYED	UNSPRAY	SPRAYED	UNSPRAY	SPR&UNSP	SPRAYED	UNSPRAY	S
Disease Name	HARVEST	HARVEST	HARVEST	FLS	FLS	BR.SPOT	BR.SPOT	SDS	ANTRAC	ANTRAC	G
Rating Data Type	BU/AC	BU/AC	BU/AC	0-10	0-10	0-10	0-10	0-10	0-10	0-10	
Trt No.	Variety Name										
1	ARMOR 38-G2	49.8	43.7	6.1	1.7	4.0	2.7	6.3	0.0	2.0	4.3
2	ASGROW 3906	52.3	49.3	3.0	2.0	4.0	3.7	6.3	0.0	1.7	2.0
3	NORTHRUPKING 39-A3	47.8	44.9	2.9	2.3	4.3	2.0	5.3	0.0	2.7	5.3
4	PIONEER 95Y41	52.1	47.1	5.0	2.0	4.3	2.0	6.3	0.0	2.7	5.8
5	ASGROW 3906A	52.5	50.0	2.5	1.7	3.3	2.7	6.7	0.3	1.0	2.3
6	PIONEER 95Y41A (1)	47.9	49.4	-0.5	0.7	0.7	1.0	2.0	1.0	---	---
	LSD (P=.05)	7.53	5.39	8.10	0.79	1.23	1.00	2.23	0.92	1.19	2.41
	Grand Mean	50.9	47.0	3.9	1.72	3.44	2.33	5.5	0.22	2.0	3.95

DISEASE RATING SCALE and green stem rating: 0 – 10, where 0 = no detectable disease and 10 = most disease possible before defoliation.

(1) Pioneer 95Y41A (Variety #6) was mistakenly planted in the MG 3 test, so the yields were not averaged in Grand Mean because harvest was much later for it.

