Soybean Disease Control
SOYBEAN DISEASE RATINGS FOR 2002

The data contained in Tables 1-7 are from tests conducted at the West Tennessee (WTES) and Milan (MES) Experiment Stations during the 2002 growing season. The test at WTES was artificially inoculated with the stem canker fungus. The occurrences of diseases at MES were the result of natural infestations. Information about disease ratings and names are contained at the end of each table along with harvest and rating dates.

Table 1. Soybean Disease Ratings and Yields, Maturity Group V Roundup Ready
Milan Experiment Station, 2002

Brand-Variety [1,2,3,4,5]	FLS	SDS	CLB	SC	Bu/A
1 Armor 5135	6.0	3.3	0.0	0.0	34.0
2 Armor 53-K3	6.7	1.0	1.0	0.0	30.6
3 Armor 54-Z4	7.7	0.3	1.3	0.0	31.6
4 Armor 56-J6	2.3	1.3	0.7	0.7	43.7
5 Asgrow 5301	5.3	3.7	1.0	0.0	40.4
6 Asgrow 5501	6.0	0.3	1.7	0.0	40.3
7 Asgrow 5603	7.3	2.7	0.0	0.0	32.0
8 Asgrow 5701	3.3	1.0	0.3	0.0	52.4
9 Asgrow 5901 RR	4.7	2.0	0.7	0.0	45.0
10 Asgrow AG 5903	2.3	2.7	0.0	0.0	56.4
11 Croplan RC 5252	5.3	4.3	2.7	0.0	47.0
12 Croplan RC 5454	8.3	0.7	2.0	0.0	43.2
13 Delta Grow 5250 RR	7.0	2.0	3.3	0.0	37.7
14 Delta Grow 5350 RR	0.3	2.0	2.3	0.0	46.1
15 Delta Grow 5450 RR	7.3	0.7	1.7	0.0	35.6
16 Delta Grow 5630 RR	2.3	4.0	0.7	0.0	46.7
17 Delta King DK 5366 RR	2.0	2.7	1.0	0.0	50.0
18 Delta King DK 5465 RR	8.0	0.7	0.0	0.0	49.9
19 Delta King DK 5661 RR	2.3	0.7	0.3	0.0	45.3
20 Delta King DK 5668 RR	1.0	0.3	0.7	0.0	50.9
21 Delta King DK 5961 RR	7.7	4.7	0.0	0.0	31.3
22 Deltapine DP 5414 RR	0.0	1.7	0.0	0.0	62.5
23 Deltapine DP 5644 RR	0.7	1.7	1.3	0.0	56.2
24 Deltapine DP 5806 RR	5.7	2.7	0.3	0.0	36.7
25 Deltapine DP 5915 RR	0.3	2.0	0.0	0.3	57.4
26 Deltapine DPX 5734 RR	0.0	1.0	0.0	0.3	70.4
27 DynaGro 3521N RR	7.0	2.3	3.3	1.3	45.5
28 DynaGro 3583N RR	1.7	5.7	0.7	0.0	49.5
29 DynaGro DG 3518	7.7	2.0	5.7	0.0	41.0
30 DynaGro DG 3562	1.3	1.0	1.0	0.0	61.4
31 Eagle ES Ranger RR	9.3	3.0	1.3	2.0	31.8
32 Eagle Marshal RR	0.0	4.3	0.7	0.0	39.6
33 Eagle Punch RR	10.0	0.7	0.0	2.7	27.3
34 Eagle Trooper RR	5.7	4.0	1.0	0.0	37.7
35 FFR 4900 RR	6.0	5.7	5.0	2.7	27.7
36 FFR 5225 RR	0.7	2.7	1.7	0.0	49.9
37 FFR 5485 RR	1.0	0.3	1.3	3.0	47.4

Brand-Variety [1,2,3,4,5]	FLS	SDS	CLB	SC	Bu/A
38 FFR 5542 RR	6.3	2.7	2.3	0.0	41.9
39 FFR RT 517 RR	7.7	5.7	2.3	0.0	31.6
40 FFR RT 557 RR	7.0	2.3	3.0	0.0	30.9
41 G. Harvest H-5422 RR	1.3	6.0	0.0	0.0	35.2
42 Garst 5512 RR/N	8.0	1.0	1.3	0.0	33.3
43 Garst 588 RR/N	0.3	2.0	1.0	0.0	52.8
44 Hartz H 5223 RR	8.0	3.3	0.3	0.0	34.2
45 Hartz H 5444	8.0	0.3	0.7	0.0	42.0
46 Hartz H 5887 RR	2.0	3.0	0.7	0.0	49.8
47 Hornbeck HBK R5422	0.0	2.3	1.7	0.3	51.8
48 Hornbeck HBK R5620	2.7	3.7	1.3	0.3	40.7
49 Midw. Perm. G. MPV 5302n RR	9.3	2.7	0.0	0.7	27.5
50 Morsoy RT 5252	4.0	5.0	0.0	0.0	43.0
51 Morsoy RT 5440	8.7	1.3	0.3	0.0	1.1
52 Morsoy RT 5442	8.3	3.0	0.0	0.0	32.3
53 Morsoy RT 5620	1.3	1.7	1.0	0.0	49.8
54 Pioneer 95B32	7.7	0.7	1.3	4.7	37.7
55 Pioneer 95B42	5.3	2.7	1.3	2.0	32.5
56 Pioneer 95B43	6.7	2.3	1.3	0.0	34.1
57 Pioneer 95B96	6.3	1.7	0.0	1.0	39.1
58 Progeny 5660	2.7	2.0	1.0	0.0	44.8
59 Stine S 5502-4	2.3	2.0	0.7	0.0	44.0
60 Syngenta S 52-U3	6.0	6.0	0.0	0.0	25.8
61 Terral TV 52 R 42	7.3	5.3	3.7	0.0	34.5
62 Terral TV 54 R 11	9.0	0.3	0.7	0.0	35.3
63 Terral TV 56 R 11	3.0	3.7	1.3	0.7	39.5
64 Terral TV 58 R 11	3.0	2.0	0.7	1.0	40.5
65 Terral TV 59 R 85	4.0	2.7	0.7	0.7	36.7
66 Terral TV 59 R 98	6.3	3.7	1.0	0.0	41.3
67 USG 510	5.7	3.3	2.0	0.0	37.9
68 USG 540	9.0	0.0	1.0	0.0	42.3
69 USG 570	3.3	2.0	1.3	0.0	49.7
70 USG 7522	6.0	4.7	4.7	0.0	40.0
71 USG 7547 RR	6.0	3.3	3.7	0.0	38.0
72 USG 7562n RR	7.7	0.7	1.0	9.0	21.4
73 USG 7582n RR	2.7	7.3	0.0	0.0	37.2
74 VA. 99VPI-67	8.7	5.0	0.3	0.0	29.7
75 VA. 99VPI-120	8.3	4.7	0.0	0.0	23.3
76 VA. V 99-3337	8.3	2.7	0.0	0.0	32.2
77 Vigoro V 503 RR	5.3	2.0	0.3	0.0	32.9
78 Vigoro V 52N3 RR	5.7	4.0	0.3	0.0	43.6
79 Vigoro V 543	8.7	0.3	0.3	0.0	36.4
80 Vigoro V 562N RR	2.7	2.3	0.3	0.3	39.2
LSD (P=.05)	**1.65**	**2.69**	**1.62**	**1.63**	**11.95**

1. Disease ratings were made on a scale of 0-10, where 0=no disease and 10=the most disease possible.
2. FLS = Frogeye Leaf Spot, SDS = Sudden Death Syndrome, CLB = Cercospora Leaf Blight, SC = Stem Canker.
3. Disease ratings were made on September 12, 2002.
4. Harvest was October 24, 2002, and all yields were adjusted to 13% moisture.
5. Plots were under pivot irrigation.

Table 2. Soybean Disease Ratings and Yields, Maturity Group V Conventional Milan Experiment Station, Frogeye Leaf Spot, SDS, Stem Canker, and Yields, 2002.

Brand-Variety[1,2,3,4]	FLS	SDS	SC	Bu/A
1 Armor 52-C2	6.00	2.00	3.3	25.1
2 Asgrow 5427	1.00	6.33	3.7	38.5
3 Asgrow 5944	6.00	1.67	1.3	38.1
4 Delta King DK 5850	1.00	2.67	7.7	23.7
5 Delta King DK 5995	2.00	0.33	1.0	56.0
6 Deltapine DP 4748 S	3.00	1.00	0.3	33.4
7 Deltapine DP 5110 S	4.67	2.67	1.0	30.4
8 FFR 5700	0.67	2.00	2.0	55.8
9 Hornbeck 5991	6.67	0.33	0.0	38.2
10 MD Manokin	1.67	1.00	0.3	35.1
11 MO Anand	1.33	0.67	0.0	67.6
12 MO Delsoy 5500	7.67	5.00	3.7	23.5
13 NC Holladay	1.00	2.33	3.0	43.3
14 Pioneer 95B33	2.17	1.00	0.7	52.6
15 TN 5002 T	0.33	1.00	0.7	60.2
16 USG 550nSTS	6.00	4.33	2.0	23.0
17 USG 5601 T	2.33	2.00	0.0	51.0
18 VA Hutcheson	6.67	4.00	2.0	27.1
19 VA V 96-0340	6.83	0.67	0.3	35.1
20 Vigoro V 521 sts	6.67	6.83	5.7	21.5
LSD (P=.05)	**1.103**	**2.064**	**3.00**	**11.11**

NOTES:

1. **Disease ratings were made on a scale of 0-10, where 0=no disease and 10=the most disease possible.**
2. **FLS = Frogeye Leaf Spot, SDS = Sudden Death Syndrome, SC = Stem Canker.**
3. **Disease ratings for FLS and SDS were made on August 28, 2002; for SC, ratings were made on September 18, 2002.**
4. **Harvest was November 2, 2002.**

Table 3. Soybean Disease Ratings and Yields, Maturity Group IV Roundup Ready

Milan and West Tennessee Experiment Stations, 2002

Brand-Variety[1,2,3,4]	MES FLS	MES SDS	MES Bu/A	WTES SC	WTES Bu/A
1 Armor 4280	0.00	1.7	43.9	0.7	49.7
2 Armor 42-L2	6.00	1.7	24.9	7.0	40.9
3 Armor 44-R4	5.00	1.0	50.9	0.7	46.4
4 Armor 47-G7	3.67	2.0	33.1	3.7	42.6
5 Armor AXR-4699 RR	2.67	2.7	27.1	6.0	50.5
6 Asgrow AG 4201	2.67	0.7	34.1	5.0	49.5
7 Asgrow AG 4403	5.33	1.0	45.6	5.0	56.6
8 Asgrow AG 4603	7.33	0.3	35.8	0.3	46.7
9 Asgrow AG 4702	6.67	1.7	30.9	1.0	57.6
10 Asgrow AG4902	2.33	1.3	47.3	0.7	51.2
11 Croplan RC 4432	5.67	3.7	40.4	0.3	47.2
12 Croplan RC 4444	5.67	0.7	49.3	1.7	43.5
13 Croplan RC 4772	5.67	0.7	39.4	1.3	41.5
14 Croplan RC 4848	6.00	1.3	29.9	0.7	46.0
15 Croplan RC 4992	7.00	1.7	30.8	0.0	43.7
16 Delta Grow 4950 RR	4.33	0.0	42.9	0.3	49.0
17 Delta King 4461	5.00	0.7	53.6	2.0	43.7
18 Delta King 4762 RR	6.00	4.0	26.3	7.0	37.0
19 Delta King 4763 RR	5.00	3.7	33.7	3.3	56.8
20 Delta King 4868	6.33	0.7	50.0	8.3	54.5
21 Delta King 4965	7.33	0.3	30.3	0.7	65.0
22 Delta King XTJ 040 RR	4.33	2.3	34.3	6.3	42.9
23 Deltapine DP 4344 RR	3.00	0.0	29.0	1.0	44.4
24 Deltapine DP 4690 RR	4.33	0.0	50.1	0.3	55.5
25 Deltapine DPX 4527 RR	7.00	0.7	23.2	1.0	49.6
26 Deltapine DPX 4727 RR	3.00	2.3	38.7	3.0	56.0
27 Deltapine DPX 4933 RR	7.67	2.7	35.4	0.0	50.8
28 Deltapine SG 498 RR	6.00	0.3	50.9	0.0	52.0
29 DynaGro 3443 NRR	5.67	0.0	57.7	4.7	49.3
30 DynaGro 3468 NRR	8.33	0.3	33.0	1.0	52.4
31 DynaGro 3484 NRR	6.33	1.7	35.9	0.7	57.4
32 DynaGro X419 NRR	4.33	4.3	39.7	3.7	44.0
33 Eagle ES Prairie RRI	9.33	8.3	16.2	0.2	49.3
34 FFR 4455 RR	6.00	2.3	44.2	0.3	57.3
35 FFR 4712 RR	6.33	1.0	31.9	1.7	56.7
36 FFR 4891t RR	4.67	0.3	46.3	0.0	60.9
37 FFR 4922 RR	8.00	2.3	32.2	0.3	55.9
38 G. Harvest H-4534 RR	5.00	0.0	55.1	5.3	52.3
39 G. Harvest H-4772 RR	4.33	4.3	31.4	4.3	45.5
40 G. Harvest H-4850 RR	6.67	0.0	28.2	0.3	56.4
41 G. Harvest H-8854	5.00	0.7	50.8	3.0	51.8
42 Garst 4312 RR/STS/N	0.33	1.7	40.4	3.0	55.0
43 Garst 4512 RR/N	5.67	0.3	51.4	4.7	55.1
44 Garst D484 RR/N	5.67	0.7	29.5	0.3	56.2
45 Hartz 4884 RR	6.00	0.7	34.7	0.0	49.8
46 Hartz H 4454	5.67	0.7	48.1	4.3	51.8
47 Hartz H 4554 RR	8.00	1.7	29.9	3.7	53.0
48 Hornbeck HBK R4622	0.00	1.0	40.3	1.3	50.3
49 Hornbeck HBK R4820	6.67	0.7	51.4	4.7	53.6

Brand-Variety[1,2,3,4]	MES FLS	MES SDS	MES Bu/A	WTES SC	WTES Bu/A
50 Hornbeck HBK R4920	4.00	0.0	48.5	0.0	54.7
51 Midw. Prem. G. MPV 457n RR	8.00	0.3	31.4	1.0	49.4
52 Midw. Prem. G. MPV 4802n RR	8.67	1.7	24.0	0.0	47.6
53 Morsoy RT 4809	6.50	0.3	50.0	3.3	53.8
54 NK Brand X248	6.33	1.0	44.6	0.0	57.3
55 Pioneer 9492	0.67	3.3	35.9	1.3	40.4
56 Pioneer 94B13	1.33	2.3	37.9	1.0	51.9
57 Pioneer 94B23	2.67	0.7	36.6	4.0	45.1
58 Pioneer 94B73	0.00	0.7	46.6	1.3	53.9
59 Pioneer 94B74	6.00	1.7	39.6	1.7	49.5
60 Progeny 4858	6.00	0.7	26.4	0.3	56.3
61 Steyer 4410	5.33	1.3	57.8	4.3	47.5
62 Stine S4442-4	0.00	1.0	55.2	1.7	50.4
63 Stine S4882-4	1.33	1.0	49.3	0.0	53.4
64 Syngenta NK X248 R	6.33	0.7	51.7	0.0	63.8
65 Terral TV 4589 RR	8.33	0.3	32.3	1.0	58.5
66 Terral TV 4886 RR	8.67	4.3	19.6	0.3	59.1
67 Terral TV 4890 RR	4.67	2.0	33.4	0.3	59.3
68 USG 7440n	6.00	2.3	52.4	4.3	54.3
69 USG 7449n RR	0.00	0.3	44.0	3.7	58.2
70 USG 7489 RR	3.33	0.3	47.3	0.0	53.6
71 USG 7499n	6.00	1.7	34.0	0.7	54.1
72 USG BG 4401	5.33	0.7	53.7	5.3	61.8
73 Vigoro V42N3 RR	0.00	1.7	58.5	1.3	51.3
74 Vigoro V442N RR	5.00	0.0	59.3	6.0	53.3
75 Vigoro V46N3 RR	0.00	2.3	44.6	0.7	37.7
76 Vigoro V49N3 RR	1.67	1.3	55.2	0.0	46.2
LSD (P=.05)	**1.490**	**2.30**	**11.91**	**2.98**	**12.47**

NOTES:

1. Disease ratings were made on a scale of 0-10, where 0=no disease and 10=the most disease possible.

2. FLS = Frogeye Leaf Spot, SDS = Sudden Death Syndrome, CLB = Cercospora Leaf Blight, SC = Stem Canker.

3. Diseases were rated at Milan Experiment Station (MES) on September 12, 2002, and plots were harvested on October 29, 2002.

4. Stem Canker was rated on September 3, 2002, at West Tennessee Experiment Station (WTES), and plots were harvested on September 13, 2002.

Table 4. Soybean Disease Ratings and Yields, Maturity Group III Roundup Ready

Milan and West Tennessee Experiment Stations, 2002

	Brand-Variety [1,2,3,4]	MES FLS	MES SDS	MES Bu/A	WTES SC	WTES Bu/A
1	Adler 395 t	0.3	0.0	62.0	0.0	32.70
2	Armor 39-E9	3.7	0.3	56.4	0.0	35.73
3	Asgrow AG 3701	1.0	1.3	52.9	0.0	36.57
4	Asgrow AG 3703	5.7	0.0	47.9	0.0	36.80
5	Asgrow AG 3902	7.7	0.0	41.6	0.0	35.53
6	Delta King 3862	7.0	0.0	53.1	0.0	35.00
7	Delta King 3964	4.7	0.0	58.9	0.7	37.10
8	Delta King 3968	4.3	1.3	60.1	0.7	37.40
9	Delta King DK XTJ033 RR	4.3	0.3	56.3	0.0	33.30
10	Delta King DK 3961RR	4.7	1.0	51.5	0.0	39.97
11	Deltapine DPX 3761 RR	0.0	1.7	63.4	0.0	34.70
12	Deltapine DPX 3819 RR	7.0	1.7	43.8	0.0	28.97
13	Deltapine DPX 3940 RR	7.3	0.0	52.0	0.0	32.20
14	DynaGro DG 3373	0.3	1.0	60.8	0.0	32.83
15	FFR 3975	0.0	0.3	60.9	0.3	33.83
16	G. Harvest 3983	5.3	0.3	61.3	5.0	33.40
17	Hornbeck HBK R 3980	9.7	1.0	46.2	0.7	31.90
18	NK Brand S39-Q4	4.7	0.7	53.5	1.3	37.80
19	Pioneer 93B67	0.3	0.3	60.9	0.7	33.53
20	Pioneer 93B68	2.0	0.0	64.4	0.0	35.93
21	Pioneer 93B72	8.7	0.7	56.0	0.0	36.60
22	Steyer 3811	10.0	0.0	38.8	0.0	34.27
23	Terral TVX 39R201	7.7	0.7	47.5	0.0	37.43
24	Vigoro V382	0.0	1.7	56.3	0.0	34.13
	LSD (P=.05)	**1.69**	**1.24**	**7.03**	**1.28**	**5.926**

NOTES:

1. **Disease ratings were made on a scale of 0-10, where 0=no disease and 10=the most disease possible.**
2. **FLS = Frogeye Leaf Spot, SDS = Sudden Death Syndrome, SC = Stem Canker.**
3. **Disease ratings were made at MES on August 29, 2002, and plots were harvested on September 13, 2002. Stem Canker ratings were made at WTES on September 3, 2002, and plots were harvested September 9, 2002.**
4. **Plots at MES were under pivot irrigation.**

Table 5. Soybean Disease Ratings and Yields, Maturity Group III Roundup Ready

Weakley County Yields, 2002.

Brand-Variety	Bu/A
NK Brand S39-Q4	38.30
Asgrow AG 3703	38.23
Terral TVX 39R201	38.13
Deltapine DPX 3940 RR	36.80
Delta King DK 3961RR	36.43
Deltapine DPX 3761 RR	36.23
Deltapine DPX 3819 RR	34.80
Delta King 3862	34.53
Steyer 3811	34.37
Vigoro V382	34.37
FFR 3975	33.17
Pioneer 93B68	32.20
Adler 395	31.23
Delta King 3964	30.93
Asgrow AG 3701	30.47
Asgrow AG 3902	30.40
Armor 39-E9	30.33
Hornbeck HBK R 3980	30.30
DynaGro DG 3373	30.13
Pioneer 93B67	29.30
Delta King 3968	29.27
Pioneer 93B72	28.80
Golden Harvest 3983	26.47
Delta King DK XTJ033 RR	25.13
LDS (P=.05)	9.56

Table 6. Variety Reaction to Foliar Fungicide Application, Frogeye Leaf Spot & SDS Ratings and Yield Differences, Milan Experiment Station, 2002.

	Treated			Untreated			Yield Diff. Bu/A
Brand-Variety[1,2,3]	FLS	SDS	Bu/A	FLS	SDS	Bu/A	Inc.+ or -
1 Asgrow AG4603	4.18	3.02	30.3	7.67	1.33	31.9	-1.6
2 Asgrow AG4403	5.67	1.33	47.8	5.00	1.67	42.1	5.7
3 Asgrow 4702	4.50	5.33	28.0	7.00	5.17	25.8	2.2
4 S.G. 498	4.14	1.96	50.7	6.33	0.67	38.5	12.2
5 Asgrow 5427	0.67	4.67	58.3	0.33	5.33	50.6	7.7
6 Asgrow 5301	2.67	3.00	54.9	4.67	3.00	45.9	9.0
7 Asgrow 5501	2.33	1.33	53.6	5.17	1.67	52.7	0.9
8 Asgrow 5701	1.33	0.67	55.3	1.67	1.00	55.8	-0.5
9 Asgrow 5603	6.67	4.00	36.8	8.00	3.33	30.0	6.8
10 Delta King 4868	4.33	1.00	46.7	6.00	0.67	41.2	5.5
11 Delta King 4965	5.43	1.51	27.2	7.33	0.33	26.7	0.5
12 Delta King 4461	3.00	1.00	48.1	5.33	1.00	42.2	5.9
13 Delta King 5366	1.00	0.33	47.8	1.00	0.33	43.9	3.9
14 Delta King 5465	4.33	0.67	53.4	6.33	0.67	39.8	13.6
15 Delta King 5661	2.00	0.33	47.5	2.33	0.00	41.3	6.2
16 Delta King 5668	0.33	0.67	57.8	1.00	0.33	57.9	-0.1
17 Deltapine 4690	3.33	1.00	39.3	4.00	1.00	40.7	-1.4
18 Deltapine 5110	3.43	1.51	38.1	4.00	1.00	41.2	-3.1
19 Deltapine 5414	0.00	1.83	50.9	0.00	3.00	53.2	-2.3
20 Deltapine 5644	0.33	0.67	57.5	0.67	1.00	59.4	-1.9
21 FFR 5485	0.68	1.52	54.8	0.33	2.33	48.7	6.1
22 FFR 557	5.50	1.67	48.4	7.00	3.00	32.1	16.3
23 FFR 5542	2.00	1.00	52.0	2.67	1.00	44.9	7.1
24 Garst 4512	3.17	1.67	49.6	4.50	1.00	38.5	11.1
25 Garst 5512	4.67	0.67	54.7	6.67	0.67	39.1	15.6
26 Hartz H4454	3.00	0.67	51.3	4.33	1.00	39.1	12.2
27 Hartz H5444	4.33	0.33	56.5	6.67	0.33	42.4	14.1
28 Pioneer 94B13	0.67	0.67	34.8	1.00	0.67	36.1	-1.3
29 Pioneer 94B74	4.33	1.33	37.1	5.33	1.00	32.9	4.2
30 Pioneer 94B73	0.67	3.17	42.1	0.33	2.00	39.6	2.5
31 Pioneer 95B32	4.17	2.00	46.8	6.00	1.33	35.6	11.2
32 Pioneer 95B42	2.67	1.00	46.0	4.00	1.33	37.3	8.7
33 Pioneer 95B43	2.67	1.00	48.6	3.83	1.00	37.4	11.2
34 TCV Holladay	0.67	0.67	56.6	1.33	0.67	59.5	-2.9
35 TCV Hutcheson	3.83	2.00	41.3	6.33	0.33	39.0	2.3
36 USG/TCV BG 4401	2.33	1.33	45.0	4.33	2.00	35.1	9.9
37 USG/TCV Anand	1.00	0.00	70.7	1.33	1.00	73.4	-2.7
38 USG/TCV 5601 T	1.00	1.33	66.6	1.67	2.00	51.4	15.2
39 USG 510	3.00	2.50	53.0	5.83	2.50	40.2	12.8
40 USG 540	4.00	0.33	55.8	6.33	2.33	39.0	16.8
LSD (P=.05)	1.448	1.661	12.06	1.476	1.853	12.97	15.40

NOTES:

1. **Disease ratings were made on a scale of 0-10, where 0=no disease and 10=the most disease possible.**
2. **FLS = Frogeye Leaf Spot (on 8/28), SDS = Sudden Death Syndrome (on 8/28), Bu/A = bushels per acre adjusted for moisture.**
3. **Harvested: 11/7/02.**

CYST NEMATODES

In 2002, 682 soybean cyst nematode samples were pulled from 389 fields in 15 counties. Of the 682 samples, 330 (48%) had some cysts present. Thirty-four percent (234 samples) contained 1-50 cysts/pt. of soil and 14 percent (96) had damaging levels of 50+ cysts/pt. of soil. The highest cyst counts were from Weakley County where 80 of the 115 samples submitted were infested with cysts. Thirty-five of those infested samples were at damaging levels. The sampling program will continue this fall and winter to obtain as many more samples as possible.

Table 7. Summary of findings from the 2002 SCN sampling season.

			Cyst Counts		
County	# Fields	# Samples	1 to 50	51 to 100	>100
Cannon	123	266	103	13	3
Chester	2	2	0	0	0
Coffee	9	13	4	0	0
Dyer	3	3	0	0	1
Gibson	37	38	16	3	7
Henderson	26	43	15	2	8
Henry	10	10	5	1	1
Humphreys	4	4	1	0	0
Lake	16	32	8	1	0
Lauderdale	25	39	6	1	0
Madison	16	16	2	1	4
Obion	18	45	17	4	0
Tipton	4	4	1	3	0
Warren	17	52	12	3	4
Weakley	49	115	44	11	25
TOTALS	389	682	234	43	53

Observation and Conclusions:
Since the program started, approximately 3,782 samples have been pulled from 94,550 acres. Approximately 50 percent of the samples contained SCN. Some of these samples were taken after dry seasons in 1997-99 when SCN populations were down.

Value: When soybean producers receive their "free" soil analysis report for SCN, they will be able to select soybean varieties, cultural practices, nematicides and control strategies that will increase their production and reduce the populations of SCN and at the same time slow down the advancement of new races. Hopefully, other producers not on this program will see the value of sampling their fields.

An even greater value stems from the fact that through this program we were able to show that a significant percentage of SCN infested fields contain Race 2. This is a very important finding since there are only one or two commercially available "conventional" varieties with resistance to Race 2. There are no "round-up ready" varieties on the market with high Race 2 resistance. Breeders were alerted so that they can begin to incorporate Race 2 resistance into their breeding programs.

There is no doubt that the cyst nematode numbers vary from field to field. Producers should soil sample every soybean field every year and keep a record so they can be proactive about their control strategies. This is especially a good year to sample because SCN counts will probably be high, and the UT Extension Service will run the samples free-of-charge through a Soybean Promotion Board grant.

Funds for disease ratings were provided by the Tennessee Soybean Promotion Board

The disease and nematode ratings contained in this bulletin have been gathered from several sources including research from the Milan, Jackson and Knoxville Experiment Stations and from several county demonstrations.

These disease ratings should be used only as a guide when considering varieties that are recommended. Disease pressure, environmental conditions and cultural practices may cause disease severity and damage to vary from location to location and from year to year.

SOYBEAN DISEASE CONTROL GUIDE

1. PLANT HIGH-QUALITY SEED WITH 80% PLUS GERMINATION.
2. USE FUNGICIDE SEED TREATMENTS AT ALL TIMES.
3. USE RECOMMENDED DISEASE AND NEMATODE RESISTANT VARIETIES WHEN AVAILABLE.
4. USE NEMATICIDES WHEN NEEDED.
5. USE FOLIAR FUNGICIDE WHEN PRACTICAL.
6. ROTATE CROPS TO AVOID BUILD-UP OF DISEASE ORGANISMS. NO-TILL PRACTICES REDUCES DAMAGE AND NUMBER OF CYST NEMATODES IN THE SOIL.
7. FERTILIZE AND LIME ACCORDING TO UT RECOMMENDATIONS.

FOLIAR FUNGICIDES

Soybean producers can expect an average increase of about five to ten bushels per acre from the proper use of a foliar fungicide.

Research Plant Pathologists with the University of Tennessee have determined that the regular use of foliar fungicides as a production practice can increase net profits. Scouting soybean fields for disease at or before proper spray time is very difficult. Most diseases do not show adequate symptoms before spray time. A decision to spray must be based on research, conditions existing at the time of spraying and use of the point system (see next page). Approximately 50% of all Tennessee soybean acres could profit from the use of a foliar fungicide in normal (adequate moisture) years.

APPLICATION OF SOYBEAN FOLIAR FUNGICIDES

WHAT:

Foliar Fungicides*	Rate for each application per acre
Topsin-M 70% WP	½ lbs./A.
Bravo 720	1.5 pts./A.
Quadris 2.08 F	6.2 to 15.4 for Aerial blight 12.3 to 15.4 for frogeye leaf Brown spot and Cercospora Leaf blight

These fungicides are preventative materials and will help control anthracnose, septoria brown spot, pod and stem blight, purple seed stain and some other foliar diseases. Topsin –M did not perform as well as expected in the foliar fungicide tests in 2002 at the Milan Experiment Station. Bravo Ultrex was tested at the same location with good results.

WHEN:

Two applications should be made, the first when 80% of pods are about 1/4 inch in length. The second application should be made 14-21 days later. Both applications should be made to insure adequate disease control and profit. Under current economic conditions only the first application is affordable and usually controls most foliar diseases enough so profit can be made.

WHERE:

Proper coverage must be obtained for maximum yield increase. Avoid spraying during windy periods or when there is a temperature inversion. Aerial applications should be made as low as possible (6-12 feet) above the beans, using at least five gallons of water per acre. With ground equipment use 20 gallons of water per acre and three nozzles per row.

* Plants sprayed with fungicides may retain their leaves 3-7 days longer.

** For additional disease control use a recommended adjuvant or spreader-binder.

SOYBEAN FOLIAR FUNGICIDE POINT SYSTEM FOR TENNESSEE

This point system should be used by producers only as a guide to determine the need for applications of foliar fungicides. It is not a guarantee for an economical return.

	Factors			Points
	(Pick only one in each category)			
I.	Yield potential (5-7 days before first spray)			
	1.	35 or above	= 100	
	2.	25-35 bu.	= 50	
	3.	below 25 bu.	= 0	_____
II.	Planting date			
	1.	Early (before May 15)	= 100	
	2.	Medium (May 16-June 14)	= 50	
	3.	Late (after June 15)	= 0	_____
III.	Cropping history			
	1.	4 or more years in beans	= 100	
	2.	2-3 years in beans	= 50	
	3.	Regular rotation with other crops	= 25	
	4.	1st year in beans	= 0	_____
IV.	Variety (Maturity)			
	1.	Early (III or IV)	= 100	
	2.	Medium (V)	= 50	
	3.	Late (IV)	= 0	_____
V.	Moisture (Rainfall & dew during flowering)			
	1.	Wet	= 100	
	2.	Average	= 50	
	3.	Dry	= 0	_____
IV.	Frogeye Leaf Spot Susceptibility Rating			
	1.	7 – 10 (high susceptible)	= 100	
	2.	4 – 6	= 50	
	3.	0 –3	= 0	_____
			Total points	_____

After inspection of each prospective soybean field (5-7 days before first application), producers should total the number of points to determine the probability of an economic return.

Total field points	Chances of economical return
350-500	Excellent
250-300	Good
250 or below	Poor

IF A "ZERO" IS INDICATED IN ANY CATEGORY, THEN THE FIELD SHOULD NOT BE SPRAYED Except for the frogeye leaf spot rating.

Seed producers should also consider the possibility of increased seed germination from the use of foliar fungicides.

STEM CANKER

Stem Canker caused by the fungus *Diaporthe phaseolorum* var. *caulivora* has recently infected thousands of acres in Tennessee and many other southern states. Stem Canker is very destructive and causes death of soybeans from mid-season to maturity. The disease is usually noticed during the last half of the growing season when seemingly healthy plants begin to die with dry leaves still attached to the plants. Many times early infection can be seen as a small, superficial, reddish-brown lesion around a leaf scar on the lower stem. The canker then spreads girdling the stem causing premature death of the plant and corresponding loss in yield. Lower stems when split show a light brown discoloration especially near and around the nodes. This indicates a plugging of the vascular system of the plant. Plants that are dry and have been killed are brittle and break easily near the canker at harvest. Leaves may become yellow between the veins and then die, remaining on the plant.

STEM CANKER CONTROL

1. Use resistant varieties for best control.

2. Do not plant infected seed.

3. Use recommended seed treatments (containing thiram or other fungicides mixed with thiram).

4. Rotation with other crops. Plow under soybean residue when practical.

5. Reduce stress on the soybean plant from any source, such as nematodes, weeds, herbicides (over-dose), or weeds.

6. Plant later in the recommended planting season. For example, plant June 1 instead of May 1 if using a susceptible variety.

SOYBEAN SEED TREATMENTS

Researchers have shown significant increases in germination and yield over the past years with seed treatment fungicides. On the average, a 3-4 bushel per acre yield increase can be expected with a recommended seed treatment.

Germination and seed quality may be reduced by foliar and seed pathogens. This occurs especially when wet and humid weather conditions prevent producers from harvesting soybeans at maturity. The longer adverse weather conditions prevail, the more severe the damage will be to beans remaining in the field.

There are many formulations of soybean seed treatments on the market. Producers should check the label on the container for the following recommended fungicides: Captan, Thiram, Terracoat (PCNB), or Vitavax or many combinations of these. Captan and Thiram are good seed surface sterilants and should be one of the components for best results. METALAXYL is also present in some products and is effective against *Phythium when planting under cool wet conditions*. Use label rates and directions for best results. These materials may be applied commercially by seed clearers or dealers or by the producer on the farm with appropriate machinery. Care must be taken to obtain uniform coverage on the seed.

Many hopper-box pour-on seed treatments can also be found to contain the recommended fungicides. This convenient method of application is very effective, provided that uniform coverage is obtained on the seed.

Some fungicide formulations contain a water base and will evaporate rapidly leaving a dry seed surface. While others may contain an oil base which promotes uniform coverage but may leave an oily seed surface. This is usually not a problem except with air type planter.

SOYBEAN CYST NEMATODE CONTROL

Control programs should be based upon full knowledge of the NUMBER OF CYSTS in the soil of each field and also which RACE or RACES are present. A recent survey has shown that about 50 % of all soybean fields sampled are infested with the cyst nematode.

The first step in controlling or preventing the soybean cyst nematode is to AVOID SPREAD of nematodes. They may be spread by various means, such as soil clinging to shoes, or equipment, by wind and water movement and in the soil mixed with seed. ROTATION with non-host crops such as corn, cotton and grain sorghum is the best way to reduce cyst nematode populations. Rotation with non-host crops or highly resistant varieties for at least two years will reduce the build-up of any race of the Cyst Nematode to a SAFER level. However, some cases have been observed in which three years with a non-host crop were required to reduce cyst populations to an economical level (usually under 100 cysts/pt. of soil). Some growers with heavy infestations may consider using a 2-year rotation and then use a nematicide or resistant variety as insurance against damage. ALWAYS TAKE A SOIL SAMPLE TO BE SURE of the number of cysts in the soil before planting a susceptible variety.

When it is known that only race 3 occurs and rotations with non-host crops cannot be followed, plant race 3 resistant varieties. Where race 4(14) occurs or it is not known for SURE which race or races are present, plant 4(14) resistant varieties (See Table 4). The Anand variety is highly resistant to all known races at this time but is not Round-up Ready. There may be some commercial varieties with slight to moderate resistance to race 2 and 5 which might help reduce damage under low nematode pressure. This has not been researched to date. Producers should make every effort to sample all their soybean fields for this new race since it has been found to be wide-spread across Western Tennessee.

Table 5. NEMATICIDES FOR SCN

NEMATICIDE	FORMULATION	RATE/A.
Temik	15G	5 - 7 lbs.*

*Granules may be placed either in-furrow (1 ½ - 2" band) or spread on a 7" band, use higher rates for band.

It is highly recommended that each producer, not on a soybean scouting program, sample their fields for cyst nematode BEFORE deciding to plant soybeans and also before deciding which variety to use.

The cyst nematode count serves as a guide in predicting when levels are generally high enough to consider control. For example, the cyst nematode problem in Tennessee has become very severe in many areas. It has been observed in many fields that when cyst counts approach 100 CYST/PT. OF SOIL, control methods should be initiated to avoid possible damage. Damage can also occur when counts are below 100 cyst/pt. of soil, but generally higher cyst counts mean more potential damage. It is very difficult to predict consistently the amount of damage from cyst counts because there are many other factors that are involved and may influence the amount of damage caused by cyst nematode. These factors may include availability of soil moisture, soil type, soil fertility, variety of soybeans, race of nematode and any factor that causes stress due to competition to soybean plants.

SOIL SAMPLING FOR SOYBEAN CYST NEMATODES (SCN)

I. WHEN to take soil sample.

A. The best time is immediately after harvest or at the end of the growing season. However, sampling can be done at anytime a cyst count is desirable or necessary. Consideration for the time of year may be necessary. Cyst counts usually go down after planting and after the winter.

B. If sampling after harvest, please indicate on SCN sampling forms if soil has been broken or disc-up or no-till. Also, indicate if soybeans are planted in rows or broadcast fashion.

II. WHICH fields to sample.

A. Sample any field suspected of having a SCN problem. Most fields in soybean growing areas should be sampled every year.

B. Sample any field before planting a susceptible variety, especially after a non-host crop rotation where nematodes have been a problem in the past.

C. Sample any field that has been in resistant varieties for two or more years that was infested with SCN. Planting resistant varieties will not produce a SCN problem if there were not any SCN present to begin with.

III. WHERE to sample for SCN.

A. Sample soil about six inches deep near soybean root system.

B. Sample each 25-acre block or field with at least 20-25 probes.

C. Mix each sample together well and follow instructions on sample Form #701. (Cost is $5/sample). At present samples are free of cost to the producer because of a Soybean Promotion Board grant .

EXPLANATION OF SOYBEAN CYST NEMATODE COUNTS

The nematode assay report (Form 739) provides the population counts for the soybean cyst nematode (SCN). The counts are expressed as two life stages, larvae and cysts. Larvae are the worm-shaped juveniles, and cysts are the lemon-shaped carcasses of the females. Only cysts that contain eggs or larvae are included in the counts.

Larval counts are variable and not dependable as a means of predicting impact on yield. These counts are used only in determining the presence or absence of SCN. They serve as a check for the cyst stage, in case no cysts are found.

Control recommendations are based on cyst counts. These recommendations are given in the table on the following page. Cyst counts of less than 100 per pint of soil usually do not cause significant damage unless certain other conditions exist. Fields containing 100 or more cysts per pint of soil should have a race determination run before being planted to soybeans. This level of SCN infestation can cause significant damage to a variety of soybean that is susceptible to the predominate race of SCN present.

Note: Race determinations are greenhouse tests requiring about six weeks to run. One gallon of soil (representative of the entire field) and $15 are required for this test. This is not the same as the routine nematode test, which requires one pint of soil and $5. These cost are now covered by a grant from the soybean promotion board for the year 2003.

NO. OF CYSTS PER PINT SOIL	POSSIBLE RESULTS* (SILT LOAM SOIL)	ACTION TO TAKE
0	NO CYSTS FOUND IN SAMPLE	CONTINUE TO MONITOR. NO DAMAGE UNLESS SCN MISSED IN SAMPLING.
1-100	LOW COUNT - POSSIBLE LIGHT STUNTING AND YIELD REDUCTION IF WEATHER IS DRY OR OTHER DISEASES PRESENT. IN LIGHT TEXTURED SOILS, 50 CYSTS PER PINT MAY BE DAMAGING.	MONITOR SCN LEVEL AFTER EACH YEAR OF GROWING SOYBEANS, IF SOYBEANS PLANNED FOR FOLLOWING YEAR.
101-250	MEDIUM COUNT - SOME STUNTING IN MOST YEARS. MODERATE TO SEVERE YIELD LOSS DEPENDING ON ENVIRONMENTAL FACTORS ESPECIALLY ON LESS PRODUCTIVE LAND.	PLANT NONHOST CROP OR HAVE RACE DETERMINATION RUN SO THAT APPROPRIATE RESISTANT VARIETY CAN BE PLANTED.
ABOVE 250	HIGH COUNT - SEVERE DAMAGE OCCURRING IN MOST YEARS WITH HIGH YIELD LOSS.	NON-HOST CROP OR RESISTANT VARIETY STRONGLY RECOMMENDED. HAVE RACE DETERMINATION RUN BEFORE PLANTING SOYBEANS.

*IT IS DIFFICULT TO PREDICT THE AMOUNT OF DAMAGE THAT A GIVEN CYST COUNT WILL CAUSE. THE ABOVE GUIDELINES ARE ONLY APPROXIMATIONS. MANY OTHER FACTORS CAN AFFECT THE DAMAGE POTENTIAL OF A SCN POPULATION. FOR EXAMPLE, A LOW COUNT CAN CAUSE CONSIDERABLE DAMAGE IF STEM CANKER, SUDDEN DEATH SYNDROME, LOW POTASH LEVEL OR DROUGHT OCCURS IN COMBINATION WITH THE SCN.

SOYBEAN FOLIAR DISEASES

DISEASE	CAUSE	SYMPTOMS	CONTROL
BACTERIAL PUSTULE	SEED AND DEBRIS-BORNE BACTERIUM (XANTHOMONAS PHASEOLI)	OCCURS MOST OFTEN DURING EXTENDED PERIODS OF WARM, WET WEATHER. FIRST LEAF SYMPTOMS ARE SMALL, YELLOW SPOTS WITH REDDISH-BROWN, SLIGHTLY PUCKERED CENTERS. BOTTOM LEAVES FIRST DAMAGED MAY LATER BECOME RAGGED AND DROP. DAMAGE IS USUALLY CONFINED TO THE LEAVES, BUT SMALL, BROWN SPOTS MAY DEVELOP ON PODS.	PLANT HIGH-QUALITY SEED. PRACTICE AT LEAST A ONE-YEAR ROTATION WITH GRAINS, GRASSES OR COTTON. PLANT RESISTANT VARIETIES. THIS DISEASE HAS CAUSED VERY LITTLE DAMAGE LATELY DUE TO USE OF RESISTANT VARIETIES.
BACTERIAL BLIGHT	SEED AND DEBRIS-BORNE BACTERIUM (PSEUDOMONAS GLYCINES)	SIMILAR TO BACTERIAL PUSTULE. FIRST SYMPTOMS ARE TINY, ANGULAR, WATER-SOAKED SPOTS THAT ARE YELLOW TO BROWN. LATER SPOTS BECOME NUMEROUS ALONG THE VEINS, TURN BROWN AND LEAVES BECOME RAGGED, ESPECIALLY DURING PERIODS OF PROLONGED COOL, WET WEATHER. LEAVES MAY FALL TO GROUND.	PLANT HIGH-QUALITY SEED. PRACTICE CROP ROTATION AND PLOW DEEP TO BURY OLD PLANT RESIDUE IN FALL. SOME RESISTANCE IN VARIETIES THAT ARE RESISTANT TO BACTERIAL PUSTULE. THIS DISEASE HAS CAUSED VERY LITTLE DAMAGE DUE TO USE OF RESISTANT VARIETIES.
BROWN SPOT	SEED AND DEBRIS-BORNE FUNGUS (SEPTORIA GLYCINES)	ANGULAR, RED TO BROWN SPOTS THAT VARY IN SIZE FROM A PINPOINT TO ONE-FIFTH INCH IN DIAMETER AND ARE MORE PRONOUNCED ON THE UNDERSIDE OF THE LEAF. DEFOLIATION OCCURS FROM BOTTOM UPWARD. WARM MOIST WEATHER FAVOR THE SPREAD OF THE DISEASE. USUALLY DEFOLIATES PLANTS PREMATURELY.	USE CERTIFIED SEED. PRACTICE CROP ROTATION AND PLOW UNDER CROP REFUSE IN THE FALL. TREAT SEED WITH A FUNGICIDE. NO COMMERCIALLY GROWN VARIETIES ARE RESISTANT. FOLIAR FUNGICIDES WILL USUALLY INCREASE YIELDS. USE POINT SYSTEM.
DOWNY MILDEW	SEED AND AIR-BORNE FUNGUS (PERONOSPORA MANSHURICA)	FIRST APPEARS ON THE HIGH-UPPER SURFACE OF THE LEAF AS GREENISH-YELLOW SPOTS THAT LATER BECOME DARK, BROWN AND IRREGULAR IN SHAPE. GRAYISH TUFTS OF MILDEW DEVELOP ON THE UNDERSIDE OF THE LEAF. SEEDS HAVE A WHITE, CRUSTY APPEARANCE.	PLANT HIGH-QUALITY, HIGH-GERMINATING SEED. USE SEED TREATMENT FUNGICIDE. SUCH SEED USUALLY CONTAIN FEWER DISEASE-CAUSING ORGANISMS. SOME VARIETIES HAVE RESISTANCE.
VIRUS DISEASES	SEVERAL VIRUSES	SEVERAL VIRUSES EFFECT SOYBEANS. IN GENERAL, LEAVES BECOME PUCKERED AND DISTORTED; MAY RESEMBLE 2,4-D DAMAGE. LEAVES MAY BECOME GREEN AND YELLOW MOTTLED.	BUY SEED FROM A RELIABLE DEALER. LOSS IS USUALLY MINOR AND NO CONTROL NECESSARY.
RHIZOBIUM-INDUCED CHLOROSIS	REACTION BETWEEN CERTAIN VARIETIES AND CERTAIN STRAINS OF RHIZOBIUM (NODULATING) BACTERIA.	CHLOROSIS OR YELLOWING OF UPPER LEAVES OF YOUNG, ACTIVELY GROWING SOYBEAN PLANTS. SELDOM MORE THAN TWO OR THREE LEAVES ON AN INDIVIDUAL PLANT DEVELOP CHLOROSIS. CHLOROSIS OCCURS DURING RAPID PLANT GROWTH WHEN PLANTS ARE HIGHLY DEPENDENT UPON NODULE NITROGEN.	NO CONTROL NECESSARY. FIELD STUDIES HAVE DEMONSTRATED NO YIELD REDUCTION FROM CHLOROSIS. YELLOWING DISAPPEARS IN 2-3 WEEKS.

Frog Eye Leaf Spot	Seed, soil and air-borne fungus (Cercospora sojina)	Frog eye leaf spot is primarily a disease of the foliage; however, infections also occur on stems, pods and seeds. After mid-season, minute, reddish-brown, circular to angular spots first appear on the upper leaf surface. As the lesions enlarge with age, the central area becomes olive-gray or ash-gray, surrounded by a narrow, dark, reddish-brown border. Older spots become very thin, often paper-white and translucent. Lesions 1 to 5 mm in diameter, but several may coalesce to form larger irregular spots. When lesions are numerous, leaves wither and fall prematurely.	Grow recommended adapted diesase resistant varieties. Plant high-germinating seed. Apply foliar fungicides on highly susceptable varieties and rotate with other field crops.
Purple Stain	Seed and soil-borne (Cercospora kikuchii)	Leaf spots are angular, reddish-purple in color and vary in size from a pinpoint in young infections to half the size of a dime in older infections. Discoloration on seed which varies from pink to dark purple. Cracks often occur in the discolored areas. Reduces seed quality. Young seedlings may be yellowed, stunted or killed by this fungus.	Plant high-quality disease-free seed and follow crop rotation. Fungicide seed treatments can be of great value. Foliar fungicides provide reduction of disease severity.

SOYBEAN ROOT AND STEM DISEASES

DISEASE	CAUSE	SYMPTOMS	CONTROL
ANTHRACNOSE	SOIL AND DEBRIS-BORNE FUNGUS (COLLETOTRICHUM DEMATIUM VAR. TRUNCATA)	SYMPTOMS BEGIN AS SMALL DARKENED AREAS, WHICH FUSE TO INVOLVE THE ENTIRE SURFACE OF STEMS AND PODS. DURING WET WEATHER, NUMEROUS, SMALL BLACK DOTS (ACERVULI) MAY BE SEEN WITHIN THE ANTHRACNOSE LESION. SEEDS IN DISEASED PODS MAY BE SHRIVELED AND QUANTITY CAN BE REDUCED BY THIS DISEASE.	PLANT DISEASE-FREE SEED TO PREVENT SPREAD TO NEW LOCALITIES. PLOW UNDER DISEASED STEMS LEFT IN THE FIELD. FOLLOW CROP ROTATION. FOLIAR FUNGICIDES REDUCE LOSS FROM THIS DISEASE. USE RECOMMENDED FUNGICIDE SEED TREATMENTS AND USE POINT SYSTEM.
BROWN STEM ROT	SOIL-BORNE FUNGUS PHIALOPHORA GREGATA	INFECTED PLANTS SHOW NO OUTWARD SYMPTOMS DURING THE MAJOR PART OF THE GROWING SEASON. AS THE PLANT MATURES, HOWEVER, A BROWN DISCOLORATION CAN BE SEEN INSIDE THE ROOT AND LOWER STEM. LEAF SYMPTOMS DO NOT ALWAYS OCCUR BUT WHEN THEY DO, THE LEAF TISSUES BETWEEN THE VEINS TURN BROWN AND DRY RAPIDLY, USUALLY ABOUT THREE WEEKS BEFORE MATURITY.	THIS DISEASE HAS NOT SHOWN UP IN TENNESSEE SINCE THE MID-1979'STHE ONLY CONTROL MEASURE KNOWN AT PRESENT IS A ROTATION IN WHICH SOYBEANS ARE GROWN IN A FIELD ONLY ONCE IN THREE OR FOUR YEARS.
CHARCOAL ROT	DEBRIS AND SOIL-BORNE FUNGUS (MACROPHOMINA PHASEOLI)	FIELD SYMPTOMS MAY INCLUDE SIGHT STUNTING LATER IN THE SEASON. SMALL BLACK SPOTS (SCLEROTIA) OF THE FUNGUS MAY BE SEEN WHEN THE BARK IS PEELED FROM DISEASED STEMS AND ROOTS. THESE ARE FREQUENTLY ABUNDANT ENOUGH TO CAUSE THE TISSUE BENEATH THE BARK TO APPEAR GRAYISH-BLACK HENCE THE NAME "CHARCOAL ROT".	THIS FUNGUS CAUSES MORE DAMAGE WHEN PLANTS ARE IN A WEAKENED, HOT, DRY CONDITION. IF POSSIBLE, MAINTAIN VIGOROUSLY GROWING PLANTS BY PROVIDING ADEQUATE FERTILIZER AND MOISTURE. ROTATIONS WITH CORN, MILO AND SUNFLOWERS DOES NOT REDUCE THIS DISEASE. ROTATIONS WITH COTTON MAY HELP SOME, BUT COTTON IS ALSO A HOST. THE FUNGUS CAN REMAIN IN THE SOIL FOR LONG PERIODS OF TIME.
POD AND STEM BLIGHT	SEED AND DEBRIS-BORNE FUNGUS (DIAPORTHE PHASEOLORUM VAR. SOJAE).	PRIMARILY SYMPTOMS OBSERVED ON STEMS AND PODS OF PLANTS NEAR MATURITY. NUMEROUS SMALL, BLACK, PIMPLE-LIKE FRUITING BODIES ON STEMS IN LINEAR ROWS. THE FUNGUS GROWS ON THE SEED COATS AND CAUSES REDUCED YIELDS. DENSELY POPULATED SOYBEANS MAY HAVE GREATER INVASION BECAUSE OF EXCESSIVE LODGING. PODS MAY BE INFECTED BEFORE FILLING AND DROP FROM THE PLANT.	PLOW DEEP IN LAND PREPARATION; BURY OLD CROP RESIDUE WHEN THE NO-TILL PRACTICE IS NOT BEING USED. USE DISEASE-FREE SEED. PRACTICE CROP ROTATION WHERE FEASIBLE. USE OF FOLIAR FUNGICIDES CAN REDUCE THE DESTRUCTIVENESS OF THIS AND IMPROVE SEED QUALITY AND USE POINT SYSTEM. SEED TREATMENT CAN REDUCE AMOUNT OF FUNGUS ON SEEDS. HARVEST SOYBEANS AS EARLY AS POSSIBLE.

Rhizoctonia Root and Stem Rot	Soil-borne fungus (Rhizoctonia solani)	Decay of lateral roots and localize reddish-brown lesions on the stem at and below the soil line. Severely-diseased plants turn yellow and infected stems remain dry and firm. Usually most damaging early in the growing season as the weather warms up.	Plant top-quality seed in well-drained fertile soil. Terraclor Super-X, Thiram, Captan, Captan-Thiram or Vitavax should be used when germination is below 90%, when planting in cold, wet soil or when root rots have been a problem in the past. Liquid or slurry treatments have been generally more effective than hopper-box dusts of the same chemicals. On-the-seed treaters are available.
Phytophthora Root	Soil-borne fungus (Phytophthora megasperma var. sojae)	Causes pre-emergence and post-emergence damping off of the germinating seed and seedling. In older diseased plants, the leaves become yellow and wilted. The stem becomes dark brown or black with this discoloration extending from below the soil line into the branches. Damage is usually more severe on low, poorly drained, heavy, clay soils.	Plant resistant varieties in warm, well-drained fields.
Southern Blight	Soil and debris-borne fungus (Sclerotium rolfsii)	Rot of stems near soil line covered with dense, white fungus mats that bear small, brown sclerotia resembling shot. Plants die suddenly--several in a spot or individually. Many soils and high temperatures favor the disease.	Plow under crop residue in the fall from 4-6 inches deep. Rotate with other crops such as cotton, corn or wheat.
Stem Canker	Seed and debris-borne (Diaporthe phaseolorum var. caulivora)	Stem canker kills plants from mid-season to maturity. Dead plants with dried leaves still attached may be the first indication of its presence. Usually a brown, slightly sunken lesion girdles the stem at the base of a branch of leaf petiole. These begin as small, confined, areas, but enlarge and spread rapidly until the stem is girdled and the upper part of the plant is damaged or killed.	Plant disease-free seed. Plow under all stubble in the fall if not practicing no-till and rotate soybeans with other crops for at least 2 years. Many varieties have a high degree of resistance.

SUDDEN DEATH SYNDROME (SDS)	Fusarium solani f.sp. glycines	SUDDEN DEATH SYNDROME (SDS) CAUSES SYMPTOMS VERY SIMILAR TO STEM CANKER AND BROWN STEM ROT. AS PODS BEGIN TO FILL, AFFECTED PLANTS SHOW BROWNING IN THE LOWER STEM AND LEAVES TURN YELLOW OR BROWN BETWEEN THE VEINS. ROOTS ARE VERY ROTTED. YIELDS ARE CUT SEVERELY AS PLANTS LOSE THEIR LEAVES AND DIE. SDS USUALLY AFFECTS PLANTS IN FERTILE SOIL WHEN MOISTURE IS ADEQUATE AND WHERE MODERATE TO HIGH POPULATIONS OF SOYBEAN CYST NEMATODES CAN BE FOUND. VARIETIES VARY WIDELY IN THEIR RESISTANCE TO SDS.	USE RESISTANT VARIETIES. KEEP SOIL POTASH LEVEL HIGH. ROTATIONS WITH CORN SEEM AND THE CYST NEMATODE SEEM TO INCREASE THE SEVERITY OF SDS.
CYST NEMATODE	Soybean Cyst-nematode (Heterodera glycines)	Yellowing of foliage, stunting of plants, lack of nodulation and reduced yields are all symptoms caused by this nematode. Infested areas usually appear in round to oval patterns. The roots of infested plants usually have small white or yellow cysts. In highly fertile soils these symptoms may be hard to detect but yields may still be reduced but not as much.	Any nematode control program should be based on reliable soil nematode analysis. The first step in controlling the soybean cyst nematode is to avoid spread of nematodes by various means, such as soil clinging to shoes, or equipment, by wind and water movement and in the soil mixed with seed. Rotate soybeans with non-host crops. At least 2-3 years or longer may be required to starve enough nematodes in order to produce higher yields. Corn, cotton and grain sorghum are common non-host crops that reduce cyst nematode populations. When it is known that only Race 3 occurs and rotations with non-host crops cannot be followed, plant Race 3 resistant varieties. Where Race 4(14) occurs or it is not known for sure which race or races are present, plant Race 4(14) resistant varieties. A very few varieties have resistance to the new Race 2 and 5. Anand is highly resistant to stem canker, SDS, frogeye and all known races of the SCN at the present time. Rotation with non-host crops will reduce the build-up of any Race of the Cyst Nematode. Race 5 and Race 2 have now been found in ,many counties in West Tennessee.

Precautionary Statement

To protect people and the environment, pesticides should be used safely.
This is everyone's responsibility, especially the user.
Read and follow label directions carefully before you mix, apply store or dispose of a pesticide.
According to laws regulating pesticides, they must be used only as directed by the label.
Persons who do not obey the law will be subject to penalties.

Disclaimer Statement

Pesticides recommended in this publication were registered for the prescribed uses when printed. Pesticide regulations are continuously reviewed. Should registration or a recommended pesticide be canceled, it would no longer be recommended by The University of Tennessee. Use of trade or brand names in this publication is for clarity and information; it does not imply approval of the product to the exclusion of others that may be of similar, suitable composition, nor does it guarantee or warrant the standard of the product.

COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS
The University of Tennessee Institute of Agriculture, U.S. Department of Agriculture, and county governments cooperating in furtherance of Acts of May 8 and June 30, 1914.
Agricultural Extension Service Charles L. Norman, Dean