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AGRONOMY NOTES

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EASTERN BLACK NIGHTSHADE

L.G. Rodrigue, W.W. Witt, C.H. Slack, J.R. Martin

The nightshade species of North America consist of black nightshade (Solanum nigrum L.), American black nightshade (Solanum americanum Mill.), hairy nightshade (Solanum surrachoides Sendt.) and eastern black nightshade (Solanum ptycanthum Dun.). Eastern black nightshade is a problem weed in many soybean producing areas and is the predominant problem nightshade in Kentucky. In addition to field crops, the nightshades are also problem weeds in canning peas (Pisum sativum L.), field beans (Phaseolus vulgaris L.), potatoes (Solanum tuberosum L.) and tomatoes (Lycopersicon esculentum Mill.). Previously, most nightshades in Kentucky have been referred to as black nightshade. It is now known that black nightshade occurs in the U.S. only in the western states, while eastern black nightshade is commonly found in many states east of the Rocky Mountains. These species are similar in their gross morphology and are easily confused with each other. When grown under different environmental conditions, the nightshades may vary considerably in many taxonomic characteristics frequently used for identification and make identification more difficult (Ogg, A.G., B.S. Rogers and E.S. Schilling, 1981).

GROWTH HABIT Eastern black nightshade is an annual plant that is typically erect or spreading, and branches profusely. Stems are usually slender and turn somewhat woody with age. The lower surfaces of leaves of seedling eastern black nightshade are typically reddish-purple in color. This characteristic is helpful as a species indicator. Leaves are alternate, commonly ovate with leaf margins that can be quite variable. The plant has a fibrous root system. The round, smooth fruits (commonly referred to as berries) that develop from 5-lobed white flowers are initially green in the immature stage and generally turn black at maturity. The berries are approximately 3/8 inch in diameter at maturity and develop in small drooping clusters. Plants commonly produce greater than 100 berries with each berry containing 50 to 100 seed. Seeds are small, flat, approximately 1/16 inch in diameter and tan in color. Using conservative estimates, a plant producing 100 berries containing 75 seeds/berry would have the potential to product 7500 seeds.

Germination of one year old black nightshade (Solanum nigrum L.) has been demonstrated to be greater than 90 percent. This species has been shown to emerge when soil temperatures are above 63°F in the upper 2 inches. Evidence suggests that eastern black nightshade behaves similarly (Keeley, P.E. and R.J. Thullen, 1982). These soil temperatures typically occur in Kentucky from mid-April to mid-May. Viable seed have been collected from plants 9 weeks of age and older.

THE PROBLEM Eastern black nightshade affects soybean growers not only by its competitive effects with the crop but also by contamination of the harvested product. During the harvesting process many berries rupture and stain soybean seed. Juice from ruptured berries can result in debris and nightshade seed clinging or sticking to soybean seed. The plants produce additional problems at harvest because they remain green and leafy after many soybean cultivars have senesced. Economic losses result not only from the resulting dockage for debris and seed discoloration but also because of the presence of eastern black nightshade seed clinging to soybean seed.

In order for soybean seed to qualify as either foundation, registered or certified seed, fewer than 25 eastern black nightshade plants per acre are allowed in fields producing certified seed. No eastern black nightshade seeds are allowed in or on soybean seeds of any category. Elimination of this weed problem from fields is especially important for seed producers because of the potential which eastern black nightshade has for berry and seed production.

FIELD STUDIES Studies were initiated in 1980 and continued in 1981 in Daviess County and at Spindletop Farm in Lexington to evaluate various herbicides and herbicide combinations and methods of application for control of eastern black nightshade. A total of 177 herbicide treatments have been evaluated during the past two years specifically for eastern black nightshade control. At the Lexington location, an eastern black nightshade plot area was established on a Maury silt loam soil with a pH of 6.6 and an organic matter of 4.2 percent. Measurement of percent eastern black nightshade control, percent soybean injury, soybean yield (bushels/acre), moisture content of harvested soybeans and debris and berry numbers harvested per plot were determined each year.

In the Daviess County study in 1980, (Table 1) 85 percent or greater control was obtained with preemergence applications of Lasso or Dual at 3 or 4 lb/A. Amiben and Furloe at 2 lb/A in combination with Lasso at 2 lb/A did not increase eastern black nightshade control compared to Lasso used alone. Combinations of Lasso plus early postemergence applications of Blazer, Dyanap and Premerge resulted in greater than 94 percent control.

Similar results were obtained with soil applied herbicides at the Lexington locations (Tables 2 and 3). Preemergence or preplant incorporated applications of Lasso or Dual provided excellent control. The addition of Furloe or Amiben at 2 lb/A did not increase control over Lasso or Dual when used alone. Post-emergence applications of Blazer provided a longer duration of control than did other postemergence applications.

Data obtained in 1981 (Tables 4 and 5) were similar to those obtained in 1980. Acceptable control of eastern black nightshade was obtained with soil applications of Lasso and Dual either alone or in combination with Lorox, Amiben, Goal or Modown. Two experimental herbicides, RH 8817 and PPG 844 also provided acceptable control. Postemergence application of Blazer, Dyanap, Tackle, Lorox and Sencor also provided control of eastern black nightshade.

Substantial yield reductions occurred in all experiments when eastern black nightshade was not controlled. These studies have shown the need for control to prevent yield loss and quality loss from eastern black nightshade in soybeans.

Soybean yield, soybean seed plus debris moisture, harvested eastern black nightshade berry number, and percent eastern black nightshade control per plot were all recorded in an effort to determine if any relationships existed among these variables which would be useful in estimating eastern black nightshade control obtained with different herbicide treatments. Among the variables

measured the strongest relationships that existed were eastern black nightshade berries with seed plus debris moisture and moisture with percent control. There was no simple correlation coefficient generated for yield with percent control that was greater than 0.58 in any of the tests. The correlation coefficient for percent control at harvest with berry number was never more than -0.55. Acceptable predictions of late season control using these measured variables was not obtained.

SUMMARY Effective control of eastern black nightshade in soybeans can be achieved using 3 lb/acre (active ingredient) or more of either Lasso or Dual applied either preplant incorporated or preemergence. Postemergence herbicides such as Blazer, Dyanap or Premerge are available to growers when additional control is required. For maximum control, applications should be made to eastern black nightshade plants that are less than 4 in. in height. Fields having high seed populations of eastern black nightshade may require use of both preplant incorporated or preemergence applications in addition to postemergence herbicides to obtain acceptable control of this species, especially in years when conditions are conducive for continued germination and emergence. Multiple herbicide applications would more likely be needed in fields where continuous soybean production is practiced or in fields producing soybean for seed.

LITERATURE CITED

- Keeley, P.E. and R.J. Thullen. 1982. Influence of Planting Date on Growth of Black Nightshade (Solanum nigrum L.). Proc. Weed Sci. Soc. Am. p. 73.
- Ogg, A.J., Jr., B.S. Rodgers and E.E. Schilling. 1981. Characterization of Black Nightshade (Solanum nigrum) and Related Species in the United States. Weed Sci. 29:27-32.

Table 1. Black nightshade control and soybean yield in Daviess County, 1980.

TRT. NO.	HERBICIDE	LB ACTIVE INGREDIENT/ACRE	METHOD OF APPLICATION	BLACK NIGHTSHADE CONTROL	YIELD
				JULY 16	
1	LASSO 4EC	3.00	PRE ^a	% 84	BU/A 43
2	LASSO 4EC	4.00	PRE	88	46
3	DUAL 8E	3.00	PRE	95	50
4	DUAL 8E	4.00	PRE	94	45
5	AMIBEN 2E	3.00	PRE	53	21
6	FURLOE 4EC	3.00	PRE	0	19
7	LASSO 4EC + AMIBEN 2E	2.00 2.00	PRE PRE	83	45
8	DUAL 8E + AMIBEN 2E	2.00 2.00	PRE PRE	55	36
9	LASSO 4EC + FURLOE 4EC	2.00 2.00	PRE PRE	89	31
10	DUAL 8E + FURLOE 4EC	2.00 2.00	PRE PRE	65	40
11	LASSO 4EC + BASAGRAN 4E + CROP OIL CONC.	3.00 1.00 1.00 QT	PRE EP ^b EP	100	35
12	LASSO 4EC + BLAZER 2E	3.00 0.38	PRE EP	100	40
13	LASSO 4EC + DYANAP 3EC	3.00 1.50	PRE EP	100	35
14	LASSO 4EC + PREMERGE 3EC	3.00 0.38	PRE EP	95	33
15	SURFLAN 4AS + BASAGRAN 4E + CROP OIL CONC.	1.00 1.00 1.00 QT	PRE MP ^c MP	53	28
16	SURFLAN 4AS + BLAZER 2E	1.00 0.25	PRE MP	75	50
17	SURFLAN 4AS + DYANAP 3E	1.00 3.00	PRE MP	45	37

TRT. NO.	HERBICIDE	LB ACTIVE INGREDIENT/ACRE	METHOD OF APPLICATION	BLACK NIGHTSHADE CONTROL	YIELD
				JULY 15	
18	SURFLAN 4AS +	1.00	PRE	%	BU/A
	PREMERGE 3E	1.00	MP	63	13
19	CHECK	----	---	0	
LSD (.05)					17

^aPreemergence application immediately after planting.

^bEarly postemergence application when black nightshade plants were less than 2 inches in height.

^cMid-postemergence application when black nightshade plants were between 3 to 4 inches in height.

Table 2. Control of black nightshade and soybean yield with preplant incorporated and postemergence herbicide applications. Lexington, 1980.

TRT. NO.	HERBICIDE	LB ACTIVE INGREDIENT/ACRE	METHOD OF APPLICATION	BLACK NIGHTSHADE CONTROL	YIELD ^a
				JULY 15	
				%	BU/A
1	S-734 75WP	1.00	PPI ^b	83	
2	S-734 75WP	1.50	PPI	83	
3	S-734 75WP	2.00	PPI	90	
4	VERNAM 7E	3.00	PPI	47	
5	VERNAM 7E + AMIBEN 2E	3.00 4.00	PPI PPI	53	
6	VERNAM 7E + PROWL 4E	3.00 1.50	PPI PPI	63	
7	TREFLAN 4E + AMIBEN 2E + SENCOR 75DF	.75 2.00 .38	PPI PPI PPI	60	
8	TREFLAN 4E + AMIBEN 2E	.75 2.00	PPI PPI	57 *	
9	TREFLAN 4E + AMIBEN 2E	.75 3.00	PPI PPI	53	
10	LASSO 4E + AMIBEN 2E	2.50 2.50	PPI PPI	87	47
11	LASSO 4E + AMIBEN 2E	3.00 3.00	PPI PPI	90	45
12	LASSO 4E + AMIBEN 2E	3.00 4.00	PPI PPI	73	40
13	LASSO 4E	2.50	PPI	87	44
14	LASSO 4E	3.00	PPI	97	43
15	LASSO 4E	4.00	PPI	100	53
16	AMIBEN 2E	3.00	PPI	33	
17	AMIBEN 2E	4.00	PPI	60	40
18	DUAL 8E + AMIBEN 2E	2.50 2.50	PPI PPI	87	44

TRT. NO.	HERBICIDE	LB ACTIVE INGREDIENT/ACRE	METHOD OF APPLICATION	BLACK NIGHTSHADE CONTROL	
				JULY 15	YIELD
				%	BU/A
19	DUAL 8E + AMIBEN 2E	3.00 3.00	PPI PPI	97	42
20	DUAL 8E + AMIBEN 2E	3.00 4.00	PPI PPI	93	48
21	DUAL 8E	2.50	PPI	97	45
22	DUAL 8E	3.00	PPI	93	46
23	DUAL 8E	4.00	PPI	93	41
24	TREFLAN 4E	.75	PPI	53	36
25	TREFLAN 4E + AMIBEN 2E + OIL CONC.	.75 3.00 1.00 QT/AC	PPI EP ^c EP	60	
26	TREFLAN 4E + AMIBEN 2E + BASAGRAN 4E + OIL CONC.	.75 3.00 .50 1.00 QT/AC	PPI EP EP EP	43	
27	TREFLAN 4E + AMIBEN 2E + ALANAP L 2EC	.75 3.00 2.00	PPI EP EP	63	
28	TREFLAN 4E + AMIBEN 2E + BLAZER 2E	.75 3.00 .50	PPI EP EP	63	33
29	TREFLAN 4E + FURLOE 4E	.75 2.00	PPI COE ^d	77	45
30	TREFLAN 4E + FURLOE 4E	.75 3.00	PPI COE	90	40
31	TREFLAN 4E + FURLOE 124 4E	.75 2.00	PPI PPI	87	40
32	KY 99 .00	4.00	PPI	43	
33	VERNAM 7E + DYANAP 3E	3.00 1.50	PPI EP	53	
34	VERNAM 7E + BASAGRAN 4E + OIL CONC.	3.00 .75 1.00	PPI EP EP	33	
35	VERNAM 7E + BLAZER 2E	3.00 .50	PPI EP	50	

TRT. NO.	HERBICIDE	LB ACTIVE INGREDIENT/ACRE	METHOD OF APPLICATION	BLACK NIGHSHADE	YIELD
				CONTROL JULY 15	
36	CHECK(CULTIVATED)			% 100	BU/A 41
				LSD (.05)	13

^a Only selected plots were harvested.

^b Preplant incorporated applications immediately prior to planting.

^c Early postemergence applications when black nightshade plants were less than two inches in height.

^d Herbicide application when soybean cotyledons had emerged.

Table 3. Control of black nightshade and soybean yield with preemergence herbicide applications. Lexington, 1980.

TRT. NO.	HERBICIDE	LB ACTIVE INGREDIENT/ACRE	METHOD OF APPLICATION	BLACK NIGHTSHADE CONTROL		YIELD ^a
				JULY 16		
				%		BU/A
1	DYANAP 3E + SURFLAN 4AS	4.50 1.00	CR ^b PRE ^c	90		
2	LASSO 4E + AMIBEN 2E	2.50 2.50	PRE PRE	97		
3	LASSO 4E + AMIBEN 2E	3.00 3.00	PRE PRE	100		46
4	LASSO 4E + AMIBEN 2E	3.00 4.00	PRE PRE	97		45
5	LASSO 4E	2.50	PRE	97		43
6	LASSO 4E	3.00	PRE	97		40
7	LASSO 4E	4.00	PRE	100		48
8	AMIBEN 2E	3.00	PRE	67		42
9	AMIBEN 2E	4.00	PRE	30		27
10	AMIBEN 2E + DUAL 8E	2.50 2.50	PRE PRE	93		
11	DUAL 8E + AMIBEN 2E	3.00 3.00	PRE PRE	97		45
12	DUAL 8E + AMIBEN 2E	3.00 4.00	PRE PRE	93		
13	DUAL 8E	2.50	PRE	100		43
14	DUAL 8E	3.00	PRE	93		43
15	DUAL 8E	4.00	PRE	100		47
16	LASSO 4E + FURLOE 4E	2.00 2.00	COE ^d COE	90		37
17	FURLOE 4E + SURFLAN 4AS + FURLOE 4E	1.00 1.00 2.00	PRE PRE COE	77		
18	FURLOE 4E + SURFLAN 4AS	3.00 1.00	COE PRE	87		41

TRT. NO.	HERBICIDE	LB ACTIVE INGREDIENT/ACRE	METHOD OF APPLICATION	BLACK NIGHTSHADE	
				CONTROL JULY 16	YIELD
19	LASSO 4E	3.00	PRE	%	BU/A
	FURLOE 124 4E	2.00	PRE	100	39
20	KY 99 .00	4.00	PRE	13	
21	LOROX 4L	1.00	PRE	90	
	SURFLAN 4AS	1.00	PRE		
22	LEXONE 75DF	.50	PRE	83	
	SURFLAN 4AS	1.00	PRE		
23	CHECK(UNCULTIVATED)			0	34
				LSD (.05)	8

^aOnly selected plots were harvested.

^bHerbicides applied as soybeans were beginning to "crack" the soil surface.

^cPreemergence applications immediately after planting.

^dHerbicide application when soybean cotyledons had emerged.

Table 4. Control of black nightshade and soybean yield with preplant incorporated and postemergence herbicides. Lexington, 1981.

TRT. NO.	HERBICIDE	LB ACTIVE INGREDIENT/ACRE	METHOD OF APPLICATION	BLACK NIGHTSHADE CONTROL		YIELD BU/A
				7-9	9-13	
1	LASSO 4E	2.50	PPI ^a	% 93	% 87	31
2	LASSO 4E	3.00	PPI	93	90	39
3	LASSO 4E	4.00	PPI	90	93	27
4	LASSO 4E + AMIBEN 2E	3.00 3.00	PPI EP ^b	97	93	39
5	DUAL 8E	2.50	PPI	100	87	38
6	DUAL 8E	3.00	PPI	100	90	42
7	DUAL 8E	4.00	PPI	97	90	40
8	DUAL 8E + AMIBEN 2E	3.00 3.00	PPI EP	100	90	34
9	DUAL 8E + SENCOR 4F	2.50 .38	PPI PPI	100	93	35
10	AMIBEN 2E + AMIBEN 2E	3.00 3.00	PPI EP	87	73	32
11	TREFLAN 4E + SENCOR 4F	.75 .38	PPI PPI	87	83	37
12	TREFLAN 4E + SENCOR 4F + AMIBEN 2E	.75 .38 3.00	PPI PPI PPI	87	57	24
13	SONALAN 3E	1.50	PPI	83	57	25
14	SONALAN 3E + AMIBEN 2E	.75 3.00	PPI PPI	80	63	28
15	SONALAN 3E + AMIBEN 2E	.94 3.00	PPI PPI	87	60	31
16	SONALAN 3E + AMIBEN 2E	1.31 3.00	PPI PPI	90	80	24
17	SONALAN 3E + AMIBEN 2E + METRIBUZIN 50WP	.94 3.00 .38	PPI PPI PPI	83	77	22

TRT. NO.	HERBICIDE	LB ACTIVE INGREDIENT/ACRE	METHOD OF APPLICATION	BLACK NIGHTSHADE CONTROL		YIELD BU/A
				7-9	9-13	
18	BLAZER 2E	.50	MP ^c	90	73	26
19	VERNAM 7E + BLAZER 2E	2.00 .25	PPI MP	90	83	30
20	VERNAM 7E + BLAZER 2E	3.00 .25	PPI MP	93	87	30
21	BASAGRAN 4E + OIL CONCENTRATE	1.00 1.00 QT/AC	MP MP	70	53	32
22	VERNAM 7E + BASAGRAN 4E + OIL CONCENTRATE	2.00 .75 1.00 QT/AC	PPI MP MP	80	60	19
23	VERNAM 7E + BASAGRAN 4E + OIL CONCENTRATE	3.00 .75 1.00 QT/AC	PPI MP MP	90	70	31
24	CHECK (CULTIVATED)			100	90	40
						LSD(.05) 12

^aPreplant incorporated applications immediately prior to planting.

^bEarly postemergence applications when black nightshade plants were less than two inches in height.

^cMid-postemergence applications when black nightshade plants were two to four inches in height.

Table 5. Black nightshade control and soybean yield with pre- and postemergence herbicide applications. Lexington, 1981.

TRT. NO.	HERBICIDE	LB ACTIVE INGREDIENT/ACRE	METHOD OF APPLICATION	BLACK NIGHTSHADE CONTROL		YIELD BU/A
				7-9	9-13	
1	LASSO 4E	2.50	PRE ^a	% 77	% 87	43
2	LASSO 4E	3.00	PRE	93	87	40
3	LASSO 4E	4.00	PRE	93	87	42
4	LASSO 4E + LOROX 4L	3.00 .75	PRE PRE	93	90	33
5	LASSO 4E + LOROX 4L	3.00 1.00	PRE PRE	97	93	38
6	LASSO 4E + AMIBEN 2E	3.00 3.00	PRE PRE	90	77	34
7	LASSO 4E + BLAZER 2E	2.00 .50	PRE MP ^b	93	80	31
8	GOAL 2E + LASSO 4E	.38 2.00	PRE PRE	97	97	37
9	LASSO 4E + GOAL 2E + BLAZER 2E	2.00 .38 .50	PRE PRE MP	97	97	41
10	RH-8817 2E + LASSO 4E	.50 2.00	PRE PRE	87	83	39
11	LASSO 4E + RH-8817 2E + BLAZER 2E	2.00 .50 .50	PRE PRE MP	100	90	43
12	MODOWN 4F + LASSO 4E	1.50 2.00	PRE PRE	77	80	35
13	MODOWN 4F	2.00	PRE	83	87	39
14	LASSO 4E + TACKLE 2S	2.00 .50	PRE MP	93	83	39
15	LASSO 4E + TACKLE 2S + X-77	2.00 .50 .50%	PRE MP MP	90	90	40
16	LASSO 4E + LEXONE 4L + BUTYRAC 200 2E + WK	2.00 .38 .20 .25%	PRE POD ^c POD POD	100	93	40

TRT. NO.	HERBICIDE	LB ACTIVE INGREDIENT/ACRE	METHOD OF APPLICATION	BLACK NIGHTSHADE CONTROL		YIELD
				7-9	9-13	
17	LASSO 4E + LEXONE 4L + BUTYRAC 200 2E + WK	2.00 .50 .20 .25%	PRE POD POD POD	% 87	% 83	BU/A 39
18	LASSO 4E + DYANAP 3E	2.00 1.50	PRE EP ^d	90	93	39
19	VISTAR 2S + X-77 + BLAZER 2E	.13 .50% .25	MP MP 3DA ^e	93	70	36
20	VISTAR 2S + X-77 + TACKLE 2S + X-77	.13 .50% .25 .50%	MP MP 3DA 3DA	93	93	41
21	VISTAR 2S + X-77 + BASAGRAN 4E + OIL CONCENTRATE	.06 .50% .38 1.00 QT/A	MP MP 3DA 3DA	80	73	40
22	VISTAR 2S + X-77 + BASAGRAN 4E + OIL CONCENTRATE	.13 .50% .38 1.00 QT/AC	MP MP 3DA 3DA	80	73	39
23	DUAL 8E	2.50	PRE	93	93	42
24	DUAL 8E	3.00	PRE	93	87	41
25	DUAL 8E	4.00	PRE	93	93	42
26	DUAL 8E + LOROX 4L	3.00 .75	PRE PRE	93	90	33
27	DUAL 8E + LOROX 4L	3.00 1.00	PRE PRE	97	97	35
28	DUAL 8E + LOROX 4L	2.00 .50	PRE POD	97	97	37
29	DUAL 8E + LOROX 4L	2.00 1.00	PRE POD	93	97	42
30	DUAL 8E + LOROX 4L + BUTYRAC 200 2E	2.00 .50 .20	PRE POD POD	97	93	38

TRT. NO.	HERBICIDE	LB ACTIVE INGREDIENT/ACRE	METHOD OF APPLICATION	BLACK NIGHTSHADE CONTROL		YIELD BU/A
				7-9	9-13	
31	DUAL 8E + LOROX 4L + BUTYRAC 200 2E	2.00 1.00 .20	PRE POD POD	97	100	41
32	DUAL 8E + AMIBEN 2E	2.50 3.00	PRE PRE	93	87	39
33	DUAL 8E + AMIBEN 2E	3.00 3.00	PRE PRE	93	90	42
34	DUAL 8E + SENCOR 4F + BUTYRAC 200 2E + X-77	2.00 .25 .20 .50%	PRE POD POD POD	97	90	37
35	DUAL 8E + SENCOR 4F + BUTYRAC 200 2E + X-77	2.00 .50 .20 .50%	PRE POD POD POD	100	97	47
36	DUAL 8E + BLAZER 2E	2.50 .50	PRE MP	93	87	39
37	AMIBEN 2E + SURFEL	3.00 1.00 QT/AC	EP EP	83	77	40
38	AMIBEN 2E + AMIBEN 2E	3.00 3.00	PRE EP	93	87	42
39	AMIBEN 2E + DYANAP 3E	3.00 .25	EP EP	90	83	42
40	AMIBEN 2E + BLAZER 2E	3.00 .25	EP EP	93	90	38
41	BASAGRAN 4E + BLAZER 2E	.75 .13	MP MP	80	77	40
42	BASAGRAN 4E + BLAZER 2E	.75 .25	MP MP	83	77	33
43	MODOWN 4F	2.00	PRE	87	80	36
44	SONALAN 3E	1.50	EP	80	70	31
45	SONALAN 3E + AMIBEN 2E	.75 3.00	PRE PRE	77	70	35
46	SONALAN 3E + AMIBEN 2E	.94 3.00	PRE PRE	63	70	36

TRT. NO.	HERBICIDE	LB ACTIVE INGREDIENT/ACRE	METHOD OF APPLICATION	BLACK NIGHTSHADE CONTROL		YIELD BU/A
				7-9	9-13	
47	SONALAN 3E	1.31	PRE	% 60	% 73	27
	AMIBEN 2E	3.00	PRE			
48	SONALAN 3E	.94	PRE	73	73	40
	AMIBEN 2E	3.00	PRE			
	METRIBUZIN 50WP	.38	PRE			
49	PPG-844 2E	.20	EP	93	90	39
50	PPG-844 2E	.30	EP	90	90	38
51	CHECK (CULTIVATED)			93	82	41
					LSD(.05)	8

^aPreemergence applications immediately after planting.

^bMid-postemergence applications when black nightshade plants were two to four inches in height.

^cPostemergence applications directed to the base of soybean plants when black nightshade plants were less than two inches in height.

^dEarly postemergence applications when black nightshade plants were less than two inches in height.

^eHerbicide applied three days after initial herbicide was applied.