

(01-NSC-3)

Evaluation of rates and postemergence application timings of Touchdown for phytotoxicity and weed control in soybean, Nashua, Iowa, 2001. Owen, Micheal D.K., James F. Lux, and Damian D. Franzenburg. The purpose of this study was to evaluate Touchdown and Roundup UltraMAX rates and application timings for weed efficacy and crop phytotoxicity in a glyphosate resistant soybean variety. The soil was a Floyd, Kenyon, Ostrander loam with a pH 6.95 and 5.1% organic matter. The experimental design was a randomized complete block with three replications and plots were 10 by 25 ft. The 2000 crop was corn. Tillage included a fall chisel plowing and spring field cultivation. Crop residue on the soil surface was 45% at planting. "Asgrow variety 2302 RR" soybeans were planted 1.5 inches deep on May 18, at 189,407 seeds/A in 30-inch rows. May rainfall included: 0.11, 1.27, 0.52, 0.03, 0.17, 0.34, 0.01, 0.06, 0.14, 0.01, 0.08, 0.60, 0.44, 0.05, 0.13, 0.51, 0.08, 0.26 and 0.23 inches, on May 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 13, 20, 21, 22, 23, 24, 25, 26 and 31, respectively. Total rainfall for May was 5.04 inches. June rainfall included: 0.42, 0.52, 0.01, 0.07, 0.04, 0.73, 0.09 and 0.27 inches on June 1, 5, 6, 11, 12, 14, 17 and 18, respectively. Total rainfall for June was 2.15 inches. July rainfall included: 0.05 inches and 2.37 inches from July 1 through 15 and 16 through 31, respectively. Rainfall total for August was 2.50 inches. Application information is listed below:

Date	June 28	July 6
Treatment	POST1	POST2
Sprayer		
gpa	20	20
psi	30	30
nozzle	11003	11003
Temperature (C)		
air	29	29
soil (4 inch)	27	25
Soil moisture	dry	dry
Wind (mph)	0-2 S	8-12 S
Sky	pt. cloudy	pt. cloudy
Relative humidity (%)	63%	63%
Soybean growth		
leaf no.	V3-V4	V5
height (inch)	5-7	11-13
Giant foxtail		
leaf no.	1-4, 0-4 tillers	4-5, 0-2 tillers
height (inch)	2-8	10-13
infestation (ft <sup>2</sup> )	2-25	10-20
Common lambsquarters		
leaf no.	numerous	numerous
height (inch)	2-6	8-12
infestation (ft <sup>2</sup> )	0-1	0-1
Common ragweed		
leaf no.	numerous	numerous
height (inch)	4-7	10-14
infestation (ft <sup>2</sup> )	0-1	0-1
Common waterhemp		
leaf no.	4-numerous	numerous
height (inch)	2-6	10-13
infestation (ft <sup>2</sup> )	0-1	0-4

#### Velvetleaf

leaf no.	2-10	6-7
height (inch)	2-6	8-13
infestation (ft <sup>2</sup> )	0-1	0-3

No soybean injury was observed on July 6, eight days after POST1 application timing. On July 13, seven days and fifteen days after POST2 and POST1 application timings, respectively, soybean injury, in the form of chlorosis, was evident with all treatments. Injury was observed as well, with nearly all treatments on subsequent observation dates, and ranged from 0 to 12% on August 22. Injury was greater with POST2 applied Touchdown treatments than POST1. However, no trend was observed with a particular application rate and whether it occurred with or without Ammonium Sulfate. Injury observations on July 27 and August 22 reflected stunting and not chlorosis. Soybean height measurements on August 20 generally indicated treatments with more soybean injury resulted in shorter plants.

Giant foxtail, velvetleaf, common waterhemp, common ragweed and common lambsquarters control was excellent on July 13, 19 and 27 with all POST1 and POST2 applied Touchdown and Roundup UltraMAX treatments, regardless of rate and whether it occurred with Ammonium Sulfate. Control continued to be excellent when evaluated on August 22. All treatments yielded significantly more than the untreated check. Several POST2 applied Touchdown treatments yielded significantly less than others, and generally reflected the injury and shortened soybeans associated with these treatments. (Dept. of Agronomy, Iowa State University, Ames)

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**COMPLETED:** N

**PROJECT TYPE:** HERBICIDE

**LOCATION:** NASHUA, IA

**RESEARCHED BY:** IA State University

**DESIGN:** RANDOMIZED COMPLETE BLOCK DESIGN

**PLOT SIZE:** 10.00 FT **WIDE X** 25.00 FT **LONG**

**REPS:** 03

TRT NUM	TREATMENT COMPONENT	DOSAGE			GLXMA PHY % 07/06/01	GLXMA PHY % 07/13/01	SETFA CON % 07/13/01	ABUTH CON % 07/13/01	AMATA CON % 07/13/01
		RATE	UNIT	TM					
1A	UNTREATED CHECK	0.00	NA	0	0	0	0	0	0
2A»	TOUCHDOWN (3SL)	0.375	LAA	1	0	5	99	99	98
B»	AMMONIUM SULFATE	8.50	PMG	1					
3A»	TOUCHDOWN (3SL)	0.75	LAA	1	0	5	99	99	99
B»	AMMONIUM SULFATE	8.50	PMG	1					
4A»	TOUCHDOWN (3SL)	1.50	LAA	1	0	5	99	99	99
B»	AMMONIUM SULFATE	8.50	PMG	1					
5A»	TOUCHDOWN (3SL)	0.75	LAA	1	0	3	99	99	99
6A»	TOUCHDOWN (3SL)	0.824	LAA	1	0	5	99	98	99
7A»	ROUNDUP ULTRAMAX (3.7SL)	0.375	LAA	1	0	7	99	99	99
B»	AMMONIUM SULFATE	8.50	PMG	1					
8A»	ROUNDUP ULTRAMAX (3.7SL)	0.75	LAA	1	0	5	99	98	99
B»	AMMONIUM SULFATE	8.50	PMG	1					
9A»	ROUNDUP ULTRAMAX (3.7SL)	1.50	LAA	1	0	3	99	99	99
B»	AMMONIUM SULFATE	8.50	PMG	1					
10A»	TOUCHDOWN (3SL)	0.375	LAA	2	0	2	0	0	0
B»	AMMONIUM SULFATE	8.50	PMG	2					
11A»	TOUCHDOWN (3SL)	0.75	LAA	2	0	3	0	0	0
12A»	TOUCHDOWN (3SL)	0.75	LAA	2	0	7	0	0	0
B»	AMMONIUM SULFATE	4.25	PMG	2					
13A»	TOUCHDOWN (3SL)	0.75	LAA	2	0	3	0	0	0
B»	AMMONIUM SULFATE	8.50	PMG	2					
14A»	TOUCHDOWN (3SL)	0.75	LAA	2	0	3	0	0	0
B»	AMMONIUM SULFATE	12.75	PMG	2					
15A»	TOUCHDOWN (3SL)	0.75	LAA	2	0	3	0	0	0
B»	AMMONIUM SULFATE	17.00	PMG	2					
16A»	TOUCHDOWN (3SL)	0.824	LAA	2	0	7	0	0	0
17A»	TOUCHDOWN (3SL)	1.50	LAA	2	0	3	0	0	0
B»	AMMONIUM SULFATE	8.50	PMG	2					
18A»	ROUNDUP ULTRAMAX (3.7SL)	0.375	LAA	2	0	2	0	0	0
B»	AMMONIUM SULFATE	8.50	PMG	2					
19A»	ROUNDUP ULTRAMAX (3.7SL)	0.75	LAA	2	0	2	0	0	0
B»	AMMONIUM SULFATE	8.50	PMG	2					
20A»	ROUNDUP ULTRAMAX (3.7SL)	1.50	LAA	2	0	0	0	0	0
B»	AMMONIUM SULFATE	8.50	PMG	2					
LSD (0.05)					0.00	5.87	0.00	1.22	0.852

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**REPS:** 03

TRT NUM	TREATMENT COMPONENT	DOSAGE			AMBEL CON % 07/13/01	CHEAL CON % 07/13/01	GLXMA PHY % 07/19/01	SETFA CON % 07/19/01	ABUTH CON % 07/19/01
		RATE	UNIT	TM					
1A	UNTREATED CHECK	0.00	NA	0	0	0	0	0	0
2A»	TOUCHDOWN (3SL)	0.375	LAA	1	99	98	2	99	99
B»	AMMONIUM SULFATE	8.50	PMG	1					
3A»	TOUCHDOWN (3SL)	0.75	LAA	1	99	99	3	99	99
B»	AMMONIUM SULFATE	8.50	PMG	1					
4A»	TOUCHDOWN (3SL)	1.50	LAA	1	99	99	3	99	99
B»	AMMONIUM SULFATE	8.50	PMG	1					
5A»	TOUCHDOWN (3SL)	0.75	LAA	1	99	99	2	99	99
6A»	TOUCHDOWN (3SL)	0.824	LAA	1	99	99	2	99	98
7A»	ROUNDUP ULTRAMAX (3.7SL)	0.375	LAA	1	98	99	5	99	99
B»	AMMONIUM SULFATE	8.50	PMG	1					
8A»	ROUNDUP ULTRAMAX (3.7SL)	0.75	LAA	1	99	99	2	99	99
B»	AMMONIUM SULFATE	8.50	PMG	1					
9A»	ROUNDUP ULTRAMAX (3.7SL)	1.50	LAA	1	99	99	3	99	99
B»	AMMONIUM SULFATE	8.50	PMG	1					
10A»	TOUCHDOWN (3SL)	0.375	LAA	2	0	0	3	99	92
B»	AMMONIUM SULFATE	8.50	PMG	2					
11A»	TOUCHDOWN (3SL)	0.75	LAA	2	0	0	5	99	90
12A»	TOUCHDOWN (3SL)	0.75	LAA	2	0	0	8	99	98
B»	AMMONIUM SULFATE	4.25	PMG	2					
13A»	TOUCHDOWN (3SL)	0.75	LAA	2	0	0	5	99	99
B»	AMMONIUM SULFATE	8.50	PMG	2					
14A»	TOUCHDOWN (3SL)	0.75	LAA	2	0	0	5	99	99
B»	AMMONIUM SULFATE	12.75	PMG	2					
15A»	TOUCHDOWN (3SL)	0.75	LAA	2	0	0	5	99	98
B»	AMMONIUM SULFATE	17.00	PMG	2					
16A»	TOUCHDOWN (3SL)	0.824	LAA	2	0	0	5	99	92
17A»	TOUCHDOWN (3SL)	1.50	LAA	2	0	0	5	99	98
B»	AMMONIUM SULFATE	8.50	PMG	2					
18A»	ROUNDUP ULTRAMAX (3.7SL)	0.375	LAA	2	0	0	2	99	90
B»	AMMONIUM SULFATE	8.50	PMG	2					
19A»	ROUNDUP ULTRAMAX (3.7SL)	0.75	LAA	2	0	0	2	99	99
B»	AMMONIUM SULFATE	8.50	PMG	2					
20A»	ROUNDUP ULTRAMAX (3.7SL)	1.50	LAA	2	0	0	3	99	99
B»	AMMONIUM SULFATE	8.50	PMG	2					
LSD (0.05)					0.852	0.852	5.00	0.00	3.00

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**PLOT SIZE:** 10.00 FT **WIDE X** 25.00 FT **LONG**

**REPS:** 03

TRT NUM	TREATMENT COMPONENT	DOSAGE			AMATA CON % 07/19/01	AMBEL CON % 07/19/01	CHEAL CON % 07/19/01	GLXMA PHY % 07/27/01	SETFA CON % 07/27/01
		RATE	UNIT	TM					
1A	UNTREATED CHECK	0.00	NA	0	0	0	0	0	0
2A»	TOUCHDOWN (3SL)	0.375	LAA	1	98	98	98	2	99
B»	AMMONIUM SULFATE	8.50	PMG	1					
3A»	TOUCHDOWN (3SL)	0.75	LAA	1	99	99	99	2	99
B»	AMMONIUM SULFATE	8.50	PMG	1					
4A»	TOUCHDOWN (3SL)	1.50	LAA	1	99	99	99	3	99
B»	AMMONIUM SULFATE	8.50	PMG	1					
5A»	TOUCHDOWN (3SL)	0.75	LAA	1	99	99	99	2	99
6A»	TOUCHDOWN (3SL)	0.824	LAA	1	99	99	99	3	99
7A»	ROUNDUP ULTRAMAX (3.7SL)	0.375	LAA	1	99	98	99	5	99
B»	AMMONIUM SULFATE	8.50	PMG	1					
8A»	ROUNDUP ULTRAMAX (3.7SL)	0.75	LAA	1	99	99	99	2	99
B»	AMMONIUM SULFATE	8.50	PMG	1					
9A»	ROUNDUP ULTRAMAX (3.7SL)	1.50	LAA	1	99	99	99	3	99
B»	AMMONIUM SULFATE	8.50	PMG	1					
10A»	TOUCHDOWN (3SL)	0.375	LAA	2	95	91	98	5	99
B»	AMMONIUM SULFATE	8.50	PMG	2					
11A»	TOUCHDOWN (3SL)	0.75	LAA	2	96	96	98	8	99
12A»	TOUCHDOWN (3SL)	0.75	LAA	2	98	96	99	10	99
B»	AMMONIUM SULFATE	4.25	PMG	2					
13A»	TOUCHDOWN (3SL)	0.75	LAA	2	99	99	99	8	99
B»	AMMONIUM SULFATE	8.50	PMG	2					
14A»	TOUCHDOWN (3SL)	0.75	LAA	2	98	99	99	8	99
B»	AMMONIUM SULFATE	12.75	PMG	2					
15A»	TOUCHDOWN (3SL)	0.75	LAA	2	96	98	94	7	99
B»	AMMONIUM SULFATE	17.00	PMG	2					
16A»	TOUCHDOWN (3SL)	0.824	LAA	2	98	99	99	10	99
17A»	TOUCHDOWN (3SL)	1.50	LAA	2	99	99	99	7	99
B»	AMMONIUM SULFATE	8.50	PMG	2					
18A»	ROUNDUP ULTRAMAX (3.7SL)	0.375	LAA	2	95	99	95	2	99
B»	AMMONIUM SULFATE	8.50	PMG	2					
19A»	ROUNDUP ULTRAMAX (3.7SL)	0.75	LAA	2	96	98	99	2	99
B»	AMMONIUM SULFATE	8.50	PMG	2					
20A»	ROUNDUP ULTRAMAX (3.7SL)	1.50	LAA	2	98	96	99	3	99
B»	AMMONIUM SULFATE	8.50	PMG	2					
LSD (0.05)					2.22	6.21	3.39	5.41	0.00

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**REPS:** 03

TRT	TREATMENT	DOSAGE	ABUTH	AMATA	AMBEL	CHEAL	GLXMA		
NUM	COMPONENT	RATE	UNIT	TM	CON %	CON %	CON %	CON %	PHY %
					07/27/01	07/27/01	07/27/01	07/27/01	08/22/01
1A	UNTREATED CHECK	0.00	NA	0	0	0	0	0	0
2A»	TOUCHDOWN (3SL)	0.375	LAA	1	99	96	98	98	2
B»	AMMONIUM SULFATE	8.50	PMG	1					
3A»	TOUCHDOWN (3SL)	0.75	LAA	1	99	99	99	99	0
B»	AMMONIUM SULFATE	8.50	PMG	1					
4A»	TOUCHDOWN (3SL)	1.50	LAA	1	99	99	99	99	2
B»	AMMONIUM SULFATE	8.50	PMG	1					
5A»	TOUCHDOWN (3SL)	0.75	LAA	1	98	99	99	99	2
6A»	TOUCHDOWN (3SL)	0.824	LAA	1	98	99	99	99	2
7A»	ROUNDUP ULTRAMAX (3.7SL)	0.375	LAA	1	99	99	98	99	3
B»	AMMONIUM SULFATE	8.50	PMG	1					
8A»	ROUNDUP ULTRAMAX (3.7SL)	0.75	LAA	1	99	99	99	99	2
B»	AMMONIUM SULFATE	8.50	PMG	1					
9A»	ROUNDUP ULTRAMAX (3.7SL)	1.50	LAA	1	99	99	99	99	2
B»	AMMONIUM SULFATE	8.50	PMG	1					
10A»	TOUCHDOWN (3SL)	0.375	LAA	2	92	90	88	92	5
B»	AMMONIUM SULFATE	8.50	PMG	2					
11A»	TOUCHDOWN (3SL)	0.75	LAA	2	90	95	96	98	8
12A»	TOUCHDOWN (3SL)	0.75	LAA	2	98	98	98	99	12
B»	AMMONIUM SULFATE	4.25	PMG	2					
13A»	TOUCHDOWN (3SL)	0.75	LAA	2	99	98	99	99	8
B»	AMMONIUM SULFATE	8.50	PMG	2					
14A»	TOUCHDOWN (3SL)	0.75	LAA	2	99	98	99	99	10
B»	AMMONIUM SULFATE	12.75	PMG	2					
15A»	TOUCHDOWN (3SL)	0.75	LAA	2	99	98	99	94	7
B»	AMMONIUM SULFATE	17.00	PMG	2					
16A»	TOUCHDOWN (3SL)	0.824	LAA	2	92	96	99	99	10
17A»	TOUCHDOWN (3SL)	1.50	LAA	2	98	99	99	99	5
B»	AMMONIUM SULFATE	8.50	PMG	2					
18A»	ROUNDUP ULTRAMAX (3.7SL)	0.375	LAA	2	92	96	99	95	0
B»	AMMONIUM SULFATE	8.50	PMG	2					
19A»	ROUNDUP ULTRAMAX (3.7SL)	0.75	LAA	2	99	98	98	99	2
B»	AMMONIUM SULFATE	8.50	PMG	2					
20A»	ROUNDUP ULTRAMAX (3.7SL)	1.50	LAA	2	99	96	96	99	5
B»	AMMONIUM SULFATE	8.50	PMG	2					
LSD (0.05)					3.67	3.00	7.85	3.82	5.22

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**REPS:** 03

TRT NUM	TREATMENT COMPONENT	DOSAGE			SETFA	ABUTH	AMATA	AMBEL	CHEAL
		RATE	UNIT	TM	CON % 08/22/01	CON % 08/22/01	CON % 08/22/01	CON % 08/22/01	CON % 08/22/01
1A	UNTREATED CHECK	0.00	NA	0	0	0	0	0	0
2A»	TOUCHDOWN (3SL)	0.375	LAA	1	99	99	96	98	98
B»	AMMONIUM SULFATE	8.50	PMG	1					
3A»	TOUCHDOWN (3SL)	0.75	LAA	1	99	99	98	99	98
B»	AMMONIUM SULFATE	8.50	PMG	1					
4A»	TOUCHDOWN (3SL)	1.50	LAA	1	99	99	99	99	99
B»	AMMONIUM SULFATE	8.50	PMG	1					
5A»	TOUCHDOWN (3SL)	0.75	LAA	1	99	99	99	99	99
6A»	TOUCHDOWN (3SL)	0.824	LAA	1	99	99	99	99	99
7A»	ROUNDUP ULTRAMAX (3.7SL)	0.375	LAA	1	98	99	99	98	99
B»	AMMONIUM SULFATE	8.50	PMG	1					
8A»	ROUNDUP ULTRAMAX (3.7SL)	0.75	LAA	1	99	99	99	99	99
B»	AMMONIUM SULFATE	8.50	PMG	1					
9A»	ROUNDUP ULTRAMAX (3.7SL)	1.50	LAA	1	99	99	99	99	99
B»	AMMONIUM SULFATE	8.50	PMG	1					
10A»	TOUCHDOWN (3SL)	0.375	LAA	2	99	92	92	88	92
B»	AMMONIUM SULFATE	8.50	PMG	2					
11A»	TOUCHDOWN (3SL)	0.75	LAA	2	99	90	95	96	98
12A»	TOUCHDOWN (3SL)	0.75	LAA	2	99	98	96	98	99
B»	AMMONIUM SULFATE	4.25	PMG	2					
13A»	TOUCHDOWN (3SL)	0.75	LAA	2	99	99	98	99	99
B»	AMMONIUM SULFATE	8.50	PMG	2					
14A»	TOUCHDOWN (3SL)	0.75	LAA	2	99	99	98	99	99
B»	AMMONIUM SULFATE	12.75	PMG	2					
15A»	TOUCHDOWN (3SL)	0.75	LAA	2	99	99	98	99	96
B»	AMMONIUM SULFATE	17.00	PMG	2					
16A»	TOUCHDOWN (3SL)	0.824	LAA	2	99	92	96	99	99
17A»	TOUCHDOWN (3SL)	1.50	LAA	2	99	98	99	99	99
B»	AMMONIUM SULFATE	8.50	PMG	2					
18A»	ROUNDUP ULTRAMAX (3.7SL)	0.375	LAA	2	99	93	98	99	95
B»	AMMONIUM SULFATE	8.50	PMG	2					
19A»	ROUNDUP ULTRAMAX (3.7SL)	0.75	LAA	2	99	99	98	98	99
B»	AMMONIUM SULFATE	8.50	PMG	2					
20A»	ROUNDUP ULTRAMAX (3.7SL)	1.50	LAA	2	99	98	96	96	99
B»	AMMONIUM SULFATE	8.50	PMG	2					
LSD (0.05)					0.852	4.00	3.24	7.85	2.71

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**PLOT SIZE:** 10.00 FT **WIDE X** 25.00 FT **LONG**

**REPS:** 03

TRT	TREATMENT	DOSAGE	GLXMA	GLXMA		
NUM	COMPONENT	RATE	UNIT	TM	HT IN	BU/A
					08/20/01	10/02/01
1A	UNTREATED CHECK	0.00	NA	0	40	33
2A»	TOUCHDOWN (3SL)	0.375	LAA	1	39	53
B»	AMMONIUM SULFATE	8.50	PMG	1		
3A»	TOUCHDOWN (3SL)	0.75	LAA	1	39	54
B»	AMMONIUM SULFATE	8.50	PMG	1		
4A»	TOUCHDOWN (3SL)	1.50	LAA	1	39	55
B»	AMMONIUM SULFATE	8.50	PMG	1		
5A»	TOUCHDOWN (3SL)	0.75	LAA	1	40	56
6A»	TOUCHDOWN (3SL)	0.824	LAA	1	39	52
7A»	ROUNDUP ULTRAMAX (3.7SL)	0.375	LAA	1	38	53
B»	AMMONIUM SULFATE	8.50	PMG	1		
8A»	ROUNDUP ULTRAMAX (3.7SL)	0.75	LAA	1	41	56
B»	AMMONIUM SULFATE	8.50	PMG	1		
9A»	ROUNDUP ULTRAMAX (3.7SL)	1.50	LAA	1	40	56
B»	AMMONIUM SULFATE	8.50	PMG	1		
10A»	TOUCHDOWN (3SL)	0.375	LAA	2	37	50
B»	AMMONIUM SULFATE	8.50	PMG	2		
11A»	TOUCHDOWN (3SL)	0.75	LAA	2	35	52
12A»	TOUCHDOWN (3SL)	0.75	LAA	2	33	48
B»	AMMONIUM SULFATE	4.25	PMG	2		
13A»	TOUCHDOWN (3SL)	0.75	LAA	2	35	50
B»	AMMONIUM SULFATE	8.50	PMG	2		
14A»	TOUCHDOWN (3SL)	0.75	LAA	2	33	50
B»	AMMONIUM SULFATE	12.75	PMG	2		
15A»	TOUCHDOWN (3SL)	0.75	LAA	2	37	54
B»	AMMONIUM SULFATE	17.00	PMG	2		
16A»	TOUCHDOWN (3SL)	0.824	LAA	2	35	47
17A»	TOUCHDOWN (3SL)	1.50	LAA	2	34	52
B»	AMMONIUM SULFATE	8.50	PMG	2		
18A»	ROUNDUP ULTRAMAX (3.7SL)	0.375	LAA	2	40	58
B»	AMMONIUM SULFATE	8.50	PMG	2		
19A»	ROUNDUP ULTRAMAX (3.7SL)	0.75	LAA	2	39	56
B»	AMMONIUM SULFATE	8.50	PMG	2		
20A»	ROUNDUP ULTRAMAX (3.7SL)	1.50	LAA	2	38	56
B»	AMMONIUM SULFATE	8.50	PMG	2		
LSD (0.05)					4.79	7.45

» = SUPPLEMENTAL CHEMICAL

## \* TIMING CODES

00 = UNTRCHK / UNTREATED TIMING (FP)

01 = POSPOS / POST1 06/28/2001(1)

02 = POSPOS / POST2 07/06/2001(2)