

Effect of adding iron and N to Velocity or Certainty on five species of cool-season

Zac Reicher and Dan Weisenberger

Dept. of Agronomy, Purdue University, West Lafayette, IN

11 March 2009

Background/Objective: To evaluate if adding Lesco 12-0-0 w/Fe will reduce phytotoxicity of Certainty or Velocity for controlling roughstalk bluegrass in Kentucky bluegrass, perennial ryegrass, turf type tall fescue, or creeping bentgrass.

Site Information

Location:	William H. Daniel Research and Diagnostic Center					
Soil Type:	Starks-Fincastle silt loam					
Soil pH:	7.2					
Turfgrass Species:	KBG	PR	TF	CBG	RBG	
Turf Condition:	good	good	good	good	poor	
Turf Management:	Mowing Height in:	2.5	1.0	2.5	0.5	0.5
	Fertilization(lb N/M/YR):	3.5	3.5	2.5	3.0	3.0
	Irrigation:	To prevent moisture stress				
Target Pest:	<i>Poa trivialis</i>					
Growth Stage:	Mature					

Application Information

Application Date:	11 June	24 June	8 July
Application Time:	8:30 am	8:00 am	6:00 am
Air Temperature F^o:	73	75	73
Relative Humidity(%):	-	-	93
Wind Speed mph:	Calm	Calm	2-3
Soil Temperature(3 in depth) F^o:	73	70	73
Soil Moisture:	Moist	Moist	Moist
Spray Volume gal 1000 ft⁻²:	2		
Spray Pressure:	30psi		
Spray Nozzle:	8001.5		
Spray Equipment:	CO ₂ backpack		
Irrigation After Application:	None		
Experimental Design:	Randomized complete block		
Replications:	3		
Plot Size ft:	5 X 5		

Treatments:

Herbicide	Rate/A	Fe+N
Velocity 17.6 WSP	3 oz	0
Velocity 17.6 WSP	6 oz	9 oz/1000 12-0-0
Velocity 17.6 WSP	6 oz	0
Velocity 17.6 WSP	3 oz	9 oz/1000 12-0-0
Certainty 75WDG	0.25 oz	0
Certainty 75WDG	0.25 oz	9 oz/1000 12-0-0
Certainty 75WDG	0.50 oz	0
Certainty 75WDG	0.50 oz	9 oz/1000 12-0-0
Check	-	0
Check	-	9 oz/1000 12-0-0

Herbicides were applied three times at two week intervals. Rate of Fe= 0.033 lbs/1000 ft² and 0.066 lbs N/1000 ft².

Results:

Creeping bentgrass

- FeN reduced phytotoxicity of Velocity at 6 oz/A and Certainty at both 0.25 and 0.5 oz/A on 18 June (Table 1).
- FeN also reduced phytotoxicity of Certainty at both 0.25 and 0.5 oz/A on 15 July.

Kentucky bluegrass

- FeN dramatically reduced phytotoxicity of Velocity throughout the study to levels similar to that of the check (Table 2).
- However, FeN did not decrease thinning of Kentucky bluegrass by Velocity at 6 oz/A at any time during the study.
- FeN also reduced phytotoxicity of Certainty at both rates on 24 June and 8 July.

Perennial ryegrass

- FeN had little effect on phytotoxicity of Velocity throughout the study (Table 3).
- FeN did reduce phytotoxicity of Certainty at 0.25 oz/A on 24 June, 8 July, and 15 July to levels similar to the check, but had little effect on the high rate Certainty.
- FeN did not affect the thinning of perennial ryegrass by Certainty, especially at the 0.5 oz/A rate.

Turf-type tall fescue

- FeN decreased phytotoxicity of Velocity on 24 June (Table 4).
- FeN decreased phytotoxicity of Certainty to levels similar to the check almost throughout the study, especially at the low rate.
- FeN did not decrease thinning of tall fescue by Certainty at 0.5 oz/A at any time during the study.

Lazer roughstalk bluegrass

- FeN did not decrease the effectiveness of either herbicide on roughstalk bluegrass (Table 5).

Summary

Adding 0.033 lbs Fe /1000 ft² and 0.066 lbs N/1000 ft² to Velocity or Certainty will dramatically decrease phytotoxicity of these herbicides on commonly used-cool season grasses without decreasing expected control of roughstalk bluegrass. However, these rates of Fe and N will not alleviate thinning of susceptible species by these herbicides, especially at higher use rates. This information is potentially valuable for sports turf and professional lawn care as roughstalk bluegrass is becoming a common contaminant in those areas, and these two herbicides are the only options for selective control. However, current labeling may still limit use of these herbicides in specific areas.

Table 1. Effect of adding 0.033 lbs Fe /1000 ft² and 0.066 lbs N/1000 ft² to Velocity or Certainty on phytotoxicity on L93 creeping bentgrass.

Treatment ^c	Phytotoxicity ^a							% Cover ^b	
	18-Jun	24-Jun	2-Jul	8-Jul	15-Jul	23-Jul	30-Jul	23 July	30 July
Velocity 17.6 WSP 3+3+3 oz/A	6.7	9.0	8.7	9.0	9.0	9.0	9.0	100	100
Velocity 17.6 WSP 3+3+3 oz/A +FeN ^d	7.0	9.0	9.0	9.0	9.0	9.0	9.0	98	99
Velocity 17.6 WSP 6+6+6 oz/A	6.3	9.0	7.7	8.3	8.7	9.0	9.0	100	100
Velocity 17.6 WSP 6+6+6 oz/A +FeN	7.0	9.0	9.0	9.0	9.0	9.0	9.0	100	100
Certainty 0.25+0.25+0.25 oz/A ^e	6.0	9.0	8.0	8.7	8.0	9.0	9.0	100	100
Certainty 0.25+0.25+0.25 oz/A +FeN	7.0	9.0	9.0	8.7	9.0	9.0	9.0	100	100
Certainty 0.50+0.50+0.50 oz/A	6.0	9.0	7.7	8.3	7.7	9.0	9.0	98	99
Certainty 0.50+0.50+0.50 oz/A +FeN	6.7	9.0	9.0	9.0	9.0	9.0	9.0	100	100
Check + FEN	8.0	9.0	9.0	9.0	9.0	9.0	9.0	100	100
Check	7.0	9.0	8.0	9.0	9.0	9.0	9.0	100	100
LSD (0.05)	0.5	NS	NS	NS	0.7	NS	NS	NS	NS

^a Phytotoxicity rated on a 1 to 9 scale with 9= perfect, 7=acceptable 1=dead.

^b Cover visually rated on a scale of 0 to 100%.

^c All treatments were applied on two week intervals on 11 June, 24 June, and 8 July 2008.

^d FeN source was Lesco 12-0-0 applied at 9 oz/1000 ft².

^e All Certainty applications included 0.25% v/v MON 0818 NIS.

Table 2. Effect of adding 0.033 lbs Fe /1000 ft² and 0.066 lbs N/1000 ft² to Velocity or Certainty on phytotoxicity on a blend of Kentucky bluegrass.

Treatment ^c	Phytotoxicity ^a							% Cover ^b		
	18-Jun	24-Jun	2-Jul	8-Jul	15-Jul	23-Jul	30-Jul	15 July	23 July	30 July
Velocity 17.6 WSP 3+3+3 oz/A	6.7	5.3	6.3	6.0	6.7	7.0	9.0	100	99	95
Velocity 17.6 WSP 3+3+3 oz/A +FeN ^d	7.0	9.0	9.0	9.0	9.0	8.7	9.0	100	100	98
Velocity 17.6 WSP 6+6+6 oz/A	6.0	3.3	4.7	3.3	4.3	4.3	9.0	90	90	60
Velocity 17.6 WSP 6+6+6 oz/A +FEN	6.3	8.0	7.3	8.3	8.3	6.7	9.0	100	98	93
Certainty 0.25+0.25+0.25 oz/A ^e	6.7	8.0	8.0	7.3	9.0	8.3	9.0	100	99	98
Certainty 0.25+0.25+0.25 oz/A +FEN	7.3	9.0	9.0	9.0	9.0	9.0	9.0	100	100	98
Certainty 0.50+0.50+0.50 oz/A	6.7	7.7	8.7	7.3	9.0	8.7	9.0	100	99	97
Certainty 0.50+0.50+0.50 oz/A +FEN	7.0	9.0	9.0	9.0	9.0	8.3	9.0	100	99	98
Check	7.3	9.0	9.0	9.0	8.7	8.7	9.0	100	100	99
Check + FEN	7.7	9.0	9.0	9.0	9.0	9.0	9.0	100	100	100
LSD (0.05)	NS	0.5	1.1	1.1	1.3	1.0	NS	5.4	2.8	10.3

^a Phytotoxicity rated on a 1 to 9 scale with 9= perfect, 7=acceptable 1=dead.

^b Cover visually rated on a scale of 0 to 100%.

^c All treatments were applied on two week intervals on 11 June, 24 June, and 8 July 2008.

^d FeN source was Lesco 12-0-0 applied at 9 oz/1000 ft².

^e All Certainty applications included 0.25% v/v MON 0818 NIS.

Table 3. Effect of adding 0.033 lbs Fe /1000 ft² and 0.066 lbs N/1000 ft² to Velocity or Certainty on phytotoxicity on a blend of perennial ryegrass.

Treatment ^c	Phytotoxicity ^a							% Cover ^b		
	18-Jun	24-Jun	2-Jul	8-Jul	15-Jul	23-Jul	30-Jul	15 July	23 July	30 July
Velocity 17.6 WSP 3+3+3 oz/A	6.3	9.0	9.0	9.0	9.0	9.0	9.0	77	85	83
Velocity 17.6 WSP 3+3+3 oz/A + FeN ^d	6.7	9.0	9.0	9.0	9.0	9.0	9.0	73	83	88
Velocity 17.6 WSP 6+6+6 oz/A	6.3	8.3	9.0	9.0	9.0	9.0	9.0	80	95	91
Velocity 17.6 WSP 6+6+6 oz/A +FEN	6.3	8.7	8.0	9.0	9.0	9.0	9.0	90	92	93
Certainty 0.25+0.25+0.25 oz/A ^e	6.0	6.7	7.3	6.0	5.7	9.0	9.0	63	70	78
Certainty 0.25+0.25+0.25 oz/A +FEN	6.3	9.0	9.0	8.7	8.3	9.0	9.0	70	72	70
Certainty 0.50+0.50+0.50 oz/A	5.3	5.0	4.7	4.0	3.0	9.0	9.0	20	42	48
Certainty 0.50+0.50+0.50 oz/A +FEN	5.3	6.3	4.7	5.3	4.3	9.0	9.0	23	55	47
Check	7.3	9.0	9.0	9.0	9.0	9.0	9.0	63	82	85
Check + FEN	7.7	9.0	8.0	9.0	9.0	9.0	9.0	70	80	90
LSD (0.05)	1.0	1.9	1.9	1.3	1.6	NS	NS	20	18	21

^a Phytotoxicity rated on a 1 to 9 scale with 9= perfect, 7=acceptable 1=dead.

^b Cover visually rated on a scale of 0 to 100%.

^c All treatments were applied on two week intervals on 11 June, 24 June, and 8 July 2008.

^d FeN source was Lesco 12-0-0 applied at 9 oz/1000 ft².

^e All Certainty applications included 0.25% v/v MON 0818 NIS.

Table 4. Effect of adding 0.033 lbs Fe /1000 ft² and 0.066 lbs N/1000 ft² to Velocity or Certainty on phytotoxicity on a blend of turf type tall fescue.

Treatment ^c	Phytotoxicity ^a							% Cover ^b		
	18-Jun	24-Jun	2-Jul	8-Jul	15-Jul	23-Jul	30-Jul	15 July	23 July	30 July
Velocity 17.6 WSP 3+3+3 oz/A	6.3	7.7	7.7	9.0	9.0	9.0	9.0	100	100	100
Velocity 17.6 WSP 3+3+3 oz/A + FeN ^d	6.7	9.0	9.0	8.3	9.0	8.7	9.0	100	100	100
Velocity 17.6 WSP 6+6+6 oz/A	6.3	6.7	7.3	9.0	9.0	8.3	9.0	100	100	99
Velocity 17.6 WSP 6+6+6 oz/A +FEN	6.7	8.0	8.3	9.0	7.3	8.3	9.0	90	100	100
Certainty 0.25+0.25+0.25 oz/A ^e	5.7	4.3	5.3	5.7	7.0	4.7	9.0	83	86	73
Certainty 0.25+0.25+0.25 oz/A +FEN	5.7	8.0	8.7	8.3	7.3	7.3	9.0	93	96	95
Certainty 0.50+0.50+0.50 oz/A	5.0	4.3	4.7	3.0	3.3	6.0	9.0	57	50	33
Certainty 0.50+0.50+0.50 oz/A +FEN	6.0	8.7	8.0	6.0	7.0	5.0	9.0	93	75	70
Check	7.0	9.0	9.0	9.0	9.0	9.0	9.0	100	100	100
Check + FEN	7.7	9.0	9.0	8.7	7.7	9.0	9.0	97	100	100
LSD (0.05)	0.8	1.6	1.5	1.9	3.1	2.0	NS	26	20	32

^a Phytotoxicity rated on a 1 to 9 scale with 9= perfect, 7=acceptable 1=dead.

^b Cover visually rated on a scale of 0 to 100%.

^c All treatments were applied on two week intervals on 11 June, 24 June, and 8 July 2008.

^d FeN source was Lesco 12-0-0 applied at 9 oz/1000 ft².

^e All Certainty applications included 0.25% v/v MON 0818 NIS.

Table 5. Effect of adding 0.033 lbs Fe /1000 ft² and 0.066 lbs N/1000 ft² to Velocity or Certainty on phytotoxicity on Lazer roughstalk bluegrass.

Treatment ^c	Phytotoxicity							% Cover			
	18-Jun	24-Jun	2-Jul	8-Jul	15-Jul	23-Jul	30-Jul	8 July	15 July	23 July	30 July
Velocity 17.6 WSP 3+3+3 oz/A	5.3	4.3	4.3	4.0	2.3	1.0	1.0	18	8	5	2
Velocity 17.6 WSP 3+3+3 oz/A + FeN ^d	7.0	6.7	7.3	5.7	2.7	1.0	1.0	22	12	1	1
Velocity 17.6 WSP 6+6+6 oz/A	5.3	4.7	3.3	3.0	2.3	1.0	1.0	6	7	1	0
Velocity 17.6 WSP 6+6+6 oz/A +FEN	7.3	6.0	7.3	3.0	4.0	1.0	1.0	10	13	1	0
Certainty 0.25+0.25+0.25 oz/A ^e	5.3	6.0	4.0	3.3	4.0	1.0	1.0	12	22	8	7
Certainty 0.25+0.25+0.25 oz/A +FEN	6.3	7.3	5.0	4.3	2.0	1.0	1.0	19	15	14	2
Certainty 0.50+0.50+0.50 oz/A	4.7	4.7	3.3	2.3	2.0	1.0	1.0	7	7	1	0
Certainty 0.50+0.50+0.50 oz/A +FEN	4.7	6.7	4.3	2.7	1.7	1.0	1.0	7	3	1	0
Check	6.3	7.7	8.3	8.0	8.3	1.0	1.0	43	37	25	11
Check + FEN	6.3	7.7	7.7	7.7	5.3	1.0	1.0	53	22	12	5
LSD (0.05)	1.3	2.0	1.5	20.	3.0	NS	NS	25	NS	NS	NS

^a Phytotoxicity rated on a 1 to 9 scale with 9= perfect, 7=acceptable 1=dead.

^b Cover visually rated on a scale of 0 to 100%.

^c All treatments were applied on two week intervals on 11 June, 24 June, and 8 July 2008.

^d FeN source was Lesco 12-0-0 applied at 9 oz/1000 ft².

^e All Certainty applications included 0.25% v/v MON 0818 NIS.