LESCO Lawn Fertilizer Study 2007

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A field study was conducted at the Washington State University Turfgrass and Agronomy Research Center (TARC) during the summer of 2007 to evaluate the effects of various LESCO fertilizers compared to other conventional fertilizers on a perennial ryegrass (cv. 'Gallery') lawn mowed at 1.5". A randomized-complete block design was used with four replications and individual treatment plots were 3' x 7'. Fertilizer treatments were applied 22 May 07 and a split application applied 17 Jul 07 (8 weeks after treatment (WAT)). All fertilizer treatments were applied with a Scott's SS-2 drop spreader except NUREA 38% N, which was applied by hand. The research area was irrigated with 0.5" water immediately following each application of fertilizers. The study area was mowed once per week with a front deck rotary mower at 1.5". Each week beginning at 5 days after treatment (DAT) up to 16 WAT (19 Oct 07) chlorophyll index readings were taken with a Field Scout CM1000 chlorophyll meter (Spectrum Technologies, Inc.). Visual color ratings were also taken beginning at 3 DAT up to 16 WAT using a rating scale of 1-9, with 9 equal to dark green. Turfgrass quality was rated weekly throughout the study using a rating scale of 1-9, with 9 equal to excellent turfgrass quality. Turf density was rated weekly using a rating scale of 1-9, with 9 equal to very dense turf. Turf injury (phytotoxicity) was rated weekly beginning at 3 DAT using a rating scale of 0–10, with 0 equal to no injury.

All fertilizer treatments showed a peak chlorophyll index at 2 WAT and a steady decline until the split application was applied at 8 WAT (Table 1 and Figure 1). A similar trend was noted 2 to 3 WAT after the split application. Before the split application at 8 WAT, Urea and Nurea had the highest chlorophyll index from 2 to 5 WAT, followed by LESCO Poly Plus SCU, Nitamin, and UMAXX. Scott's Poly S SCU and LESCO EcoSential showed the least increase on chlorophyll index during this time period. After the split application was applied Urea and Nurea along with Scott's Poly S SCU resulted in the highest chlorophyll index readings. Scott's Poly S SCU peaked a 2 weeks after the split application and maintained a high level of chlorophyll index readings through 16 WAT. A release of nitrogen from Scott's Poly S SCU was not noted during the first 8 weeks of the study suggesting that the SCU particle did not dissolved to release the nitrogen inside. However, later in the summer, following the split application, conditions were conducive for the SCU prill to breakdown and release the nitrogen inside. The question is, was the increase in chlorophyll index due to the breakdown of the SCU prill from the initial application

or from the split application as well? Probably the initial increase in chlorophyll index following the split application was due to the initial SCU applied, but at some point afterwards there was a release of nitrogen from the split application as well, which resulted in the prolonged high chlorophyll index. Nitamin and UMAXX increased after the split application, but not as high as Urea, Nurea, or Scott's Poly S SCU. LESCO Poly Plus SCU and LESCO EcoSential had the lowest chlorophyll index following the split application. It was surprising, in that, one would think that LESCO Poly Plus SCU and Scott's Poly S SCU would behave very similarly.

Following the initial fertilizer application, all fertilizer treatments showed an increase in visual color, except for LESCO EcoSential (Table 2 and Figure 2). However, there was not a similar downward trend in color, as was noted with chlorophyll index until 8 WAT (Figures 1 and 2). Urea and Nurea had the highest color ratings, followed by Nitamin and UMAXX. Even though LESCO Poly Plus SCU had a low color rating, Scott's Poly S SCU was even lower up to 7 WAT. However, following the split application, visual color for the Scott's Poly S SCU increased, whereas, the LESCO Poly Plus SCU did not. After the split application was applied Urea, Nurea , and Scott's Poly S SCU had the highest color ratings, followed by Nitamin and UMAXX, then LESCO Poly Plus SCU and LESCO EcoSential. For the most part, visual color ratings were very similar to the chlorophyll index readings (Figures 1 and 2).

Turfgrass quality was first taken 3 WAT, at that time Urea and Nurea had the highest quality, followed by nitamin and UMAXX, then the 2 SCU's, and lastly LESCO EcoSential (Table 3 and Figure 3). Following the split application treatment, 8 WAT , in general, Urea, Nurea, and Scott's Poly S SCU had the highest quality ratings up to 16 WAT. As with chlorophyll index and visual color, an increase in quality was not observed with the LESCO Poly Plus SCU following the split application, as was seen with Scott's Poly S SCU (Figures 1, 2, and 3). Among the fertilizers, LESCO EcoSential had the lowest turfgrass quality ratings throughout the 16 weeks of the study.

Up until 4WAT Urea and Nurea had the highest turf density, followed by Nitamin and UMAXX, then the 2 SCU's and finally LESCO EcoSential (Table 4 and Figure 4). Following the split application Urea, Nurea, and Scott's Poly S SCU, for the most part, had the highest turfgrass density among the fertilizer treatments. Turf density was lowest with the LESCO EcoSential even though there was an increase in density 10 to 12 WAT. Turf density of LESCO Poly Plus SCU treatment compared to Scott's Poly S SCU were very similar prior to the split application at 8 WAT, however, following the split application Scott's Poly S SCU had significantly higher turf density.

No phytotoxicity was observed following any of the fertilizer applications.

In summary, Urea and Nurea had high chlorophyll index, visual color, turfgrass quality, and density, for the most part, up until 5 to 6 WAT and up to 5 to 6 weeks following the split application. Surprisingly LESCO Poly Plus SCU and Scott's Poly S SCU did not behave in a similar manner throughout the study as one would expect. Even though LESCO Poly Plus SCU had higher chlorophyll index, color, and quality up to 5 WAT than Scott's Poly S SCU, following the split application, Scotts Poly S SCU resulted the best chlorophyll index and visual color ratings at the end of the study. It appears that following the split application 8 WAT conditions were conducive for the Scott's SCU prills, that were applied initially, to dissolve releasing the nitrogen inside. In addition, sometime later the Scott's SCU applied at the split application also dissolved to release the nitrogen inside, thus, the prolonged response. Nitamin 42% N, a 'steady-delivery nitrogen' fertilizer, behaved very similar to UMAXX (Agrotain), a quick-release fertilizer. LESCO EcoSential performed poorly throughout the study. No phytotoxicity was observed following any of the fertilizer applications.

Table 1. The effect of LESCO fertilizers compared to other commercial fertilizers on chlorophyll index of a 'Gallery' perennial ryegrass lawn.

				Chlorophyll index*								
Fertilizer	Exp Code	Rate (lbs N/M)	App dates	5/27/07 5 DAT	5/29/07 1 WAT	6/5/07 2 WAT	6/12/07 3 WAT	6/19/07 4 WAT	6/26/07 5 WAT	7/3/07 6 WAT	7/10/07 7 WAT	7/17/07 8 WAT
LESCO Poly Plus SCU 39%N	L-0541	1	1 & 2	244.1 c**	228.0 abc	323.1 b	296.7 b	290.4 ab	265.4 ab	271.5 a	249.4 ab	254.6 ab
LESCO EcoSential 5%N	L-0539	1	1 & 2	225.8 cd	194.3 c	248.5 c	227.2 c	231.9 cd	217.7 cd	229.6 c	207.9 d	227.9 cd
Urea 46%N	L-0532	1	1 & 2	295.4 a	248.6 ab	420.5 a	354.3 a	324.2 a	285.6 a	276.6 a	257.6 a	250.5 abc
Scott Poly S SCU 38%N	L-0538	1	1 & 2	225.3 cd	192.3 c	267.7 c	249.0 c	254.8 bc	234.2 bc	258.1 ab	238.5 abc	274.8 a
Nitamin 42%N	L-0535	1	1 & 2	275.1 b	204.5 bc	347.5 b	290.9 b	274.9 b	250.1 b	250.4 b	232.3 bc	233.2 bcd
NUREA 38%N	L-0536	1	1 & 2	297.9 a	268.9 a	431.4 a	346.1 a	328.6 a	289.9 a	272.6 a	250.0 ab	252.0 abc
UMAXX (47-0-0)		1	1 & 2	273.7 b	216.3 bc	354.0 b	301.9 b	290.1 ab	251.4 b	256.6 ab	221.6 cd	235.3 bcd
CHECK		0		205.9 d	191.8 c	225.1 c	196.8 d	197.6 d	195.1 d	220.2 c	203.6 d	218.3 d

* Chlorophyll index values from 1 - 999.

**Values within a column followed by the same letter are not significantly different LSD *P* = 0.05.

Table 1 con't. The effect of LESCO fertilizers compared to other commercial fertilizers on chlorophyll index of a 'Gallery' perennial ryegrass lawn.

				Chlorophyll index*							
Fertilizer	Exp Code	Rate (lbs N/M)	App dates	7/24/07 9 WAT	7/31/07 10 WAT	8/7/07 11 WAT	8/14/07 12 WAT	8/21/07 13 WAT	8/28/07 14 WAT	9/4/07 15 WAT	9/11/07 16 WAT
LESCO Poly Plus SCU 39%N	L-0541	1	1 & 2	276.9 c**	302.6 c	306.4 cd	304.7 de	288.5 d	311.1 bc	258.8 bc	269.5 b
LESCO EcoSential 5%N	L-0539	1	1 & 2	249.6 c	269.1 cd	266.5 de	272.1 e	277.8 d	295.6 cd	246.2 bc	256.8 bc
Urea 46%N	L-0532	1	1 & 2	378.5 a	397.7 a	378.6 ab	343.8 bc	319.9 bc	353.3 ab	286.7 b	285.0 b
Scott Poly S SCU 38%N	L-0538	1	1 & 2	333.5 b	395.0 a	380.7 a	382.2 a	366.6 a	392.0 a	364.9 a	365.0 a
Nitamin 42%N	L-0535	1	1 & 2	328.4 b	347.1 b	324.1 c	318.9 cd	298.0 cd	322.7 bc	259.8 bc	270.6 b
NUREA 38%N	L-0536	1	1 & 2	390.2 a	419.8 a	413.2 a	363.4 ab	332.1 b	362.7 ab	294.6 b	289.7 b
UMAXX (47-0-0)		1	1 & 2	328.8 b	356.1 b	336.3 bc	318.3 cd	298.2 cd	316.1 bc	262.6bc	256.1 bc
CHECK		0		217.1 d	234.5 d	229.7 e	229.2 f	240.1 e	248.8 d	218.6 c	223.6 c

* Chlorophyll index values from 1 - 999.

**Values within a column followed by the same letter are not significantly different LSD *P* = 0.05.

Figure 1. Chlorophyll index of a 'Gallery' perennial ryegrass lawn fertilized with LESCO and other commercially available fertilizers.

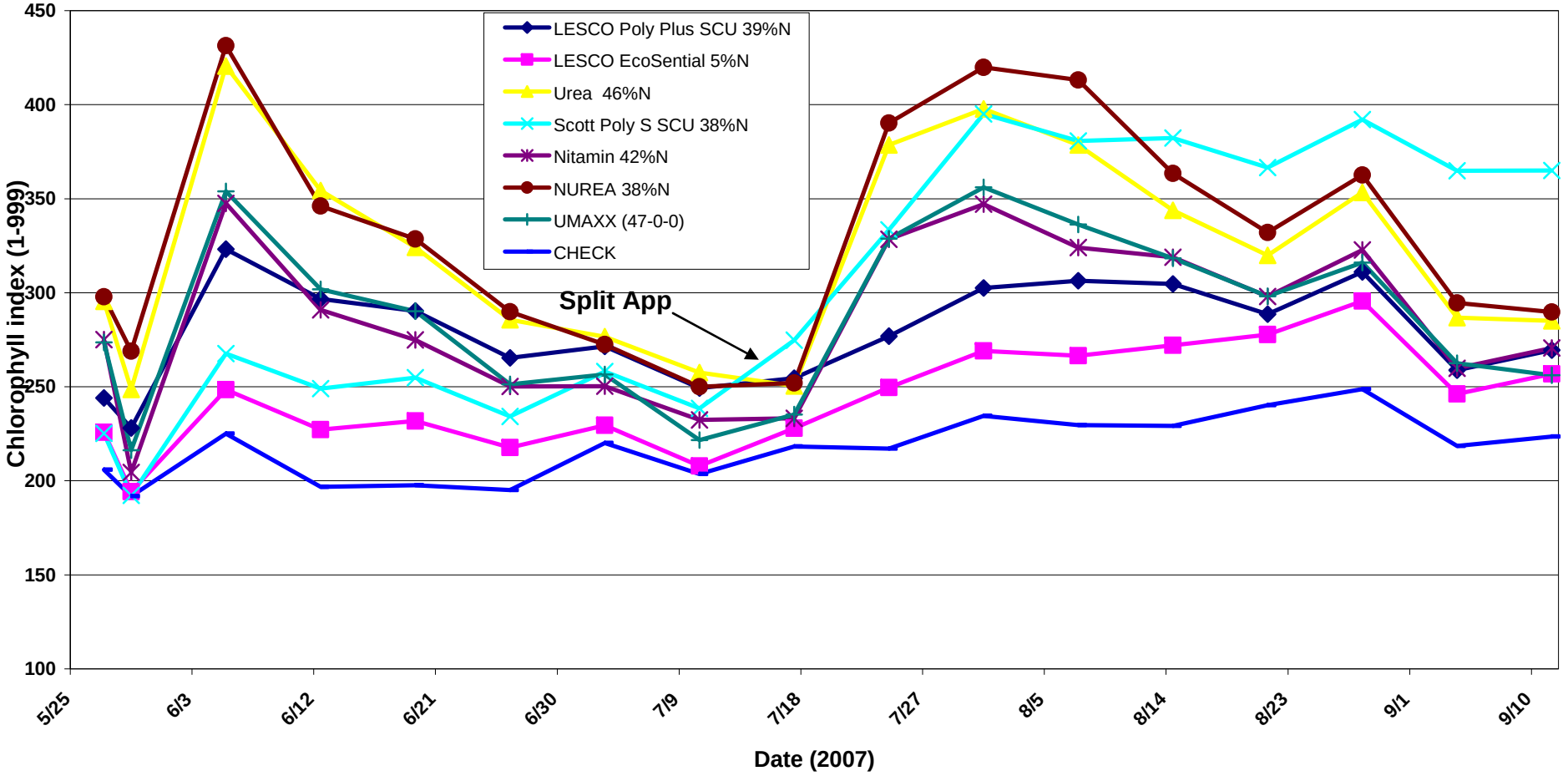

Table 2. The effect of LESCO fertilizers compared to other commercial fertilizers on visual color of a 'Gallery' perennial ryegrass lawn.

								Color *				
	Exp	Rate	App	5/27/07	5/29/07	6/5/07	6/12/07	6/19/07	6/26/07	7/3/07	7/10/07	7/17/07
Fertilizer	Code	(lbs N/M)	dates	3 DAT	5 DAT	1 WAT	2 WAT	3 WAT	4 WAT	5 WAT	6 WAT	7 WAT
LESCO Poly Plus SCU 39%N	L-0541	1	1 & 2	4.0 b**	4.3 c	5.0 c	5.0 c	5.0 c	6.0 a	6.3 a	6.3 ab	6.3 ab
LESCO EcoSential 5%N	L-0539	1	1 & 2	3.7 b	4.0 c	4.0 d	4.0 d	4.0 d	4.3 b	4.3 c	4.3 cd	4.3 cd
Urea 46%N	L-0532	1	1 & 2	5.0 a	6.0 ab	7.0 a	7.0 a	7.0 a	7.0 a	7.0 a	7.0 a	6.7 a
Scott Poly S SCU 38%N	L-0538	1	1 & 2	3.7 b	4.0 c	3.7 d	3.7 d	4.0 d	4.3 b	5.3 b	5.3 bc	5.3 bc
Nitamin 42%N	L-0535	1	1 & 2	5.0 a	6.0 ab	6.0 b	6.0 b	6.0 b	6.3 a	6.3 a	6.0 ab	5.7 ab
NUREA 38%N	L-0536	1	1 & 2	5.0 a	6.3 a	6.7 a	7.0 a	7.0 a	6.7 a	7.0 a	6.7 a	6.7 a
UMAXX (47-0-0)		1	1 & 2	4.7 a	5.7 b	5.7 b	5.7 b	5.7 b	6.0 a	6.7 a	6.3 ab	6.0 ab
CHECK		0		3.0 c	3.0 d	3.0 e	3.0 e	3.0 e	3.0 c	3.3 d	3.3d	3.3 d

* Visual color rated 1 - 9, with 9 = dark green.

**Values within a column followed by the same letter are not significantly different LSD *P* = 0.05.

Table 2 con't. The effect of LESCO fertilizers compared to other fertilizers on visual color of a 'Gallery' perennial ryegrass lawn.

								Color*				
	Exp	Rate	App	7/17/07	7/24/07	7/31/07	8/7/07	8/14/07	8/21/07	8/28/07	9/4/07	9/11/07
Fertilizer	Code	(lbs N/M)	dates	8 WAT	9 WAT	10 WAT	11 WAT	12 WAT	13 WAT	14 WAT	15 WAT	16 WAT
LESCO Poly Plus SCU 39%N	L-0541	1	1 & 2	5.3 a**	5.7 b	5.7 b	6.0 cd	6.3 cd	6.0 c	5.3c	5.7 bc	5.7 b
LESCO EcoSential 5%N	L-0539	1	1 & 2	4.0 b	5.0 b	5.3 b	5.3 d	5.7 d	4.7 d	4.0 d	4.3 cd	3.7 c
Urea 46%N	L-0532	1	1 & 2	5.3 a	8.0 a	7.7 a	8.0 a	7.7 ab	6.7 bc	6.7 b	6.3 b	6.3 b
Scott Poly S SCU 38%N	L-0538	1	1 & 2	5.3 a	7.0 a	8.0 a	8.0 a	8.0 a	8.0 a	8.0 a	8.0 a	8.0 a
Nitamin 42%N	L-0535	1	1 & 2	4.7 ab	7.0 a	7.3 a	7.3 ab	7.3 ab	6.3 bc	6.0 bc	6.0 b	6.0 b
NUREA 38%N	L-0536	1	1 & 2	5.3 a	8.0 a	8.0 a	8.0 a	8.0 a	7.0 b	7.0 ab	7.0 ab	6.7 ab
UMAXX (47-0-0)		1	1 & 2	4.7 ab	7.0 a	7.3 a	6.7 bc	7.0 bc	6.0 c	5.3 c	5.7 bc	5.3 b
CHECK		0		3.7 b	3.7 c	3.0 c	3.3 e	3.3 e	3.3 e	3.3 d	4.0 d	3.7 c

*Visual color rated 1 - 9, with 9 = dark green.

**Values within a column followed by the same letter are not significantly different LSD *P* = 0.05.

Figure 2. Visual turfgrass color of a 'Gallery' perennial ryegrass lawn fertilized with LESCO and other commercially available fertilizers.

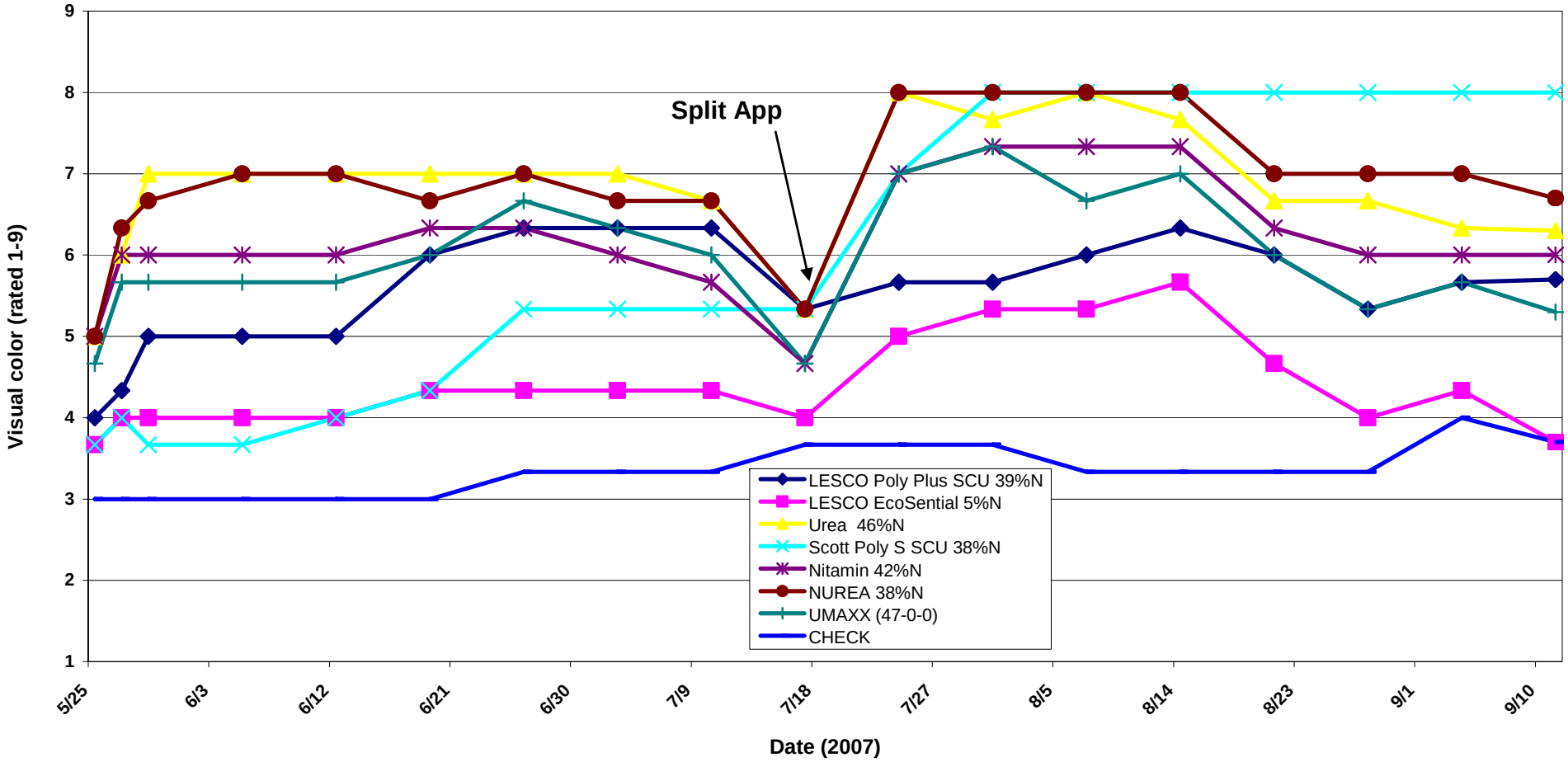

Table 3. The effect of LESCO fertilizers compared to other commercial fertilizers on turf quality of a 'Gallery' perennial ryegrass lawn.

				Turfgrass quality*							
Fertilizer	Exp Code	Rate (lbs N/M)	App dates	6/12/07 3 WAT	6/19/07 4 WAT	6/26/07 5 WAT	7/3/07 6 WAT	7/10/07 7 WAT	7/17/07 8 WAT	7/24/07 9 WAT	7/31/07 10 WAT
LESCO Poly Plus SCU 39%N	L-0541	1	1 & 2	4.0 c	5.3b	6.3a	6.3 a	6.3 a	5.3 ab	5.7 cd	6.0 c
LESCO EcoSential 5%N	L-0539	1	1 & 2	3.0 d	3.7 cd	4.3 b	4.3 cd	4.3 cd	4.0 cd	4.7 d	5.3 c
Urea 46%N	L-0532	1	1 & 2	6.7 a	6.7 a	6.7 a	6.7 a	6.7 a	5.3 ab	8.0 a	8.0 a
Scott Poly S SCU 38%N	L-0538	1	1 & 2	3.7 cd	4.3 c	5.0 b	5.0 bc	5.0 bc	5.3 ab	7.0 ab	8.0 a
Nitamin 42%N	L-0535	1	1 & 2	6.0 ab	6.0 ab	6.3 a	6.0 ab	5.7 ab	4.7 bc	6.7 bc	7.3 ab
NUREA 38%N	L-0536	1	1 & 2	6.7 a	6.7 a	7.0 a	6.7 a	6.7 a	5.7 a	8.0 a	8.0 a
UMAXX (47-0-0)		1	1 & 2	5.7 b	5.7 b	6.3 a	6.0 ab	6.0 ab	5.3 ab	7.0 ab	7.0 b
CHECK		0		3.0 d	3.0 d	3.3 c	3.3 d	3.3 d	3.3 d	3.3 e	3.0 d

* Turfgrass quality rated 1 - 9, with 9 = excellent.

**Values within a column followed by the same letter are not significantly different LSD *P* = 0.05.

Table 3 con't. The effect of LESCO fertilizers compared to other ferilizers on turf quality of a 'Gallery' perennial ryegrass lawn.

				Turfgrass quality*					
Fertilizer	Exp Code	Rate (lbs N/M)	App dates	8/7/07 11 WAT	8/14/07 12 WAT	8/21/07 13 WAT	8/28/07 14 WAT	9/4/07 15 WAT	9/11/07 16 WAT
LESCO Poly Plus SCU 39%N	L-0541	1	1 & 2	6.0 cd	6.7 c	6.0 c	5.0 c	5.3 bc	5.0 bc
LESCO EcoSential 5%N	L-0539	1	1 & 2	5.7 d	5.7 d	4.7 d	3.7 d	4.3 cd	4.0 cd
Urea 46%N	L-0532	1	1 & 2	8.0 ab	8.0 ab	6.7 bc	6.7 ab	6.3 ab	6.3 ab
Scott Poly S SCU 38%N	L-0538	1	1 & 2	7.3 ab	8.0 ab	7.7 a	7.7 a	7.0 a	6.7 a
Nitamin 42%N	L-0535	1	1 & 2	7.3 ab	7.3 bc	6.7 bc	5.7 bc	5.7 abc	5.3 abc
NUREA 38%N	L-0536	1	1 & 2	8.3 a	8.7 a	7.3 ab	7.0 a	6.7 ab	6.3 ab
UMAXX (47-0-0)		1	1 & 2	7.0 bc	7.0 c	6.0 c	5.3 c	5.3 bc	4.7 cd
CHECK		0		2.7 e	2.7 e	2.7 e	2.7 d	3.3 d	3.3 d

* Turfgrass quality rated 1-9; with 9 = excellent.

**Values within a column followed by the same letter are not significantly different LSD *P* = 0.05.

Figure 3. Turfgrass quality of a 'Gallery' perennial ryegrass lawn fertilized with LESCO and other commercially available fertilizers.

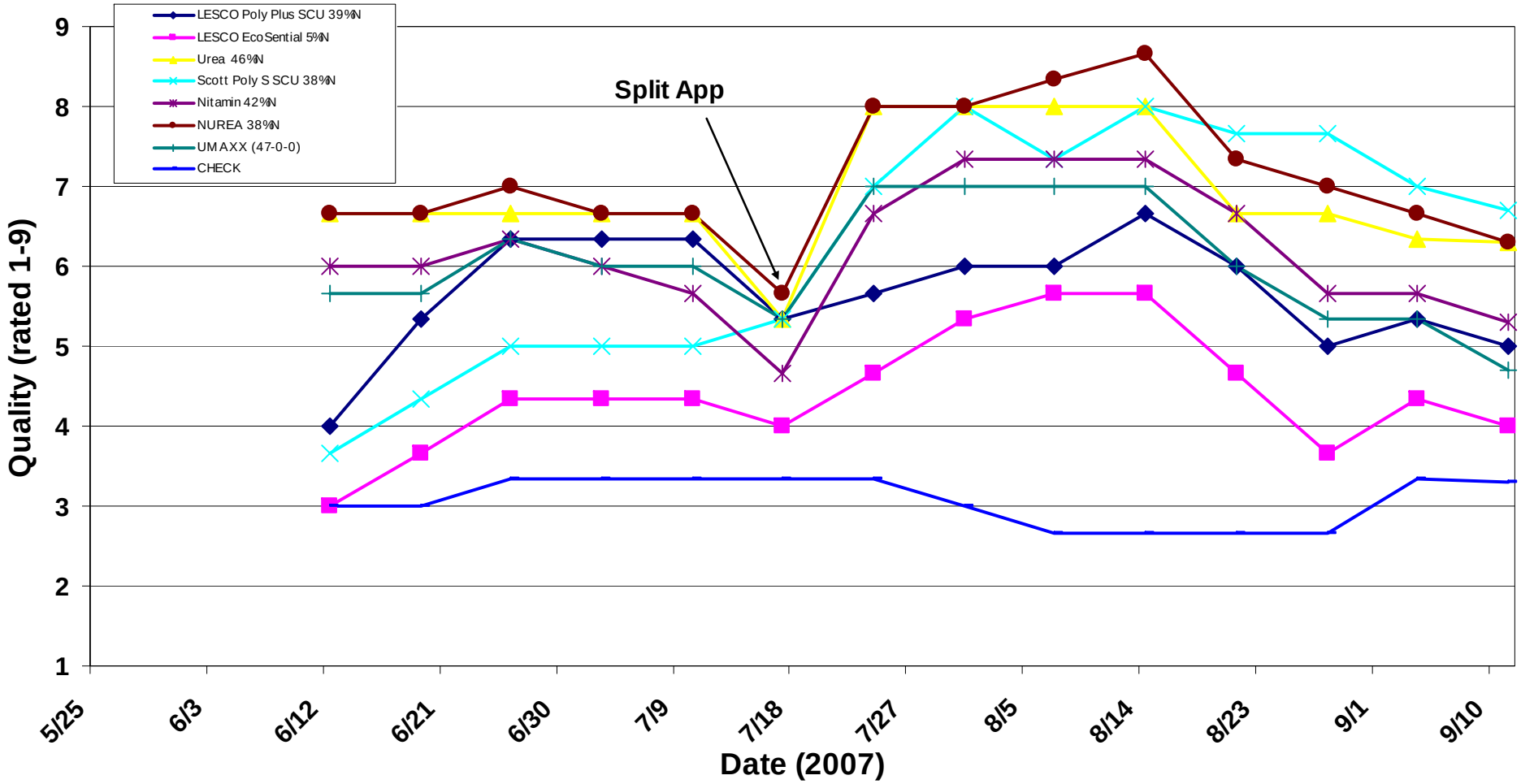

Table 4. The effect of LESCO fertilizers compared to other fertilizers on density of a 'Gallery' perennial ryegrass lawn.

				Density*								
Fertilizer	Exp Code	Rate (lbs N/M)	App dates	5/29/07 1 WAT	6/5/07 2 WAT	6/12/07 3 WAT	6/19/07 4 WAT	6/26/07 5 WAT	7/3/07 6 WAT	7/10/07 7 WAT	7/17/07 8 WAT	7/24/07 9 WAT
LESCO Poly Plus SCU 39%N	L-0541	1	1 & 2	4.3 c	4.3 b	4.0 c	5.0 c	6.3 ab	6.0 ab	6.0 a	5.3 a	6.0 b
LESCO EcoSential 5%N	L-0539	1	1 & 2	3.0 d	3.0 c	3.0 d	3.3 de	4.0 c	4.0 c	4.0 b	3.7 b	4.3 c
Urea 46%N	L-0532	1	1 & 2	6.7 a	6.7 a	6.7 a	6.7 a	7.0 a	6.7 ab	6.7 a	5.7 a	7.7 a
Scott Poly S SCU 38%N	L-0538	1	1 & 2	3.7 cd	3.7 bc	3.7 cd	4.0 d	5.7 b	5.7 b	5.7 a	5.3 a	6.3 ab
Nitamin 42%N	L-0535	1	1 & 2	5.7 b	6.0 a	6.0 ab	6.0 ab	6.3 ab	6.3 ab	5.7 a	5.3 a	6.3 ab
NUREA 38%N	L-0536	1	1 & 2	6.7 a	6.7 a	6.7 a	6.7 a	7.0 a	7.0 a	6.7 a	5.7 a	7.3 ab
UMAXX (47-0-0)		1	1 & 2	5.7 b	6.0 a	5.7 b	5.7 bc	6.3 ab	6.3 ab	6.3 a	5.3 a	6.7 ab
CHECK		0		3.0 d	3.0 c	3.0 d	3.0 e	3.3 c	3.3 c	3.3 b	3.3 b	3.3 c

*Density rated 1 - 9, with 9 = dense turf.

**Values within a column followed by the same letter are not significantly different LSD *P* = 0.05.

Table 4 con't. The effect of LESCO fertilizers compared to other fertilizers on density of a 'Gallery' perennial ryegrass lawn.

				Density*						
Fertilizer	Exp Code	Rate (lbs N/M)	App dates	7/31/07 10 WAT	8/7/07 11 WAT	8/14/07 12 WAT	8/21/07 13 WAT	8/28/07 14 WAT	9/4/07 15 WAT	9/11/07 16 WAT
LESCO Poly Plus SCU 39%N	L-0541	1	1 & 2	5.7 c	6.0 d	6.7 b	6.3 b	5.7 c	5.3 bc	5.3 bc
LESCO EcoSential 5%N	L-0539	1	1 & 2	6.0 bc	6.0 d	5.7 c	4.7 c	4.3 d	4.3 cd	4.3 cd
Urea 46%N	L-0532	1	1 & 2	8.0 a	8.0 ab	8.0 a	7.7 a	6.7 abc	6.3 ab	6.3 ab
Scott Poly S SCU 38%N	L-0538	1	1 & 2	7.0 ab	7.3 bc	7.7 a	7.7 a	7.7 a	7.3 a	7.0 a
Nitamin 42%N	L-0535	1	1 & 2	6.7 bc	6.7 cd	6.7 b	6.7 b	6.0 bc	6.0 ab	5.7 abc
NUREA 38%N	L-0536	1	1 & 2	8.0 a	8.3 a	8.0 a	8.0 a	7.0 ab	6.7 ab	6.7 ab
UMAXX (47-0-0)		1	1 & 2	7.0 ab	7.0 c	7.0 b	6.7 b	5. 7 c	5.7 bc	5.7 abc
CHECK		0		3.0 d	2.7 e	2.7 d	2.7 d	2.7 e	3.3 d	3.0 d

*Density rated 1 - 9, with 9 = dense turf.

**Values within a column followed by the same letter are not significantly different LSD *P* = 0.05.

Figure 4. Turfgrass density of a 'Gallery' perennial ryegrass lawn fertilized with LESCO and other commercially available fertilizers.