Georgia-Pacific's Nitamin® 30L (30-0-0) and Blends of Nfusion® (25-0-0) 'Steady-Delivery'® Nitrogen Soluble Fertilizer Compared to Urea (46-0-0) on a 'T-1' Creeping Bentgrass Green

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A field study was conducted at the Washington State University Turfgrass and Agronomy Research Center (TARC) in Pullman, WA during the summer of 2008 to evaluate the effects of Nitamin 30L, Nfusion + urea, and urea alone on a 'T-1' creeping bentgrass green mowed at 0.130". A randomized-complete block design was used with four replications and individual treatment plots were 6' x 7'. Nitamin 30L was diluted 1:1 with water. Two soluble fertilizer blends with Nfusion were used: Nfusion (15%) + Urea (85%) and Nfusion (40%) + Urea (60%). Soluble fertilizer treatments were applied every other week during the summer: 22 May, 5 Jun, 19 Jun, 3 Jul, 17 Jul, 31 Jul, 14 Aug, 28 Aug, 11 Sept, and 25 Sept 08. Fertilizer applications were made with a bicycle-wheeled CO_2 pressurized (40 psi) sprayer using 11002 flat fan nozzles at 21 gpa rate. Each week, up to 2 Oct, chlorophyll index readings were taken with a Field Scout CM1000 chlorophyll meter (Spectrum Technologies, Inc.). Visual turfgrass quality and color were rated on a scale of 1 to 9, with 9 equal to excellent quality or dark green color, respectively. Turfgrass quality rating of 6 is considered acceptable. Clipping dry weight samples were not taken due to the fact that the green was routinely verticut and lightly topdressed with sand during the summer which would result in picking up sand along with the clippings when collecting the samples.

Surprisingly, there were no differences in chlorophyll readings among any of the 4 fertilizer regimens up to 7 Aug (Table 1 and Figure 1). This may, in part, be due to the numerous localized dry spots that appeared on the green during this time. By mid-August the localized dry spots faded away. However, by 14 Aug and through the end of the study (2 Oct), the Nfusion (15% N) + Urea (85% N) and Urea alone fertilizer regimens, in general, resulted in higher chlorophyll readings compared to Nitamin 30L or Nfusion (40% N) + Urea (60% N) fertilizer regimens.

For the most part, turfgrass quality and color did not show any differences among the 4 fertilizer regimens until 4 Sept (Table 2 and 3 and Figure 2 and 3). At this time and to the end of the study (2 Oct), Nfusion (15% N) + Urea (85% N) and Urea alone fertilizer regimens resulted in higher turfgrass quality and color compared to Nitamin 30L or Nfusion (40% N) + Urea (60% N).

In this study, the higher the percentage of Urea in the fertilizer treatment corresponded with higher chlorophyll readings late in the season, but not in the late spring through summer (Table 1 and Figure 1). From September on, the treatments divided into 2 groups, with Nfusion (15% N) + Urea (85% N) or Urea alone showing similar, but higher, turfgrass quality and color ratings compared to Nitamin 30L or Nfusion (40% N) + Urea (60% N) (Table 2 and 3 and Figures 2 and 3). Surprisingly no differences were detected up until early August which may, in part, be due to the development of numerous localized dry spots in the study area, but these spots faded away late in the summer.

Table 1. The effect of Nitamin 30L, two Nfusion + urea blends, and urea on chlorophyll readings of a 'T-1' creeping bentgrass green. Pullman, WA 2008.

	Chlorophyll Index*								
Fertilizer treatment	5/30/08	6/12/08	6/19/08	6/26/08	**7/2/08**	**7/10/08**	**7/17/08**	**7/31/08**	**8/7/08**
Nitamin 30L (30-0-0) 1:1 dilution	298.8	295.5 a**	292.3 a	203.1 a	265.4 b	199.9	147.3 ab	227.5 a	240.5 a
Nfusion (15% N) + Urea (85% N) blend	313.1	303.5 a	293.9 a	198.9 a	277.4 a	202.5	136.7 b	239.9 a	264.7 a
Nfusion (40% N) + Urea (60% N) blend	310.0	296.8 a	283.6 a	196.1 ab	270.5 ab	208.1	149.8 a	221.5 a	243.1 a
Urea solution	304.8	298.0 a	291.2 a	205.6 a	281.4 a	212.6	146.1 ab	230.8 a	253.9 a
CHECK	295.4	274.0 b	252.7 b	180.2 b	232.6 c	185.8	118.5 c	186.7 b	194.8 b

*Chlorophyll index 0 - 999; with 999 = high chlorophyll content.

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

	Chlorophyll Index*							
Fertilizer treatment	**8/14/08**	**8/22/08**	**8/28/08**	**9/4/08**	**9/10/08**	9/18/08	9/26/08	10/2/08
Nitamin 30L (30-0-0) 1:1 dilution	264.6 c	241.7 b	234.5 b	227.3 c	261.2 b	254.0 b	251.7 c	261.2 b
Nfusion (15% N) + Urea (85% N) blend	290.8 a	261.8 ab	255.5 a	249.3 a	284.9 a	283.4 a	273.0 b	303.4 a
Nfusion (40% N) + Urea (60% N) blend	266.0 bc	247.6 ab	242.0 ab	236.4 bc	267.2 b	261.7 b	266.3 b	279.0 b
Urea solution	288.8 ab	265.5 a	254.4 a	243.4 ab	285.9 a	295.0 a	288.8 a	314.2 a
CHECK	208.0 d	187.2 c	178.1 c	169.0 d	177.6 c	173.1 c	163.7 d	172.2 c

*Chlorophyll index 0 - 999; with 999 = high chlorophyll content.

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

Figure 1. The effect of Nitamin 30L, two Nfusion + urea blends, and urea on chlorophyll readings of a 'T-1' creeping bentgrass green. Pullman, WA 2008.

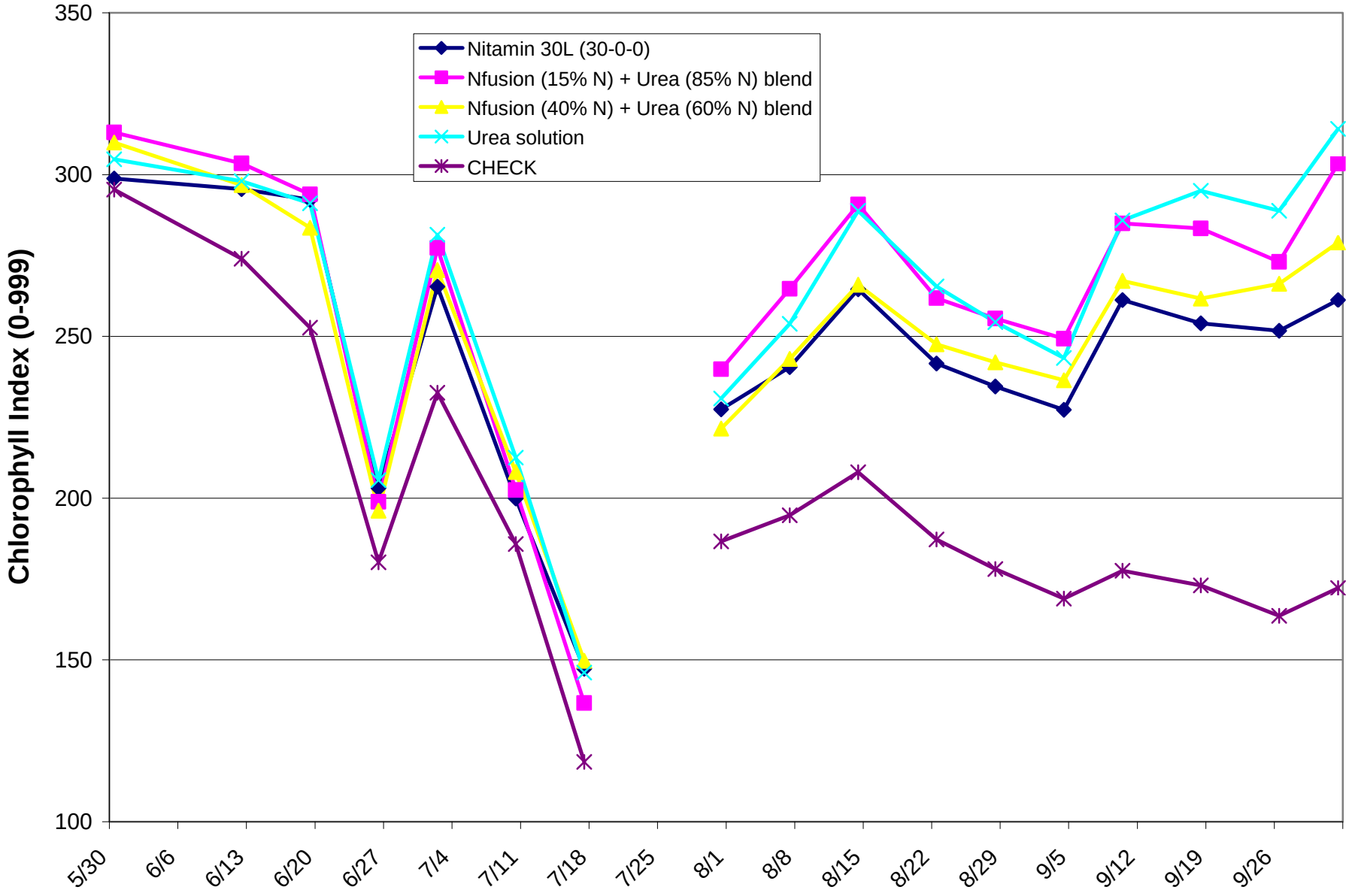

Table 2. The effect of Nitamin 30L, two Nfusion + urea blends, and urea on turfgrass quality of a 'T-1' creeping bentgrass green. Pullman, WA 2008.

	Turfgrass quality*								
Fertilizer treatment	5/30/08	6/12/08	6/19/08	6/26/08	**7/2/08**	**7/10/08**	**7/17/08**	**7/31/08**	**8/7/08**
Nitamin 30L (30-0-0) 1:1 dilution	7.0	6.5 a	7.0 a	7.0 a	7.0 a	7.0 a	6.0 b	6.0 a	5.8 a
Nfusion (15% N) + Urea (85% N) blend	7.0	7.0 a	7.0 a	7.0 a	7.3 a	7.0 a	6.5 ab	6.0 a	6.3 a
Nfusion (40% N) + Urea (60% N) blend	7.0	6.5 a	7.0 a	7.3 a	7.0 a	7.0 a	6.8 a	6.0 a	6.0 a
Urea solution	7.0	7.0 a	7.0 a	7.3 a	7.0 a	6.8 a	6.3 ab	5.8 a	5.8 a
CHECK	7.0	5.3 b	5.8 b	5.5 b	6.0 b	5.8 b	5.0 c	4.3 b	4.3 b

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

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

	Turfgrass quality*							
Fertilizer treatment	**8/14/08**	**8/22/08**	**8/28/08**	**9/4/08**	**9/10/08**	9/18/08	9/26/08	10/2/08
Nitamin 30L (30-0-0) 1:1 dilution	5.8 a	5.8 a	6.0 a	6.0 b	6.3 ab	5.8 b	6.5 b	6.0 b
Nfusion (15% N) + Urea (85% N) blend	6.3 a	6.3 a	6.5 a	6.8 a	6.8 a	6.8 a	7.5 a	7.3 a
Nfusion (40% N) + Urea (60% N) blend	6.0 a	5.8 a	6.3 a	6.3 ab	6.0 b	5.5 b	6.5 b	6.0 b
Urea solution	6.0 a	6.5 a	6.5 a	6.5 ab	6.8 a	6.8 a	7.8 a	7.0 a
CHECK	4.3 b	4.0 b	4.0 b	4.0 c	3.8 c	3.0 c	3.0 c	4.0 c

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

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

Figure 2. The effect of Nitamin 30L, two Nfusion + urea blends, and urea on turfgrass quality of a 'T-1' creeping bentgrass green. Pullman, WA 2008.

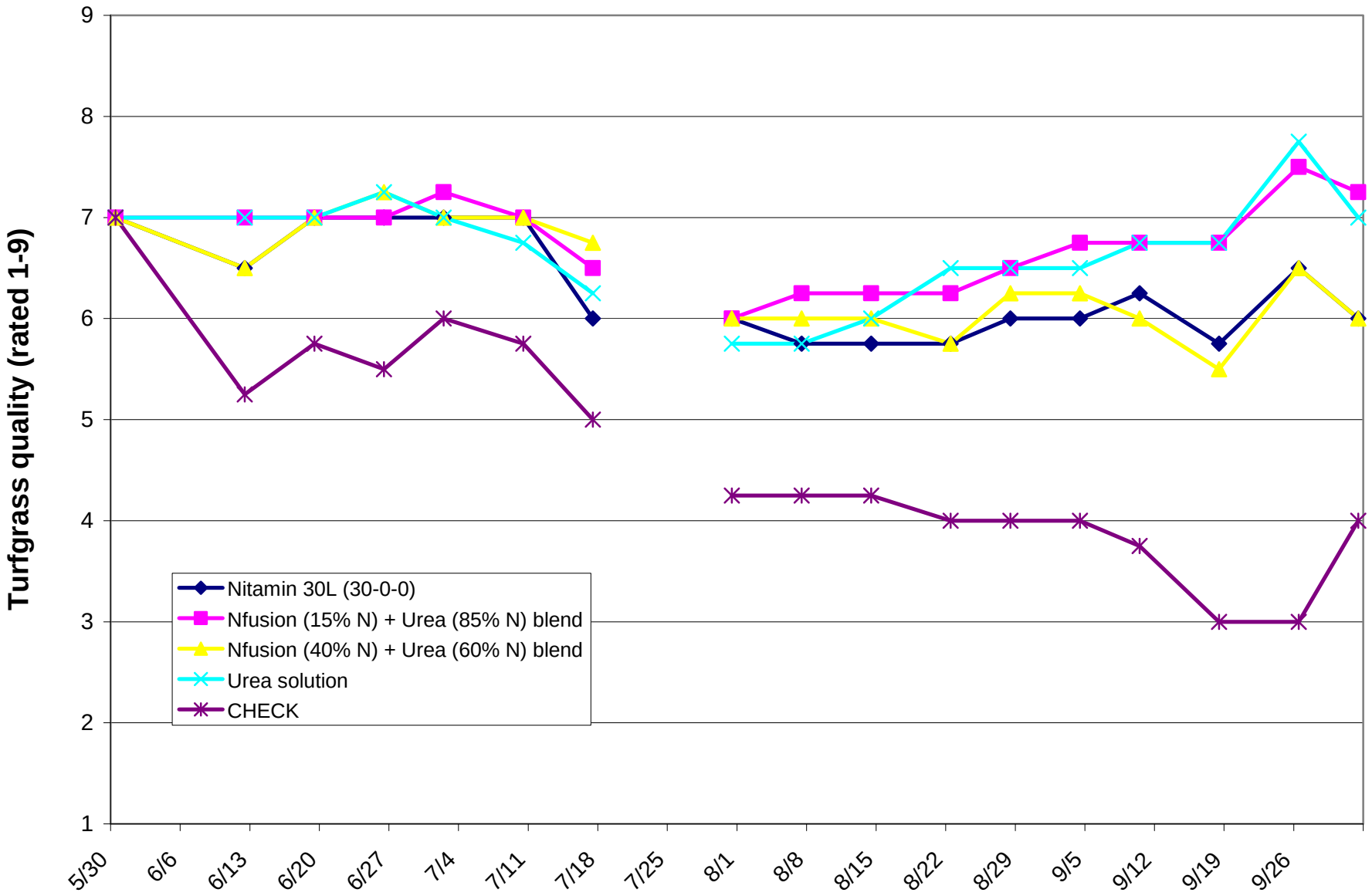

Table 3. The effect of Nitamin 30L, two Nfusion + urea blends, and urea on turfgrass color of a 'T-1' creeping bentgrass green. Pullman, WA 2008.

	Color*								
Fertilizer treatment	5/30/08	6/12/08	6/19/08	6/26/08	**7/2/08**	**7/10/08**	**7/17/08**	**7/31/08**	**8/7/08**
Nitamin 30L (30-0-0) 1:1 dilution	7.0	6.8 a**	7.0 a	7.3 a	7.0 a	7.0 a	6.0 a	6.0 a	6 0 a
Nfusion (15% N) + Urea (85% N) blend	7.0	7.5 a	7.5 a	7.0 a	7.3 a	7.0 a	6.5 a	6.3 a	6.5 a
Nfusion (40% N) + Urea (60% N) blend	7.0	7.0 a	7.0 a	7.5 a	6.8 a	7.3 a	6.5 a	6.0 a	6.3 a
Urea solution	7.0	7.3 a	7.3 a	7.3 a	7.3 a	7.0 a	6.3 a	5.8 a	6.3 a
CHECK	7.0	5.3 b	5.5 b	6.0 b	6.0	6.0 b	5.0 b	4.3 b	3.3 b

*Color rated 1 to 9 with 9 = dark green color.

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

	Color*							
Fertilizer treatment	**8/14/08**	**8/22/08**	**8/28/08**	**9/4/08**	**9/10/08**	9/18/08	9/26/08	10/2/08
Nitamin 30L (30-0-0) 1:1 dilution	6.0 a**	5.8 a	6.0 c	6.3 b	6.3 b	6.0 ab	6.5 b	6.0 b
Nfusion (15% N) + Urea (85% N) blend	6.0 a	6.3 a	7.0 a	6.8 ab	7.0 a	6.8 a	7.8 a	7.3 a
Nfusion (40% N) + Urea (60% N) blend	6.0 a	5.8 a	6.5 b	6.5 ab	6.5 ab	5.5 b	6.5 b	6.0 b
Urea solution	6.0 a	6.5 a	7.0 a	7.0 a	7.0 a	6.8 a	7.8 a	7.3 a
CHECK	3.3 b	4.0 b	3.8 d	4.0 c	4.0 c	3.0 c	3.0 c	4.0 c

*Color rated 1 to 9 with 9 = dark green color.

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

Figure 3. The effect of Nitamin 30L, two Nfusion + urea blends, and urea on turfgrass quality of a 'T-1' creeping bentgrass green. Pullman, WA 2008.