Ana-Lync Kentucky Bluegrass Trial

2015

Report Submitted by:

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EXECUTIVE SUMMARY

Ana-Lync is a proprietary soil testing system and an expert interpretive program for identifying and prioritizing challenges for crops (including turfgrass) growing in various soils. Floratine Products Group, Inc.'s proprietary blend of nutrients and biostimulants claims to enhance nutrient uptake into the plants—impacting turfgrass health, quality, and appearance. The first year of an evaluation of a Ana-Lync system approach to identifying and correcting nutrient deficiencies utilizing products with claims of enhanced nutrient uptake and efficiency applied to Kentucky bluegrass (*Poa pratensis* L.) was performed in 2015 at Brigham Young University in Provo, Utah. The objectives of this study were to determine whether Ana-Lync could identify the nutritional deficiencies and recommend nutritional inputs and positively impact turfgrass growth, appearance, and quality. The crown density, NDVI, and root biomass and depth all were increased when using the Ana-Lync based nutrient program. Verdure and shoot height and biomass were generally not impacted. Nutrient concentrations were also increased with P and K increased at one location and Zn, Mn, and B increased at both locations. Although just the first year of the trial, these results are very promising and warrant further evaluation.

INTRODUCTION

Ana-Lync is a proprietary soil testing system and an expert interpretive program for identifying and prioritizing challenges for crops (including turfgrass) growing in various soils. Floratine Products Group, Inc.'s proprietary blend of nutrients and biostimulants claims to enhance nutrient uptake into the plants—impacting turfgrass health, quality, and appearance.

Turfgrass is challenging to grow, especially in the intensive discipline of sports turf management. Sports turfs have intensive traffic and other wear challenges. The surfaces are required to both look good (verdure) and be highly functional. The turfgrass should be tightly knitted together (crown density) and cover all of the soil and be resistant to excessive tearing. It needs to rebound quickly after damage.

One of the major challenges is nutrient management. For example, turfgrass seedlings are known to especially be responsive to phosphorus—even in moderately high testing soils. Although mature turfgrass is relatively less responsive to phosphorus, sports turf is constantly being over-seeded to facilitate recovery from foot traffic damage. However, phosphorus solubility is very poor in the arid and semi-arid regions of the world. Turfgrass in these regions tends to be grown on calcareous soils with resulting challenges with phosphorus and micronutrient solubility.

Kentucky bluegrass is the most commonly planted turfgrass species in the world is the dominant species used for sports turfs in the cool-season regions. It is also the most common fairway grass on golf courses in the cool-season and transition zones and is the most common lawn grass in these areas as well. There is a need to find improved methods of fertilization and growth of this important species.

The objectives of this study were to determine whether the Ana-Lync system could collectively identify the nutritional deficiencies and recommend nutritional inputs to positively impact Kentucky bluegrass yield and quality.

MATERIALS AND METHODS

Two established Kentucky bluegrass sites were selected for these trials in Provo, UT (40.2444° N, 111.6608° W; elevation 4,549 ft.). Two treatments were applied in a Randomized Complete Block Design (RCBD) with three replicates of one location and there was a single strip applied to the other location. The control included standard management practices and the Ana-Lync treatment included everything involved with the control plus the treatments described in Table 1. Plots at the replicated site were sprayer width of 12 feet wide by 100 feet in length. The strip trial at the football practice field was three sprayer widths wide (36 feet) by about 120 yards in length.

The soil was a constructed loam—being uniform over the study area, having moderate to high fertility levels, and reasonable infiltration and drainage. A Ana-Lync test was performed and recommendations were made accordingly (see Appendix items below), while the control plot's nutritional needs were determined using a traditional soil test and standard recommendations.

The turfgrass was raised following best management practices for sports fields—including nutrient, soil, water, pest, and crop management. The crop was scouted almost daily for weed, disease, and insect pressure. Insect, weed, and nematode control was excellent.
Weather was mostly typical for the Provo area with a moderate amount of precipitation and near average temperatures (Figs. 1-2). The end of May and early June had relatively higher temperatures than average. There was some temperature stress due to the susceptibility of this species to heat. However, the turfgrass was never water stressed with the aid of irrigation. The crop was irrigated with an automatic irrigation system.

Measurements included:

- height, ~monthly
- Normalized Difference Vegetative Index (NDVI), ~monthly
- Verdure, Sep. 21 and Nov. 18
- shoot and root biomass, Sep. 21 and Nov. 18
- crown density, Nov. 19
- root depth, Nov. 19,
- nutrient concentrations, sampled Nov. 18.

Statistical analysis was performed by Analysis of Variance using SAS software (SAS 9.3, Cary, NC, USA).

Table 1. Ana-Lync treatment products, rates, and timings

Order of Addition	Product	Rate	Applications	
	SOIL APPLIED		40 - 80 gallon per acre spray rate. If less than 80 Gal rate will require watering in.	
1st	DEFENSE MAN	3.2lbs/acre	Once every 3 weeks for a total of 4 applications (Add water to jug and shake)	Tank Mix 1
2nd	TRICAL	15lbs/acre	(Pre-Slurry before adding to tank mix)	
3rd	MAXIPLEX	4oz/1000		
			STARTING ONE WEEK LATER	
1st	PERVADE	2oz/1000	Once every 3 weeks for a total of 4 applications	Tank Mix 2
2nd	CALPHLEX	3oz/1000		
3rd	TURGOR	3oz/1000		
	FOLIAR APPLIED		15 - 30 gallon per acre spray rate	
1st	KNIFE PLUS	3oz/1000	Every 2 weeks for a total of 6 applications	Tank Mix
2nd	ASTRON	2oz/1000		
3rd	POWER 23-0-0	5oz/1000		
4th	PROTESYN	3oz/1000		
5th	PK FIGHT	3oz/1000		

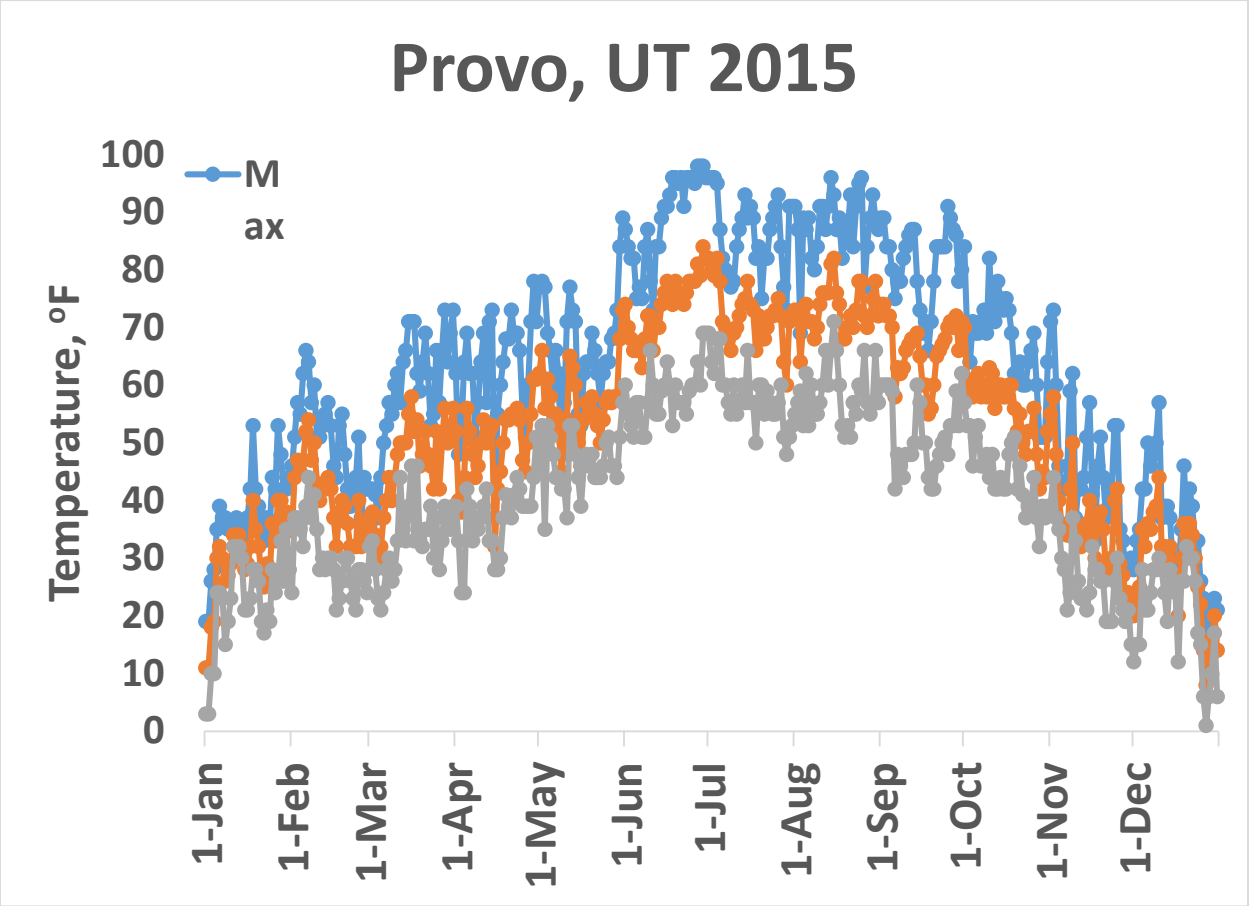

Fig. 1. Air temperatures for Provo, UT in 2015. (https://www.wunderground.com/history/airport/KPVU/2015/1/1/CustomHistory.html?dayend=31&monthend=12&yearend=2015&req_city=&req_state=&req_statename=&reqdb.zip=&reqdb.magic=&reqdb.wmo=)

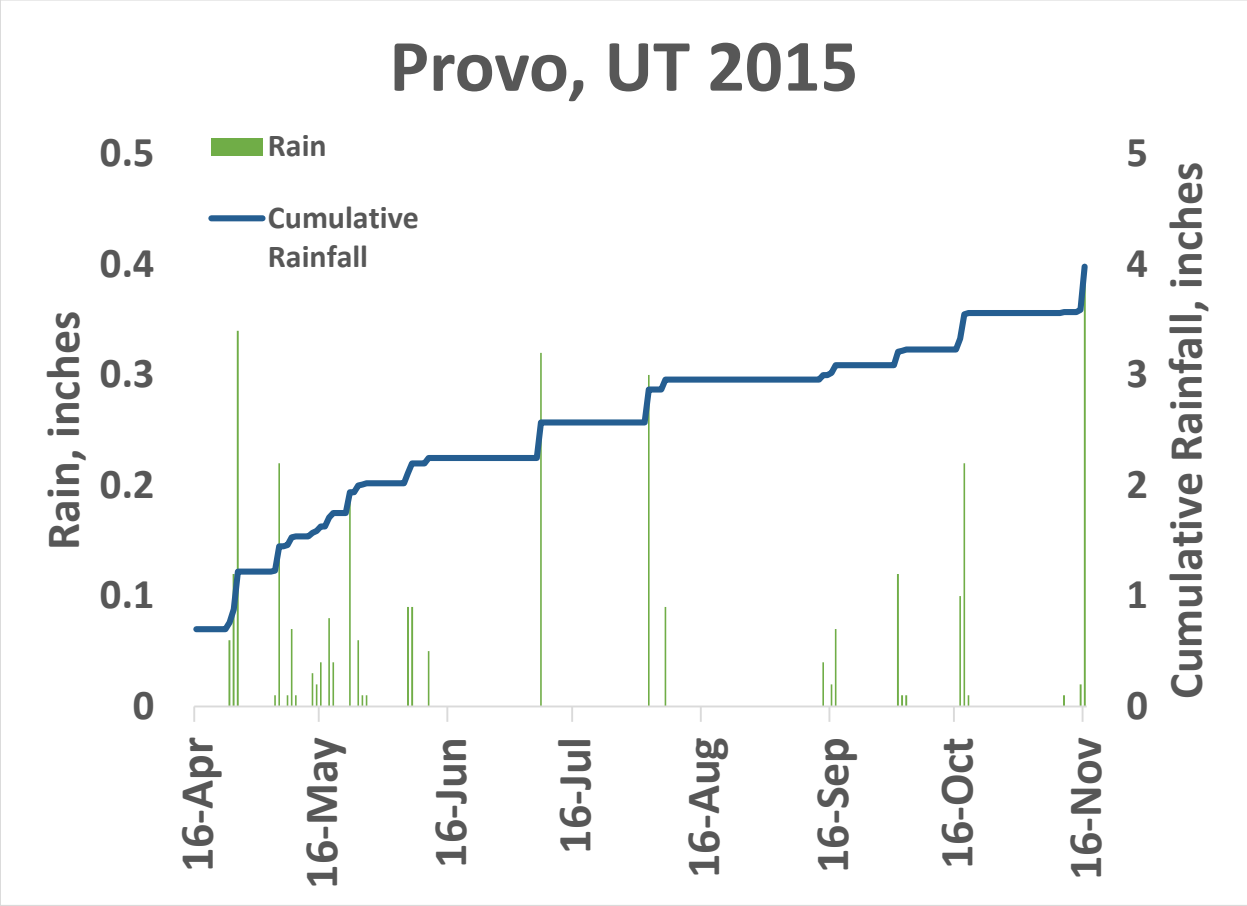

Fig. 2. Precipitation for Provo, UT in 2015. (https://www.wunderground.com/history/airport/KPVU/2015/1/1/CustomHistory.html?dayend=31&monthend=12&yearend=2015&req_city=&req_state=&req_statename=&reqdb.zip=&reqdb.magic=&reqdb.wmo=)

RESULTS

The NDVI measurements resulted in significant increases with the Ana-Lync nutritional approach on several dates, as well as for the average over the course of the season at both locations (Table 2; Fig. 3). However, shoot height was generally not impacted (Table 2). These results are promising in that the plants showed better health without additional mowing needs.

Although plants had better health, as measured by NDVI, there were no visual differences at either location at any date (Table 3). Similarly, shoot biomass was unaffected, although crown density was impacted favorably at the practice field location and the average for both locations.

Root biomass and depth were also increased at both locations with Ana-Lync guided nutrient applications (Table 3; Fig. 3).

Nutrient concentrations were also increased with P and K increased at the practice field and Zn, Mn, and B increased at both locations with the Ana-Lync guided nutrient program (Table 4).

Although just the first year of the trial, these results are very promising and warrant further evaluation.

Table 2. Height and Normalized Difference Vegetative Index (NDVI). Values in bold were significantly different from each other (as compared within the same date and location)

		Ordinal Day of the Year								
Location	Treatment	155	183	218	246	274	288	309	316	ave.
		height, cm								
p.f.	control	1.9	1.9	1.8	1.9	2.5	2.9	3.5	3.0	2.4
	Ana-Lync	1.8	1.8	1.8	1.9	2.5	2.8	3.4	3.2	2.4
plots	control	2.0	2.2	2.1	**2.1**	3.0	**3.3**	3.5	3.2	2.7
	Ana-Lync	2.3	2.2	2.3	**2.4**	2.9	**3.1**	3.2	3.2	2.7
ave.	control	2.0	2.1	2.0	2.0	2.8	3.1	3.5	3.1	2.6
	Ana-Lync	2.0	2.0	2.0	2.1	2.7	2.9	3.3	3.2	2.6
		NDVI								
p.f.	control	0.62	0.53	0.52	**0.54**	0.58	**0.71**	0.70	0.62	**0.60**
	Ana-Lync	0.61	0.54	0.56	**0.59**	0.59	**0.79**	0.72	0.66	**0.63**
plots	control	0.67	0.66	**0.62**	**0.70**	**0.70**	0.78	**0.63**	0.65	**0.68**
	Ana-Lync	0.67	0.70	**0.72**	**0.77**	**0.79**	0.79	**0.71**	0.69	**0.73**
ave.	control	0.64	0.59	**0.57**	**0.62**	**0.64**	**0.74**	**0.67**	0.64	**0.64**
	Ana-Lync	0.64	0.62	**0.64**	**0.68**	**0.69**	**0.79**	**0.72**	0.68	**0.68**

Table 3. Verdure (visual), shoot and root biomass, root depth, and crown density. Values in bold were significantly different from each other (as compared within the same date and location)

		---------- Ordinal Day of the Year ----------							
Location	Treatment	264	322	264	322	264	322	323	323
		visual		root biomass, g		shoot biomass, g		root depth, cm	crown density, plants/ring
p.f.	control	1.9	4.6	**5.1**	**17.1**	16.7	80.6	**7.0**	**5.3**
	Ana-Lync	1.9	4.7	**5.3**	**17.9**	16.1	82.8	**7.3**	**5.7**
plots	control	2.5	4.7	**7.3**	**23.2**	19.0	99.2	**10.2**	8.0
	Ana-Lync	2.5	4.5	**8.0**	**24.3**	21.1	97.5	**10.8**	8.0
ave.	control	2.2	4.7	**6.2**	**20.2**	17.9	89.9	**8.6**	6.7
	Ana-Lync	2.2	4.6	**6.7**	**21.1**	18.6	90.1	**9.1**	6.8

Table 4. Nutrient concentrations. Values in bold were significantly different from each other (as compared within location)

		%					
Location	Treatment	N	P	K	S	Ca	Mg
p.f.	control	3.2	**0.30**	**2.2**	0.27	0.34	0.15
p.f.	Ana-Lync	3.4	**0.35**	**2.6**	0.31	0.30	0.14
plots	control	3.1	0.33	2.5	0.28	0.33	0.15
plots	Ana-Lync	3.4	0.32	2.5	0.32	0.32	0.14
ave.	control	3.1	0.32	2.3	0.27	0.33	0.15
ave.	Ana-Lync	3.4	0.34	2.6	0.31	0.31	0.14

		ppm				
		Zn	Fe	Mn	Cu	B
p.f.	control	**26**	186	**51**	11	**7.1**
p.f.	Ana-Lync	**31**	218	**55**	10	**7.5**
plots	control	**28**	227	**53**	11	**7.2**
plots	Ana-Lync	**31**	222	**57**	10	**7.6**
ave.	control	**27**	206	**52**	11	**7.2**
ave.	Ana-Lync	**31**	220	**56**	10	**7.5**

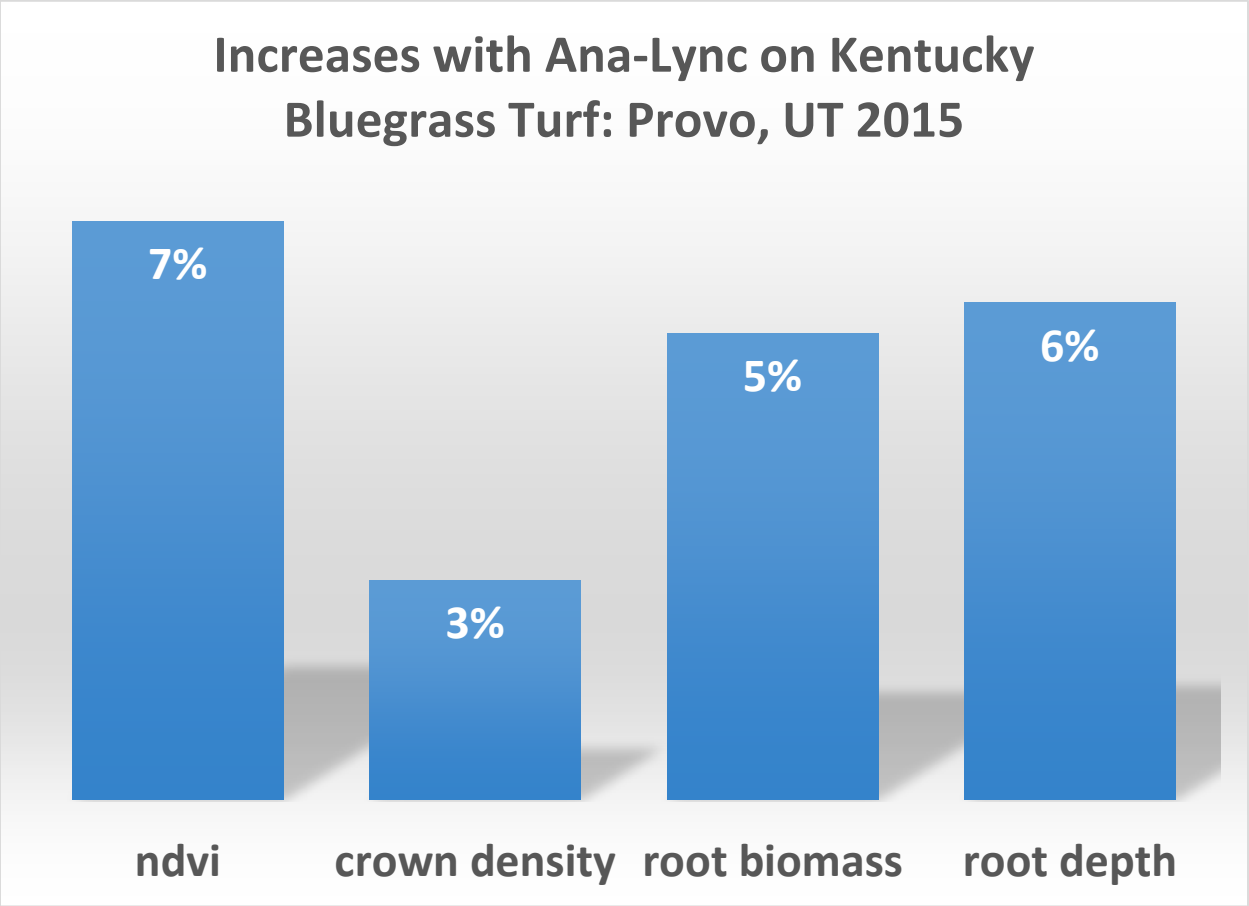

Fig. 3. Average significant increases with Ana-Lync based nutrient management

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