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# TURF HACKER

Ideas about growing grass

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Jason's Productivity Files

TUESDAY, 2 FEBRUARY 2016

Turfgrass fertilization is not that complicated.

I recent did a talk for the Western Washington GCSA about my experience using the MLSN (minimum level of sustainable nutrition) guidelines. I will be making a post about this soon. Today one of the attendees and speakers shared the following link about skipping granular fertilizer.



**Kevin Hicks**  
@golfsuper1992



@PenderSuper I'll let you answer this one 😄  
[twitter.com/superintndtmag...](https://twitter.com/superintndtmag...)

**SuperintendentMag** @SuperintndtMag

What problems might superintendents encounter by skipping granular fertilizer application? [goo.gl/xzDLrh](http://goo.gl/xzDLrh)



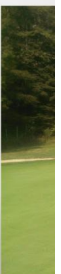
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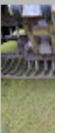
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[See Kevin Hicks's other Tweets](#)



Kevin was right to assume that I would enjoy this article. I enjoyed it for probably the wrong reasons though, I find it baffling that there is still so much confusion when it comes to fertilizing grass on sand rootzones. I also find it interesting that they only talked with people who work for fertilizer companies and who's best interests are to sell more fertilizer. It's too bad they didn't include any independent turfgrass scientists in the discussion.



The main focus of my recent MLSN discussion was how simple the MLSN guidelines are and how they have helped me simplify my fertilizer use on my golf course. I talked for an hour about how I haven't applied much fertilizer but Micah Woods sums it up in one sentence.

"If your soil tests are above the MLSN guidelines, you can be confident that the grass is supplied with all of that element that it can use."

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# Minimum Levels for Sustainable Nutrition Soil Guidelines

The Minimum Level for Sustainable Nutrition (MLSN) Guideline is a new, more sustainable approach to managing soil nutrient levels that can help you to decrease fertilizer inputs and costs, while still maintaining desired turf quality and playability levels. The MLSN guidelines were developed in a joint project between PACE Turf and the Asian Turfgrass Center. All soil analyses were conducted at Brookside Laboratories, New Bremen, OH.

	MLSN Soil Guideline
pH	>5.5
Potassium (K ppm)	37
Phosphorus (P ppm)	21
Calcium (Ca ppm)	331
Magnesium (Mg ppm)	47
Sulfur as sulfate (S ppm)	7

Nitrogen requirements are best determined based on **turf growth potential**, which incorporates site-specific weather and turf type to calculate nitrogen demand (Gelernter and Stowell, 2005. Golf Course Management, p. 108-113, March, 2005).

## How the guidelines were developed

From a database of over 17,000 soil samples, we selected 3,721 that were classified as having:

- not poor performing turfgrass
- pH 5.5 - 8.5: to avoid aluminum toxicity at pH less than 5.5, and to avoid alkalinity hazard at pH greater than 8.5
- total exchange capacity <6 cmol/kg

A log-logistic model provided a significant fit of the data, and was used to identify the concentration (in ppm) of each nutrient that 10% of the soil samples fell below, but were still performing well. This 10th percentile value is the MLSN soil guideline shown above.

For more information, see the Facebook MLSN page at: [www.facebook.com/misnturf](http://www.facebook.com/misnturf)

Of course it's not entirely that simple. A soil test gives you a snapshot of what is in the soil at that time. The grass will use the nutrients as it grows. Micah Woods describes it, "*That's why I like to express the quantity of fertilizer to apply as a function of those three amounts: (a) the amount the grass will use, (b) the MLSN guideline, and (c) the soil test. Then  $a + b - c$  gives the amount of the nutrient to apply as fertilizer.*" Even then, it's way more simple than many will have you believe.

My talk discussed how there is a lot of fear when it comes to under-fertilizing but we are lucky in that we have the ability to take soil tests so that this doesn't happen. With a test we can confidently make decisions on what nutrient needs to be applied as fertilizer.

Here is my 2015 soil test results.

Table 1: Key data values for sustainability. If the value for a factor exceeds the guideline value, additional fertilizer application is not needed. The value for pH is reported in standard units, the values for the elements are reported in mg/kg soil (ppm). Soil salinity (EC) is reported in dS/m (mmhos/cm). t=Tee, g=Green, f=Fairway. Num=hole number. K=potassium, P M3=Phosphorus (Mehlich 3 analysis), P Bray2=Phosphorus (Bray 2 analysis), P Olsen=Phosphorus (Olsen analysis), Ca=Calcium, Mg=Magnesium, S=Sulfur, TOT-N=Total nitrogen, EC=electrical conductivity (soil salinity)

Area	pH	K	P M3	P Bray 2	P Olsen	Ca	Mg	S	TOT-N	EC
G1	5.9	37	64	81	15	367	59	19	5.5	0.7
G689	5.8	33	60	67	16	360	57	12	4.9	0.6
T15689	5.6	43	49	57	14	380	62	13	8.1	0.6

Which I used to base my fertilizer applications on how much nitrogen I expected to apply.

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## Nutrient Requirements reported in lb per 1000 sq ft based on the MLSN guidelines

Table 6: Total fertilizer requirement based upon soil nutrient deficit plus nutrient removal as clippings when 2 pounds of nitrogen per 1000 square feet is applied for maintenance and clippings are removed. Reported in lb of element per 1000 sq ft.

Area	K	P M3	P Bray 2	P Olsen	Ca	Mg	S
G1	0.8	0.0	0.0	0.0	0.0	0.0	0.0
G689	1.0	0.0	0.0	0.0	0.0	0.0	0.0
T15689	0.5	0.0	0.0	0.0	0.0	0.0	0.0

Table 7: Total fertilizer requirement based upon soil nutrient deficit plus nutrient removal as clippings when 4 pounds of nitrogen per 1000 square feet is applied for maintenance and clippings are removed. Reported in lb of element per 1000 sq ft.

Area	K	P M3	P Bray 2	P Olsen	Ca	Mg	S
G1	1.6	0.0	0.0	0.0	0.0	0.0	0.0
G689	1.7	0.0	0.0	0.0	0.0	0.0	0.0
T15689	1.3	0.0	0.0	0.0	0.0	0.0	0.0

As you can see there are a lot of zeros! Last year I only applied nitrogen and potassium as fertilizer on my greens and tees. On my fairways I have only applied nitrogen for the past 3 years but they are on native soil!

I was one of the first people to use the MLSN guidelines which I explained in my recent talk and will share in an upcoming post. Since then the experience has been 100% positive. If anything, applying hardly any fertilizer has made my golf course better and certainly hasn't made anything worse. We are always concerned about the consequences of under-fertilizing but I wonder what the consequences of over fertilizing are having?



Makes you think about the impacts of over-fertilization

I also haven't applied a granular fertilizer to my greens in over 3 years. I apply my fertilizer with my sprayer in very small quantities in a relatively high volume of water (2.5gal/1000 or 1000L/ha). I don't think that granular fertilizers are required and if anything they can result in you applying nutrients that aren't needed in your soil leading to waste because you can't change the nutrient ratio in a blended granular fertilizer.

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The only time I've used my granular spreader in past 3 years.

The MLSN guidelines make it very easy to apply the right amount of fertilizer. Not too much, not too little. It's not complicated or risky. In the end it's all about results. You tell me if my lack of fertilizer use has made a negative impact on my golf course.



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Posted by [Jason Haines](#)



Labels: [fertilizer](#), [MLSN](#)

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