Hello,

It's been a while since MLSN newsletter #20. You can read it, and other recent MLSN newsletters, in this new section on the ATC website.

There's been so much written about MLSN in the eleven years since its introduction, so much research done, case studies shared, and presentations made, that I can often point people to those existing items when there are inquiries. I find I don't have to generate so many new explanations.

But earlier this year, if you follow me on Twitter, (or is it X now, or Xitter?), you may have seen my explanation of MLSN, what it does, and why I use it. I wrote that as a response to the anonymous TurfTruth account, which had been questioning whether MLSN "works" for all grasses and soils, no matter how they are maintained.

I took that opportunity to write this new explanation of MLSN, which I repeat here with a little more elaboration. I was reminded of Sayre's law, paraphrased as "academic disagreements are so bitter and intense precisely because the stakes are so low." And I figured that making the disagreements clear would draw attention to MLSN, which is what I wanted, because it works so well.

Explaining MLSN to Turf Truth

Here's what I wrote.

> At the 2010 US Open, Stan Zontek told me that sometimes you have to tell people what NOT to do. But you have to give some advice about what you should do, too. I advise using #MLSN for turfgrass fertilizer recommendations. Here's why.

> The @TurfTruth account has the telling people what not to do part covered pretty well. Don't do BCSR, don't do saturated paste, "majority of turfgrass soil tests are not correctly correlated or calibrated."

> We developed #MLSN more than 10 years ago to address these very issues. MLSN doesn't use BCSR, it does not use saturated paste, and it completely bypasses the intractable calibration problem.

> #MLSN is a modern method for interpreting soil tests for turfgrass. It is designed to simultaneously do 2 things:

> 1. prevent nutrient deficiencies
> 2. avoid unnecessary fertilizer applications

TurfTruth has been ambivalent for a long time about #MLSN, stating that "MLSN provides a reasonable starting point," that "there are probably as many bad reasons to follow MLSN as good reasons," & recently asks for evidence that MLSN "works."

Specifically, TurfTruth says "there is no evidence to support such a broad claim," that claim being that MLSN works for any grass, anywhere, any soil, any maintenance regime. The evidence is simply solving a math problem.

Remember, #MLSN is designed to prevent nutrient deficiencies and at the same time to avoid unnecessary fertilizer applications. If MLSN "works" then it will do both of those.

So how does #MLSN work? Well, to start with, it considers that if we don't know what is in the soil, the only safe way to prevent nutrient deficiencies is to supply nutrients at or at slightly above (efficiency matters—Bob Raley's advice sticks in my mind) the grass use rate.

This "demand-driven" approach to nutrient supply is well-documented. Nutrient supply in equal quantities to nutrient use rate prevents nutrient deficiencies.

[at this point I linked to three articles about demand-driven nutrient supply, by Ericsson et al. a, Ericsson et al. b, and Kussow et al.]

#MLSN only involves cases in which there is a soil test. It adjusts the nutrient supply rate based on comparison to a public database of soil test results from professionally-managed turf around the world.

[at this point I linked to the public MLSN database]

That recommendations made according to the #MLSN method "work" in being sufficient to prevent nutrient deficiencies is well-documented. If anything, they are more than ample.

[I linked here to four recent research projects that show the recommendations made by the MLSN method are more than sufficient to prevent nutrient deficiencies. These were Øgaard & Aamlid, Hesselsøe et al., Bier et al., and Guevara]

How about avoiding unnecessary fertilizer applications? How does #MLSN do in that aspect? This is a math problem. It doesn't need peer-reviewed research. Here's how to do this simple math.

Take known nutrient use rates on golf course putting greens. In 2021, P_2O_5 was 1 lb/1000 ft^2/yr. K_2O was 2.9. N was 3.1.

[I cited here the recent GCSAA nutrient survey summarized by Shaddox et al.]

Consider what's normal in the soil. Median soil P on greens is expected to be 73 mg/kg. Median K on greens is expected to be 58 mg/kg.

[those data are from the Global Soil Survey]

Based on that average N rate and those median soil nutrient levels, #MLSN recommendations would be for 0 P_2O_5 and 1.1 lb of K_2O. For the average

soil, that's a 100% reduction in P_2O_5 and a 61% reduction in K_2O.

That's how #MLSN works. It prevents nutrient deficiencies and it avoids unnecessary nutrient applications.

And if you somehow, by some kind of miracle, have some soil test calibration data for your soil type and grass type, sure, go ahead and use that instead of #MLSN. But everyone knows that those data are few and far between.

Because those data don't exist, and won't exist, we developed #MLSN. And I'll continue to recommend it, and update it, and make sure it continues to work, until I find a better way to do it.

That was the concise explanation I made for MLSN. And yeah, definitely a low stakes argument when the topic is soil test interpretation. But it is nice to have the opportunity to explain it in another way, and to a large and engaged audience.

Lawn project MLSN soil test video

If you watch the [ATC YouTube channel,](#) then you probably already saw the video going [step-by-step through the soil report](#) from my brother-in-law Nathan's lawn. We discussed the MLSN approach to soil test interpretation as we went through his report.

New soil test report example

Do your soil reports look anything like [this](#)? That report was generated with version 0.4.0 of ATC's `soil-report` software. Some of the most useful items on the report include:

- charts that show the test results (and the trend) over time for all soil test parameters
- most recent 5 year average for that turf area (green, fairway, rough, tee, lawn, etc.) from *other locations*
- MLSN minimum for soil test parameters, if there is one
- a site specific temperature summary
- site specific mineralization calculation based on site temperatures and the most recent soil organic matter test results

New posts about MLSN

These are the five new posts on the ATC website with the MLSN tag, ranked in order of popularity.

1. [Best judgment of the agronomist](#)
2. [Planning forwards and measuring backwards](#)
3. [Soil sampling and interpretation questions: OM246 & MLSN](#)
4. [Olds College turf club presentation](#)
5. [Converting between soil test extraction methods](#)

Thanks for reading, and please let me know if there is anything about MLSN that remains unclear, or if there is some aspect of MLSN and turfgrass nutrition that you would like to hear more about from me.

That's all I've got for now about MLSN. It turned out to be a lot, again, didn't it! If you would like more frequent updates, on a range of turfgrass topics that goes well beyond only MLSN, then I recommend:

- The ATC blog email, with the full text of each new post on the same day it is posted.
- A PACE Turf subscription, for a weekly subscriber-only update email and, if you want them, thrice-weekly weather alerts for your location, wherever you are in the world.
- Check out the best ways to keep up blog post for a listing of *all the ways* to follow along with my turfgrass work.

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