

Nutrient uptake in the soil

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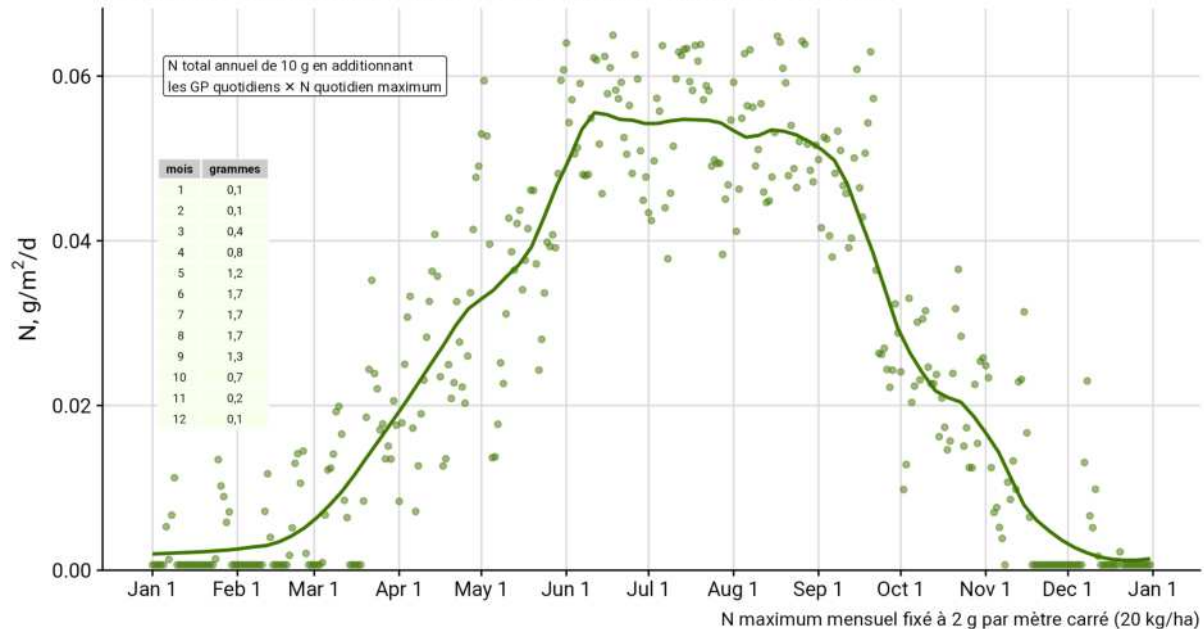
PACE Turf

www.paceturf.org

Asian Turfgrass Center

www.asianturfgrass.com

Prédit quotidiennement N par GP au Golfpark Oberkirch en 2025



Normal nutrient content of bentgrass leaves

Element	Concentration (%)		
	10 th percentile	Median	90 th percentile
N	3.4	4.6	5.9
P	0.36	0.52	0.68
K	1.4	1.9	2.5
Ca	0.41	0.58	0.75
Mg	0.17	0.23	0.28
S	0.41	0.56	0.72

Estimated annual use

- Nitrogen, 100 kg/ha
- Potassium, 41 kg/ha
- Calcium, 13 kg/ha
- Phosphorus, 11 kg/ha
- Sulfur, 12 kg/ha
- Magnesium, 5 kg/ha

MLSN matches modern turf & soil conditions

Reference

September 2014

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 (Gelenkar 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 3,725 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



Amount in the soil at MLSN value

- Nitrogen, no MLSN value, turf rootzones usually have less than 10 kg/ha of available N (**100 kg/ha used**)
- Potassium, 55 kg/ha (**41**)
- Calcium, 494 kg/ha (**13**)
- Phosphorus, 31 kg/ha (**11**)
- Sulfur, 10 kg/ha (**12**)
- Magnesium, 70 kg/ha (**5**)

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