

# Clipping volume (ClipVol), growth vs. expected (GvX), & OM246

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Micah Woods

7 October 2026

PACE Turf

[www.paceturf.org](http://www.paceturf.org)

Asian Turfgrass Center

[www.asianturfgrass.com](http://www.asianturfgrass.com)

# Two Years of the KPMG Women's PGA Championship

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18

PAR

4

YARDS

412

KPMG

PGA  
OF AMERICA



KPMG



June 2019



June 2026

# Tournament week maintenance

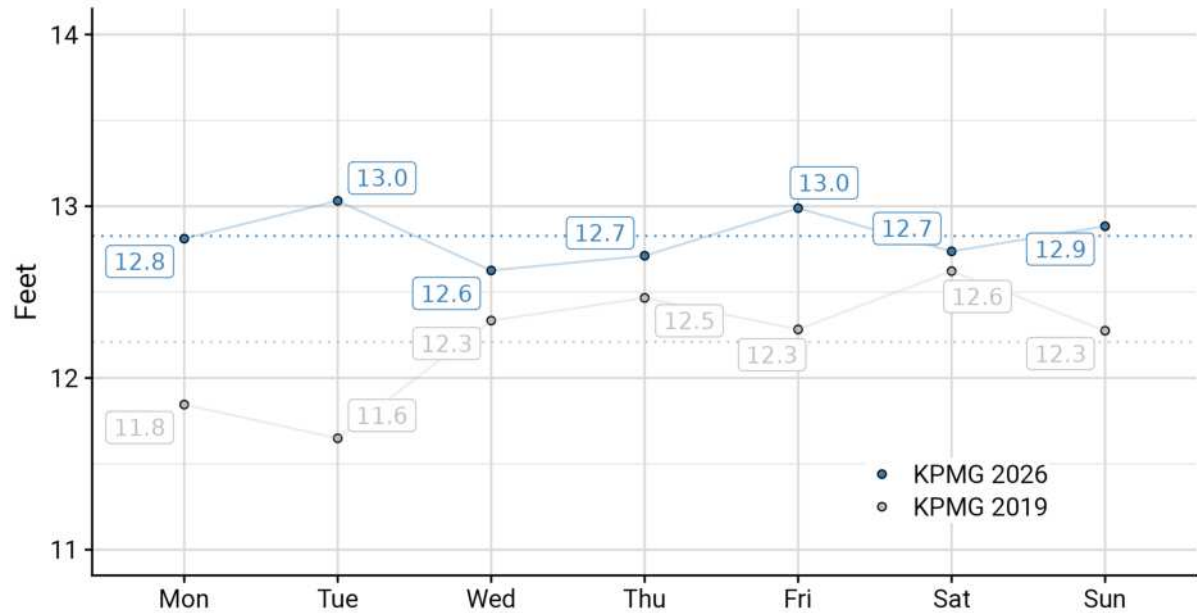
## 2019

- 2.8 mm bench setting
- Mon/Tue a.m. 1x cut + roll
- Wed–Sun a.m. 2x cut + roll

## 2026

- 2.9 mm bench setting
- Mon–Sun a.m. 1x cut
- Mon–Sat p.m. roll

# Average green speed



# Clipping volume

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Video time stamp: 1 second



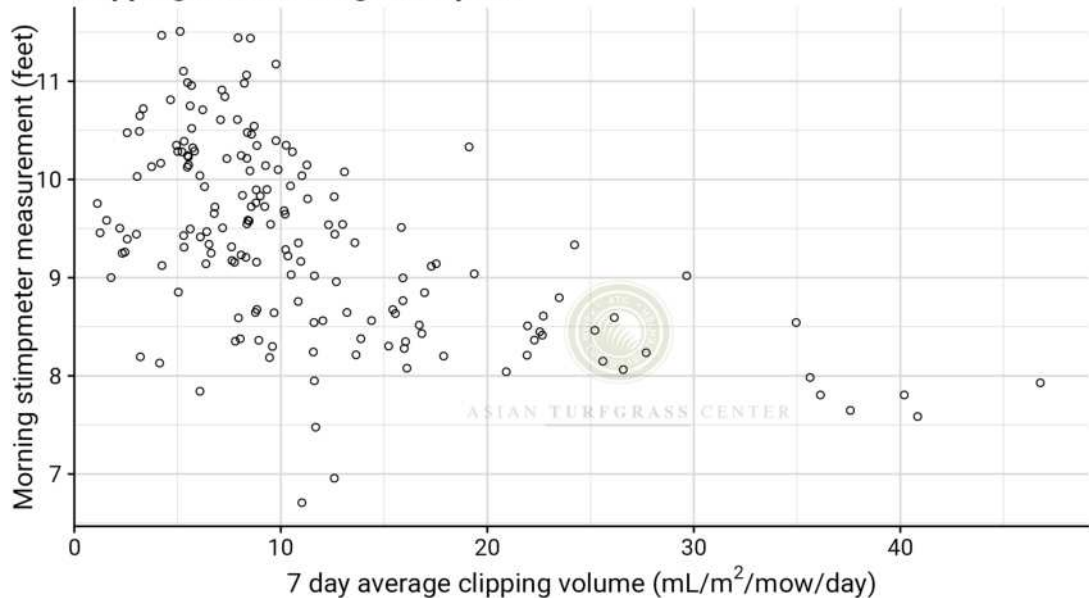
Video time stamp: 4 seconds



Video time stamp: 10 seconds

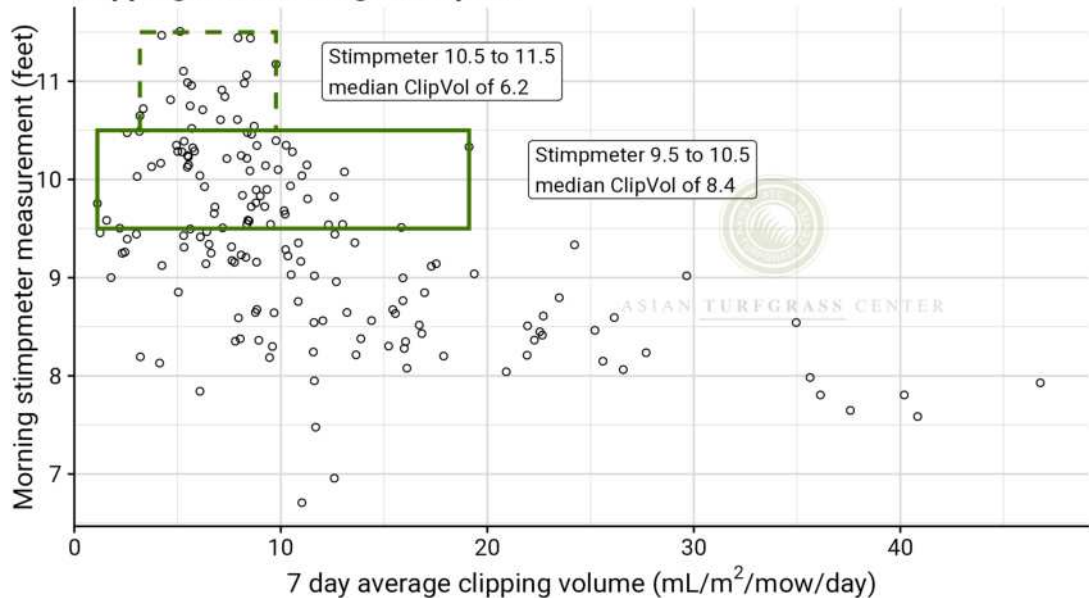


## Clipping volume vs. green speed



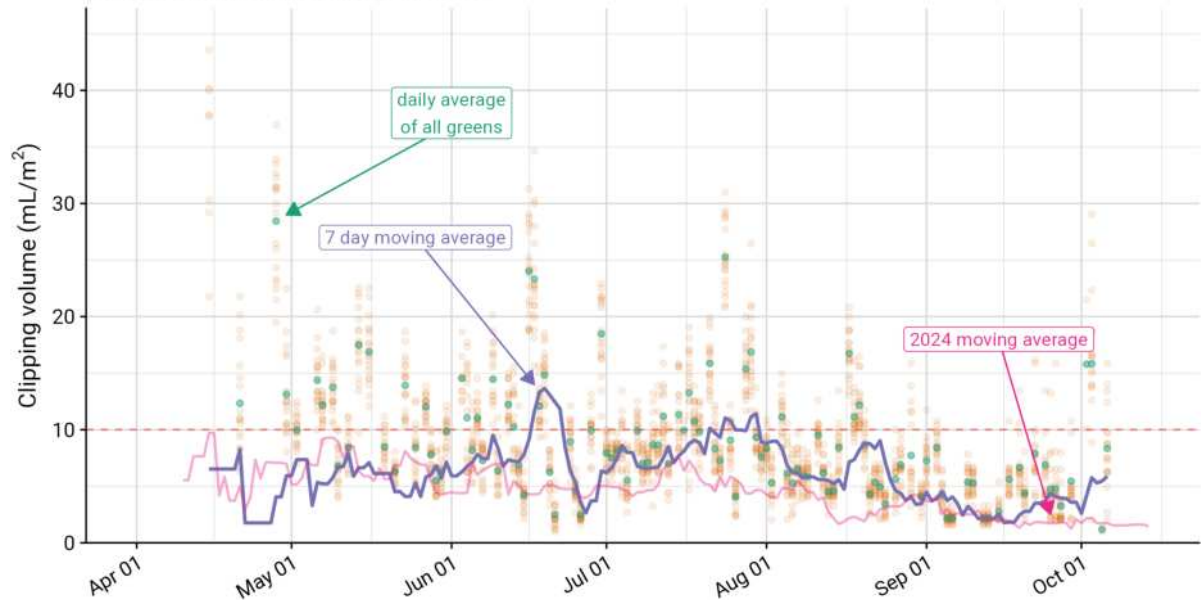
Data from two years of measurements at a single golf course

## Clipping volume vs. green speed

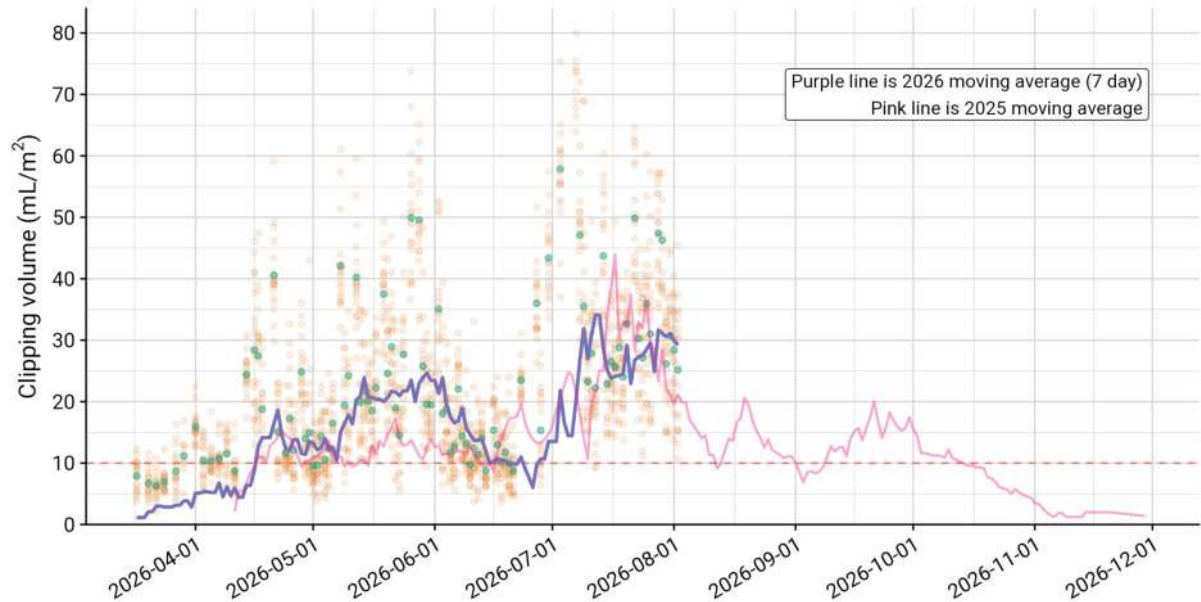


Data from two years of measurements at a single golf course

## Morning clipping volume in 2025

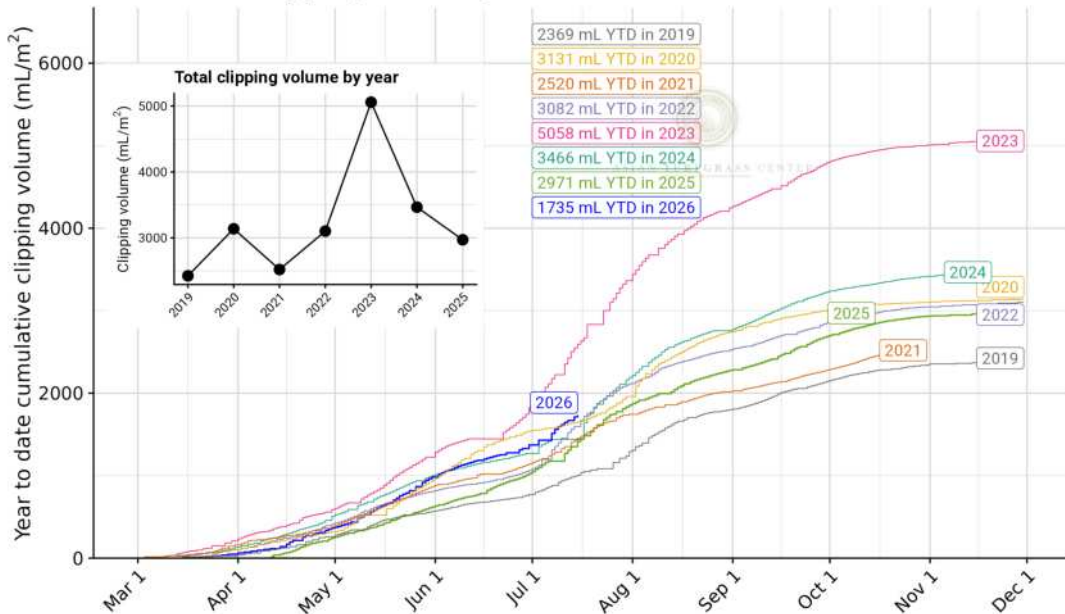


## Morning clipping volume



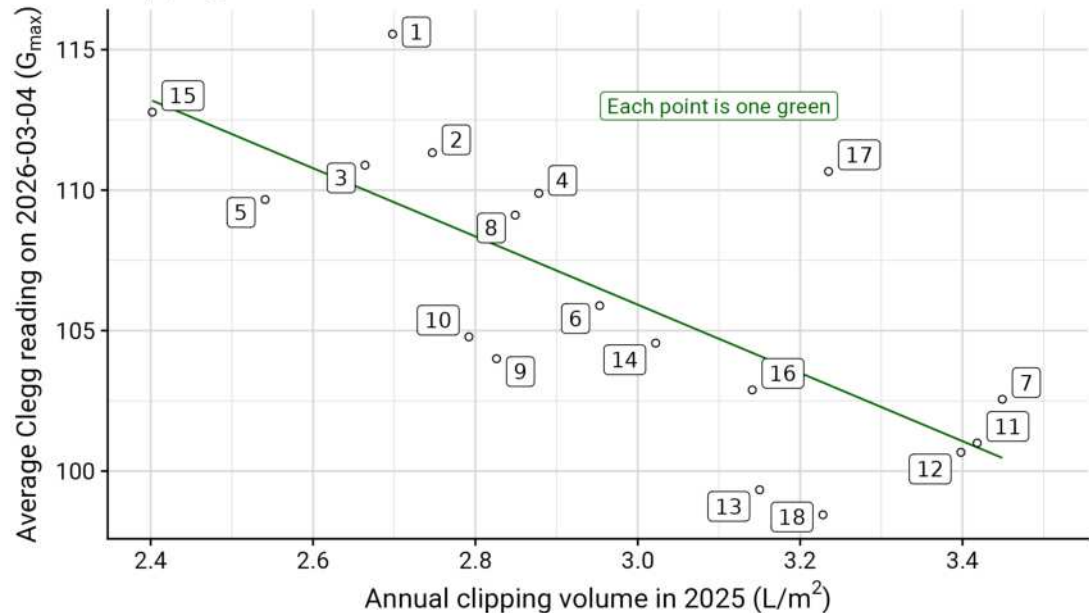


# Cumulative clipping volume year-to-date



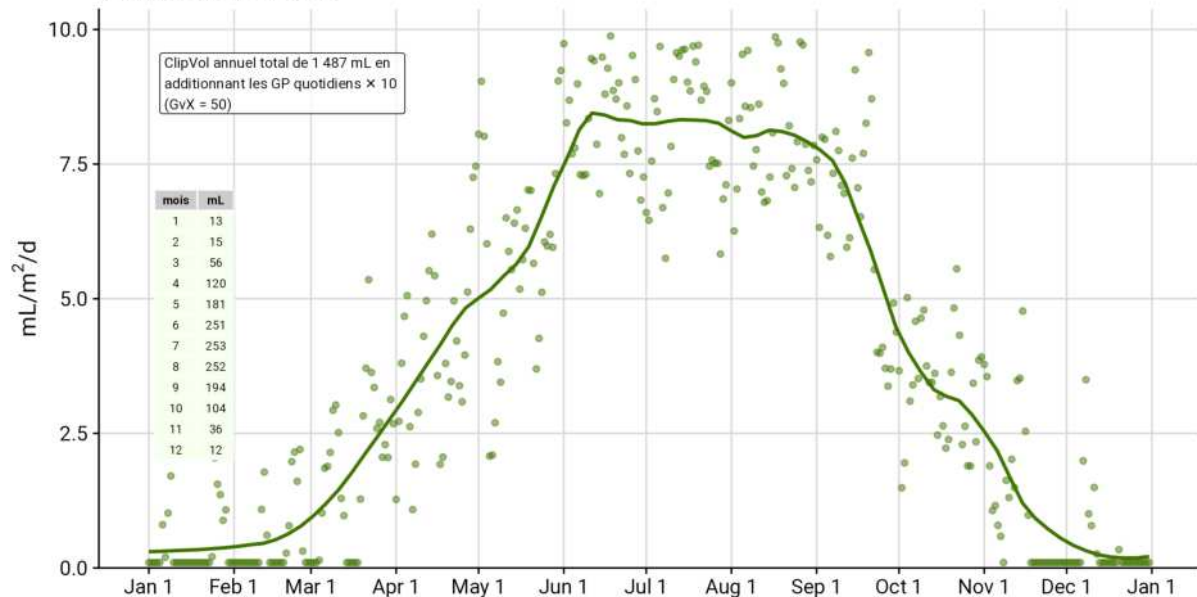


Clipping volume vs. surface firmness

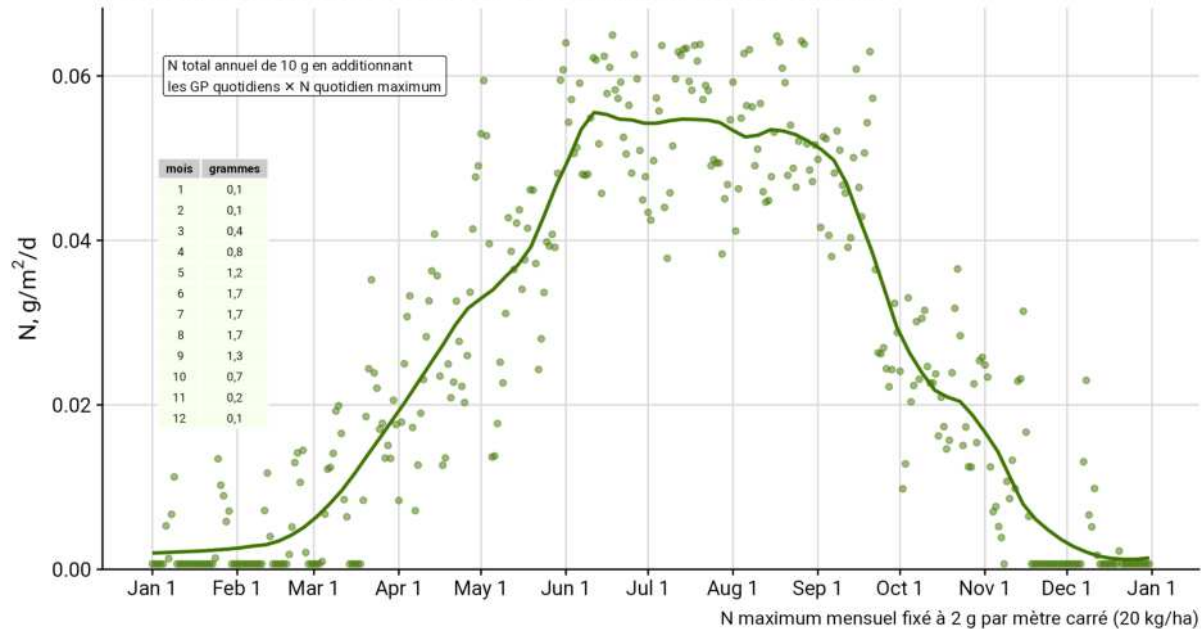


# Volume de tonte attendu pour le Golfpark Oberkirch en 2025

sur la base d'un GvX de 50



# Prédit quotidiennement N par GP au Golfpark Oberkirch en 2025



# Growth versus Expected Growth: GvX

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The **Turf GvX** is the actual growth of the grass compared to the expected growth of the grass.



# Use the GvX for ...

- adjusting N fertilizer
- adjusting plant growth regulators

## Results may include ...

- Improved playing conditions
- Fewer inputs (N, sand, mowing)



# What should my ClipVol be?

turf GvX ClipVol growth potential

Micah Woods

2023-03-30 · 2 min read

This is a common question. I heard another one recently, too. "How big of a bucket should I get to measure clipping volume?"

I like to answer these questions by looking at the site-specific conditions. One can use the turf GvX to get an idea for what a normal amount of clipping volume might be for your site.

The amount of clippings are going to be influenced by three main factors. One is weather. For example, I'd expect no clipping volume in Alaska in January, but some amount of clipping volume in July. A second factor is the grass species or variety being grown. There must be some differences here, but they may not be as big as you think. From looking at data from different grass species around the world, managing turf to produce a high quality putting surface tends to converge on similar clipping volumes. A third factor is how you like to—or how you need to—manage the grass. A course with 12,000 rounds can probably be managed with a really low clipping volume. A course with 60,000 rounds, maybe with that amount of traffic a higher growth rate (clipping volume) would be more appropriate.

The GvX accounts for *all* of these factors. Because the PACE Turf growth potential is already included in the GvX calculation, the weather effects are already included by

# Actual growth

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The standard units for clipping volume  
(ClipVol) are mL/m<sup>2</sup> or L/1000 m<sup>2</sup>.

# Expected growth

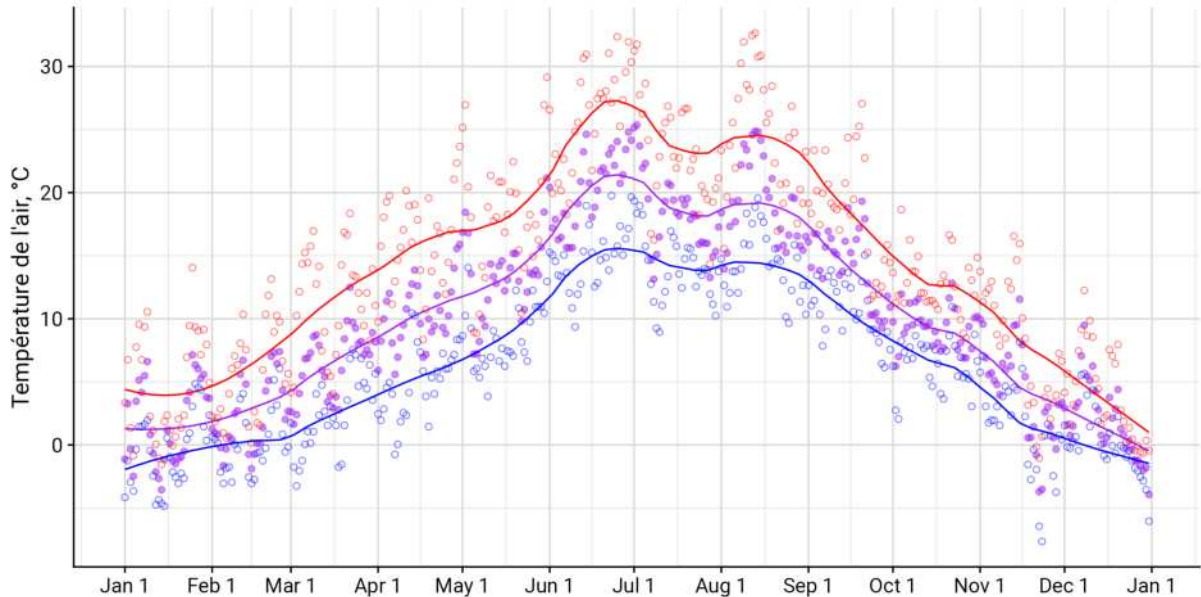
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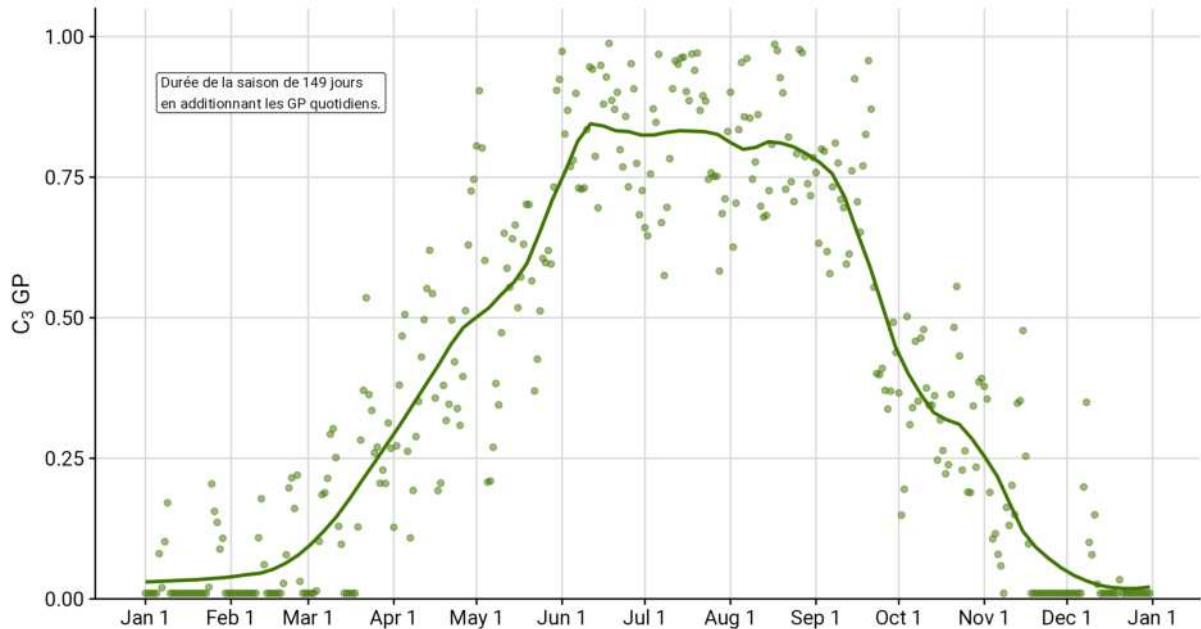


# Résumé quotidien des températures en 2025

Sursee



## GP au Sursee en 2025



# Calculating the GvX

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$$GvX = \frac{ClipVol_{14}}{20 \times GP_{14}} \times 100$$

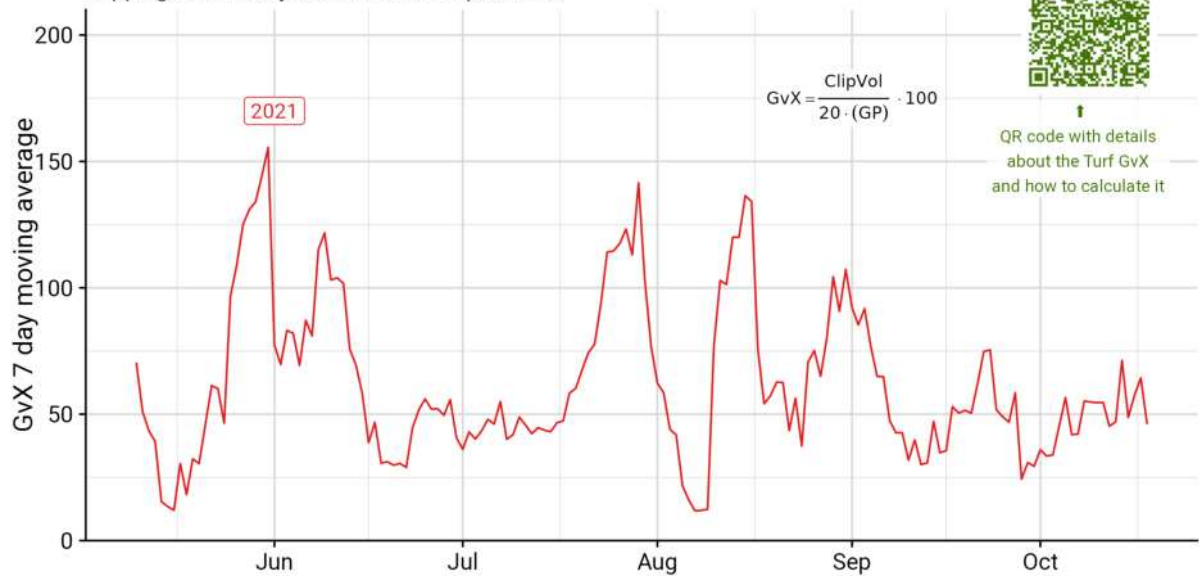
where  $ClipVol_{14}$  is the 14 day average of clipping volume and  $GP_{14}$  is the 14 day growth potential average.

# Using the GvX

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# One year of GvX

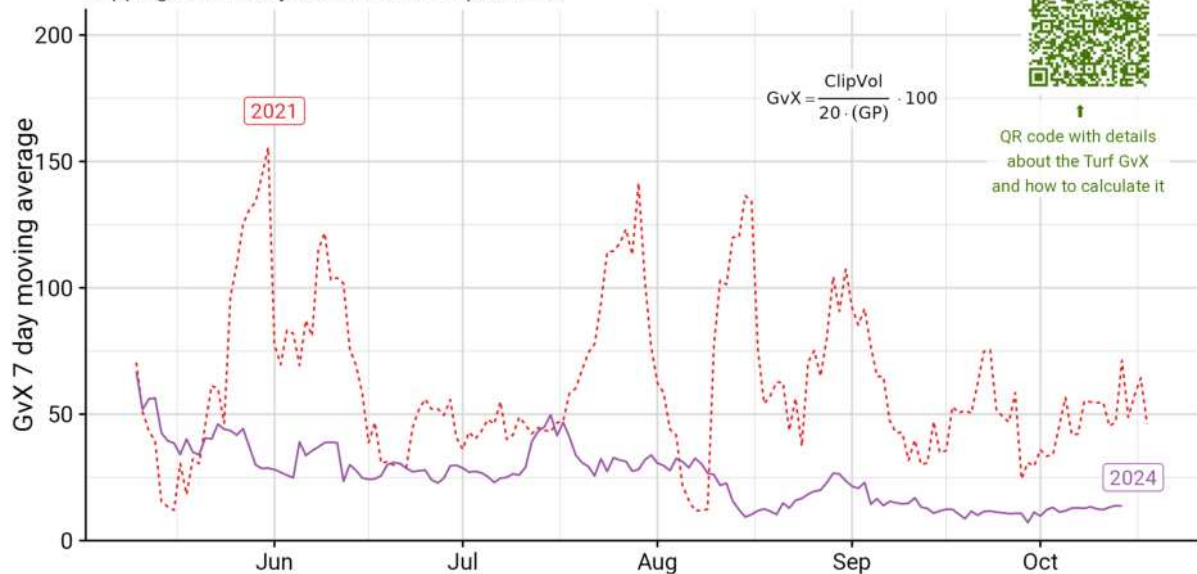
Clipping volume adjusted for site temperatures



Data from Penn A-4 creeping bentgrass greens at Hazeltine National GC (Minnesota, USA)

# Four years of GvX

Clipping volume adjusted for site temperatures



Data from Penn A-4 creeping bentgrass greens at Hazeltine National GC (Minnesota, USA)

OM246

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0 to 0.8  
inches

0 to 2 cm  
OM2

0.8 to 1.6  
inches

2 to 4 cm  
OM4

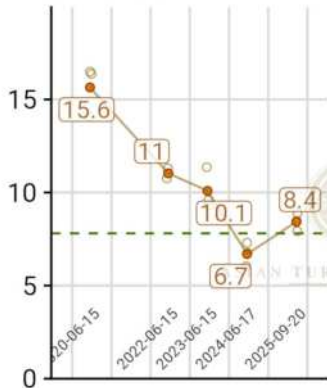
1.6 to 2.4  
inches

4 to 6 cm  
OM6

## Total organic material time series

0 to 2 cm

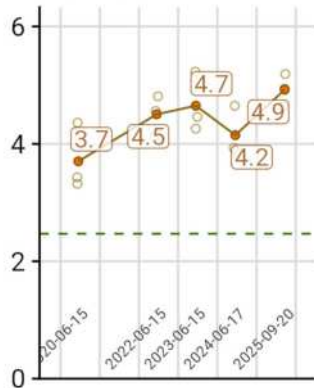
OM% by mass



2 to 4 cm



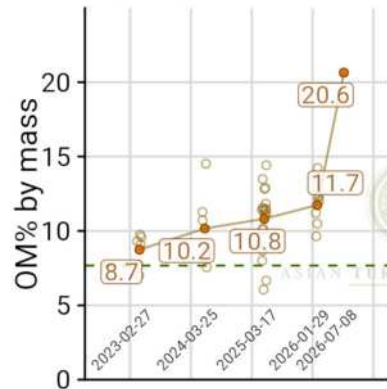
4 to 6 cm



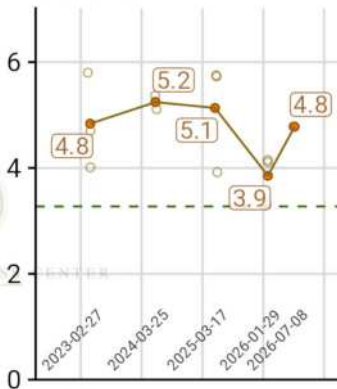
The horizontal dashed line marks the average value (50<sup>th</sup> percentile) of all bent-Poa samples at that depth.

## Total organic material time series

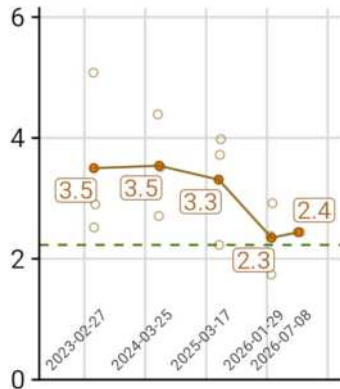
0 to 2 cm



2 to 4 cm



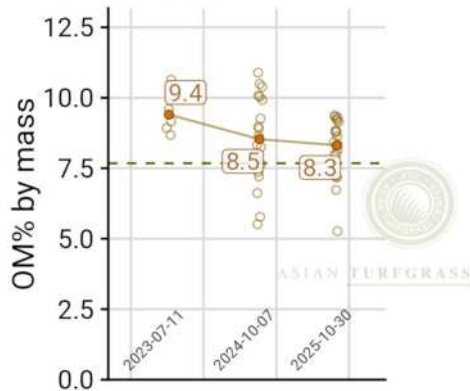
4 to 6 cm



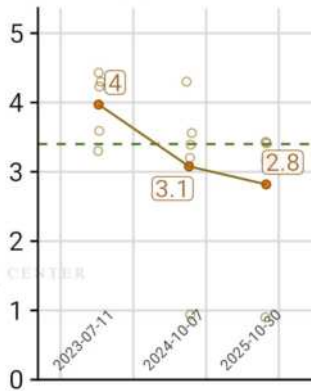
The horizontal dashed line marks the average value (50<sup>th</sup> percentile) of all bermudagrass samples at that depth.

## Total organic material time series

0 to 2 cm



2 to 4 cm



4 to 6 cm



The horizontal dashed line marks the average value (50<sup>th</sup> percentile) of all bent-Poa samples at that depth.

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