

# 10 things I've learned about clipping volume

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February 28, 2024

Asian Turfgrass Center  
[www.asianturfgrass.com](http://www.asianturfgrass.com)

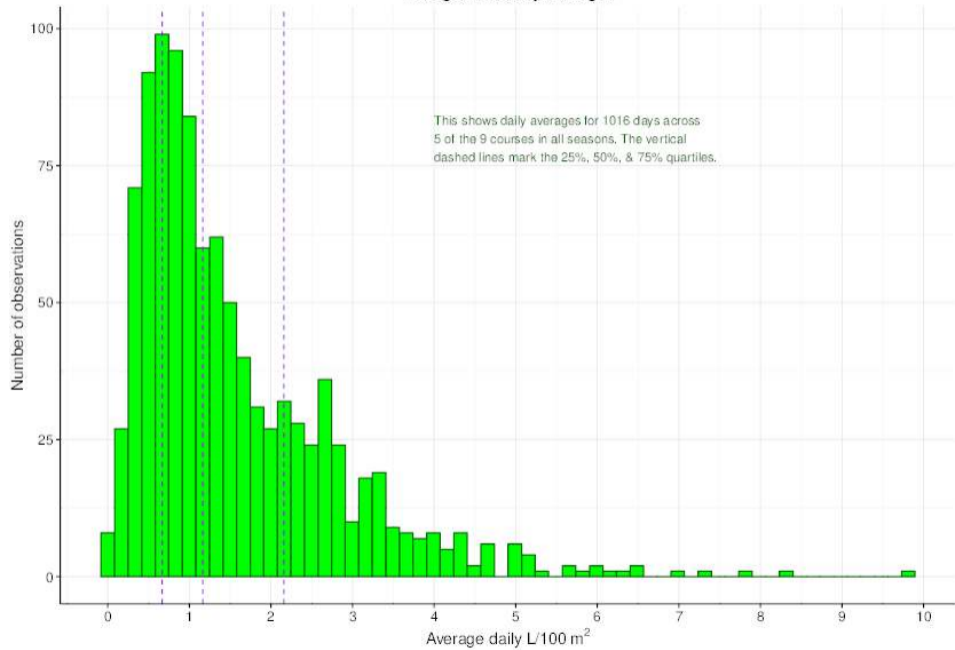
PACE Turf  
[www.paceturf.org](http://www.paceturf.org)



1. The average clipvol for a mow  
is 12 mL

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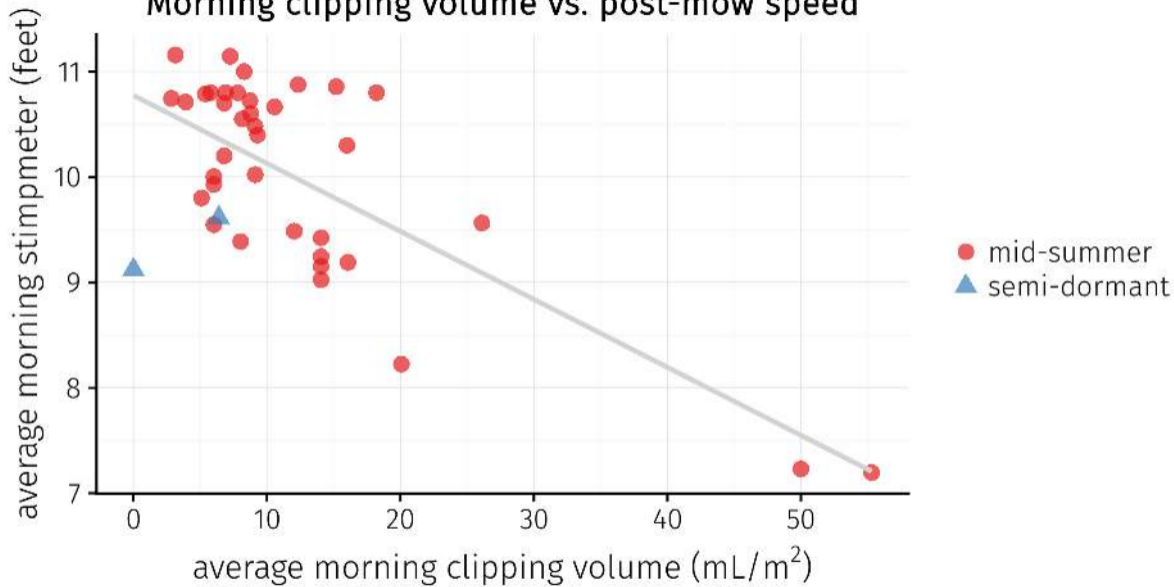
### Histogram of daily averages



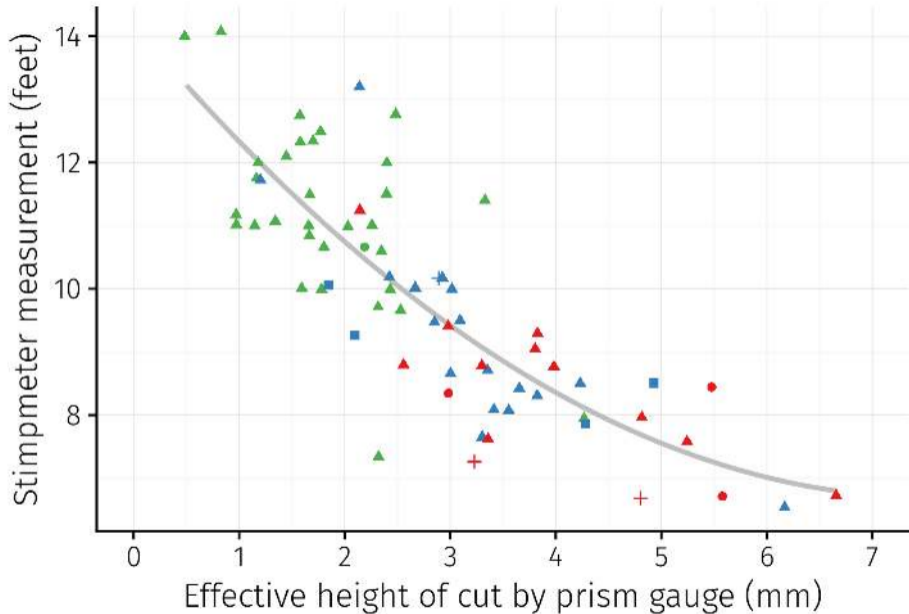
2. When clipvol goes down, green speed goes up

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# Morning clipping volume vs. post-mow speed



39 days at Keya GC from 2013 to 2018



country

- Japan
- Thailand
- United States

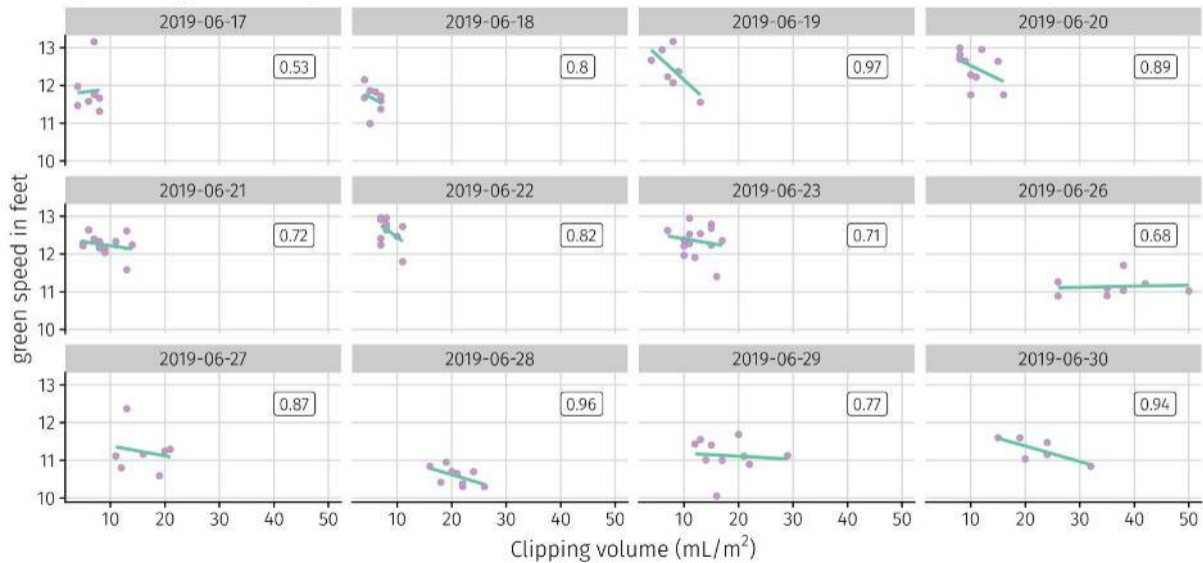
species

- Bentgrass
- ▲ Bermudagrass
- Paspalum
- + Zoysia

data from Dr. Eric Reazor (@TurfBlade) ball dispersion project

# Green speed and clipping volume

by individual greens on 12 days in June



the two digits in the top right corner of each panel are the probability that the green speed is slower on greens with a higher clipvol





### 3. Machine and cutting unit setup and clipvol variation

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4. It takes less than 30 seconds to empty and record

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Video time stamp: 1 second



Video time stamp: 4 seconds



Video time stamp: 10 seconds



5. Estimate dry mass as 6% of the fresh clipvol

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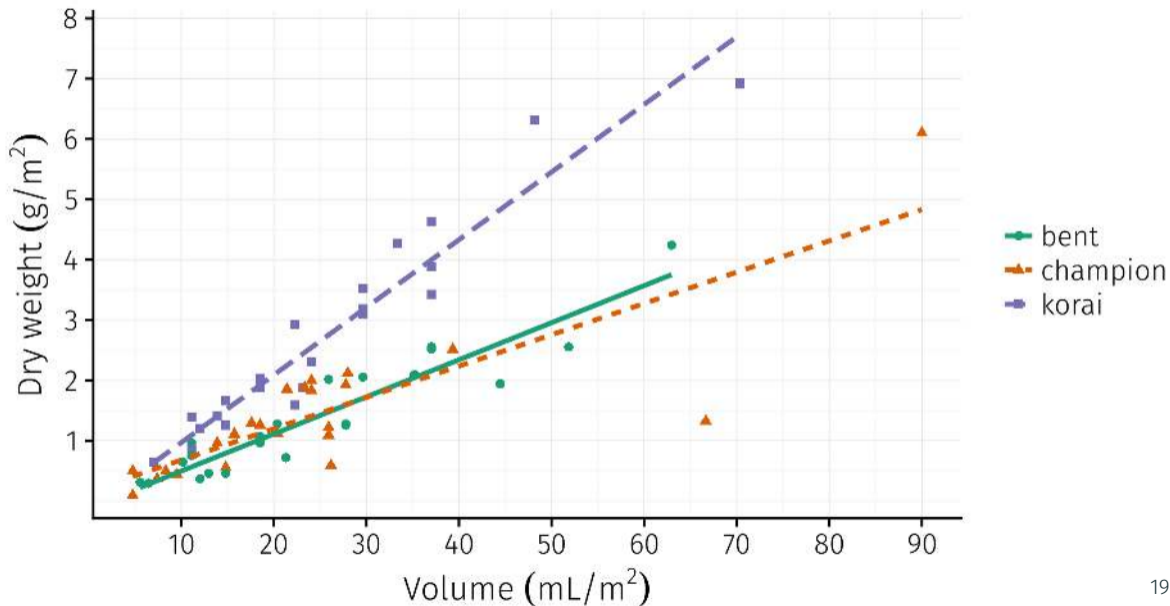








Nichino Ryokka combined data 2015 & 2016





## 6. How to estimate nutrient harvest from clipvol

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From 1 L of clippings, I expect 63 g of dry clippings.

In 63 g of dry bentgrass clippings I expect this percentage of macronutrients and of secondary nutrients.

element	25 <sup>th</sup> percentile	Median (%)	75 <sup>th</sup> percentile
N	4.3	4.8	5.3
P	0.5	0.6	0.6
K	1.8	1.9	2.0
Ca	0.5	0.6	0.7
Mg	0.2	0.2	0.3
S	0.5	0.5	0.6



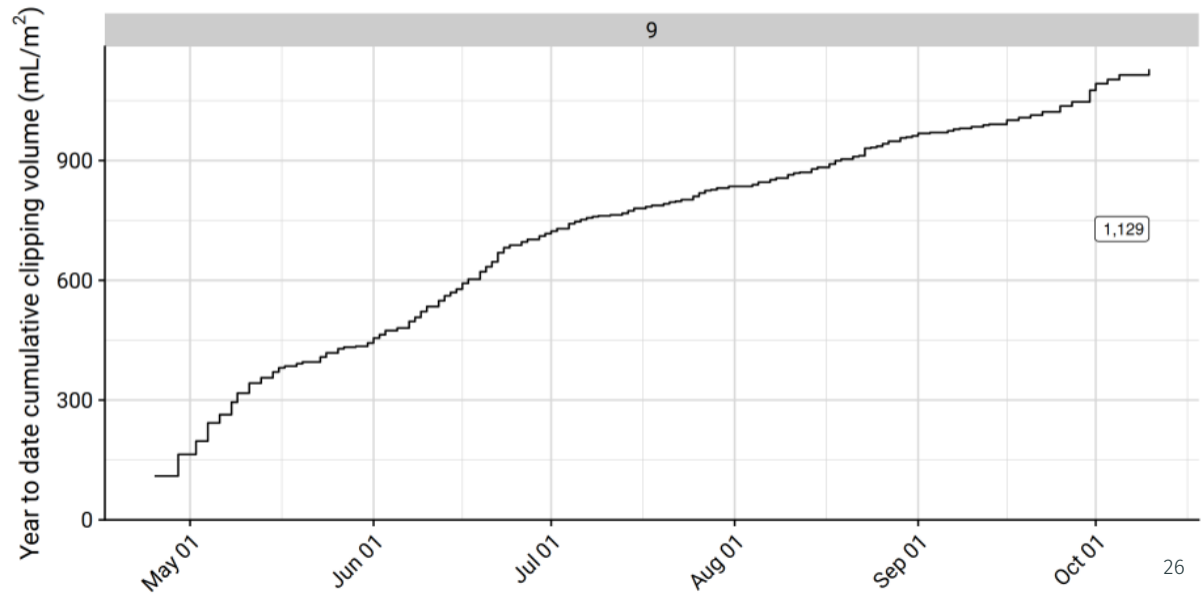
## 7. Cumulative and annual sum of clipvol

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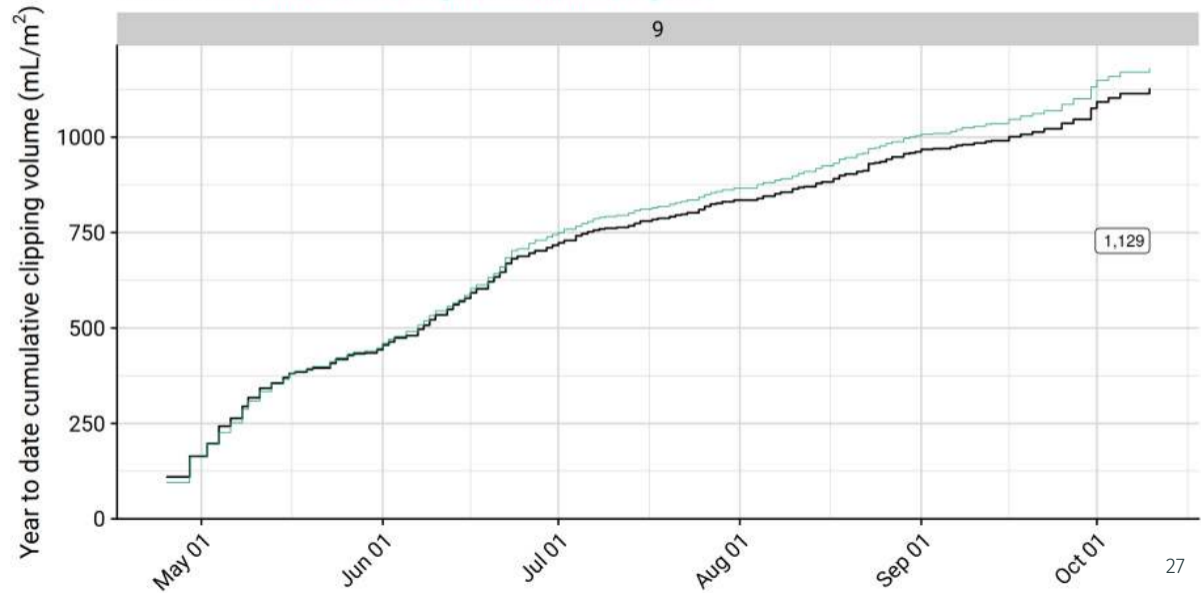
# Cumulative clipping volume

2023 in black



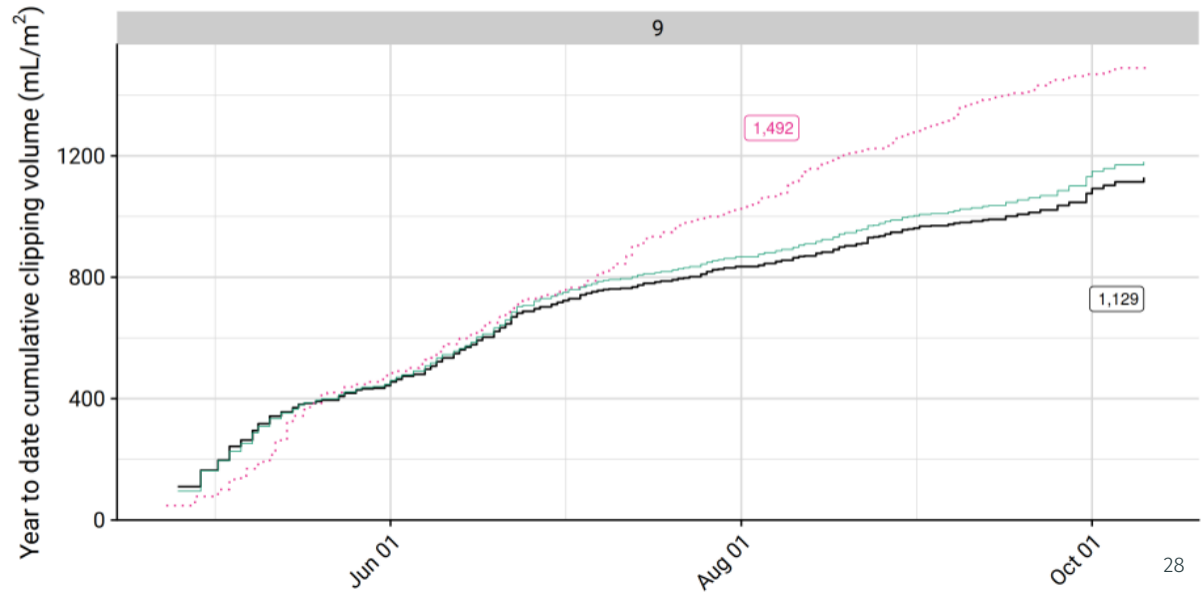
# Cumulative clipping volume

2023 in black, and the 2023 average across all holes in green.



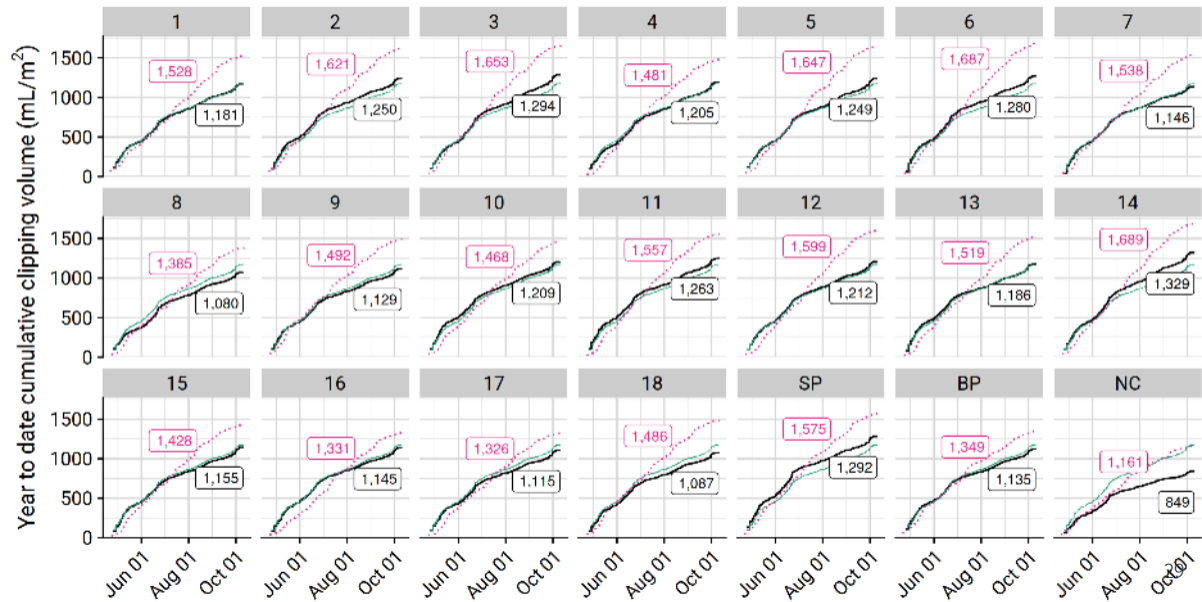
# Cumulative clipping volume

2023 in black, 2022 in pink, and the 2023 average across all holes in green.



# Cumulative clipping volume green by green

2023 in black, 2022 in pink, and the 2023 average across all holes in green.



## 8. Clipvol and sand topdressing

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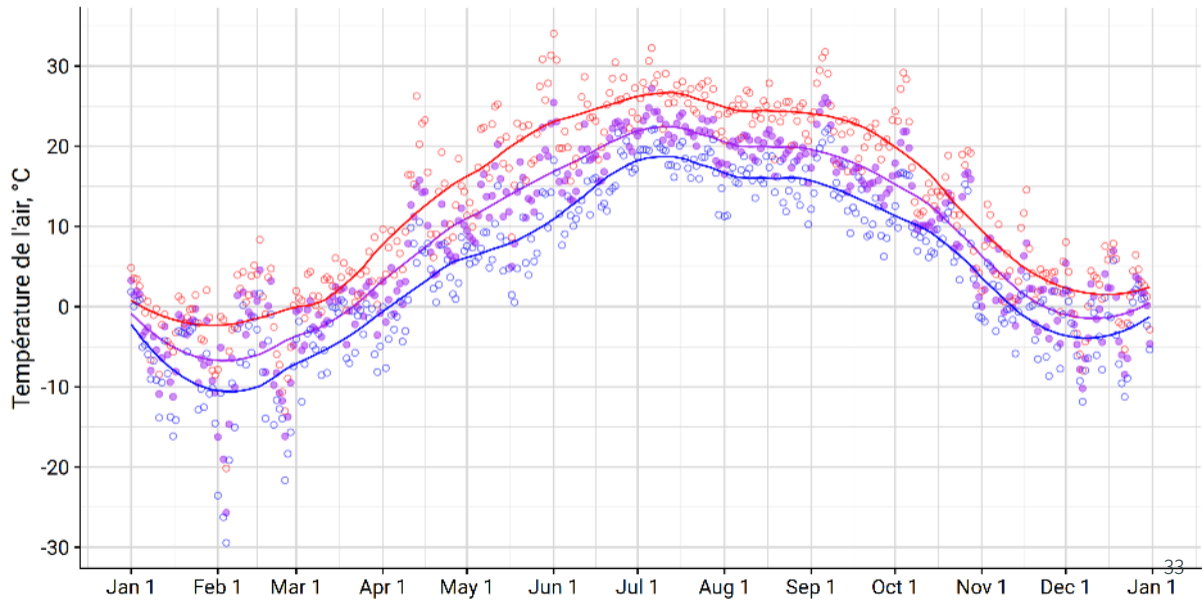


## 9. Growth ratio and nitrogen adjustments

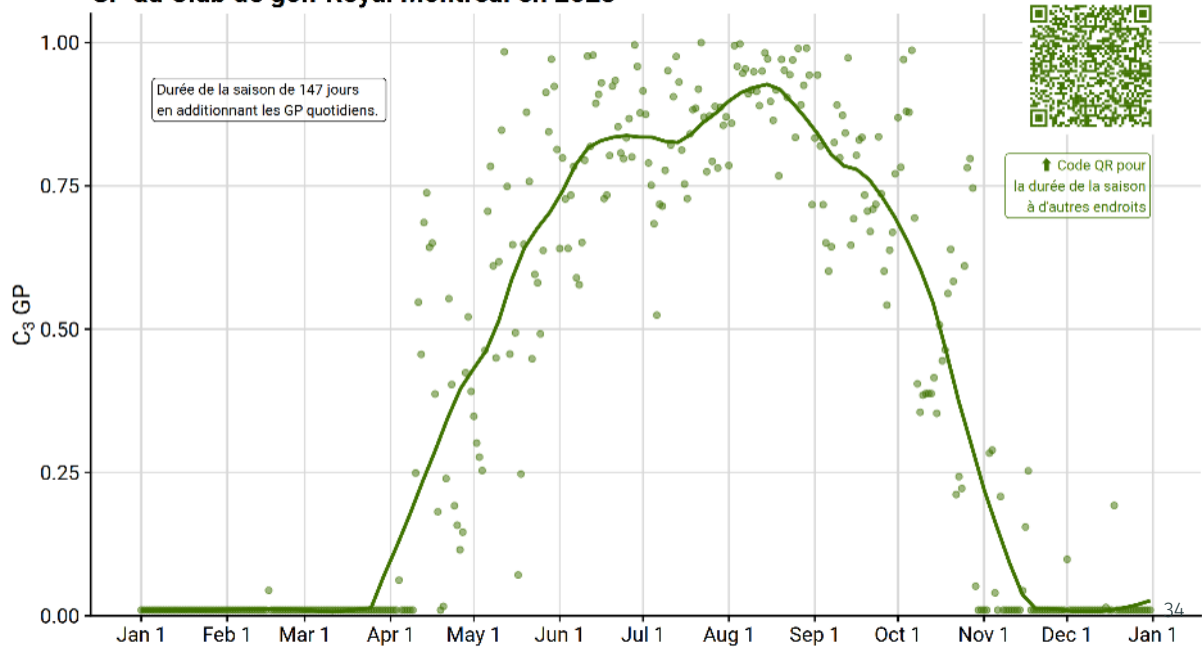
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# Résumé quotidien des températures en 2023

Club de golf Royal Montréal

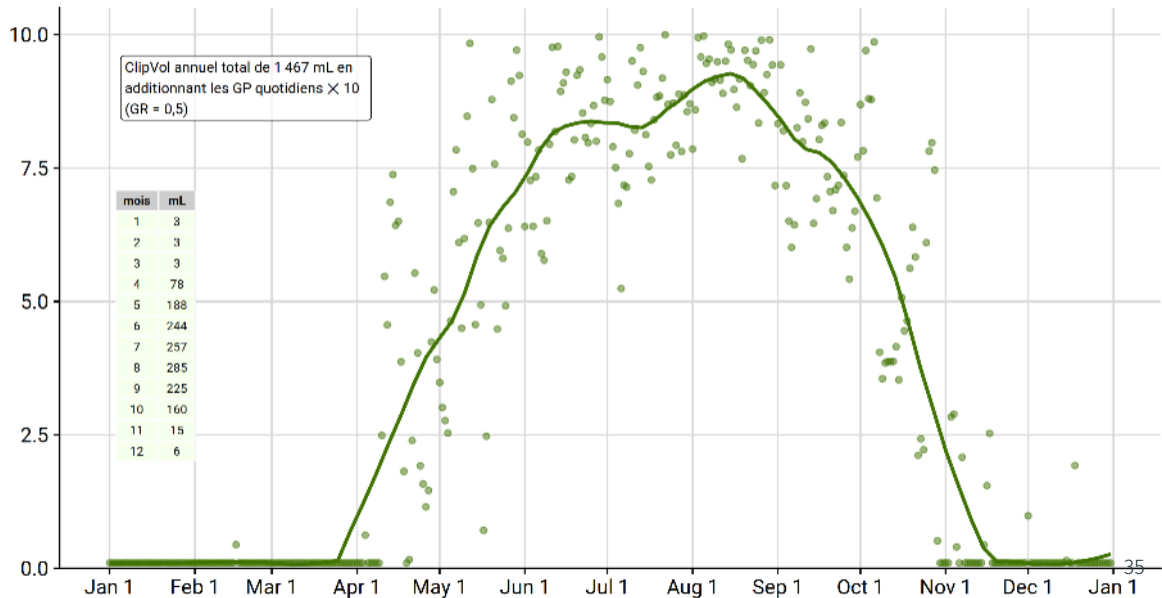


# GP au Club de golf Royal Montréal en 2023



# Volume de tonte attendu à Club de golf Royal Montréal en 2023

sur la base d'un taux de croissance de 0,5



# 10. How I'd save data in a spreadsheet

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date | time | 1 | 2 | 3 | 4 | 5 | 6 | ... | 18 | avg | sd | notes

Bonus: there's a clipping volume  
book

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# One Bucket at a Time

A guide to rapid measurement of clipping volume with various permutations, applications, and implications

Micah Woods



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Online handout with slides & more info



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