

## Drive your growth rate

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As turf managers, we are really growth managers. If the grass grows too slow, then it can have reduced recuperative potential, get low growth (nitrogen) diseases, and have poor quality. When turf grows too quickly, it increases the demand for nutrients, burns sugar reserves, gets high growth diseases, and negatively impacts turf playability. Successful managers are able to balance growth rate and maximize plant health and playability. There are several different ways to measure turf growth, but clipping volume (yield) is the easiest to monitor. While monitoring clipping volume does not tell the complete story, it can be helpful to understand turfgrass performance, health, and playability.

Few turf managers actually track growth despite its importance. It is like driving down the highway without a speedometer. You may be able to approximate your speed, but it's hard to know if you're speeding or significantly below the posted speed limit. Many managers routinely ask their crews, "How much grass was in your buckets?", but few actually measure and record those values. Even fewer turf managers and researchers have clipping volume targets or goals. What is the ideal clipping volume to maximize conditioning and turf health? We are driving the turf growth rate without a speedometer and a speed limit.

### ***Measuring clipping volume: The Speedometer***

Measuring clipping yield doesn't need to be an added hassle. Resourceful superintendents have found clear containers, poured one liter of water in at a time, and painted a line after each liter. I'm sure some entrepreneurial companies will sell calibrated buckets in the future. The emerging preferred unit of measure is liters per 100 square meters. Alternative units include mL per 100 square meters or liters per 1,000 square feet (100 square meters = 1,076 sqft), but most stick to L/m<sup>2</sup>. Volume is easier than clipping weight because water content varies and sand debris is heavy. You can track and convert liters per green to liters per 100 square meters in Excel, on a Google sheet, or apps like GreenKeeper. A good goal for 2018 is to find the optimum clipping volumes for your facility.



Figure 1. Collecting clipping volume is as technical as dumping the clippings into a clear bucket with marks on the side. Divide by the size of area to calculate the rate. Photo courtesy of Andrew McDaniel.

# How do we manage turf growth rate?

**Clipping Yield/Volume**

**Accelerator Pedal**

**Brake Pedal**

**Clutch/Gear**

**Environmental Factors (GP)**

- Temperature
- Light quality & quantity
- Soil nutrient levels
- Mowing practices
- Soil water and oxygen
- Other factors

**PGR Rate**

**Nitrogen Availability**

- Fertilizer
- Water
- Soil mineralization

**Growth Potential**

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## Managing clipping volume: The Gas and Brake Pedal

Water availability, nitrogen fertilizer, and plant growth regulators are a few factors managers can manipulate to manage clipping volume. All impact the production of the plant hormone gibberellin – the hormone that promotes leaf elongation. Continuing the car analogy, nitrogen fertilizer is the gas pedal and PGRs are the brakes when soil water is at the desired level.

Add fertilizer – push the gas pedal – if clipping yield is too low and the turf isn't meeting expectations. Sometimes growth rate can exceed your target range. It could be the result of too much fertilizer, but is more typically the result of nitrogen mineralization from soil organic matter. In either case, PGRs can block gibberellin production and reduce clipping volume. Increase the PGR application rate to achieve more growth suppression or reduce the application rate when clipping volume is too low. We suggest managers continue with low PGR rates during these lower growth periods because they can have other plant health benefits. Remember, PGR application rate has a minimal impact on the duration of growth suppression. That is controlled by mowing practices (greens vs athletic fields) and temperature. When it's hotter in the summer, the PGR will need to be applied more frequently. [PGR GDD Turf iNfo.](#)

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***Environmental Factors: The Gear Selector***

Other environmental factors impact nitrogen fertilizer response. These factors are collectively called growth potential. Basically, growth rate response to nitrogen fertilizer will be reduced when environmental conditions (temperature, sunlight, genetics, growth habit, etc.) are sub-optimal. It's similar to being in a low gear. If your truck is in 1<sup>st</sup> gear, your top speed will be limited. Unfortunately, Mother Nature is controlling the gear of our turf growth. When it's too hot or cold, it may be impossible to hit your clipping yield targets. This isn't the time to push harder with nitrogen because uptake is low and it could put significant stress on the turf plant. Our M.S. student, Jacob Fuehrer, has been isolating these variables in this research. We'll have a future Turf iNfo article describing his results so far.

Drive your growth rate this year. Try to collect clipping volume and establish a target for your turf. It doesn't need to be every green or an entire ball field. At the minimum, collect from a known area, write down the results, and use them to dial in your nitrogen and PGR rates. To measure (and record) is to know. It is a fairly small time commitment to gain a lot of guidance.

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