



(up to speed)

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FOC had 'no impact' on green speed, disease, or even the amount of clippings collected when mowed at any of the three HOCs.

## What's the frequency?

In 1980, I set off on my career path by working at Lilac Brothers Golf Course in Newport, Mich. The Lilacs were 70-year-old twin brothers who had made their fortune (or so I was told) by making Walter Hagen's golf clubs and eventually selling the patent to Spalding. Besides the brothers, I was the only crew member, and my only responsibility was to mow rough by driving a Ford 2000 tractor pulling a seven-reel gang unit.

A year later, I had gained enough trust from the Lilacs that they allowed me to mow fairways with a similar yet different set of gang units. The reason for my promotion was I'd learned how to avoid "marcelling" the roughs with the gang units. Marcelling means "wavy or rippled," which explains why the word "marcelled" appears on the bags of some brands of rippled potato chips.

In the world of turfgrass, the frequency of clip (FOC) should equal the height of cut (HOC). Marcelling of turfgrass most often occurs when a mower is traveling faster than the reel blades can clip the grass. In short, FOC is the distance between "clips," meaning the smaller the FOC number, the greater the number of clips. Therefore, when reel speed is slower than ground speed, there is too much space between clips, which results in marcelling. When reel speed is faster than ground speed, there is an increased chance of tissue bruising and potential turfgrass decline.

Factors that can impact the FOC include the number of blades on a reel, speed of the reel rotation and ground speed of the mower. Obviously, the number of blades is fixed once the initial purchase is made, and today's walk-behind mowers, as well as many ride-on reel mowers, have the reels and ground speeds synced to alleviate operator error that often results in marcelling.

With that said, there is a notion that FOC can be a significant management component to promote turfgrass health and improve playing conditions. In 2012, a two-year study was initiated at Michigan State University to investigate three FOCs on mowers with bench setting HOCs of 0.080, 0.110 and 0.140 inch.

The study used nine Toro Greensmaster Flex 2100s with 14-blade reels and EdgeMax micro-cut bedknives. For each HOC, there were mowers set at FOCs of 0.100, 0.126 and 0.149 inch. Data collection included green speed measurements, disease observations and clipping weights. Given statements made in the literature, MSU researchers anticipated that plots mowed with mowers having the smallest difference between FOC and HOC would result in the best playing conditions (measured as green speed) and the least amount of disease.

After two years, plots mowed at the lowest HOC (0.08 inch) had the greatest green speed, the most moss and the most clippings compared with plots mowed at a higher HOC. Additionally, plots maintained at the highest HOC (0.140 inch) resulted in the slowest green speeds, the greatest amount of dollar spot and the least amount of clippings. Because all of those results are intuitive (though they may take some thought to digest), they certainly verify the study design. This is important, because the study also found that FOC had "no impact" on green speed, disease, or even the amount of clippings collected when mowed at any of the three HOCs.

Thanks to improvements in technology, marcelling is not as big of a concern when training new employees as it was when I started my career with the Lilac Brothers. HOCs are certainly lower than they were 36 years ago, and results from this study hint that as mowing heights decrease, the "range of forgiveness" between FOC and HOC expands. On a day-to-day management basis, that is a good thing. With that said, be on the lookout for the rest of the story on FOC in a future column.

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