

# Green Section Record

## FEATURED

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*Triplex mowing can provide significant savings compared to walk mowing with little to no compromise in turf health or playability.*

# TRIPLEX VS. WALK MOWING: GETTING TO THE BOTTOM LINE

BY PAUL JACOBS, AGRONOMIST, CENTRAL REGION

## Key Takeaways:

- Triplex mowing can improve operational efficiency and help combat labor challenges.
- Based on the labor savings, purchasing a triplex mower can pay for itself within two or three years.
- The potential return from investing in triplex mowers can be easily calculated with the USGA Triplex Mowing Model.
- Altering mowing procedures can alleviate turf issues like triplex ring that prevented facilities from triplex mowing putting greens in the past.

It was not long ago that many superintendents believed smooth and fast putting greens could only be achieved with the use of walk mowers. Many thought that triplex mowing was only for “low-budget” facilities. Negative perceptions surrounding triplex mowing of putting greens still persist today – but things are changing.

The days of spending extra time and money walk mowing greens to provide narrow striping patterns are coming to an end for many facilities. That’s not to say that sending four or five people out with walking greens mowers can’t provide great putting surfaces, because it certainly can. However, recruiting and retaining quality employees continues to be one of the biggest challenges facing the golf course maintenance industry and the COVID-19 pandemic certainly hasn’t helped. Thanks to improvements in equipment and some modifications to mowing procedures, courses are reaping the benefits of improved operational efficiency and enjoying a relatively quick return on investment (ROI) by implementing triplex mowing on putting greens.

## Calculating the Bottom Line

In this era of data collection and interpretation, the importance of calculating the financial impact of management decisions has never been greater. For this reason, the USGA Green Section developed an ROI calculator to determine the payback period and future savings of switching to triplex mowing from walk mowing. The calculator can also determine the savings associated with triplex mowing compared to walk mowing if a facility is already using triplex mowers.

INPUTS			
HOURLY AVERAGE LABOR RATE	\$12.50		
AVERAGE FUEL COST (\$ PER GALLON)	\$2.50		
MOWING DAYS - DOUBLE MOW	30		
MOWING DAYS - SINGLE MOW	200		
	RIDING	WALK BEHIND	
PURCHASE OR LEASE?	PURCHASE	PURCHASE	
PURCHASE COST FOR FLEET	\$50,000	\$80,000	
LEASE COST FOR FLEET / MONTH	N/A	N/A	
REMAINING USEFUL LIFE (YEARS)	0	3	
USEFUL LIFE IF NEW (YEARS)	10	10	
TOTAL DAILY HOURS ON COURSE WITH MOWER - DOUBLE MOW DAY	6.5	16.0	
TOTAL DAILY HOURS ON COURSE WITH MOWERS - SINGLE MOW DAY	4.0	12.0	
GALLONS USED / HOUR	1.25	0.25	
OUTPUTS			
	RIDING	WALK BEHIND	
TOTAL HOURS THAT MOWERS ARE ON THE COURSE	995.0	2880.0	
ANNUAL LABOR COST	\$12,438	\$36,000	
ANNUAL FUEL COST	\$3,109	\$1,800	
ANNUAL LABOR AND FUEL COST	\$15,547	\$37,800	

*Even if new equipment needs to be purchased, triplex mowing can provide a rapid ROI and long-term savings.*

Information such as hourly labor costs, annual mowing frequency, fuel cost, purchase price for equipment, remaining useful life of the existing fleet and labor hours for walking and triplex mowing are entered into the calculator to determine the payback period for investing in new triplex mowers as well as long-term savings. To illustrate how the model works, let's use the following situation as an example:

Triplex Golf Club has been using walk mowers to mow their greens for several years. We will assume the existing fleet of four walk mowers has three years of useful life remaining. Their new superintendent wants to use a triplex mower to mow the greens because it would reduce the amount of labor required to mow greens each day. He wants to purchase a new triplex mower for \$50,000. To calculate the breakeven period for purchasing the mower we need to clarify a few key costs, which can be seen in the graphic below. In this model, we assume that one triplex mower would be used to mow daily and that four walk mowers are currently used.

The assumed purchase price was \$50,000 for a new triplex and \$20,000 for each walk mower. Under these assumptions the breakeven period would be less than 2 years! Future savings are also calculated – under this scenario the total savings would grow to more than \$100,000 in year three. This is when the new fleet of walk mowers would need to have been purchased based on the useful life of the existing machines. The model can also be extended over many years to illustrate the long-term impact that triplex mowing can have on the bottom line. If you'd like to leverage the Triplex Mowing Model, this is one of the many solutions made available to facilities through the [Course Consulting Service](#).

ANNUAL COSTS			
YEAR	RIDING	WALK BEHIND	SAVINGS
0	\$65,547	\$37,800	-\$27,747
1	\$81,094	\$75,600	\$5,494
2	\$96,641	\$113,400	\$16,759
3	\$112,188	\$231,200	\$119,013
4	\$127,734	\$269,000	\$141,266
5	\$143,281	\$306,800	\$163,519
6	\$158,828	\$344,600	\$185,772
7	\$174,375	\$382,400	\$208,025
8	\$189,922	\$420,200	\$230,278
9	\$205,469	\$458,000	\$252,531
10	\$271,016	\$495,800	\$224,784

*The USGA Triplex Mowing Model is a great way to communicate the financial impacts to stakeholders at your facility.*



## Triplex Solutions

Triplex mowers have been used on golf courses for over 50 years, but the modernization of these mowers has dramatically improved their reliability, productivity and quality of cut. For example, leak detection systems provide an immediate response to potential hydraulic fluid leaks – that’s if the triplex has hydraulic fluid at all. Some units today are completely battery operated and others operate on a hybrid system, which significantly reduces the amount of hydraulic fluid in the machine and the risk of leaks. As for the cutting units themselves, they provide a quality of cut that is virtually identical to that of walk mowers. Regardless of these improvements in technology, some facilities still refuse to adopt triplex mowing because they feel walk mowers are required to provide high-quality putting greens. A few common concerns about triplex mowing that USGA agronomists hear during site visits are listed below along with solutions to each issue.

## “The mower turning at the end of each pass damages turf on the green or collar.”

Certainly, abrupt and tight turns at the end of each pass can damage turf. However, modifying mowing procedures can significantly reduce, or eliminate, the need to make these tight turns. One option is to mow the green in a 50/50 pattern, similar to how a Zamboni resurfaces an ice rink. This calls for wide and sweeping turns instead of tight turns after each pass. The second option is to [mow the green all in one direction](#). This requires the operator to lift the reels at the end of each pass and then reverse across the green to begin the next pass. This method eliminates the need for nearly all turning on the green and collar, though it does involve some extra trips back and forth. The USGA article “[Triplex Tips For Success](#)” explains these methods in greater detail.



**Manufacturers offer hybrid triplex options with fewer leak points and less hydraulic fluid in the mower. Many new models also have quick-connecting motors and reels, which allow for easy reel and attachment changes.**



*Mowing in a 50/50 pattern or all in one direction reduces the number of tight turns made while mowing greens with a triplex.*

**“Our green complexes are too severe for triplex mowing. There are lots of steep slopes and bunkers close to the greens.”**

The same mowing procedures outlined above can be used to limit the amount of turning necessary outside the putting green and collar area. Using a 50/50 pattern or mowing all in one direction can reduce the challenges that greenside bunkers or steep slopes present to triplex use. It is also worth noting that the mowing issues associated with severe green complexes are not unique to triplexes. Walk mowers can cause severe damage to collars when turning in tight areas as well. Turning boards can alleviate this issue, but that adds time to the mowing process and oftentimes employees don't use the boards properly. If your course is planning on renovating green complexes in the near future, it may be worth lobbying for architectural adjustments that provide enough room around the putting greens to easily accommodate triplex use. The benefits in operational efficiency will likely outweigh the minor changes necessary in design.



*Walk mowers can be damaging to collars and greens when they are turned in tight spaces.*

## BACK TEE YARDAGE, FOOTPRINT AND FAIRWAY AREA (80-COURSE SAMPLE)

BACK TEE YARDAGE	COURSES IN YARDAGE RANGE	AVERAGE FOOTPRINT (ACRES)	AVERAGE FAIRWAY AREA (ACRES)
<6000	2	112.7	18.2
6000-6499	13	134.9	20.9
6500-6999	38	167.8	23.6
7000-7499	23	210.7	27.7
>7500	2	217.1	35.2

*80 Course Sample: Back Tee Yardage, Footprint and Fairway Area.*

### “The quality of cut is inferior to walk mowers.”

Simply put, properly setup triplex mowers can provide the same quality of cut as a walk mower. Several of today’s triplex manufacturers use the same cutting units on triplex mowers as they do on walk mowers. Aside from concerns about the cutting units, some may worry about triplex tires creating depressions in the green. While this may be a valid concern in some cases, if you are already spraying greens with a heavy utility vehicle and not seeing issues you should have nothing to worry about because the sprayer will be heavier than the triplex. Furthermore, if organic matter content is adequately managed, tire tracking will be minimal and should not impact playability. For most courses, the improvement in operational efficiency will outweigh any negative impacts from tire tracking. Greens rolling can also mitigate tire-tracking issues and provide many other well-documented benefits to your greens care program.

### “We can’t afford to purchase new equipment.”

The USGA Triplex Mowing Model explained earlier in this article can determine the payback period for switching from walk mowing to triplex mowing. Due to reduced labor requirements, the new mowers will likely pay for themselves fairly quickly. Calculating ROI and presenting this information to facility decision-makers should change the discussion from “Can we afford this?” to “How can we afford not to?” Leasing can be a better option for courses wanting a lower-cost entry point for acquiring new mowers.





## “Triplex mowers are too stressful to the turf on putting green perimeters – i.e., triplex ring.”

Triplex ring can be problematic but there are several options to reduce the amount of stress on putting green perimeters while using triplex mowers:

- Mow the cleanup pass every second or third day, depending on turf growth rate.
- Mow the cleanup pass with a walk mower equipped with a smooth, segmented front roller at a height of cut slightly higher than the rest of the green.
- If using a triplex to mow the putting green perimeter, alternate between mowing on the exact edge and approximately one foot inside the collar the next day. If your triplex has offset reels, mow the cleanup pass in a different direction each time to achieve the same goal.
- If there is concern about losing the original size and shape of the green by adjusting the daily cleanup pass, small dots of turf paint can be painted weekly to mark the green edge and help guide mowing operators.

## “All of the top courses use walk mowers, why shouldn’t we?”

In early 2021, the USGA Green Section sent out a survey to collect data about triplex use on golf courses. In the end, 375 courses responded to various questions related to the mower they use on their putting greens. The results show that only 17% of courses with a budget over \$1,000,000 use walk mowers exclusively during the peak season. The highest annual budget category – i.e., more than \$1,000,000 – had the most respondents with close to 100. Of those courses, 72% used triplex mowers at least once or twice per week and 36% use them exclusively during the peak season!

## COURSES ACROSS THE BUDGET SPECTRUM RELY ON TRIPLEX MOWERS

### “DURING PEAK SEASON, WHAT BEST DESCRIBES YOUR USE OF TRIPLEX MOWERS FOR MOWING GREENS?”

BUDGET	TRIPLEX MOWERS ARE USED EXCLUSIVELY	TRIPLEX MOWERS ARE USED 1-2 TIMES PER WEEK	TRIPLEX MOWERS ARE ONLY USED WHEN DOUBLE MOWING	TRIPLEX MOWERS ARE NEVER USED
>\$1 MILLION	36%	36%	11%	17%
\$750K - 1 MILLION	64%	26%	<1%	10%
\$500K - 750K	81%	7%	<1%	11%
\$250K - 500K	87%	10%	0%	3%
<\$250K	90%	10%	0%	0%

THE SURVEY WAS CONDUCTED IN EARLY 2021 AND HAD 378 RESPONDENTS.

If this survey were conducted 20 years ago, most respondents at high-budget courses would likely have reported that they use walk mowers exclusively. Today, many high-budget and “Top-100” courses are using triplex mowers with great success. However, some superintendents still feel that all high-end courses use walk mowers exclusively. Although some do, an increasing number are switching to triplex mowing to take advantage of improved operational efficiency with little to no compromise in turf health or playability.

Below are some comments made in the survey by superintendents at courses with budgets over \$1,000,000:

- “The quality of cut with triplexes has improved dramatically over the last several years. I will probably increase my use in the future as labor gets more difficult to find.”
- “The triplex mower has evolved to where it provides a quality of cut that matches walk mowers. The superiority of the walk mower over the triplex isn’t what it once was.”
- “We are a Top-100 course in the Northeast and during 2020 we used triplex mowers more than walk mowers because we were limited on staff. I predict you will see more courses using triplex mowers now than in the past.”
- “I believe there is no advantage to walk mowing a green considering the new technology of triplex mowers.”



## Conclusion

Triplex mowing equipment has advanced tremendously in the past few decades. However, the perception of triplex mowing is lagging behind reality. Across the spectrum of golf facilities, 2020 was a year full of budget and staffing challenges due to the pandemic. Many courses were forced to rely on triplex mowing because they didn't have the labor to walk mow. The experience that followed was an eye opener for many facilities and will improve operational efficiency for years to come as more and more courses embrace triplex use for mowing greens.

To be clear, walk mowing can provide a great quality of cut. It is likely to remain the standard for maintaining greens during professional events. However, daily maintenance and championship maintenance are far from the same. Championships are regularly staffed with numerous volunteers so labor is not a concern. Walk mowing also offers a slightly lower level of risk because there is no hydraulic fluid involved and, generally speaking, they are simpler machines to operate. For a championship it makes sense to spare no expense and minimize risk regardless of cost, but for daily maintenance there is a point of diminishing returns. With equipment such as hybrid triplex mowers, the risk of leaks is significantly less than it was with older triplex machines that had hydraulic motors powering the reels. Considering the rapid ROI, improvement in operational efficiency, nearly identical quality of cut, and reduced risk of hydraulic leaks with modern hybrid technology, it is time to ask if walk mowing is really the best decision for your course.

*Paul Jacobs is an agronomist in the Central Region.*