Return of the Triplex

An old reliable machine for mowing putting greens has made a big comeback.

BY PATRICK O´BRIEN

Triplex putting green mowers are back, and they are better than ever. The quest to reduce maintenance expenses has superintendents returning to this workhorse of efficiency that was developed in the 1960s. Startling? Maybe. Worth investigating? Definitely.

The history of the triplex mower and its role in golf maintenance is interesting and is highly correlated with economic trends in the game. This article will review the development of the triplex, how it has fit within the industry, and why it has made a strong comeback. Further, the article is intended to help superintendents, course officials, and owners think through how the triplex putting green mower might be an answer to lowering the operating budget without sacrificing playing quality.

TRIPLEX PUTTING GREEN MOWERS: WHAT ARE THEY AND WHERE DID THEY GO?

If something has made a comeback, it is important to know where it went and why it left. The development of the triplex mower grew out of the demand for a more efficient way to mow putting greens using less labor. With three cutting units on a triplex, one or two triplex mowers were able to take the place of three to six walking mowers. This produced an instant labor reduction to mow putting greens.

The first triplex greens mower was developed by Jacobsen® in 1968 and was named the Greens King. The success of the triplex was immense and even earned recognition from *Golf Digest* in its "Top 60 Innovations of Golf's Modern Era" (*Golf Digest*, September 2010).

Triplex use escalated during the 1970s and reached the pinnacle of course maintenance when it was used to mow the putting greens at the 1977 U.S. Open at Southern Hills Country

Playing conditions on a putting green mowed with a triplex mower are exceptional as a result of technological advancements in recent years.

The 1968 Greens King. The original triplex putting green mower was developed in 1968 by Jacobsen® and named the "Greens King." The instant success earned recognition from Golf Digest *in 2010 as one of their "Top 60 Innovations of Golf's Modern Era." (Photo courtesy of Jacobsen®)*

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Hand mowing of putting greens requires a large outflow of labor for daily mowing operations. It is never easy to find and attract workers for this important assignment.

Club in Tulsa, Okla. USGA officials were concerned at the time, fearing that the necessary championship green speeds of approximately 8 feet 6 inches could not be achieved with these machines. Much to everyone's surprise, superintendent Sonny Faust managed to attain green speeds in excess of 9 feet for the U.S. Open. Special bedknife grinding operations done at that time made it possible to set the reels low enough to achieve those speeds, which started a trend with bedknives that continues today. For additional reading about this story, see the 1979 *Green Section Record* article Putting Greens - The Height of Cut.

Despite the early popularity of triplex mowers, two catalysts emerged that drew golf facilities back to walk mowing. The first catalyst was a discernible gap in putting green quality between triplex mowers and walk mowers. Quality of cut was superior with walk mowers and triplex mowers could not be set to mow as low. Hydraulic leaks on triplex mowers were also a concern. If a hydraulic hose on a triplex burst and leaked onto a putting green, turf loss was inevitable in those areas. Finally, "triplex ring," otherwise known as distressed turf around the cleanup lap along the perimeter of the putting green, was problematic with a triplex.

However, it was an economic catalyst that likely served as the driving force that pushed triplex mowers into the background. Golf boomed in every measurable way between the 1980s and early 2000s. And what a boom it was! According to the National Golf Foundation, the number of golfers increased by 244 percent (11.7 million to 27.4 million) between 1970 and 1990, but the number of golf courses increased by only 26 percent (Golf Course Industry, 2012, and Yasuda, 2012). Whenever demand exceeds supply, expect prices to be bid up and revenues to increase.

As a result, golf course operating budgets increased far faster than the rate of inflation as facilities sought to improve all aspects of the course, including the playing quality of the putting greens. The emphasis shifted away from efficiency to maximum putting green quality. The trend back to walk mowers started at the high-end private facilities and trickled down to those with lower and mid-level budgets. This was especially true for those with cool-season grasses exposed to high-temperature stress during the summer and/or high volumes of play. There was also a desire to improve the quality of overseeded bermudagrass putting greens in the winter months with both a lower height of cut and a higher quality of cut. The walking putting green mowers not only elevated the

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Offset cutting units from the center line of the triplex machine are a new design feature to counter the "triplex ring." The offset feature is easily observed in these two views of the front reel units. Alternating the cutting direction when making the cleanup pass will ensure the tires will not follow the same path while mowing the green perimeter areas.

level of quality, but reduced mechanical stress to cleanup laps and eliminated hydraulic issues.

WHY DID THE TRIPLEX COME BACK AGAIN?

Three catalysts emerged to pave the way for a triplex mower comeback:

1. Lower labor requirements for putting green mowing.

2. Technological advancements in triplex mowers.

3. More flexibility in mowing practices.

The need for less labor to maintain golf courses has arisen from a difficult golf economy. Simply put, triplex mowers require far less labor than walking mowers. A few facts about the growth of golf between 1990 and 2010 will make it clear why there is a drive for efficiency and why this will continue for the foreseeable future.

Despite the phenomenal growth in golfers between 1970 and 1990, growth patterns have since changed. The number of golfers grew by about 9.5 percent between 1990 and 2005 (27.4 million to 30.0 million), but from 2005 through 2010, the number of golfers decreased by 13 percent (30 million to 26.1 million). As a result, there are actually fewer golfers today than in 1990. Unfortunately, the number of courses has increased by approximately 30 percent since 1991 (Golf Course Industry, 2012, and Yasuda, 2012). When supply exceeds demand, prices will be bid down and revenues will decrease.

The above statistics produced a predictable decline in the demand for tee times and private club memberships. It became urgent for golf course superintendents to shift from pursuing maximum quality with increasing budgets to becoming more efficient in order to produce the same level of quality for fewer dollars. Since the late 2000s, most maintenance budgets have been closely reviewed in an effort to squeeze out inefficiencies, but the greatest savings are only going to come by reducing the largest line item: labor. The final part of the course, and arguably the most important part of the course, to be analyzed for reducing costs was the putting greens. Would the trade-off for more efficiency and lower costs be reduced putting green playing quality? Or are there advances in technology that will allow costs to be reduced and quality to be maintained at current levels? Fortunately, leading equipment companies have stepped up in a major way.

Technological advances with the triplex mower are a second catalyst that has enticed more golf facilities to give triplex mowers another look. In my travels as a USGA Green Section agronomist, the quality with triplex mowers has never been better, and those making the change back to triplex mowers have been satisfied thoroughly. Below is a brief list of a few key technological advances of the triplex mower in recent years:

- **Improved Cutting Units:** The same cutting units used on many walking mowers are now used on triplexes. Thus, it is possible to maintain the same height of cut with either mower. In fact, electrically controlled reels are available on triplex machines, too. This allows an equipment technician to vary the frequency of clip, which provides greater control over the bedknife and reel interaction in order to produce desired results.
- **Counter-Rotation Attachment:** The most advanced groomers and brushes are available on triplex mowers today and provide superintendents with another tool to finely manage the turf canopy. One of the big advantages

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of using either a brush or groomer on a mower is that the superintendent is able to perform two tasks at once. Recent triplex mower advances include the installation of counter-rotating (rotation opposite of the direction of the reels) groomers or brushes, which means that sand or debris is no longer discharged into the reel but is pushed into the basket instead. This helps preserve mower and bedknife sharpness.

- **Triplex Ring Prevention:** Reels offset in relation to the wheels or individual reel control features are advances that reduce mechanical stress to the cleanup lap and perimeter of a putting green. In the original triplex mowers, the reel patterns couldn't vary and tire movement caused compaction on the same perimeter areas, resulting in turf decline. The offset reel feature reduces tire compaction with a simple change in direction with the cleanup pass. Varying the cut pattern by turning on or off individual reels is another option for reducing triplex injury at outer perimeters because it allows tire patterns to move to the collar areas rather than putting greens
- **Lower Risk of Hydraulic Leaks:** The risk of a hydraulic oil spill on putting greens with the triplex machines was always a concern. Today, triplex mowers can be powered by electricity without any hydraulics, hybrid technology (combination of electrically controlled reels and hydraulic tractor and reel lifts), or traditional powered hydraulic reels, lifts, and tractor. The elimination of the hydraulic-powered reel circuits on the new electrical and hybrid triplex mowers was key new technology to prevent the number-one problem in the past for oil leakage issues on triplex machines. The belt-driven alternator to power the electric reel motors eliminates this problem. Also, hydraulic triplexes are now equipped with an alarm system mounted on the tractor that signals to the operator when a leakage of four ounces occurs in the hydraulic system, reducing the chance for a major spill on a putting green. Hydraulic hoses also have protective plastic sheaths that protect against rubbing and

Triplex mowers are now essentially built around the identical cutting units as hand mowers. New hybrid and electric models reduce fuel costs and limit issues with hydraulic leaks.

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Hydraulic alarm systems signal to the mower operator when hydraulic leakage happens. This new advancement helps minimize turf injury.

vibration. Finally, many manufacturers now supply their equipment with biodegradable hydraulic fluid. Should a leak occur, there may still be some damage from the heat of the fluid, but this is short lived and allows for rapid turf recovery.

A third catalyst that has driven the return to triplexes is additional flexibility with mowing options. The triplex mower offers an affordable option for double mowing putting greens. Double mowing has been one of the most underutilized management options available to superintendents at golf facilities with modest budgets. Factors limiting double mowing included labor issues and play schedules or just simply having putting greens so large that it would be too big a task for the operators. Today, the triplex mower provides an affordable option for double mowing prior to important golf events. The triplex also provides flexibility during the off-season or winter months in many areas when less labor is available.

IS THE TRIPLEX MOWER A GOOD FIT FOR YOUR GOLF FACILITY?

Is your golf facility seeking ways to maintain current conditions at a lower cost? If so, your course may be a candidate for triplex mowers. Outlined below are questions to consider before making this change.

- Are there design issues that preclude triplex mowing? Sometimes the proximity of slopes or bunkers in relation to the putting green makes triplex mowers impractical and unsafe.
- Is your golf course prone to summer heat and humidity stress? A commonly held view is that walking mowers, particularly those with a floating head, are less stressful to the turf than triplex mowers. While this was certainly true with the first generation of triplex mowers nearly 40 years ago, the improvements in triplex mowers should encourage you to reconsider. Look for similar courses in your area that are using newer triplex mowers and evaluate their results.
- Will the triplex mower produce the desired level of quality at your course? A popular theory is that turf quality is always superior with hand mowers versus triplex mowers. After years of visiting golf facilities, I can say that the quality of the triplex mower cut has never been better. If you are considering a change, work with your local equipment distributors to learn more about these units and make arrangements to either demonstrate the equipment or visit golf facilities using the mowers you are considering.
- What are potential cost savings for triplex mowing versus hand mowing at your facility? There are numerous factors that need to be analyzed for your facility to come up with a rough estimate of the cost differences between walk mowing and triplex mowing.
- **Labor Hours:** How many labor hours are required annually to walk mow or triplex mow your putting greens? What is the average wage per hour paid to perform these tasks?

Innovative brushes and turf groomer attachments are available on triplexes and allow two operations to happen when mowing. New counter rotation of these attachments preserves reel and bedknife sharpness.

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- **Equipment Costs:** Include any ancillary items such as trailers and utility vehicles used when walk mowing greens.
- **Equipment Operating Costs:** Be sure to include fuel costs, parts and repair, etc.
- **Used Equipment Value:** Is there any residual value at the end of the estimated lifespan? Check with your local distributor, as circumstances have changed dramatically in recent years. There is little to no demand for used walking mowers, but there is tremendous demand for high-quality triplex mowers.

CONCLUSION

One of the goals of this article is to provide a thorough review of the history of the triplex mower and provide information on how it may benefit your golf facility. Although difficult economic times are never enjoyable, they do spur creativity and innovation. Our industry is definitely in the midst of rethinking how golf courses are maintained, and success stories are seen each year. As your golf facility makes changes to drive down costs, remember that not only will your course benefit financially, but golf will remain affordable as the game seeks to grow once again. The triplex mower is a workhorse, and it just might drive you toward more prosperous times.

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