Managing New Putting Greens

After a new putting green is built, unique management practices are necessary to promote turf maturation and quality playing conditions.

BY ZACH NICOLUDIS AND ADAM MOELLER

utting green conditions have a tremendous influence on a golfer's perception of a course. Inconsistent, bumpy putting greens frustrate golfers when a well-read, well-struck putt bounces offline. Many maintenance practices can be implemented to improve smoothness and consistency, but sometimes the turf species, poor drainage, or the growing environment are limiting factors in meeting golfer expectations. To address these issues and deliver high-quality putting conditions more consistently, golf facilities often invest in renovating their putting greens.

Arguably the most critical stage in a putting green's life begins immediately after it is established. How new putting greens are maintained during their first year has long-term impacts on turf health and playability. Maintenance practices must be tailored to promote the maturation of new turf so quality playing conditions can be consistently delivered for years to come. This article will guide you through the critical factors that impact the health and performance of newly seeded or sprigged putting greens.

FERTILIZATION

New putting greens require a customized fertilization program. During grow in, a combination of both slow- and quick-release fertilizers will deliver the best results. Slow-release fertilizers provide a steady source of nitrogen and can be applied in larger amounts than quick-release fertilizers with minimal risk of burning the turf or leaching. On the other hand, readily available nitrogen sources provide the quick burst of nitrogen necessary to encourage rapid growth and achieve complete turf coverage.

The key is to fertilize immature putting greens often but in small amounts.

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Table 1: Sample Grow-In Fertilization Schedule

Before planting — usually one to three days before seeding or sprigging	Apply a starter fertilizer — typically in a 1:2:1 ratio of N:P:K — at 1 to 1.5 pound of P_2O_5 per 1,000 square feet. A nutrient package to ensure micronutrients are available in sufficient quantities can also be applied. Also, apply a slow-release product at a rate that provides 1 pound of nitrogen per 1,000 square feet. Ideally, these materials should be lightly incorporated into the upper 1 to 2 inches of the rootzone using a mechanical bunker rake or by hand with a garden rake.
First week following planting (week 1)	Apply a complete fertilizer — typically a 1:1:1 ratio of N:P:K — at 0.3 to 0.5 pound of nitrogen, phosphorus, and potassium per 1,000 square feet. This provides a readily available source of nutrients for the emerging plants.
Second week following planting (week 2)	It is likely that new turf is already surfacing. To apply a light feeding of nitrogen and phosphorus without burning the turf, often a slow-release fertilizer is applied at a rate that provides 0.3 to 0.5 pound of nitrogen per 1,000 square feet.
Third week following planting (week 3)	By now, turfgrass should be rooted enough to withstand its first mowing. This is usually a good time to apply another 0.3 to 0.5 pound of nitrogen per 1,000 square feet. A fertilizer with a 3:1:2 ratio — e.g., 15-5-10 — will provide enough of each element but in small enough amounts to avoid burning new leaves.
Each week thereafter until complete coverage is achieved	Continue this rotation of applications beginning with week 1 and continuing through week 3.

It is not uncommon for a new putting green to require 1.5 to 2 pounds of nitrogen, 1 to 2 pounds of phosphorus, and 1 to 2 pounds of potassium per 1,000 square feet every month until complete coverage is achieved, usually within 6 to 12 weeks. Although the exact amounts of fertilizers must be adjusted to every situation, many superintendents have success using a program similar to that depicted in Table 1.



There is no universal grow-in regime that fits all putting greens because there are simply too many variables. For example, a sprigged bermudagrass putting green must be managed differently than a seeded bentgrass putting green. Grow-in regimes may even need to be adjusted for different putting greens at the same course to account for different microclimates. USGA agronomists and university extension specialists are excellent

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Mowing should begin on new putting greens when the turf is well rooted and the surface is firm enough to support equipment, even if turf coverage is not complete.



Hand watering is labor intensive, but it is the most effective way to apply water where it is needed without overwatering areas that have sufficient moisture.



Frequent evaluations of the soil profile will help guide management practices and provide an opportunity to assess the structure of the mat layer.

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resources for help planning a unique grow-in program for your project.

MOWING

Mowing can begin when putting green turf is well-rooted and the rootzone is firm enough to tolerate equipment traffic. In most cases, mowing begins even if turf coverage is less than 100 percent. The initial mowing height on new bentgrass putting greens should be between 0.180 and 0.250 inch. New ultradwarf bermudagrass putting greens should have an initial mowing height between 0.150 and 0.200 inch. Use a prism gauge to determine the height of newly established turf and decide when to conduct the first mowing. The appropriate mowing height for the first mowing largely depends on the smoothness of the surface. Prior to the first mowing, roll the new putting greens to smooth minor inconsistencies that may have developed during growin. Rolling to continually smooth new putting surfaces can also be beneficial as the mowing height is lowered.

Field experience has shown that it is best to remain at the initial mowing height until putting greens have near complete turf coverage. At this point, the process of gradually lowering the mowing height can begin. Lowering the mowing height in 0.010- to 0.020inch increments should help increase turf density without injuring the turf. Visually inspect the putting surfaces after each mowing when lowering the mowing height. Since it is almost impossible to keep the putting surface perfectly smooth during establishment, minor scalping is inevitable.

If moderate scalping occurs, delay lowering the mowing height further until the reason for scalping is determined. Some likely causes include mower setup issues, surface unevenness, and soft conditions. After the issue has been corrected and the turf has recovered, continue lowering the mowing height at a reasonable pace.

For northern golf facilities, the planting date and unpredictability of when winter dormancy begins can impact the process of lowering the mowing height. Aim to reach a mowing height between 0.140 and 0.150 inch

Green Section Record Vol. 56 (7) April 6, 2018 before turf growth slows during fall. This will allow for a reasonable mowing height when mowing resumes come springtime so that minimal adjustments will be necessary to reach the desired mowing height by the time play begins.

The establishment of bermudagrass putting greens typically begins in early summer. As a result, there is usually ample time to lower the mowing height before cold weather impacts turf growth.

WATER MANAGEMENT

Water management is critical to maintain high-quality putting greens, regardless of age. During the initial phase of grow-in, shallow-rooted seedlings will require light-and-frequent irrigation. As the turf matures, irrigation frequency should transition to deep and infrequent. Portable moisture meters help to establish thresholds for when irrigation is necessary. The USGA article <u>Identify Soil Moisture Status</u> <u>More Accurately Than Ever Before!</u> will guide you on how to utilize portable moisture meters and establish irrigation thresholds at your facility.

Once a threshold has been established, use a moisture meter to check the moisture content of new putting greens every morning. Areas with moisture below the established threshold should then be hand watered. If labor is not available to hand water, carefully use the irrigation system. Keep in mind that each putting green will likely require different amounts of water, requiring site-specific adjustments. Applying the same amount of water to every putting green is a recipe for disease, mechanical damage, and poor playing conditions.

Frequently monitor new putting greens throughout the day to scout for moisture stress. Juvenile turf growing on a new sand-based rootzone can be highly susceptible to wilt. Syringe areas showing signs of wilt to relieve turf stress until soil moisture deficits can be corrected with hand watering or overhead sprinklers. A moisture meter can also be used in the afternoon to identify whether new putting greens need to be proactively watered to prevent wilt.



Deciding to initially maintain a new creeping bentgrass putting green without a collar can help establish healthy turf along the putting green perimeter.

TOPDRESSING AND ORGANIC MATTER MANAGEMENT

Light, frequent topdressing applications should begin as the mowing height is being lowered. This practice smooths the putting surface and dilutes organic matter. However, be mindful that overzealous topdressing can hinder the development of a thin, desirable mat layer (<u>Dowling and Vavrek, 2018</u>). A mat layer diluted with topdressing provides stability to the putting surface and gives it the resiliency required to tolerate maintenance and golfer traffic.

Topdressing at a rate of 0.5 to 1 cubic foot of sand per 1,000 square feet at a frequency that matches the turf growth rate will adequately dilute organic matter. A similar topdressing program should remain as the foundation for managing organic matter throughout the lifetime of the putting greens.

Regularly examine the rootzone profile to guide maintenance programs that prevent excessive organic matter accumulation. Excessive organic matter retains water near the putting surface, creating soft conditions and a variety of turf health issues. Also, use a soil profiler or cup cutter to periodically observe the structure and stability of the mat layer. For a quantitative measurement of organic matter, send



Even when collars are not initially created, some superintendents choose to use turning boards to manage wear in the cleanup pass.



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Discussions about rebuilding putting greens often begin when old putting greens experience turf decline that significantly impacts playability.

undisturbed samples of the soil profile to an accredited soil-testing lab for annual organic matter analyses. Use the test results to establish an organic matter threshold and guide topdressing and aeration.

OPENING FOR PLAY

Committing to a firm opening date well in advance of project completion is not recommended. Delays during construction and establishment are common. Further, the rate of turf maturation is highly weather dependent. As new putting greens mature, hold regular meetings involving the golf course superintendent and other facility decision-makers to build consensus on when to open them for play.

New putting greens could be weeks away from being ready for play despite having complete turf coverage. Cultural practices during grow-in focus on producing a deep root system, complete turf coverage, and a thin mat layer. Opening the putting greens to play will likely result in rapid turf thinning if any of these goals have not been achieved. Prematurely opened putting greens may even need to be closed to promote further maturation.

Determining when a new putting green is ready to be opened is more

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of an art than a science. Frequently inspect the soil profile and test the stability of the surface before opening a new putting green for play. The turf and rootzone mix should feel stable and firm when you press down on the surface with your fingers. A 0.25-inchthick mat layer typically provides the stability and resiliency a putting green needs to handle maintenance and golfer traffic. Once a putting green reaches this level of maturity, it is likely ready to be opened for play.

MANAGEMENT TIPS FOR YEAR ONE

PLAY VOLUME

Golfers are understandably eager to enjoy new putting greens. Unfortunately, concentrated foot traffic combined with maintenance equipment traffic can quickly lead to turf thinning. Therefore, it is a good idea to limit the number of rounds when new putting greens are first opened for play. This provides an opportunity to evaluate turf resiliency before a full day of rounds is permitted. Control daily play volume while the new putting greens mature by establishing a maximum number of rounds or by lengthening tee time intervals to 10 or even 15 minutes. Also, restrict



rounds when weather forecasts predict extreme heat, high humidity, or heavy rainfall, since new turf is especially vulnerable to decline during these conditions.

HOLE LOCATIONS AND TRAFFIC

Disperse hole locations over all available cupping areas to reduce concentrated foot traffic. Use a digital level to determine all possible areas for hole locations, a process that can be especially challenging on putting greens with new contours. Document each day's hole location to avoid overusing an area. Additionally, train employees to recognize signs of turf thinning and teach them to avoid setting hole locations in stressed areas. Traffic control around new putting greens must be especially diligent. Use ropes, signs, and barriers to direct players to as many different entrance and exit points as possible.

COLLARS

Maintaining healthy collars on new putting greens is often a challenge. Some facilities maintain new creeping bentgrass putting greens without a collar until after the first year of growth because juvenile turf maintained at

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Some scalping is likely to occur as the mowing height of new putting greens is lowered. Topdressing and frequent rolling should help smooth the surface and minimize scalping.

collar height actually has lower traffic tolerance than turf maintained at putting green height. Many courses maintain an intermediate rough around new putting greens if a collar is not immediately established. If a collar is immediately established on new creeping bentgrass putting greens, a mowing height near 0.250 to 0.300 inch often results in better traffic tolerance than a higher height. Additionally, mowing with walk mowers may require placing turning boards on the collars to protect them from mechanical damage. The USGA article Collar Problems and How to Prevent Them provides additional information on maintaining healthy collars.

New ultradwarf bermudagrass putting greens have collars that are planted with a different bermudagrass variety or another warm-season grass. Increased fertilizer rates to establish new putting greens can over-stimulate collar growth, causing encroachment into the putting green. Encroachment from the collar can be controlled by using a <u>simple edging tool</u>.

AERATION

Putting green performance and organic matter development should determine aeration practices during the first year. There are a few indicators that can help determine the need to remove organic matter. For instance, aeration is probably not needed if golfer and maintenance traffic cause excessive wear and turf thinning during the first year. Exploding ball marks that are impossible to repair and collapsing hole edges are signs that a putting green lacks structure and does not yet need core aeration. If core aeration is not necessary, use solid-tine aeration to break surface tension in the mat layer and increase gas exchange into the rootzone.

MANAGING EXPECTATIONS

Superintendents and other facility decision-makers must establish reasonable expectations for the playability of new putting greens and communicate that information to golfers. It often takes 12 to 18 or more months before a new putting green matures to the point where it can withstand intensive maintenance. As a result, new putting greens often must be maintained at a slower green speed than golfers have come to expect of mature putting greens. Having patience will help ensure that new putting greens are not subjected to unnecessary risks. Even short-term demands for fast green speeds could jeopardize turf health on young putting greens. The result could be long-term issues and possibly prolonged recovery time.

CONCLUSION

Every putting green establishment project presents a unique set of challenges. A lot can be learned from other facilities that have undertaken similar projects, but it is important to remember that each situation is different. Just because one course started mowing new putting greens at a certain height or opened them for play on a certain date does not mean that the same program will work at a different facility. Assess the unique circumstances of putting green establishment at your facility and determine the best strategies for managing new turf. Successful grow-in and maturation during the first year set the stage for healthy, high-quality putting greens for years to come.

REFERENCES

Vavrek, Bob, and Elliott Dowling. "<u>USGA Putting Greens: 58 Years of</u> <u>Innovation and Counting</u>." USGA Green Section Record, vol. 56, no. 3, Feb. 2018.

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