

Regrassing Cool-Season Putting Greens With Sod

An old concept with a new twist sparks renewed interest in regrassing greens for northern golf facilities in the U.S. and Canada.

BY JIM SKORULSKI

Regrassing putting greens was once looked upon as an interesting concept that was suited primarily for high-budget golf facilities with members willing to tolerate the process. Convincing northern golfers of the merits of shutting down their golf course in early to mid-August and then opening the following spring to provide a monostand of creeping bentgrass was never an easy sell. Recently, however, there has been renewed interest in regrassing and rebuilding cool-season putting greens — and for good reason! New bentgrass cultivars are durable and provide excellent playing conditions over a wide range of weather and moisture conditions. Annual bluegrass (*Poa annua*), on the other hand, is far less reliable in that it is highly vulnerable to annual bluegrass weevil and disease pathogens, combined with poor heat and cold tolerance. This equates to high management costs and many sleepless nights for those who manage it. The growing availability of quality commercial bentgrass sod and renewed confidence in its use have also made regrassing programs a more practical option in cooler climates where a disruption in play for any reason is not popular. Golf facilities that have successfully regrassed or rebuilt greens are rewarded with much improved and more reliable playing surfaces that can be managed to be consistently firmer and faster. This article will take a closer look at the regrassing concept and how it might be more applicable to your golf facility than you think.

REGASS OR REBUILD?

Regrassing is not recommended for every golf facility, and it may not even be an option unless greens are rebuilt



The quality of the sod, whether grown on sand that meets USGA recommendations or that is washed, is critical to the establishment of the sod and ultimate success of the project.

first. Poorly designed greens with serious drainage issues are always better candidates for reconstruction. Reconstruction is more costly, but it offers an opportunity to address major design and agronomic flaws. It involves altering the architectural design (if necessary), installing new rootzones, adding internal drainage, and, finally, resurfacing the greens with new turf. Conversely, simply regrassing is much less invasive and will usually include some aggressive soil modification techniques, the installation of sand channel drainage (where necessary), fumigation, and replacing the turf. Either option is only suitable when the green complexes and sites themselves can support bentgrass growth. More specifically, this includes full exposure

to sun and air movement. Those not willing to remove the trees necessary to properly manage bentgrass should not pursue this option! Annual bluegrass, for all its weaknesses, does tolerate shade and wet environments and is a better choice in those situations. The USGA Turf Advisory Service can be a highly valuable tool in helping to evaluate your green complexes and provide an objective opinion on regrassing or rebuilding options.

SOD SELECTION

Regrassing greens with sod is the primary focus of this article. Most turf managers would prefer establishing putting green turf from seed, and many have done so successfully. But, in reality, sod has become a more prac-

Considerations before regrassing:

- Is regrassing or rebuilding the best option?
- Will the existing rootzone support creeping bentgrass?
- Are major grade changes required to provide surface drainage or enlarge hole location areas?
- Have the growing environments for each green been thoroughly assessed to make sure there is adequate sunlight and air circulation?
- Will the membership support the project and the related work to prepare the green sites for regrassing and proper management of bentgrass?

tical choice in northern climates where a shorter growing season makes late summer course closures required for seeding very unpopular. The use of sod will significantly increase project cost but should shorten the time greens will be out of play. That said, the project's ultimate success relies heavily on the quality of sod used to regrass the greens. It is critical for golf facilities planning to use sod to begin the selection process far in advance of the project to ensure that high-quality sod will be available. Regrassing projects that are done on short notice have much less flexibility and are often forced to accept whatever sod is available at the time.

There are several types of commercial bentgrass sod used to regrass greens, the two most common being sod that is harvested from sand-based rootzones or sod that has been washed to remove soil. Sod produced on native soils that will be installed over high-sand rootzones should always be washed to remove the soil that would otherwise create an unwanted soil layer condition that will impact water movement through the soil profile and adversely affect establishment. Sod that is grown on sands that meet [USGA Recommendations for a Method of Putting Green Construction](#) can be placed over other high-sand rootzones so long as the sands are compatible. A physical soil analysis should always be completed to make sure the sands are compatible. Both types of commercial sod are used successfully for green establishment projects. Sod grown on sand will probably establish more quickly than

washed sod, but it will also be more expensive. The option to contract with a sod producer to grow sod on sand that you specify may be an option in regions where washing equipment is not available.

There are certain things to look for when selecting a commercial grower to produce sod for a project. Obviously, the grower should be reputable for reliability and the quality of sod produced. It is a good idea to tour other golf courses where sod has been used and inquire about the quality of the sod at the time of delivery and overall experience of working with the pro-



Sod grown on a native soil was placed over a sand-based rootzone, creating a layer condition that will have long-term impacts on establishment and the greens' performance. Aggressive cultivation will be needed to remove the soil layer and its impacts.

ducer. Meet with sod producers and tour their facilities. The fields should be clean and free of annual bluegrass and other weeds. Check the soil texture in the fields where the sod is produced. Determine whether the grower is willing to produce sod on specific sand for you or if they have washing capabilities. Ask the grower about their maintenance practices. Do they have the equipment and capability to manage the bentgrass to putting green standards? Are bentgrass fields topdressed with sand? Will they topdress your sod if requested? Ask the grower what cultivars are being produced and if they are willing to contract-grow specific cultivars. Will the grower establish the fields based on the date it is to be harvested for your project? Ask about fertility practices. Check thatch levels in fields that are marked for harvest. What is the height of cut at which the sod is maintained and will be harvested? Are plant growth regulators used, and what programs are in place to eradicate annual bluegrass? How will the sod be harvested and shipped to your golf facility?

REGRASSING PROCESS

Every regrassing process differs depending on many site-specific variables, including the condition of the rootzone, whether surface modifications are necessary to improve drainage or soften contours, if green perimeters have been lost and are to be restored, if slit drainage will be added, and whether the green complexes will be fumigated. The regrassing process offers a unique opportunity to complete practices that would otherwise



Annual bluegrass control programs begin with soil fumigation and continue as soon as the sod is installed. Hand picking or dabbing plants and the use of growth regulators and preemergent herbicides offer the best control options. Several new selective herbicides are also showing promise against annual bluegrass in trials.



Sod is being removed from a green which can then be cultivated and fumigated prior to installing new sod.

be too disruptive. Use the opportunity to address contouring and drainage issues as well as thatch or other soil-related problems. Speak with superintendents, sod growers, and contractors who have completed regrassing projects to help formulate a specific plan at your facility. Work closely with your USGA agronomist to evaluate the putting green rootzone and determine the best cultivation methods to prepare the surfaces for sodding. The process will include multiple core aerations. Sometimes deeper soil modification is necessary where thatch levels are excessive or more extensive soil modification is recommended. If only organic accumulation near the surface requires attention, then core aeration and deep vertical mowing may be all that is needed after the old sod has been removed from the surface. Fertilizer amendments should be added at this time, and the surfaces raked and rolled to create a smooth, firm surface that ties in smoothly to the green surrounds.

Most who have regrassed greens also fumigated the rootzones to rid the soil of annual bluegrass seed, disease pathogens, and parasitic nematodes. The most popular fumigant, methyl bromide, will be phased out by 2013, so those wishing to fumigate after that time will be required to use alternative products like Basamid®. There are other alternatives as well, but their cost and use protocols differ from methyl bromide. Several references regarding the fumigation process are listed at the end of the article.

ESTABLISHMENT PROGRAMS

The methods for establishing bentgrass putting green sod vary depending upon the type of sod, i.e., washed versus unwashed, and its condition. Sod that has been managed to putting green standards in the field will establish and transition more quickly and easily into putting green turf at your site. Sod that has excessive thatch will always be more difficult and slower to establish, while also requiring more intensive cultivation to reduce thatch. Sod delivered to the golf course should be fresh with no obvious signs of desiccation, heat damage, or disease activity. Check washed sod to make

sure that most of the soil has in fact been removed. Washed sod will often be fragile. Do not be alarmed, as this is a good indication that the sod was harvested at a good stage of development. It may look weak, but its establishment and performance long term will be better than that of older sod with too much thatch. Do not accept sod that is contaminated with annual bluegrass or is showing obvious signs of damage from harvest or transport. Coordinate the delivery of the sod to minimize the time between harvest and installation. Order enough sod to establish a putting green nursery that is built with the same sand rootzone mix that is used to topdress greens. That sod will be used to replace any sod that does not establish well or where annual bluegrass becomes established.

The basic establishment processes focus on promoting rapid root development while gradually lowering mowing heights and preparing the surface for play. Rolling is an important aspect during establishment. Sod produced on sand can be rolled with heavier rollers, such as a one-ton roller, almost immediately after installation to smooth



Overly mature washed sod can be too thatchy. A thick thatch mat will make it more challenging to establish the sod and will require more cultivation.

the grade. The sod may shift slightly, but seams can be topdressed. Washed sod can be rolled with lighter rollers, such as those commonly used on putting greens, tennis courts, or for landscape purposes, after it has knitted to the underlying soil. Heavier

rollers can then be used once the washed sod is better established and stable. Regular, light sand topdressing should be initiated soon after sod installation to begin to stabilize and level the surface in preparation for lower mowing heights and to protect plant crowns.

Mowing is initiated as soon as the sod is stable enough to do so. The sod will be vulnerable to scalping, so be patient and lower the cutting units in increments of 0.01 to 0.02 inches as the surfaces become smoother and more stable from topdressing and rolling. Maintain collars at the same mowing heights as the greens throughout the establishment of the sod. Equipment mowers with smooth front rollers at least in the initial establishment phase. Mowing and other forms of mechanical injury can go unnoticed but seriously impede the establishment process. Take a conservative approach to mowing new sod. The presence of off-color or chlorotic patches of turf across the surface is a subtle sign that mowers are probably set too low and that more topdressing and/or rolling are required before the height of cut is lowered further. Ball roll will be very good over the new surfaces, but it should not dictate management decisions. Do not push new sod too aggressively in its



Rolling is an important process in establishing new sod. Rolling with a heavier one-ton roller was initiated after the washed sod was well knitted and stable or about four weeks after installation.

first season of growth. Remember, the objective is to establish and enjoy the new stand of bentgrass for years to come, so exercise extra caution in the first year or two.

One primary challenge with using sod has been overcoming the effects of the interface between sod and underlying soils. The interface is caused by a physical incompatibility between the parent material on which the sod was grown and the rootzone soils in the greens. The interface, or layer, is most problematic when the parent soils contained within the sod are finer textured than the underlying rootzone soils of the greens. A soil layer of this sort will retain excessive water in the sod that leads to saturated surfaces. This prevents gas exchange and inhibits root development. The wet surfaces will remain soft, making the turf more susceptible to mechanical injury. This is why it is critical to make sure that purchased sod is grown on sand compatible with that in your greens or that soil is washed and removed from the sod. A soil interface or layering effect can also be the result of a dense thatch and/or mat resulting from overly mature or poorly managed sod.

Managing or eliminating soil layering involves a structured cultivation program. The aggressiveness of that program depends on the extent of the interface between the sod and underlying soils. Cultivation with ¼-inch-diameter solid or hollow tines is usually completed as soon as the sod is securely rooted to the underlying soil. That program will be repeated the following spring or continued regularly through the season if sod is installed in the spring. Cultivating with larger ½-inch-diameter hollow tines may be required where thatch levels are very high or a distinct soil interface exists. Expect to cultivate the new surfaces every three to four weeks through the first few years of establishment. Most of that will involve venting the greens with smaller needle tines, but ¼-inch-diameter hollow and solid tines should be used as well to maintain adequate gas exchange in the rootzone. Frequent cultivation of the new surfaces may seem contradictory to some, but it is an important strategy that will maintain

good gas exchange through the upper rootzone and interface, and it is critical for turf establishment. Work closely with your USGA agronomist to help formulate a cultivation program to ensure a successful sodding project, and especially so if there is a soil layering problem or excess organic matter associated with the sod.



New washed sod is being rolled carefully not long after installation to begin to stabilize and smooth the surface.

Collars can prove to be more challenging to establish than greens. New bentgrass is prone to traffic damage, especially once it has thinned or if it is allowed to grow longer or become leggy. Maintaining the collar at the same height of cut as the putting green will help develop a dense turf canopy that has better wear tolerance. The collar height of cut can be finalized after the sod is fully established and at some point after the greens are opened to play. Bench setting heights of 0.325 to 0.350 inch are not uncommon for establishing new collars. Brush and cut the collars to keep the surfaces upright and dense. Do not allow mowers to turn directly on collars or greens rollers to stop and start

there. Utilize mats, boards, or lattice where mowers are forced to turn on sodded collars.

There is a wide array of ideas regarding fertility management plans for new greens. A balanced pre-plant fertilizer should be made. A natural organic fertilizer can be used as long as soil temperatures remain warm enough to ensure nitrogen availability to the turf. Triple 10-10-10 (N-P-K) or a starter fertilizer can also be raked into the surface soils to provide 0.5 pound of nitrogen per 1,000 square feet. Post-plant fertilizer programs during establishment focus on providing enough nutrients to keep the sod growing vigorously and to produce a dense root system. The specifics of the fertilizer program for your site and conditions can be discussed with your USGA Green Section agronomist

ANNUAL BLUEGRASS CONTROL

The most effective strategy for managing annual bluegrass in regrassed greens is to begin with clean sod and soil. Fumigation remains the only means to eliminate the annual bluegrass seed bank from the soils. Collars, approaches, and rough in the green surrounds containing annual bluegrass should be fumigated or at least regrassed to keep annual bluegrass as far from the greens as possible. The first line of defense against annual bluegrass is to hand pick plants as they become visible. This strategy has delayed the onset of annual bluegrass encroachment into new greens at many golf courses. Dabbers containing herbicide can also be used to control individual colonies of annual bluegrass as they become noticeable. Larger-scale chemical control programs using plant growth regulators paclobutrazol or flurprimidol, as well as the preemergent herbicide Bensulide, are also options to control annual bluegrass populations. The growth regulator programs rely on regular applications of the products through the growing season. Bensulide is usually applied in a split in late summer to prevent annual bluegrass establishment in the fall.

Controlling annual bluegrass will be a major challenge in managing the



More northern golf courses are turning to commercial sod to establish greens that have been rebuilt or regrassed. A good-quality sod can speed the establishment process and reduce the time greens are taken out of play.

new surfaces. Superintendents and turf managers need to remain vigilant and be almost fanatical in keeping the greens clean. One or two individual plants can quickly become 10 to 20, and in no time the problem explodes. There is hope that a safe and selective herbicide for controlling annual bluegrass on bentgrass greens will one day be available. There are several herbicides that show promise and one, Methiozolin, is particularly promising in research trials. We all hope that the silver bullet for managing annual bluegrass will soon be found. Until then, we will be left to use a combination of cultural practices and chemical controls to suppress annual bluegrass.

COST BENEFIT

Is the investment to regrass greens worth it? After all, a project like this can cost \$250,000 to \$500,000, depending on the depth of work included. There are costs associated with tree removal, installation of sand slit drainage, green contour changes, green extensions, and regrassing approaches and green surrounds. This estimate does not include lost revenues from closing the course to complete the project. The sticker price of upgrading to pure bentgrass greens may seem high, but so are costs of doing nothing. The annual costs associated with winter cover

systems, disease and insect management programs, seed suppression programs, and the labor to manage annual bluegrass greens are not only high but not always successful. Golf courses that have suffered extensive damage to annual bluegrass greens to winterkill, heat stress, or pest damage are fully aware of revenue losses incurred when temporary greens are required. The monetary benefits of a regrassing project, other than potential cost savings alluded to above, are harder to define but might be equally important to a golf course operation in a competitive market. The ability to provide uniform, smooth, and fast playing surfaces on a more consistent basis will keep the golf course appealing to golfers and competitive with other operations. A successful regrassing operation is not only a strong marketing tool but also is a means to create a more sustainable operation in the modern era of golf.

The increased availability of bentgrass sod and the allure of new bentgrass cultivars have created an unprecedented opportunity for northern golf courses to raise the quality and dependability of their putting surfaces as never before. Regrassing is not for every golf course, but with thorough planning, the right growing conditions, the use of quality sod, a good

establishment program, and realistic play expectations, it can produce superior putting surfaces that should require fewer management inputs.

FURTHER READING

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