

# Green Side Up!

Sodding putting greens can be a viable method of establishment with proper care, good product, and reasonable expectations.

BY MATT NELSON



Quality bentgrass sod will establish quickly when placed on a well-chosen and prepared sand rootzone.

Given the option, most cool-season turf managers would prefer to establish putting green turfgrass directly from seed. Seeding enables turfgrass plants to germinate, establish, and mature in the rootzone selected for the greens. Strong roots will develop in a well-oxygenated sand rootzone, and the developing thatch/mat layer can be integrated with sand during grow-in to avoid layering and maintain optimal soil structure. Surfaces can be prepared during construction and maintained during grow-in with topdressing, grooming, and rolling to provide superior smoothness and playability. Typically, creeping bentgrass establishment from seed requires at least 12-16 weeks of good growing weather for sufficient maturation to tolerate play. Seeding in late summer is preferred, taking advantage of warm soils, cooling nights, reduced disease pressure, and limited

physiological stress for best establishment. When grow-in goes well, greens seeded in mid to late August are ready for play by late May or early June of the next year across most of the northern United States.

At many northerly and higher-elevation sites, however, a limited growing season extends the amount of time required to open seeded putting greens. A longer grow-in may not fit the timeline at higher-end projects dependent upon real estate sales and/or revenue generation. Sod has become increasingly utilized at these types of locations to compress the window between construction and opening.

Winterkill and renovation projects also contribute to the demand for high-quality putting green sod. Replacing putting green turf dominated by annual bluegrass (*Poa annua*) with creeping bentgrass sod significantly improves

turfgrass reliability over the winter. Installing bentgrass sod will not overcome limitations with respect to shade or poor design, but improved resistance to freeze injury can be expected.

Regrassing with improved creeping bentgrass cultivars also may be a viable means of meeting golfer expectations with respect to putting quality and turfgrass performance.<sup>1</sup> Many of the newer cultivars of creeping bentgrass exhibit good tolerance of close mowing, disease resistance, outstanding morphological characteristics, and enhanced overall stress tolerance. In some climates it is a real challenge to meet current golfer expectations for ball roll and consistency with a mix of annual bluegrass and older genotypes of creeping bentgrass due to anthracnose, nematodes, and/or physiological stress.



A long grow-in time does not always fit into a project timeline. Sod provides an opportunity for rapid putting green establishment.

Sod quality and production has evolved considerably in recent years, meeting industry demands for agronomic excellence and superior playability in a short time. This article will address some of the major issues regarding putting green sod selection and establishment for the best opportunity for success. Although the information in this article pertains directly to creeping bentgrass putting green turf, the principles of agronomy should be pertinent to the culture of bermudagrass sod in warm-season climates.

### SELECTING THE BEST SOD

Of paramount importance when selecting putting green sod is rootzone compatibility. Sod grown in soil that is finer textured than

the underlying rootzone will likely pose establishment difficulty, as excess moisture held in the sod layer will limit root growth and gas exchange. Creeping bentgrass sod grown in a clay, silt, or loam soil placed on a sand rootzone is practically doomed from the start and should never be considered. Superintendents or project managers should visit potential sod farms and ask for particle size distribution analyses from the top one or two inches (depending upon cutting depth) of the sod rootzone. These test results can be compared with rootzone mix parameters of the putting greens to estimate physical compatibility. If in doubt, seek input from an agronomist, university extension specialist, or a USGA-accredited physical soil testing laboratory.

In recent years, soilless sod has become available in the western United States. This patented technology involves producing creeping bentgrass sod on thin plastic with only enough sand to germinate seed and establish the turf. The risk of rootzone incompatibility may be reduced with this type of sod, although organic matter accumulation must be managed appropriately, a concern with practically all types of bentgrass sod. Sod grown on plastic does not require bottom cutting for harvest; thus, turfgrass roots remain intact although bound in the thatch/mat layer. Producers market the lack of root cutting as a benefit to establishment. Sod produced on plastic can usually be harvested at various widths, since undercutting is not required.

Selecting young sod (less than one year or so) is usually desirable, since thatch will be more manageable. Excess thatch can restrict gas exchange into the rootzone, hold too much moisture near the surface, decrease tolerance of environmental extremes, increase the likelihood of mechanical injury as cutting heights are lowered, and compromise recuperative potential of the turf. About 0.75 inch of thatch or less would be considered desirable when selecting putting green sod.

Cultivar selection can be based upon regional NTEP (National Turfgrass Evaluation Program) trials, regional performance, compatibility with existing turf (if only sodding one or a few greens), player expectations, and maintenance capability. If a major renovation involving sod is to be carried out, most producers will contract to grow the cultivar of choice and, within reason, manage accordingly. Perhaps growth regulator applications and/or topdressing will be

desired, and these practices are feasible provided equipment and costs are identified. Long-distance transport for the sod may require refrigeration to avoid desiccation and damage to the sod.

## ESTABLISHMENT TIPS — GREEN SIDE UP!

Anybody who has had the good fortune to have hands-on involvement with major sod projects has heard all the installment jokes, none of which will be repeated here. Jokes and puns aside, however, there are some tried and true tips worth considering when working with putting green sod.

Using big rolls of sod is not necessary for a successful project, but they provide some advantages. Big rolls speed the installation process, which can be advantageous under many circumstances. Fewer pieces of sod also mean fewer seams for potentially smoother surfaces earlier, slightly easier management, and reduced risk of edge desiccation.

The prepared finished grade should be smooth and firm. Ideally, the surface should be firm enough that footprints are less than 0.25 inch deep. Check grades with a digital level and survey equipment to ensure that putting greens have positive surface drainage for water discharge. This point is especially critical where winterkill is an issue; water from melting snow and ice needs to flow off of putting green turf.

When renovating existing greens, cut the existing sod deep enough to remove organic matter from the upper soil profile. Leaving behind excess organic matter compromises soil structure and potentially skews the balance between capillary and non-capillary porosity. Roots from the new turfgrass sod will have a difficult time penetrating thatch or mat layers present in the rootzone. Aggressively cultivating the rootzone of older greens prior to installing sod presents a good opportunity to modify soils with sand for improved physical properties and performance. Conventional or deep-tine aeration both are viable options, depending upon root-



zone properties, and aggressive cultivation prior to sod establishment can enhance success with potentially reduced surface disruption during establishment. Physical testing of existing rootzone parameters prior to renovation and regrassing will provide valuable insight into necessary rootzone modifications.

Install sod as uniformly as possible and, with renovations, pay special attention to grade tie-ins. Offset seams for reduced displacement, mechanical damage, and desiccation. Avoid damaging the prepared finished grade or imparting excess wear on newly installed sod by using plywood to walk on or drive installation machinery.

Once sod is installed, aggressive rolling will firm and smooth the surface. Walk-behind vibratory asphalt rollers or riding one-ton asphalt rollers typically provide best results. Rolling can begin immediately after the sod has been laid and can be repeated every few days during the establishment process. Smoothing the surface limits mechanical damage (scalping) from mowers as height of cut is reduced in preparation for play, and it also helps provide optimal playing quality.

Begin mowing at a reasonable height of cut as soon as possible to avoid scalping and mechanical damage. It is important to begin mowing soon after installation to avoid letting the turf become

Sod grown on plastic may reduce soil compatibility issues and does not require cutting turfgrass roots during harvest.



Using plywood helps to limit wear injury to sod and is a good tip during successful installation.

puffy and to start the process of lowering the height of cut in preparation for the planned opening date. Floating-head, walk-behind mowers equipped with a smooth, out-front roller minimize the potential for mechanical damage. Be diligent with cutting height reductions to prepare the surface for play, but don't hesitate to raise the height of cut in the event of excessive scalping, as mechanical damage can take a long time to recover and may jeopardize the opening date, playing quality, and short- and long-term performance of the turf.

Taking the time to hand topdress the sod seams will limit the potential for mechanical injury, lessen the potential for desiccation of sod edges, and hasten the development of the desired surface smoothness. Green colored sand has worked well for seam topdressing during cool spring weather, as colored sand will absorb more heat and some superintendents report quicker stitching of individual sod pieces. Heavy sand topdressing of the entire sodded green at rates of 250–350 lbs. of sand per 1,000 sq. ft. for the first three to four weeks also will be very important for surface smoothing and preparing the green for play. Integrating sand into the organic matter layer as quickly as possible also will establish sand as the dominant component of the thatch/mat matrix and provide balanced soil structure for good agronomic performance and playability. Physically incorporate sand into the turfgrass canopy by brushing or dragging.

Aerating new sod as quickly as possible has repeatedly demonstrated great results in the field

with respect to vigorous establishment. Aeration can often be conducted within the first week of installation with the proper technique. Small-diameter solid or hollow tines (0.25–0.375 inch) provide good results since the primary objective of early cultivation is to maintain good gas exchange through the sod layer and encourage roots to penetrate into the underlying rootzone. Repeating this procedure once or twice prior to opening the greens is advised since cultivation is typically more difficult to employ once the greens are opened for play. Periodic aeration with small-diameter solid tines or slicing units during the first season will safeguard turf health by promoting gas exchange into the rootzone and preventing sealing that is often a concern on newly sodded greens. Watch for signs of reduced turf vigor, poor recuperative potential, or development of black algae on the surface. These conditions usually indicate insufficient oxygen in the rootzone.

Fertility recommendations vary considerably between new construction and renovation of existing greens. Soil testing is a good place to start. With new construction, pre-plant fertility usually includes a homogenous starter fertilizer application at a rate of around 1 lb. nitrogen and  $P_2O_5$  per 1,000 sq. ft. Good results have been observed where starter fertilizer is augmented with additional controlled-release fertilizer in a balanced formulation of nitrogen, phosphorus, and potassium at 1–2 lbs. each per 1,000 sq. ft.

Pre-plant fertilization rates for existing rootzones will be lower than new construction. Consult with your regional USGA agronomist, soil testing laboratories, and/or university turfgrass extension personnel for best advice at your particular location.

Once installed, relatively modest and frequent applications of complete fertilizer usually provide good results.

## IN-HOUSE CUSTOM SOD

Occasionally there is a need to renovate one or more greens at an older golf course not experiencing agronomic problems. The design may be outdated, with excessive slopes for modern green speed or insufficient area to adequately support the volume of play.<sup>2</sup> Property sales or trades may necessitate relocating a green. In these instances, matching the turfgrass composition and playability with the existing greens is a primary objective. At most cool-season golf courses, this

constitutes a mix of various genotypes of annual bluegrass and creeping bentgrass.

With proper planning, a nursery green can be created utilizing aeration plugs from the existing greens and perhaps a little bentgrass seed.<sup>3</sup> Usable sod normally can be obtained in about a year, depending on the growing season, management capability, and nursery location. Similar management protocol will apply as suggested above, and using the best available means to harvest uniform sod will yield the best results.<sup>4</sup>

## DETERMINING AN OPENING DATE

Creeping bentgrass putting green sod usually requires at least 4–6 weeks of decent growing weather for adequate establishment to tolerate play. Root growth should be at least a few inches into the rootzone for anchoring and stability, and to take up sufficient nutrients and water for vigorous growth and recovery. Surface preparation needs to be advanced enough to provide good ball roll characteristics and tolerate reasonable mowing without scalping.

Ultimately, reasonable expectations need to be established early on in the construction and renovation process. Opening newly sodded greens too early can jeopardize performance, result in turfgrass failure, and threaten a significant investment. Green speed expectations should be properly balanced with long-term performance during the first few months of playing the sodded greens. Scheduling some time for cultivation and topdressing will safeguard success. Closing one day or half a day per week and providing the turf a chance to recover from wear and stress can make an enormous difference in putting green performance.

Among the best recommendations for managing newly sodded greens is to give the golf course superintendent and green committee sole discretion to close the greens should turfgrass decline or failure become evident. New sod generally does not have the recuperative potential of established turf, and a modest to heavy volume of play can result in rapid and significant decline. A “soft opening” during the first few weeks of play, whereby the greens are played for 3 or 4 days and then rested for 2 or 3 days is often a good way to allow golfers on the greens fairly quickly (4–6 weeks after installation) while still enabling the new sod to establish and mature. Every situation is slightly different, but adopting a fairly conservative approach with

respect to agronomic realities and golfer expectations is advised.

## GREEN SIDE UP!

Sod production methods have evolved considerably in the past decade or so and present viable options with respect to turfgrass establishment on putting greens. Production on construction specification sand, washed sod, and sod grown on plastic have facilitated smoother and more successful projects and can provide championship-level putting surfaces in a previously unattainable time frame. Proper planning, product selection, installation, and construction techniques, and good management make sod a realistic option for putting green turfgrass establishment at new or existing golf courses.



Green side up!  
An instant putting green.

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**MATTHEW “SOD” NELSON** is senior agronomist in the USGA Green Section's Northwest Region, visiting golf courses in the Rocky Mountains of the United States and Canada.