

# Turf Reduction Template

A guideline for reducing turf acreage while maintaining golf course quality.

BY PATRICK GROSS AND TODD ECKENRODE



*Encircling a grove of trees with a three- to four-inch layer of a playable mulch material is an effective method to eliminate turf and reduce water consumption.*

**H**ow much turf does a golf course really need? Drought and economic issues coupled with a sharp increase in the price of water have course owners and superintendents reevaluating their golf courses and making difficult decisions on where to best utilize shrinking resources. A common strategy is to reduce the amount of water and resources evenly over the entire golf course. A different approach is to take the same amount of resources and apply them to a

reduced amount of turf acreage. When considering a turf reduction project, the question then becomes what to cut and what to keep.

A 2007 survey published by The Environmental Institute for Golf indicated that the average size of an 18-hole course in the United States is 150 acres, of which 100 acres is maintained turfgrass. And of the 100 acres of maintained turfgrass, just over half (51 acres) is designated as rough and out-of-play areas.<sup>1</sup> Reducing the

amount of rough and eliminating turf in non-play areas create excellent opportunities to save money by reducing costs for irrigation, fertilizers and other turf care products, mowing, and maintenance.

Water districts throughout the southwestern U.S. have recognized this opportunity and offer attractive rebates to golf courses and other large landscapes that pursue turf removal projects. Such programs have been very helpful to offset the cost of the



Once potential areas for turf reduction have been identified and integrated into the design, it is possible to accurately measure the proposed areas on the GPS base map and incorporate necessary adjustments to the irrigation system. Precise measurements provide a basis for the development of accurate budgets before the work begins.

projects and have created an incentive for golf courses to do the work.

Like many projects, it is sometimes difficult to decide where to begin. In this article a step-by-step approach for planning and implementing a turf removal project is discussed. Recommended steps are outlined as follows:

- Site assessment and architectural considerations
- Planting and design
- Irrigation adjustments
- Implementing the plan
- Turf removal
- Maintenance considerations
- Measuring and evaluating the effectiveness of the plan

## SITE ASSESSMENT AND ARCHITECTURAL CONSIDERATIONS

Four primary goals for every turf reduction project should include:

- Ensure that there will be no loss of playability.

- The project will maintain, if not enhance, the pace of play.
- Reduce or eliminate the amount of maintenance and resources needed in out-of-play areas.
- The end result will improve the popularity of the golf course.

To achieve these goals, it is necessary to begin with a detailed site assessment. This is best accomplished with the help of a golf course architect who can provide an impartial review of existing conditions along with an assessment of playing characteristics and unique qualities of each hole. Assembling a group and walking the golf course with the architect, superintendent, PGA professional, and committee provides a good opportunity to perform a ground-level analysis and discuss playability and golfer tendencies on each hole.

Next, using an accurate GPS base map, various design concepts can be sketched and discussed regarding

potential areas for turf reduction. A map that includes an overlay of the irrigation system is important for this purpose so that design concepts are carefully coordinated with the existing irrigation system. The following areas provide good opportunities for reducing turf without affecting the overall playing quality of the golf course:

- Out-of-play areas in the rough
- Tee banks
- Elimination of underutilized tees
- Green banks
- Densely shaded areas where it is difficult to maintain turf
- Perimeter areas of the golf course where there is a need to eliminate overspray of recycled irrigation water onto adjacent properties

Equally important is designating areas where turf should be preserved so as to not slow the pace of play or unfairly penalize mid- to high-handicap players. Remember, the average driving distance for golfers varies widely and is generally within a range of 160 to 250 yards. As most golfers would agree, rarely does a tee shot fly straight; therefore, the width of the intended landing zone should be generous, optimally in the range of 80 to 100 yards wide. This width accounts for the entire turf area including the fairway and rough from edge to edge.

Healthy turf around the putting greens is important for good playability. However, rarely are approach shots hit more than 60 feet beyond the back edge of the green. Given the fact that the coverage radius of most turf sprinklers is 60 feet, eliminating turf beyond the radius of the sprinklers is another viable option that should be considered.

Ultimately, a good design will make the turf reduction project visually attractive and help ensure that non-turf areas look like an integral part of the golf course and not just “no man’s land.”

## PLANTING AND DESIGN

The planting and design in turf reduction areas is highly subjective. Sometimes, a specific plant palette and a recommended planting density are mandated by water agencies that offer grants and rebates for such

projects. In other cases, a committee is formed to determine what style and type of plants, if any, will be used as replacement vegetation where turf is removed. Replacement vegetation should complement and enhance the golf course landscape. Arranging field trips to neighboring courses that have completed turf reduction and revegetation projects is a good way to evaluate different landscape materials and eventually form a consensus on what is appropriate for a particular course. Architects, designers, and amateur photographers who are adept with the use of photo editing software can digitally enhance photographs of the golf course and insert different landscape materials. This provides useful visual representation of what the finished project will look like.

Design considerations should also take into account practical matters, such as:

- Soil stabilization
- Capturing and redirecting drainage and irrigation runoff
- Using stabilized sand or soil in turf reduction areas so that they may be used as future paths for golf carts and equipment

If the main objective is to reduce water consumption, installing a 3" to 4" layer of mulch material that is playable is one of the best options. Mulching eliminates the need for installing supplemental drip irrigation, helps suppress weed growth, and will provide



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a clean and attractive appearance. The aesthetic value of large mulch areas with no added landscape should be carefully evaluated. A lack of trees and shrubs will often look stark and not integral to the golf design. Mulch areas tend to work best where a grove of existing trees of the same species can be encircled, with their normal leaf fall adding to the natural appearance.

### IRRIGATION ADJUSTMENTS

Once areas have been proposed for turf reduction, the next step is making

the necessary adjustments to the irrigation system. Where practical, it is recommended to adjust the design and position of turf removal areas based on the existing configuration of irrigation heads. This is the easiest and most practical approach and requires far less expense for moving or relocating sprinklers. An accurate GPS base map with an irrigation system overlay is indispensable in this regard. The base map makes it possible to accurately measure the size and scope of turf reduction areas and prepare budget estimates for the proposed work. Often the architect and irrigation designer can work together to make minor modifications that save the course a significant amount of money. Attempting to make turf reduction decisions in the field without the help of an accurate GPS base map can end up being far more expensive and often produce an inferior product.

Frequently, turf reduction areas will be revegetated with trees, shrubs, or other low-water-use plants. Having a plan for the new planting scheme in advance of the work will allow the irrigation designer to develop a plan for drip or bubbler irrigation. A well-planned and properly installed irrigation system is a major contributing factor to the success of turf removal projects.



*It is incorrect to assume that all turf reduction projects will eliminate the labor previously used to maintain such areas. For example, ongoing maintenance is still required for weed control, raking and clearing debris, and trimming plant material.*

Gaps in coverage or excessive irrigation overspray into non-turf areas contributes to excessive weed growth, poor turf/plant performance, increased labor for maintenance and weed control, and an overall poor appearance.

Redesigning the irrigation system in turf reduction areas will require some expense and should be included in the budget for the project. In general, the design and installation cost for non-turf spray irrigation heads ranges from \$12,000 to \$14,000 per acre, and drip irrigation ranges from \$10,000 to \$20,000 per acre.

## IMPLEMENTING THE PLAN

Based on interviews at golf courses in the southwestern U.S., breaking the project into phases is the most popular approach for a turf reduction plan. Using in-house labor, it is possible to reduce construction costs and limit the amount of disturbance to the golf course. Starting small also provides an opportunity to take photos and publicize the goals of the turf reduction plan with golfers. Doing so often generates support and enthusiasm for reducing turf in other areas of the golf course.

Wide-scale turf reduction has been done by some facilities as part of an architectural remodeling of the golf course and replacement of the irrigation system. Although the initial investment is higher, this is the best opportunity to coordinate the design of the

irrigation system with the planting and design of non-turf areas as well as any other architectural changes that may be proposed. This results in a more integrated appearance of the finished product.

## TURF REMOVAL

Once a design has been agreed upon, removal of the turf is a relatively straightforward process that involves four basic steps:

- Make multiple applications of a nonselective herbicide to eliminate existing vegetation.
- Locate and remove existing sprinklers and place caps on swing joints.
- If necessary, scarify or till the soil to prepare a planting bed.
- Grade or move soil as called for in the design and to promote good surface drainage.

One of the largest potential expenses associated with this part of the project is hauling and disposing of the debris. To avoid the need for debris removal, treated areas can be tilled to reincorporate the dead turf into the soil and then graded to create a planting bed for landscape materials. It is important to note that extensive soil disruption also increases the chance of bringing weed seed to the surface that can compete with new plant material. For this reason, some golf courses have avoided removing the herbicide-treated turf and

simply plant into the existing material followed by the application of a 3" to 4" layer of mulch.

## MAINTENANCE CONSIDERATIONS

It is incorrect to assume that all turf reduction projects result in a huge cost saving by eliminating the labor previously used to maintain such areas. Ongoing maintenance can be anticipated for the following items:

- Weed control
- Raking and clearing of debris
- Vertebrate pest control, i.e., gophers, moles, ground squirrels, etc.
- Replacement or addition and spreading of mulch
- Trimming and maintenance of plant material
- Maintenance and repair of the drip irrigation system

Maintenance of the new landscape zones may be high at first but can be anticipated to decline over time as the plants gain greater surface coverage and the need for weed control is reduced. Also, incorporating native plants into the design provides an opportunity to reduce maintenance and eventually eliminate irrigation once the plants are established.

Maintenance expectations can vary widely. Some may envision a rustic and natural look, while others expect a clean, manicured appearance at all times. It is strongly recommended to



*Removing turf on tee banks presents a good opportunity to reduce mowing, irrigation, and maintenance without impacting the playability of the golf course.*



*Paths composed of stabilized sand or soil can be incorporated into turf reduction areas to help facilitate movement of golfers, carts, and equipment through the golf course.*



*Removing turf between the cart paths on these adjacent golf holes accomplished the four main objectives of the project: 1) no loss in playability, 2) maintained pace of play, 3) achieved a reduction in water use and maintenance resources, and 4) improved the popularity of the golf course.*

agree upon the maintenance expectations for non-turf areas during the planning process and include such provisions as part of the maintenance standards document for each golf course going forward.

### MEASURING AND EVALUATING THE EFFECTIVENESS OF THE PLAN

Once the project is complete, it is important to track necessary labor and water use in turf reduction areas. Has the program actually reduced water use and, if so, by how much? Is more or less labor devoted to maintenance of these areas after the project? The answers to these questions will be different for every golf course and will be useful for planning and implementing future phases of a turf reduction plan and communicating the impact of the project to golfers, owners, and civic authorities.

Although maintenance practices will definitely change, most courses report more of a labor offset than a complete labor savings. By tracking the amount of labor and materials used in non-turf areas for several months, necessary adjustments can be made to the budget and maintenance schedule going forward.

Based on the experiences of golf facilities in the Southwest, water savings have been the most beneficial

aspect of turf reduction programs. In general, savings of \$1,700 per acre up to \$7,000 per acre have been achieved as a result of lower water use. Other savings have come in the form of less fuel, fertilizer, seed, herbicides, and overall inputs, along with the ability to reallocate labor to other areas of the golf course. The ability to reallocate labor should not be taken lightly, for if the maintenance resources can be better focused on greens, tees, and fairways, the overall condition of the golf course is likely to improve. This can certainly distinguish a course from others in this competitive era for the golf industry.

### CONCLUSION

Golf is played on grass, but it is not necessary for turf to cover every square foot of the property. There are opportunities to reduce turf in out-of-play areas while preserving and enhancing the golf experience. Good planning is the key to a successful project so that essential playing corridors can be preserved while accurately identifying areas where turf can be eliminated without negatively impacting the playability of the golf course.

Reducing water use has been the primary objective of turf removal projects, which has translated into a significant cost savings to golf courses in the southwestern U.S., where water

prices are high. Even if water is plentiful, reducing turf acreage is a viable option for redirecting maintenance inputs over a smaller and more sustainable area. In the end, less turf can result in a more attractive appearance because more resources are being directed to primary playing areas, and this ultimately leads to more enjoyment for golfers.

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### ENDNOTE

<sup>1</sup>Golf Course Environmental Profile. Volume II. Water Use and Conservation Practices on U.S. Golf Courses. 2009. GCSAA Environmental Institute for Golf.

*PAT GROSS is southwest director of the USGA Green Section and provides assistance to golf courses in California and Mexico.*

*TODD ECKENRODE is a golf course architect and principal with Origins Golf Design and has helped courses with successful turf reduction projects.*