

# THE BUILDING BLOCKS OF A SOLID MAINTENANCE PROGRAM

*Golf course maintenance is often complex and confusing. How can the superintendent and course officials sort through maintenance issues and prioritize their investment of time and money?*

by R. A. (BOB) BRAME



*The triplex tire mark depression shows how mowing equipment can affect putting surface quality and demonstrates the impact of mowing height. The wheel mark depressions allow the grass to have more leaf tissue. This slight increase in mowing height produces a fairly clean stand of bentgrass, while the majority of the putting surface is heavily infested with Poa annua.*

**I**N A HIGH-TECH WORLD it often is difficult to sort out golf course maintenance issues. A question often asked on Turf Advisory Service (TAS) visits is, "How do we prioritize our maintenance efforts? We understand your individual recommendations, but how does it all fit together?" This article provides a systematic approach for prioritizing golf course maintenance decisions.

First, it is important to understand the three major components in every

maintenance decision: agronomics, economics, and politics. No operation is immune from these three ingredients. However, the importance of each will vary depending upon the personalities at the course and specific maintenance issues. Although it is important to consider individual details of these three categories, they tend to weave together and are impossible to separate.

Politics often can be offset by positive, proactive communication. An article published in the November/

December 1996 *Green Section Record* elaborates on the importance of communication in golf course maintenance. When considering agronomics and economics, agronomics should be given the higher billing. Investing in a basic agronomic program pays dividends over the long run and leads to positive economics. This does not mean economics should be thrown to the wind, but agronomics is the vehicle that carries the real payload. Focus on solid agronomics, and when economic



*The microenvironment of this site has been improved by a combination of tree removal to improve morning sunlight penetration and installing a fan to maintain surface air movement.*

alternatives exist that do not compromise solid agronomic building blocks, cost savings can be safely considered.

So, what are the agronomic building blocks upon which a high-quality maintenance program should be built? There are four: **water management** (drainage/aerification and irrigation), **growing environment** (sunlight and air movement), **mowing** (bench setting, type of mower, and sharpness), and **fertilization**. While these four agronomic building blocks can be applied to all playing surfaces, greens are the heart of any golf course maintenance program.

### **Water Management**

A few years ago a survey of the Green Section staff identified *overwatering* as the most common agronomic pitfall in golf course maintenance. This is not surprising, given the many side issues

that tie directly to overwatering. Turf health, playability, and operating costs are a few key factors that are directly connected to water management.

The water management equation includes drainage and irrigation. Since aerification (any type) improves air, root, and water movement in the root zone, aerification/drainage and irrigation should not be considered separately. The equation looks like this: **Water Management = drainage/aerification + irrigation/rainfall.**

Conceding there is little that can be done about rainfall, the importance of drainage/irrigation is brought into focus. There are two basic types of drainage: (1) surface runoff and (2) downward movement of water through the soil. Both are important, but positive surface runoff is vital and emphasizes the importance of proper design. The more directions water can run off

a green after a heavy rain, the better. Although it is possible to modify surface runoff after construction, this can be difficult and the results often are inconsistent. If a *bird bath* depression is present on a soil-based green, the possibility of installing a wide and very subtle surface runoff channel should be considered before taking the next obvious step — adding drainage.

A subsurface drainage system, combined with positive surface runoff, achieves the best possible movement of water. It is true that a few courses have been able to install subsurface drainage lines in greens after construction and achieve improved water movement, but the best approach is to build in good drainage during construction. When poor surface runoff is combined with non-existent subsurface drainage, rebuilding should be considered along with the potential value of installing

runoff swales and/or drainage lines. The long-term improvement of turf health, playability, and maintenance costs may justify the cost of rebuilding.

Since aerification improves internal water movement (in addition to other agronomic benefits), it should be viewed as a key maintenance tool. This is true despite the occasional outcry from golfers trying to putt on aerified greens. The frequency of aerification, type of equipment, and processing or removal of cores must be custom-fitted to a course's needs. Recognizing the importance of well-timed aerification, do not allow players to dictate maintenance timing. Any short-term inconvenience will return dividends over the long haul.

Volumes have been written about golf course irrigation. The bottom-line focus should be to maintain ideal soil moisture conditions for the health of the turf. A high-quality irrigation system is an invaluable asset, and labor expense directed toward hand watering is money well spent. Regardless of how good an irrigation system may be, if the intent is to maintain ideal soil moisture conditions, hand watering will occasionally be necessary.

### Growing Environment

The importance of positive air movement and direct sunlight to the health of the turf are often overlooked when prioritizing the investment of time and money to build an agronomically solid maintenance program. Yes, many people have heard that trees can cause sunlight and air movement problems, but course officials/owners often do not place enough weight on the negative impact that too many or badly placed trees can bring to agronomic conditioning.

Try to provide the turf at least eight hours of direct sunlight each day, as early in the day as possible. Morning sunlight is the most important for the growth of healthy turf. Remember also to consider the changing angle of the sun with the passing seasons. There is absolutely nothing that can be done to counteract inadequate sunlight, short of opening up the growing environment through tree pruning or removal.

Sunlight is necessary for the photosynthetic process. Air movement is needed to help dry and cool the surface. If trees and/or underbrush are blocking air movement, their presence should be viewed as a direct threat to turf health and the resulting course playability. Oscillating fans can be a

very good investment when air movement needs to be improved. First, do any needed tree and/or underbrush removal and then consider oscillating fans as a supplement to further improve air circulation.

### Mowing

This building block has three sub-components — type of mower, blade sharpness, and bench setting. There are many greens mowers to choose from. The first decision is whether you want a triplex or walk-behind unit. Walk-behind units normally produce a better quality of cut, with less stress on the turf. However, many courses continue to achieve acceptable results with triplex units. There are differences among mowers within each of the two major categories (triplex walkers), including such factors as weight, width, and type of mowing head. The types of rollers and blades, as well as their sharpness, also will impact mowing quality. It is very important to match the correct mowing equipment with a course's needs.

The bench setting, which affects the amount of leaf tissue available to absorb sunlight, obviously impacts plant health. Lower mowing heights may produce faster green speeds, but they weaken the plant and reduce turf dependability. Defining what is too low for healthy, dependable growth is related to the turf species and variety being maintained. There are limits to agronomically sound mowing heights and the resulting green speeds, despite cries from some golfers for faster and faster surfaces.

### Fertilization

Fertilization is as important to the grass plant's health as how we eat is to ours. We have the luxury of choosing what we eat (some choose better than others), but a grass plant must live or die with what we provide. The first step is annual representative soil testing. Carefully monitoring soil chemistry, year after year, makes it possible to fine-tune fertilization treatments. Tissue testing, at this point, may confuse and unnecessarily complicate putting green fertilization.

An article published in the March/April 1995 *Green Section Record*, titled "A Practical Approach to Putting Green Fertilization," provides a guide for fertilization in the north and central parts of the country. Plant feeding requirements vary with species, variety, location, soil chemistry, traffic, weather conditions, and other factors. Yet, proper fertilization is essential to plant health.

### Conclusion

A solid foundation in the areas of **water management, growing environment, mowing, and fertilization** enhances all other golf course maintenance efforts. Conversely, you cannot compensate for limitations in one or more of these areas by using fine-tuning strategies, which include pesticide application programs.

Keep the focus.

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#### A Key for Prioritizing the Focus of a Golf Course Maintenance Program

- Putting surfaces are the most important areas on a golf course. The ranking of tees, fairways, bunkers, roughs, and other areas will vary.
- Consider the three main components of every maintenance decision: (1) agronomics, (2) economics, and (3) politics.
  - Proactive, positive, creative communication helps offset politics. Invest as much time in communicating as agronomics.
  - Solid agronomics safeguards long-term economics. With the focus on building an agronomically solid foundation, economic choices will be much clearer.
- Agronomically, invest your first dollar and all your best efforts in:
  1. **Water Management** (Drainage/Aerification and Irrigation),
  2. **Growing Environment** (Sunlight and Air Movement),
  3. **Mowing** (Type of Mower, Sharpness, and Bench Setting),
  4. **Fertilization.**