# TURFAX™

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*The International Newsletter about Current Developments in Turfgrass*


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**CONTENTS:**



## J B Comments: TOPDRESSING

A basic principle of topdressing is to avoid a soil layering problem which blocks downward soil water percolation and the resultant impaired rooting. A situation commonly observed is where root zones on putting greens or sports fields have been constructed of the proper USGA particle size specifications. However, later an ill-advised decision is made to use a finer sandy root zone mix for topdressing. During the initial years rooting into the high-sand root zone is quite good. However, as the topdressing layer of finer material starts to accumulate the rooting tends to become more restricted to the upper layer with minimal to no penetration into the underlying high-sand root zone. Intensive coring will partially alleviate this problem situation, but the proper preventive solution would have been to utilize a topdressing material with a comparable root zone particle size distribution to that used in the original construction.

To ensure the topdressing mix is matched with the underlying construction, it is imperative that a physical soil analysis be obtained for the proposed topdressing mix. Subsequently, it should be done on each lot of topdressing mix or on the sand-soil-organic matter components at the time delivered.

I hope for a trend to using an organic matter component that has been composted to contain the maximum possible microorganism population representative of a quality-living soil. There is a lot of landscape organic debris from grassy areas, trees, and shrubs which is ideal to produce quality, living compost for use in topdressing. It can be particularly beneficial in the initial 4 to 5 years following original high-sand construction to accelerate the development of a living soil.

One final reminder is that when a pre-construction physical soil test is obtained, it is important that a chemical soil test be obtained at the same time to avoid potentially phytotoxic chemicals. I have observed both sports fields and golf putting greens where a physical soil analysis for the proper particle size according to the USGA specifications has been obtained, but no chemical soil test was requested. Later when problems developed, chemical soil tests revealed problems such as zinc (Zn) and copper (Cu) toxicities or a very high saline and/or sodium (Na) level. Unfortunately, the post-construction period when an actively growing turf is being maintained is a very difficult time to correct such problems. A preventive approach of pre-construction chemical soil tests is a much more sound approach that involves a very minimal cost.

## SOFT SPIKES

While lecturing in Europe I received a number of questions about soft spikes and what was happening in the United States. Evidently it has not received much attention in Europe as yet.

If one stops to think, perhaps one reason driving the acceptance of soft spikes at this time relates to the trend to more close mowing heights on greens. Close mowing greatly amplifies the undesirable effects of spike marks on what otherwise is a smooth, uniform, closely mowed surface. In this situation, the effects of spike marks on ball roll are more readily evident to the golfer. Thus, the situation is favorable for golfers to accept soft spikes, particularly if he or she believes it will assist in better scoring.

Now a new question should be raised as to what design of soft spikes is best? Early research by the USGA demonstrated that the raised hub above the shoe sole on metal spikes was one of the major causes of turf damage and thinning. Does the same principle apply to soft spikes? Hopefully the research will be done in the near future to clarify such questions.

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## NEW PUBLICATION AVAILABLE:

**1996 Turfgrass Pathology Research Report - University of Georgia -** by Dr. Lee Burpee, Department of Pathology, University of Georgia, Griffin, Georgia, 30223-1797, USA. 48 pages.

This report includes (a) comparative incidence of Rhizoctonia brown patch, Sclerotinia dollar spot, algae, and hydrophobic dry patch on 26 cultivars and 6 blends of creeping bentgrass (*Agrostis stolonifera*), (b) fungicide assessments for the control of brown patch and dollar spot on creeping bentgrass, (c) fungicide and algaecide effects on surface algae control, and (d) fungicides and PGR's for the control of brown patch on tall fescue (*Festuca arundinacea*).

## TURFGRASS VIGOR - PROS AND CONS:

Turfgrass species and/or cultivars with a rapid or vigorous growth rate are needed on turfgrass areas that are subjected to very intense traffic and the associated wearing away of the turfgrass vegetation. The selection of a cultivar with superior vigor may be the best alternative in many high traffic situations. At the same time there may be portions of a turf area, such as a sports field or golf fairway, that receive far less traffic and thus are prone to substantial thatch development. In these cases increased vertical cutting to remove the excess vegetation may be required. Also, differential reductions of nitrogen fertilization on these low traffic areas may be considered.

## UPCOMING JB VISITATIONS:

Provided for Institute Affiliates who might wish to request a visitation when I'm nearby:

- July 8 to 10, Woodstock - Vermont.
- July 17 to August 4 - Australia.
- Sept. 5 to 11 - Eastern Oregon - Idaho.

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The goal of the six issue per year TURFAX™ newsletter is to provide international turf specialists with a network for current information about turf. This newsletter is faxed to all Institute Affiliates that use the ISTI technical assistance services on an annual basis. Faxing is more costly, but ensures quick delivery to those outside the United States.

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## JB VISITATIONS:

**March - Phoenix, Arizona.**

Presented an invited lecture before the Arizona Golf Course Superintendents on Champion bermudagrass. There was great interest in Champion vertical dwarf bermudagrass (*Cynodon dactylon* x *C. transvaalensis*). Its performance on golf course sites has been good to date, with putting speeds comparable to creeping bentgrass being produced. In Arizona in the winter of 1996-97, Champion exhibited much better winter low-temperature color retention than either Tifdwarf and Tifgreen under putting green conditions.

The one concern I have for this cultivar, and similar high-density, vigorous lateral stemmed, vertical-dwarf genotypes, is that the superintendent conduct the appropriate frequency and timing of vertical cutting and topdressing, along with close mowing, in order to avoid development of a thatch problem. Experience to date at the oldest 18-hole golf course planting (Barton Creek), which is in its third year, indicates it is possible to maintain thatch control.

**May - Dublin, Ireland, UK.**

Presented an extended lecture before a large group of golf course superintendents from around Ireland. More than two-thirds of all golf courses in the country were represented. They were certainly a very enthusiastic and inquisitive group. The Irish government is very active in promoting tourism, with golf being a key cornerstone.

**May - England, UK.**

Presented extended lectures in three locations around England. Sunshine and very warm weather were the norm throughout the 1½ weeks, a rare occurrence in England. Ran across an interesting problem situation near Durham in northeast England. The golf course was constructed and a well drilled for irrigation water. A water analysis showed good quality. The grow-in and subsequent surface quality of the turfed putting greens were good for the first several years. Subsequently, in a very short time serious problems started to develop, with the putting green turfs continuing to deteriorate. Proper diagnosis of the problem was not achieved until new soil tests revealed a high saline level. A subsequent analysis of the well water also revealed a high saline level. As it turned out, the well had been drilled into a cavity or possibly a mine shaft, where they initially were pumping fresh water. However, when this supply was exhausted there existed interconnections over a 20 mile (12.4 km) distance to the North Sea, such that salt water eventually moved throughout the cavity area and they began pumping this salt water for irrigation. This occurrence suggests the need to periodically monitor the irrigation water quality level.

**June - Germany, Netherlands, and France.**

The pesticide, fertilizer, and environmental issues are a hot topic throughout these countries. Attendance was particularly strong at Munich, Germany. In most of these regions the golf course superintendents do not meet regularly for educational programs.

A common question throughout the lecture tour concerned the perceived problem of excess vigor for many of the newer turfgrass cultivars. It was explained that the appropriate vertical cutting practices may be needed on less intensive trafficked portions of a turf area, and furthermore that lower nitrogen nutritional levels should be considered. The typical response was that there is no time for vertical cutting because of too much golf play. I then would ask what is too much golf play? The response typically would be in the range of 10,000 to 15,000, and sometimes 20,000, rounds a year. I would respond that many golf courses in the United States have two to four times that intensity of golf play and still can sustain proper thatch management including vertical cutting and topdressing.

## ENGLISH AND AMERICAN TURFGRASS CULTURE

by

James B Beard

A controversy has been promulgated by certain turf specialists, particularly in the United Kingdom. The basic assumption is that the so-called Scottish or English system of turf maintenance on golf courses is far superior to the so-called American system involving the use of more intensive fertilizer, pesticide, and water inputs. What is the real-world situation? First of all, there is no one American system of turf culture, but rather a great diversity of types and intensities of turf culture, depending on the soil and climatic conditions plus the budgets available for turfgrass maintenance. This article will address the more basic reasons why variations exist in the culture regimes between the United Kingdom and the United States.

**United Kingdom Status.** The United Kingdom and especially Scotland is one of the more ideal climatic regions of the world in terms of favorable temperature and moisture conditions for growing cool-season turfgrasses. Heat stress is rare. Likewise, water stress is relatively uncommon for any extended period of time. I personally remember a visit to the St. Andrews Old Course in Scotland in the late 1960's just after they had installed their first pop-up irrigation system around the putting greens. I asked Greenkeeper John Campbell what his typical irrigation practices would be. John made an earnest reply of "15 minutes, once a week when it really needed the water."

However, England has experienced extended drought periods in recent years. Whether this is a short-term cyclic phenomena or a long-term trend related to global changes in climatic patterns remains to be seen. If it is the latter, it may dictate the need for the installation of more effective irrigation systems, especially for the fairways.

Next is the question of pest problems of turfgrasses and the need for their control. In much of the United Kingdom the only disease for which control is planned on a regular annual basis is Microdochium patch (*Microdochium nivale*), formerly known as Fusarium patch or pink snow mold. Two other diseases that occasionally occur are red thread (*Laetisaria fuciformis*) and takeall patch (*Gaeumannomyces graminis* var. *avenae*). A similar situation exists for insects where there is one principle insect requiring annual control, which is the leatherjacket (*Tipula paludosa*) or European crane fly. Another pest problem, especially of greens on upland clay soils, is the earthworm.

The third major stress of concern is turfgrass wear as related to the intensity of traffic stress. From 10,000 to 20,000 rounds of golf annually is not uncommon for many UK courses. This low intensity of traffic has a lower requirement for fertilization to provide the growth needed to repair damaged turfs. This is an aspect that could cause some dramatic changes in the traditional way that turfs are maintained in the United Kingdom. The intensity of play on a number of golf courses is increasing. Greenkeepers are experiencing the development of bare areas on the golf course and finding they are not able to regrow turf on these areas without significant changes in their cultural program. This may encompass not only increased fertilization and irrigation, but also changes in the turfgrass species and/or cultivar to more wear tolerant, vigorous genotypes.

One of the toughest challenges in golf course maintenance is the position of greenkeeper at the Old Course in St. Andrews, Scotland. The goal is to maintain the traditional turfgrass species of colonial bentgrass (*Agrostis capillaris*) and fine leaf fescue (*Festuca rubra*) without any significant use of pesticides. This is as it should be! At the same time, the intensity of traffic and resultant wear stress on the turf at the Old Course is quite severe compared to most golf courses in Scotland. How this is managed is illustrated by the 28 acres (113 hectares) of nursery turf that are maintained for resodding the facilities.

**United States Status.** Now let's address the environmental conditions in the United States in terms of the temperature and water aspects. A large part of the United States is characterized by a continental climate, particularly in areas where cool-season turfgrasses are utilized. This means large extremes in temperatures from winter to summer and wide variations in rainfall, both total seasonal amount and the variation within a given year.

Many golf courses within the continental climate in the United States are subjected to heat stress during the summer period which greatly slows the growth rate and recuperative ability of turfgrasses. Sometimes the heat stress may be so severe that actual kill of turfgrasses occurs. Increased plant water management and potassium fertilization in the drier continental climates can be utilized to partially alleviate the potential for turfgrass loss from heat stress.

Within this continental climate there also are large areas that are subjected to periodic drought stress during the summer growing season. This dictates the need for irrigation encompassing fairways, greens and tees because the American golfer has demanded green turfgrass areas which dictates the installation and use of irrigation systems. Color television coverage of major golf events has contributed to this golfer preference. Herein lies a problem in that historically there is a tendency for golf courses to be watered excessively, especially in humid climates where periodic rainfall is a relatively unpredictable occurrence. In arid climates irrigation scheduling can be more precise.

There are some climatic regions in the United States which are very similar to the temperature and rainfall conditions in the United Kingdom. Thus, the cultural program in terms of irrigation and fertilization inputs and the grass species/cultivar selection can be similar to those in the United Kingdom, assuming traffic stresses are not excessive.

The second aspect relates to the extent of pest problems in the United States. There are many locations, particularly in humid climatic regions of the United States where from 6 to 10 diseases and 4 to 8 insects may occur in sufficient severity to dictate use of the appropriate fungicides and insecticides, respectively. In contrast, there are also some locations in the US that have very limited disease and insect problems similar to the situation in the United Kingdom, although they are much less common.

Finally, there is the very negative impact of intense traffic. In the United States it is not uncommon to have golf courses, especially municipal, daily-fee, and resort facilities, faced with the challenge of 60,000 to 80,000 rounds of golf a year, with some in the order of 100,000 rounds in warmer climates. Added to this is the extensive use of golf carts, which are much less common in the UK. These stresses dictate the need for irrigation and fertilization to stimulate turfgrass recovery from the substantial damage of ball marks, divoting, and the physical wearing away of the turfgrass vegetation from intense traffic in order to sustain quality turfgrass playing surfaces.

**A Perspective.** From a fundamental standpoint, selection of the turfgrass cultural system and allied resource inputs is dictated by the specific environmental, pest, and traffic stresses of a particular soil and climatic site. There is no one "best" golf course cultural system for all regions of the world. A cultural system that is successful in Scotland could be a total disaster in a number of climatic regions in the United States. By the same token, certain cultural systems used in the United States could not be justified, and in fact unwise, in many locations in the United Kingdom where the environmental, pest, and traffic stress problems are minimal. Another significant controlling factor is the surface playing quality that the golfer desires and is willing to pay for in terms of the turfgrass maintenance budget.

The late 1950s, 1960s and early 1970s were a period in the United States when many inputs into turfgrass culture were excessive. Included were (a)

excessive use of nitrogen, which led to increased thatch and disease problems, (b) excessive irrigation practices, which were partly due to manual and semiautomatic irrigation systems that did not apply water uniformly, thereby resulting in what was essentially a flood irrigation practice, and (c) fence-to-fence mowing and grooming of the golf course property with no secondary rough and a minimal penalty in the primary rough.

Times have changed in the USA! Now the nitrogen nutritional levels practiced on cool-season grasses are relatively low and matched to the recuperative needs as affected by the intensity of golf play and cart traffic. Multi-row fairway irrigation systems and improved irrigation equipment, including the use of evapotranspiration prediction models, have substantially reduced the excessive watering problems of the past. There also is a trend to less fence-to-fence mowing and toward selective grooming of designated play areas. The latter has been met with great resistance on the part of the less skilled golfers who are constantly agitating for wider fairways and closer mowing of widened primary roughs.

A problem that still persists in the United States is the green grass syndrome. It pervades turfs on golf courses, sports fields, and lawns. The general consensus continues to be that dark-green grass is the standard. Unfortunately, dark-green grass produced by increased nitrogen fertility levels is not the most healthy grass. In fact, nitrogen induced dark-green cool-season turfgrasses have significant reductions in rooting, reduced tolerance to environmental stresses, increased proneness to many turfgrass diseases, reduced traffic tolerance, and increased thatching problems. The bottom line is increased costs for turfgrass maintenance. All professionals within the turfgrass industry need to develop and sustain an educational campaign concerning the desirability of an intermediate-medium-green turf as the ultimate, rather than a dark-green turf. It also is hoped that this dark-green syndrome will not become commonplace in the United Kingdom.

This discussion is focused on the United Kingdom versus United States. Point in fact, the same basic principles apply anywhere in the world.

**Historical and Traditional Considerations.** A great aspect of golf is its preservation of the game and its traditions, thanks to the efforts of the United States Golf Association and the Royal and Ancient Golf Club of St. Andrews, Scotland. This same preservation of traditions should continue to be extended to the early linksland golf courses on the seasides of the United Kingdom. For golfers world-wide they represent the historical traditions of the game. These historical linksland courses are essentially a treasure to be protected and preserved. This author feels very strongly about this issue. The preservation extends not only to the architectural design of these golf courses, but also to the type of grass playing surfaces and specific grass species utilized. This in turn dictates the particular cultural systems to be employed.

Perhaps the greatest threat to preservation of these history-ladened golf courses is too much golf play. The fine leaf fescue (*Festuca rubra*) and colonial bentgrass (*Agrostis capillaris*) polystand traditionally used on these linkslands is not particularly strong in terms of wear tolerance and recuperative ability from traffic stresses. In other words, the carrying capacity in terms of number of rounds of golf played, which varies cyclically throughout the year depending on the rate of grass growth, should be controlled. Otherwise, the traditional surface playing qualities of these golf courses and a great tradition will be lost. Will these golf treasures be protected?

One final comment is that Americans fortunate enough to play the traditional linksland golf courses of the UK give them raves and great praise, even though the fairways may be brown and of an erratic to open shoot density. When those same US golfers return home to play on their own golf courses, they demand green, dense playing surfaces. An incongruity that is difficult to explain!