

UNDERSTANDING AMERICAN GREENKEEPING

Is there an 'American' Golf Course?

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During recent months, much has been written, and no doubt much discussion has taken place, concerning 'American' golf course maintenance systems, budgets, manning levels and turfgrass quality.

The arguments are familiar and, usually, have been voiced as a condemnation of 'American' techniques and as an indication that they are not relevant to the British climate and economic situation. Rarely are the criticisms supported by explanations of turfgrass maintenance techniques currently in use in various parts of the United States.

How do 'American' turfgrass maintenance systems differ from their 'British' counterparts?

The first consideration in discussing 'American' golf is the vastness of the country. With an area of 3,615,123 square miles, it is approximately twice the size of the whole of Europe and Scandinavia combined, or almost forty times larger than the United Kingdom and Northern Ireland. Obviously, there is bound to be enormous diversity in climates, soils, vegetation cover, and economic constraints.

Here, even with our general climate, we feel the necessity to distinguish between links, parkland, and moorland courses, with further considerations given to North, South, East and West locations. The diversity in climate, topography and vegetation within the United States makes it preposterous to embrace all the different types of golf courses in the general terms 'American'. We should never refer to an 'average' American course or generalise about any aspect of American greenkeeping. Generalisations of this kind are inaccurate and misleading.

If you were to stand with one foot in boiling water and the other in freezing water, would you, in general, be comfortably warm?

There is no 'American' golf green; nor is there an 'American' maintenance method. There are many types of greens and there is a wide diversity in maintenance practices. After all, there are about 13,000 golf courses in the States and each golf course superintendent is an individual.

Simplifying the variety of environments and maintenance systems encountered in the U.S.A., some broad groupings can be distinguished. Turfgrasses can be classified according to their season of most active growth. Species which produce most growth during Spring and the cooler months of Autumn, remaining semi-dormant during the hot summer and cold Winter months, are described as cool-season grasses. All the turfgrass species grown in Britain fall into this category and include such species as the Fescues, Bents, Smooth-stalked Meadowgrass (known as Kentucky Bluegrass in America), Rough-stalked Meadowgrass (known as Rough Bluegrass), Annual Meadowgrass (Annual Bluegrass) and Perennial Ryegrass.

The other broad group of turfgrasses, making their maximum growth during the hot Summer season, are classed as warm-season grasses and are typified by such species as the Bermudagrasses (*Cynodon* spp.) St. Augustinegrass (*Stenotaphrum secundatum*), Zoysia-grasses (*Zoysia* spp.) and Centipede-grass (*Eremochloa ophiuroides*). The optimum temperature for these species is 80-95°F. (26.5-35°C), making very little growth at temperatures below 55°F (12.7°C) and becoming completely dormant with a browning of the foliage at temperatures below 30°F (-1°C).

The United States can be divided into broad zones of adaptation for cool and warm season species. (See FIG. 1). Within these zones, climatic conditions can vary quite considerably according to latitude, elevation and maritime influences. Between the zones, transitional areas display intermediate characteristics of the bordering regions.

Man has long recognised the importance of climate in the development of a regions plant communities. It is climate that largely decides whether a species will survive in a given region, and it is soil characteristics and topography which determines the degree of adaptation and abundance of the plant species.

Although the cool humid regions of the States are classified as temperate climates with cold Winters and mild Summers, there are enormous differences between the north and the south, east, and west. For example, average mid-winter temperatures in the south of the region are 35 to 40°F (1.6 to 4.5°C), whereas in the Dakotas it is about 5°F (-15°C). Total annual precipitation ranges from 20 inches (500mm) or less in the West to 45 inches (1125mm) or more along the Atlantic coast.

The Pacific Coast area is generally less extreme and more similar to the British climate, displaying turfgrass species and maintenance problems more reminiscent of our own.

Most of the western half of the United States is classified as arid or semi-arid and may be divided into two main sections, depending on average temperatures.

The hot, arid and semi-arid region covers an area from Texas to California, forming a narrow belt which extends between a series of mountain ranges in California, Arizona and New Mexico, and the Mexican border. Average summer temperatures are very high, with some areas such as the notorious Death Valley of California and the Arizona desert, experiencing

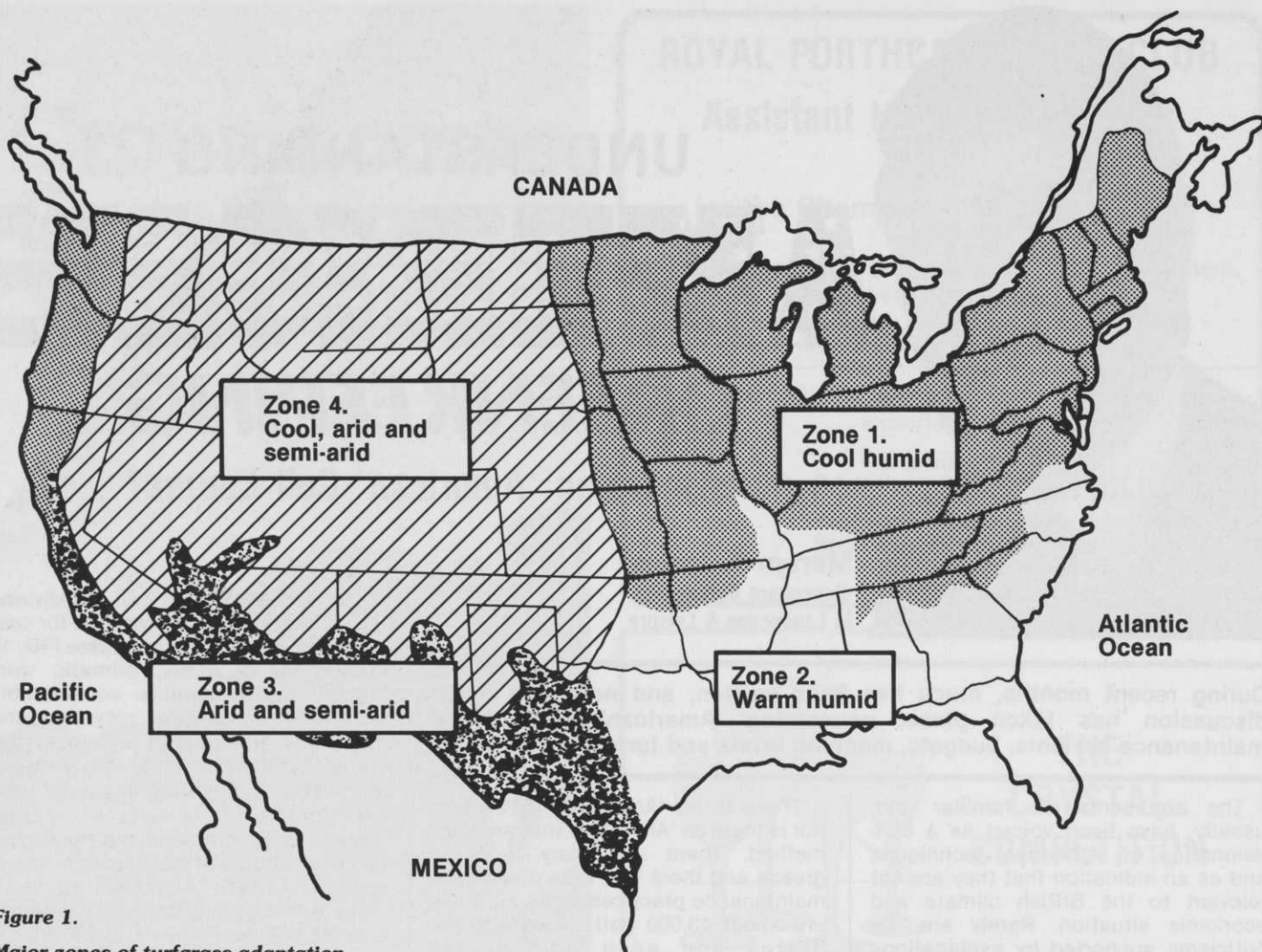


Figure 1.

Major zones of turfgrass adaptation in the U.S.A. (Musser, 1962)

temperatures in excess of 100°F (37.5°C) in the shade day after day during the midsummer period. However, temperatures can drop sharply at night because of the dry air and clear skies. The growing season can vary from 200 days in the north to 365 in southern California and areas of Arizona. Annual rainfall is generally low with less than 5 inches (125mm) in the subtropical areas to about 20 inches (500mm) in Texas.

The cool, arid and semi-arid zone encompasses the vast mid-interior region of the U.S. and can be subdivided into the Northern Great Plain and the Inter-mountain Region.

The vast level expanse of the Great Plains produce the greatest diurnal variations in temperatures in the U.S. An advancing polar air mass can reduce the temperatures by as much as 60°F (15.5°C) in a matter of a few hours. Seasonal variations in temperature can also be extreme. Summer temperatures can be above 100°F (37.5°C) and winter temperatures can be below -30°F (-34°C). The cold winters with extended periods of heavy snow cover can produce a variety of problems. Winter desiccation of groomed turf can be horrendous and rodents such as prairie dogs and mice that burrow below the snow can also destroy large areas.

A problem associated with aridity is the phenomenon of wind erosion and subsequent dust deposits. Dust can be transported across many miles of the vast plains and it is not unknown for a dust layer of 1½ inches (37.5mm) in thickness to have accumulated on a golf course in a matter of a few weeks.

Visitors to the hot zones of America will often comment on the seemingly relentless use of irrigation systems on golf courses. Throughout the day, it would seem, water is being indiscriminately pumped on the greens, tees and fairways. To the uninitiated, accustomed only to the irrigation procedures of our cool temperate climate, this practice may be construed as excessive watering. On the contrary, in such areas water is not only applied to turf to avoid drought damage but also a means of protecting the closely mown grasses from the intense heat.

Periodically, small quantities of water are applied to the turf to cool it and reduce its transpiration rate, rather in the manner that we would seek shade. Heat energy is utilized in evaporation of the applied water, rather than permitting it to over-heat the grass plants. During very hot weather, the operation may be necessary on four or more occasions during the day. Failure to 'syringe' the turf in this way would soon result in death of the grasses.

The practice does not actually irrigate the soil; it merely cools the foliage and avoids heat stress. In fact, excessive wetting of the soil is diligently avoided. If the soil were saturated during the day, available soil oxygen would be depleted and the grass roots would fail to function efficiently. The result would be that the grasses were less capable of absorbing water and they would suffer from drought.

In areas of the States where high temperatures and drought are common, an irrigation system is a vital tool and breakages or other failures cannot be tolerated. Therefore, the system must be regularly checked.

Some Clubs designate Mondays as 'maintenance day' and the course is closed to play. 'Maintenance day' provides an ideal opportunity to systematically test and check all valves, sprinklers, control stations, etc., of the irrigation system. It is a long and tedious operation and can only be executed when the course is free of golfers. On occasions, the 'check' may coincide with rain and consequently, the irrigation system may be operating, even though there is heavy rain. To the uninitiated British visitor, unfamiliar to the golf course superintendent's programme, this may be misconstrued as excessive irrigation.

Therefore, when the casual visitor sees an irrigation system in use throughout the day, he should not assume that the golf course is heavily irrigated. It may be that the course is merely being *syringed* to combat high temperatures or that it is a routine check on 'maintenance day'. All too often though, because he can only relate to his experiences in the cool British climate, he ignores the implications of the harsh weather and returns home to Britain, criticising the 'American' ways.

Whether a golf course is situated in an arid or semi-arid, warm-humid or cool-humid zone will govern the maintenance requirements, and, to some extent, determine the size of its maintenance budget. A severe climate will proportionately increase the cost of maintenance if general standards are to be achieved.

The United States of America is a country of extremes, both in climates and degrees of affluence. Standards of golfturf management vary considerably. Some golf courses are disappointingly poor whilst others display unbelievable excellence. Some struggle on very limited maintenance budgets, whilst others enjoy the luxury of an almost limitless one. This is not to say that it is only the wealthy Clubs that have good greens. Some low budget courses are excellent. Knowledgeable and dedicated superintendents can produce good greens, even on relatively low budgets. Understandably though, the cream of superintendents are normally offered a



Not all golf courses are healthily irrigated even in Arizona

position at a wealthy Club.

The severity of some climates dictate a minimum maintenance budget required to achieve an acceptable standard. If the Membership is unwilling to pay the price, they are denied the privilege of a golf course as we know it. If they are willing to pay the price for excellence, they are justly rewarded.

There is no 'typical' American green, just as there is no typical American. It is a vast country with an incredible diversity of climates, soils, vegetation cover, and maintenance methods, and a vast array of golf courses.

To be continued

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