

FAIRWAY Notepad

How often should aeration be carried out? Also can this operation be carried out too much and what are the best times of the year for aerating?

Most greenkeepers are well aware that the management of good turf is due to a carefully planned programme of maintenance which includes, mowing, top-dressing, irrigation, aeration, etc. Yet it is still surprising how all the benefits of aeration are not fully appreciated and the frequency of this operation still continues to be neglected.

The pounding and rolling action of human feet can cause the development of the compact impermeable surface layer of soil and this condition can be aggravated by mowing, rolling and the use of other heavy equipment when soils are wet. It is often difficult to avoid compaction under such circumstances, and when it develops, grass roots generally suffer due to lack of sufficient air and moisture to permit normal functioning. In addition it becomes more difficult for water and fertiliser to penetrate the soil.

In order to remedy this condition, various types of aerating equipment has been devised to break through the compacted soil layer mechanically. These different types of cultivating machines can be used by the greenkeeper to help relieve this compacted condition of the soil.

One often hears individuals asking

how often the turf should be aerated; what the relative merits are of hollow-tining; slit-tining and spiking; what the benefits are of aeration? There may not be completely satisfactory answers to these questions for much of the evidence is based on observation and experience, not theory. However, the mere fact that these questions get raised from time to time does justify some discussion on the subject of aeration.

The important function of aeration is to alleviate compaction, assist drainage, control thatch and break up surface crusting. Correction of these problems even at the best, will never be complete as a percentage of the turf always remains untouched by spikes, tines or blades. The effectiveness of any aeration programme generally depends on the type of equipment used and the frequency of use.

The term aeration itself implies an improvement in the air penetration, or the oxygen-carbon dioxide relationships in the soil. It is acknowledged that frequent use of aerating equipment will improve the rate at which oxygen penetrates the soil, and carbon dioxide from root respiration and other sources will leave the soil. Compacted soils have a poor structure and drainage is restricted which inhibits this gas exchange; roots cannot develop and the capacity of the turfgrass plant to absorb water and nutrients is reduced. As a result, the turf suffers by becoming thin, weak, losing colour and vigour of growth. It is also likely to be more susceptible to disease in this condition.

According to experiments in the U.S., it was found that greens in good condition had satisfactory oxygen diffusion rates to a depth of 4 inches, but greens in poor condition had unsatisfactory levels, even at a depth of 2 inches. The tests also showed that routine aeration treatment produced satisfactory values at 4 inches, but not at 10 inches. On the other hand, experiments with deep aeration gave satisfactory values to a depth of 10 inches and perhaps

The deep slitting aerator fitted with 8 ins tines produced by Sisis as an attachment for their Hydromain System.



deeper. It would appear from this that there is a direct relationship between depth of penetration and depth of good oxygen soil levels.

Further experiments have shown that standard aeration had little effect on water infiltration rates in a soil of bad textural and structural characteristics to a depth of 12 inches. This lack of response was attributed to the shallow depth of the holes (2½ inches) in relationship to the tight soil. It was found that aeration to a depth of 6 inches provided temporary benefits.

Most experts agree that it is important to achieve deep penetration of the soil when aerating the turf. Several companies who have specialised in the designing of aerating equipment for a great many years, have long been convinced that a greater beneficial effect can be attained in the management of turf by relieving sub-surface compaction which is a problem that has bedevilled many greenkeepers for ages.

The Sisis company, for instance, have recently introduced an 8 inch slitting tine for greater depth penetration in use with the Hydromain System as an alternative to the standard 6 inch tine. Obviously this operation is best carried out at a time of the year when conditions are soft enough to permit maximum penetration of the tines during the autumn and winter months.

Good moisture penetration is assisted by regular aeration and the small openings created in the compacted surface provides channels and small reservoirs through which the water may seep into the soil and reduce the surface run-off.

Over a period of time, compacted soil layers may build up near the surface level on a green as a result of frequent top-dressing and a build-up of buried fibres. This often causes the surface to remain soft and soggy, due to poor water infiltration and restricted root growth. Penetration of these compacted layers with aerating tines may assist drainage into more permeable soil below.

The mixing and cultivation action of aerating tines helps to break down thatch and compacted soil layers. It also assists the penetration of top-dressing material into the thatch layers to enhance more rapid decomposition of the fibre build-up.

How often should aeration be carried out? This is a question often asked and no precise answer can be given. In fact, this operation is rarely overdone for most turf areas would benefit from much more use of aerating equipment. The poorer the soil conditions, the more frequent aeration should be. Even when there are not turf problems any turf expert would agree that regular aeration is a good preventative measure. The frequency of this operation is often limited by management rather than agronomic considerations.

This month's question has been answered by John Campbell who is a golf course consultant.