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THE BRITISH GOLF

GREENKEEPER

HON. EDITOR: F. W. HAWTREE

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Front Cover Picture:

Front view of the Victorian Manor House on the Foxhills Estate, near Chertsey, Surrey, site of a new 36 Holes Golf and Country Club complex. Work started May, 1973. (With grateful acknowledgements to Aer Lingus.)

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Tee Shots

PLANS ARE WELL AHEAD for the International Greenkeepers' Tournament at Ipswich in October. The Association is hoping to organise a Turf Conference in connection with this event at which all those interested in the maintenance of fine turf will be welcome. Further details will appear here and in other golfing magazines shortly.

* * *

Bill Machin, Head Greenkeeper at Addington Court, will be international for the next six months, having taken on a young Frenchman, Eric Tairraz from Chamonix. Eric is over here to learn all about greenkeeping, as the shortage in France is even more acute than in this country. He is an expert skier among other accomplishments.

* * *

Our cover this month shows the house at Foxhills, Chertsey, lately the home of Sir John Borthwick. Aer Lingus is the major partner in a consortium which has purchased this property. They propose to lay out 2 championship golf courses, both about 6,750 yards, while an eclectic course, chosen out of the two 18's, can be made to produce an even tougher circuit of 7,000 yards. Golf Landscapes Limited were the successful tenderers and work will already have started by the time this editorial appears. The site is typical Bagshot sand country with Scots Pine and Silver Birch and there are some Beech trees, most of which will be retained.

* * *

The Elstree Rural District Council has received planning permission for a 9 hole golf course. Land alongside means that eventually 18 holes should be feasible. This method of starting with 9 holes seems quite a sensible one because popular demand inevitably brings the second 9 holes into action at an early date.

* * *

George Wilson had some of the Burnham and Berrow members on his golf course at Le Prieuré, near Paris, in May. A party of 12 had flown from Bristol to play against the Racing Club de France at La Boulie and wished to make acquaintance with some of the other courses nearby. It being a Sunday, George was able to join the party to make up the numbers.



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EXTRAORDINARY GENERAL MEETING

19th May, 1973

AT THE ABOVE MEETING the proposition put forward by the Executive Committee for increase in subscription rates was passed with one or two minor amendments. The final figures agreed upon were:-

Class 'A' Head Greenkeeper	Rate to be £4.00 p.a.
Class 'B' First Assistant	Rate to be £3.00 p.a.
Class 'C' Assistants	Rate to be £2.00 p.a.
Class 'D' Greenkeeper/Professional	Rate to be £4.00 p.a.

The first amendment was that Class 'E' Honorary members should remain at £2.50 p.a.

The second amendment was that Entrance Fee should be 50p and not 50% of the subscription. It was agreed that all additional income should be allocated to Head Office funds. This would mean that the allocation of subscriptions would be as follows:-

Class 'A'		Class 'B'	
Section Fund	50p	Section Fund	50p
Central Fund	£2.90p	Central Fund	£1.90p
S.T.R.I.	25p	S.T.R.I.	25p
Postage of Journal	35p	Postage of Journal	35p
Class 'C'		Class 'D'	
Section Fund	40p	Section Fund	50p
Central Fund	£1.00	Central Fund	£2.90p
S.T.R.I.	25p	S.T.R.I.	25p
Postage of Journal	35p	Postage of Journal	35p
Class 'E'			
Section Fund		£2.15p	
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The final agreement was that all new members should pay full subscription whatever time of year they join. This would necessitate a change of rules whereby the second part of Rule 7 (b) would be deleted.

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They can be power driven with the cutters stationary by operating a cutter release clutch.

What's more, either machine may be used with or without the optional standard Atco trailer seat.

Another feature is the tubular handles specially designed for added manoeuvrability when turning.

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There's a new 'swing over' type glass fibre grass box. It is mounted on tubular steel support arms and its lower section is recessed so it can be used with swivel front rollers.

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Basic Principles of Aeration

by

Tom Mascaro, *Director, Product and Market Development,
Hahn-West Point Division*

'Roots do not grow in the soil, they grow in the spaces within the soil.'

'Water does not move through the soil, it moves through the pore spaces within a soil.'

'Air does not pass through the soil, it moves in the spaces within a soil.'

'Nutrients do not move in the soil, they move in the spaces within a soil.'

The need for aerification of a turfgrass area is determined by the above statements. Aeration of soils under turf is, simply stated, the mechanical manipulation of the soil to renew soil structure. It is a modified form of ploughing without materially disturbing the turf surface. When soils are ploughed (to renew soil structure) the sequence that takes place is as follows. The shape of the plough is designed to lift the soil, gently turn it over, and move it to a new location. This process of lifting and relocating the entire soil mass, renews soil structure. Spaces are mechanically created to provide channels, or pore spaces, for the free movement of roots, gasses, nutrients and water.

Implements for renewing soil structure on turfgrass areas are specially designed to perform the same function as the plough. The difference, however, is that instead of lifting and relocating the entire soil mass, the operation is modified in order to leave the turf surface relatively undisturbed. This is accomplished by means of concave steel elements, commonly called spoons. The steel elements penetrate the soil, scoop it out and eject it on the turf surface. Like ploughing, the soil is lifted and relocated. The design of the aerating machine determines the number of loose walled cavities created per square foot. Turfgrass areas aerified on a management basis will, over a period of time, have all of the soil relocated and structurally modified.

Aeration of turf grass areas should be viewed as a process that actually has a three-fold purpose. The first purpose of aeration is to renew soil structure. The second purpose is to utilize the soil removed in the process to assist in the decomposition of surface thatch. The third purpose of aeration is to keep the grass areas level.

The need for renewing soil structure has already been discussed. The second purpose for aeration, that of utilizing the soil cores to help decompose thatch, is self-evident. Decomposition of thatch is materially hastened when soil with its decomposing organisms, plants and fungi, is in intimate contact with the accumulated material. The third purpose of aeration utilizes the soil removed from the root bed to fill depressions, thus keeping the turf surface level.

Depending upon the type of aerator used, as much as eight to ten tons of soil per acre are deposited on the turf surface. These soil cores, when pulverized with a dragmat of sufficient width, fill depressions.

Forces which determine the need for aeration.

It has often been mis-stated that turfgrass areas which have no traffic need no aeration. The facts are, the need is not as great as compared to heavy use areas but the benefits are most decidedly evident.

All turfgrass areas are constantly being subjected to compacting forces. The mechanical action of rain or irrigation water is a compacting force: the movement of water through a soil conveys the finer particles and gradually fills the pore spaces.

The pounding and rolling action of human feet subject soils to severe compaction. It has been estimated that the foot of an average human will apply a pressure of 94 pounds per square inch.

The weight and rolling action of maintenance and other equipment subject soils to severe compaction. In these cases, puddling, due to the kneading action of the wheel, is

far more of a compacting factor than is the weight of the vehicle. According to a manufacturer, a fully-loaded golf car, equipped with flotation tyres, exerts only eight pounds per square inch. However, they make no mention of the puddling effects of such a tyre. Documentation at the Georgia Coastal Plains Experiment Station reveals that compaction on relatively sandy soils is very severe when subjected to the forces of these tyres.

Compaction Indicators

Numerous methods can be employed to determine the compactability of soils. Various laboratories equipped to make these determinations are available. For the most part, observation or 'eye balling' can be very helpful in determining the degree of compaction and the need for aeration to renew soil structure. The following are some excellent indicators:

- Poor water infiltration. If the soil does not absorb at least an inch of water per hour, compaction may be a significant factor.
- The presence of knotweed and crabgrass are usually good indication of soil compaction.
- Blue, mottled or putrid soils. Compaction promotes an aerobic activity. Iron in the soil changes to a blue or dark mottled colour. A putrid odour (due largely to methane gas) is evident when a fresh sample of the soil's profile is smelled.
- A shallow root system: as mentioned earlier, roots do not grow in the soil; they grow in the spaces within the soil mass. Roots cannot penetrate solids. Soil particles pushed together by compacting forces severely restrict root growth.
- High salt index at the soil surface. Salts, accumulating from fertilizer and exudated water are held near the soil surface, since compaction prevents downward movement. Detection of excess salts can be determined in the lab. and also by the detection of stem burn at the soil surface.
- *Poa Annu*a, being largely a surface grower, can survive and grow quite well on compacted surfaces. This is essentially true if management practices such as frequent light irrigation, surface feeding, etc., are practiced.
- Run-off-water. Water accumulating in low lying areas indicates that infiltration is poor. It has been determined that as much as 70% of applied water will run-off of a severely compacted turfgrass area.

Management versus Renovation

The use of aeration equipment can be divided into two separate and distinct categories. One is aeration on a continuing management basis to keep up with soil compaction as it forms. The other is to allow compaction to become so severe that turf has deteriorated to the point that complete renovation is necessary. Specification must be based on the type of programme being followed. Aeration done on an 'occasional basis' should be considered practically worthless.

If a turfgrass area has deteriorated to the point where less than 50% of the turf is composed of desirable grasses, then renovation aeration should be employed.

A complete renovation programme will consist of:

- Complete removal, or chemical kill, of all existing vegetation, or a combination of both.
- Severe aeration consisting of at least 10 passes over the area at full depth with an aerating tool. (A good rule of thumb is when the area appears to be ruined, you are half-finished aerating). Each pass over the area should be done from a different angle.
- Lime if needed, and apply fertilizer as determined by soil tests.
- Dragmat the area until soil is pulverised to form a good seed bed. This will also level the area.
- Seed or stolonize the desired grass or grasses.
- Keep moist, but not wet until turf is established.



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Management Aeration

When a turf grass area is over 50% populated with desirable grasses, a programme of management aeration can be initiated.

Aeration is done on an 'as needed' basis. In order to minimise disturbance of the turf surface (and its use) the first aeration is done at a slow speed. The area is then carefully dragmatted to pulverise all soil cores. On a management basis, aeration is always done prior to fertilisation and liming.

Water infiltration is correlated with the need for aeration and done when needed. No set rules can be applied to a management aeration programme. The turf manager must correlate all indicators of compaction and perform the operation in relation to them.

Aerifying 'by the calendar' is as senseless as irrigating every third Monday. The type of soil, the use of the area, etc., are all determining factors as to when management aeration should be done. Generally speaking, however, the autumn period is a critical time for aeration. This is a period in the life cycle of the grass plant when root growth is at its greatest. Aeration will contribute to good growth at any time during the growth period but aeration of the turf in the early autumn will largely determine the health and vigour of the grass for the following season. Many good turf managers follow the rule, 'What I do for my turf today will determine its condition a year from now'.

Costs for aerification are difficult to determine on a national basis. Consideration must be given to the size of tractor used, prevailing manpower costs and whether the turf grass area is open and clear, such as a fairway, or landscaped with trees, shrubs and walks, such as park areas. Depreciation and repairs must also be taken into consideration. All of these factors can best be determined by the turf manager.

One of the greatest misconceptions relating to the practice of aeration is the fear that disturbing the turf surface will promote weed invasion. This concept is as relevant as keeping soils acid to prevent weeds. The presence and growth of weeds in a turf grass area is the most reliable indication that something is basically wrong with the management programme. Unless the basic problem or problems are determined, weeds will always be present. Basic problems which must be determined and alleviated are: soil compaction, the wrong grass for the climatic area and use, improper irrigation practices, inadequate or imbalance of nutrients, or mismanagement, such as height of cut, air drainage, etc.

Aeration, therefore, is the catalytic agent that allows the turf manager to utilize all the other methods he employs to produce healthy turf. We must conclude, therefore, that the turf manager who is reluctant to aerate because he fears weed invasion, is the man who has not learned to seek out and correct the basic problems.

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