The Greenkeepers

No. 1 – JOCK GLASS

This is the first in an occasional series about greenkeepers and the courses they care for.

JOCK GLASS is the Head Greenkeeper of Thorpe Hall Golf Club at Thorpe Bay in Essex. The course is a flat open one although many new trees have been planted over the past few years. The club has over 600 members and a greenkeeping staff of five.

Before working at Thorpe Hall, Jock was assistant greenkeeper at Prestonfield G.C. at Edinburgh from 1921-1934, when he took up his present position, completing 40 years service with the club this year. He was chairman of the BGGA from 1949-1951 and again in 1961-1962. In addition he was chairman of the Southern Section for many years.

The club owns a Ransomes Hahn Triplex mower with all attachments, seven Auto Certes 18 in. mowers, 2 Marquis mowers, one ride-on mower and four Hayter rotary mowers. In addition there is a crop-guard sprayer for fairways, two small sprayers for greens and a Pattisson self propelled spiker.

Other equipment includes 2 Fordson tractors, one with a front loader, another with a tip up trailer, a Ransomes 5-gang Sportcutter for fairways and a Ransomes 3-gang Magna for rough. Finally the club boasts a chain saw.

For a fertiliser Jock prefers Fisons Greenkeep 1 and 2, also sulphate of ammonia and iron and hoof and horn. For a fungicide he uses May and Baker Maysan fungicide and May and Baker Dicotox Extra weed killer.

With such a large playing membership one of the biggest problems is keeping greens and tees in condition. This is achieved by applying a complete fertiliser spring and autumn, with monthly doses of sulphate of ammonia and iron with compost during the summer. There is also a fair amount of fusarium, which is kept under control with a fungicide. Thatch is another problem and much scarifying, spiking and slitting has to be done.

Although the course is only 200 yards from the sea it is on heavy clay and in some parts below sea level, causing it to become very wet in winter.

Drainage is controlled by ditches, one of them being the main drainage ditch for roads and farmland for miles around. After heavy rain this ditch overflows and floods the course in places making playing difficult. About three years ago an automatic sluice gate was installed which helped quite a lot. With this gate the water table can be controlled in summer, which helps keep fairways green with plenty of grass.

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Deep-seated problem

by D. B. HARGREAVES

WITH ALL sports turf the outstanding problem is getting rid of excess surface moisture and this involves getting the water through the top soil and then having somewhere for it to go. The latter is usually a matter of drains or drainage layers and is not the subject of this article. There is, however, little value in a drainage system if surplus water does not reach it or reach it fast enough.

Getting rid of surplus moisture is important not only from the direct point of view of providing good playing conditions which stand a good deal of wear, but also from the indirect point of view of allowing plenty of air to get to the plant roots. Poor aeration results in lack of oxygen in the soil.

It may be caused by compaction which pushes the soil particles close together, thus reducing the volume of pores in the soil. It may also be caused by an excess of water held in the soil pores thus displacing air. Commonly both factors are involved.

For root growth there must generally be at least 10 per cent air filled pore space in the soil. Oxygen in the soil is used up by plant roots and soil organisms and must be replaced by fresh oxygen from the atmosphere above the soil. Thus barriers to the exchange of gases such as a surface cap or a waterlogged top soil will result in poor aeration.

Preservation of a good soil structure helps to provide sufficient pore space, to facilitate passage of surface moisture and to maintain conditions of good aeration in the soil. Unfortunately, the use of sports turf by players and the passage of machinery necessary to maintenance readily cause damage to soil structure and induce compaction. This leads to wet surface conditions and increased susceptibility to damage.

The effects are obviously most marked on the less sandy soils such as clays or silts. Such soils, even under the best conditions, transmit water only slowly so that they are, as a result, more easily damaged.

In agriculture, improvement of soil conditions can be achieved by ploughing up and cultivating, but obviously sports turf is meant to be a permanent "crop". Nevertheless, despite the difficulties, it is generally appreciated that some kind of top soil cultivation to give improved moisture transmitting and aeration characteristics is required for sports turf.

With demands for ever-increasing amounts of wear tolerance, the need for effective action is increased, and there is thus an ever-increasing requirement for the use of efficient aeration machinery by means of which overcompaction in the soil can be relieved (or, better still, prevented from developing) since this means stronger grass and better drainage, less mud and increased tolerance of wear.

Further, routine maintenance involving sufficient attention to this problem can greatly reduce the amount of the kind of wear which involves costly renovation at the end of a playing season.

On the majority of fine turf areas and a very large proportion of other sports turf areas such as football fields, hockey pitches, and golf fairways, routine treatment with suitable implements penetrating to about 4 in. is common practice, and the benefits have been well proved by experience.

There are, however, numerous situations on football fields etc. where deeper penetration is necessary. This is

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particularly so where sports turf constructed relatively recently has been sown down under conditions of inadequate cultivations. Deep aeration should not be required for well constructed new fields in the first year but unfortunately sometimes it is.

Much thought has been given to the required shape and form of tines to make the large hole necessary for deep penetration with a view to ensuring the quickest and most beneficial effects. In order to break the compacted earth to a depth, a shattering effect needs to be produced, but obviously with the minimum of surface disturbance and interference with play.

Solid or hollow tines do not produce this shattering effect because their action is to cause sideways displacement of soil into the walls of the hole produced. This is the whole effect with round solid tines and part of the effect with hollow tines.

Observations on the holes produced by flat bladed tines led to the adoption of larger flat, pointed tines capable of producing a deep shattering or cultivating effect. These tines do cause some minimal surface disturbance, especially when campaction is severe.

A chisel shaped root development tine produces a rather less deep but uncompacted hole of large area below the surface. It is clean at the point of entry under almost all conditions and is, threfore, capable of being used in a regular maintenance programme even on areas in regular use.

The two tines referred to are shown in figures 1 and 2, together with penetration diagrams based on plaster casts of actual holes. It will be seen that these holes have a large volumetric capacity for the immediate acceptance of surface moisture or of applied top dressings. Their shattered condition encourages rapid movement of both air and water to the roots which are thus able to grow much better. Increased root development leads to improved soil structure and to increased drought resistance. Some of the principal benefits to be gained from the use of machinery to improve deep aeration of the soil can be summarised as follows:—

- Deep holes with uncompacted walls.
- Shattering of the top soil to a depth.
- Improved passage of moisture.
- Improved penetration of air and easier exchange of soil air with the atmosphere.

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Fig. 1. Deep Cultivating Tine

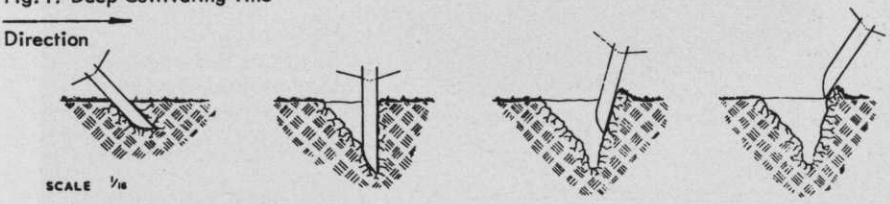

Fig. 2. Root Development Tine

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- Better root growth leading to better soil structure.
- Improved incorporation of top dressings.
- Improved drought resistance.
- Improved wear resistance and, therefore, frequently, reduced costs of maintenance and end renovation.

If adequate drainage conditions are absent there are limits to the benefits which can be obtained by these procedures. Most sites need a full drainage system, but on occasion the provision of deep sumps filled with aggregate has helped considerably.

The choice of implement for a particular application is, as usual, dependent on the tractor available, and obviously the type of tractor also affects the number and frequency of applications.

An agricultural type tractor with grassland tyres and provided with a three point hydraulic linkage is the most suitable. The linkage allows the implements to be raised for turning with consequent reduction of adhesive loads on the driving wheels.

It is, of course, important to use the implements when surface conditions are not too wet to cause difficulties at the surface, but with the soil sufficiently moist to get adequate penetration. For this and other reasons the operation offers the greatest benefits when used on a preventative basis, and should not be undertaken only when drastic remedial measures become essential.

A particular aspect might be the relationship between what is now conventional aeration as discussed here and present work with slitting, trenching and back filling procedures. It is considered, for example, that the movement of surface water towards such supplementary drainage ways will be assisted by regular spiking.

Study of actual case histories facilitates useful practical conclusions and it is hoped that users of this equipment may have useful contributions to offer regarding their own experience.

Trials and findings

A further report on the work of the Sports Turf Research Institute at Bingley

Some of the first trials by the Institute (in 1929) were on the subject of fertilisers and many of these were kept on as demonstration plots until 1964. The trials were on the value of various standard fertilisers with and without sulphate of iron on fine turf established from seed and on existing meadowland turf. Further differently orientated and organised trials on similar marterials were initiated in 1937, 1939 and 1948. The general picture that emerged was:—

(a) Turf needs a balanced fertiliser with nitrogen the most important plant food, phosphate second and potash third.

(b) Sulphate of ammonia is a very good nitrogenous fertiliser for turf, having a marked effect in keeping down disease, worms and weeds including annual meadow-grass and in producing a firm playing surface but long continued exclusive use leads to poor rooting, fibre formation and lack of drought resistance.
Organic nitrogen fertilisers help drought resistance but continued exclusive use leads to a soft, easily damaged turf prone to weed and worm invasion and susceptible to Fusarium patch disease. Alkaline type fertilisers encourage weeds, worms and disease, especially if used regularly.

(c) A suitable fertiliser for fine turf

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