

REPORT: THE VERTI-DRAIN

COMPACTION is a term with which greenkeepers and groundsmen have become increasingly familiar.

Soil compaction is the most common cause of poor turf on golf courses. Constant traffic and intensive use of heavy equipment can squeeze soil particles into a highly impervious mass, especially in the top surface layer.

Most compaction in turfgrass situations occurs within two to three inches of the surface, with the highest densities occurring in the upper inch. Even though a thin layer is compacted, it can profoundly affect turfgrass growth by restricting soil aeration and water movement. This results in stagnant conditions that prevent grass roots from functioning properly.

Aeration is one of the most effective methods of dealing with compaction and it is essential for the operation to be carried out as much as possible to combat the condition. For grasses, as for other

plants, the presence of air in the soil is necessary and the object of aeration is to penetrate the ground so that air may be admitted to various depths in the soil.

Air is needed to assist chemical changes necessary for the conversion of mineral salts into available plant food. It also helps the free passage of water and permits greater ramification of grass roots, which, in turn produce healthier plants. It also benefits the physical condition of the soil, so that despite intensive play there is a reduced risk of compaction.

Compacted soils have a poor structure and drainage is restricted. This prevents root development, inhibits the gas exchange and the capacity of the turfgrass plant to absorb water and nutrients is impaired.

As a result the turf suffers by becoming thin, weak, lacking in colour and vigour of growth. It is also likely to become more susceptible to disease. According to the experiments in the USA it was found that

Verti-Drains are available in different sizes as follows:
 Popular Verti-Drain - width 1.2 metres, hp. required 17 plus.
 Tines 1/2" dia. by 10" long at 2" spacings. Tines 3/4" dia by 10" at 4" spacings.
 Hollow tines 1/2" or 3/4". Weight 500 kilograms. Ground speed 1/2 mph.
 Greens Verti-Drain - width 1.45 metres, 30 hp. required.
 Tines 1/2" by 12" at 2" spacings, 3/4" by 12" long at 4" spacings. Hollow tines 1/2" and 3/4" are also available.
 Weight approx. 800 kilograms. Ground speed .25 mph.
 Sports Ground Verti-Drain (ideal for fairways) 2 metres wide.
 70 hp. required. Tines 1/2" by 12" at 4" spacings. Tines 1" by 16" at 4" spacings. 3/4" hollow tines are available. Weight 1300 kilograms.
 Ground speed required .25mph.
 Sports Ground Verti-Drain - width 2.5 metres, as above but requiring 80 hp. tractor and weighing 1450 kilograms.

golf greens in good condition had satisfactory oxygen diffusion rates to a depth of four inches, but greens in poor condition had unsatisfactory levels, even at a depth of two inches. The tests also showed that routine aeration treatment produced satisfactory values at four inches, but not at ten inches. On the other hand, experiments with deep aeration gave satisfactory values at a depth of ten inches and perhaps deeper. It would appear from this that there is a direct relationship between depth of penetration and depth of good oxygen soil levels.

A machine which effectively achieves good depth of penetration is the Verti-Drain. Some aerating methods cause the tine to be driven into the ground forcing the soil to move sideways, increasing texture tightness and smearing the side wall. What actually is required is equipment which will deep-cultivate the soil without damage or disturbance to the turf and the Verti-Drain efficiently does this.

The Verti-Drain is fitted with powerful tines which smoothly penetrate the most compacted ground and is capable of gently heaving the soil from half an inch to two inches. The lift

is uniform, maintaining good surface levels, but directly related to the amount of air and cracking which has been exerted into the ground down to as much as 16 inches (depending on the length of the tines).

This cracking effect relieves compaction, splits up any pan, creates fissures and enables trapped stagnant gases to be released and allows oxygen laden air to take its place and water to freely percolate to the drains or drainage levels. After such treatment, roots will often be found going down to ten or 12 inches within weeks if the work is undertaken during the growing season. This improves health and vigour and enables the grass to cope with drought and hard wear.

Verti-Drains can also be equipped with hollow tines either half or threequarter inch nominal size. Using these tines large quantities of undesirable material can be removed to improve aeration, or replaced with top dressings that will eventually change the nature of the soil in which the grass is growing. Hollow tines penetrate the soil to a depth of six inches in the case of half tines and nine inches in the case of threequarter inch tines.

