

Introduction

In recent years the general quality of high quality winter sports pitches (especially soccer) has improved considerably. It is not long ago that grass less, muddy surfaces were common place by the middle of December. Now days it is rare to see even the goalmouths worn even at the end of the season. However, some may argue that this statement only applies to the wealthier clubs that can afford expensive maintenance treatments. In the UK it is not unusual for premier league clubs to completely rebuild the pitch at the end of the season, even during the season in some cases! Various different construction techniques are used in order to achieve the 'perfect surface'. Many are built to the same specification as a USGA specification golf green which obviously has excellent drainage potential, other techniques include the DESO system which uses artificial fibres incorporated into the grass sward which influences sward density and reduces wear.

However, the majority of winter games pitches are composed of indigenous soil with varying rates of drainage depending on the type of soil present. Scotts believe it is possible to achieve a good surface without the need for expensive reconstruction work or 'sky high' maintenance costs, although ultimately the amount of play and the desired surface quality will influence the amount of maintenance and, in particular, drainage and aeration that is necessary.

Drainage

Due to the fact that winter games are played through the wettest months, good drainage is essential for the creation of good surface conditions. Apart from the wealthiest clubs who can construct purpose built free draining rootzones, the majority of winter pitches rely on pipe drains or nothing at all. If the soil is naturally heavy (clay based) it is likely that some form of pipe drainage scheme will be required in order to produce reasonably good surface conditions. Pipe drainage schemes are normally designed in a 'herringbone' or 'grid' system depending on the most appropriate design for the site.

In order to further improve the drainage potential some pipe drainage schemes are supplemented by 'sand slits'. These slits are designed to 'link up' the drain runs. They can be installed after the original pipe drainage system has been installed, although it is better if both are installed at the same time. Sand slits are normally spaced approximately 1 metre apart although this can be greater or less depending on the required drainage and the type of soil. Even where a good quality drainage scheme is in place the drainage of the pitch is still reliant upon the natural drainage characteristics of the rootzone for water movement into the system. This is why regular and appropriate aeration work is needed.



Aeration – Compaction Relieve

Soil compaction is one of the most common problems found on winter sports pitches. This is mainly due to the fact that pitches are played on in wet conditions; this situation exacerbates soil compaction. Compaction is also greatly influenced by the type of indigenous soil present; for example a clay-based soil is more prone to compaction than a sandy soil due to the nature of the soil particles (texture).

If regular aeration work is not carried out, soil compaction will build up throughout the season. If this occurs the large pores within the soil structure (which influence the movement of water through the soil) are reduced or lost. If water cannot move through the soil, water logging of the pitch will occur during rainfall. Other growth factors will also be affected such as beneficial bacterial activity, available oxygen and the uptake of nutrients. In this situation the grass sward will deteriorate quickly.

Types of Aeration

The most important principle is to make sure that the whole of the soil profile is aerated. This will allow water to move from the surface, through the soil profile and into the drainage system (once field capacity is reached) or to naturally filter away. However one of the biggest problems on winter pitches is deep compaction.

Over the last 15 years the most significant innovation in deep compaction relieve has been the introduction of the Verti Drain type machine. On winter sports grounds this type of machine is widely used as part of the renovation programme to relieve compaction at the end of the season. However, some clubs use it more regularly in order to keep the soil profile open, using the larger diameter tines in the spring and the smaller tines in the autumn, although number of treatments and timing depend on individual circumstances. It is also worth noting that the larger tine will cause more surface disruption, which might not be acceptable.

Verti draining will only be successful if it is backed up by regular Slit tine aeration. Slit tine aeration normally aerates the top 75mm-200mm. There are various methods, which include 'chisel' or 'diamond', although the 'slit' tines are the most common. Apart from encouraging 'cracking' within the soil profile, the slitting action also produces a channel for water to run into.

The other benefit is that slitting will encourage deep rooting, either directly by allowing roots to move through the created cracks or indirectly by generally improving the rootzone. Suitable implements are either self propelled or attached to tractor units.

Slitting can be over done! Research has shown that too much slitting can actually reduce grass cover. Every situation is different although slitting can be carried out approximately every three weeks from September to January, in good weather and ground conditions. However it is really a case of trying to get the balance right according to the pitch conditions.

Other methods of aeration are available such as solid tining and hollow tining. Solid tining is useful for allowing air into the upper layer of the rootzone and therefore plays an important role within the aeration program. It does not relieve compaction. Solid tining can be carried out through the year on a regular basis. Solid tining is particularly useful for sandy rootzone pitches that do not need so much compaction relieve.



Hollow coring is used to remove accumulated fibre at the base of the turf sward. It is also sometimes used to allow exchange of a poor soil for a better one to be introduced through top dressing. It is also used for over sowing during renovation, although we would recommend the use of a specially designed over sowing machine rather than this method.

In recent years the use of a 'rubber crumb' material has been used to great effect on many high quality pitches in the UK. This type of material is said to reduce wear and tear on the surface and increase soil temperature. Hollow coring is used to incorporate this type of material into the grass sward.

Various other methods of aeration/compaction relieve are available. Machines such as vibrating mole ploughs are useful if there are isolated wet areas, although the channels created by the machine must be cut into a positive outlet so that the water can move away. Probes that penetrate deep into the soil profile and release compressed air are sometimes used to 'restructure' soil profiles (e.g. Robin Dagger). High pressure water jets on machines such as the Toro Hydro jet have also been successfully used for compaction relieve and are also useful for re-wetting soils affected by Dry Patch.

Nutrition

Nutritional input through the autumn and winter is normally necessary in order to encourage healthy growth through this period, although it does depend on rootzone type, growing conditions and sward composition.

The amount of fertilizer applied may depend on soil analysis results, a typical NPK fertilizer analysis will be 9.7.7, 10.10.15, 12.0.9 or similar. Scotts Sportsmaster range has many different analysis to cover all situations.

Some clubs find that a controlled release fertilizer gives all the necessary nutrient that the pitch needs throughout the autumn and winter. Coated fertilizer slowly releases nutrient through this period as and when the grass needs it. Scotts Sierrablen 15.0.29 provides an ideal analysis for autumn application. Sierrablen 25.5.12 is an ideal controlled release product for spring and summer use and is regularly used at Ipswich Town Football Club to maintain their award winning pitch.

Worm Cast Control

At this time of year worm casts can become problematic. Casts smear on the surface after cutting etc. clogging up mowers and making open soil areas for weeds seeds to germinate.

It may be worth carrying out a soil analysis to check the soil pH. A high pH can sometimes encourage worm activity. Acidifying products such as sulphate of iron can help to acidify the surface – always take advice before using this approach to control worm activity.

Disease Control

Warm, moist weather conditions can encourage turf disease attack. The most common turf disease is still Fusarium patch (*Microdochium nivale*), although there seems to be more and more unusual diseases cropping up now days.



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Try to keep the surface as dry as possible. Regular aeration work will help in this regard. Occasional brushing or harrowing will also help to remove moisture and create an upright sward. If nutrient levels are too high this can encourage lush, soft growth which is susceptible to disease attack. However, it is also worth remembering that low soil nutrient levels can also encourage turf disease such as Red Thread

If the disease gets to the stage where it needs chemical treatment, Scotts have three powerful fungicides that can control most major turf grass diseases; Daconil Turf, a broad-spectrum fungicide for the control of many major diseases on turf, Heritage, the unique-action turf fungicide for control of Fusarium Patch, Take-All Patch, Anthracnose, Brown Patch, Leaf Spot/Melting Out, Rust Disease and Type 2 Fairy Ring, and Banner MAXX, an exceptional new fungicide offering three-routes to effectively control a broad-spectrum of turf diseases...fast.

Brushing/Harrowing

Brushing or light harrowing should be carried out following games to restore even surface conditions and to help create an upright grass sward. Be careful not to over do treatments as this can reduce grass cover during poor growing periods.

Top Dressing

Top dressing is a vital part of the maintenance program on winter pitches and is intrinsically linked with the aeration program. Sand top dressings help to produce a firm/open surface, maintaining a drainage link with the surface and the soil structure. It also helps to control the build up of fibre.

It is also advisable to carry out some form of aeration prior to top dressing in order to incorporate the material into the root zone (it is normally carried out during renovation).

The correct choice of sand top dressing is vital in order to avoid interpacking within the soil structure. A narrow particle distribution should be chosen in the medium range – approximately 0.5-0.125-mm diameter particles.

Sand top dressing is also vitally important for maintaining sand slits in good condition. If sand slits are present they must be kept open by regular top dressing treatments. It also helps them to remain level with the rest of the surface.

Summary

Aeration (and drainage work) is just one part of the necessary overall maintenance programme, although is arguably the most important part as it directly influences the soils ability to supply the grass plant with essential nutrients, air, moisture and stability.

The type of soil, number of games and quality of surface required will influence the type and intensity of treatments required. Now days there are various suitable implements available to buy. For smaller clubs it is not always possible to buy the necessary equipment, in this situation it is wiser to hire or borrow!

The best advice is to try to carry out as much aeration as necessary or possible, and stick to a regular programme, even when compaction problems are under control. It is far easier controlling compaction than curing it. The benefits will eventually outweigh any surface disruption problems that initially occur.



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