

moisture is trapped in the soil. Since Turface works to control moisture, it will assist in the prevention of disease due to stagnation.

In summarizing, Turface produces a better turf structure because it works toward satisfying all the conditions that must be met for good root growth. It does this by delivering moisture to deep roots, allowing the soil to breathe and providing excellent drainage.

On golf courses, Turface is widely used as a top dressing material following aeration of the greens. Maximum effectiveness is obtained by top dressing with straight Turface, although Turface may also be incorporated into any top dressing mixture.

Turface is a montmorillonite clay. It is mined from a specially selected earth deposit in Mississippi. Obtaining special cuts of material from the mine is only the first step of many important operations. The crude clay is crushed and ground only after analysis verifies top quality material. Materials of uniform particle size are then fed to a calciner. A calciner is an inclined, revolving cylindrical chamber, flame fired to temperatures above 1300 F. The humidity in the calciner is exactly controlled. The crude clay enters at the top and leaves at the lower end. It has been subjected to constant high temperatures over a definite period of time. Through the use of specially designed ribs in the calciner it is possible to get a uniform degree of calcination. Careful control of particle size, temperature, time and tumbling action is absolutely necessary to produce a product that will absorb moisture, allow free air movement, and not disintegrate while in the soil. High temperature calcining over a short period of time is not enough to ensure complete calcination. Also, if the particle size varies, it is possible to over-calcine small particles and under-calcine large particles. Following the calcining procedure,

Turface is reground and screened to ensure the exact particle size and distribution. Finally, the product is packaged in attractive 50 lb. bags.

HOW TO USE TURFACE FOR TURF CONSTRUCTION

When new greens or tees are constructed, Turface is an excellent choice as a component of the topsoil mix, usually replacing part of the sand. Where practical, it is desirable to condition the top six inches of soil with approximately 20% to 25% Turface (by volume), depending upon the physical structure of the soil.

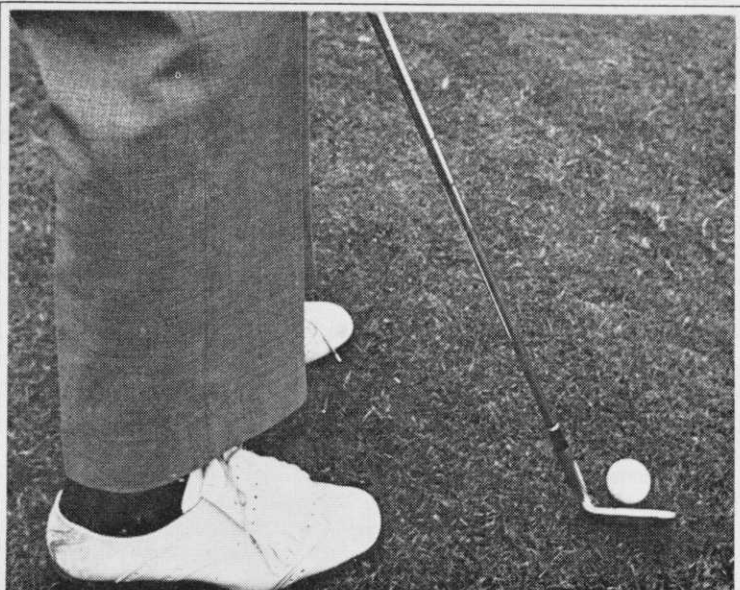
It is important to distribute the Turface evenly throughout the top several inches of soil; this is true whether Turfing or sowing. There are many ways of accomplishing even distribution. The following are suggested methods which have proven satisfactory:

A. Direct Application

Rototill or cultivate one bag of Turface per 10 square feet into the top 6 inches of soil (Soil is usually a mixture of sand, top soil and peat). At this rate, the top 6 inches of green surface will be conditioned with approximately 22% Turface. After levelling, turf or sow.

B. Pre-Mixed Soils

With the use of a mechanical soil mixer, mix 5 bags of Turface with each cubic yard of soil. One cubic yard of the mix will cover 54 square feet of the green surface to a 6 inch depth, or 27 square feet to a 12 inch depth. The soil will be conditioned with approximately 21% Turface.



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HOW TO USE TURFACE FOR TURF MAINTENANCE

Since compaction is always a problem on greens, a good maintenance programme is important. Top dressing with Turface will help to ensure a friable soil, good drainage, and optimum root development of the turf.

A. Straight Top Dressing

Aerify, remove plugs, and apply Turface through a spreader, using one bag for each 250 square feet of surface area.

With reverse side of rake, push-broom, or drag screen, work Turface into turf and aerification holes.

Verticut machine may be used before Turface application, to provide additional avenues of entry into the soil. Turfacing is recommended twice or more a year (once a year for Turface-built greens).

B. Surface Levelling by Top Dressing

Greens develop low areas which need to be relevelled. A soil mixture similar to that in the green plus Turface can be used to facilitate excellent drainage.

Premix 1/3 Turface with 2/3 soil. Soil may be mixture of sand and peat or sandy loam. Verticut area to remove thatch, and apply Turface mix to area in regular levelling manner.

FORMULAS

The following formula is used to determine the number of Turface bags necessary for construction when depth of mix in inches, per cent Turface, and square feet are known:

Bags = $.0007 \times \text{Depth} \times \text{Per Cent} \times \text{Square Footage}$.

Example

5000 sq. ft. green

15% Turface desired to a 4" depth.

Bags = $.0007 \times 4 \times 15 \times 5000$

Bags = 210

If, however, a greenkeeper wishes to put so many bags into a green to a certain depth, the following formula is used to determine the percentage Turface in the mixture:

Percentage Turface in Mixture = $1550 \times \text{Bags} \div \text{Depth} \times \text{Square Footage}$.

Example

150 Turface Bags

6000 sq. ft. green

4" depth to be conditioned

Percent Turface in Mixture

= $1550 \times 150 \div 4 \times 6000$

= $232,500 \div 24,000$

= 9.7 or 10%

This means that if 150 bags of Turface are worked into a 6000 sq. ft. green, the top 4 inches of soil will be conditioned with 10% Turface, by volume.

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Applicants should send full details of career, together with copies of any references, to:

The Managing Director
Woburn Golf Club,
Crowholt, Woburn, Beds.
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THE LOOK OF A HOLE

Patrick Smart

There are several ways of surveying a hole from the teeing ground, depending on the skill of the player.

It should be a matter of thinking, and there can be bad thinking even among the shorter handicaps.

One thing is certain. The designer has not set out to make it simple for the golfer. It occurs to me, having written that, some of the most difficult holes I have known were simple. Flat, featureless, dull. There is no incentive to try, and that induces sloppy stroke making.

Standing to his ball, the long handicap will look down the fairway, ignoring the geography of the hole, and hope he can knock one down the middle. It is a waste of time to decide on which side of the fairway he should place the ball. He knows that to be beyond his compass.

Perhaps he misses something here. There is fun in examining the problem before us, and in a sense reading the architect's mind. We shall come to that later, and the aesthetic pleasure of gazing upon a really good lay out. That can only be done in a carefree round.

It is a principle that there should be two routes to the hole. The one enforcing accuracy, combined with an element of risk. The other, for the higher handicaps, leaving them—providing the drive is in play—with two comparatively easy strokes to the green. No large carry to overcome. I

say two more strokes, because if they try to get up with the second (and try they will), it may lead to an 8. or more, when a 6 was possible.

It is one of golfs facts that the handicap player will not accept that he has spare strokes from his allowance. By all means let the youngster have a go. It is fatal to instil into him a defensive attitude. He will learn the hard way. Which is the only way. The elderly, good golfers when younger, have the experience to fiddle their way round.

We come to the better average club members, giving a fairly wide margin, say 11 down to 6. Here, I believe, the handicaps could be reduced by several strokes if they would take a good intelligent look at the hole they are about to play.

On their home course, they consider they know all about each hole. It can be that they have been adopting the wrong strategy on certain holes. Hence the stationary handicap. On a strange course, there should be a pause to study the design, reasoning: "Now, what devilry is the designer trying to entice me into." Just a little care can make a lot of difference.

On many courses the greens are either angled away from the centre of the fairway, or guarded by bunkers that call for placing the drive. Hence the need for correct tactics. The fall of the ground comes into this. It will govern the roll of the ball, and the middle can be ignored. The fader, or the puller can use that slope to his advantage. To clarify that. A right to left slope will help the fader. If the prospect is the other way, then he who puts draw on the ball will benefit. The ball will not run into trouble. The 6 handicap should be capable of putting the ball approximately where he intends.

I once wrote of the drive being the most important stroke, a good start

Continued on Page 19

MOSS ON SPORT TURFS

by R. L. Morris,
Senior Horticulturist,
Levington Reseach Station

Moss invasion is one of the greatest problems with which greenkeepers are faced on turf areas under their control. Moss is often an embarrassment to them as its presence offends their professionalism, rightly so as neglect of essential cultural work is one of the root causes. Since these primitive plants have the ability to survive under a wide range of conditions, it is important to understand the factors that account for their presence in turf so that the correct control measures can be taken.

Retention of moisture at the surface is the key factor and may be due to shade, soil conditions or management,

and often to a combination of all three.

Very little can be done about shade on established turf, but should be taken into account when siting a new area. Soil conditions are usually the greatest contributors to water retention. The soil type has on obvious bearing, for even on light soils settlement and compaction over the years tends to seal the surface, resulting in water retention in the sward.

Fibre build up in the upper profile caused by accumulation of debris gives a spongy layer that is very water retentive. This is perhaps the most frequent cause of moss development in the winter following a dry summer—such conditions have prevailed in the last two seasons. The fibre dries out badly and is difficult to wet up again. As a consequence sufficient water remains at the surface for development, but penetration into the



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grass root zone is limited, and thus over a period of several years the overall strength of the sward declines. September to December is the period when most active root development takes place, and it is logical that restriction of water supply at this time will cause roots to become weaker, and seeking surface water, more shallow. This leads to a lack of competitive ability on the part of the grasses and unless remedial steps are taken, moss rapidly gets the upper hand.

There are two main groups of moss. The acrocarpous mosses, which are mostly cushion forming and generally have a fairly high light requirement, so that they are not normally found in a dense sward. This group is symptomatic of neglect (where the grass is starved out and thin) and over-close mowing (which places the grass under severe stress and reduces its strength—very noticeable where high spots are scalped) and the

pleurocarpous or feathery mosses, which are far more general and may exist in quite pronounced patches where the grass is not competing satisfactorily, and often uniformly over the whole area in which moss can invade and take over if it is not checked.

From what has been said so far, it is clear that mosses are very adaptable and whilst chemical control is possible, their elimination will depend on the removal of the conditions conducive to their growth.

Good cultural practices involving year-round aeration using tines appropriate to the season are essential adjuncts of chemical control. These will open up the surface, enabling air and water to penetrate satisfactorily and, by improving air/water relationships in the soil, enable root strength to increase and the grass plant as a whole to become stronger—thereby enabling it to compete on better terms.

To be concluded

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in any game or sport is helpful. The second shot to a hole, to a narrower target, requires careful consideration. A cool assessment of the possible (let us leave percentages to the Stock Exchange) may ward off disaster. The question of attempting to carry, or play short of a lateral stream is one. The pin placement may make attack dangerous. Once again, he has his handicap.

The most tricky courses are those where, incorrectly, trouble lies behind the greens. These even for me, are old fashioned. I know one well.

A test of a good, interesting lay out, is that after one visit the holes remain in the mind. A dull course leaves no memories.

And now for the pleasure of looking at a fine hole. The famous have been described before; the public without seeing them have come to know them. Come with me to a links that deserves to be better known. It is Pennard, on the Gower peninsular, west of Swansea. I told the late Bernard Darwin I was going there. He replied: "I have it on the best authority, James Braid, that it is one the finest natural links in the country."

Like Muirfield it lies above the sea, the Bristol channel. There are mountainous, terrifying dunes. One hole stands out, though after twenty five years I can remember them all.

You stand on a high teeing ground. Below, all the way to the green is sand. On either side buttress of great dunes elbow their way in. The green, 200 yards away, is perched high, cut out of the side of a dune. It is green, or purgatory. According to the wind, it can be anything from a No. 4. iron through to a driver. It brings to mind the famous Calamity Corner on Royal Portrush.

It strikes terror into the hearts of some, a tingle of excitement at the challenge in others. A short hole, it has majesty. You cannot ask for more than that.



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