

SAND GREEN CONSTRUCTIONS IN GREAT BRITAIN

The need to keep golf greens in play throughout the year has led increasingly to the use of sand based rootzones in Great Britain. This type of green construction has also been employed on many newer courses across the United States, hence the investigation into its potential for use in this country.

Fertiliser nutrition was considered to be a critical aspect of management and thus worthy of specific experimentation, due to the inherently low nutrient status of sands and the very high potential for leaching of fertiliser. It is worth noting that the results discussed herein can only be applied to the establishment phase of green management, as the trial ran only for the first three years following construction.

Generally the trial proved to be a great success, and we were able to gather a great deal of information, not only relating to fertiliser management but on the various problems associated with sand greens themselves. Here is a summary of our findings:

■ **Nitrogen:** To establish and retain a 'satisfactory turf cover, the greens require much more nitrogen than soil greens, the exact rates being somewhere between 250 and 400 kg/ha per year of N, a rate of nitrogen which is at least twice as much as is normally applied to soil greens. However, it should be noted that the requirement for nitrogen would probably decrease with time as natural organic matter accumulates in the sand. It is also worth noting that these higher rates of nitrogen also favoured the development of *Agrostis* (bent) at the expense of *Festuca* (fescue).

■ **Phosphorus:** Phosphate application was required to prevent significant losses of ground cover. *Agrostis* was particularly susceptible to phosphate deficiency in the sand and problems were noted at levels of less than 10 ppm of P_2O_5 . However, only very low application rates are recommended in these circumstances (ie. no more than 25 kg/ha/year) as there was a definite tendency for *Poa annua* colonisation of plots receiving high rates of phosphate.

■ **Potash:** The application of potash did not have a significant effect on ground cover readings during the trial period, although it appears there was some natural release of potash from the sand, which complicated these findings. However, we noted that there was a definite response to potash in a number of the playing quality tests which we carried out. In particular, the turf tended to exhibit a much 'springier' response to ball impacts with increasing potash application, and this may indicate other effects on the turf which were not picked up with ground cover tests, eg. increased root growth, organic matter production, etc. We also found that fertiliser derived potash was highly prone to leaching, through the acid plots in particular.

■ **pH:** Acidity increased (ie. pH decreased) very rapidly as a response to the repeated application of sulphate of ammonia (the chosen source of N). In some instances pH levels dropped below 4.0.

This very rapid decrease of pH had a significant effect on turf growth and caused unacceptable ground cover losses. It was also interesting to note that the bent grass (in this case Highland) was much more tolerant of the increased acidity than the (Frida) fescue.

The very acid plots were also characterised by poor surface water infiltration rates due to a capping effect, which may have been caused by poor organic matter degradation.

As part of the experimental programme, lime was applied to half the plots, with the purpose of neutralising the effect of repeated sulphate of ammonia treatment. In the short term this resulted in stimulation of growth and good ground cover response, but as expected, there were a number of longer term severely detrimental effects. *Poa annua* invasion was rapid and we also observed the development of Take-all patch disease in a significant number of limed plots.

Based on the results of this work and our own experience

- Is there a place for them?
- Is there a *need* for them?

in the field, we do not recommend the use of pure sand based constructions for the follows reasons:

1. pH control is critical: because sand is such an inert substance pH can vary considerably, depending on the treatment. The environment of the grass plant is consequently open to rapid and possibly detrimental changes.
2. As there is no naturally derived organic nitrogen source, the condition of the turf deteriorates rapidly through the winter, and in the case of the particular trial severe losses of ground cover were noted throughout this period. As the fertiliser derived nitrogen source ran out through the autumn, the lack of any naturally available nitrogen prevented steady growth through mild periods and thus the turf was prone to wear damage.
3. Sand greens are very prone to Take-all patch disease due to the lack of any naturally occurring antagonistic bacteria/fungi in the rootzone.
4. Establishment of the turf can be slow and patchy due to the very rapid loss of moisture from the surface, this having an effect on germination and seedling growth.
5. Maintenance costs are potentially high due to the need for repeated fertiliser application during the first few years of establishment.
6. Repeated rootzone sampling is required as nutrients are prone to leaching and regular applications of potash, together with low rates of phosphate, may be necessary. Consideration will also have to be given to micro-nutrient testing with a view to possible application.

In theory, the basic rationale behind the use of pure sand constructions would appear to be perfectly sound. There is no doubt that the provision of a free draining rootzone is highly desirable and of great importance in this country, because of the frequently wet and mild winters which characterise our climate. This weather pattern, combined with the massive increase in playing levels, particularly during the winter, does make provision of free draining putting surfaces essential.

It is worth bearing in mind that many of our best greens – in terms of drainage and year round quality – have been established on coastal links sites, frequently utilising the local dune or beach derived sand. However, closer inspection of these greens reveals a rootzone that does not consist of pure sand alone. Usually the sand has a significant organic and soil component. It is this distinction which we have found to be so critical.

The lack of organic matter and soil renders the pure sand rooting medium prone to rapid changes in pH, increases the requirement for fertiliser and substantially influences turf growth and wear tolerance through the winter. We consider these problems far outweigh the potential advantages ➔ 13

● **Conclusions are based on research following a three year trial on the fertiliser nutrition of sand greens, carried out at the Sports Turf Research Institute and sponsored by the Royal and Ancient Golf Club of St Andrews.**
Tim Colclough is an Advisory Agronomist with the Sports Turf Research Institute, specifically serving the south west of England.

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in terms of rapid drainage rates.

Furthermore, it is frequently the condition of the surrounding land, ie. fairways and especially green approaches, which dictate the feasibility of winter play through periods of heavy rainfall and consequently, the availability of ultra free-draining greens becomes irrelevant. That is not to say that the provision of a free draining putting surface is of low priority, indeed quite the opposite is true. A compromise is the obvious solution and we prefer to use a growing medium which contains at least 70-80% of uniformly graded lime free sand of medium particle size, blended with a small amount of light soil and organic material. Given the provision of good quality materials which conform to a very tight specification, this growing medium will provide free drainage and promote healthy growth of the desirable turf grasses. Indeed, this type of sand/soil mixture is more in line with our original links green constructions, when compared to pure sand.

In conclusion, the combination of research work and site experience leads us to believe that generally there is no place or need for pure sand greens in this country. The only mitigating circumstances which could contradict this conclusion may arise due to a complete lack of suitable local materials and a tight construction budget.

As is so often the case with experimental work, more questions become apparent and in responding to the need for further investigation into the whole subject of green construction, the Institute is carrying out extensive comparative research into pure sand greens, the USGA Green Section specification and local topsoil constructions. This five year experiment, again sponsored by the R&A, will also encompass investigations into irrigation rates and links with fertiliser application.

■ May I use the pages of Greenkeeper International to thank everyone in the North Scotland Section for the presentation of a print of The Old Course at St. Andrews, made to me at our section AGM.

It came as a great surprise and although being secretary of the section was hectic at times, the post gave me a great opportunity to make a great many friends in greenkeeping, not only in the north of Scotland but also throughout Britain, Europe and beyond.

I would also like to thank once again all those who helped and supported me in my capacity as secretary, including my wife, Pauline, and my past employers, Fraserburgh Golf Club. It is a job I would recommend every member might care to try for and I am sure that my successor as section secretary, Iain McLeod, will be an excellent ambassador for BIGGA, North Scotland.

GORDON MOIR St Andrews, Fife, Scotland

■ As a member of BIGGA I want to congratulate you on your fine magazine Greenkeeper International. I enjoy reading it and look forward to it every month.

I was particularly interested in the recent article: "Lessons To Be Learned" (September '91). I too was one of the millions of viewers who watched The Open at Royal Birkdale on my TV set and although as a fellow greenkeeper I was curious about the appearance of the greens, what really disappointed me was the speculation and misinformation that the so-called professional announcers – both British and American – were feeding to the viewing public. Whilst this misinformation has been a problem in America for some time, I was distressed to see that it had now reached global proportions.

It has always seemed curious to me that the mere presence of a microphone and a camera can instantaneously transform an observer of the game into an agronomist. The situation is even more alarming because to the viewing public these men are uttering the final word and their rambling theories are taken verbatim as THE TRUTH! This is particularly troublesome for the greenkeeper in question and for the industry as a whole. One of the few positive signs that this situation might improve, at least here in America, is that the announcers are more frequently commending our golf course superintendents by name during their telecasts. Positive it is, for it wasn't too long ago that the local golf professional was given credit for the spectacular condition of the course, which as you might imagine was a real thorn in the sides of all golf course superintendents.

Suffice it to say we still have a long way to go before we can be satisfied that we have turned the corner on this particular problem. Certainly it would be nice if these announcers were to seek out the person in charge of the maintenance and improvement of the golf course to get the real facts, but until they do it is important to use a forum such as your magazine to help them recognise their deficiencies.

ROBERT J MAIBUSCH CGCS, Hinsdale GC, Illinois, USA

■ As we come to the close of another year I am in the habit of reflecting on the various milestones which have occurred during the previous twelve months. One such major milestone has been the upgrading of BIGGA's magazine, Greenkeeper International, which in my view has successfully combined news from within the golf industry with helpful and instructive articles.

In particular, I have found Jim Arthur's articles to be ideal. They seem so often to epitomise the realities which many people tend to skirt around and incorporate helpful, positive suggestions and direction. I trust this beneficial and vital format will continue in the years to come.

To everybody who works on Greenkeeper International I send my best wishes for a prosperous New Year.

DAVID JENKINS

Managing Director, Charterhouse Turf Machinery Limited

Letters

■ I suffer from apathy! My chosen sport is cycle racing and I cover around 200 miles a week during the summer. I also enjoy watching golf on TV as well as most other sports.

All very well, you may say, but because I don't play golf (though I do belong to BIGGA) I suffer from apathy. This complaint about non-golfers is one levelled at non-playing Kent section members, which is why I'm writing.

I'll admit I did play golf in the past, but found it slow and boring. Now I find myself asking how many other greenkeepers – like me – work very hard on golf courses and yet enjoy another sport and are therefore branded as apathetic? Do the rules of BIGGA state that members must play golf?

GARY MILLS Chestfield Golf Club, Kent

Whilst talking with other members of the team here at Walton Heath, I offered an opinion that greenkeepers who play golf make better, or more complete, greenkeepers than those who do not play; by virtue of seeing and understanding the golf course from both sides. The room went very quiet for a while and I think my comments upset a few. Am I right, what do you think? I don't know if I am qualified to offer such an opinion, but I've been an artisan golfer for 25 years, a mechanic/greenkeeper for 8 years, and I keep my eyes open and use my common sense too.

TED JAMES BOND Walton Heath Golf Club, Surrey

– Two divided opinions, poles apart, and separated by nothing more than a delightful game and its vociferous devotees. Perhaps it is because the greenkeeping profession so often attracts entry from those who play golf that such opposing views are often aired. Readers comments are invited.

■ Whilst playing at Eltham Warren I hit a shot to the elevated first green, to my own satisfaction and retorts of 'good shot' from my partners. Upon reaching the green the ball was noticeable by its absence. A relentless search ensued – even looking in the hole – without success.

The following group were pressing and with mumbled remarks such as 'come on Biscoe, we'll never get round', with shaking heads we abandoned the Slazenger and moved on.

The matter was forgotten in the heat of battle until the eighth was reached, the green being adjacent to the first. My third shot hit the green, stopping 12 feet from the pin and ending in birdie territory in more ways than one, for as I walked forward my partner exclaimed 'did you see that, a crow has taken your ball and flown off with it?'. I couldn't believe it, but sure enough, one of the balls – mine – was missing. I looked and spotted the villain of the piece, 50 yards away with ball in mouth, taking a breather.

Suddenly my mind snapped, perhaps it was part of my RAF Regiment training, for I found myself charging at it, brandishing my putter. The fact that I'm an RSPB member didn't enter into the situation, for my ball was in danger and I was out of control. The bird, realising his little game might end in mortality, dropped the ball as my putter soared through the air, and took to the sky.

The putter never reached the target, clunking innocently through intervening tree branches to the ground. I proudly retrieved both ball and putter, replaced the ball and missed the birdie for a second time, settling for a par.

Well, I've heard of the thieving magpie but stone the crows – this takes the cake!

PETER BISCOE Keston Wood, Kent