

A FIRM NO TO SAND ONLY GREENS . . .

by Jim Arthur

As with so many catch phrases in golf, not every course described as having sand greens has been built with sand-only or pure sand greens. As one Texan Golf Course Superintendent said some years ago he wanted nothing to do with the sand-soil root zone of the USGA Green Section specification, as he had enough problems getting rid of the enormous amount of irrigation water he had to apply to stop the grass dying under what were virtually desert conditions.

Those who will doubtless leap to the defence of much publicised new courses with sand-only greens should first carefully check that there is no humus or soil addition to that sand. In fact they will be less ready to defend truly 'pure' sand-only greens because there is not one example of one in Britain which has stood the test of even a short period of play. Many so called examples of this desert inspired technique have in fact some source of moisture and nutrient retaining material, uniformly pre-mixed with the sand. In passing, rotavating bales of Irish peat into what were originally pure sand greens, as at one North Western venture is not a solution!

Research, generously funded by the Royal and Ancient, carried out for several years at the STRI, on the management of pure sand greens confirms both analytically and visually exactly, what logic would expect it to prove. Where there is nothing to retain water or plant foods, the grasses must snatch what they can as they passed own through the root zone and both feeding and watering must be both frequent and generous. Equally, with no compost-like buffer to hold basic nutrients, unless such sand greens are fed (and watered) regularly with complete (NPK) fertilisers and lime, the sown grasses die and if they are fed, then unsurprisingly *Poa annua* rapidly colonises and eventually replaces the bent grasses.

EXCELLENT SURFACES

Under arid conditions, and using heat resistant strains of bent (*Agrostis stolonifera*) the heat prevents any other grasses from invading and in any case there is not much *Poa annua* in the desert to provide seed to support the invasion. This is why such desert courses are virtually monocul-

SAND GREENS - STRI RESEARCH RESUME

by Dr Peter Hayes

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- 1) Sand greens require an intensive fertilizer programme with repeated applications of nitrogen, phosphates, potash and trace elements. If these fertilizers are not applied, deficiencies of the nutrients will occur.
- 2) The management of the pH (acidity/alkalinity) of the sand rootzone is critical as sand greens are prone to rapid fluctuations in pH, leading to poor growth and vigour. For example, on our trials the pH of the sand rootzones could drop by one unit in a year.
- 3) If liming is used to correct the lowering of the pH, lime causes too rapid an increase in the surface pH of the turf, thus leading to ideal situations for the ingress of the weedgrass *Poa Annua* and for moss, and the risks of obtaining the diseases Take-all patch and *Fusarium* are heightened with liming.
- 4) A rapid deterioration in winter

quality can occur on sand rootzones, resulting from nutrient starvation. This is due to the fact that there is no organic buffer to offer a supply of nutrients during mild weather periods.

5) The playing quality of sand greens is different from 'normal' greens. There is no resilience in the base of the turf which produces a "dead" ball bounce behaviour.

6) The quality of the sand used for the construction of pure sand greens is critical. It must be of uniform particle size and be lime-free, consequently construction can be subject to mistakes and, by using cheaper sands, inferior quality materials are often employed which lead to problems in the future with "concrete-like structures".

At the present time, the STRI would not recommend the use of pure sand greens for construction on golf courses.

tures of a specific bent, producing under these conditions superb fine, uniform and fast putting surfaces. Arguments about (or especially against) sand-only greens in Northern Europe are often confused by the effects of two other factors, the poor quality of sand used (which we will deal with later) and the all too frequent combination of sand-only and Penncross bent.

It must be accepted that Penncross and its relatives are simply not suitable for Northern European conditions, though unsurprisingly since they were bred primarily for heat resistance, so that bent could be used instead of Bermuda grass, they are satisfactory for Southern Europe etc. Claims that Penncross survives American winters in the cold Northern States are irrelevant. What Penncross will not stand up to are our long wet rather than very cold winters, coupled with

being subjected to constant play. In northern America, they spend the winter under snow and ice, with obviously no play.

It is fully accepted that regular spraying with dilute solutions of Paraquet can control for a time, seedling *Poa* in Penncross but in an unpredictable climate, this is akin to Russian roulette - and at best is certainly a very skilled operation dependent on calm weather, very accurate application and suitable growth. With so many imponderables, Murphy naturally is likely to have a field day!

The conclusion is unarguable. The system, though having considerable advantages in hot arid 'desert' climates, has no relevance to northern European conditions and creates a hundred times more problems than it solves. In passing the STRI confirm Penncross has poor winter colour, very poor disease resistance and worst of all is a

thatch producer a doubtful second only to *Poa annua*.

This makes pronouncements by a senior member of the USGA Green Section that "English (sic!) greenkeepers have progressed no further than the belief that *Poa annua* and fescue are the two best grasses for greens and fairways in Britain" so infuriating! This is compounded by the claims that "only recently a few have come round to the belief that bent grasses may be superior and more dependable." So obviously, they are thinking of 'their' bents, which were bred for completely different climatic (and soil) conditions, rather than our native strains of *Agrostis tenuis* and *Agrostis stolonifera*. It may come as a surprise that Scottish golfers, were playing on bent grass greens and fairways whilst America was still a British colony!

Fine fescues have always been associated more with links and a few favoured sandy heathland courses, but the bulk of our better courses even today are based on bent, especially on heavier and more acid soils. It was only the mistakes in the past fifty years of overfeeding in a chase for colour, based on 'agricultural' advice, that caused *Poa annua* to dominate so much fine turf, and everyone (well, almost everyone) has been desperately trying to reverse this pattern for the past two decades at least.

But to return to sand-only greens, the specification for a suitable sand both in regard to uniformity and narrow range of particle size and shape is difficult enough but to find supplies of such sands in consistent quantity to build even 18 greens is nigh on impossible and demands constant check analysis, - indeed of almost every load. The use of sands with angular particles over a wide size range, which bed down with all the permeability of a motorway is indeed a major cause of poor performance of many earlier sand-only greens, all of which either have been or should be lifted and relaid to specifications more relevant to our Northern European conditions.

To state that we should at the present state of research into their management, confine verdicts on the use of pure sand greens to saying that the disadvantages outweigh the advantages is classic fence-sitting which, as it always is, will be rewarded by the sitters being left behind. When leading American Architects such as Robert Trent Jones Jr. at Wisley (not the professionals turned designers whose knowledge of relevant agronomy could be written on the top of a tee-peg) specifically reject sand-only and opt for sand-soil greens for all those courses where they are involved in Northern Europe and echo the above condemna-

tions, it is surely time to take a positive view.

What indeed are these advantages which are so obviously and heavily outweighed in the UK? The only one is that such greens are easier (not necessarily cheaper and certainly not better) built and the problems arise only when the contractor and architect have left with their fees safely banked.

What we must ensure, if only to avoid Britain being littered with "costly monstrosities which are maintenance nightmares", is that naive if well endowed developers are not taken for a ride by inexperienced designers or contractors into building courses which will predictably fail to meet the effects of our climate and ceaseless play - and incidentally, which cost so much more than they need do, because lack of flair in using the land to best advantage is replaced by costly and destructive earth moving and the creation of artificial water features perched half way up hills, often retained by banks looking like the sides of major reservoirs!

All members of the British Association of Golf Architects would not advise sand-only greens, and no qualified agronomist (least of all the staff of STRI) would recommend them. Research programmes into their hydroponic management may well not have been completed (and indeed when they are, the findings may well be of academic interest only in northern Europe) but we know enough now from both research and practical experience to justify advising a total prohibition on this method of construction, which is so clearly unsuitable to our weather conditions, soils and above all constant play all winter.

CORRECT CONSTRUCTION

If pure sand greens must be condemned what then is the correct specification? Virtually without exception all concerned with golf course construction in this country at each and every level, would advise building greens (and tees) with a uniform sandy soil root zone, over an underdrained stone carpet. There may be differences in detail but not in principle.

The only exception might be where the natural 'soil' is virtually sand e.g. links courses. The root zone of the greens is deliberately a copy of the black sandy top spit of such links built up by years of decomposition of grass and organic matter.

Certainly there can never be any excuse to use the local soil (save in exceptional heathland sites etc). as no amount of sand added to a basically clay soil will produce anything better

than bricks. We have progressed some way from the situation so common 25 years ago when greens were built on native soils with 2" of 'seed bed compost' - asking for and receiving a certainty of annual meadow grass dominance, by virtue of impeded root development. The soil is available quite economically from limited sources and is characterised by having a very low 'fines' content (less than 4% clay and silt) but 8% of humus.

One must feel a certain sympathy for inexperienced developers whose sole knowledge of the game seems to be based on what they have seen on television, swayed by those whose golfing experience is confined to playing it professionally, albeit once superbly, employing unskilled contractors, whose previous skills were gained in motorway construction. Such unfortunates end up with a £multi million monstrosity far too difficult for the average golfer to enjoy and costing fortunes to maintain.

As with all aspects of golf, including construction as well as greenkeeping, the clue lies in better education - in this case of inexperienced designers and their equally naive 'employers'. Sadly in every aspect of golf today everyone seems to be convinced that they can do another man's job far better - and make more money at it - than that man, who has spent a lifetime at the job, kept himself up to date (if he didn't he would be out of work) and has seen it all before. This trend is by no means confined to golf course construction nor even to agronomy and the root cause, it must be accepted, is that there is a boom and money to be made. This is a plea for avoiding mistakes, spending money wisely and learning from the errors (often very expensive to make, and even more so to correct) that others have made before.

Whether 700 new courses will be built before the year 2000 is arguable. What is certain is that we must build those well: provide all year round play; as attractively as possible (using the latent advantages of the site and not trying to move half Britain from A to B); and certainly as economically as possible (if only because diabolically expensive construction cannot be funded from returns). Ultra expensive courses, equally with cheap golf-in-a-field ventures will certainly not survive a down-turn in the economy, but properly designed, specified and constructed courses will remain as memorials to the varied skills of those producing them and be both a source of pleasure to all grades of golfers and profit to their owners, whatever happens, be it boom or bust!