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TALKING

This month, Greenkeeper International's bi-monthly series featuring Course Managers and Head Greenkeepers from every Region, looks at Bunkers.

Bunkers

Compiled by Malcolm Huntington MBE



Name: Duncan Peddie Course: Alloa GC Region: Scotland Type of Course: Parkland Number of Holes: 18 Staff: Head Greenkeeper plus five



Name: Vincent Magill
Course: Cairndhu GC,
Northern Ireland
Type of Course: Parkland
Number of Holes: 18
Staff: Head Greenkeeper plus four and two students
in the summer



Name: Jeremy Duffield Course: Cleckheaton and District Region: Northern Type of Course: Woodland Number of Holes: 18 Staff: Head Greenkeeper plus four and a part-time gardener



Name: Jonathan Wood Course: Ross-on-Wye GC Region: Midland Type of Course: Woodland Number of Holes: 18 Staff: Course Manager plus four, plus part timer three days a week.



Name: Paul Jenkins Course: Lilleybrook GC Region: South West and South Wales Type of Course: Parkland Number of Holes: 18 Staff: Course Manager plus five



Name: George Barr Course: Ham Manor GC Region: South East Type of Course: Parkland Number of Holes: 18 How many bunkers do you have and have you added or subtracted from that number in the past?

We now have 56 bunkers. We had 58 ten years ago but took two fairway bunkers out.

25 plus one practice bunker. This year we are having two or three changes, but we will finish with the same number.

We have a total of 48 at Cleckheaton now. Last year two greenside bunkers were changed into one.

We used to have 28 but added another near the 13th green during 97-98 when all the bunkers were reconstructed.

A total of 32. We added one some time ago – the greenside at the 14th

We have got 74 bunkers and in last 10 years we've taken away four and installed one new one.

HEADS

- 2. What type of sand do you have and what are its advantages?
- Have your bunkers been designed with maintenance in mind or would you make any major alterations if given the chance?
- 4. How often do you do major maintenance work on your bunkers and of what does it general consist?
- 5. What is your your policy regarding where the rake is left?

We use Stewart's No 2 which is dark brown and very good after heavy rain as it doesn't compact and it is very consistent wet or dry. We used to have a silicon white sand but it caused problems by burning the face of the bunker and tended to congeal after rain.

Originally they were designed with maintenance in mind but over the years with constant edging and trimming they lost their shape and became ugly. Last year after a visit to the King's Course, at Gleneagles we copied the Braid design and are now the subject of good comments from the members.

We edge twice a year, fly-mow weekly and the lads take edging shears out with them once a week. Inside the bunkers. This was a club council decision about five years ago, I believe, after comments on the subject by Peter Alliss on television. I always believe that if a shot is heading for a bunker it shouldn't be stopped by a rake.

We are experimenting with Wexford white sand in six bunkers at the moment as in my opinion it looks quite spectacular. However, it's a bit expensive at £25 a tonne and we may go back to filtered sand.

They were never designed with maintenance in mind and we have suffered from waterlogging. We are doing a lot of work this winter on lessening the slope on the bunkers so they don't retain too much water.

We top up with sand twice a year and edge twice yearly. There is a continous programme of strimming and weeding to keep them tidy. We always keep rakes in bunkers, overwise our staff have to keep getting on and off the cutting machines to move them. I also believe that a rake shouldn't stop the ball from going into a bunker.

Moneystone at present. It doesn't blow about as it is quite a heavy sand and it eliminates sand splash.

Maintenance was in mind when the bunkers were designed. We are now reshaping them as they don't face up, so there is quite a bit of work to be done.

We top up the sand usually once a year, although obviously more often if needed, on the greenside bunkers in particular. Edging, fly-mowing and weeding is done fortnightly.

I like to put the rake inside the bunker because if a shot is heading towrds a bunker it should go there rather than be stopped by a rake.

We have Bank's GS 5 sand, the advantage being that I didn't want a white or too bright sand as it wouldn't fit the environment. The disadvantage is that sometimes it blows about a bit as it is very fine.

When we reconstructed we tried to maintain the original design which has been good from a maintenance aspect. We could perhaps do to enlarge one or two.

We top up the sand twice a year in spring and autumn and trim the bunker edges every two weeks in the growing season. Our policy is to leave the rakes in the bunkers as near to the edge as possible. It is possible we could have a 'Y' stand for bunkers in future, as it has been discussed.

A white double washed sand which is not too fluffy. The golfers like it and it is compatible with our top dressing so any splashed out of a greenside bunker blends in very well.

Originally they were, but after 70 years of play they are not perfect. I would like to turf down the banks rather than have sand all the way to the top.

We edge and trim fortnightly. Four years ago we drained every bunker and took all the old sand out.

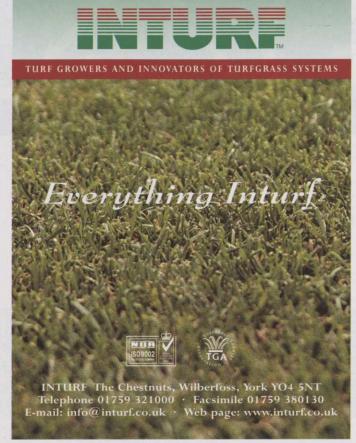
It is the club policy to have the rakes in the bunkers. Rakes outside can stop a bunker-bound shot from going in.

The sand we use is a Tarmac Top Sports Minstead HMS2 because it is a sand that suits us. It firms up and the ball doesn't plug in and it is free draining and consistant. Our bunkers are not maintenance friendly and are a little difficult to maintain at times due to characteristics of a Harry Colt design. There are a lot of banks and edges on them. We don't maintain them mechanically - they are all raked by hand.

We edge them maybe three or four times a year, strim some of them and flymow them. We have a five year written maintenance programme for our bunkers for sand replacement so that all the bunkers will have exactly the same sand in them. It is written down as per a policy document.

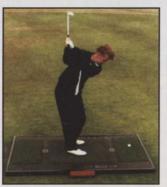
Our policy is that rakes should be placed inside the bunker with about six or eight inches of the shaft of the handle coming out of the bunker and the rake should be pointed at the green. The bunkers are raked every day and the staff position the rakes as they should be then.







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A bunker according to the new Shorter English Dictionary is a pit containing sand etc. and constituting a hazard trap. In this article Keith Thompson discounts the "etc" and concentrates on the sand...



Bunking ff



Right: Bunkers maintained by mechanical process have to be carefully designed and constructed to ensure that the bunker rake performs to maximum efficiency and without damaging the edges

Bunkers originated from the early Scottish Links courses as hollows created by the forces of nature and enhanced by grazing animals. The natural occurrence of these hazards on the early links courses led to some fiendish course designer incorporating the sand trap into his own course design and from there the idea spread. It is reported that there is an 18 hole course that has over 300 bunkers, but this seems to be excessive leaving little room for the grass. The average golf course has four to five bunkers per hole, which in my view can still be too many.

The bunker should not only be strategically positioned to afford the maximum discomfort to the golfer but should also enhance the visual amenity of the course. The design of the bunker will vary from course to course with the greatest marked difference being between Links courses where wind blow is a major factor and inland parkland courses where the wind factor is less but drainage can be the main problem.

The design of a Links bunker generally is small in area, but deep and the sand used will more than likely

be that occurring naturally in the local area. An inland course, unless built on gravely land will, almost certainly, have a drainage problem. In this case, the bunkers should then be constructed with a comprehensive under-ground drainage system.

This consists of gravel filled channels in the bunker floor falling to a main drainage course piped to a soak away. The gravel layer should be covered with a geotextile membrane to keep the drainage channel free from clogging. The overall bunker should be designed to channel surface run



Right: Bunkers should be strategically positioned, but also enhance the visual amenity of the course.

off water around or away from the bunker. Ideally, the face of the bunker should be no more that 30 degrees from the horizontal, this will enable the sand to hold position and avoid erosion.

Once the bunker has been properly designed and positioned, the final and most important ingredient is the sand. Trying to cut costs at this vital stage is a false economy. Any old builders sand simply will not do; the cheapest

Acceptable sand size limits

This grading curve defines recommended and acceptable limits of sand size for golf bunkers on inland courses Graph reproduced by kind permission of the Sports Turl Institute

100

90

80

70

60

20

10

0.063

0.125

0.25

0.50

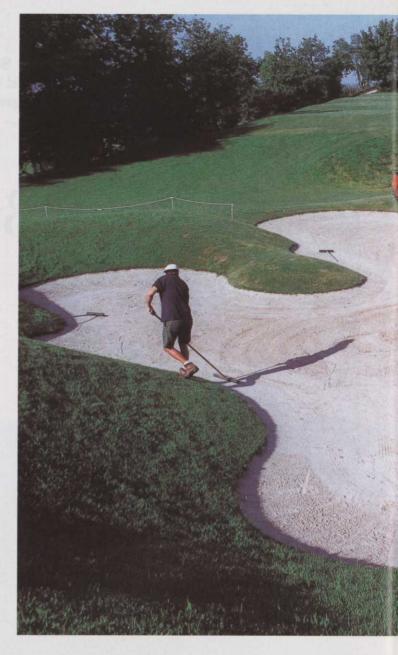
1.0

2.0

4.0

8.0

Selve Size (mm)



option is almost certainly not the best.

Sand can be too fine resulting in poor drainage and crusting, so a high quality silica sand is essential. The correct grading is also important; if the sand is too coarse the high-pitched ball will plug and the golfers stance will be unstable. The grit particles from coarse sand in greenside bunkers will be strewn onto the green. Too fine and the sand blows away.

The shape of the particle size is also

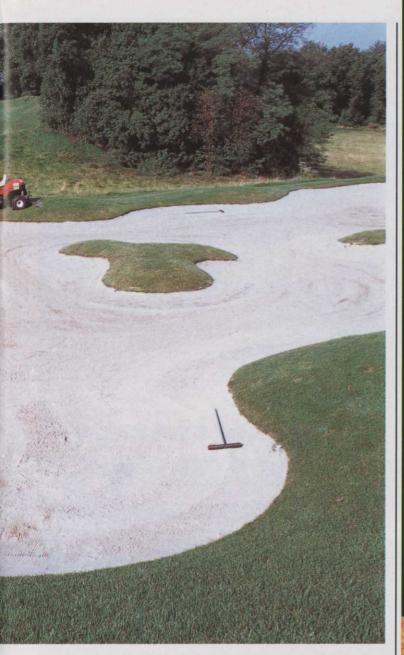
The shape of the particle size is also an important factor and a semi angular grain shape is preferred with not more than 60% of the particles rounded to well rounded. This is to ensure sufficient drainage and improves the stacking angle at the bunker face.

The chemical composition of the sand has also to be considered and the best sands have a high silica content; the higher the percentage the better, as this reduces the impurities. A low lime content of less than 0.5% is considered beneficial; this avoids the possibility of damage to the surrounding grass areas.

Silica sand deposits are the small siliceous fragments resulting from the wearing down action of ice, water and wind. The ideal sands for bunkers occur in only a few places in the United Kingdom and where these deposits exist, sand and gravel quarries have developed.

The material is excavated from the quarry face and transported to a processing plant. The initial segregation is to separate the gravel particles from the sand by passing them over a large vibrating screen. The sand is washed through the screen and then to a pump which carries the particles to the final selection process which, in most cases, splits the bulk sand into three graded sizes - Soft, Medium and Sharp. Medium sand is the preferred grading for bunker sand and in some cases this sand is re-washed to remove excess fines and discolourants.

There is no perfect grading for bunker sand but the Sports Turf Research Institute has done considerable work on preferred sands and they recommend "at least 95% of the particles in the size range 0.125mm to 1.00mm with the greatest proportion between 0.25mm and 0.5mm. There shall be no more than 2% fine gravel and less than 2% silt and clay". The grading is best shown in the grading curve shown opposite. The most suit-



able sands will fall into the darker coloured area of the diagram.

The colour of bunker sand is a matter of taste, but the general trend on inland courses is towards the lighter to white colours. This lighter sand is more likely to occur in the high silica areas, but even here to get the best results selective quarrying at the face is sometimes necessary prior to the grading process

grading process.

The depth of sand used in a bunker can be both too great and too small. The recommended compacted depth is 100mm. This provides a firm footing and ensures that the clubface does not impact with the sub-base. Daily maintenance of the surface is required and this can be done either manually or by machine. Bunkers maintained by mechanical process have to be carefully designed.

Specifically, constructed to the correct radius and depth this will enable the machine to rake the bunker with maximum efficiency and without causing damage to the edges.

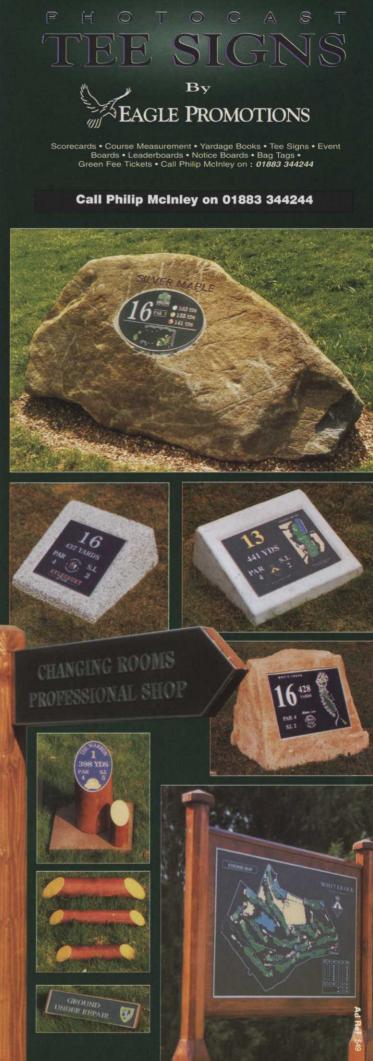
causing damage to the edges.

It is probably more important with a mechanical rake to have clean, high quality silica sand as this prevents clogging of the machine and ensure

the sand in the bunker does not become compacted.

In summary it can be seen that bunkers should be carefully designed and constructed with attention given to adequate drainage, especially on inland courses. Cheap builders sand will almost certainly prove to be a false economy, so adherence to STRI guidelines is strongly recommended to ensure that you provide the optimum facilities for your paying customers. This article has not designed to help those paying customers get out of bunkers, but I hope it has provided some technical reasons for their failure, sometimes, to do so!

Keith Thompson is General Manager of Bucbricks Co. Ltd of Ardleigh, near Colchester in Essex, who for the past 20 years have supplied high quality bunker and root sands to many major and championship golf courses in the south-east of England.





BIGGA's Education and Training Manager, Ken Richardson gives information on training courses, and sets a quiz for readers

REGIONAL TRAINING

Most of this year's Regional Training Courses are full. However, there is still chance to book a place on five of the Courses. These are:

Budgeting Inchyra Grange 15 and 16 November

Project Management Inchyra Grange 17 and 18 November

Project Management BIGGA HOUSE 22 and 23 November

Budgeting Newcastle, Northern Ireland 2 and 3 December

Golf Course Design 2 Belper 15 and 16 February 2000

Each two day course costs an extremely low £80 plus VAT. This includes accommodation, meals and tuition. Contact Sami now to reserve your place.

The Learning Experience 2000

Applications for the National Education Conference, Workshops, Seminars and the BTME Banquet are flowing into BIGGA HOUSE at a steady rate. Thanks to the continuing support of Textron Turf Care and Specialty Products, the Learning Experience 2000 looks set to be a sell out. Make sure of your place by sending in your completed booking form as soon as possible. Learning Experience brochures are being sent to all golf clubs this month.



TORO Student of the Year Competition

Last month's copy of Greenkeeper International previewed the entrants for the 1999 TORO Student of the Year Competition, which for the first time. The GTC nominated three of their Modern Apprentices and two of them, Vincent Gilroy, from the Midlands and Michael Bush from the South West were selected to progess to the Final which took place at BIGGA HOUSE on 25 October.

Full results will be published in the December edition of Greenkeeper International. Unfortunately, the

Scottish Finalist, Jim Gilchrist was shown to have attended Langside College when in fact he was trained at GOSTA Training.

Training and Development

In the past year, 62% of managers in the UK have been affected by some sort of organisational change.

As the greenkeeping industry changes, with new techniques, increasing mechanisation, new products and computerisation, greenkeepers need to learn new skills or new ways of working on a continual basis. Whose job is it to ensure that greenkeeping staff are trained to a sufficient level of competence and to ensure that all staff continue to develop? Look at the following questions and see if you can come up with the answers.

- 1. Who is responsible for the performance of a greenkeeping team?
- A. The Green Committee.
- B. The Golf Club Secretary.
- C. The Head Greenkeeper/ Course Manager.
- D. Individual Greenkeepers.
- 2. Who is best placed to know what standards of presentation have to met by the greenkeeping team?
- A. The Greenkeepers' Training Committee.

- B. BIGGA.
- C. Golfers.
- D. The Head Greenkeeper/ Course Manager.
- 3. Who should identify training and development needs?
- A. The Greenkeepers' Training Committee.
- B. The National Training Organisation.
- C. Colleges.
- D. The Head Greenkeeper/ Course Manager.
- 4. Who should carry out assessment and give feedback on performance?
- A. The Head Greenkeeper/ Course Manager.
- B. Colleges.
- C. Internal Verifiers.
- D. Awarding Bodies.
- 5. Who should assess improvements in competence?
- A. Colleges.
- B. The Greenkeepers' Training Committee.
- C. The Head Greenkeeper/ Course Manager.
- D. Green Committees.

Watch out for the answers in next month's edition of Greenkeeper International.

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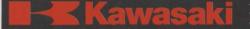
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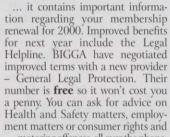


This month, Tracey Maddison, BIGGA's Membership Services Officer, welcomes over 80 new members to the Association, and gives some important membership renewal information

Renew your membership for increased benefits!

In September, over 80 new members joined BIGGA and became part of the largest greenkeeping association in Europe. Membership has grown in strength and now boasts over 6,700 members. If your expiry date is 31 December 1999 or 31 January 2000, your renewal pack will be with you later this month. Read it! It contains important information on improvements to your benefits.

Watch out for this envelope dropping through your door later this month...



motoring offences, all over the phone. This service has now also been extended to include all members within EU countries, and will be available from January 1, 2000.

Remember, the best way to get the most out of any type of membership is to be an active member!
Read the leaflet enclosed in your Membership
Renewal Pack and find out exactly what you are entitled to as a member of BIGGA.

BIGGA welcomes...

Scottish

Malcolm Baxter, Central
Stephen Brown, Ayrshire
Calum Ross Faulkner, North
Lawrence Foley, Ayrshire
Frank Forrest, East
John Henderson, Central
Kenneth R MacNab, Ayrshire
Kevin John Malner, Ayrshire
Stuart Manattini, Central
David Wilson McAvoy, North
Stuart Millar, East
Scott Reid, Central
Robert Robertson, Central
Robert Robertson, Central
Kevin Andrew Rogalski, Central
Gary William Roger, East
Adam Sherwood, Ayrshire
Isin Lawson Eadle Sinclair, Central
Richard Smith, Central
Murray Wright, Central
Murray Wright, Central
Tommy Yeomans, East

Norther

Richard Anthony Barker, Northern Adam Stephen Blanchard, Northern Andrew John De Wet, N East Chris Docherty, North West Paul Dunning, North West Jared Ellison, North West Nicholas Peter Foggarty, N West Steven Lee, North Wales Fraser Nellies, North West Marc Read, Northern David Robson, Northern Neil Richard White, North West Barry John Wright, North West

Midland

Peter Chandler, Midland
David Collins, Midland
Robert Andrew Deane, BB&O
Matthew Evans, BB&O
Stuart Ferguson, BB&O
Stuart Ferguson, BB&O
Garry John Goodchild, BB&O
Daniel Groome, Midland
David James Herbert, E Midland
Luke Jones, Midland
Paul Kendal, East Midland
Anthony Leinster, BB&O
John Andrew Litster, BB&O
David Maine, BB&O
Michael Anthony Moser, E of England
Karen Shaw, East of England
Matthew Richard Steward, Midland
Garry Strudwick, BB&O
Justin Michael Woods, Midland

South East

Lawrence Christopher Blunt, Sussex Gary John Cousins, London Nigel John Margetts, Surrey Malcolm James Mcgoech, Essex George Reid, London Elliott Daece Whattingham, Surrey Lee Stuart Wilkinson, London

S West & S Wales

George Alexiou, South West Paul Mitchell Banger, S Coast Richard Philip Darcy, S West Tomos Elfyn Hughs Davies, S Wal Christian Garner, South Coast Paul Andrew Govier, S Coast Andrew Philip Howard, S Coast Mitchell Elliott Knott, S Coast Stephen Paul Mills, South Wales David William Niicholas, S Wales Paul Graeme Tilmouth, S Coast Stephen John Wood, S West

Northern Ireland

Michael O'Neill, South East

Republic of Ireland

Niall Kerr, Simon O Hara,

International Members

Palle Sorensen, Denmark Andrew Fillery, Norway Armand H Le Sage, USA Kendall Lee Marquardt Cgcs, USA

Associate Members

George Munro, Scottish North David Bottomley, Northern Andrew Gibbows, East of England

Check out
December's editio
for October's
new members!



Trevor Downing of J. Rothschild Assurance looks at financial provision if illness or injury were to affect your ability to work

Look to the future in a partnership for life

As we approach the Millennium, it is interesting to look back upon the many changes that have taken place within our society. It is particularly interesting to see how nowadays, the majority of modern day couples regard their relationships as an equal partnership rather than having one person reliant on being the main bread winner.

If you are in a relationship, you will know that you both tend to contribute financially to your lifestyle. But have you ever asked yourself what would happen to this lifestyle if either of you were to become seriously ill and unable to work?

Suddenly, instead of enjoying your financial independence, you could now become a real financial burden on your partner. Consider how you and your partner would be affected if you became seriously ill and unable to work.

Your mortgage will still have to be paid. What about other household bills

that have been traditionally shared in the past?

How will it affect your social lifestyle? What about intended holidays, are they still likely to happen?

Could you afford to pay for any medical treatment or modifications to your home, should they be needed?

You would be totally dependent on others for your security and well-being. In addition those who are dependent on you would suddenly be exposed to hardship.

This list is by no means exhaustive. It just touches on the basics, underlining some of the financial issues that you could be faced with particularly at a time when you would be already trying to come to terms with your own or your partner's illness.

If you have children, their situation would be quite vulnerable as their welfare could be undermined.

Some partners take career breaks to

stay at home and look after their children. Although there may not be any obvious financial loss should the non-working partner become seriously ill or die, consider this, if you were the working partner, how would you cope with all the things you previously took for granted?

Who would look after your children? Who would take your children to and from school?

What would happen if one of your children became ill?

How would you cope with the everyday domestic chores?

Could you afford to pay for help at home?

The fact is, in today's society, there are no State benefits to help you and few family structures are capable of coping with a financial shock when a family member is seriously ill. Concerns such as these are all very frightening. So, how

can you make sure that you and your partner will be able to cope financially if any of these misfortunes should

There are many simple and inexpensive steps that can be taken to safeguard against these issues. After all, you happily insure your house, your car, perhaps even your contents. It's worth asking yourself: What is more important, replacing a stolen television set or insuring your continuing financial independence and hence you, your partner's and your family's future?

If you would like more information on the financial protection available to you, please contact Trevor Downing on 01959 500427.

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