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to be completed by Trade and Associate Members who joined during 1987

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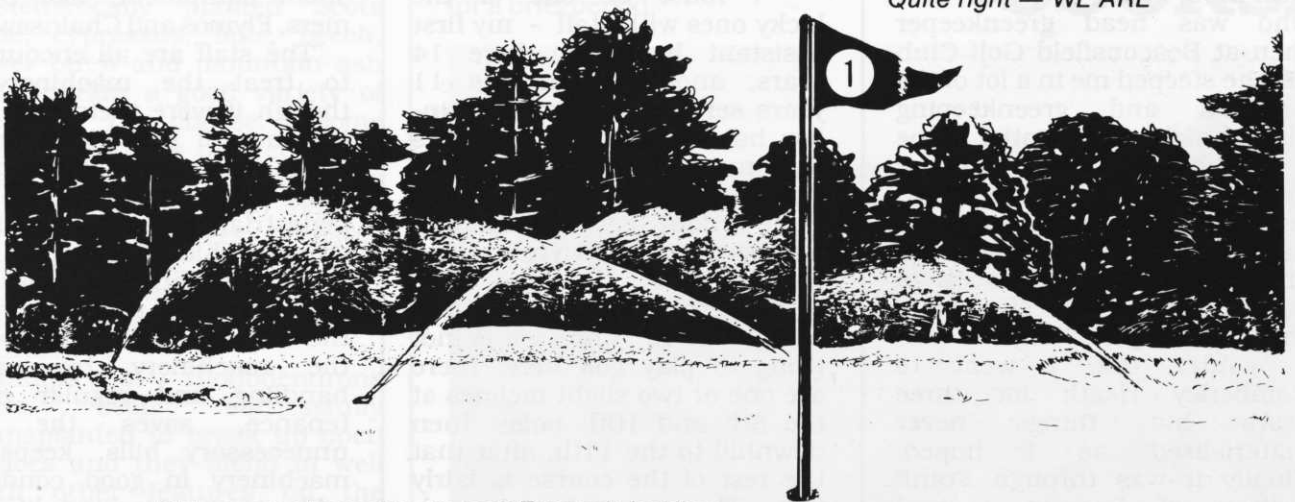
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THE COUNTY of Surrey is endowed with a profusion of good golf courses and one that has always been a popular choice with golfers is Betchworth Park Golf Club on the outskirts of Dorking. Don Major, 57, head greenkeeper has been with the club for 21 years and his enthusiasm for golf and his course has never diminished during the long period I have known him. The fine condition of the course is a tribute to all the hard work and interest shown by himself and his staff over the years.

Talking about his career and his love for the game, Don Major said, "Having been in the Forces and enjoyed an outdoor life playing golf, cricket and football, it was difficult afterwards to settle down to a humdrum job with the Eagle Star Insurance Company and I always had a hankering to work on a golf course."

"Our local course, Flackwell Heath, was only a four iron shot from my home and the head greenkeeper there used to pass the door mornings and evenings, so it was not long before I persuaded him to give me a job, and from there my career in greenkeeping blossomed. I worked at the club for five years after which I married a bonnie local lass, Gillian, and we have a daughter who is married to one of my staff now at Betchworth Park.

"From there I went to work with Bob Plain, a genial Scot who was head greenkeeper then at Beaconsfield Golf Club and he steeped me in a lot of the tradition and greenkeeping skills which are essential to be a successful golf course manager. After serving seven years with Bob he decided that I had the necessary experience and competence to seek a position that would offer more scope and responsibility.

"After this I went to Camberley Heath for three years but things never materialised as I hoped. Finally it was through Frank Brittan of Parkers that I learned of the vacancy for head greenkeeper at Betchworth

Park - I applied and got the job and have remained here ever since.

"When I took over the course there was a lot of work to be done to reach the standards that I was aiming for. Over the years we have done a lot of construction work to improve the layout, tree planting, renovation and repair combined with a regular programme of turf management to keep the course in good playing condition.

"As an example we have recently had installed by Watermation a new irrigation system for all tees and upgraded the greens irrigation.



Don Major, headgreenkeeper at Betchworth for 21 years

"I must be one of the lucky ones with staff - my first assistant has been here 14 years, another man has 11 years service, and my son-in-law has clocked up five years with me. I also have a part-time employee, who works three or four days a week, who has been on the payroll a long time."

"The terrain at Betchworth is slightly undulating. It is not tiring to play golf here; there are one or two slight inclines at the 8th and 10th holes, then downhill to the 11th, after that the rest of the course is fairly flat. The greens have undulations and are deceptive to read but they putt reasonably well.

OUT ON THE COURSE

Betchworth Park

by

John Campbell

"We are fairly well equipped with two Toro GM 3's for the greens and have on standby four Auto-Certes mowers. A Ransomes 180 is used on the tees which we hope to replace with a Toro 216 Reelmaster. Trimming around the trees is done with a Toro 70 machine. A 27hp. four wheel drive Kubota tractor pulls the fairway gang units and a ten year old Ferguson tractor is used to cut the semi-rough together with a full Cushman System. In addition we have all the usual assortment of small equipment, like Strimmers, Flymos and Chainsaws.

"The staff are all encouraged to treat the machinery as though it were their own. For instance, if the GM 3 breaks down through incompetence it may mean resorting to the pedestrian mowers to cut the greens, which is not popular - so the incentive is look after the equipment properly or take the consequences. Respect for the machinery by careful handling and regular maintenance, saves the club unnecessary bills, keeps the machinery in good condition, adds to its working life and efficiency of operation and reduces down time.

**the Golf
Course**

"BIGGA deserves the full support of every greenkeeper and golf club in the country"

Don went on, "Like many tree lined courses around here we lost a lot of lovely old trees during the night of the hurricane force winds which devastated the south of England. Damage was quite extensive around the 2nd tee where 13 massive beeches came down. Around the ruins of the ancient Betchworth Castle at the 11th hole we lost a few lime and beech trees. Fortunately most of those blown over fell back into the wood behind so there was little damage to the course. Many of our trees were magnificent specimens which have taken a lifetime to grow. Their loss is a great blow.

"We have some lovely American oaks - two of these were brought down and the horse chestnuts took quite a bashing from the wind. Thankfully many of the majestic trees that enhance the golfing scene at Betchworth did survive that dreadful night but we are left licking our wounds and picking up the pieces. Hopefully we will never experience this again in our lifetime."

"Over the years we have systematically planted Scots pine, cypressus, lime, beech, silver birch and mountain ash to maintain a good variety of trees on the course. Some horse chestnuts planted a few years ago have not done so well, but we plan to replace them with may trees, probably white and pink, or white and red to add a welcome splash of colour in the middle of the course.

"Clumps of rhododendrons have been successfully transplanted to break up open spaces and they blend in well with other features on the course and create a satisfactory balance."

Don Major is a modest man, a



Betchworth has some large traps

very good golfer whose name is inscribed on many trophies. He has won the British Greenkeepers Tournament several times and been runner-up on occasions. His proudest moment recently was to win the Artisan Senior Handicap Championship at Moor Park and bring the honour back to his own artisan club at Betchworth. The trophy is displayed in the parent club.

"I was always a staunch supporter of the old BGGGA," said Don, "and have been involved with the administration of the association since 1962 when I was elected to the committee of the Southern Section. I served as an executive member for the south of England during which time my wife took over as secretary for a brief period."

"It's good to have all the greenkeeping associations now under the one banner of BIGGA with our own Executive Director, Neil Thomas at the helm. This deserves the full support of every greenkeeper and golf club in the country, but we must be patient and appreciate that it's going to take a little time to set up our new organisation - the future is bright and we have much to look forward to".

OUT ON THE COURSE



The clubhouse at Betchworth Park has a commanding view of the course

FOR the benefit of new readers of this magazine I should explain that this series started in July 1986 and was designed, in part, as a contribution to greenkeeper training to review books that might be helpful.

However, many new books are too complicated and too specialised (and too expensive!) to be considered, and anyway, I know that many greenkeepers share my own passion for ferreting around in old bookshops.

In the first article I dealt with the pathetically inadequate books devoted specifically to the upkeep of greens and lawns and found that too many of them have little or no relevance to the problems of today as they exist on British golf courses.

Further instalments have covered a much wider spectrum - the history and philosophy of golf, golf architecture, site potential, general nature study, geography and geology, soil sciences, chemical usage, botany and plant ecology.

Now it is time to focus on the grasses and their identification. Men have been writing about grasses for almost two centuries, but for most of that time their interest lay in improving pastureland. There are some beautiful old books with hand-coloured illustrations, notably one by the first Martin Sutton, but they are not really about "our" grasses. Examples of this type of book in my collection are *Grasses* by H. M. Ward (1901) and *Manual of British Grasses* by W. J. Gordon.

From the Inter-War period I have *Grasses and Rushes* by J. H. Crabtree and the standard agriculture handbook *British Grasses* by S. F. Armstrong (1917). A very helpful book from this period, because the line drawings are so good, is *Common British Grasses and Legumes* by Thomas and Davies. In the copy I found, some unknown owner had interleaved dried specimens which made it even more useful.

In passing, it is worth noting

BOOKS FOR GREENKEEPERS AND GREEN COMMITTEES

what has actually happened in agriculture. After the depression of the 1870's there was a move to "permanent grassland", achieved by sowing chosen mixtures of seeds as opposed to using areas of grassland as it had occurred naturally.

This movement was to increase in pace and reach a climax in the Second War especially with the work of Stapledon and Davies when mixtures of clover and ryegrass were substituted for agrostis pastureland. With fertiliser these new crops could be more productive and carry more stock. The methods used in this "artificial" production of grassland were soon to rub off on the maintenance of sports turf with disastrous results.

Going back to agriculture again, further casualties have been the old meadows with a rich diversity of species and the ploughing-up of grassland to increase the arable acreage.

Most books on greenkeeping

becoming a world authority, and died as recently as 1980. His blue Pelican paperback has become known to thousands involved in turf-culture. In 1984 his son J. C. E. Hubbard, published an up to date edition of his work with some sections being the work of John Shildrick, deputy director of the STRI. The book consists in the main of detailed descriptions and drawings of the grasses and also contains a series of so called "keys" to enable systematic identification. An essential buy at £5.95.

Other modern books include *Grasses, Ferns, Mosses and Lichens of Great Britain and Ireland* by Roger Phillips (1980) which is notable for its beautiful colour photography, and *Collins Guide to the Grasses, Sedges, Rushes and Ferns* by R & A Fitter, recommended for a new single-access computer type key for identification. Most booksellers carry small books about grasses, but they do not give us enough detail.

Coming closer to home, in the *GREENKEEPER* of March 1984 there was a really practical article entitled "Know your Grasses" by none other than Jim Arthur.

Nobody can tell me that it is easy to recognise grasses in the cut state, but, for those engaged in golf course maintenance it is an absolutely essential skill.

In reality, unless the site is a freak, we are dealing with relatively few species although each may have countless strains and ecotypes. The greatest errors seem to arise on acid soils with confusion between the bents and invading *Poa Annua*.

It may then be necessary to get very close to the ground, put on the specs (!) and use some of these books to check out all the characteristics.

By Eddie Park

include descriptions of desirable grasses and very useful booklets were published by Suttons Grass Advisory Service and also by the STRI. The former was called *The Identification of Grasses by the Foliage* and the latter, by David Clouston, was *Identification of Grasses in Non-Flowering Condition* (1962).

For many years now the standard authority has been *Grasses* by C. E. Hubbard, first published in 1954. Hubbard started his career in the Royal Gardens, Sandringham, but spent most of his life in the Royal Botanic Gardens at Kew. He specialised in grasses,

THE ACT

WHAT was significant about October 6th, 1986? If you are intent on being an ostrich then bury your head in a bunker and forget about FEPA until it is too late. October 6th, 1986 saw the introduction of the Control of Pesticides Regulations 1986, introduced as a direct result of the Food and Environmental Protection Act 1985.

This Act of Parliament affects everybody concerned in the sale and application of Pesticides. Pesticides, it must be explained, is a broad term which includes all weed-killers, fungicides, pest control substances and even wood preservatives - in fact any chemical covered by the 'Blue Book' MAAF Publication 500 'Pesticides 1986'.

The Regulation states that 1) Those born after December 31st, 1964 require a Certificate of Competence.

2) Those working on land other than his own or his employer is regarded as a contractor and requires a Certificate of Competence.

3) Those involved with the supervision of uncertified operators require a Certificate of Competence.

4) Those born before December 31st, 1964 and who do not fit into any of the other categories do not need a Certificate but must prove that they have been adequately trained.

The Certificate of Competence required under the Act is divided into separate modules.

The first of these modules will be required by all those seeking certification and is known as the Foundation Module.

This module consists of the following topics.

- Current legislation
 - Personal hygiene
 - Preparation for use of pesticides
 - Transport and temporary storage
 - Contamination
 - Environmental factors
 - Interpretation of labels and literature
 - Selection and use of protective clothing
 - Disposal of surplus materials
 - Keeping records
- and takes about one full day.... 6 1/2 hours.... to complete with already experienced operators.

Further operating modules will then be taken according to the types of equipment in use;

- a) Hand held applicators
- b) Tractor mounted hydraulic sprayers.

As a hypothetical situation let us consider a golf club employing five staff, a head

By Dennis Mortram. Cheshire College of Agriculture.

greenkeeper aged 42, first assistant aged 28, tractor driver aged 58, assistant greenkeeper aged 19, and YTS trainee.

First the YTS trainee cannot handle any chemicals until he is 18 years of age.

The assistant greenkeeper will require a Certificate of Competence in order to apply chemicals alone, but before he can acquire his Certificate he must attend either a registered training course and / or be under constant supervision during training by his supervisor.

The tractor driver does not need a Certificate if he can show he has been adequately trained (attending a registered

training course would be regarded as desirable by the Health and Safety Inspectorate).

Neither the head greenkeeper or the first assistant under the present law require a Certificate of Competence but like the tractor driver must show they are adequately trained. If however the tractor driver, first assistant or head greenkeeper are directly involved in supervising or training the assistant greenkeeper, they would require a Certificate. Courses are available under the Ministry of Agriculture, Fisheries and Food banner with the ATB acting as administrators. Courses are available at the colleges listed below and testing for certification will be on a one to one basis and may be carried out at your place of work. However, operators cannot gain an operating test module until successfully completing the foundation module.

The Greenkeeping Colleges Consultative Group was set up as a direct result of the Greenkeeping Training Committee appointing five colleges as centres of excellence for greenkeeper training. The GCCG is made up of the colleges listed below, and consists of tutors from those colleges, their county liaison office's, and a representative from Bingley and the GTC. For further details consult:-
Cheshire College of Agriculture, (0270) 625131
Askham Bryan College of Agriculture, (0904) 702121
Cannington College of Agriculture, (0278) 652226
Sparshalt College of Agriculture, 096272 441
Plumpton College of Agriculture, (0273) 890454.

EXPLAINED

REPORT: THE VERTI-DRAIN

COMPACTION is a term with which greenkeepers and groundsmen have become increasingly familiar.

Soil compaction is the most common cause of poor turf on golf courses. Constant traffic and intensive use of heavy equipment can squeeze soil particles into a highly impervious mass, especially in the top surface layer.

Most compaction in turfgrass situations occurs within two to three inches of the surface, with the highest densities occurring in the upper inch. Even though a thin layer is compacted, it can profoundly affect turfgrass growth by restricting soil aeration and water movement. This results in stagnant conditions that prevent grass roots from functioning properly.

Aeration is one of the most effective methods of dealing with compaction and it is essential for the operation to be carried out as much as possible to combat the condition. For grasses, as for other

plants, the presence of air in the soil is necessary and the object of aeration is to penetrate the ground so that air may be admitted to various depths in the soil.

Air is needed to assist chemical changes necessary for the conversion of mineral salts into available plant food. It also helps the free passage of water and permits greater ramification of grass roots, which, in turn produce healthier plants. It also benefits the physical condition of the soil, so that despite intensive play there is a reduced risk of compaction.

Compacted soils have a poor structure and drainage is restricted. This prevents root development, inhibits the gas exchange and the capacity of the turfgrass plant to absorb water and nutrients is impaired.

As a result the turf suffers by becoming thin, weak, lacking in colour and vigour of growth. It is also likely to become more susceptible to disease. According to the experiments in the USA it was found that

Verti-Drains are available in different sizes as follows:
 Popular Verti-Drain - width 1.2 metres, hp. required 17 plus.
 Tines 1/2" dia. by 10" long at 2" spacings. Tines 3/4" dia by 10" at 4" spacings.
 Hollow tines 1/2" or 3/4". Weight 500 kilograms. Ground speed 1/2 mph.
 Greens Verti-Drain - width 1.45 metres, 30 hp. required.
 Tines 1/2" by 12" at 2" spacings, 3/4" by 12" long at 4" spacings. Hollow tines 1/2" and 3/4" are also available.
 Weight approx. 800 kilograms. Ground speed .25 mph.
 Sports Ground Verti-Drain (ideal for fairways) 2 metres wide.
 70 hp. required. Tines 1/2" by 12" at 4" spacings. Tines 1" by 16" at 4" spacings. 3/4" hollow tines are available. Weight 1300 kilograms.
 Ground speed required .25mph.
 Sports Ground Verti-Drain - width 2.5 metres, as above but requiring 80 hp. tractor and weighing 1450 kilograms.

golf greens in good condition had satisfactory oxygen diffusion rates to a depth of four inches, but greens in poor condition had unsatisfactory levels, even at a depth of two inches. The tests also showed that routine aeration treatment produced satisfactory values at four inches, but not at ten inches. On the other hand, experiments with deep aeration gave satisfactory values at a depth of ten inches and perhaps deeper. It would appear from this that there is a direct relationship between depth of penetration and depth of good oxygen soil levels.

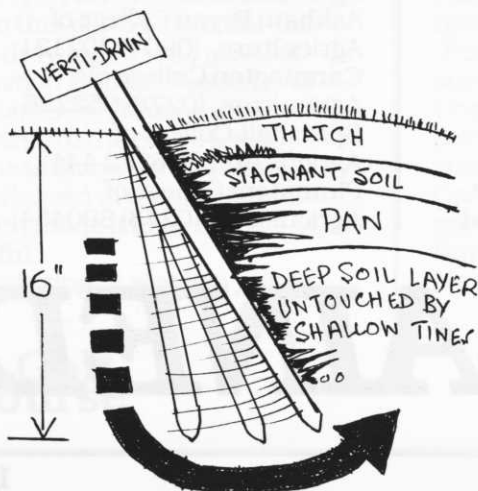
A machine which effectively achieves good depth of penetration is the Verti-Drain. Some aerating methods cause the tine to be driven into the ground forcing the soil to move sideways, increasing texture tightness and smearing the side wall. What actually is required is equipment which will deep-cultivate the soil without damage or disturbance to the turf and the Verti-Drain efficiently does this.

The Verti-Drain is fitted with powerful tines which smoothly penetrate the most compacted ground and is capable of gently heaving the soil from half an inch to two inches. The lift

is uniform, maintaining good surface levels, but directly related to the amount of air and cracking which has been exerted into the ground down to as much as 16 inches (depending on the length of the tines).

This cracking effect relieves compaction, splits up any pan, creates fissures and enables trapped stagnant gases to be released and allows oxygen laden air to take its place and water to freely percolate to the drains or drainage levels. After such treatment, roots will often be found going down to ten or 12 inches within weeks if the work is undertaken during the growing season. This improves health and vigour and enables the grass to cope with drought and hard wear.

Verti-Drains can also be equipped with hollow tines either half or threequarter inch nominal size. Using these tines large quantities of undesirable material can be removed to improve aeration, or replaced with top dressings that will eventually change the nature of the soil in which the grass is growing. Hollow tines penetrate the soil to a depth of six inches in the case of half tines and nine inches in the case of threequarter inch tines.

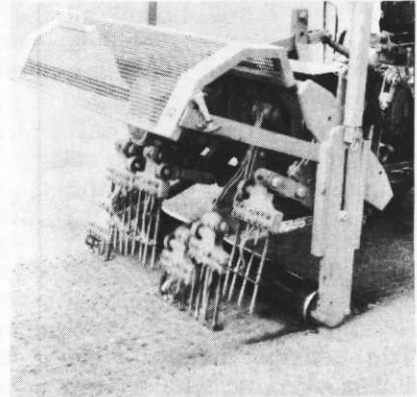


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PORTUGAL

GOLF continues to boom all over the world and Portugal is no exception to this explosion in the game.

The Algarve coast in the south of the country has long been a special favorite for the Northern European golfer in ever growing numbers and in recent years the pressure on courses has become considerable.

The early sixties saw Portugal's Algarve have its first course at Penina, designed by Henry Cotton and built by Alex Swan. Others followed quite quickly- Vale do Lobo, Vilamoura, Palmares-all inspired by British expertise.

But the 1974 revolution put a severe halt on development and although tourists began to flood back once political stability was restored, it is only now that confidence in the long term economy of the country has grown sufficiently to allow real investment in new projects.

Exclusive

Courses are now being planned all along the coast and three or four are under construction. Two are at Quinta Do Lago, an exclusive and stunningly beautiful resort where the existing 27 holes, which has hosted the last three Portuguese Opens, is being extended to 54 holes.

In Quinta do Lago, as in so many developments today, courses have taken on the role of beautiful gardens for the luxury homes that line the fairways. Therefore design has to accommodate both villa and villages in order that the financial equation works.

The eighteen hole Sao Lourenco golf course is no exception. Designed by an American practice, Joseph Lee Associates, to championship length and calibre, it is the property of Bovis International Ltd., who are developing properties around the course.

The course has, however had its problems. Early construction was left entirely in local hands, and without adequate experience, the finish being produced was less than satisfactory.

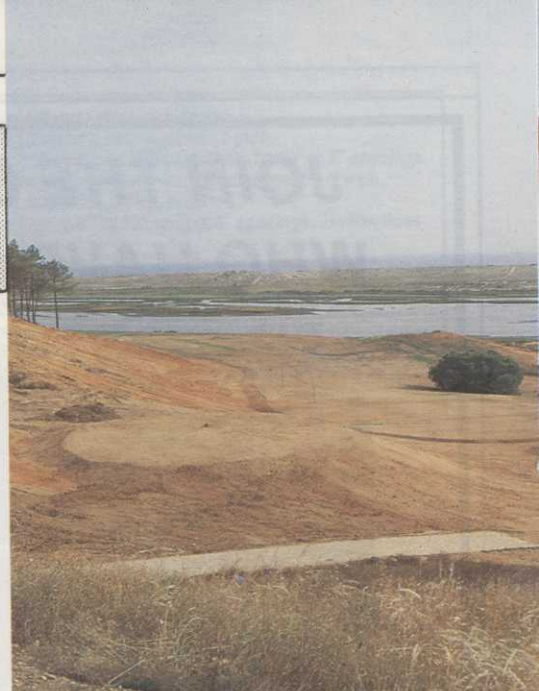
As a result, Bovis commissioned Howard Swan to inject specialist construction management to the project. Soon after, Neville Coleman, a site manager with Golf Landscapes was appointed to oversee the construction work on behalf of Bovis. Earlier this year Neville took charge, and together with local landscaping contractors and the Toro Irrigation agents, the course is nearing completion.

All work carried out on the course is under the guidance of Howard Swan. Howard spends up to eight days a month at the course, administering the construction process. It was certainly an inspired choice by the developers for he has ensured that no work is accepted unless it is to the highest standard and much of the golf course has had to be rebuilt in the past six months to ensure adequate quality of finish.

Now that construction and irrigation are close to complete, and landscaping is well underway to Swan's design the maintenance programme has commenced, and Peter Wisbey was engaged in June as golf course superintendent.

Peter is well known in greenkeeping circles, having been head greenkeeper at North

The 6th green and cart path



A view from the 6th tee of the course at Sao Lourenco

Foreland, an Open Championship qualifying course and, a leading light in the Greenkeeping Association.

Since his arrival in the Algarve, Peter has grown in confidence, having taken a change in job, staff and climate, not to mention lifestyle and language, comfortably in his stride.

Extrovert

Communication, at first a problem, has now been successfully solved by the appointment of Manuel Castro. This extrovert Portuguese has spent much of his life in Angola and until recently was head greenkeeper at Quinta do Lago. He has many talents - interpreter and engineer amongst them. The rest of the team are all locals who have learnt quickly under Peter's instruction.

Conditions are, of course, totally foreign to Peter, but he has received a great deal of assistance from Howard who, with his many trips to the States and attendance at GCSAA seminars has made a study of greenkeeping practices and grasses in a variety of differing climates.

The greens at Sao Lourenco are Pennncross Bent and already look as if they will provide excellent putting surfaces.





Peter Wisbey gives the 15th fairway its first cut

All the other parts of the course, greens surrounds, tees and fairways, were originally planted with Tifton 41A Bermuda grass, but because of poor workmanship they did not establish well.

The summer of 1987 has seen an extensive resprigging operation take place with 41A, but supplemented on the green surrounds and tees with a cool season mix of Bluegrass, Fescue and Bent, and on the fairways with common Bermuda. This action has ensured a fine cover of grass within three months, capable of taking play.

Much of the marginal areas of the course, sides of fairways, carries and tee banks have been planted with mesembryanthemum, a locally harvested succulent, yielding brightly coloured orange, yellow, red and pink flowers throughout the spring, summer and autumn.

Pine Avenues

The course winds its way through Pine avenues on undulating land, relatively sandy in its make up. A central string of lakes ensures that water comes into play on the 9th, 10th and 17th, and there is a most spectacular finishing par four to an island green beneath a hillside, atop of which is the clubhouse and hotel site.

Peter or "super" as he is known, has had to cope with many problems in his first few months and he has known moments of frustration, but not quite as many as working for a members' club in England!

Stocking the new course with machinery was an important part of Howard Swan's brief from Bovis and together with superintendent Wisbey's expert advice, some £150,000 of equipment is now on site. Some has been brought locally, but most has come from the UK. It is simply not available in Portugal.

Getting it there

But getting it there isn't easy.

Shortly after Peter's arrival, the first container of equipment arrived, but it was three weeks before Customs came to inspect the contents and give it a cursory glance for clearance. Three weeks of frustration for everyone, especially Peter.

Of course, not all the equipment is new. Some of the machines are secondhand or ex-demo models, as Peter believes the initial wear from a new course will be considerable. One piece of new equipment still to arrive and eagerly awaited is the Toro 450D. This versatile unit will help considerably with fairway management and will make contour mowing relatively simple on the hybrid Bermuda surface.

Even getting things locally is pretty difficult. There are no turf suppliers, so Bentgrass and Bermuda nurseries have been built.

Drainage pipes took eight weeks to come, eventually arriving by bus! Getting the right fertiliser is almost impossible - 5.10.15 compound requested from a local supplier was to cost £30 per kilo, and would be on 12 months' delivery from Israel! An order for Hoof and Horn became, in the supplier's own words, the supply of "hands and feet" special, and Peter is still waiting for it to arrive!!

All this, with Manuel Castro's invaluable help. What might it be without it?

Even then, Aquagro comes by charter plane, in a suitcase. Flags, poles, and holecutters arrive in golf bags. Spares and sprinklers in hand luggage... all from the UK.

Mesembryanthemum



The machinery shed!

Whilst Peter holds strong traditionalist views on the game and how it should be played, he is aware of the opportunities on offer to the skilled head man from the UK in the booming golfing market of Europe.

Big business

Golf is big business with budgets to match and playability is the key. So many courses at luxury developments are poorly maintained, that this must offer our greenkeeping talent export potential.

There is no doubt that what has been achieved by the British team at Sao Lourenco has put a professional stamp on a fine product and will lead to similar and equally exciting opportunities elsewhere in southern Portugal fairly soon.

Watch the golf course in the next few months for more news on the British influence on Portuguese golf.



..... **on the golf course**

MOLES can be responsible for considerable damage to golf courses and greens which can prove time-consuming and costly to repair.

Rabbits also cause problems because of their grazing and burrowing habits.

Rentokil believe they have the answer to these mole and rabbit pest problems with phostoxin, a 3gm tablet, coated in wax, which on contact with atmospheric moisture gives off phosphine gas, lethal to moles and rabbits. Phostoxin is manufactured in Germany and distributed exclusively in the UK and Eire by Rentokil.

From November onwards, mole activity becomes a serious problem as it is their breeding season and they are at their most active.

Moles belong to the order of mammals known as the Insectivora, which also includes shrews and

A Mole in one

of this, an average heavy infestation will only consist of about eight to ten moles per acre.

Autumn cultivation of farmland forces moles to leave arable land for pasture land, and in doing so they can cover considerable distances over ground. They swim well, so streams present no barrier to

distinctive group of workings. Within each group (which may cover many square yards) it is essential to locate the most recent excavations. In other words, the ones made within the last 24 hours (there will probably be less than half a dozen).

These can be most easily identified by a number of clues such as flattened grass around the mound - on older hills the grass will have had the chance to straighten; loose damp soil bridging the gaps between the blades grass; soil on the mounds will be soft and fine in texture and there will be no evidence of new vegetation growing on the hills. If there is still some doubt, removing some of the soil from the hill will reveal fresh not yellowed grass in recent excavations.

To use phostoxin, a hole should be made, with a probe, through the mole hill at an angle of 30 degrees. The tablet should then be dropped through this hole into the mole run. The hole should then be closed, either by heeling in or by placing a cut turf, grass side down, over the hole and heeled in. This operation should then be repeated at each fresh mound until the entire infested area has been treated.

Within an hour of the tablet being introduced into the mole run, phosphine gas is released and it will continue to evolve for up to 24 hours with maximum concentrations being achieved within six hours. The gas will work its way through the tunnel system, killing any moles in it.

Within 48 hours all traces of phosphine will have disappeared, leaving a small amount of grey, inert powder. This will have no residual effect on the soil, nor will it in any way harm plant life in the treated area.

The greatest problem encountered when attempting to eradicate moles is the risk of reinfestation by neighbouring moles. A vacant mole run is an



Locating and opening a run before treatment

hedgehogs. They nest below ground in an extension to one of their tunnels, always separate from the 'workings'. They produce one litter each year with an average of four young. Young moles leave their nests in July and August and establish their own areas, even re-infesting previously treated runs. They live on average for only about three years and are solitary animals with strong territorial instincts. Because

their movement.

It is important when attempting to control moles with fumigation products to locate the areas in which the moles are 'live' before treatment commences. A large number of mole hills often gives the impression of many moles working in the area, but often there is only one.

A careful examination of the area will soon reveal whether there are more than one