

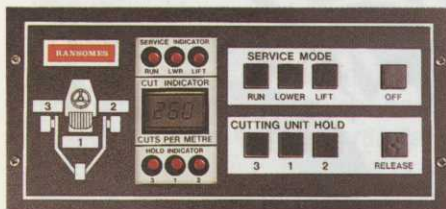
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The units are programmed to lift and lower in sequence to finish or start precisely at the same point on the green. A backlapping facility is built in to keep the cutters razor-sharp.

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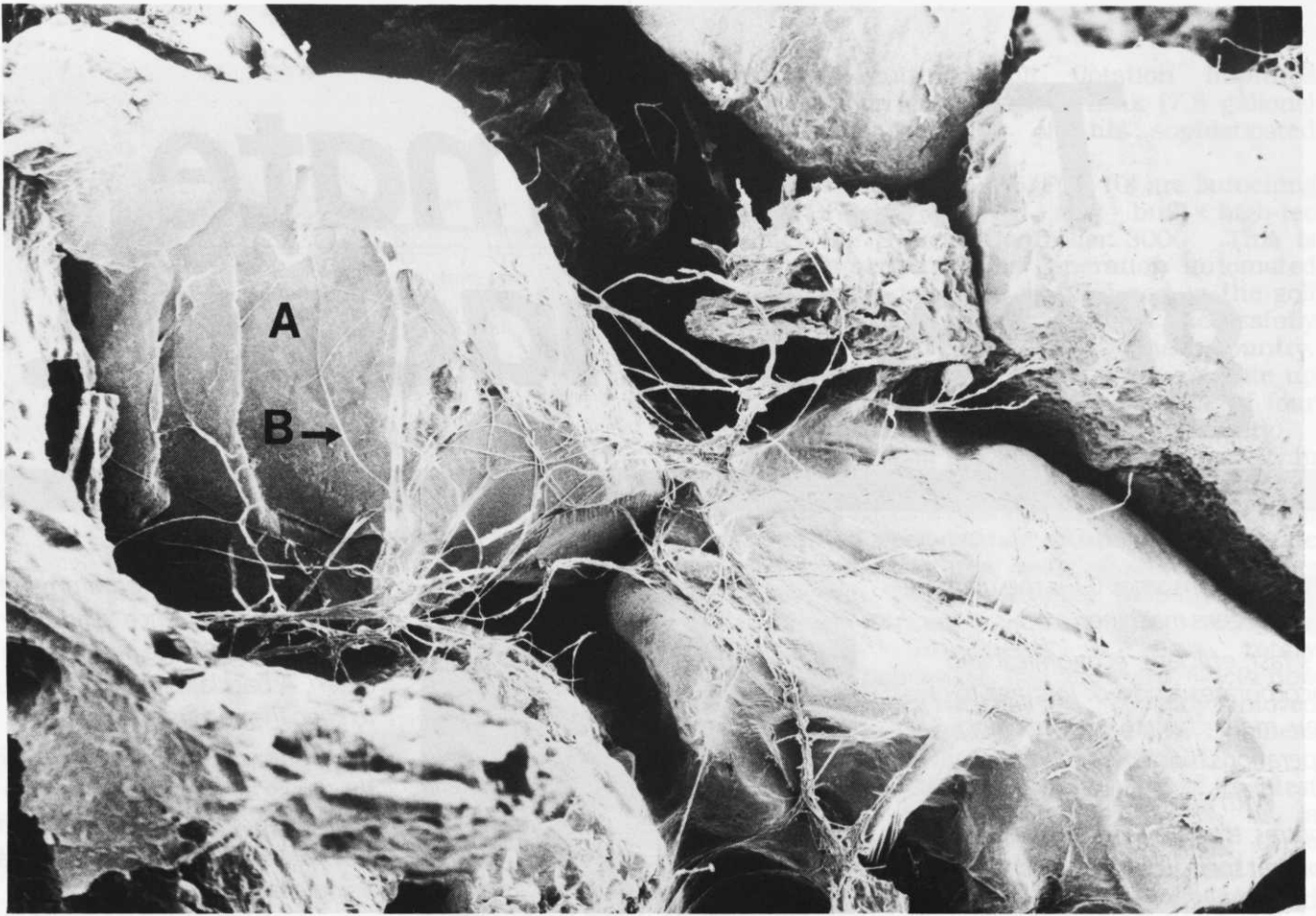


Figure 1

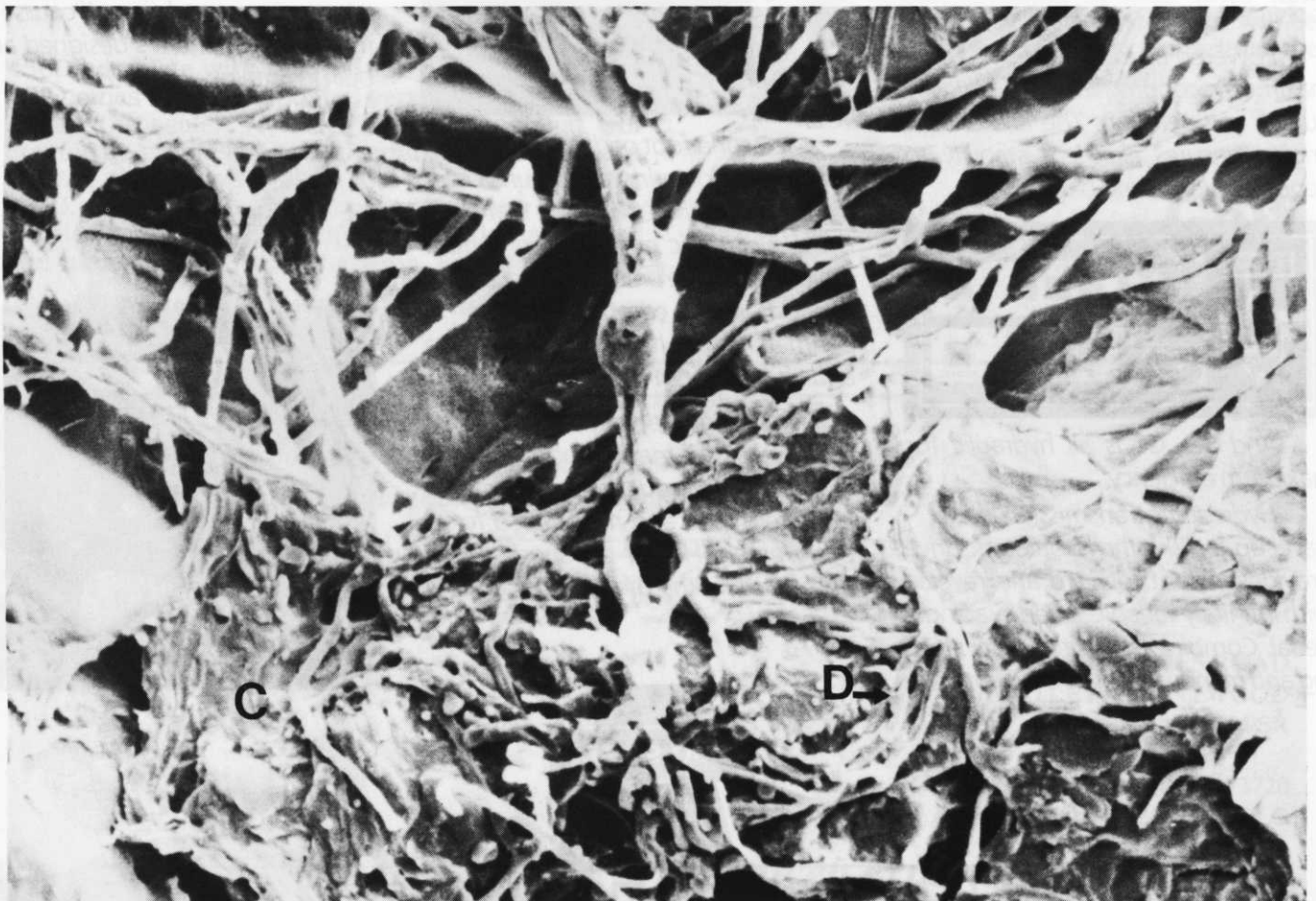


Figure 2

RESEARCH UPDATE...

Neil Baldwin, plant pathologist at the Sports Turf Research Institute has been researching the causes of and solutions to the dry patch problem. In this article he describes in detail one of the main causes of dry patch and describes control measures available.

MOST greenkeepers will have come across the condition known as "dry patch" at some time during their working life. The typical dry patches which affect both sward uniformity and the playing quality of the turf occur as frequently on less intensively maintained areas like fairways as they do on the finer turf of golf greens. Causes of dry patch are many and varied.

Dry patch may be caused simply by the physical characteristics of the area, such as mounds or undulations which, being higher than surrounding turf, are the first to dry out.

Localised dry spots can also be created by compaction due to foot traffic or extra mowing around the green perimeter. The formation of a surface mat of fibre can also be a factor in dry patch development. Where such fibre is allowed to dry out, it is extremely difficult to re-wet, and consequently these areas show up as very dry patches.

In most cases, special hand work (aeration and watering with a wetting agent) should be effective in dealing with cases of dry patch.

Of increasing concern is the type of dry patch caused by certain soil-inhabiting fungi, to which sand-based greens are particularly prone. The classic example is, of course, the dry bare patch or ring created by the fairy ring fungus *Marasmius oreades*.

FIGURE 1. Sand grains (A) covered with fungal mycellium (B). (approx. x 400 magnification).

FIGURE 2. Extensive colonisation by fungi (D) covering sand grain with a waxy, water repellent substance (C). (Approx. x 1000 magnification).

Recent research at the STRI has examined closely dry patch areas and, in many cases, dense fungal mycellium has been found in affected areas. It has been found that the zone of maximum non-wettability in such patches is immediately below the thatch layer, i.e. in the top 1-2 cm of soil, which confirms similar studies on dry patch undertaken in New Zealand.

In collaboration with Leeds University, sand grains from this water-repellent zone have been examined using a scanning electron microscope (SEM). Whereas an ordinary optical microscope works by focussing light rays of a magnified image using glass lenses, a SEM relies on beams of electrons focussed using magnets, which are then viewed on a television screen. As can be seen in the photographs (left) superb quality images at high magnification can be obtained.

These photographs give us indication of how the fungus makes the affected area so water-repellent. When observed at low magnification, (Fig.1 approx. x 400) sand particles covered with wispy fungal mycellium can be seen. At higher magnification (Fig. 2 approx. x 1000), the fungal mycellium seems to be embedded in a substance coating the sand grains. Workers in New Zealand have analysed these substances and they have been characterised as waxy materials which, by their very nature, are hydrophobic.

Now the exact cause of this dry patch condition has been elucidated, strategies to alleviate the problem can be developed. To date, extensive use of wetting agents such as Aqua-Gro, Pene-Turf or Synperonic on a routine basis have been met with some success.

DATES FOR YOUR DIARY

THE dates and venues of this year's Turf Care Workshops, a national series of regional conference, are now available.

Such notable industry personalities as Dr Peter Hayes (STRI), James Kidd (Gleneagles) and senior representatives of such leading companies as ICI, SISIS, TORO, SAI, LELY and FARMURA, are all coming together under the chairmanship of Howard Swan, Chairman of the National Turfgrass Council.

Write to Turf Care Workshops, Freepost, Basildon, Essex. SS16 6BR for more details.

THE British and International Golf Greenkeepers Association, Northern Area, are holding a one-day seminar on Thursday, 19th November on 'Greenkeeper, Golf Course and Conservation'.

The seminar is being held at Askham Bryan College of Agriculture and Horticulture, York, and its objective is to highlight and bring into perspective the golf course environment, its ecology and the way it is manipulated, used and abused.

Speakers will include Dr Andrew Deadman from the Nature Conservancy Council, Bob Rust from the Leeds Weather Centre, Dr Kenneth Mellanby from the Institute of Terrestrial Ecology, Fred Hawtree, a golf course architect, Martyn Jones, a Consultant agronomist, and David Hannam, a head greenkeeper.

If you would like to take part, contact David Hannam on Menston 72008. The fee for the day, which will include lunch, is £15

COURSES IN TURF MANAGEMENT

THE STRI will hold three courses at Bingley in the Autumn on the theory and practice of turf construction and management.

The courses last five days (Monday to Friday) and will cover soils, grasses, turf diseases and pests, drainage, watering, fertilizers and machinery.

The commencing dates are 19th and 26th October and 2nd November. The fee is £94 for members and £115 for non-members plus VAT (exclusive of accommodation and meals).

For further details from the Secretary, Sports Turf Research Institute, Bingley, West Yorkshire. BD16 1AU Telephone Bradford (0274) 565131

BOOKS ON BOTANY AND PLANT ECOLOGY

THE verb 'to botanise' is not one that comes to mind readily, yet one hundred years ago botany was a favourite pastime for millions of people of all ages and classes.

As we might suppose from the name, it consisted of trips to the countryside to look at and collect specimens from the large variety of flora to be found almost anywhere in the country.

Actually, it was a good deal more than that, for it was a way of breaking through the rigid moral framework of the Victorian era. It would have been deemed quite improper for young men and women to go off together unchaperoned but, by some curious quirk, it was perfectly all right if they said they were going to study nature - and, what's more, they could then bring back specimens to prove it!

Today, things have changed, and not just morally, for botany has become a somewhat neglected subject. Far fewer study it at school and university and a quick count in a bookshop will establish the fact that, on the nature-study shelves, the animal kingdom outscores the plant kingdom by about four to one. In spite of David Bellamy!

The earliest book in my library on this subject is *A Manual Of Botany* by Professor Balfour (1849) and it's only interest is that it demonstrates the extraordinary detail available to the student at what now seems such a far-off age. Most plants had been discovered, illustrated, described, identified and classified in every detail. There are modern books equivalent to this, such as the standard school textbook, *Lowson's Botany*. Any edition will do and I picked up one, from 1971, for £1.

I frequently recommend books from the New Naturalist series and a classic here is *British Plant Life* by W.B. Turrill (1953). If you want a book to help you to identify plants on site, *The Excursion Flora Of The British Isles* by Clapham, Tutin and Warburg (1959) is a shortened, portable version of their complete *Flora Of The British Isles*. Bookshops are awash with

books on wild flowers - interesting to us because they are indicators of the underlying soils.

A small modern book is Longman's *Illustrated Dictionary Of Botany*, which is helpful in defining a number of terms we meet. There is a useful introductory section on plant ecology and the final chapters of *Lowson's Botany* are devoted to the same subject.

Plant ecology describes the relationship of the plant to the environment in which it lives and we enumerate the factors that influence this as being 1) climatic, 2) edaphic and 3) biotic - i.e. weather, soil and other organisms (including man).

By Eddie Park

Various natural processes, such as selection, adaptation, succession, etc, are made clear and there are explanations of why particular grasses invade or die out from the sward.

That simplistic description makes it sound a complicated subject, but the basic principles are quite straightforward and, without them, golf course maintenance becomes a lottery. They provide the rules that enable the greenkeeper to predict the future with some degree of confidence.

It is, however, vital to choose a book that really does stick to the basics. My favourite is *Plant Ecology* by William Leach (1933), but you might find it difficult to find, so try *Discovering Ecology* by Patrick Armstrong (1978). Both stick to simple first principles, whereas *An Introduction To Physiological Plant Ecology* by P. Bannister and similar books start to get complicated.

Once you consider plant communities and the way they change, shrink or multiply, you are into higher mathematics and I can manage very well without that!

Much more interesting is a book such as *Plant Ecology* by Hilda Drabble (1937), which looks at differing habitats, or *Introduction To Plant Ecology* by Maurice Ashby (1961), which details the effects of changes in the environment on plant populations.

We are now getting into the most important part of the subject as it affects the practical greenkeeper. The nice thing about plant ecology is that the practical man already knows many of the facts, but he is assisted to present them in a logical framework.

Books such as *Practical Field Ecology* by R.C. Mclean and W.R.I. Cook (1946) describe how to make observations and carry out experiments in the field.

So this is an interesting and useful subject that enables those engaged in golf course management to have a much greater chance of success in deciding both what is required and what will be the effects of their actions. A book already suggested, *Wild Flowers*, by John Gilmour and Max Walters (1954), in spite of its title, is one of the most pleasant introductions to plant ecology I know.

For those who get hooked on the subject, let me just add a word on the general implications. Ecology is very much a modern word. It seems to crop up in politics, conservation and even religion. It also seems to be a word that can be used to prove just about anything! Most of the general principles have been around for a long time. Charles Darwin, with his theories that evolution could explain the origin of all species (including man) strengthened the beliefs of many scientists of his day.

Men were pretty sure that 'climax ecology,' as it was called, was more than just a theory. In plant terms, this

Continued on page 40

the Golf Course

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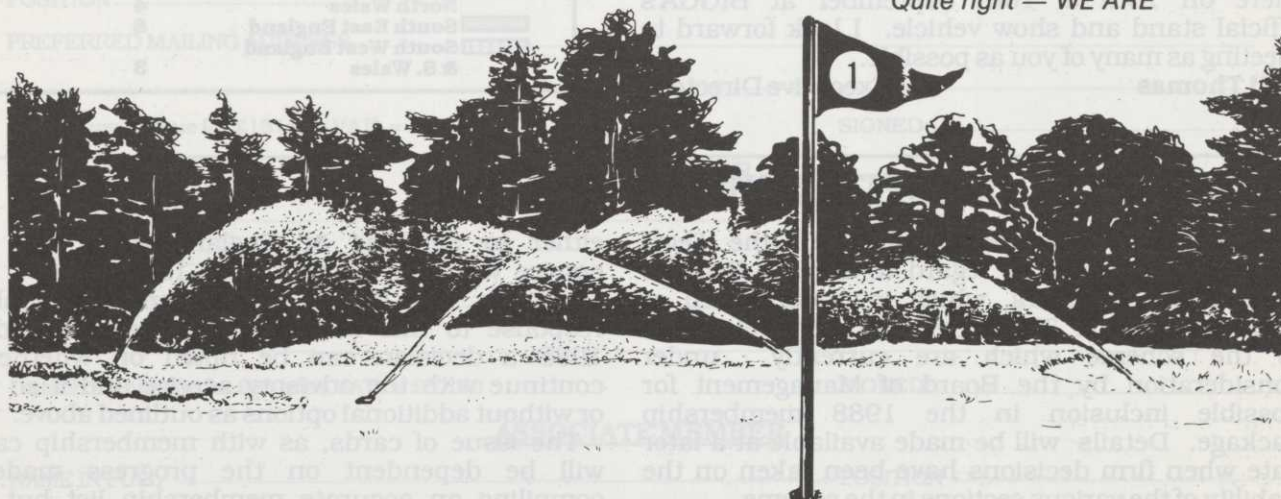
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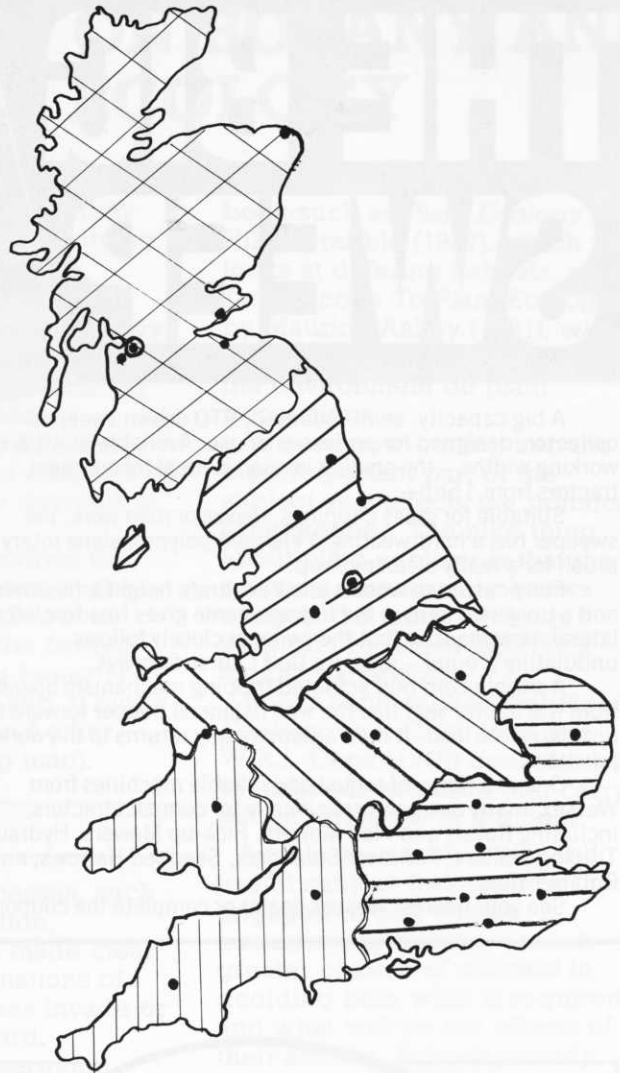
I understand that the position relating to the production of the newsletter is not clear throughout the regions. The magazine sub-committee has decided that the long term aim will be the production of a monthly newsletter. The achievement of this aim will depend on the submission of sufficient material and here the onus clearly lies with the branch secretaries. At present, it is only possible to produce a newsletter at two monthly intervals, and, given enough material, the next newsletter will appear in the October issue of the magazine. Again, there seems to be some misunderstanding on the use of a separate newsletter within the magazine. Essentially, the Board of Management feels that the newsletter can be used in a positive manner to communicate on matters and issues which directly affect the membership but which are not applicable to the wider readership which 'the Golf Course' will be seeking to reach and influence on greenkeeping matters in general. As an example, details of next year's national tournament would be more appropriate for the Newsletter rather than the magazine.

I am receiving many requests to attend branch meetings/seminars and it is my intention to get around and meet members as soon as possible. In the next few months it will not be possible to accept every invitation, though, over a period of time, I will get to all branches! For the next six months or so I think it important that I listen to members' views, aspirations and concerns, and these can form a future basis for discussion at Board level as well as representing a learning process for myself. My approach during this period will be informal as there will be many formal occasions in the future when I will need to project the Association's aims and policies, hopefully from a position of strength based on an understanding of the issues concerning greenkeepers.

Finally I will be attending the Institute of Groundsmanship's show at Windsor and will be there on 15th & 16th September at BIGGA's official stand and show vehicle. I look forward to meeting as many of you as possible.

Neil Thomas

Executive Director



B.I.G.G.A. Regions & Branches

Region	No. Branches
Scotland	5
Northern England	5
Midland, England & North Wales	4
South East England	8
South West England & S. Wales	3

BIGGA - LEGAL BENEFITS SCHEME

DISCUSSIONS have been held with the Legal Protection Group with regard to a Legal Benefits Scheme for members, which is underwritten at Lloyds of London. There are a number of elements to the scheme which are currently under consideration by the Board of Management for possible inclusion in the 1988 membership package. Details will be made available at a later date when firm decisions have been taken on the viability of the various sections in the scheme.

However, I have negotiated a special arrangement whereby all paid-up full members as at 30th September 1987 will have access to a 24 hour legal advisory service on any subject whether this relates to their employment or any other personal matter. Members will be issued with a special card with applicable telephone numbers for use

either in Scotland or England/Wales and this service will then operate from 1st October - 31st December. By the end of December, members' response to this service will be known and for 1988 a decision can be taken on whether to continue with the advisory service and if so with or without additional options as outlined above.

The issue of cards, as with membership cards, will be dependent on the progress made in compiling an accurate membership list but any members not in possession of the special card at 1st October and wishing to make immediate use of the service should contact me personally in order that the matter can be actioned. I would be pleased to hear from members with their views after making use of this service.

Neil Thomas

Executive Director

BIGGA - MEMBERSHIP **INFORMATION**

THE Board of Management has now given further consideration to the membership categories within BIGGA. There will be two other membership categories in addition to the full greenkeeping member category. Details are as follows:-

(1) **Trade Membership.** Initially, membership will run for a 15 month period from 1st October 1987 - 31st December 1988. Membership will be on an individual and not a group basis. The cost of membership for the period indicated will be £50 per member plus VAT = £57.50. This fee will include the cost of subscription to the Association's official magazine 'the Golf Course' throughout the period.

(2) **Associate Membership.** This membership is available to those whose circumstances are such that they do not qualify for membership in either the full or trade categories. Membership will be on an individual and not a group basis and the initial membership period will be the 15 months from 1st October 1987 - 31st December 1988. The cost of membership for this period will be £35 per member plus VAT = £40.25. This fee will include the cost of subscription to the Association's official magazine 'the Golf Course' throughout the period.

N.B. A number of prospective applicants for trade and associate membership have already, in registering their interest, submitted payment in the sum of £17.25 inclusive of VAT. In such cases, trade and associate members should now submit the appropriate balance of payment, i.e. £40.25 for trade membership or £23 for associate membership, and confirm their previous registration and payment.

A membership form for all categories is set out below.

Neil Thomas
Executive Director

BRITISH AND INTERNATIONAL GOLF GREENKEEPERS ASSOCIATION

APPLICATION FOR MEMBERSHIP

FULL GREENKEEPING MEMBER

NAME IN FULL _____ CLUB _____

POSITION _____

PREFERRED MAILING ADDRESS _____

I attach my cheque for £15 (plus VAT) = £17.25

SIGNED: _____

TRADE MEMBER

NAME IN FULL _____ COMPANY _____

POSITION _____

PREFERRED MAILING ADDRESS _____

I attach my cheque for £50 (plus VAT) = £57.50

SIGNED: _____

ASSOCIATE MEMBER

NAME IN FULL _____ POSITION _____

PREFERRED MAILING ADDRESS _____

I attach my cheque for £35 (plus VAT) = £40.25

SIGNED: _____

Return to: The Executive Director, BIGGA, Sports Turf Research Institute, Bingley, West Yorkshire, BD16 1AU

ABROAD on the Golf Course



CORFU GOLF CLUB

in the
beautiful
Ropa Valley

CORFU golf club must be one of the most under-rated courses in the Mediterranean.

Designed by Donald Harradine and opened in 1972, it remains largely undiscovered by comparison with Spanish or Portuguese courses.

Today however, things are set to change. The club has a thriving amateur week each May, this year's championship having been won by the editor of *Golf Monthly*, Malcolm Campbell.

The course is open for seven months of the year, April/October.

The club and course are run by David Crawley, a PGA qualified professional who learnt his trade at Lindrick and who had already spent many years teaching on the continent before taking up his present post in 1984.

At that time the course was in a poor state. For the first ten years it was maintained very well by an English green-keeper, then an inexperienced man took over. The result was overwatering to a phenomenal extent. The daily

routine was "water the greens till they flood, twice a day" receiving up to 40 times more water than was necessary. By 1984 there was stinking thatch and an invasion of crabgrass.

That summer Howard Swan, on a family holiday in Corfu, called in to play a round with a friend. He had heard various stories about the state of the course and was very disappointed with what he found. He had previously played and enjoyed the course in 1978, but by this time the course had deteriorated to such an extent he felt compelled to talk to David Crawley. Much to his surprise and delight, David asked if anything could be done to reverse the downward trend. The answer was "yes" and so together they set about the task of improvement.

The unqualified "head greenkeeper" had by this time departed, so with five Greeks out on the course, the two began analysing the problems, trying to come up with a sensible five year

programme of work.

Three years on and the course has improved out of all recognition. Spiro (all Corfiots are called Spiro after their Patron Saint, St. Spiridon) is now the course foreman, under direction from David Crawley with Howard making three visits a year to offer advice and update the programme.

The original problems of the course were primarily with the greens. They were lush and highly receptive to any shot - good or bad. They were almost pure Pennncross bent, an excellent grass for Corfu's climate if not elsewhere. It wasn't surprising that having been so drastically overwatered for years, when a ball struck the surface it almost disappeared and then popped up again without seeming to leave any pitch mark.

Walking across the greens had certain similarities to trampolining, the putting surfaces having the same properties as jelly. There was, in places, up to four inches of stinking

thatch. So much for overwatering and lack of aeration!

The first part of the programme was to tackle the irrigation system and its operation. Needless to say it was twelve years, old, indifferently designed and not functioning properly. The sprinkler spacing was wrong, the inconsistencies producing localised high precipitation and dry spots. Ideal conditions in fact, to produce thatch in an already thatch producing grass species.

The pop-ups themselves were not working properly, so a phased replacement was introduced. Four or five Toro 650 heads were installed at each green. So far, six greens have been completed and now have the basis for correct irrigation. A full set of replacements should be completed by next year.

A further improvement has been the drilling of several bore holes. Not only has this guaranteed water supply, which had been in the past cut off by the local village

when levels were low, but the lakes on the course can now be maintained at the proper level, adding to the beauty of the course.

The course has already improved significantly, which is due to the drying out process. This, combined with intensive verticutting and aeration, has reduced the four inches of thatch down to a more manageable inch. The greens are certainly truer and faster than they were and are receptive to only the well struck shot.

The previous aeration programme had been virtually non-existent. The Greek staff were told that if they scarified during the summer months the grass would die. So only in October, when all the golfers had gone, did they verticut.

One can only imagine how much grass they removed!

As part of the reclamation the staff were asked to verticut one of the greens during August, to prove the benefits. To their credit they did as they were bidden and then stayed up all night convinced that by dawn they would witness the green's demise. Suffice to say the greens are

now verticut once a week and are better in every respect.

Greens obviously were not the only area for concern. Nutrition to all the grassed areas was always a mystery. Olive skins, chicken manure and inorganic compounds in no particular sequence had been administered. David and Howard have taken three years to discover the problems and to ascertain what had been going on. Now a balanced regime is in operation.

So now, in 1987, with the basics right and improvements made, the team have a chance to tackle some cosmetic alterations.

This spring, again much to the Greek crew's concern, contour mowing of the fairways began. By the simple turn of the tractor steering wheel, the motorway look disappeared and the golfing strategy changed. No doubt Messrs Crawley and Swan enjoyed their chance to be golf course architects, but by this simple operation a large improvement was achieved.

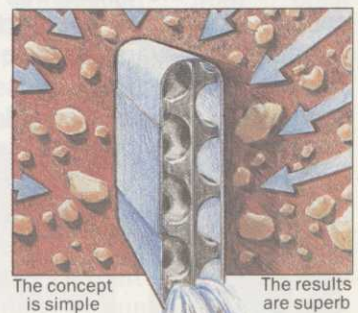
Certainly Corfu is a beautiful place to play golf and the course is firmly on the path to recovery.



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A view of Corfu's magnificent coastline

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TREES

on the golf course

By **TONY GENTIL**

IN my previous article in this series I stressed the importance of protecting the root systems of trees that are being transplanted. From this I think you'll appreciate that when it comes to actually planting a tree, the preparation of the hole that the root system will occupy also requires considerable care.

It doesn't matter whether the tree is a small forest transplant or a large standard, its root system must be able to fit comfortably into the hole you've excavated. Furthermore the soil backfill must have a fine enough tilth to make intimate contact with as many root hairs as possible. This is because the root hairs extract the moisture that the tree needs from the thin layer held round each soil particle.

The techniques used for planting the main types of tree varies slightly.

FOREST TRANSPLANTS are small trees, two or three years old and perhaps six inches tall. They have the smallest root systems of all the tree types and because of this they are often planted using a high speed technique.

The method used is to first skim the surface vegetation off with a spade to expose the soil over an area of approximately a square foot. Then two vertical cuts are made into the bare soil with a spade. The second of these cuts crosses the end of the first one at 90 to form a 'T' shape. The planter doesn't take the spade out of the ground after the second cut. Instead he levers back on the handle of the spade, pressing it from the vertical towards the

horizontal. This has the effect of forcing the 'T' cut upwards and open, so exposing a slit. The roots of a forest transplant are next placed into the slit and the spade is lifted back up to the vertical and removed. This traps the tree's roots in the soil and holds the top in place.

The millions of conifers growing in upland Britain are testimony to the fact that this technique works. I'm not too happy though that this method deals kindly enough with a tree's root system. On the smaller scale of golf course planting, I think you'll get better results this way.

First skim off the vegetation to expose the soil but then dig out a hole of about one cubic foot in volume. Chop the excavated soil down to a fine tilth and then plant the tree, working the fine soil round its roots. Finally consolidate the backfill by pressing it down with the heel of your boot.

Forest transplants planted amongst vigorous competing vegetation do have difficulty in getting established.

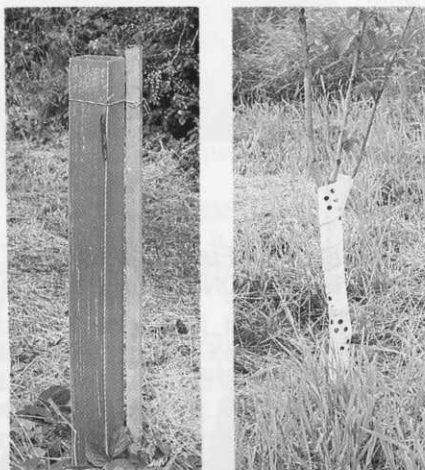
A new technique has recently been developed to help small trees through the difficult establishment period. The new method is to plant the tree, as I've already described, and then to fit a rigid plastic tube vertically over it. These tubes are known as "Tuley

Tubes" or "Tree Shelters". They provide a greenhouse-like microclimate round the tree inside them. This enables the tree to grow vertically at three or four times the speed it would do so without their protection. They also act as rabbit guards and keep external vegetation at bay.

Tree Shelters have become very popular and you'll see these square, brown, plastic statues springing up all over the countryside. Give them a try by all means, but don't expect them to be a panacea for bad planting. Success still depends on keeping the root system happy all the way through the transplanting process.

WHIPS are small trees with a single whip-like stem. Generally they have branches all the way to the ground. They are, in my opinion, the best size of tree for planting on golf courses. This is because they are tall enough to hold their own against encroachment from the surrounding vegetation and yet still have a root system small enough to cope with the trauma of transplanting.

Whips are planted by clearing the ground of vegetation over an area of, say, a square yard, and then excavating a hole big enough for the root system. Backfilling and consolidation is the same as for



A whip planted in a Tuley Tube (left) and protected by a spiral rabbit guard.