

Portmarnock, the dazzling jewel in Ireland's crown, is considered by many to be one of the greatest courses in the British Isles.

DAVID WHITE learns of course manager **Iain Ritchie's** passion for Portmarnock, celebrated last year on a postage stamp

of approval

meet many people who envy the golfing journalist's lot, seeing it as one long holiday roaming around the countryside, rubbing shoulders with the famous and the well-to-do, visiting places that remain for most a mere dream. Mistaken though this may be, I would be the first to admit, on occasions, that I would not change places with any man on earth.

One such recent occasion provided me with the good fortune to visit Ireland, oft described as an Emerald Isle that might have been created just for golf. Forgetting for a moment the rift that separates Northern Ireland from Eire (and, incidentally, one that is traversed by the love for golf that epitomises both nations), I came eventually to a course which many consider one of the greatest in the British Isles, some would say the greatest, the glorious links of Portmarnock.

If you envy this writer, let me turn the tables by suggesting that you should reserve some envy for the keeper of the links at Portmarnock, the Scot, Iain Ritchie. Not that Iain has an easy job, far from it, but he does manage 27 holes of God's Kingdom which, in my opinion, represent the jewel in Eire's crown – a positive bonus. Portmarnock boasts a gorgeous location, with water on three sides, the Hill of Howth to the south, to the east a line of sandhills marking the strand and ocean, beyond the clubhouse westward a sheltered arm of the sea. It is blessed also with an abundance of fascinating bird life and rare flora of quite exquisite beauty. Proof that Portmarnock is a grand place to work may be gathered by the record of a previous incumbent, John Temple, who served the club from 1939 until his death in 1974, 35 years in total.

Born in Aberdeen in 1960, Iain Ritchie took to golf at an early age and was soon a very proficient player indeed. His love for the game took him straight into the business and he joined the golf course construction company, Souter's of Stirling, as an apprentice. Iain's wisdom in gaining expertise in construction cannot be overstated, for in seven years of building golf courses he met and befriended many different greenkeepers, exchanging ideas and ideologies, ever conscious of the huge importance to playing quality that proper drainage, green construction specifications and manage-

ment husbandry has on the finished sward. The experience was to stand him in good stead, whilst bringing about a close and understanding relationship with the consultant agronomist for Portmarnock, Eddie Connaughton of Sports Technology International, whose passion is equal to Iain's whenever Portmarnock is mentioned.

During these construction years Iain also attended Elmwood College, the seat of learning for so many fine course managers, sailing through Scotec Phases II and III with distinctions and credits before embarking on a fourth year in Turf Management. It is indicative of Iain's enthusiasm for education that one of his key apprentices at Portmarnock, Alan Walsh, is encouraged to follow the 'Elmwood Trail'.

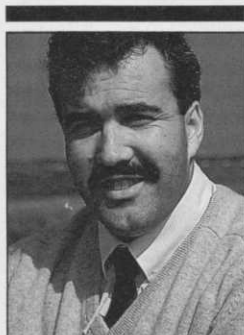
Backtracking somewhat, I learned that Iain took the advice of John Souter to enter the maintenance side of golf, 'a good business to be in', as John put it, and as Iain now acknowledges 'one hell of a good piece of advice'. Hearing that Elliott Small was looking for an assistant, Iain fired off a letter and though Elliott's job was taken, a discussion between Elliott and Bobby Fleming at Dullatur resulted in Iain becoming Bobby's assistant, a post he was to enjoy for some two years.

Time and opportunity marched on, and Iain moved to Ladybank, a delicious heathland course in Fife, first as assistant head greenkeeper and, within one year, promoted to head greenkeeper as reward for his skills and dedication. Listening to Iain speak of Ladybank, the

feeling he has for this course shines through: 'I loved that golf course', he told me, and one is left in no doubt that here is a man whose career is also his passion, for the same light shines in his eyes when talking of his latest love – Portmarnock.

Five years at Ladybank came to an end in 1990 when Iain was lured by the prospect of 'championship' golf management – the Carrolls Irish Open has been staged regularly at Portmarnock – and, for the first time ever on Irish soil, the Walker Cup was to be staged there in 1991, heady stuff indeed. The move to Dublin Bay was not taken lightly, however, for Iain and his wife Yvonne, together with their two young daughters, had never seen Ireland, let alone lived there, and they were to spend several days in Dublin weighing the pro's and con's – the pro's won and they now enjoy a pleasant lifestyle in nearby Malahide.

Iain was fortunate in knowing Eddie Connaughton through his Souter's connection; his opinion valued: 'It's right for you and you are right for them', Eddie declared, 'Ireland's not unlike Scotland but just a wee bit more laid-back, you'll love it'. The job secured, Iain was fortunate again in having the retiring head greenkeeper, Tommy Clark, remain with him through the first few months of his appointment as course manager.



Iain Ritchie:
a feeling for his course



A passion for

We talked about a typical annual programme, Iain of the opinion that Portmarnock's sandy soil suggested a regime not dissimilar to that carried out at Ladybank. 'Come the winds, the course can dry very rapidly and dry patch has been a problem over the last year', he told me, 'and though we apply wetting agents, I haven't yet found a magic cure-all'. Similarly, fairy rings have found their way onto the links, though these are responding to treatment, as is the fusarium that seemed to invade the whole of Ireland in '91, following the mild winter.

In the spring, greens are hollow tined using 2" centres with half-inch tines, relieving compaction an essential task following heavy winter traffic. Many members at Portmarnock (1000 strong, all-male) are also members at other inland courses and they tend to gravitate toward the links in winter. Taking the winter of '91 as an example, Portmarnock experienced only three frosts, all superficial and dispersed by mid-morning. It's as busy as any course might be and this contributes in part to the compaction problem. The pattern of scarifying, hollow coring and top dressing (using local dune sand) is one of little but often.

Come March or April, the greens and tees receive a stimulant feed, a 12: 0: 6 organic seaweed based mix that works well in Eire's higher spring temperatures - often some three or four degrees warmer than in Scotland - and this gets them started sooner. They'll receive about three feeds a year, changing from 12: 0: 6 to 8: 0: 0, plus a monthly spray cover of Seamac or, occasionally, Seamac + N, seaweed applications that Iain find most effective. Back end of the season he also applies sulphate of iron, essentially to prevent disease outbreak.

The emphasis at Portmarnock is on producing first rate playing surfaces, Iain of the opinion that he can control the *Poa annua* content to around 40/50% without resorting to drastic starvation methods that would leave little putting surface at all. His greens are roughly 50/50, with bent grass predominant over fescue and competing vigorously against the *Poa annua*. To keep such surfaces in fine order, Iain's regime is to verticut each week, hand cutting on Monday and Tuesday, Triplex cutting mid-week with verticutters and groomers fitted to the Jacobsen, handcutting again until the week-end, when the same triplex regime is repeated (without verticutter) on Saturday and Sunday. Levels are set to 3/16" for regular play, 1/4" over winter, 1/8" for premier events such as the Walker Cup. In Iain's two years the greens have only been Vertidraind once, though tees and fairways have an annual 'going over', the effect well worthwhile.

For the Walker Cup there was no problem in producing great surfaces on the greens, but if the wind failed to materialise the course was wide open for attack. A player could, in Iain's words, 'hit the ball anywhere and have some sort of lie to strike the ball'. A dry summer had left the fairways sparse and at the end of 1990 an overseeding programme was deemed necessary. Three tons of fescue/bent mixture was drill applied quite late in October - sensibly waiting for rain. Fortunately a wet and mild winter gave a near 90% seed strike from the highly successful programme, which utilised a Unidrill, covered by the added insurance of a pre-seeding fertiliser - 'when you spend that sort of money you leave

nothing to chance'. During the run-up to the Walker Cup, an R&A event, the agronomist David Stansfield was another regular visitor and both he and Eddie Connaughton could be seen striding the fairways. 'The reports from both were without controversy and surprisingly similar, indicating that their ideas were never far apart'.

As the course manager, Iain liaises with the secretary, with reports produced regularly by Eddie Connaughton and Iain on management regimes. Iain's report to committee is essentially a mixture of what has been done by the nine strong staff (plus John Kane, a mechanic who 'does a fantastic job'), the problems that have been found, how they've been tackled, and any plans afoot for the next three months. It's a good, workable system that leaves Iain with a comparative free rein - the right to properly manage, so to speak.

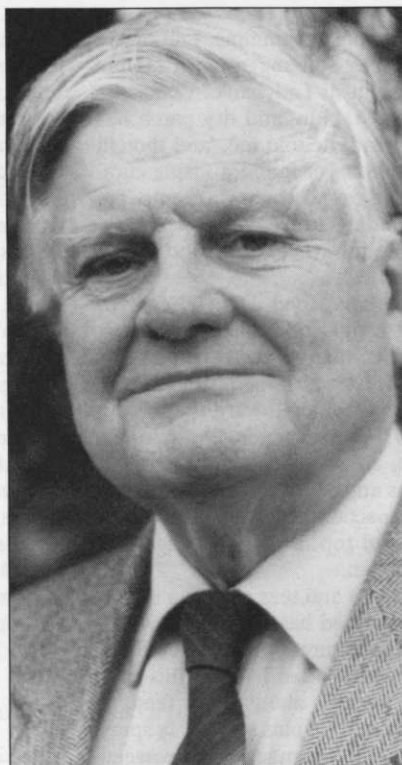
There are few courses that dare boast better all round surfaces than Portmarnock, and fewer still that can lay claim to immortalisation on postage stamps. In 1975 the Killarney course appeared on 6p and 9p Eire stamps, and in 1991 Portmarnock was singled out for this great honour, an illustration of their 15th green struck on a 28p stamp to commemorate the Walker Cup. This was a proud time indeed for all Portmarnock members, with none prouder than their highly talented course manager, Iain Ritchie.

Major machinery in the Portmarnock stable

- 1 x Ransomes 3500
- 1 x Ransomes Motor 180
- 2 x Ransomes 171
- 4 x Ransomes Super Certes
- 4 x Ransomes Auto Certes
- 3 x Ransomes Marquis
- 1 x Jacobsen Greens King
- 1 x Steam Cleaner
- 1 x Supreme Auto Leader Grinder
- 3 x Ford Tractors (various)
- 1 x Kubota 1750 Tractor
- 1 x Iseki 530 Tractor
- 2 x Major Toppers
- 1 x Royer Power Screen
- 1 x Coremaster
- 1 x Three gang units
- 3 x Trailers (various)
- 1 x Vertidrain
- 1 x Shredder
- 1 x Unidrill seeder
- 1 x McConnell Back Actor

Portmarnock

A Winter's Tale



carpets. In other cases, where there is no will to change, there will be no change.

Clearly, there must be a lot of give and take. Not all of us are blessed with all-weather, free-draining links or heathland greens – and not all such favoured environments have good bent/fescue greens anyway! The culprit is, of course, annual meadow grass, which often became dominant as a result of the demand for nice green greens in the 1970s. Getting rid of annual meadow grass is easier said than done, but it can always be reduced. While it is easier to stop it getting into new greens in the first place, there are nevertheless countless cases where greens built many years ago without special under-drainage and on heavy clay soils are dom-

inantly *Agrostis* (bent) with, admittedly, some annual meadow grass but not enough to affect all year round excellence. It has been said that greenkeeping is a constant fight against annual meadow grass and one which we never quite win. But we can all attempt to improve. I have little patience with those who regard annual meadow grass with affection or even tolerance. One listens to talks about how this or that greenkeeper manages *Poa annua* successfully. The best are implementing a programme which, if carried out conscientiously and intensively, will in the long if not the short term reduce this wretched weed grass and swing greens to *Agrostis* – and often they do not realise this. Sadly too, the problem is aggravated by poor grass identification. I read with incredulity a report from an inexperienced adviser to a club I had advised for many years, that their greens were some of the best annual meadow grass greens he had seen – they were in fact at a conservative estimate about 75% *Agrostis* and the best all-year-round surfaces for miles around!

What then is the answer? It must of course depend on individual cases. Some greens, even on newly built courses, are so badly constructed that the essential free drainage which makes an improvement programme feasible could only be achieved by rebuilding. The first step must be intensive, deep, regular and frequent aeration all year round. This first rule of greenkeeping is so often not observed because members do not like to see the slits. 'Can't you leave the greens alone for

There is perhaps no more contentious point in the whole of golf – from the viewpoint of both players and course managers alike – than that of temporary greens. There can really be no rules to cover all situations, but we can at least agree that any greenkeeper worth his salt wants to keep his members – and visitors – on full greens for as many of the days of the year that severe frost and snow cover permit. The gap between desire and performance is sometimes wider than it needs to be.

A first step towards achieving this standard must be the education of the golfer – and the second the education of the greenkeeper. We have all met the character whose attitude is best expressed by the remark 'If we could only get rid of yon golfers altogether we would always have the course in perfect order'.

There is a world of difference between the situation where members turn up on a bright sunny frosty morning to discover the course closed, albeit temporarily, and that which was often the norm on many inland courses 20 years ago, when it was the rule rather than the exception for temporary greens to come into play from October until Easter. Often such greens were well prepared in advance – more often they were just a bit of fairway, preferably not on the actual approach to the green, mown out a week before the switch!

Part of the problem was the thatchy, soft, soggy annual meadow grass greens, which today are much rarer but in those days of

feed and water were the rule.

I well remember one Surrey downland course where there were two sets of temporary greens. The full greens were inches deep in thatch, dominated by *Poa annua* and literally unplayable in winter – the members liked soft lush holding greens in summer. On a set day in early autumn, the club came off full greens, for the next seven months, on to really excellent fescue-dominated greens of about 350 sq yds maintained all summer and even top dressed as well as regularly mown with the main greens. These greens were much better than the full greens – and much preferred by members, who however still failed to make the necessary mental connection. So proud were all concerned of these temporary greens that at the first sign of frost, play was switched to temporary temporary greens just cut out of the downland turf, on the other side of the green. And that is true! A few years, under a new head man, of intensive aeration, controlled irrigation and limited fertiliser treatment produced such an improvement in the full greens that they were playable most of the winter – and then we had a change of green committee and greenkeeper and with it a reversal to the bad old ways.

There can be no slick answers to this vexed question. In some cases the old greens have been mismanaged for so long that not even eternal optimists who share my views can improve them sufficiently to produce tolerable winter conditions without complete rebuilding of the greens on stone drainage

avoiding a golf club's 'winter of discontent'

five minutes' is the parrot cry, to which the only answer is 'Certainly, provided you keep off them'.

I am the first to admit that there are cases where one must come off the greens on to temporaries and not just for frost, though severe damage can be done by play on greens when the surface is thawing out and the soil an inch below frozen solid – when roots are sheared off and the damage lasts well into the growing season – just because a selfish few demand to play full greens under obviously unsuitable conditions.

There must be understanding and discipline. There is only one man who can and must close the course, if only because he has the knowledge and is first there in the morning, and he, of course, is the head greenkeeper. Equally, he must not abuse his powers and will want to keep his course open to the limit, if only as a matter of pride.

What really saddens me is an increasing tendency to say that we must learn to live with annual meadow grass. I can quote course after course on heavy clays – from Essex to the Welsh marches, from central Scotland to Wealden clays – where erstwhile bogs have been so improved that the *Agrostis*-dominant greens are often the best in the area, despite their poor history. Equally, I despair when I am told, as I was recently, of one Scottish inland course which I advised for many years, before I retired, where the head greenkeeper was as convinced as he was hard working and skilful and we as a team converted thatchy bogs to good bent greens, which 'under new management' have gone straight back to bogs and they are on 'temporaries' permanently from 1st October. All so avoidable and such a waste of our efforts and enthusiasms.

If you must have temporaries then I suppose it is sensible to prepare them well in

advance, but it is my experience that if you have such good temporaries, they will be used! Where it is at all feasible, I advise using a 10" hole cutter and sinking a hole cup in the base to one side of the approach – it is just as good a test of winter putting really!

There are many other dodges to keep players on full greens – such as pin placements nearest the next tee and rescinding Rule 34.3 about attending the flag under non-competitive winter play, to cutting two holes (one closed with a sorbo-rubber plug) so that the flag can be moved to spread wear when new holes could not be cut, but that is another story, and, I am the first to agree, these are not invariably applicable.

'The need for better winter conditions is increasing every year'

If switching to temporary greens arouses wrath, this is nothing to that caused by going onto tee mats. Clearly there will be circumstances where mats are unavoidable as a last resort, but even then much can be done by thoughtful construction and the use of pulverised bark paths to avoid the area all around being turned into a quagmire. There have also been successful results with movable (on wheels!) tee mats to reduce such traffic wear. The secret to keeping golfers on full tees over the winter is, of course, to have more teeing space. This is often easier said than done, especially on older courses on a restricted area, or where tees are tight up against boundaries.

Sadly, on many such courses, only recently

has there been any serious attempt to increase teeing space from the level which was just adequate 30 years ago, when there was in any case much less winter play.

On heavy land, especially, new tees should be constructed just as greens are, on under-drained and blinded stone carpets, with a free draining root zone, (which of course to save costs can be shallower than for greens (as we are not sinking hole cups in tees!). Such tees will naturally need irrigation, as they will be drought susceptible, if only to aid recovery after winter wear.

With new courses we talk of a minimum of 400m² for teeing space, as a matter of course. Tees, incidentally, should not be rectangular: round-ended tees are more natural looking and easier to mow with triplex mowers. The pro's and con's of single large tees, compared with several smaller ones could keep us going all night, but a major factor must be traffic to and from tees. If main tees and specially built winter tees are well separated (where this is possible), then the risk of thoughtless players walking over a tee out of play (whether the full tee rested in winter or the winter tee being renovated in spring) will be minimised.

I am fully aware that it is much easier to recommend than to put the recommendations into practice, but the need for better winter conditions is increasing each year with more winter play – certainly vastly more than even ten years ago. If we accept the need and agree the methods, then results will follow but many factors such as course layout, soil type, even budgets may limit the implementation. Above all we need education of golfers to accept temporary closures as unavoidable or where play in such circumstance would leave a lasting legacy. It is, in my view, up to greenkeepers to get such points over – and not to abuse the powers given to close courses when the need arises.



Testing, testing

MICHAEL BIRD
on the steps to take to
calculate spring
fertiliser requirements

Assessing and satisfying the spring fertiliser requirements of fine turf are probably the two most difficult tasks faced by the greenkeeper. Soil type and structure, climate, moisture levels and existing soil nutrients all play a significant part when determining the present and future needs of the turf. The influences of just one or all of these factors can greatly affect the requirement for and availability of the essential nutrients required for plant growth. There are more than a dozen different chemical elements in the soil which are utilised by growing turf. The most important are those which are needed in greatest quantity: nitrogen; potassium; phosphorus; calcium; magnesium and sulphur.

However, it is vital that trace elements such as iron, manganese, zinc and boron are not overlooked as all are vital during the numerous stages in growth. Nutrient non-availability and losses occur for a variety of reasons. Although formed within the soil, plant-available nitrogen, for example, is not retained naturally and is leached out quickly by drainage water. It can also be lost through gaseous release.

Potassium is held naturally by clay soils but not by those containing a high level of sand. Phosphorus becomes increasingly insoluble – and less readily available – the more acid or alkaline the soil becomes. It is therefore most readily available under neutral conditions.

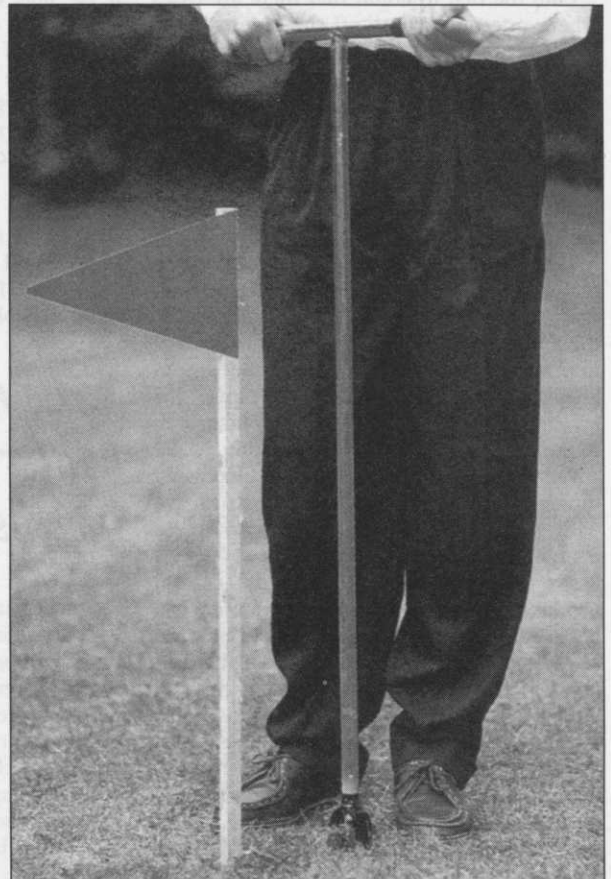
Although heavier soils are able to retain nutrients due to particle and ionic bonding, the increased level of moisture present can limit the microbial activity which helps to naturally recycle soil nutrients. Such factors also effect the availability of other soil nutrients to the point where, not so many years ago, assessing plant requirements in the spring was left primarily to experience and previous management practices.

Only when the season was well advanced, with its longer daylight hours and higher soil temperatures, could the turf professional then assess whether the initial treatments had had their desired effect. But guess-work should be playing an ever-decreasing role, stresses Dave Lawson, soil chemist with the STRI: 'Soil chemical analysis should be carried out well ahead of the spring', he says. 'In most rootzones, only phosphate and potassium nutrients will require analysis. However, testing for magnesium, copper, zinc and manganese will also be beneficial in extremely sandy conditions'.

Mr Lawson points out that there are no completely reliable tests at present for the level of plant-available nitrogen in outdoor soils due to the variable rates at which organic matter is mineralised. Established methods such as growth rate and grass colour are still important, therefore, to establish soil nitrogen levels and requirements. Because of the large number of factors affecting plant growth and nutrient availability at any time of the year, increasing use is being made of slow release fertilisers to ensure a ready and continuous source of nitrogen available to the plant as and when it is needed.

Their low solubility and reduced leaching characteristics means that application does not have to be restricted to periods of active growth. Indeed, many products can be applied safely and cost-effectively from December onwards, and even earlier, so that during periods of milder weather, sufficient nitrogen is available for plant growth and greening without risk of disease. Furthermore, the required nutrient is then present in the soil to encourage and sustain vigorous plant growth when conditions are suitable in the spring.

Slow release fertilisers can be had in straight 'N' or compound form to suit the turf's needs, as determined by soil chemical analysis. Dave Lawson recommends that soil pH



To ensure representative results, soil samples should be taken at several locations across the area to be tested, marking each sampling point prior to using the soil auger

should be tested at the same time as its nutrient status due to the effect that different fertilisers can have on a soil's acidity or alkalinity. Both the chemical analysis and pH of the soil can be assessed using hand-held test kits, taking care to ensure that a representative sample is taken from the area under examination. In the case of soil testing for phosphorus, potassium, magnesium or levels of micro-nutrients such as iron, manganese or copper, Mr Lawson recommends that random samples be taken to a depth of 10cm. All samples taken should then be mixed well together to form one sample for testing. The same advice applies when measuring pH levels.

Using the results, decisions can be taken with regard to the amounts of phosphate or potash needed by the plant, applied either before the growing season together with a slow-release nitrogen or as part of the spring dressing programme, applied in granular form. Mr Lawson comments that the soil test for magnesium and trace elements can often reveal relatively low levels in the rootzone. 'Visible symptoms of deficiency are not normally seen in turf grass, even on sand-only rootzones', he points out. 'However, if the soil test reveals low concentrations, then it is important that remedial treatment is carried out.'

Soil pH levels have a major bearing on the grass species grown. More acidic conditions increasingly limit the availability of nitrogen, phosphorus, calcium, potassium and magnesium to the plant. As a result, many grasses will not

flourish or even survive. Similarly, many trace elements, as well as phosphorus, become less available to the plant as soil alkalinity increases. Therefore, the majority of grasses are selected and grown for their tolerance to the prevailing conditions, although soil pH can be adjusted over the years using top dressings of the required pH, enabling different grasses to be established to suit prevailing conditions and course requirements.

Changes of a more immediate and less lasting effect to soil pH can be made also through different fertiliser applications. An ammonium sulphate-based nitrogen fertiliser can, for example, be used to reduce the alkalinity of a soil to better support red fescue and browntop bent grasses, noted for their hardiness and ground covering abilities. Care must be taken both with application rates and evenness of spread to avoid scorch. Washing-in by rain or artificial watering is also recommended for optimum results. Top dressings of a neutral pH value are normally used to reduce soil acidity. However, where there is serious acidification, lime can be applied in the form of ground limestone or chalk, although great care should be taken on established turf to avoid over-application which can lead rapidly to disease problems. Ideally, treatment should be made before the growing season to allow rain to wash the dressing into the soil. Also, Mr Lawson commends a laboratory soil lime test to establish the precise application rate required. Apart from the nature and structure of the soil, the grass species and the level of nutrients already present, the removal or return of grass clippings can play a significant role in assessing the turf's fertiliser requirements.

Dry leaf material contains approximately 3% nitrogen, 2% potassium and 0.3% phosphorus. On longer, rougher parts of the course, adequate nutrients can be returned to the soil by leaving the grass clippings, allowing them to degrade naturally. However, where clippings are boxed off, close attention must be given to ensure that the nutrient reserves removed in the grass box are returned through the annual fertiliser programme.

Most experts agree that the application of large quantities of potash and phosphates prior to or during periods of rapid growth are wasteful. Testing has shown soils on many golf courses have accumulated high levels of phosphates, and lower levels of potassium, due to over-applications in the past and the inability of the plant to absorb them, irrespective of whether the turf in question was mown with the grass box on or off. This situation still exists today, making regular soil testing an absolute must on all courses. The type of fertiliser chosen and the form in which it applied will depend very much on the results of a soil analysis and the experience and eye of the greenkeeper.

Demand and expectations from golfers for surfaces all-year round has highlighted the importance of fertiliser applications being made with care, accuracy and close regard to the needs of the turf. The use of slow release fertilisers, dependent on suitable moisture or temperature levels (both, in some cases) means that applications need not be restricted solely to times of active growth. However, there can still be a need to boost the application rate, particularly to help the grass recover from winter wear or to give a greening-up ahead of an important tournament.

Long-term benefits have also been reported from the early application of root and shoot growth stimulants in the form of liquid organic fertilisers containing seaweed extract or farm slurry, together with added trace elements and micro-nutrients. These factors all underline the importance of measuring the level of nutrients within the turf so that accurate

and cost-effective supplementary treatments can be made. The margin for error is substantial when one considers the wide range of major nutrient application rates that may be necessary each year on golf greens, tees and fairways.

According to Dave Lawson in his essential publication 'Fertilisers for Turf' published by the STRI*, a traditional golf green or tee may require between 8 and 20gm² of nitrogen, up to 20gm² of phosphate and between 6 and 15gm² of potassium during the year, with 25% additional N for a sand-constructed green. A similar range of NP&K will be needed on tees, again depending on soil analysis, and between 8 and 12gm² of nitrogen on parts of fairways which come under heavy wear, often applied in two or three dressings. On these areas, slow release fertilisers have proved particularly useful. If fairway clippings are boxed, a full re-assessment of requirements will have to be made with the help of a soil test. 'And greenkeepers should not forget that selection of the appropriate fertiliser is not the end of the matter', comments Mr Lawson. 'It still has to be applied accurately and evenly. So, the winter period must be used to check over the machine for wear or damage prior to the spring. Also, it is vital that the spreader is calibrated to give the required output with the fertilisers being used, due to the large variations in flow characteristics shown by different products'.

Calibration is carried out by setting the spreader according to the manufacturer's recommendations and then driving through a line of one metre square trays at normal working speed. The fertiliser collected is weighed and compared with the required output in grams per square metre. Any machine adjustments can then be made and the calibration re-checked before going to work.

■ The writer, Michael Bird, based this feature on discussions and correspondence exchanged with David Lawson, Soil Chemist, STRI.

* 'Fertilisers for Turf', by D M Lawson, is published by the STRI, Bingley, W Yorkshire BD16 1AU. It costs £4.50 including postage.



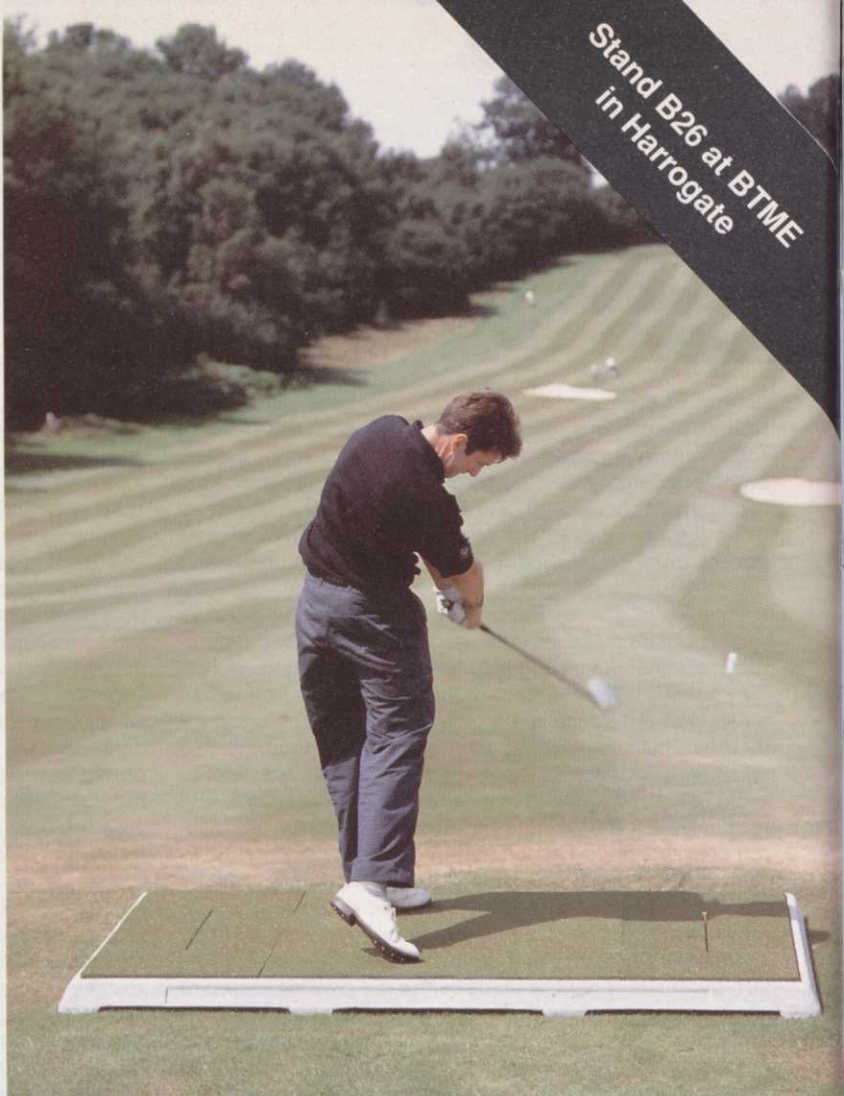
Because of the varying flow and spread characteristics of different fertilisers, pre-calibration of a spreader with the material to be spread is essential for accurate and cost-effective results

PRO-TEE PRODUCTS

TOP QUALITY
TEEING OFF
PLATFORMS FOR GOLF
COURSES.

MAT SYSTEMS FOR
DRIVING RANGES,
GOLF PRACTICE NETS,
TRADITIONAL
RUBBER LINK MATS.

HILL HOUSE FARM, MISBROOKS GREEN ROAD,
BEARE GREEN ROAD, DORKING, SURREY RH5 4QQ.
TELEPHONE 0306 712998 FAX 0306 712997



Stand B26 at BTME
in Harrogate

AD
REF
385

See us on
Stand B5 at BTME

THE COURSE LEADER

Lindum - the perfect turf for golf greens, tees, fairways and landscaping.

A range of the finest quality seeded turf; seed prescriptions and fertilisers matched to customers special needs; with a full preparation and after-care advisory service.

For golf courses, Lindum are the leaders, of course!

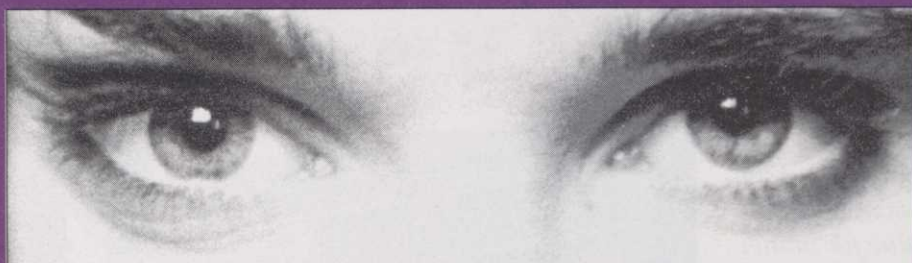
LINDUM Seeded Turf
FOR LANDSCAPE AND LEISURE

Church House, Horkstow, Barton on Humber, South Humberside, DN18 6BG. Telephone (065 261) 564 or 329. Fax (065 261) 447

AD
REF
38



The countdown has begun



LOOK OUT for what promises to be the best BIGGA Turf Management Exhibition so far, at the Harrogate Conference Centre, January 20-22, 1993.

The Duke of York will officially open this, the fine turf industries' premier event during the morning of Wednesday, January 20. BIGGA president Viscount Whitelaw will also be there - as will Association officials, members, greenkeepers, the trade and everybody with an interest in golf course maintenance.

You can't afford to miss the 1993 BTME. A world class exhibition, a sparkling educational seminar programme and now even Royal recognition. Complete and return the post-paid card in this issue to confirm your place, and we'll see you there. Meanwhile, this special preview gives an introduction to the show people will be talking about for months to come...

Preview

Practice makes Perfect!

Here at Atterton & Ellis we have been making Grinders for over 100 years and although we say so ourselves, we are rather good at it and our Grinders prove it!

It is hardly surprising that during this time we have made Grinders for just about every type of cylinder on the market and for most of the prominent Grounds and Golf Clubs around the country.

In fact, in our work shops at the moment we have Express Duals ready to go to America – the Atterton is well proven on the other side of the Atlantic too!

Our customers tell us the reasons we are still in demand 100 years on – *our dedication to service, the quality of build, the value for money* – they all add up to the finest Grinders available today.

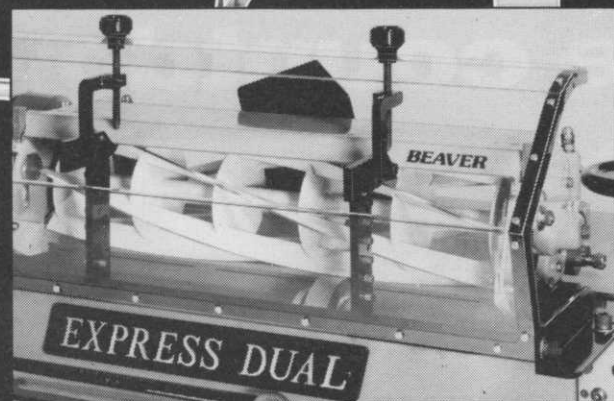
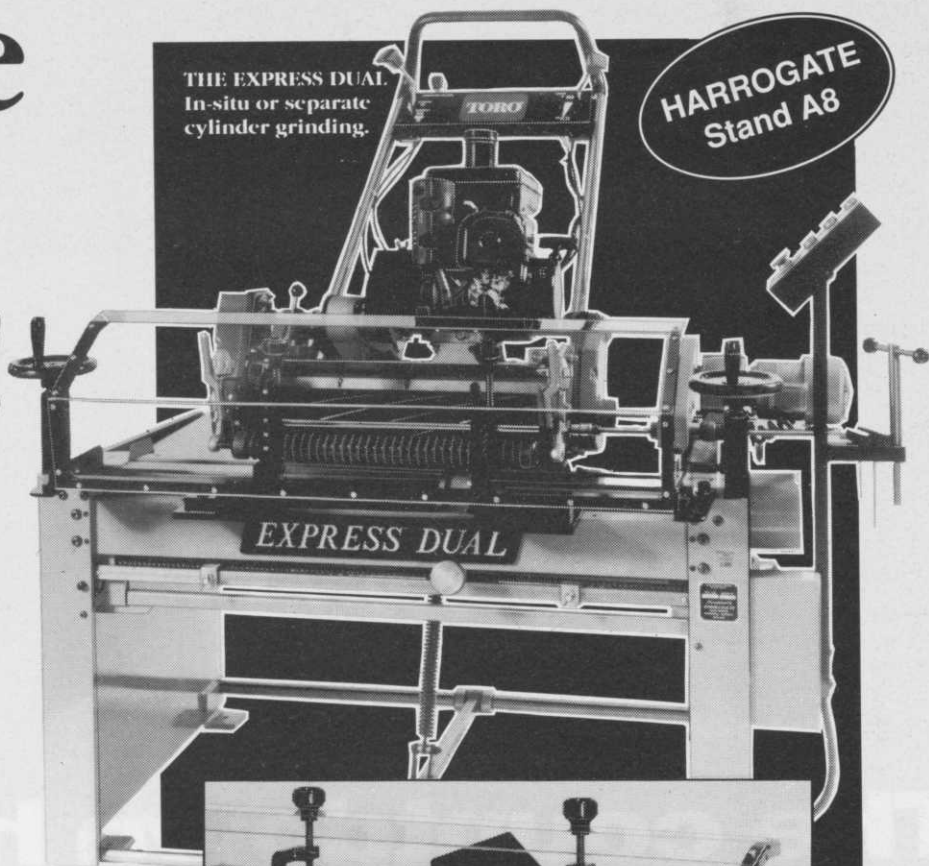
We have constantly changed and adapted our manufacturing techniques to combine *the best of yesterday's skills with the benefits of tomorrow's technology*.

But more important than all that we are first and foremost Grinding enthusiasts and are happy to talk and give advice whatever your grinding requirements.

The Express Dual is a technological revolution, in situ and separate cylinder grinding – The Anglemaster, a bottom blade grinder to complement the best in cylinder grinding machines.

THE EXPRESS DUAL
In-situ or separate
cylinder grinding.

HARROGATE
Stand A8



THE ANGLEMASTER
Bottom blade grinder
for all machines.



ATTERTON & ELLIS LTD

Manufacturers of Fine Grinders for over 100 years

Iron Works, Haverhill, Suffolk CB9 8QH
Tel: (0440) 702312 Fax: (0440) 712138

AD
REF
7