



FEBRUARY '88

GREENKEEPING

MANAGEMENT AND MAINTENANCE FOR THE GOLF COURSE INDUSTRY



Thatch problems highlighted after Verti-draining a Poa annua green

Controlling or cultivating Poa - page 12

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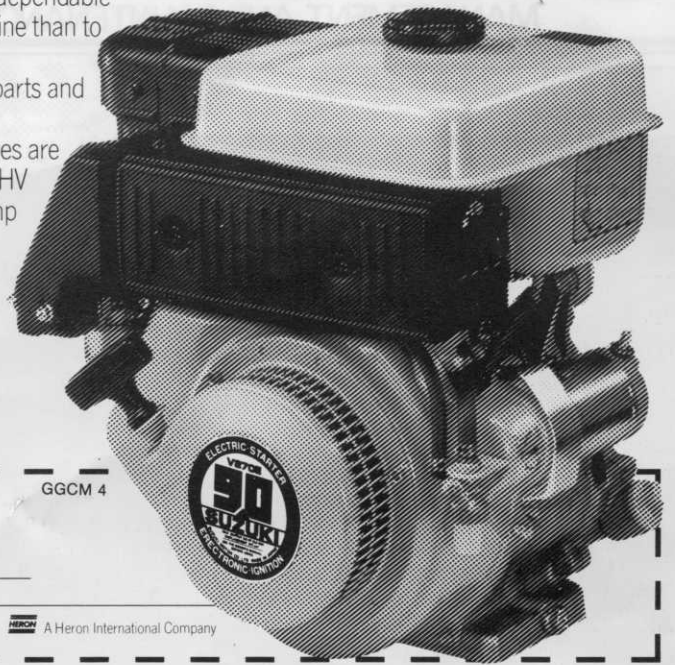
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GGCM 4



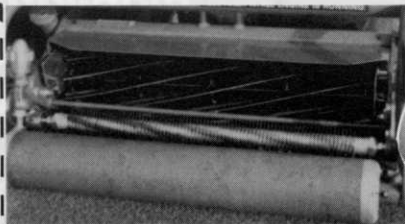
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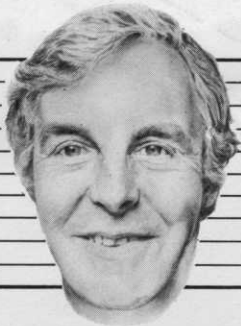
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Greenside Comment...



John Lelean

Financial Crisis

Despite the huge sums of money floating around the world of golf in an ever increasing spiral, we hear of yet another plea from a deserving cause.

No, it is not the Greenkeepers asking for a living wage, but this time it is the Golf Foundation, a charitable organisation whose sole objective is to promote junior golf at grass roots level through coaching schemes at both schools and clubs.

This year they face an income shortfall of around £50,000.

Figures supplied by the Golf Foundation reveal that only 300 clubs in Britain make a contribution to the funds. That leaves some 1,700 skinflint Committees who have totally ignored requests for a donation to help not only the new generation of junior golfers without a club, but those juniors, sons and daughters of senior golfers, already with a golf club attachment.

Ask at your own club for a breakdown of the payouts made each year to the various bodies controlling the game and we guarantee you will be in for a bit of a shock. The unions and local alliances cream out a considerable chunk, though you will find some difficulty in obtaining a balance sheet.

What they actually do with the golfer's money is somewhat shrouded in mystery, though the elite in the amateur game, those dozen or so who represent the County together with the back-up administrators, live pretty well whilst in team competition.

We have of course heard it all before. If every golfer would donate just 10p then the Foundation would have £180,000 and their financial problems would be over. Most golfers if asked would donate 10p, probably more if he understood the excellent work of the Golf Foundation.

The only way this sum can be raised is to make a direct appeal to management committees. If they feel they cannot justify a sum from the annual subscription then surely someone could organise at least one competition during the season, run a sweepstake or even put a Golf Foundation swear box on the bar.

How many of us have said as we swing the club in an arthritic curve - if only I had started the game earlier?

It is too late for us, but not too late to help a youngster on the right path to golfing success.

Tragic ending to prize trip

There was a sad ending to the Houston trip for Young Greenkeeper of the Year, Huw Morgan, who heard by telephone that his father, Vivian, the Course Manager at Pontadawe Golf Club, Swansea, had died suddenly on his home course.

Huw, Head Greenkeeper at Fairwood Golf Club, had already made the most of his prize visit to Texas and was spending a final few days taking up the numerous invitations he had received to see the top courses in the northern part of Houston.

Despite a bout of "Texan Flu", Huw had participated in as many events as could be squeezed into his hectic schedule and was using his last few days to see how the best courses were managed.

We would like to extend our sympathy, to Huw and his family, in their sad loss. We know how much he was looking forward to sharing his experiences with his father on his return to Swansea.

Huw is a fine ambassador for the younger generation of British Greenkeepers and his club can be proud of him.

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March: Drainage Schemes for Greens and Fairways
Update on Fertilisers, Fungicides and Herbicides



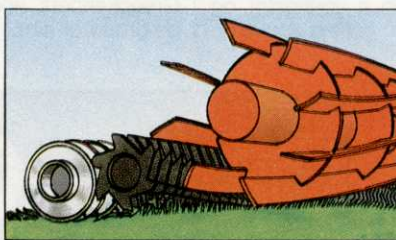


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By cutting horizontal runners and removing thatch, the patented Turf Groomer™ attachment creates faster, truer and healthier greens *without* lowering height of cut.

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And, the unique *performance monitor* which digitally displays all speeds, including cutting frequency, so the operator can evaluate mowing performance, instantly.

What's more, every Greens King is backed by the most extensive support network in the industry. So, contact your Jacobsen distributor to arrange a free demonstration. And see for yourself why the Greens King family is the best in the business.

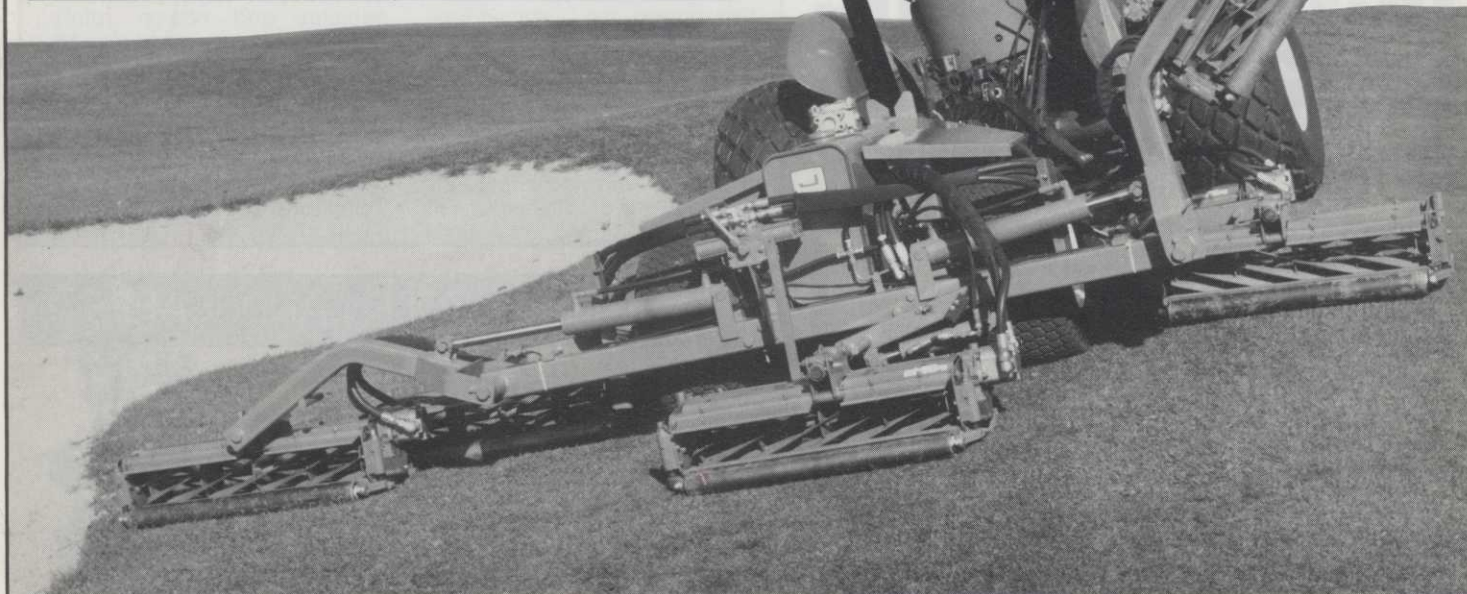
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NEWS ROUND-UP

PEOPLE, PRODUCTS AND DEVELOPMENTS
IN THE GOLF COURSE INDUSTRY



Jacobsen's new 7-Gang Hydraulic Ranger. Its seven hydraulically driven reels can be set to float over fairways, cutting at $\frac{3}{8}$ " with $\frac{1}{2}$ " frequency of clip at 5 mph.

NEW 7-GANG HYDRAULIC MOWER GIVES A TOURNAMENT- QUALITY CUT

Racine, WI Jacobsen's new 7-Gang Hydraulic Ranger gives a tournament-quality cut on up to 60 acres per day with its productive, 15-foot cutting swathe. Powerful hydraulic reel motors cut heavy or wet grass easily, with plenty of extra power for large-area vertical mowing.

Tractor-mounted operator controls allow cutting with 3, 5, 6, or all 7 reels. The Ranger is less than eight feet wide with all reels raised for transport. It has reversing reel controls for vertical mowing and backlapping.

Combined with Jacobsen's G-20D turf tractor, the 7-Gang Hydraulic Ranger gives high-production, quality mowing with low ground pressure, good manoeuvrability, and improved operator control.

The unit can be pulled by any 35 P.T.O. hp or larger tractor. The Ranger's hydraulic pump attaches directly to the tractor P.T.O., allowing sharper turns than models with a drive shaft connected to the P.T.O. The 7-Gang Ranger can turn 180° without leaving an uncut circle of grass.

The 7-Gang Hydraulic Ranger can be equipped with either 6- or 10-bladed reels for a wide range of high-quality mowing applications. Reels can be free-floating to closely follow ground contours at low cutting heights on fairways and other formal turf areas, or they can be locked in a fixed position for efficient cutting of roughs and informal turf and higher cutting heights.

Vertical reels are available to convert the Hydraulic Ranger into one of the most productive large-area verticutters available. Blade spacing of $1\frac{3}{4}$ " and penetration of up to $\frac{7}{8}$ " gives thorough, one-pass coverage.

NEWS 1

WOOSNAM HEADS STAR CAST FOR DUBAI'S GOLFING SHOWPIECE



نادي جولف الامارات دبي

EMIRATES
GOLF CLUB DUBAI

Ian Woosnam, leading money winner in the world last year, will line up alongside three more of golf's top professionals to help launch the first championship venue in the Arabian Gulf next month.

Woosnam will partner his European Ryder Cup team-mate Sam Torrance during a \$150,000 18-hole challenge match against Australian stars Rodger Davis and Graham Marsh at the Emirates Golf Club in Dubai on March 11.

The Emirates Challenge will climax a four-day inauguration for the first grass championship course in the Gulf.

H. H. Sheikh Mohammed bin Rashid Al Maktoum, the UAE Minister of Defence and the Principal behind the Emirates Golf Club, will perform the official opening on March 8.

Over the following two days, Woosnam, Torrance, Davis and Marsh will take part in two Pro-Am tournaments with 72 amateurs as a build-up to the East v. West Challenge match.

"The appearance in Dubai of four such accomplished players will be a significant step towards establishing the Emirates Golf Club as a venue for full-scale professional tournaments", said

Stephen Trutch, Sheikh Mohammed's Yorkshire-born projects co-ordinator.

With tournament specialists Dunhill one of the main sponsors, the Emirates Challenge is assured of world-wide media coverage.

In little more than 18 months, the Emirates Golf Club has transformed 700,000 square metres of desert on the outskirts of the city of Dubai.

An elaborate irrigation system draws water from Dubai's desalination plant and feeds it to the course through more than 700 sprinklers, giving life to Bermuda grass and thousands of trees and shrubs.

As much as 40 per cent of the water may be re-cycled as a result of a novel scheme devised by the construction team to pump water back up out of the ground into two lakes linked into the irrigation system.

NEWS 2

It's a whole new ball game aerating with a Greensaire

With Ryan's famous 2 inch by 2 inch tine pattern, removing 36 cores per square foot – and its unique vertically in and out tine action eliminating hole elongation and side wall compaction – aeration with the new Greensaire 24 can really lead to a whole new ball game.

It's those unique Ryan features that result in more soil removal, better root development – and a smoother putting surface.

Up to 8000 square feet per hour can be aerated and the Greensaire 24's transport speed is quicker too. Then there's the optional core processor and windrow attachment – both designed to let you complete the job more quickly. With less maintenance downtime too you can see why we say that aeration with the Greensaire 24 is a whole new ball game for your players and for you.



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VICTA UK

Tune-up guide for Cushman Users

A pocket-sized guide to the tuning of petrol engines fitted to Cushman Turf Truckster vehicles and Cushman Front Line ride-on rotary mowers is now available free of charge from the Cushman distributor for the British Isles, Huxleys Grass Machinery.

Produced using full colour illustrations with clear accompanying text, the Cushman tune-up book covers both the 18hp and 22hp petrol engines manufactured in the USA by Cushman parent company, OMC.

Included within the guide is step-by-step instruction to checking and adjusting the engine's valve clearances, its

ignition timing and governor settings. Also described and illustrated is compression testing, carburettor adjustment and the correct replacement of spark plugs, points and fuel filters.

Designed to complement the comprehensive workshop service manuals available for the range of Cushman turf maintenance vehicles and ride-on rotary mowers, the new guide may be obtained through Cushman dealers nationwide or direct from:

Huxleys Grass Machinery,
The Dean, New Alresford,
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Telephone: 0962 733222.

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The 1988 Kubota Golf Challenge is to be played on Monday 10th and Tuesday 11th October at the Belfry. This will be the 7th challenge between members of The Association of Golf Writers, The British and International Golf Greenkeepers Association, The Golf Club Stewards Association and The Association of Golf Club Secretaries.

In the past six challenges there has been fierce competition resulting in the greenkeepers having won 4 times and the secretaries twice.

Associations establish their national team representation through qualifying events throughout the summer. This allows the tournament to run for a period of some six months making it the most eagerly awaited event of the year for the participating parties.

Kubota are market leaders in small tractors supplying major golf courses throughout the UK.

NEWS 3

S.T.R.I. Seminar

A unique seminar. The first to be held in the U.K. specifically concentrating on sands and sand construction of sports fields will take place on Tuesday 29th March at the Metropolitan Police Sports Ground, Imber Court, Ember Lane, East Molesey, Surrey.

The seminar organised by The Sports Turf Research Institute in association with TORO and B.A.S.F. will discuss the factors affecting the choice of sands and the design of sand constructed sports fields, irrigation requirements, systems available and the specific nutritional management and fertiliser programmes required.

A field visit is planned and delegates will be able to inspect and discuss at first hand the management and maintenance of a sand constructed sports pitch.

Attendance by invitation including buffet lunch will be free but numbers will be limited and invitations be restricted to applicants who have an interest in and responsibility for sports field design, constructive management and maintenance.

Invitations are available by applying to:

Turf Care Communications, Freeport, Basildon, Essex SS16 6BR no later than March 18th.

NEWS 4

BIGGA join National Turfgrass Council

September's NTC business meeting saw the unanimous acceptance of the British and International Golf Greenkeepers' Association's application to join the Council and seek representation on its main body.

In 1980 both BGGA and SIGGA were members of the NTC, but the latter's participation lapsed, and the former's was dissolved when the three greenkeeping associations came together under one roof in late 1986.

Howard Swan, NTC Chairman, commented "I am delighted that the new greenkeeping association has decided to join all the industry's other bodies on the Council and to show its support for us in our growing role as the umbrella organisation. I understand that in the short time BIGGA has been formed it has attracted almost 2,000 members, without trade involvement, which is a remarkable achievement worthy of much congratulation. With such strength behind it, and under Executive Director Neil Thomas, I look forward to BIGGA's contribution to the future working of the NTC, which will be of important significance".

NEWS 5

Courses in Turf Management

The Sports Turf Research Institute will hold two courses at Bingley in spring 1988 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 22nd February and 29th February.

If there is sufficient demand for places a third course will be held during the week commencing 7th March. The fee is £100 for members and £120 for non-members plus VAT (exclusive of accommodation and meals).

Further details from:

The Secretary, Sports Turf Research Institute, Bingley, West Yorkshire, BD16 1AU.

Tel: Bradford (0274) 565131.

NEWS 6

SALE DAY AT TURFLAND

A bargain sale and demonstration day is to be held at the Warrington headquarters of Turfland on Tuesday 22nd March.

Turfland are the sole distributors for the Brouwer range of turf maintenance machinery in the UK.

Snip of the sale is likely to be the Brouwer Vac on offer at £9,500, saving almost £5,500 on the standard price.

Janet Watmore, wife of the Managing Director, Chris Watmore, told *Golf Greenkeeping* this was their demonstration model used out on the "Road Show" only nine times. For cleaning up after an event such as a major golf tournament or a race meeting the Brouwer Vac is ideal to gobble up the accumulated debris.

There are many other bargains on offer, mainly from the demonstration equipment including a full range of five and seven gang fairway mowers with both fixed and floating heads. Other equipment will include ride on and pedestrian turf rollers, turf cutters and lawn renovators.

There is also an ex-demonstration verti-cutter at well below the usual asking price.

Those attending the show and demonstration day at Redhouse Farm, Dutton, would be well advised to take their cheque book, as Janet has told us there are a number of offers on new equipment as well.

NEWS 7

NEW GROUNDSMASTER

Toro have just introduced a new intermediate size mower which they claim is the most productive and user friendly mower in its class.

The Groundsmaster 220-D is specifically designed for professional turf maintenance on parks, schools and general estate areas. Graham Dale, Toro General Manager says "Our customers had told us that the current need within the market was for a compact, liquid-cooled mower with exceptional manoeuvrability and high productivity but which didn't sacrifice comfort and servicing ease. We think our new 220-D reflects those needs".

Because manoeuvrability and quick steering response can be created by only shortening a tractor's wheelbase, the resulting productivity is normally achieved at the expense of operator comfort with increased maintenance difficulty. Toro decided at the outset that they were not prepared to compromise the comfort and size of the 220-D's operator area in the slightest. "This model is even better than our expectations and a test drive plus comparison with any other trim mowers will immediately show what I mean" said Graham Dale.

The Groundsmaster 220-D's additional operator comfort and handling ease have been achieved by way of a new power-assisted four-link steering

design. Additionally, unlike previous models, the new 220-D has 23" front driving tyres which give increased riding comfort, better kerb climbing and traction.

Servicing has become much easier and less time consuming by including a PTO drive shaft with easy-to-change electric clutch together with a mid mounted industrial radiator and highly reliable engine. The engine being a 20.5 hp 3 cylinder Mitsubishi diesel.

Three cutting deck width options are available, 52", 62" and 72". Each of the Toro Groundsmaster 200 series mowers feature a patented full flotation cutting unit design with casterwheels and anti-scalp blade cups. The height of cut is easily adjusted from 1" to 4" in 1/2" increments. In addition a new counterbalance (deck weight transfer) system permits precise single knob adjustments to match flotation balance with tractor traction.

NEWS 8



HAVE YOUR SPRINKLERS LOST THEIR IMPACT?



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Ask your Head Greenkeeper if he's totally happy with the performance and reliability of the sprinklers around your course. If there are doubts, call your nearest Toro Distributor for helpful professional advice. He will show you the range of Toro gear-driven sprinklers designed especially for golf course watering. He will tell you just how technically superior they are - how they can improve watering efficiency and just how simple it is to improve your existing system.

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Hadley Wood Golf Club,
Beech Hill,
Barnet,
Herts. EN4 0JJ**

WHAT'S NEW IN GOLF COURSE MANAGEMENT

'The Wearing of the Green'

Surprise addition to the Ransomes, Wisconsin stand were four machines easily recognisable as made in the Macclesfield factory of SISIS. A fact quickly confirmed by the arrival of none other than SISIS Sales Director, Arthur Harrison accompanied by Joint M.D. Bill Hargreaves.

The colours of the Auto Turfman, Autor Rotorake, Trio Rotorake and the Auto Seeder were still in the traditional SISIS orange but superimposed with the Ransomes logo, an event which raised several eyebrows among the newshounds seeking an inside story of intrigue within the international manufacturing industry.

Delving deep into his brief case, jet setting Mr. Harrison, produced a press release still warm from its passage through the photo-copying machine to announce that Ransomes Inc. had agreed to carry out a market evaluation of the SISIS products on their stand. He pointed out these machines were already distributed successfully in other countries through joint Ransomes/SISIS dealers, but denied the arrangement would be extended to the UK.

To match the Ransomes image, the machines would be re-painted.

Old Tom Morris Award Presentation

Gene Sarazen, winner of the Open Championship and the US Open in 1932, the year after he invented the sand wedge was presented with the prestigious "Old Tom Morris Award" at this year's GCSAA closing banquet.

Now a sprightly 85 year old, Gene, one of golf's all time greats received many tributes prior to the presentation, but none more moving than from his friend and colleague, Robert Trent Jones Snr.

Winner of the US Open for the first time in 1922 at only 20 years of age he went on to win countless championships, but became known best for his hosting of the television series 'Shell's Wonderful World of Golf' in the 1960's.

Sarazen last played in the Open Championship at Troon in 1973 to commemorate his 50th Anniversary and celebrated the event by holding in one in front of a huge television audience.



Yardage Markers Mushroom on fairways

Although some of our more rule conscious golfers will be thumbing through their bibles to check whether distance markers are defined as "outside advice", or information, they may be interested to know the provision of such information is a growing business in the United States.

Ways of indicating distance to the green come in a variety of both distinct and discreet fashions. Even the giant Karstan Ping company have diversified into a range of multi-coloured thermo-plastic yardage markers that can be let into the fairway surface at ground level at the same height as a fairway sprinkler head.

Three figures are shown on the 7½ inch diameter discs. The distance to the centre of the green, the distance to the front of the green and the yardage to the back.

If the club do not want their course marked out with red, white and blue discs, then the discreet way to speed up play is to use the metal discs that can be screwed to the tops of the fairway sprinkler heads. They are custom made to fit the leading makes of irrigation equipment, can include the name of the club and show the distance in yards to the green centre.

Getting players around a course in the shortest possible time is the responsibility of any commercially minded management. Members know their distances by experience. Yardage markers will help visitors to play the correct shot, enjoy their round and alleviate hold-ups from over or under clubbing into lost ball positions.

This is a golf course accessory which could do well in Britain once the initial prejudice has been overcome.

Our next issue will contain more news of machinery developments we can expect to see in the next few months.

RECORD BREAKING HOUSTON SHOW

Another memorable convention linked to a three day exhibition was held at the newly opened George R. Brown Convention Centre in Houston, Texas, during the first week in February.

Organised by the Golf Course Superintendent's Association of America this 59th International event attracted an even larger attendance than the record breaking Phoenix show in 1987. By Sunday night, with a further full day to complete, registered visitors topped the 13,000 mark, 500 up on the total for last year's Arizona Convention.

British visitors, boosted by a party from the Institute of Groundsmanship, swelled the numbers from this side of the Atlantic to a respectable sixty plus, most of whom travelled out from Gatwick by DC-10 on a British Caledonian scheduled flight to stay at the Houston Grand Hotel adjacent to the magnificent Galleria shopping complex some eight miles from downtown Houston.

First time visitors to the USA, particularly to relatively new cities are initially puzzled by the distances most hotels are situated from the Conference facilities, though thanks to the faultless transport organisation this is never a problem. A fleet of courtesy coaches run throughout the five full days of the Convention, picking up visitors from

their hotels and taking them, often on a scenic route, to the hub of activities.

Those who did book into downtown Houston Centre hotels found that after 6.00 p.m. the night time activity had shifted out of town to places such as the Greenway Plaza with its teeming restaurants, bars and shopping Malls, many open until the early hours.

British greenkeepers, fortunate enough to make the trip were rewarded not only with a wealth of fascinating lectures and seminars, but one of the finest turf grass exhibitions staged anywhere in the world. If this was not enough they were on the receiving end of an extended hand of friendship from their American counterparts and hospitality to a standard, which can only be described as memorable.

The grateful thanks from those this side of the Atlantic must be extended to Ransomes' American subsidiary, the Toro organisation and the Jacobsen Corporation, for invitations to their dealer receptions. Not only were the Brits superbly entertained, but they were given the opportunity to meet and discuss golf course problems with others of similar interests from the four corners of the globe.

Where else could golf course managers, machinery manufacturers and their dealers, from

the East, West, North and South, meet in the atmosphere of 'an international family reunion' other than at an event such as the Jacobsen Banquet. From Tokio to Singapore, Sydney to Zurich, London to Los Angeles, regardless of colour or creed, all had a common purpose, the betterment of playing conditions on the golf course.

Jacobsen's International Director of Sales, Curt Kimpfbeck, must have been a proud man that night presiding over his gathering of friends and colleagues, all of whom he introduced by name, awarding accolades for achievement including one to Chris Smith, their Sales Manager in the UK, who heads up the King's Lynn operation.

Among the special guests was Berkhamsted, first assistant greenkeeper, Gerald Bruce, who last year won the National Greenkeepers' Tournament, sponsored by Jacobsen after a nail biting sudden death three way play off over Hunstanton Links Course in October. His birdie putt at the first extra hole not only took him to the international banquet but gave him a once in a lifetime opportunity to see another side of golf course management.

BROUGH GOLF CLUB

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Applications in writing with
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Invite applications for the post of

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The continuing saga of **POA ANNUA**



Poa Annua, annual meadow grass, or as it is known in the USA, annual bluegrass, forms the world's most prolific species of amenity turf. To live with it remove it or replace it, is a continuing subject for debate.

Stanley J. Zontek, an agronomist with the United States Golf Association examines the latest methods of control or culture.

The verti-drain is probably the best piece of turf grass equipment since the invention of the hand fork.

Of all the puzzles in turf-grass management, the one involving POA ANNUA and whether to live with it or attempt to control it, is perhaps the most enduring. It has been on the minds of turfgrass managers since at least the early 1920s, when one writer recommended removing it from greens by continual hand weeding.

With modern equipment, new chemical tools, and a better understanding of the plant itself, golf course superintendents are in the best position ever to decide whether to live with annual bluegrass (annual meadow grass) or to control it. The game has come a long way since Dr. Fred V. Grau wrote his memorable article "Poa annua - Friend or Fo?" for the Green Section, in 1948. Golf course superintendents in the northern sections of the United States now have a choice.

Poa annua Control

Realistically, Poa annua can be controlled by two methods. First, certain chemicals can either kill the plant or control its germinating seeds, or they can do a combination of both. A second method uses cultural practices such as aeration, irrigation, and fertilization. A single chemical or management practice rarely controls Poa annua by itself. The best results are obtained when all those programs are meshed together.

Which program to use should be governed by what is best for you and your course and what materials are registered for use. As always, be sure to follow the labeled rates and suggested timings. Keep up to date. Continuing field and university testing provides new information all the time.

Finally, before you begin these chemical control programs it is always a good idea to see how they will work by testing them first on a limited area of the course. Besides, it is also a good idea to demonstrate to the golfers themselves how these chemicals are used and what they can expect from their application. This experience and exposure is valuable for the success of the program.

Editor's Note:

Arsenical compounds are now banned in the UK and throughout most of Europe. Although they cannot be used, the information is included to provide a complete coverage of the subject of Poa annua.

1. Arsenical compounds

(lead arsenate, tricalcium arsenate). These compounds are old and proved materials for Poa annua control. Some states allow them and others do not. Obviously, check this detail before you implement this program. Generally, when care is exercised in the use of arsenical compounds, good and safe control is achieved. Problems arise when these materials are applied under situations where their activity is accelerated and these products work too well, i.e., controlling Poa annua in less time than prudence dictates. Too much is lost too fast. Nonetheless, the arsenicals are still available, and if they are applied carefully, they can be effective.

Arsenicals basically work by replacing phosphorus in a most important chemical reaction within the photosynthetic cycle, the conversion of adenosine diphosphate (ADP) to adenosine triphosphate (ATP). This is "light reaction", requiring sunlight and one phosphorus molecule. The "light reaction" is the reason grass will not grow well in the shade ... not enough sunlight! Molecularly, arsenic is nearly identical to phosphorus. Thus, when the arsenical is absorbed instead of phosphorus, this important metabolic pathway is blocked, and the Poa annua becomes weakened.

2. Progress

This is a relatively new compound (initially labeled for use on sugarbeets) that has shown quite good results when it is used as labeled for Poa annua control in perennial ryegrass. The label is now being expanded to include other grasses.

Ethofumesate is the common name, marketed as Nortron in Britain.

3. Plant Growth Regulators (PGRs).

Included in this category are materials such as Cutless and "PGR". For convenience, these materials have been grouped together primarily because their method of action is nearly the same to the observer. Basically, these chemicals stunt Poa annua's growth, allowing the non-stunted, desirable grass species to continue growing and eventually crowd the annual bluegrass out of the stand. These are relatively new materials that hold good promise in controlling Poa annua, principally on bentgrass fairway turf. Eventually, their use may be suggested on other areas of the course, but their primary use now is on fairways.

The only negative effect of PGRs seems to be some discoloration of the turf, which some people find objectionable.

4. Rubigan (Fenarimol)

At higher application rates, Rubigan shows similar plant growth regulating effects as we discussed above. Because this chemical is also labeled as a fungicide and has some pre-emerge effect on controlling *Poa annua* seed, it is included as a separate item. Some users believe this is an advantage. Gradual suppression of *Poa annua* (especially the annual types) and disease control are notable qualities. To date, the best results with Rubigan have been achieved where it has been used in a continuing, long-term program. This includes applications in the fall, when some preemerge control of *Poa annua* seed can also be achieved. One should not expect results after only one or two applications. A Rubigan program requires some patience.

This product is marketed in Britain by Elanco

5. Roundup/Paraquat/Simazine

Although different compounds, these are grouped together for convenience. They all offer almost complete *Poa annua* control in bermudagrass when they are applied at the correct rate and properly timed. Many superintendents wish bermudagrass

Aeration is an essential part of turf cultivation.

grew in the far north. Products like these would make *Poa annua* control much easier for them.

In a few instances, total vegetation control on northern courses is achieved with Roundup, and the area is then re-planted to the desired grass species. This effects *Poa annua* control and regrassing in a short time but with obvious inconvenience to the golfers. Results, however, have been excellent.

6. Embark (Melfluicide)

This compound is included in the control portion of this article even though Embark does not, *per se*, control *Poa annua*. It does, however, control *Poa annua* seedheads when the material is properly timed and applied in the spring.

Embark has worked well so far, although it has caused some discoloration early in the spring. Many superintendents consider this a minor inconvenience, however, when they compare it to eliminating the nuisance of profuse seedhead production of annual bluegrass each spring.

Marketed by May & Baker as MOWCHEM

7. Other chemicals

Included in this category are sulphur, preemerge herbicides such as Bensulide, Dacthal, Balan, and Pendimethalin, and post-emerge herbicides, like Endothal. All of these materials can be used in *Poa annua* control programs. In the final analysis, the choice depends upon how you wish to use the strengths of each of these materials to suppress and control annual bluegrass under the unique conditions found on your course. Some of the products have dual purposes. You may use sulphur to lower soil pH while at the same time suppressing *Poa annua*. You may be using a preemerge herbicide to control crabgrass or other weeds and also suppress germination of *Poa annua* seed as well.

Pendimethalin is marketed as STOMP by Cyanimide

cont.....p.14.

IMPORTANT WARNING

The chemicals listed in this article concern research conducted in Universities and trials in the U.S.A.

Some products are available in the UK under other brand names, though they have not necessarily been cleared by the Ministry of Agriculture for use on amenity turf.

The recommendations must not be taken literally and can only be applied according to the directions by the UK distributors.

Some products may be banned in this country as are the arsenical compounds.

The advice of your local supplier must be sought in all instances.



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8. Management

No discussion of *Poa annua* control would be complete without discussing good management. You may have the best chemical program in the world to control *Poa annua*, but if a compatible management program is not in place, the chemical approach will not be as successful. Such factors as proper timing of aeration (*Poa annua* grows better than other grasses under compacted soil conditions), frequent topdressing, proper nutrient balance in the soil, proper total amounts of nutrients applied, proper soil pH, good water control (never over-watering), and even the physical removal of annual bluegrass, whether by plugging or by re-sodding an area, are all included in the management category.

Lightweight mowers and removal of clippings must also be included in management. Research at Michigan State University shows what many golf course superintendents have observed for years, that on bentgrass/*Poa annua* fairway turf maintained with lightweight mowers and with the clippings removed, bentgrass predominates with time. It literally crowds out the *Poa annua*. The phenomenon seems hard to believe, but it works. All of the mechanisms to explain what is occurring are not thoroughly understood (thus the University research), but one of the most effective means of *Poa annua* control in fairways (cut at $\frac{3}{8}$ " - to $\frac{5}{8}$ " - inch) is a lightweight mowing and clipping removal program. In fact, if there is a single program to follow for reducing the total amount of *Poa annua* in bentgrass fairways or tees, this is it.

Lightweight mowing and clipping removal as an ongoing program also contributes to keeping the *Poa annua* alive during the summer. In many ways, this is almost a perfect combination. The fairways look good and play well while there is an ongoing conversion from annual bluegrass to bentgrass. The only negative aspect is the cost of the machinery and the extra manpower necessary to operate it and dispose of the clippings.

These, then, are the *Poa annua* control programs seen most often in the field today. No one program is a panacea. The choice of what control program you should choose depends on your individual situation: what you have to work with, what your golfers want, and what they are willing to pay for and tolerate.

Poa annua Maintenance

Over the past decade, a number of good golf courses and good golf course superintendents have made the decision to

encourage, cultivate, and generally live with *Poa annua* as their principal golf turf, whether it is on greens, on tees, or on the fairways. Years of research (largely supported by the USGA) has uncovered a great deal about the strengths and weaknesses of annual bluegrasses. In order to keep *Poa annua* alive, the superintendent must accent the strengths of the grass and minimize its weaknesses. It is clear now also that annual bluegrass encompasses a whole range of different bio-types, which include true annuals, biennials, weak perennials, strong perennials, types that produce profuse seedheads, few seedheads, or no seedheads at all. Therefore when you speak of maintaining *Poa annua*, you may be maintaining any number of different grass types collectively called *Poa annua*, even though a percentage of the turf species are true perennials. Obviously, the more perennial types, the easier and more successful will be the *Poa annua* maintenance program. Since there are great differences in this plant we called *Poa annua*, these differences may be the reason why some golf courses can live with *Poa* and others may not be quite as successful.

Part of the USGA Green Section turf research effort is aimed at identifying perennial types and hopefully improving them to the extent that one day *Poa annua* may be a desirable species, not a noxious weed.

The following observations and management programs can be used to help *Poa annua* survive the summer and winter stress periods.

A. Lightweight mowing and clipping removal

The same program that, in the long term, encourages bentgrass over *Poa annua* also helps to keep annual bluegrass alive in the short term. This is achieved by reducing physical mower stress with lighter equipment. The plant is less prone to wilt decline in the summer. Lightweight mowing makes a difference; it is one of the most important management programs the superintendent can follow for keeping the grass alive, healthy, good looking, and playable during the golf season.

B. Water control

By being able to apply the right amount of water at the right time, good water management will help keep *Poa annua* alive. An automatic irrigation system is an important tool if it is programmed properly. Generally, lighter and more frequent applications of water are preferred for *Poa* management rather than heavy, soaking, infrequent waterings.



Deep spiking improves both drainage and root growth.

C. Drainage

Another form of water control. You cannot successfully grow any grass species under wet and soggy soil conditions. Good surface/sub-surface drainage must exist to eliminate summer wet spots, scald, and disease pockets, as well as reduce winter ice damage.

D. Disease control

Poa annua is susceptible to a number of turfgrass pathogens. Although by no means an absolute necessity, a preventive approach rather than a curative program is best for controlling turfgrass disease. Diseases to be controlled include dollar spot, brown patch, **Pythium**, **Anthrax** and patch organisms like the *Phialophora* sp., *Leptosphaeria* sp., and snow mold organisms.

E. Disease control

Any time insects are feeding on the grass plant or its root system, control measures are essential. You simply cannot tolerate the outside influence of insects destroying the grass. A good preventative control program needs to be exercised where a history of insect problems exist.

F. Management for roots

This encompasses all of the programs important in helping a grass plant with an inherently weak and shallow rooting system to have as deep a system as possible. Heavy accumulation of thatch and soil compaction must be overcome. A good aeration program and topdressing program allows annual bluegrass to develop as deep and as fibrous a rooting system as possible. Grow roots. This equates to healthier, stronger grass. It means grass better able to tolerate stress in summer or winter.

G. Fertility

One should not over-fertilize nor underfertilize *Poa annua*. A good balanced fertility program should be followed with approximately a 3-1-2 if not a 4-1-4 ratio of N-P-K. Good grass growth means balanced fertility and

enough fertility. Good grass growth requires a common sense approach to fertility, never applying too much overall, or at any one time. Whenever soil fertility is discussed, soil tests can be found extremely helpful in planning nutrient applications and pH adjustment. This holds true for both *Poa annua* maintenance or control.

There is also some new research data indicating higher levels of potassium (note the 4-1-4 ratio) contribute to a better rooting system in the grass plant, thicker cell walls for a tougher grass plant, and better summer heat and winter stress tolerance. Keep potassium levels up.

Finally, it may be a good idea to apply carefully light summer applications of fertilizer to the *Poa annua*. Heavy fertilizer applications hurt annual bluegrass during the summer stress period. However, light applications of nitrogen in the range of 1/4 to 1/3 pound actual nitrogen (depending upon the product, granular or sprayable) can contribute to better, stronger grass growth during the peak play of summer. *Poa annua* maintenance does require some summer fertility - fertility carefully applied. This includes application of iron and magnesium to help maintain a good level of chlorophyll and green color in the grass plant.

TECHNICAL 1

In Conclusion

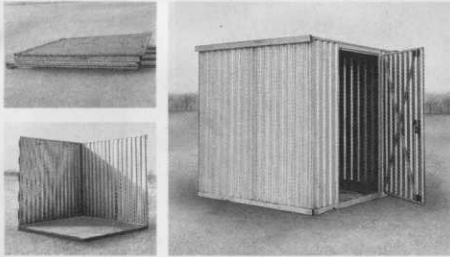
Today we have the best tools ever to either maintain or control *Poa annua*. We have the best understanding ever of just what is this hodgepodge of grass varieties called *Poa annua*, as well as what is required to maintain or control it. Several common denominators exist: lightweight mowing and clipping removal, a good common sense management program, and a commitment to follow these programs. With this in mind, you can look forward to success in either controlling or maintaining *Poa annua*. Today there is a choice.

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