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This month, BIGGA'S Education and Training Manager, Ken Richardson, outlines some major changes planned for the provision of Education and Training needs for members

Education: Have your say...

Part of BIGGA's Mission Statement is concerned with the development of members through Education and Training. The Association has a long history of Education and Training provision and has committed almost £2 million pounds since 1987.

Thanks to contributors to the BIGGA Education and Development Fund, BIGGA has provided training courses, in the Regions and at BIGGA HOUSE and it has helped to produce videos, books, field guides, posters and leaflets.

It has helped greenkeepers to attend training courses by giving refunds of fees, set up a technical lending library and organised an annual Essay Competition.

More recently, BIGGA has introduced its Continuing Professional Development Scheme which encourages greenkeepers to keep their skills and knowledge current.

Finally, BIGGA has influenced National Training Standards by using its place on the Greenkeepers Training Committee.

All of this is provided for the benefit of all greenkeepers but especially BIGGA members.

To try to keep education and training relevant to the needs of members I am going to conduct a Major Training Needs Analysis in the early part of 2001.

Although you may think that it has nothing to do with you, you would be wrong. I can provide the education and training that you need, only if you tell me what that need is. Consequently, you need to consider:

Should BIGGA be involved in Greenkeeper Education and Training?

What Education and Training do I need? eg. Supervisory/Management training, First Aid training, Health and Safety training, Soil Science, Spraying, Grinding and Blade Setting, Computing, Maths for greenkeepers, tractor driving, chain saw operation etc.

Where should that Education and Training take place? eg. At BIGGA HOUSE, in Regions, in Sections, in Hotels, at Golf Courses, at Colleges.

When should it take place? eg. Autumn, Winter, Spring, Summer, Weekdays, Weekends.

How much should it cost? eg. Nothing, £50 per day etc.

Who should pay? eg. Individuals, Golf Clubs, BIGGA, Government, R&A, Home Unions.

We sometimes concentrate on failure in this country, but BIGGA's involvement in greenkeeper Education and Training is a success story unmatched within the Fine Turf Industry nor by few other industries.

Last year alone saw almost 300 greenkeepers attend courses presented by BIGGA with a further 200 attending the first two days of the Learning Experience at Harrogate and almost 500 attending BTME Seminars.

Let's work together to ensure that this century's greenkeepers continue to have access to the high quality education and training that they need and deserve.

You can have your say by either contacting your Section Secretary/Regional Administrator prior to their meeting at BIGGA HOUSE on 26 and 27 March or by contacting myself or Sami at BIGGA HOUSE.



Greenkeeper Education and Development Fund

The Fund provides the key to the future for greenkeeper, golf club and game. Individuals and companies can join the Golden Key Circle and Silver Key Circle. For details, please contact BIGGA on 01347 833800

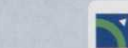
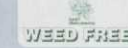


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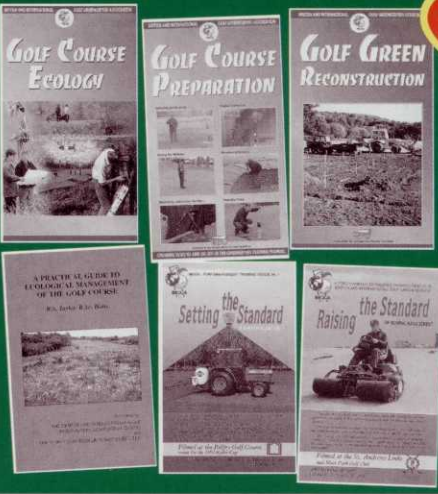
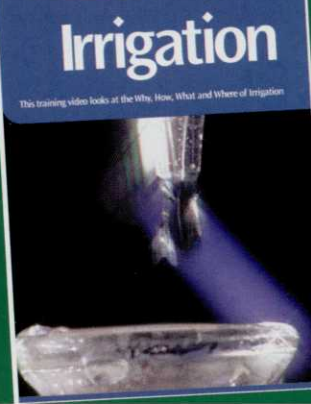
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The new BIGGA Chairman Clive Osgood begins his year in office with some strong views on how the Association should proceed in the future, as Scott MacCallum found out...

Passing the baton

A year after becoming a Head Greenkeeper, Clive Osgood prepared a course for a Ryder Cup match which featured the best Ryder Cup team ever to compete for the famous trophy.

But BIGGA's new National Chairman says that he didn't probe Past Chairmen too deeply about the role as it probably would have frightened him. He laughed as he said it but you can be sure that for him the responsibility of leading the Association for the next 12 months is a challenge that compares to 1981 when he ensured that Walton Heath was at its best for the historic Ryder Cup match. Of course he's jesting when he says that he didn't look into the workload that a modern BIGGA Chairman can expect, Clive Osgood is a thoroughly professional man who doesn't approach important matters lightly.

Knowing the commitment that is required he gave the matter serious thought before accepting the role. He is the first to admit that he is a home-loving family man and wouldn't have taken it on without the support of his family.

"The club has also been very supportive and they look upon it as a great honour for Walton Heath as well as for me.

"I've certainly gone into the Chairmanship with my eyes open and I'm now looking forward to getting out and meeting people. I know I shall gain a great deal from the experience and so will Walton Heath Golf Club as I shall be looking for ideas as I go round having the pleasure of meeting fellow greenkeepers."

Walton Heath boasts a large greenkeeping staff to maintain the two magnificent courses currently running at 17 including a mechanic and a gardener.

"I have absolute confidence in the team and in my able Deputy, Mick

Haynes, that they will work well during the periods that I'm away from the golf course on BIGGA duties."

As he settles into the role he has firm ideas of how he would like the Association to progress over the next 12 months.

"I'd like to think that the membership will continue to rise. I believe there is still scope for that to happen and it is good to see that the numbers have

organised into a more orderly fashion."

So you can already see that Clive Osgood is a man of firm ideas with a quiet determination to move the Association forward and it is just those qualities which has seen him ensure that Walton Heath Golf Club has maintained its place as one of the country's foremost golf clubs over the last 20 years.

A local man born and brought up in

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Clive Osgood

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Clive also has strong views about how the collective know how of the BIGGA membership could be put to better use.

"I'd like to think we could pool our knowledge a bit and that we should stand up and be counted on the technical side a bit more than we do at present," he explained.

"I think the website should help us to share the vast knowledge that our membership possesses. For example on the subject of waste disposal wouldn't it be nice to ring up BIGGA, or visit the website, and be advised on who was the best person or company to contact in a particular part of the country.

"This information could be gathered informally on the web initially and then

Walton-on-the-Hill - he's lived there all his life apart from a two year spell in Boxhill...two miles away! - he joined the greenkeeping staff as an apprentice.

"As a lad, golf was very much a rich man's game but I got into it through the local Artisan Section as a junior and I had hopes of being a pro," recalled Clive, who reached a handicap of 4 and represented Surrey at Colts, Youth and Artisans level.

"I was never going to make it as a professional but thought that greenkeeping would give good opportunities to play the game. After that I still played golf but greenkeeping took the upper hand."

Clive was taken on by Head Greenkeeper, Fred Dulake, who was an extremely well respected greenkeeper.

"He was here for 27 years as Head Greenkeeper and one or two will remember him because he used to ride around the course on his bike. He was famous for his bike and he taught me a great deal about greenkeeping," explained Clive.

Walton Heath has obviously benefit-

ed from the continuity that has been in place at the golf club. Not only was Fred Dulake Head Greenkeeper for 24 years and Clive 21 and counting, James Braid, one of the great triumvirate and a five time Open Champion was professional at the club for 46 years.

The club has always held important golf events including right back to the turn of the century when the course was first opened and Braid played big money challenge matches with his great rivals Harry Vardon and JH Taylor. It also hosted the oldest professional tournament in the world, the News of the World Matchplay which attracted some of the finest players of their generation. But the event which brought the course to worldwide fame was the Ryder Cup in 1981.

"That really was the highlight of my career and it goes without saying that it was a privilege to prepare a course for a Ryder Cup.

The American team that year, Captained by Dave Marr, has been lauded as the best ever and the margin, by which they retained the match, 18.5-9.5, is wide by the standards of the more recent matches but still a tribute to the performance of the European team, which included youngsters such as Faldo, Lyle, Langer, Torrance and James

All but one of the American team was a Major winner and the other, Bruce Leitzke, was a multiple winner on the US Tour. The majority of the team would be known even in the homes of non-golfers. They were Crenshaw, Floyd, Irwin, Kite, Leitzke, Miller, Nelson, Nicklaus, Pate, Rogers, Trevino and Watson. Try finding the weakest link among that lot.

"The weather was poor but the course stood up to it very well and I got some very nice letters from the players afterwards."

The highlight for the greenkeeping



staff came when Lee Trevino popped into the sheds and had a chat with the guys.

"It was early in the morning and he came in looking for an axe because the clubhouse was closed and he wanted to get in to change his shoes so he could go and hit a few practice balls. It made everyone's day when he came over," recalled Clive.

Since then Walton Heath has hosted several European Opens and many top amateur and ladies events and Clive admits to enjoying the buzz of preparing for tournaments although they have caused headaches.

"In the old days entry was free and there was no problem but the course is

on common land so in more recent tournaments when entry fees were charged this meant extra work. An Act of Parliament allowed us to enclose the course for one week in the year but we had to erect fencing with the help of the local Artisan Section just before the start and then bring it down as soon as the tournament was finished. We had four and a half miles of chestnut fencing at one time but the arrival of the M25 cut on any access on one side so it made it a bit easier for us."

Clive is proud of the course for which he has had custodianship over the last 20 years.

"I'd like to think we have kept it as a true heathland and that has involved a

constant effort to keep the trees and scrub at bay. Surrey is the most heavily wooded county, would you believe, and if you stand in the middle of the course you are surrounded by trees but for our little patch and we want it to remain as it is, a heathland habitat with a feeling of openness.

"Heathland is just a semi permanent state and there will always be encroachment. At the moment we are in the middle of a big project clearing quite an acreage," he revealed.

While much effort goes into retaining the heathland qualities of the golf course a great deal of change, and for the better, has taken place in the maintenance facilities.

The compound, opened by the local

Mayor four years ago is state-of-the art and Clive has shown round many other greenkeepers keen to gain an idea of what they should look for in their own new facilities.

"For us it really was a case of from stable block to modern facility. We didn't have power or hot water until 1996 and sitting here with our computers and security cameras I often think back to Fred Dulake and wonder where he would have parked his bike."

It would be hard to find a better measure of how far the industry has come in the last 20 years and under Clive's stewardship you can be sure more strides will be made over the next 12 months.

Noel MacKenzie takes a timely look at mowing practices in a sequel article to "A Close Shave" (GI March 2000)

Second pass

Further thoughts on mowing practices

Of all the maintenance operations carried out at a golf club mowing certainly has the biggest impact. It is the only maintenance operation that, if it is left for more than a day or so, quickly draws the attention of all and sundry who visit the club. Every club official and employee from Club Secretary to trainee Greenkeeper should remember that clubs can stand or fall by the reputation of their greens. Greens that are not up to standard are quickly noticed and, as the word spreads, so the financial implications for the course concerned may be keenly felt.

Of course, there are many reasons why greens may slip out of condition but so often it is the case that mowing practices can be a fundamental and yet insufficiently considered part of the equation.

In my last article on mowing I described some of the background to cutting heights and how these should be considered. In this follow up arti-

cle I want to highlight some important issues of mowing and how these will affect the playing surface. Unfortunately, research into this most fundamental of practices lacks detail but I hope I can get across the essence of the important considerations.

What is it that makes the playing surface what we want it to be?

On greens the main concern is that the surface presents conditions that are fair for players to demonstrate their skills, especially in competition. What is required is a smooth (but not necessarily flat) surface that is free from discrepancies that would result in unpredictable ball behaviour ("bobble"). The surface should also allow the ball to roll at a suitable pace. We are concerned that the green should be consistent in both pace and surface uniformity without either factor becoming dominant.

To create such conditions from grass is asking a lot! We aim to achieve these goals by mowing to present a smooth surface where the ball can roll along the uniformly cut leaves. Without cutting, shoot growth from the sward quickly creates an uneven surface due to differences in growth rates across the green caused by the presence of a variety of species, and variations in soil moisture, nutrients, drainage, wear, etc. However, summer or winter, the grass comes under stress from many sources and since mowing makes up the majority of maintenance carried out, the importance of cutting regimes should not be underestimated. I hope that I can encourage the reader to consider some of the issues he/she should be addressing on a regular basis when looking at mowing practice and greens condition.

How grass grows

Most plants are severely damaged as a result of grazing by animals as the grazing occurs toward the outer edge of the plant where the buds are located. Grass is able to survive, even thrive, under grazing pressure since the bud or growing point (apical meristem) is located just above ground level, away from the herbivores' teeth. Cell division (growth) in grasses occurs from the bottom of the leaf rather than at the extremities as in most plants. Therefore, when the leaf is damaged or removed the plant just keeps growing up from the base.

Mowing by humans mimics the effects of grazing and, provided that mowing also mimics the consistent height and frequency at which grazing occurs, poses few difficulties for wild grass species in a non-playing situation. However, on a golf green the mechanical "grazing" we undertake has been taken to extremes. I find it amazing that plants have adapted to

survive the regimes that are often in place on golf courses, after all, many of the commonly used grasses naturally grow to around 30-50cm yet we expect them to survive (even thrive) at 5mm cutting height (or less!). Furthermore, this closely mown grass may have to take several hundred pairs of feet across it in a weekend, something that even the average domestic lawn would struggle to accommodate!

These close cutting regimes have been made possible by the development of low growing cultivars allowing mowing to be carried out more closely than grazing ever would. *Poa annua* however, has a natural ability to withstand close mowing, indeed close mowing may favour this grass against others in many situations - hence its widespread distribution on many golf courses.

The mechanical cutting of grass leaves triggers a whole chain of biochemical and physiological reactions in the plants. In order to survive, the plant must maintain enough leaf area to manufacture its own food through photosynthesis. Over short periods of time the plant can survive near complete defoliation (e.g. on a cricket pitch) but only if the meristem remains undamaged and the plant has enough resources in reserve (stored in the roots) to rebuild leaf tissue. We have to manage the growing environment to reduce stresses and allow it to thrive despite very low cutting heights. Our difficulty comes in achieving a balance between providing a good enough playing surface to satisfy the players while still maintaining a healthy sward that does not succumb to disease and stress at every opportunity.

What does this mean for the UK golf green?

Mowing is a fundamental tool in





the production of the surface as we have already identified. Most of us have had the textbook values for mowing drummed into us over the years, 5mm (3/16th") in summer and 6-8mm (1/4-5/16") in winter. Perhaps these are fine for what I would describe as the 'stable seasons' of summer and winter when more consistent expectations of weather prevail. However, each season also provides its own problems as we will see below where we will also consider the 'unstable' seasons of spring and autumn.

Stable seasons

Summer

In my experience it is quite rare to find a 5mm cut being employed on a UK golf course in summer these days. Many courses bench set to 4mm and some go as low as 3mm for regular cutting. Come tournament time cutting might be taken closer still with as much as 50% of the leaf area of the plant being removed without consideration of the implications for the plant. Last summer this problem was worse than usual due to the

wetter conditions that prevailed leaving mowers sinking into the greens surfaces and thereby exerting a closer cut.

Not surprisingly the grass frequently objects to such close cutting, though usually these reactions are predictable if only Course Managers or club committees would look further than the immediate requirements demanded by players. In summer time close cutting can quickly see the grass dehydrate and stress when the sun comes out, especially after a poor spring. How much time and money is spent correcting such issues and how much play is lost? It would be possible for a club to measure this in purely financial terms if required.

Winter

In winter the grass is semi-dormant depending on the weather and soil temperatures. At this time of year the plant needs to make greater use of resources stored in its roots. Grass growth is limited so pedestrian cutting is the norm on many courses, something I approve of because it allows the greenkeeper to feel the

green underfoot, an ability which is lost when using a triple mower.

In the winter mower heights are raised but usually only to the minimum winter height of 6mm.

However, because greens are often softer at this time of year the height of cut can be even closer than in the summer when the machine is set at 5 or even 4mm. If the height of cut is too low then the grass comes under greater stress. It is less able to manufacture food, less able to grow and produces less tillering. Rooting depth can also be affected. In addition the proportion of the leaf damaged when cutting in relation to the healthy leaf remaining will be greater. Under such conditions greens will wear more severely and it may be necessary to put play onto temporary/winter greens more frequently.

Unstable seasons

Spring and Autumn

Spring and autumn both bring with them the same types of problems though from slightly different angles.

The problems of autumn were really brought home last year when a course hosting a significant tournament contacted me. The course in question was losing grass density from its creeping bent/Poa annua greens and patches of grass were stressed and dying back. Signs of sub-lethal pathogen activity were identified in the samples submitted to a laboratory. Some inquiries soon identified the cause of the problem, close mowing (3.25mm) in October (in a wet year). Fortunately, frosts did not come early last year but even so with the height of cut raised it still took several weeks to restore reasonable surfaces. The moral is to watch those low heights of cut in late season or disease risk increases dramatically and the greens become wear-susceptible and slow to recover.

Low cutting heights in the spring or autumn cause real stress and dif-

ficulty to the grass. These are times of year when starch and other materials are either being mobilised for growth (spring) or stored (autumn). Damage or stress at these times uses up nutrients from stores held in the roots limiting sward performance for some time to come. Close cutting in the spring may hold swards back by two to three months, or leave them more susceptible to summer stress (drought). Such problems are more significant on inland and upland courses where soil temperatures are slower to rise in the spring.

The impact of mowing is both a simple and a complex matter. Simple because most green staff can quite quickly see a green beginning to deteriorate (provided they are looking for it!) and take appropriate action. Complexity stems from the business side where there are political and commercial pressures to pursue management policies which are less than ideal for the long term health of the green(s).

To conclude briefly I would like to emphasise the following:

- The greenkeeper must attempt to manage the greens in a more scientific manner with greater consideration of plant biology, balancing the demands of the golfer as well as possible with the long term condition of the greens.
- Mowing heights and frequency may have significant implications for sward species composition as well as sward health. Grass in a greens situation can cope very well provided that the height of cut is not altered too quickly or taken too low.
- Excessively low cutting should be avoided as it reduces playing surface quality (threatening course income) while increasing management costs.
- Cutting too high is equally undesirable and may result in poor playing characteristics, untidy appearance and problems such as greater disease susceptibility due to increased humidity within the sward microclimate.
- In a country such as ours we need to consider the weather far more carefully when attempting to mow the greens at a consistent height, especially in the light of warnings of future more extreme weather events from climatologists.
- While we must look to provide winter greens where possible we and, more importantly, players must understand that winter golf in the UK is going to be a compromise of what can realistically be achieved by grass in a cool, maritime climate.
- Competition and tournament organisers should aim for the main summer months to avoid possible long-term repercussions for golf clubs trying to maintain a regular income.
- Demands for speed come mostly from an elite band of members within a club. Correct mowing practice, balanced with other techniques, should make it possible to satisfy the majority without making conditions too fast. The scratch and low handicap players should be satisfied with good green speeds but no course can sustain high speeds for long.



Noel MacKenzie, B.Sc. (Hons) MBPR, is Senior Agronomist at Grass Science (covering Southern England and South Wales). Noel and the rest of the Grass Science team are contactable on tel: 01204 377750 or via email: info@grass.science.com

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Water way to go

Question: When is the best time to think about irrigation system maintenance?

Answer: When it's pouring with rain. Not when the sun is shining and the temperatures in the 20s, it's simply too late.

It may seem strange that irrigation is being discussed when most greenkeepers are struggling to get water off the course, but now is the time to get everything ready, because it might just be a long hot summer and all the

worries about taking water away could be replaced with concerns about getting the right amount onto the turf.

It is only a few weeks before irrigation could be needed and preparation now will ensure a smooth transition from one form of water management to another.

An irrigation system is a combination of mechanical, electrical, hydraulic and electronic components and equipment and therefore requires a suitable level of regular pro-active servicing if it is to operate reliably and efficiently. As with many other technologies, advances are being made at an ever-increasing rate and

end-user serviceability is becoming more complex. Despite the recent prolonged period of wet weather and the stricter control of water for irrigation, systems will continue to grow in size as more areas of the courses are irrigated playing surfaces of ever higher quality are sought.

So what does a Course Manager need to consider when looking at servicing the system? Is it a general task, which can be undertaken by the greenstaff? Or does one member of the team need to be given responsibility? Perhaps consideration should be given to bringing in a specialist irrigation company and if this option is chosen, upon what contractual basis should this be done?

Each option has certain merits and factors such as the type of system, the composition of the green-keeping team and operational budgets all have a bearing on which is adopted.

As systems increase in size and control systems in particular become more sophisticated the trend is towards bringing in a contractor and retaining his services through a formal service agreement. Such agreements may involve simply re-commissioning the system in the spring, the "open up" and a return visit in the autumn to drain down and pre-



Water way to go



pare the system for the winter.

Many companies offer a more extensive service that allows several visits during the year to check operations and undertake minor repairs. In addition support services are offered for PC based control systems and these can include technical assistance with aspects of controller operational and scheduling over and above the normal faultfinding and repair functions.

At clubs where irrigation covers greens, tees and fairways an irrigation technician should be employed to take responsibility for maintenance, and this individual can undertake basic repairs and servicing tasks, calling in assistance from a contractor when a deeper knowledge or specialist equipment of techniques are required. Certainly more and more Course Managers see the use of contractors as a cost effective way to handle irrigation system servicing.

When looking at service agreements it's important to ensure that you compare like-for-like. Check how much of the system is covered by the agreement and get a good insight into how each company will deal with any calls for assistance.

If you have the expertise you may decide to take on the servicing in-house and there are a number of areas to consider. These include training, spares stock holding and equipment sourcing.

Some irrigation companies provide servicing training on the specific equipment including sprinklers and control valves. They offer a basic insight into routine maintenance, faultfinding and in repair and replace-

ment procedures. It is important to remember, of course, that there are certain elements of the system such as pump control panels and any mains electrical components that require qualified engineers and investigation or repairs should not under any cir-

cumstances be attempted by anyone who does not hold the appropriate professionally recognised qualification. Remember that irrigation systems operate at pressures of up to 150 PSI (10 Bar) and water at this pressure can be very dangerous. Always follow the manufacturer's and supplier's instruction when operating or servicing any piece of irrigation equipment. Important rules such as isolating and depressurising pipelines before attempting to dismantle or remove components and never leaning over sprinkler heads when operating them manually may seem obvious, but the important of following them cannot be over emphasised.

In an ideal world there would be no need to carry spares, but we all know that things can go wrong, sprinklers in particular can be subject to damage and replacement parts need to be available. Carry a small inventory of pipe connection and repair fittings making sure that they are compatible with the pipe system you have. The move to using polyethylene (PE) pipe is almost universal and recent systems will use this durable pipe material. Many of the PE pipe systems are jointed using fusion welding, an operation requiring specialised equipment and trained operators. Some systems use compression fittings that are tightened using threaded nuts holding the pipe in place and on smaller size PE pipe systems compression fittings can be used for re-connection following minor repairs. Once pipe sizes reach 90mm and above it may be necessary to have fusion joints and contractors

will be required. While PE is accepted as the best current material, there are still many older systems using PVC pipe and the use of solvent welded (glued) joints is still prolific. Repairs should be relatively straight forward, but remember to comply with all Health and Safety requirements when storing, transporting and handling the solvent cleaners and cements required to carry out PVC pipe jointing.

Most UK control systems are decoder based and modern decoders should be very reliable and the need to replace them a distant memory. If you do suffer with unreliable decoders you will have to hold some in stock and a decoder replacement programme is a serious consideration.

Whether you take the increasing popular route of contracting system service work to an irrigation company or undertake the work yourself the key is to be pro-active. Preparations for the forthcoming irrigation season should be complete by February with any component replacement, particularly if of a large scale, finished so that in March or April it is simply a matter of starting up the system. If the previous autumn's drain down was carried out correctly and provided there has been no physical damage to pipes, cables etc, the system should start up and work correctly. Don't wait until components fail, sprinklers, valves and pumps all have wearing parts, particularly seals and these have to be replaced on a regular basis. Create a programme of inspection and replacement that includes a comprehensive winter check. Look at the system now, visually check all accessible parts for mechanical damage.

The wet summer, autumn and winter we have just seen has created a fairly uncommon set of circumstances that make attention to irrigation systems particularly important. Systems did not generally operate with anything like the normal frequency during 2000 and prolonged periods of inactivity can be

detrimental to any engineered system. If you have experienced flooding over the last few months, it is possible that other issues may arise. Sprinklers may be covered or filled with slit or other debris washed onto the course, valves boxes may have been subjected to similar conditions and will need to be cleaned out and valve assemblies check for contamination or damage.

Damage to water storage facilities may have been sustained. Obviously, if roof panels are blown off liners are very likely to be punctured, but erosion of foundations due to running or standing water may have a serious effect on stability. Where in-ground water storage is used, contamination of the water from materials washed in with floodwater must be considered. Pump suction pipes may be covered in slit or debris and need to be inspected before pumps are started, as drawing these materials into the system can cause damage that could be both extensive and expensive.

Check pumphouses, if they have been flooded, all the electrical installations need to be checked and expert advice sought if there's a possibility of damage.

It may sound strange, but not all irrigation components are designed to be submerged for prolonged periods, some decoders, cable joints and some external parts of valves could have suffer water ingress or corrosion if they have been under water for a long time and these need to be checked now before they are required in March and April.

In summary, irrigation maintenance and servicing has to be a pro-active process, if the forthcoming season is warm and dry there will be some course managers who will be caught out. Make sure you are not one of them and seek expert advice now whilst there is still time.

Graeme Francis is Sales and Marketing Manager, The Hydroscape Group, UK Toro Irrigation Distributors.

NEW

& Training resource video 6

Greenkeepers Association



Irrigation

This training video looks at the Why, How, What and Where of Irrigation

The fifth in the series of BIGGA Training Videos - Irrigation - was launched at BTME 2001.

Although it may not have been apparent in recent months, water is a precious resource and extraction is becoming increasingly difficult and expensive. At the same time irrigation is a vital tool to the greenkeeper and the 28 minute video looks at using it to its best advantage with the Why, What, How and Where of irrigation.

The video features interviews with recognised experts in their field, graphics and film showing why irrigation is needed, when to apply and what equipment to use. "This video is not only of benefit for training greenkeepers in the art of good water management and irrigation, it would also be very useful for

communicating to the wider golfing community," said BIGGA's Education and Training Manager, Ken Richardson. The other four video's in BIGGA's portfolio cover, spraying; golf course preparation; golf green construction and golf course ecology.

The production of this video was only possible through the generous support of the Association's Golden and Silver Key Supporters who donate to BIGGA's Education and Development Fund.

Irrigation is produced by Goodwood Videos, who also produced the Golf Course Ecology video, and is priced at £15 for BIGGA members and £25 for non-members.

Contact the BIGGA Education Department for further details on 01347 833800 or via education@bigga.co.uk