

The 1995 National Education Conference got BTME week off to a cracking start. With the best line-up of speakers anywhere in Europe, it really was THE Learning Experience. For those that missed it, here are some of the key messages to come from the experts on show.

WATER



Independent irrigation consultant Philip York said:

It is most important that the course manager/head greenkeeper is aware of how much water he is applying (not how long!) in a given period of time

– A level maths is not required!

For spacings with full circle sprinklers the formula is:

$$\frac{\text{Litres per minute (of one sprinkler)} \times 60}{\text{Side 1} \times \text{side 2 (in metres)}} = \text{mm/hr}$$

For triangular spacing:

$$\frac{\text{Litres per minute (of one sprinkler)} \times 60}{\text{Side 1} \times \text{side 2 (in metres)}} = \text{mm/hr}$$

For in-line spacing:

$$\frac{\text{Litres per minute (of one sprinkler)} \times 60}{\text{Side 1} \times \text{hr}} = \text{mm/hr}$$

This latter formula is not 100% accurate particularly if the spacing is not head to head, therefore it should be treated as a guide.

It must be remembered that in the British Isles many installations feature part circle sprinklers around the greens and that assuming they are set at 180° the application rate will be twice that of full circle.

For this reason part circle sprinklers should never be on the same station as full circle, and a group of part circles should all be adjusted to the same arc, do not be tempted to set a greater arc on the windward side to the leeward side.

Incidentally in discussing the use of part circle sprinklers I am not endorsing the practice as we feel that in many cases full circle sprinklers will give more satisfactory results

A few of you may have special application sprinklers, ie sprinklers which rotate at different speeds through different sectors of the arc of coverage. In this event the following factors should be applied to the application rate:

2 speed 180° x 180° with the slow arc facing the opposing sprinkler x 1.33

2 speed 180° x 180° with the slow arc facing outwards x 0.67

2 speeds 120° x 60° x 120° x 60° in a single row configuration (the only time it can be used) x 0.91

Martin Smith, head greenkeeper at Ramsdale Park Golf Centre, said:

If you are having an irrigation system installed, find out if the irrigation company intends using its own staff to do the job or if

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they intend using sub-contract labour. If sub-contract labour is used they'll have a vested interest in finishing their work as quickly as possible since they will be paid on the quantity of their work – that is, how much pipework and how many sprinklers they put in the ground, not how long they take. This could result in short cuts being taken, both in preparation and installation.

One obvious example of a shortcut which is often impossible to detect until a much later date is the practice of cementing lengths of pipe together and then mole-ploughing them into the ground on the same day. Many times I've dug out burst pipework only to discover a joint that was not given enough time to bond properly and had consequently blown apart under pressure. If a joint is cemented properly and given the time necessary to achieve a strong bond before being put under the stress and tension of being dragged through the ground, often for quite long distances, then the chances of the joint coming apart are minimal. At a previous club of mine, more than 25 joints came apart at various times and all simply because the installation was done by subcontractors working to tight schedules.

James Moore, director, green section, Mid-Continent Region, USGA, said:

There's a golf course I know in Colorado that has a real problem with *Poa annua* and diseases in their fairways. They have bentgrass and lots of *Poa*. They have snow mould problems and red thread – and the superintendent is pulling his hair out.

The problem is he has bentgrass fairways, Kentucky bluegrass in the semi-rough on the mounds and tall fescues and native grasses in the rough. And with his fairway irrigation he has full circle heads operating on the same clock watering all three areas at the same time. If he sets it for the mounds, which he tends to do because they require the most water, he over-waters the fairways and over-waters the rough at the same time.

And so he ends up having a lot of weed problems. One of the best fixes for this is the Verti-drain.



Charlie Barebo of Otterbine Barebo, said:

Ponds and lakes, whether they are man-made or natural, have a natural life cycle. They start out clean, fresh and clear; grow into middle age with weed and

algae growth and high nutrient levels and pass into old age as shallow bogs or marsh land. Before man began to impact the environment this progression took hundreds or thousands of years. Ponds and lakes now can be created, live and die within decades. Why is the life of our ponds and lakes so short? Much of the reason lies in the fact that water is our most abused and least understood natural resource. For centuries streams and lakes have been our dumping grounds. We have allowed our ponds and lakes to be unmanaged so that now many of them are unmanageable. The problems we commonly associate with ponds are excessive algae and aquatic weed growth, foul odour, fish kills and insect infestations.

This ageing process can be slowed down by good management. Good pond management practices include:

- Preventing or controlling water runoff from other areas bringing organic products into your pond.
- Identifying and correcting septic tank leeching.
- Stopping poor management practices such as disposing of grass clippings, leaves and other organic material in your pond.
- Using chemicals intelligently to treat stubborn or persistent problems.

But one of the main ways of slowing down the process is aeration.

How does an aerator improve water quality and control algae growth? By puffing large amounts of oxygen into the water, an aerator encourages a strong colony of aerobic bacteria which, in turn, work to clean the pond of organic nutrients and waste. The presence of oxygen in the water also encourages the chemical bonding of phosphorous with calcium in the water and causes the phosphorous to precipitate to the bottom of the pond and become unavailable for plant use. High

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oxygen levels also prevent anaerobic digestion which leads to nutrient cycling and foul odours. The introduction of dissolved oxygen to the pond's bottom may inhibit phosphorous release from sediments, curtailing this internal nutrient source.

The high pumping rate or circulation rate of an aerator breaks through thermal stratification and distributes oxygen to all parts of the pond. By pulling cool bottom water up to the top of the pond, the surface layers of the water are cooled and the growth of algae is slowed. Single celled algae are mixed to the pond's bottom which increases the cell's time in darkness and will slow growth and reproduction. Rapid circulation and contact of water with the atmosphere, as well as the introduction of carbon dioxide rich bottom water during the initial phase of mixing, may increase the water's carbon dioxide content and lower pH, leading to a shift from blue-green algae, which can release toxins and cause odours, to less noxious green algae.

Aeration attacks the source of the problem – poor water quality. It is an economical and on-going method of pond management. It has no harmful side effects and it supports the natural ecosystem. In addition, spray type aerators are aesthetically pleasing.

Billy McMillan, course manager at Wildwood Golf Club, said:

Many years ago I was a young, headstrong, head greenkeeper. I suppose I thought I knew everything there was to know about green-keeping. I had just fed all the greens with sulphate of ammonia and iron, one hot July day as I remember. I packed up shop and went to visit my mum and dad for the evening, some 60 miles away. We were discussing work and dad asked, "What have you been up to?" I explained the day's work and he asked if I had given the greens a good water. I replied no because it's going to rain, they said so on the weather forecast. "Son," he said, "It's raining when you're getting a wet head, now get back and give them a drink." I did as I was told and, you know what, it didn't rain that night nor for the next month, contrary to the weather forecasters.

Irrigation is only one of the tools available to us as greenkeepers. It's not the be all and end all to successful course management, however when well designed and maintained it is without doubt an asset. It must be used in conjunction with a healthy aeration programme, because it would be no good us throwing this valuable resource (water) onto a surface too compacted to accept it. It has great value, when we are using fertilisers,

top-dressings, wetters etc because it releases us from the constraints of the weather. If you have an automatic system (not everyone has, you know), it allows us to water the course during the night removing the problem of inconvenience to the golfer and of course cutting down evaporative loss etc.

How much water should we use on our golf course? It's worth noting that you may experience some restriction due to cost if coming directly from a water board, or extraction limits from a natural source on site.

Some golfers, bless them, would have us apply sufficient water that would allow a well struck three iron from 100yds to stop a ball dead. On the other hand greenkeepers have over the years, me included, applied so little amounts that the playing surface has been as receptive as an airport runway. Please remember, golf is a game played on grass, not bare ground. We must apply just enough water to maintain a healthy sward and a moist soil profile. Remember, I said moist and not soaking. Each golf course will in my experience require different amounts of water to achieve this end, depending on its climate, location, topography, and soil conditions. It's up to us as the greenkeeper to determine when and how much to achieve the best possible results.

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I have, over the years, under-used water in an effort to maintain a bent/fescue dominant sward. But, in hindsight, it may have been our cutting policies, in an effort to maintain high levels of pace for long periods, and the dramatic increase in the volume of play on our golf courses that have been the main villains.

Water is an increasingly valuable commodity, your irrigation system is an expensive tool, look after them both.

AGRONOMY

Michael Wattam, superintendent at Loch Lomond Golf Club, said:

Compaction is a big problem on the greens here. There is a great deal of rain in the area and there is no downward movement of water in the greens due to severe compaction. The greens are USGA-spec with a gravel base and drains but they are totally useless because the water can't get down to them. The water gets away from the greens purely by run-off. After a downpour they puddle badly. What we intend to do is use sand to topdress and after deep hollow-tining and Verti-draining. (These will allow for not only water movement but air movement.)

The grass on the greens is creeping bentgrass, Pennncross. As far as I am aware it is the most northerly site for Pennncross. It is doing extremely well, especially considering the soil it is on. Any *Poa* on the greens is being hand-picked out.

Dr James Beard, president of the International Sports Turf Institute and Professor Emeritus, turfgrass science, at Texas A&M University, said:

It is critical to educate the golfers that the darkest green turf, which many people strive for, is in fact not the healthiest turf. A medium green turf with a moderate growth rate will have the deepest root system with less thatching, reduced disease and insect problems, and increased tolerance to environmental stresses such as heat, drought, cold and wear.

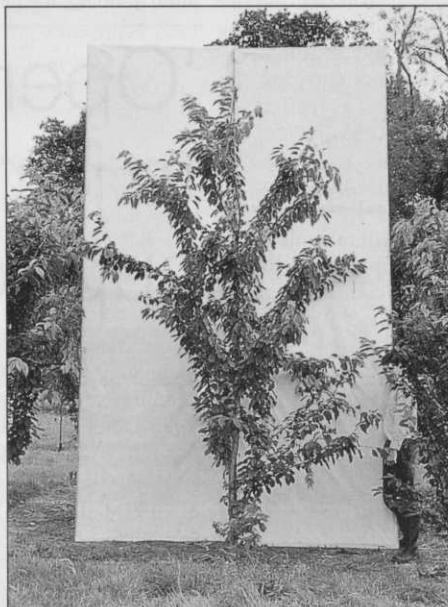
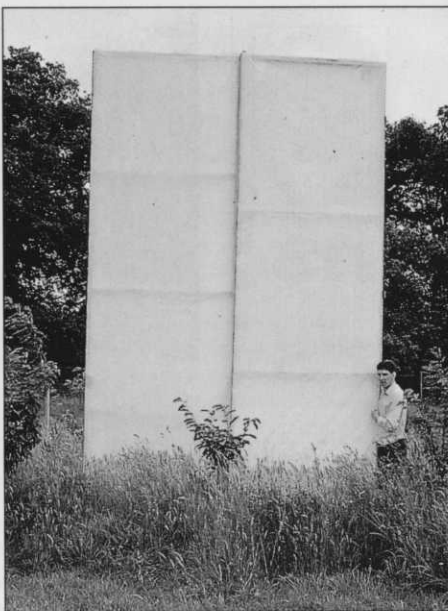
Dr Beard also said:

Among the less well-known benefits of turfgrass are noise abatement and glare reduction...

"The surface characteristics of turfgrasses function in noise abatement as well as in multi-directional light reflection that reduces glare. Studies have shown that turfgrass surfaces absorb harsh sounds significantly better than hard surfaces such as pavement, gravel, or bare ground. These benefits are maximised by an integrated landscape of turfgrasses, trees, and shrubs."

Billy McMillan, course manager at the Wildwood Golf Club, said:

In an ideal world we would all have golf



Wally Grice, woodland officer of The Forestry Authority, showed these two photos of four-year-old wild cherry trees. The difference in the trees' height is put down to weeding. Both were placed in rich brown earth, one was left unweeded, the other (the taller one) had 1m sq around it kept weed free by herbicides. Pictures courtesy of the Forestry Authority.

courses covered with bents and fescues, and no wear and tear from golf. However, the reality is not as simple as that. With today's levels of play it's not always possible to keep these ideal grasses. We all, I am sure, have to contend with *Poa* infestation on some part of the course. The most likely situation is that we have a percentage of *Poa* on our greens and at worst we have *Poa* dominant greens. I am not advocating that this is the best situation to find ourselves, however the reality is we have to manage what grass we have got, rather than to worry about the grass we haven't in most cases got.

We have been advised over the years by some experts that creeping bentgrass will not grow well in the UK, I would just say that in my present position I am working with this grass and I must say the observation by the experts has not been true. At Wildwood I have been very impressed by this grass. The most important factor is does the golfer like playing on it? Well again, in our case, they all seem very pleased with our bentgrass greens.

ECOLOGY

David Stubbs, executive director of the European Golf Association Ecology Unit, said:

One of the buzzwords in ecology at the moment is biodiversity. Even if you are conserving a common species you are contributing to the preservation of biodiversity. Here are the ways in which a golf course can relate to biodiversity:

- Habitat protection – there is a wide range of habitat types among golf courses, from sand dunes to woodlands and grasslands.

- Species protection – there are plenty of examples of rare species thriving on golf courses.

- Species diversity is a product of the diverse habitats on a golf course – from the open in-play areas to the rough, trees and water features.

- Golf courses also serve as valuable habitat links – green corridors. On a broad level the whole golf course may serve as a link in a whole chain of environments around an urban area or it might be within a golf course that there might be certain links such as ditches or hedges which can be very important connectors for wildlife.

- The golf course might be a buffer zone between say a residential area and an adjacent nature reserve site.

- Ecotones is the gradation of one environment into another. Along these borders or edges between habitats you get a very rich variety of wildlife

- Habitat management. One of the great things about a golf course is that it is a managed environment and the need for constant management of habitats is important

Also important is the ability to create new habitats. Obviously you're doing that with new golf courses but also within existing courses you can create new features, whether it is planting trees and extending woodland or wildflower meadows or building new ponds.

Bob Taylor, the STRI's ecologist, said:

If you put a bird table up in your back garden, blue tits and robins will come onto it and take the food from it. But if you stop putting nuts and seed out there is a problem. A lot of those birds will have moved from an area of stability to your area of relative instability because you can't afford to keep putting the seed out at the rate that it's needed. If it gets cold and we get snow for a number of weeks it is likely that the smaller birds will actually die because they can't get back to the area they left. It's the same with your golf course. Whatever you do needs to be sustainable into the longer term. So if you start developing and encouraging wildlife onto the course, you've got to appreciate the costs of it and you need to develop a practical method so that you can keep your programme going.