



Ken Richardson discusses the department's latest projects

**The countdown is running to the release onto the Internet of the BIGGA/AGCS Safety Management System and Ken Richardson gives an overview of how you can access the site and start producing your own Safety Management System. Ken also takes a closer look at Continuing Professional Development schemes.**

## National Register of Spray Operators (NRoSO)

NRoSO is a register of sprayer operators who use CPD as a means of on-going training. The Scheme is open to anybody who holds an appropriate NPTC PA certificate of competence, or was born before December, 31, 1964 and is applying pesticides under "Grandfather Rights". As a member you are required to collect 30 or more CPD points in each three-year period to qualify for membership renewal. A similar range of education and training as in the BIGGA Scheme attract CPD credits. For example an in-house, one-day health and safety workshop would attract 12 credits. For full details go to [www.nroso.nptc.org.uk](http://www.nroso.nptc.org.uk)

Organisers of education and training who wish to have their event recognised for the award of NRoSO credits can download an application form from [www.nroso.nptc.org.uk/events.aspx](http://www.nroso.nptc.org.uk/events.aspx) or contact NPTC on 024 76857300

## The BIGGA CPD Scheme

All greenkeeper members of BIGGA are entitled to join the BIGGA CPD Scheme. It encourages greenkeepers to adapt outdated skills, keep in touch with changes in legislation, update skills and knowledge, promote greenkeeping as a profession and give them the skills to cope with change. If you accumulate 10 credits in the year 1 July to 30 June, you will be awarded a Certificate. Moreover, if you are awarded five consecutive Certificates, you will receive a diploma in CPD. All types of education and training could attract CPD credits; for example, a one-day seminar could attract 3 credits. Contact BIGGA to have your course, seminar, workshop or conference registered.

The BIGGA CPD Scheme is free to join and application forms are available from BIGGA House.

## Golf Course Superintendents Association of America

Class A members of the GCSAA need show that they are keeping their knowledge and skills up to date by participating in on-going training. The GCSAA Scheme is similar to the BIGGA CPD Scheme in that superintendents can gain credits for a wide range of education and training. BIGGA works with the GCSAA to gain recognition for its workshops and seminars at Harrogate each year and both UK based members of the GCSAA and visitors from overseas can take advantage of the arrangement.

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For details, please contact Ken Richardson on 01347 833800 or via [kem@bigga.co.uk](mailto:kem@bigga.co.uk)

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## BIGGA/AGCS Safety Management System

The launch of the BIGGA/AGCS Internet based Safety Management System sponsored by Ransomes Jacobsen is fast approaching. This interactive resource that has been in development for almost two years, has been designed to make it possible for all golf clubs to produce a safety management system for the whole club. It has been designed by a team of software experts, using inputs from golf course managers and golf club secretaries, to be a practical, easy to use system that should help clubs to conform with health and safety law, follow codes of practice and make golf courses safer places to work and play.

The resource will be available, free of charge to all members of BIGGA and/or members of the AGCS, through each Association's website. Check the members area of the BIGGA website to see if the system is up and running.

More details on the System, plus a handy reference guide will appear in the May edition of Greenkeeper International.

## Continuing Professional Development (CPD)

There are many CPD schemes operating for a variety of trades and professions. The four main CPD schemes for greenkeepers, groundsmen and others working with fine turf management are the BIGGA Scheme, the BASIS Scheme, the NRoSO Scheme and the GCSAA Scheme. The Schemes have been designed to show that turf professionals are continuing to improve their knowledge and skills, thereby keeping up to date with changes in their industries.

## BASIS Registration

To be a member of the Register demonstrates that each person is technically qualified in line with Government legislation and that they are updated on an annual basis. To remain on the Register, individuals need to accrue annual Continuing Professional Development (CPD) points. Many BIGGA courses seminars and workshops attract BASIS CPD credits. For details of membership go to [www.basis-reg.com/index2.asp](http://www.basis-reg.com/index2.asp).



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## Happy BIGGA Members

It looks like Greenkeepers are happier with their Greenkeeping Association lately with BIGGA members being more faithful to the organisation than ever before. A staggering 90.3% of members chose to renew in 2006 up until September, compared with 79.5% at our all time low in 2002.

Year	Members that renewed	Retention
2000	5186	85.4%
2001	5893	86.3%
2002	5277	79.5%
2003	5862	88%
2004	5169	86%
2005	5688	86.8%
2006 to September	4463	90.3%

In the marketing world it is said that if you are keeping 90% or more of your members you are doing a great job in terms of customer satisfaction. We are doing our best to keep this figure as high as possible by improving our service to you.

Still think it's not good enough? Get in touch now and let us know why: [vanessa@bigga.co.uk](mailto:vanessa@bigga.co.uk) or 01347 833800. We would welcome any feedback from you as to how we can improve our service.

## What have we done for you lately:

- In 2006 a new legal helpline was chosen with an improved service.
- The BIGGA website was upgraded to improve interaction between members.
- In 2006 we spent £200,000 on education and training.
- More than £25,000 was given in scholarships and refund of fees.
- Four more BIGGA Members became Master Greenkeepers.
- Harrogate Week 2007 included 50% more education hours than ever before.
- The membership administration system was improved for greater efficiency.
- Direct Debit payments were introduced so that membership fees could be spread over the year.

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- A maximum of 2 rooms can be booked under any one reservation.
- This offer cannot be used in conjunction with any other offers or special promotions.
- The promotional rates are non-commissionable. Priority Club points do not apply.

## Competition success

BIGGA came runner-up in The Membership Development Awards 2007. With the retention figures, shown above, we demonstrated how the Association has improved its service to members.



Email your letters to;  
melissa@bigga.co.uk

## ANAHEIM 2007

I would like to thank all at Bernhards Grinders and BIGGA for the excellent trip that was provided for the 10 delegates to the GCSAA show in Anaheim, California. This was an incredible experience for all who participated and we were made to feel extremely welcome by all of our American counterparts with whom we had the pleasure of meeting.

I would additionally like to thank all at British Seed Houses, Florantine, the GCSAA and Ransomes Jacobsen for the wonderful hospitality offered towards us while on the visit - it certainly will not be forgotten.

Finally, I would like to thank Kim and the rest of Bernhards staff for making this trip possible and thanks also to the rest of the delegation who made this trip truly memorable.

**Andrew de Wet**

Staverton Park Golf Club



## SCHOLARSHIP GRADUATION

The Nordic course, Turfgrass for golf courses, has now come to an end. The essence of this programme has been three gatherings, at which a different topic was addressed.

- Turfgrass physiology and plant material
  - Morphology and plant physiology – plant morphology, seasonal development, non-structural carbohydrate content
  - Plant material – species, varieties, mixtures
  - Growth components – light, temperature, water, mineral nutrients, soil air
  - Establishment – germination, direct drilling
- Pest management and biological disease control
  - Pest management – fungi, insects, weeds
  - Maintenance techniques for the prevention of pests
  - Integrated pest management (IPM) and biological disease control
  - Weed control without the use of herbicides
  - Soil microbiological activity and soil organic matter
- Winter survival of turf
  - Turfgrass overwintering physiology
  - Causes of winter injuries
  - Management techniques for the prevention of winter injuries

In addition to the above, we had to perform compulsory written assignments, and a compulsory oral and written report of a course project. I was involved with 2 others, and we made a report called “thatch – the worse enemy for the greenkeeper”. We had to perform a 45 min. presentation of the report.

I am very grateful for the scholarship from BIGGA and Ransomes Jacobsen. Thank you very much for the opportunity to achieve new goals. I have been able to get a higher standard for my golf course and most importantly, I feel much more confident in discussions towards the golf course manager and to some extent to the board members. For the moment I am trying to set up my budget for the 2007 season. I do think that my ability to stand up and do a presentation is more solid now than earlier.

Once again – thank you very much for the possibility to achieve a higher level of education.

**Best regards**

**Per-Ove B. Lysvold**

Head Greenkeeper

Voss Golf course - Norway

## THANK YOU

Just a short note to thank all those involved in arranging this year's BIGGA delegation to the Golf Industry Show in Anaheim. The week was crammed full with interesting seminars, innovative ideas, new products and field trips to some great venues including L.A Country Club and the grounds of the L.A. Galaxy “Soccer” team.

During the show and education conferences I was impressed by the levels of enthusiasm, dedication and commitment shown by all our American colleagues. The quality of education available was something for us to aspire to. Amazing levels of interest and hospitality were shown to us and it will be great to reciprocate when the American delegation come to Harrogate next January.

This trip reminded me of how different our approaches to the industry are, the Americans are leading the way with research, science based education, lifting standards and pushing boundaries whilst here at home we are driving forward with ecological, efficient and responsible maintenance practices. We have so much to learn from each other it is important to keep communicating and this delegation is a very important part of that.

What a great week we all had, exchanging ideas, making new friends, visiting excellent venues and learning so much. I thoroughly recommend this to any greenkeepers in the industry - it's a great opportunity to see a different side of the industry. Thank you to John Pemberton, the other greenkeepers in the delegation, Stephen Bernhard, all the Bernhard Company team and especially Kim Furnell for making last week happen.

**Glenn Kirby**

The London Golf Club





All Golf Clubs, regardless of size, have safety hazards e.g. slips, trips and falls, use of cutting machinery etc. These hazards can pose risks to members of the club, to visitors and to all employees. A Safety Management System, SMS, is a proactive tool that is used to identify, reduce and control these hazards to prevent injury to those who use the Club and the employees. A SMS consists of all the arrangements used by the Club at all levels to actively to manage health and safety. Its purpose is to provide an easily understood framework for those who manage the Club and its employees of how a Health and Safety policy is formulated and executed. Actively managing health and safety will help in preventing accidents and also in ensuring compliance with UK law

## The SMS is comprised of clearly defined elements:

- A clear statement of the Health and Safety Policy outlining the top-level goals of the Club.
- A commitment to providing support and financial resources to achieving these goals.
- An organisational structure of the persons responsible for achieving the aims and goals outlined in the policy.
- A plan of how the policy would be implemented addressing the assessment of risks and how these are to be reduced.
- How health and safety standards and performance will be measured and assessed.
- How the system will be audited and reviewed to ensure that it continues to meet the clubs needs and aspirations.

An SMS should form part of the routine day to day running of a Club and not seen as something looked at once a year or

when there has been an accident. The progress of the required actions within it should form part of the Club's regular Committee meetings.

A key element of the success of any Safety Management System is a commitment from the Board of Management/Committee to proactively embrace the actions within the SMS and to discharge the Club's health and safety responsibilities. This commitment must be made clear to all those who use the Club and work in it.

It is important that individual committee members are seen to be applying and adhering to the requirements of the SMS as their behaviour will influence the attitude and actions of others within the Club.

A Club which implements a successful Safety Management Systems will benefit from improved morale of their employees, reduction in accidents and injuries as well as providing a firm base for the defence in any criminal or civil action on health and safety. This should be reflected in a reduced overall financial cost to a Club.

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# RESPONSE OF GRASS SEED GERMINATION RELATIVE TO SOIL TEMPERATURE

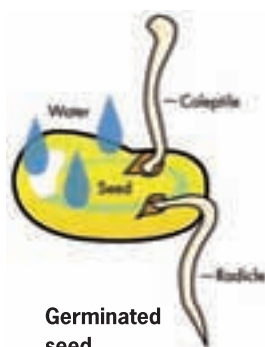
## Gerard van 't Klooster looks at the remarkable results of temperature germination trials

One of the most frequent enquiries we get from Course Managers and greenkeepers is about germination times for particular grass seed species or mixtures. The traditional response has been a very general statement in relation to a specific species, for example 7-10 days for perennial ryegrass (*Lolium perenne*) and 14-21 days for smooth-stalked meadowgrass (*Poa pratensis*). But, as our research at Barenbrug discovered during a recent germination trials programme, there are significant differences in temperature germination response not only between species, but also between different cultivars within a species.

### The germination process



Grass seed



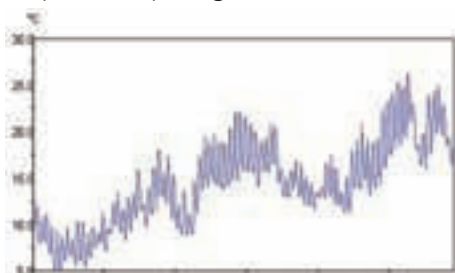
Germinated seed

Germination of grass seed begins when sufficient temperatures are present and adequate moisture is available for absorption; the larger the seed the more water is required. Moisture taken in results in a cascade of signals that direct development; Gibberellin hormones signal the production of enzymes which function to break down the starchy endosperm for nourishing the embryo. The radicle (primary root) is the first structure to emerge from the embryo, followed by the coleoptile, or primary shoot (see diagram below). Green leaf tissue emerges to begin the photosynthetic process to provide energy for successful establishment of the emerging plant.

### Trial objectives

The increased performance and presentation demands placed upon natural turf surfaces during recent years have been further compounded by the effects of climate change. One of the most influential factors is the inconsistency of seasonal temperatures; cold temperatures in late spring (soil temperatures of just 8°C), warm winters (soil temperatures remaining at 10°C or above) and extremely hot periods during summer months (soil temperatures at +30°C). Graph 1 (see below) shows the differences in soil temperatures at Barenbrug Research in Holland during the cold,

late spring of 2006. The temperature influence is an extremely important point to note. The opportunity for turf managers to have access to temperature response germination data cannot be



underestimated. Having the information to select individual cultivars and mixture formulations for increased percentage germination at different soil temperatures, combined with other desirable characteristics, will offer real practical solutions.

**Graph 1. Variation of soil temperatures at 4in (100mm) depth of soil during April to June 2006.**

Discussions with end users, combined with experience from our own trials, made it apparent there were significant differences in germination temperature response between cultivars within the same species. Observations of turf trials for many years showed consistency in temperature germination response for the same individual cultivar. These experiences inspired more research into the germination process; this particular characteristic would become a very influential part of cultivar selection when formulating seed mixtures for successful seeding or overseeding, particularly given the demands of reduced or enforced renovation windows. It was with this objective in mind that our company began temperature germination response trials.

### Trial methodology

In 2005, we began working with the University of Hohenheim in Germany to research the germination temperature response of different cultivars of *Poa pratensis*.

The joint research programme became the first series of trials to explore a more detailed examination of the germination process. *Poa pratensis* was the first species selected for the pilot germination experiment, because the general understanding of the germination and establishment period within this species is a notoriously slow process, therefore any significant differences could offer real practical value. The ability to germinate or achieve higher percentage germination at cooler (or warmer) soil temperatures could significantly assist the establishment period or renovation window.

The optimum germination temperature range

for *Poa pratensis* is accepted as 16-32°C. Five different cultivars were tested for speed of germination under different temperature regimes. The

experiment was conducted on a temperature gradient plate. This temperature gradient plate has 196 protected cells and the temperature of the cells can be adjusted between 0-30°C. The temperature range for the trial was set from 5-35°C. All the cultivars were tested in three replications. 25 seeds per replication were sown on the germination paper in each cell. This is the same protocol as would be used in an official International Seed Testing Association (ISTA) test, but with a different temperature scale (lower and higher). Only seed lots with a positive ISTA germination certificate (certified seed, as per the official label sown onto a bag of grass seed) were used (see Graph 2 below). Every 12 hours seeds which had successfully germinated were counted and recorded.

Cultivars of other species of amenity turf grasses, including *Lolium perenne* and *Festuca rubra* spp., have been independently trialled by us for temperature germination response. The experiments were again carried out using a temperature gradient plate. The temperature gradient was set to a range of 10-30°C. All the cultivars were tested in two replications and assessed (counted) in the same way as the official ISTA test. An important part of the protocol was also to test different seed lots to see if the influence of the seed lot on germination was bigger than the specific cultivar influence.

One of the key benefits of *Lolium perenne* is that as a species it generally has the ability to begin the germination process at cooler soil temperatures. Research and practical experience has shown that germination of *Lolium perenne* at relatively low temperatures of 7-10°C is possible, although there are again differences within cultivars, with some needing relatively higher temperatures than this to germinate.

### Trial results

#### *Poa pratensis*

The *Poa pratensis* trial revealed significant differences in temperature germination response at both low and high temperatures relative to the species.

Table 1 shows the data results of the smooth-stalked meadowgrass trial (University of Hohenheim). Note the significant difference of relative high and low temperature percentage germination.







**Count on it.**

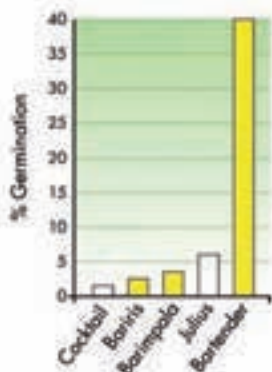
**Average germination rate (%)**

Temp(°C)	Bartender	Julius	Bariris	Cocktail	Barimpala
35.0	56.00	20.00	22.67	66.67	82.00
32.7	89.33	45.33	60.00	82.67	94.00
30.4	90.67	52.00	57.33	74.67	88.00
28.1	92.00	66.67	24.00	76.00	88.00
25.8	80.00	40.00	9.33	86.67	72.00
23.5	76.00	44.00	10.67	69.33	62.00
21.2	70.67	52.00	9.33	81.33	62.00
18.8	61.33	45.33	9.33	73.33	30.00
16.5	62.67	46.67	2.67	53.33	30.00
14.2	68.00	21.33	8.00	33.33	32.00
11.9	41.33	8.00	4.00	2.67	6.00
9.6	9.33	0.00	0.00	0.00	0.00
7.3	0.00	0.00	0.00	0.00	0.00
5.0	0.00	0.00	0.00	0.00	0.00

**Table 1. Germination percentage for 5 Poa pratensis cultivars.**

Graph 2 (below) represents the significant cool temperature, high percentage germination capability (41 per cent) of a particular cultivar of Poa pratensis, Bartender, in comparison with four different cultivars of the same species (less than 10 per cent)

**Germination temperature trials**  
Germination of different cultivars of smooth-stalked meadowgrass (Poa pratensis) at 11.9°C after 17 days.



**Graph 2. Percentage germination at 11.90C after 17 days**

**Lolium perenne**

Lolium perenne is an extremely variable species in relation to characteristics such as fineness of leaf, wear tolerance, shade tolerance and tolerance to close mowing. There are circumstances when a combination of these characteristics in conjunction with temperature response germination could be invaluable. Table 2 shows the results of the laboratory trials in Holland at low temperature, 100C day temperature and 70C night temperature. Note the high percentage germination (+80 per cent) of several cultivars after just 14 days at this temperature. Sowing different combinations of cultivars for different rootzone/soil temperatures could significantly influence the rapid germination and subsequent establishment and performance of the sward.

Crop Name		Ryegrass, perennial	Ryegrass, perennial	Ryegrass, perennial			
Description		14 days germination	25 days germination	35 days germination			
Rating Unit	Sample Size	PLANT	PLANT	PLANT			
Entry No.	Entry Name	Unit	Rate	Rate			
1	Barclay	1	i	64	f	78	ei
2	Barball	61	c	94	ab	95	Ab
3	Barcredo	0	i	55	g	70	I
4	Barrage	31	ef	72	ef	75	Ghi
5	Barluxe	0	i	36	h	54	J
6	Barlinda	0	i	64	f	79	e-h
7	Barmona	6	hi	62	f	70	I
8	Bardessa	17	fi	72	ef	79	e-h
9	Barsportivo	88	ab	95	ab	96	Ab
10	Sabor	8	hi	72	ef	83	d-h
11	Pinnacle	11	ghi	80	de	91	a-d
12	Bareine	77	ab	99	a	99	A
13	Bartwingo	6	hi	85	bcd	88	Bcd
14	Bardoria	24	fg	68	f	75	Hi
15	Premier II	42	de	92	abc	94	Abc
16	Bargold	88	ab	96	ab	96	Ab
17	Romance	69	c	80	de	83	d-g
18	Barrington	89	ab	98	a	98	A
19	Adeline	90	ab	97	a	98	Ab
20	Barlennium	74	b	90	abc	90	a-d
21	Barlady	95	a	96	ab	96	Ab
22	Bareuro	83	ab	95	ab	95	Ab
23	Barvites	58	c	83	cd	84	Def
24	Barsoccer	48	cd	72	ef	76	fi
25	Barillion	53	cd	83	cd	85	De
26	Barsunny	86	ab	93	ab	94	Abc
27	Bardorado	86	ab	95	ab	96	Ab
28	Barblack	83	ab	96	ab	96	Ab
29	Pinnacle II	24	fg	88	a-d	90	a-d
LSD (P=.05)		10.8	6.2	5.5			
Standard Deviation		6.6	3.8	3.4			
CV		13.26	4.54	3.87			
Grand Mean		50.09	83.24	87.23			
Bartlett's X2		53.941	40.599	29.958			
P(Bartlett's X2)		0.0005*	0.17	0.619			
Replicate F		1.725	1.614	1.51			
Replicate Prob(F)		0.186	0.207	0.228			
Treatment F		80.183	47.355	28.872			
Treatment Prob(F)		0.000	0.000	0.000			

**Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls) Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.**

**Table 2. Germination temperature for different perennial ryegrass cultivars.**

**Conclusion**

Germination temperatures for individual cultivars of Poa pratensis cultivars are significant. Cultivars such as Bartender have an excellent germination percentage capability at lower temperatures combined with a wide temperature optimum. Conversely, Barimpala has an excellent germination percentage capability at higher temperatures with a more limited germination percentage at the perceived 'optimum' germination temperatures. There is a significant difference in the temperature germination response of perennial ryegrass cultivars. Certain cultivars show a significantly high germination rate of +80 per cent with a soil temperature of 100C.

The Hohenheim research programme revealed a very surprising result; a cultivar of Poa pratensis, Bartender, can – unlike other cultivars of the same species – germinate at soil temperatures as low as 70C. As a result of these findings, Bartender was included in the formulation of a special mixture for Falkirk Stadium, in Scotland, where it again proved its ability to germinate successfully at cooler soil temperatures. This enabled it to compete and establish with the Lolium perenne in the mixture and to effectively provide the required characteristics for this particular project.

At the other end of the scale, different cultivars can germinate successfully at temperatures higher than 300C. This rootzone temperature can be found in many stadiums throughout Europe in the summer. The majority of Poa pratensis cultivars will have very low germination percentage at these high temperatures. A cultivar of Poa pratensis, Barimpala, has been used for many years in Italy and other southern European countries with great success. The data from the temperature germination research in Germany clearly demonstrated why this particular cultivar performs so well. It is important to understand why individual cultivars perform particularly well given certain constraints, and in the case of Barimpala, the research data concurred with results in the field to provide the explanation. Naturally, germination is a key factor, but successful establishment is vital. To increase the chances of this, turf managers should take great care with seeding or overseeding, paying particular attention to adequate irrigation. When overseeding, it is important to delay nutrient input until a high percentage of successful germination is reached, otherwise you will only be feeding the existing sward which will out-compete the new, more desirable grasses.

It is imperative that Course Managers and greenkeepers have access to vital information such as temperature germination response. Good germination is not only the start, but could be the key to seeding and overseeding success. Other key characteristics remain extremely important, but there are certainly times when temperature germination response will be the key to a solution. Our company is continuing germination temperature response trials to screen both existing and, most importantly, new cultivars from the breeding programme.

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**References**  
(1) How grass grows <http://www.ahnrt.vt.edu/portfolio/howgrassgrows/howgrassgrows.swf>  
(2) International Seed Testing Association (ISTA)

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# Course Feature

## Best Peak Practice

**Scott MacCallum travelled to Derbyshire to meet a Course Manager who is living up to the family name.**

The Peak District town of Buxton is known for its famous spring water while the local golf club, Buxton & High Peak Golf Club, is certainly synonymous with the name Norton.

Steve Norton is the current Course Manager, having taken on the role in 2001. His father, Ray, worked at the club for 35 years but that's nothing. His grandfather, Bill, devoted 55 years to the club starting in 1911 as a shepherd (sheep were an ideal form of early triple mower); caddie; and eventually pro/greenkeeper with stints as Club Steward thrown in as well. Another sideline was cutting the juniors' hair for them in the pro shop. You had to turn your hand to everything in those days.

"It seems that I've inherited the family role – that of custodian of Buxton & High Peak Golf Club. When I was growing up I didn't realise it would become a lifetime's work," joked Steve, who was given some time off to increasing his greenkeeping knowledge in other parts of the country before, almost inevitably, returning home.

And there is a fair chance that the dynasty will not end with Steve, as his 12 year-old son, Jonty, is already mad keen to join the family firm and helps his dad on the course whenever the opportunity arises. Steve also smiles when he says that the incoming Captain may cause him a few problems when he takes up the reins in December.

"He's my brother, Philip!"

Buxton & High Peak is very much a



community golf club edging right onto the edge of the town and split by the extraordinarily busy A6.

"I remember when we were kids that we just ambled across it. We rarely needed to stop for cars. Now at peak times we can be sitting on a machine for up to half an hour for a gap in the traffic to allow us to cross."

Steve started as a 16 year-old under his father at the club before moving to become Assistant Course Manager at Tewkesbury Park Golf and Country Club which was initially owned by Country Club Hotels but was bought by Marriot while he was there.

He then moved to Goodwood which was also owned by Marriott and worked there for just over a year before moving to Elsham, near Scunthorpe, where he spent five and a half good years at a "great golf club with some lovely people".

The lure of his home town was too strong though and Steve, who had retained his membership, was invited to take up the challenge.

"After my father left the course was managed by an ex-farmer, a super guy, but it would be fair to say the most sophisticated agronomic techniques weren't employed. He didn't have the experience or the knowledge to take the club forward, nor did he have the right people to support him in the club."

**"A lot of the machinery was still the same kit my father had used and a lot of it was older than me,"**

Steve found a course in need of some drastic work. "The club had invested in reports from several agronomists, including the STRI, and all had reached the same conclusion which had taken them back a bit. They needed investment in machinery, investment in buildings, investment in staff training.

“ There was an old Toro Mark 1 and the Certes hand mowers were at least 40 years old.

**It was a working museum. ”**



“A lot of the machinery was still the same kit my father had used and a lot of it was older than me,” recalled Steve.

“We had an old Land Rover which was used to trail a set of five Allen gang mowers. The view was that the Land Rover still worked so why the need to change it. There was an old Toro Mark 1 and the Certes hand mowers were at least 40 years old. It was a working museum.” Steve marked out a five year plan to remove thatch and solve the drainage problems. At its lowest ebb for six months of the year they were on temporary greens and the club was leaching members at an alarming rate.

“The plan wasn’t difficult to sell to the club because they’d hit rock bottom but I knew that due to the drastic nature of the work that needed to be done a lot of criticism would come our way.”

The first 18 months involved making sure the foundations were in place and that the equipment which would be expected to take the strain was safely tucked away in the maintenance facility.

The club has a basic irrigation system but as the local water is licensed to Perrier, the owner of Buxton Spring Water, they would be unable to drill a borehole even if they wanted to. The thought of irrigating a green with Perrier has quite a ring to it though!

“We didn’t have a top dressing machine and you can’t put on top dressing without one while we also invested heavily in aeration equipment.”

When they started, they did so with a vengeance.

“For the first three years we hollow tined every six weeks with heavy top dressing into the rootzone and scarified in between times. We also vertidraind three times a year,” said Steve, a close friend of another Buxton Boy, David Golding, of the GTC, who began his greenkeeping career working under his dad.

The golf season, because of the unusual nature of Buxton, is only really May to September so the membership had to be particularly tolerant. Last year the Met Office, who have a station in the town, recorded 64 inches of rain, while the highest village in England is just a few miles away.

“We used to have four months of snow every year but now it falls as rain. I remember being confined to barracks and working on odd jobs in the clubhouse for much of the year,” said Steve, adding that the Norton family, himself included, are skilled joiners providing much of the course furniture.

“Granddad Bill always said you should have more than one string to your bow.”

There was four and a half inches of thatch across the entire course and the par-3 8th green which used to be played over the aforementioned A6 had six and a half inches of thatch.