

NEW TERRITORY MANAGER

Sisis Equipment (Macclesfield) Ltd is delighted to announce the appointment of Grant Broderick as Territory Manager for the London Boroughs. Grant is Australian and has spent his whole working life in the Australian turf industry as a greenkeeper, landscape contractor and Sales Representative. He is a keen follower of all sports, has played Australian Rules football, and now golf.



RENOWNED TURF PROFESSOR TO OVERSEE

Floratine Products Group has announced its relationship with Dr. Tom Watschke, professor emeritus of turfgrass science at Penn State University.

Dr. Watschke will join Floratine as a consultant, specifically in the area of university research protocol.

Dr. Watschke is an expert in turf growth regulation and has spent much of his career studying and evaluating biostimulants and plant growth regulators and their effects on turfgrass development and management.

GROWING IN NUMBERS

Gloucestershire-based LED lighting provider, Greenled, has appointed four new sustainable lighting specialists to its expanding team – Ian Russell, Paul Stearman and Paul Haines join the sales force, and Nigel Thomas joins the technical team. Based in London, Ian Russell will manage key sales accounts in London and the South East, focusing on the new build and built environment sectors in particular.

Merseyside-based Paul Haines has been in sales for 15 years, and now heads up Greenled's Northern UK sales team. Nigel Thomas joins Greenled's technical team, having worked as a technical manager with Metropolis in Swansea for the last four years.

HELPING WITH OPEN PREPARATIONS

Fairway mowers supplied by Ransomes Jacobsen dealer, Burrows GM of Leyland, are being used by Chris Whittle and his greenkeeping team at Royal Birkdale as preparations for The Open gather pace.

Chris has been using the two-wheel drive version of the Jacobsen LF-3400 light fairway mower for the past few years and his current pair of machines will be supplemented by a further three from Ransomes Jacobsen's tournament support fleet as the prestigious event commences this month.

The R&A has stipulated that the fairways will be cut in one direction only, once every day from tee to green, with all clippings boxed off. The five machines will drive in staggered formation down each fairway to achieve the required finish.

Royal Birkdale has seen many alterations over the past couple of years with only holes 7 and 12 remaining in their original configuration. Bunkers have been removed, refurbished or moved with eight new ones created to bring the total up to 123.

"I won't be changing my maintenance regime, it will just become more intense in the final weeks leading up to The Open," said Chris. "I have 10 permanent staff and I will supplement those with 12 experienced greenkeepers from local clubs. We'll be working from 4am until 10pm and we're really looking forward to it with increasing anticipation."



HAMPTON COURT CHOOSES TORO

Hampton Court Palace Golf Club has become the latest golf club to invest in the new Toro Golf Decoder Controller (GDC) irrigation system.

Owned by Crown Golf, the 112-year-old parkland site in Kingston-upon-Thames is the only course in Britain where golfers can play in the grounds of a royal palace.

Though flanked by the River Thames, the club is all too aware that water is an increasingly valuable resource and so, when its old irrigation system became wasteful, General Manager, Guy Riggott, sought an efficient and cost-effective replacement.

Guy turned to irrigation specialist, Irritech, to manage the project and source the ideal system, and the installation contract was awarded to Lakes & Greens, from east Sussex, which began the work in September 2007 and completed just six weeks later.

Toro 834 and 835 sprinklers were used on the greens, tees and approaches and 2001s and 720s on tees. The PC-based SitePro controller operating the entire system enables the course manager to programme a precise watering plan and view the course layout on screen from the comfort of his office. He can also use a hand-held remote control to start the irrigation system when he is out on the course.

Membership



BACK TO THE FUTURE

Tracey Maddison has returned to BIGGA, after a six year absence, to manage the Membership Department.

Tracey originally joined the Association in 1998, taking on the role of Membership Services Officer. After four years in this post, she felt it was time for a new challenge and for her to gain more experience of professional bodies.

In 2002, Tracey took on the role of Membership & Training Manager for the Institute of Physics & Engineering in Medicine (IPEM). While in this post, Tracey completed an MSc in Management and built on her knowledge of membership workings and associations.

A keen golfer with a handicap of 16, Tracey feels she can relate to many of our studious members: "After studying part time while in a full time role, I now understand how hard it can be. It's hard work but well worth the effort."



**Over to the new
Membership Manager,
Tracey Maddison...**

It's lovely to be back at BIGGA and BIGGA House again. I can't believe how quickly the last six years have gone.

So what have I been doing and what's brought me back to BIGGA?

Well as you can see from my profile I have been working for a professional body called IPEM, their members are made up of clinical scientists, clinical technologists and clinical engineers who work in healthcare, mainly in hospitals and many work with cancer patients.

What's that got to do with greenkeeping I hear you ask, well nothing! But I have gained valuable experience and further knowledge of being involved in working among professional bodies and in particular membership strategies and issues.

I now have 10 years experience of working in a membership setting and six years in a training environment (and six years as a budding golfer!).

During my time at IPEM I completed an MSc in Management, studying part-time is not easy so I can empathise with those of you out there who are studying while working.

I also took the decision to join a professional body, which gave me the support and contacts to help me with my career.

Why become part of a professional body?

I became part of my professional body because I know that it provides me with recognition, credibility and the resources to help me maintain my professional competence through education, training and lifelong learning by undertaking CPD. It also gives me a valuable source of networking with people who have similar interests to me.

Why join BIGGA?

BIGGA is no different to my professional body in their support of you, whether you are still training to complete your minimum qualification or whether you are an established Course Manager, BIGGA is your professional body and can provide the resources to help you in your career as a greenkeeper, not to mention the fantastic range of personal benefits available to you.

So why have I returned to BIGGA? Because I enjoy working for, and being part of, a professional membership organisation. I enjoy working with members and being able to offer the support, through the range of membership services available, to help meet their day-to-day challenges.

Part of my brief is to develop the range of welfare services offered to members and put these on a much more formal basis. If you are prepared to help or have any comments on this please contact me.

I am looking forward to travelling out to the Sections and Regions to meet many of BIGGA's members in person.

CONTACT THE MEMBERSHIP DEPARTMENT

If you have any issues at all regarding your membership please contact a member of the membership team Justine, Brad or myself, contact details below: -

By telephone - 01347 833800
option 1 for Membership.

By email

Tracey (traceymaddison@bigga.co.uk)
Justine (Justine@bigga.co.uk),
Brad (brad@bigga.co.uk)

Useful Telephone Numbers (for greenkeeper members)

Personal Accident Helpline – 02075 603013
Greenkeepers Legal Assistance – 0800 177 7891

The new members list can now be found in the members' section at www.bigga.org.uk

Learning & Development

Key Sponsorship:

UNLOCK THE POTENTIAL OF GREENKEEPERS

The funding provided by Gold and Silver Key Sponsors is used to produce training and career aids, DVDs, CD Roms, field guides and provide refunds for training fees and subsidised learning and development courses. The funding also helps support seminars, workshops, courses, the lending library, careers advice, posters and manuals.

Many young greenkeepers owe their career progression to the assistance they've had from the Learning and Development Fund. An equal number of established greenkeepers have also been able to access the fund to continue their professional development thanks to the donations of the Gold and Silver Key Sponsors.

THANK YOU TO THE FOLLOWING KEY SPONSORS



GOLDEN KEY



Golden Key Individual Members

JH Greasley; WJ Rogers; Andy Campbell MG, CGCS; Iain A Macleod; Tom Smith; Frank Newberry; Christopher Lomas MG, Lee Strutt MG.



SILVER KEY



Silver Key Individual Members

Ade Archer; Steven Tierney; Paul Jenkins; Iain Barr; Richard McGlynn; Steve Dixon; Sam Langrick.



Gold and Silver Key Presentations Day

In late May, we hosted an event for those companies and individuals who support BIGGA by being a Gold or Silver Key member of BIGGA. The financial contributions we receive from these members are used to support the Learning and Development Fund.

The Learning and Development Fund is used to provide a variety of different schemes and projects, specifically for members, including Field Guides, subsidies for Section and Region events, library books, the CPD scheme and the Refund of Fees scheme to name a few.

Since the Gold and Silver Key Fund was established in 1992, we have spent in excess of £879,000 and we hope that total contributions to the fund will top the £1Million mark in 2009. We list the Gold and Silver Key members on this page every month, but I would like to take this opportunity to thank them on your behalf for the difference they have made to the Learning and Development of greenkeepers.

Funding Opportunities

Scotland - Individual Learning Accounts (ILA Scotland) is a Scottish Government scheme that helps you pay for learning that you can do at a time, place, pace and in a way to suit you. If you are over 18 and living in Scotland, you could get up to £200 towards the cost of learning new skills with an individual learning account from ILA Scotland. If you earn £18,000 a year or less, you could get £200 a year towards the cost of learning. If you earn more than £18,000 a year, you could get £100 a year.

For further details call 0808 100 1090 or visit www.ilascotland.org.uk

England - Train to Gain is a service provided by the Learning and Skills Council (LSC) to help businesses get the training they need to succeed. It aims to encourage all businesses and individuals to realise the benefits that learning and skills can bring. Funding is available to help adults to achieve a first full NVQ Level 2 qualification and to help improve basic literacy and numeracy skills.

For further details call 0800 015 55 45 or visit www.traintogain.gov.uk

Higher Education Scholarships Supported by



The most recent scholarship has been awarded to Lee Strutt MG – and it is for MSc Sports Turf Science.



After a few days of sunshine we've been fooled into thinking that summer is here – long may it continue! For those of us that are office bound we long for lunchtime to go outside and soak up some rays, for those of you who work outside, please make sure you're wearing suitable sun protection!

Toro Student of the Year 2008



Rachael and I have had a busy month during which we have been organising the Toro Student of the Year regional interviews. By the time you read this, I'll have done my whistle-stop tour of the country and will have been involved with interviewing 33 student greenkeepers from 17 colleges. The final of the competition will take place in September at BIGGA HOUSE for the eight finalists who have been selected following the interview process.

The BIGGA/GCMA Safety Management System



The SMS is celebrating its first birthday and is about to undergo its first review to ensure that it is 'doing what it says on the tin'.

With the help of the Golf Club Managers' Association (GCMA), with whom we are partnered on this project, and our various Health and Safety Advisors we hope to develop this safety management system so that it will become the recognised industry standard.

If you are registered on the SMS you will have received a short questionnaire, via email, that will help us with the review process. Please do take the time to complete and return it to us as your input is invaluable.

Learning & Development

GRASS SEED SELECTION AND SEEDING PREPARATIONS FOR NEW CYPRUS COURSE

By Arne van Amerongen

In the first of two articles, Golf Project Manager, Arne van Amerongen, gives a fascinating and rare insight into the preparations that take place for the golf-build of a new course located in the hot, dry climates of the Mediterranean. The Korineum Golf & Country Club is the first 18-hole golf course in Turkish North Cyprus and the first seeded course in the world where the grass seed Paspalum was used from tee to green.

Which to choose: Cool or warm season grass?

This was a difficult question especially as this golf course – in Turkish North Cyprus – is in what is called the ‘transit zone’ area.

Here the summer months from June to September are very hot and therefore ideal for warm season grass, but the other eight months are good for cool season grass.

So it is risky during the hot summer months to try to sustain and maintain cool season grass. But if you do manage to succeed in this, it means no more over-seeding with ryegrasses – with savings in this area alone amounting to 40,000 euros for just the grass seed.

However, there were also several other factors that influenced this difficult choice at the Korineum Golf & Country Club:

The quality of the topsoil

- pH 7.9
- SAR: Sodium adsorption ratio from 1.6 to 5.3
- Topsoil texture: Sandy clay loam

The quality of the water

- We had the desalination plan from the sea
- 357 ppm, almost drinking water
- pH 7.2

The temperatures

- Summer temperatures ranging from 29degC at night to up to 45degC in the noon sun
- (as a general guide).
- Winter temperatures ranging from 5degC at night to 15degC during the day
- (as a general guide)

After taking all these factors into consideration, the decision was finally made to use cool season grass, with the species and cultivars for the golf course as follows:

Greens

Agrostis stolonifera	Cultivar	Penn G2	100%
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Tees, fairways & semi-roughs

Lolium Perenne	Cultivar	Citation Fore	25%
Lolium Perenne	Cultivar	Vantage	25%

Festuca rubra rubra	Cultivar	Aberdeen	25%
Festuca arudenece	Cultivar	Heel	25%

Seeding began in September 2005 and, with the grass germinating and growing, everything appeared to be going well.

Indeed, in the picture below of the 4th hole, the course is four months old and was playable. Seeding had begun on November 29, and the contours and definition of the cool season grass are clearly visible.



The 4th hole established with cool season grass.

Now, I've been in the golf course industry a long time and I thought that I was no longer surprised by anything – but in April 2006 I got a big surprise!

It was then that the investor came to me and, despite having already told him that the golf course was almost in play, he told me that we were going to have to reseed the whole golf course!

This after we had already used 13,000 kilos of grass seed and with the course was almost ready for play.

But the advisors were in charge – and so the entire golf course was to be sprayed.

It doesn't bear thinking about all those wasted hours of maintenance and hard work the greenkeeping team had put in to getting the golf course ready for the opening date.

But the decision had been made, and we duly sprayed the whole golf course with the total weedkiller Round-up, even spraying it twice in some areas because the grass was not completely dieing.

The pictures below show the 7th hole established with the cool season grass; and then three weeks after being sprayed.



The cool season grass on the 7th hole before and after being sprayed.

Meanwhile, Seaspray Seashore Paspalum was selected as the replacement warm season grass, and reseeding preparations were put in hand.

When complete, the Korineum Golf & Country Club would be the first seeded golf course in the world where this grass seed, Paspalum, was

used from tee to green. For me personally it was a great experience to be given the opportunity to work with the two different types of grasses in this way.

Seeding preparations for 'Seaspray' Seashore Paspalum

Seeding preparations for Seashore Paspalum were no easy task, especially as nobody was experienced in seeding with this particular grass seed type, added to the fact it was the first time anywhere that an entire course was being seeded entirely with Seashore Paspalum.

With the investor insisting on getting the golf course ready for play, there was no time to do any research. Basically, it was a case of experimenting by trial and error.

But it has to be accepted that this is normal because, for the investor, 'no play' means 'no income' and for every single day the golf course remains unopen for play he is losing money. Understandably the pressure was enormous, but the agronomy consultants decided to begin seeding on June 1 with the aim of finishing on June 6, 2006.

First, as stated earlier, the whole course was sprayed with Roundup 480g/l (37%W/W) 5.0 litre/he. Then, after three weeks, work started on the rest of the preparation process.

For the greens and tees, we started by Verti-cutting in two different directions to a depth of 1.5mm. Then we collected the dead grass clippings. The amount we collected was enormous, amounting to about 1m3 per green.



Verti-cutting one of the greens.

Enormous amounts of dead grass were collected from the greens.

Preparations for the fairways and semi-roughs consisted of spraying with Roundup and then cutting them down to 9mm and 15mm respectively

LOCATION	Golf Course	Planting rate	Total grams	Total kgs	Total bags
	Total m2	Grams/m2			
Fairways & semi-roughs	166,174	6	997,044	997.04	99.70
Greens	12,618	14	176,652	176.65	17.67
Green surrounds	37,044	6	222,264	222.26	22.23
Tees	10,974	6	65,844	65.84	6.58
Tee surrounds	39,282	6	235,92	235.69	23.57
Roughs	124,425	3	373,275	373.28	37.33
Total:	390,517	5.30	2,070,771	2,070.77	207.08

Table. Seeding quantities of Seaspray Seashore Paspalum and extent of seeded areas.



Cutting down fairways and roughs after spraying.

We also needed sand to cover the grass seed for the tees, fairways and semi-roughs. We got this from the beach and because we had to clean it we had a self-constructed shredder. The total amount of sand we needed for this work was approximately 1,200m3. The shredder could clean about 20 lorries a day, which amounted to a capacity of 300m3/day.



Cleaning beach sand.

The sand was driven to different locations on the golf course to get the job finished much quicker.

UK course managers and greenkeepers will, I'm sure, be interested in the quantities of seed used, and the extent of the areas covered, for all the

different parts of the course. Therefore I have given them in the table above.

Additionally, as part of preparations all the bunkers had to be covered with plastic to prevent grass seed or dirt contaminating the sand. The total area that needed covering was 7,532m2. The biggest bunker that required a cover was this 1,289m2 fairway example shown in the picture below.



Covering bunkers with plastic

In next month's issue:

At last, with all preparations completed, the staff are organised and more people employed, as a team of 40 makes ready for the incredible task of seeding the entire course in only one week. Establishment and initial maintenance of the turf follows, with special attention paid to cutting and watering in the lead-up to the course opening.

About the author

Arne van Amerongen is a golf project manager. He spent three years building the first 18-hole course in Turkish North Cyprus at the Korineum Golf & Country Club. He can now be contacted at arne-golf@spin.ch



Count on it.



PUMP STATIONS: SIMPLE JOB, COMPLEX TECHNOLOGY

By Charles De Haan

Ask any Course Manager what the most important elements of their golf course irrigation system were, and they would probably tell you it was the central control system and the rotors, closely followed by the pump station. But in fact the pump station is the heart of any irrigation system, and arguably the most critical part. After all, without water being delivered at the correct pressure for the rotors to do their job properly, any irrigation system is both inefficient and ineffective.

Two main types of pump sets are made for golf courses: the Vertical Centrifugal type, which are the most popular throughout the UK markets, and the Submersible type, typically used throughout courses in the Mediterranean and US regions where water drawn from bore holes is a more common practice.

Two major pump innovations

A number of important innovations have been made to pump stations and equipment, and for course managers and green keepers everywhere two in particular are worth knowing more about:

- Variable speed pump sets
- Real-time two-way communication between the central control system and pump station.

The experience of a large number of course managers using pump stations installed with these two relatively new technologies is completely

consistent: they are critical to an irrigation system's performance. Even the most economical pump set can still have an operating range based on a flow rate between 20-400m³/h, and pressure between 4-13 bar and 70-188 PSI, and when such systems have to work for literally years at peak efficiency, it's worth understanding why these two features are so significant.

Variable Speed Control technology

On the face of it, just like an irrigation system appears to do the simple job of watering the golf course, the pump station simply has to pump water from the reservoir to the rotors. But supplying that water requires a constant pressure to be maintained so that the rotors' capabilities – length of throw, arc, droplet size, water curtain and volume delivered - are fully exploited. Any loss of pressure means that the course doesn't get watered properly, so reaching and maintaining the ideal water pressure is paramount.

However, while few people would dream of driving a car by keeping the accelerator to the floor and using the brakes to control progress, this is exactly how many pump systems are still being made to work. But a pump set with Variable Speed Control technology will save energy, minimise wear and prevent water hammer.

An electronic or software-based technology, Variable Speed Control enables the pump sets to maintain a constant pressure against variable flow. Variable Speed Control is simply designed to provide a smooth automated start and stop of the

pump station, along with an extremely quiet low vibration operation. This has several other important operational benefits: much higher efficiencies, extremely low energy consumption and long term running costs. So it's a simple technology, but one with very desirable benefits.

Real-time communication

Real-time communication is another software-based technology, but does a very different sort of job. It manages the pump itself and enables remote control access from the central control system. The pump station is connected to the central control system by either hard-wired communication cable or wireless radio communication. This enables troubleshooting of the pump station from a remote location, a major benefit as more often or not, pump stations are not close to office areas and can easily be forgotten or simply overlooked, a case of 'out of sight, out of mind'.

But with pump management software that links the central control system to the pump station directly, it can both monitor and track both actual and controlled flow and direct or real-time communication between the pump station. In turn the irrigation's central control system optimises the required irrigation cycle by adjusting the flow demand according to actual field conditions. This pump management software can also be linked to the central control system to act as a 24-hour course supervisor. Because it is always watching the system, it can make constant minor adjustments so that the irrigation system runs much more efficiently.



In practice, what this means is that the pump management software will make active real-time decisions on your behalf, depending upon the parameters you have set. So when you've set a required programme of watering, and left for the evening, the upgraded system can automatically detect if there's a problem, such as a burst mains pipe where the demand is greater than the available capacity.

Usually what would happen with most pump stations is that the burst main pipe would cause the system pressure to drop and then cut out and close the pump down automatically on low pressure. Then the controller would continue to open and close valves over the golf course/turf area thus draining the system down of water, as there is no communication between them. So when the course manager returns in the morning there would be no idea of knowing this other than checking on the pump station specifically and then further investigation.

By contrast, the new pump management software would enable the central control system to make an active decision at the moment the main pipework burst. The system would notice the drop in operating pressure and it could decide to reduce the amount of stations it is trying to operate simultaneously, or even stop the watering cycle completely. It then would record what had and what had not been completed against the planned programme, so that on their return the following morning you as the Course Manager would be made aware of this problem - even if your pump station was in a remote location from your office.

The benefit of experience: Damon Kirk, PGA National Ireland

With over 15 years in the greenkeeping business, it's interesting to hear what Damon Kirk has to say about his new irrigation system at the new PGA National Ireland course. First, some statistics: Palmerstown's irrigation system can deliver on a daily/nightly basis:

Greens	3.57 mm, or 25 mm per week
Tees	2.86 mm, or 20 mm per week
Approaches	2.86 mm, or 20 mm per week
Fairways	2.14 mm, or 15 mm per week

That adds up to a maximum application of 690 cubic metres a day or 151,800 gallons in old money. The pumping system that drives all that water to the course's 567 sprinkler heads is a Rain Bird V-3200 Series skid-mounted pump set, delivering 80 cubic metres an hour @ 9.0 bar.

But 9 bar of pressure is no use unless each and every sprinkler head can deliver a consistent amount of water over its designated area. The fairways are irrigated using Rain Bird pressure-regulated valve-in-head sprinklers, and set to operate at 5.5 bar, which is enough to provide an irrigated width of 33 metres. The area covered by the Palmerstown course - and thus its irrigation system - is 300 acres in all, so the water has to travel very significant distances to do its job. In fact there are over 30,000 metres of underground pipe work the water travels along before it can be sprayed from those 567 sprinklers.

Maximum efficiency, minimum effort

So what does Damon think about it in practice? "One of the most impressive things about the irrigation system is the sheer efficiency. We've had over four years to see the whole system in action, and although this course is one of the most spread out, there's no loss of pressure at the head end and a really good rate of water is delivered."

So what's the moral of this particular story? Water is rapidly becoming one of the most expensive overheads for every golf club, so it's essential that every drop is used as efficiently as possible. In turn, the pump sets used by clubs must be designed to be efficient as possible at delivering water at the correct pressure, and to keep doing that, day in and day out, for years.

To achieve that sort of level of pump efficiency over its lifetime, you need to be exploiting the latest electronic technology like Variable Speed Control, and real-time two-way communication between pump stations and the central control system. Anything else is inefficient, potentially risky, and will cost the club a lot more than planned to deliver expensive water to the course.

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BUNKER RAKES: THE RAKE'S PROGRESS

By James de Havilland

Based around a three-wheeled 'tractor unit', the most popular models of ride-on bunker rakes in the UK include the Jacobsen Groom Master II, John Deere 1200A and Toro Sand Pro 2020, 3040 and 5040. With entry level retail pricing starting at under £9,000, these diminutive machines need not be restricted to a life working in a bunker either.

With their light footprint, there is no reason why a ride-on bunker rake cannot be used as a light tractor unit. Example applications include pulling a small drag mat to knock off the dew ahead of early mowing through to applying light solid dressings

through a small trailed spreader to areas that are less accessible to larger or heavier kit.

In practice this sort of versatility is seldom exploited. Most users employ their machines for their primary role of keeping bunkers not just raked but conditioned to a greater depth to improve consistency. A good number of courses will have modified some bunkers to allow them to be accessed by a ride-on rake, so if you are not using one due to poor bunker access, this is a point to consider.

These tools can also be used for heavier 'landscaping' duties, their ability for light grading making them ideal when undertaking reconstruction work,

landscaping etc. There is no reason why a rake's skid unit cannot be exploited as a light 'tractor' unit to operate a brush or blower either.

So what is on offer? Starting with the John Deere 1200A bunker and field rake, this simple, robust tool can trace its roots back to 1995. Powered by a Kawasaki 10hp petrol engine, the 1200A has a rear axle differential lock. This helps boost traction when undertaking heavier work, freeing off the diff to allow the unit to turn pretty much within its own length.

Fitted with flotation tyres with an offset lug, the 1200A should actually grip well, a useful point to consider when trying to scale a bunker edge or grade heavier material. Sticking with



traction, the Deere is fitted with mechanical drive, a wet clutch and torque converter taking up drive. Two foot pedals on the left control the direction of travel, the right throttle pedal. Top travel speed is 18.

The 1200A is equipped with a three-section rake as standard, with a choice of serrated or optional smooth blades. Electric power lift is standard for the rear-mounted rake, and there is a fitted rear basket. The sections float and articulate to follow the bunker's contours.

A cultivator and front blade with spring-assisted lift are available as options. Dual headlights and/or rear work lights can also be specified.

Jacobsen offers its Groom Master II with a choice of Briggs and Stratton 18hp petrol or Kubota 19hp diesel power. Both versions have full hydrostatic drive to all three wheels with a variable speed range of between 0 and 15kph.

A driven front wheel is important as it not only improves traction but also helps to 'pull' the unit along as it is steered.

Running on three 10x11.00-10 tyres, these units again offer low ground bearing pressure with great manoeuvrability. Power steering helps in this respect, fast lock-to-lock turns really helping spin the machine round quickly.

The basic skid unit can be dealer specified to meet specific requirements, the essential choices including mechanical of hydraulic lift blades, cultivators and fan rakes. A drag mat and carrier, scarifier, box blade, can also be specified.

Joining the established Toro two-wheel drive and 16hp petrol powered Sand Pro 2020, the more recently introduced 3040 and 5040 have a three-wheel parallel drive system for optimum traction.

With respective 16hp and 18hp Briggs and Stratton power units, the 3040 and 5040 are designed for all sizes of bunkers, including those with steep faces and uneven contours.

Unlike the 2020, both models boast the added benefit of power steering, plus a slight increase in transport speed to 10mph. In addition, the tractor unit's ground clearance has been increased to 6in and 7.5in on the Sand Pro 3040 and 5040 respectively.

This essentially allows these machines to work over rougher terrain, a feature that is of value during course reconstruction and landscaping.

Sand Pro attachments for bunker repair and maintenance include a spring rake, tooth rake, spikers of various widths, a manual or hydraulic blade, a

variety of mats, a finish grader and levelling bar. Attachments for other landscaping tasks include a rear broom, utility box, debris blower and weeder/cultivator.

All models feature foot pedal controls, forward and reverse, a Quick-Attach System (QAS) for the front and rear hydraulics, mid-mount capability for several of the attachments and an optional light kit to help extend the working day.

As can be seen, these machines are actually more diverse than a casual glance may suggest. Several landscaping companies employ a 'bunker rake' for finishing work, grading slopes and levelling ground prior to seeding or turf laying. They are serious bits of kit and far more versatile than non-users may think.

Although all models are easy to operate, it does take practice to exploit what they have to offer. If arranging a demonstration, ensure you take in some of the tips and advice offered by the demonstrator before assuming you can rake your bunkers to perfection from day one.

Also ensure you get to try some alternative rakes, blades and attachments. It may be difficult to convince those controlling the purse strings that a bunker rake is justified, but showing a ride-on unit has other potential applications may help.