

Modern fairway management has certainly benefited from the introduction of 'lighter' mowers with narrower units. This has not made the actual job any easier, a wet mild spring and fast growth sometimes stretching mowing capacities to the limit. The key is having the capacity to cope

Making Light Work

# Making Light Work

James de Havilland hops on the current crop of light ride on mowers.

When trailed gang sets first started to be replaced by ride-on fairway mowers, the choice of models on offer was initially limited. Indeed, some of the earliest ride-on models had much in common with the five-gang commercial cylinder models upon which they were based. Fairway mowers have now changed considerably, but the trick still remains in matching the right mower to the job.



With five 21 inch units, the 2 and 4WD Toro Reelamster 5200-D and 5400-D can be specified with 5 or 8 bladed 5 inch cylinders. In damp conditions, all-wheel drive can be of benefit, even of a relatively flat fairway





John Deere 3225C and 3235C models feature 22 inch cutting units, this now universally popular format being the size Deere has stuck to from day one. Cab option is increasingly popular, offering protection from the elements and stray balls

If the mowing equipment clock suddenly turned back to the mid-80s, many courses would be in trouble if modern kit had to be replaced with the best that was offered back in 1985. Staffing levels would probably need to be doubled and members would notice a dramatic change in the look and play of greens and fairways. Lost balls would triple overnight.

A bit of an exaggeration? As it is not possible to go back and both manage and play a course as it would have been a couple of decades in the past, it is difficult to say. But anyone who has an intimate knowledge of a given golf course will no doubt agree that greens now tend to be far more consistent and faster, roughs are ringed with more forgiving aprons and year round play and winter mowing is far from unusual. The whole look and feel of a course now would be very different than it could have been back then.

A key change, however, would be in the fairways. Although mowing heights have not necessarily altered, the quality and frequency of cut certainly has.





Alternate day mowing is now common in high season, and the 'ultra' light fairway mower, with diminutive 5 inch cylinders and 18 inch cutting units, is available, albeit with a relatively limited market.

Early ride-on fairway mowers would typically offer five sets of 30 inch units with 7, 7.5 or even 8 inch cylinders. By the time John Deere entered the golf market with its light fairway models in around 1993 with its 22 inch units, it offered a choice that could include 5 inch cylinders. Fast forward, and Jacobsen has been brining in its 18 inch ultra light 1880 models for a couple of years.

This has lead to a pretty diverse range of ride-on fairway mowers. At the standard end, it is possible to have a model like the Jacobsen Fairway 405 with its seven 26 inch units and the Toro Reelmaster 6700D, also with seven gangs but 22 inch cylinders. At the other extreme the 18 inch five gang Jacobsen Super Light LF-1880 is offered with diminutive 5 inch cylinders.

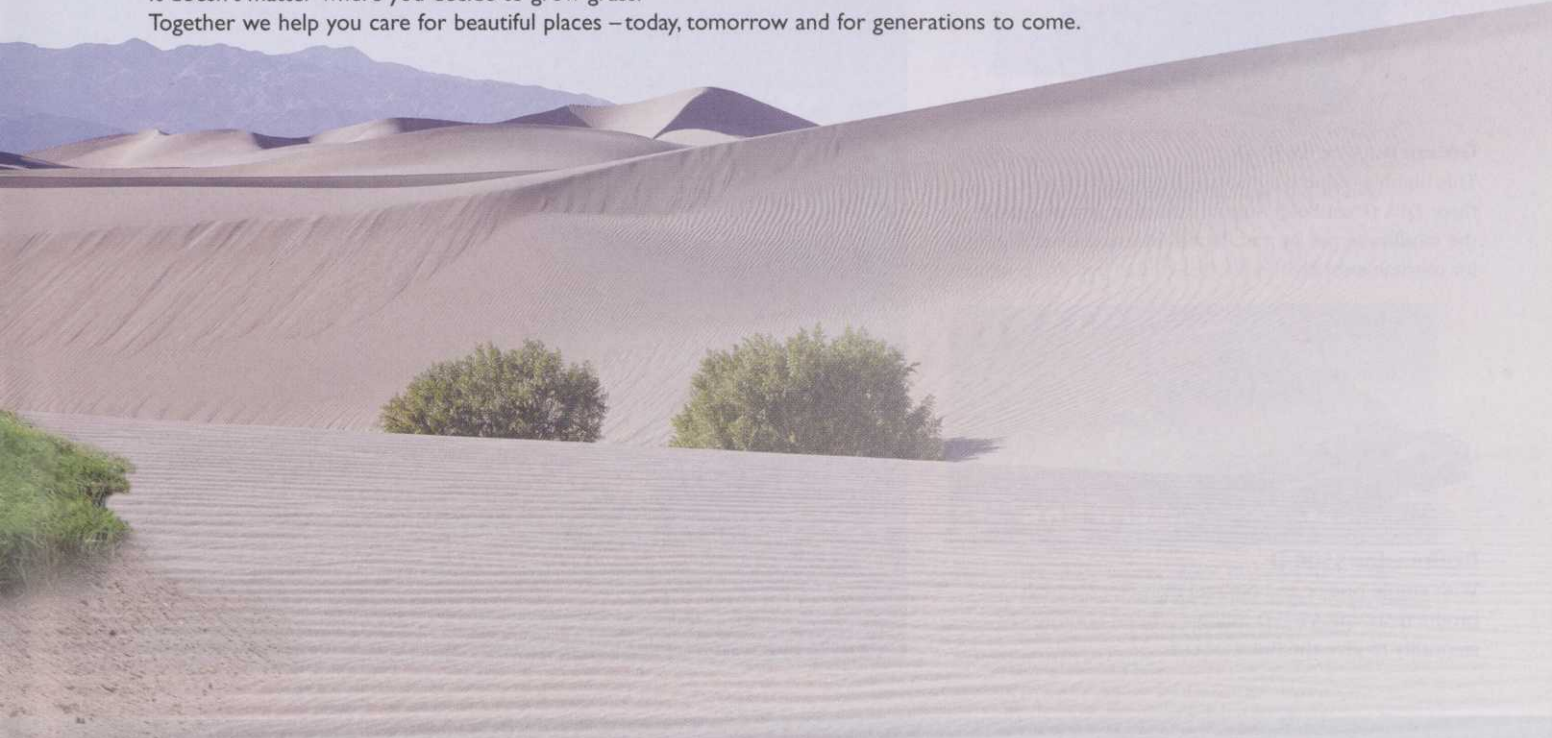
As such, it is useful to divide what is on offer into standard, light and ultra light categories. The description of course relates to the cutting units, but it is fair to say lighter units are associated with a physically lighter mower as well. Sit the extremes of what is on offer next to each other and it is soon apparent that the bigger the units, and particularly when seven as opposed to five gangs are fitted, the larger the power unit becomes.



No, Hayter has not entered the light fairway mower market with its 26 inch unit FM524, but it is a relatively light machine in terms of ground bearing pressure, the company putting this at between 10 to 24 psi depending upon specification and tyre pressures

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All obvious stuff. But it is when visiting a course that has made a progressive switch from a 'standard' ride-on to increasingly lighter models that the differences in the look of the fairways can be noticed. So too can fairway management. Light mowers are less able to tackle long wet grass and the odd stone or patch of soil that were easily digested by heavier models can spell a trip to the workshop on an ultra light model.

Stepping into the dangerous waters of generalisation, links type courses with fine grasses are more likely to adopt smaller 5 inch diameter reels, parkland courses perhaps erring toward a larger 7 or 7.5 inch cylinder. Again in generalisation territory, the smaller diameter units will be maintaining a cut height of 12 to 13mm, the larger 15 to 16mm.

As is often the case, however, local conditions and available water have a tremendous influence on how a given course mows its fairways. There are also different mowing heights that can be dialled in depending upon annual rainfall. Winter mowing heights are also a consideration. In many cases a cosmetic winter mow will see mowing heights increased to 18mm plus. None of these are cast in stone and as such it will always pay to know how mowers differ and how what is the right choice now could well change in the future.

Popular for its versatility, the five-gang Toro 5500-D is fitted with 22 inch units with 7 inch cylinders. Available with a choice of 5, 7 and 11 blades, it is this type of mower that can be specified to cope with different mowing conditions



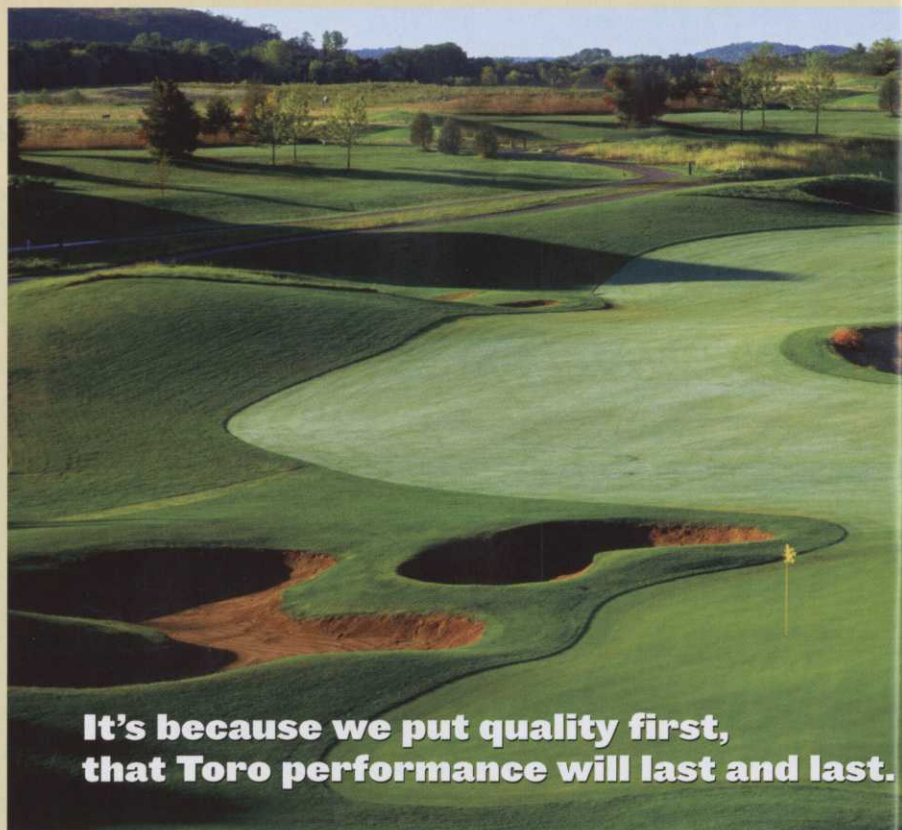
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Perversely, some suggest it is winter mowing that has influenced the uptake of light fairway models. With grass growing on through the season, being able to get onto the fairways to cut it with a physically light machine is a key issue. Compaction remains a concern, the footprint of light fairway mower often enabling grass to be cut in conditions when a larger ride-on is best left in the shed.



Jacobsen LF3400 and LF3800 models look pretty much the same, but offer a choice of 34 or 38hp power units to drive the five 22 inch units. The more powerful model is offered with 7 inch cylinders, against the 5 inch units on the 3400



The diminutive Jacobsen LF1880, now offered in Turbo 33hp form, is claimed to be the lightest fairway mower on offer. Its narrow 18 inch cutting units even have the option of 'greens' specification 11-blade cylinders



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# Efficient Practices

Phillip Armitage discusses Bentgrass Water use rates and efficient water management practices.

Prehistoric man seems to have appreciated water's importance. He realised that rainfall was often inadequate for his crops because irrigation was being practiced at the beginning of recorded history. The Egyptians and Babylonians built dams to store water in 5000BC; the Persians (Iran) built extensive tunnels to bring the water down from the hills, many of which are still in use today. The Spanish invaders of America found elaborate irrigation projects in Peru and Mexico, while the Indians of south western Arizona had extensive canal systems (Masse, 1981).

Throughout time we have understood and appreciated the importance of plant and water relationships. In recent years we have become more aware that a good quality water source is an increasingly restricted commodity. It is now absolutely essential that golf course managers encourage techniques that reduce water wastage and encourage more efficient watering practices whenever possible. Professors all around the world are currently involved in research aimed towards identifying and understanding plants' individual traits at a molecular level. This information helps us all to understand more about the abilities of individual cultivars and their capability to respond to high levels of drought, wear and shade.



Fan operating behind the bentgrass swards

## BENTGRASS TRIAL

An experiment aimed to identify the exact level of water required by different types of bentgrass subjected to a variety of environmental conditions was carried out (Armitage, 2001). Mature bentgrass swards were used in this experiment and were grown in Bingley, West Yorkshire, at the Sports Turf Research Institute (STRI) and then transported to Preston to start the experiment.

These swards were constructed in 1998 on a USGA profile and subjected to a close mowing trial there on, until March 2001. The bentgrass swards were cut at 5mm during the summer months and 7mm during the winter months. The bentgrass swards were broken down into the following varieties:

- Bentgrass varieties (Species, Common name, Commercial name);
- A - *Agrostis tenuis*, Browntop bentgrass (cv. BAR AT 894)
  - B - *Agrostis stolonifera*, Creeping bentgrass (cv. Penn A-1)
  - C - *Agrostis canina*, Velvet bentgrass (cv. Avalon)
  - D - *Agrostis castellana*, Highland bentgrass (cv. Highland)

The bentgrass swards were transplanted from outdoors into plastic plant pots (130mm in diameter). The plant pots had been prepared earlier by tagging and placing circular pieces of matting into the bases with stapled strands of matting on the underside which would then loosely hang through the plant pots and then through holes in the water pots lids.

The water pots located directly under each of the bentgrass sward pots, contained a set level of water of 400ml. These water pots were refilled daily and a record of the water used up in mm was measured. This method was chosen as it enabled plants to uptake water in response to stress at its own rate. Another reason was that by applying water to the plant through the roots the potential for water wastage was significantly decreased from potential problems such as uneven distribution, wind drift and evaporation.

16 bentgrass swards - four of each cultivar of bentgrass - were kept in this condition in the greenhouse, which was still for one month. Two further sets of 16 bentgrass swards were also kept in the greenhouse house.

One set was placed in front of a fan at low speed. The second set was placed in front of a fan at a higher speed. This was done to replicate wind conditions.

## RESULTS

Table to summarize the results of the average daily water use rates (WUR) of each bentgrass variety in each microclimate

	WUR	(mm)	
	No wind	Low wind	High wind
Browntop	3.00	4.25	5.00
Creeping	3.25	4.00	4.50
Velvet	3.75	5.00	4.75
Highland	4.00	4.00	5.00

Table 1. Results of the water use rates (WUR) for the bentgrass experiment (mm)

The bentgrass results were reasonably accurate, although some bentgrass plots died off due to an inability to cope with sudden changes to watering through the root systems. However, the majority of the plots were able to withstand the stresses exerted upon them.

This experiment shows that the daily uptake of water from the bentgrass was around 3-5mm depending on the cultivar, and environmental stress. This information should be treated with great interest when selecting a grass cultivar for a particular environment! Precise water use rates that demonstrate the performance of any grass under different environmental stresses, in particular - heat and wind, offer the potential to make a better judgement of water requirements, resulting in improved water efficiency and better performance by the turfgrass.

Please remember that these figures do not take into account several







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Overhead irrigation system operating on a golf green

other influential factors that are typically associated on a golf course such as height of cut, close mowing, verti-cutting and high wear; mainly because these issues are sometimes difficult to replicate on an experimental basis. However, it is possible to see that as each stress is added into the equation the likelihood of increasing the turgor pressure on the plant becomes higher.

#### EFFICIENT WATER MANAGEMENT PRACTICES

These water use rates can be used to help coordinate an efficient watering programme. The basic level of watering needed by the plant therefore ought to be around the 3-5mm of water per day. Irrigation systems that are directly connected to weather stations that aim to monitor wind, rainfall, and humidity and soil temperatures will also help us to understand plants requirements and the correct amount of water required.

It is recommended that water is applied to a surface in a uniform distribution pattern. Ideally, irrigation systems should be designed with appropriate spacing in order to suit the requirements of the grass on each surface, i.e. approximately 21 - 35mm per week.

The irrigation should be delivered through mains pipe work to each sprinkler at an even rate of flow and pressure. Energy efficient pump units, pipe work with no leaks and pressure sensors connected to solenoid valves are encouraged to help apply exact levels of water evenly. Additional sensors ought to be used to ensure that sprinklers are operated during the correct weather conditions. Watering during windy periods with rainfall is highly wasteful and should be avoided at all cost.

It is also recommended that water is applied in large quantities, such as 8mm in one application, ideally directly after aeration in order to reach down into the soil profile. Three days after this application of water the next review for watering should take place. The two days between should apply water using the following techniques;

#### SYRINGING

Supplemental irrigation (syringing) is another irrigation technique that is crucial to enhancing summer turf survival on golf greens. Mid-day wilt, even with seemingly abundant soil moisture, is common with creeping bentgrass and annual meadow grass, especially with close mowing. Head Greenkeepers are forced to keep greens at low cutting heights, even during summer stress and heavy traffic.

This results in a shallow root system that cannot effectively use water, even if soil moisture is adequate deeper in the rootzone. Syringing applies water to correct plant deficits, reduces plant tissue temperature and removes substances from the leaves. Syringing calls for 2.5mm or less of water, primarily to the turfgrass leaves.

#### HAND WATERING

Hand watering is similar to syringing, this involves applying more water. Hand watering treatments apply enough water to penetrate into the crown and soil surface interface. This allows the water direct contact with the bentgrass' shallow root system. As the name implies, hand watering is often labour intensive. It should be restricted to those greens or green areas where moisture stress symptoms have been visually noted.

Water management practices that encourage root depths to be extended can significantly help nutrient uptake and the plants ability to withstand other stress factors in the long term. Several grasses on existing greens shall suffer to cope with such an aggressive watering regime in the short term, and these practices should be slowly worked towards over a period of time. These watering techniques require daily inspections of the greens throughout the mid morning/afternoon for any signs of drying out.

It will also be necessary to hand water individual areas with a light syringe. These individual areas or micro-climates are often termed 'hot spots' by Interns working in the US and shall occur mainly on heavily worn areas, around the flag stick, or on high undulations. By carrying out this style of watering on greens, it is possible to apply water in a more specific amount for each individual plant.

#### SUMMARY

In summary, the main principles encouraged to help golf course managers are:

- Monitor and record current and future water usage, applications and weather patterns.
- Check irrigation systems performance regularly.
- Apply a base level of water to the greens on a controlled basis using the automatic irrigation system.
- Top up greens water requirements through daily inspections of the greens and light syringing where necessary.
- Water immediately after aeration in order to encourage deep rooting.
- Aim to apply water appropriate to the environmental conditions.

It is clear that more knowledge of individual micro climates around the golf course are needed in order to help grasses survive under heat stress and meet the demands of optimal water efficiency. It is also clear that while improvements have clearly taken place over time, a great deal of further research in this area is certainly encouraged to be carried out.

#### REFERENCES

Armitage, P.D. The effect of wind and heat on water use rates for bentgrass. Unpublished.

*For further information on irrigation issues or agronomic support, contact Phillip Armitage at the STRI on philip.armitage@stri.co.uk.*





# NEW PRODUCTS

## GREEN MASTER

Scotts' has unveiled an improved range of Greenmaster Liquid fertilisers. The improved products are based on more than just NPK and trace elements. Every product in the Greenmaster Liquid range now includes TMax, a powerful nutrient uptake activator which improves the rate of nutrient intake by the grass plant and ensures the turf has a consistent colour with no rapid tail off.

TMax ensures that the liquid application spreads out and sticks onto the leaf to maximise the leaf area for nutrient uptake and reduce leaf run off. In addition, TMax enables nutrient to move through the soil profile to the root area. Here it makes available previously locked up nutrients resulting in better nutrient balance in the soil and improved turf quality.

The new range includes four core products High N, NK, High K and Spring and Summer. There are also three speciality products STEP liquid (a trace element mix), Iron 4 (Fe 4% ESDA chelated) and Ca Booster (08 00 00 + 10% CaO + TE).

For further information Tel: 01473 830386;

Web: [www.scottsprofessional.co.uk](http://www.scottsprofessional.co.uk).

## REEDFELT

Lindum Turf has joined forces with British Flora, a UK aquatic and wild flower nursery, to produce the company's latest innovation, Reedfelt.

A combination of Lindum's Grassfelt technology, using a biodegradable felt made from recycled British textiles, and British Flora's high quality reeds, Reedfelt provides a lighter and more sustainable alternative to traditional coir blankets.

Aimed mainly at landscapers, local authorities and environmental agencies, Reedfelt can be used for the stabilisation of waterways and wild margins as well as water filtration treatment. British Flora, whose core business is bioengineering, specialise in the production of native reed species, collecting seed and plant material from all over the country. The two companies believe the product will also find favour at golf clubs for use in lakes and water runs, amongst other things.

For further information Tel: 01904 448675; Web: [www.turf.co.uk](http://www.turf.co.uk).



## CAST OVER THE WORM

The Wormcast Company has unveiled a new range of products for turf care at Harrogate Week. The company's wormcast products: Wormcast Organic fertiliser and probiotic soil conditioner and new development especially for turf care, liquid Wormcast Wormcast 'T'.

Kent based, The Wormcast Company successfully launched Wormcast last year for the gardening market and is now keen to make this product available to the sports, landscaping and turf industries. It is an organic fertiliser and probiotic soil conditioner made from casts produced by millions of earthworms and contains beneficial micro organisms in abundance.

Wormcast aims to appeal to those looking for a versatile organic product which improves soil quality, encourages healthy growth, deters pests and diseases and has many other benefits such as improving germination and turf quality.

For further information Tel: 0845 605 5000.

## TWO HEADS ARE BETTER THAN ONE

A new flail head has been introduced for the Fern range of hedge cutters distributed in the UK by Rustons Engineering to give a particularly high quality cut on hedges and grass verges. It can be top mounted or rear mounted and has a 115cm width of cut.

The flails on the new TJ120 head are arranged in a spiral on the heavy duty rotor, which gives more overlap than is possible with a conventional linear arrangement, so a finer finish is achieved. The rotor is balanced electronically, with the counterweights bolted on the end shields where they cannot be damaged or knocked off.

The hood is a double skin structure with replaceable side skids and rubber protection at the front. The clearance between flail and casing gradually increases, which produces a turbine effect, so the cut material is discharged particularly effectively, giving higher work rates. The adjustable rear roller not only controls cuffing height but can also be moved out of work for hedge cutting.

For further information Tel: 01480 455151.



## MAPPING FAST

Korec, a UK Mobile GIS and Mapping GPS solutions company, is launching its new FastMAP Greenkeeper Golf Course GIS and Management system.

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