

The Twin GT by Trelleborg is a low pressure tyre. It has a large air volume and can be driven at very low inflation pressure. The large contact area, combined with low pressure, gives minimum soil compaction. The pores of the soil are not pressed together so the soil remains loose, the grass is able to absorb nutrition, and the drainage is unaffected

Making tracks

HUGH TILLEY reports on tyre options for vehicles on the golf course

Realisation that tyres are a major contributor to soil compaction has resulted in a change in the types of tyre used on golf courses, while the risk of soil compaction has been increased by greater volumes of traffic as clubs become more mechanised and use heavier equipment, typically with the use of tractor-mounted slitters and corers replacing pedestrian machines. Furthermore, it is not just greens and tees which are getting increased traffic, fairways and rough get more traffic too.

The concise dictionary definition of tyre is 'a rubber ring placed round wheel of vehicle to prevent jarring', however this only reveals one single function. Most tyres are required to transmit traction or steering forces and spread the weight of a load as well as acting as shock absorbers. Tyre technology and reliability have developed very considerably in the last few decades but then so have the demands placed upon them.

Greenkeepers give low ground pressure and minimum grass damage their highest priority and this usually takes precedence over grip. Nevertheless, grip is often required and without it smearing of the grass or soil surface is likely – a problem which may be no less important than compaction when it comes to reducing air and water permeability.

There is a direct relationship between tyre and ground pressures and most vehicles designed specifically for turf have wide low-pressure tyres, typically with pressures under 15 psi or 1.0 bar. These tyres will also have a non-aggressive

tread pattern, which will not impress or cut in, thus further minimising the danger of soil and turf damage. A useful way to assess ground pressure and damage potential is to run over some loose sand such as the edge of a bunker and measure the impression. It will be seen that traditional traction tyres such as those used on agricultural tractors are likely to leave marks fully one or two inches (25mm-50mm) deep. Ribbed steering tyres may be even worse, and because they are narrow they are liable to produce even higher contact point loadings. The worse culprits of all are two-wheel drive loader tractors with conventional single rib steering tyres.

Vulnerability to damage is also effected by soil conditions, when wet poorly structured soils such as clay are easy to compact and deform, as are some of the finer sands. Thus care needs to be taken in these circumstances. Similarly, wet conditions are also likely to produce lusher grass which is more easily smeared, and of course wet conditions reduce tyre adhesion and so make slipping more likely. All tractors and most mowers are offered with various tyre options, the cheapest inevitably being the narrowest and potentially the most damaging.

Unfortunately there is a direct relationship between ground pressure and grip: greater weight provides greater grip, hence agricultural tractors which are loaded up with weight to gain traction. Fortunately grip and traction can also be increased by increasing the ground contact area or footprint, hence the market for very wide low ground pres-



If the soil is compacted the roots do not have the space they need to absorb water and nutrition. The grass becomes weak and less resistant to damage or disease

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sure (Igp) or flotation tyres and even dual wheels. These options are available for the golf course tractor, though they do mean an investment which can be quite significant as wider, stronger wheels will likely be required. Of course there is little point in putting wide wheels on the back unless the same is done for the front axle. Problems can arise with older tractors – due to the extra forces imposed on the steering system and axle – and in many cases it will be more cost effective to start with a new tractor bought with the right wheels and tyres.

There is contention over exactly what is low ground pressure, with some tyre manufacturers maintaining that their low profile tyres fitted to standard rims and operated with low inflation pressure have a low ground pressure. This is something the greenkeeper should judge for himself – try the sand-pit test.

Equally important to ground pressure is tread pattern, eg. cleated, barred or ribbed tyres produce localised higher pressures on the ground with greater grass damage. Worst offenders are new agricultural tyres designed for grip, and easy options include dual-purpose road/traction tyres such as those found on diggers, which have more rubber and are less aggressive, while full road tread patterns are even better – all of these fit standard rims. However, there are a growing number of tyres with treads specifically designed for fine turf and these are likely to be produced with a wide (or wider) profile and softer sidewalls, thus further reducing damage potential. This can be done because these tyres do not need great sidewall strength as they are not designed for traction.

'Preventing jarring' is of course one of the most important aspects of a tyre as far as the golf course is concerned, as most ride-on machinery has minimal other suspension – perhaps a sprung seat – and thus depends on the air in the tyres. Obviously the greater the pressure the harder the ride.

Tyre markings provide a great deal of information and need to be quoted in full when ordering replacement or alternative tyres. Tyre developments have complicated the marking system to the extent that it can be confusing to all but the experienced, and there are a number of traps for the unwary, particularly if trying to fit non-standard sizes and tyres on wheels produced to differing standards. While the first numbers give tyre size and the nominal rim diameter, the final alphanumeric code is now likely to be a speed/load indicator, which imparts detail of the tyre's load rating at specific maximum speeds – this code replaces the ply rating given in the past – still found on many older tyres.

Other problems in fitting alternative sized tyres and wheels include the possibility of altering rolling radius so that speeds vary. This is not significant if only the speedometer is effected, however with four wheel drive there is a danger that front and rear axle can be mismatched, leading to wind-up and potential damage to the drives. Specialists in this field should have tables to provide a list of the possible options.

Few regulations apply to golf course machinery tyres unless used on the road, when they must be 'suitable' and in good order. Health and Safety requirements will apply to inflation pressures and to maintenance, especially if you have your own compressor. However, most turf tyres operate at relatively low pressure, where there is little danger of a high pressure blow-out.

Maintenance of tyres should be a simple routine of regular inspection and pressure check. This inspection should look for wear and damage, particularly to the wall → 10



Top: Is this really necessary? Will the added weights come off when the implement is removed from the tractor? Too much weight in the wrong place is bad for both turf and tractor

Middle picture: A decent width of tyre – but it still may leave lines

Left: Ugh! Tractor 'traction' tyres at play – is this necessary?

Making tracks

9 and shoulder, as early discovery can often save sudden failure or prevent premature wear and damage. Marking the correct pressure, either on the vehicle or on the wall near the pump, makes it easier to ensure that tyres are maintained at optimum pressure. Load carriers such as trailers have a range of optimum pressures, but inevitably these have to be set for the maximum load – unless you are prepared to adjust pressures frequently.

Tyres are actually designed for a specific deflection, or bulge, and the use of pressure as a measure of inflation is purely for convenience, allowing the tyre to be set for maximum loading and preventing over-inflation. Nevertheless with non-load carriers it is perfectly practical to measure the deflection rather than put a gauge to the valve.

Some greenkeepers undertake their own repair of punctures but most rely on specialist fitters. Punctures should not be a frequent occurrence unless you have bad tracks or are abusing your tyres by driving over rocks at high speed. If you have a lot of punctures, perhaps you should first look at the specification of the tyres – chances are that they are under-specified and an alternative make or pattern may provide the simple solution. Other premature failures come from misuse, abuse and under inflation, causes about which most tyre fitters readily inform you, especially if you accuse them of supplying a faulty tyre. However, tyre faults do occur occasionally and most manufacturers are happy to give a replacement or credit when this is due.

That stated, most greenkeepers get very good value from their tyres and apart from an occasional puff of air, seldom need to touch them from the time the machine is purchased until it is sold or scrapped – this makes it vital that the right tyres are fitted right from the start.

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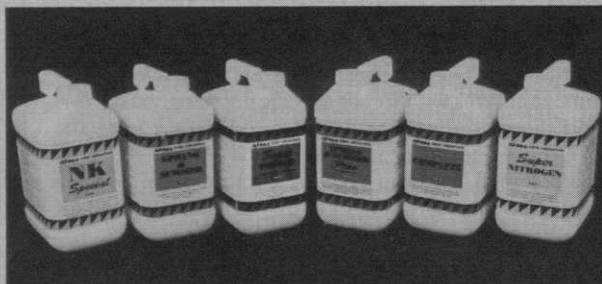
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■ A new range of distinctively styled tractors has been launched by Renault Agriculture Ltd. Identified by the new name and logo – CERES – the new line-up has power outputs from 54 to 83 DIN hp. Of particular interest will be the availability of a creeper transmission and the ability to lock a spool valve in the open position.

Comprising four models – the Ceres 65 (54hp), Ceres 75 (65hp), Ceres 85 (75hp) and Ceres 95 (83hp) – virtually every aspect of the range is new, with the exception of the engine. The robust and fuel efficient MWM (Ceres 65, 85 and 95) and Perkins (Ceres 75) power units used in the former MX and PX models have been retained. All models are available with either two or four-wheel drive. Details, Tel: 0608 62727.



■ The Farmura range of Flo Gro Super Concentrates are now available with new colour coded, wrap-round sleeves giving comprehensive information on how to use. Analysis is also expressed in weight:volume, enabling the turf manager to calculate the exact amount of nutrient he wishes to apply. Packed in 10 litre containers there are two containers per outer. With a concentration of two to five times greater than ordinary liquid fertilisers, Super Concentrates claim major advantages in storage, handling, distribution and packaging. Details, Tel: 0233 76241/581. Fax: 0233 76419.

■ Launched for the first time in the UK in April, Supaturf's Dilute 'n Shoot has been repackaged into one litre containers. Dilute 'n Shoot is the alternative way to apply a full strength application of AquaGro Liquid in a quick one-step operation. The package now incorporates a lightweight container of AquaGro Liquid attached to a hand-held spray gun that fits into the end of a standard hose pipe. The gun injects the correct level of AquaGro Liquid into the flow of water from the hose at a safe level for all turf areas. Details, Tel: 0455 234677.

