

What's at stake for newly planted trees?

Dr Terry Mabbett offers some advice on how to maximise success from your tree planting

Trees are an important and integral part of sports and amenity facilities and none more so than golf courses. Trees are positioned and planted for maximum playing and visual aesthetic effect, and to enhance the ecology of the facilities, directly through their presence and indirectly through the wildlife which they harbour and support.

Actual planting material and inputs including the labour required to plant and manage the trees does not come cheap.

Greenkeepers should strive for speedy and sound tree establishment and steady growth thereafter, interrupted only by pruning intervention to ensure mature tree canopies are of appropriate size and shape for their position, with respect to playability and negative impacts on turf such as shading of greens and encouragement of turf diseases like Fusarium patch.

Newly planted trees require a balanced integrated programme of care and maintenance including irrigation, fertilisation and support, the latter supplied by staking and tying.

Stakes and ties for newly planted trees

Newly planted trees lack the inherent stability of those in situ having grown from seed or natural vegetative propagation. As such they may require support and stability from staking and tying while forming a firm root anchorage.

Staking and tying is used to secure and steady trees to avoid undue stem movements and their transmission underground which may disrupt root anchorage and thereby reduce stability. Tree movements can tear newly developed roots from their tenuous anchorage around soil particles, and especially fine microscopic root hairs absorbing life-giving water and mineral nutrients.

The decision whether to stake and tie trees depends on size and condition of planted stock, site conditions, planting practice and maintenance and function of the planting site. It invariably comes down to cost versus benefits because staking and tying trees will significantly raise overall planting and establishment costs. Indeed it is not always worth the trouble and can be more cost





Double staking and tying is more appropriate for this substantial tree in an exposed situation

effective to plant replacement trees in the event of failure.

Trees planted on wind susceptible sites and sloping ground are most likely to benefit from staking and tying especially when planted in shallow sandy soils. Trees planted in locations prone to wind funnelling (eg. between buildings) are particularly at risk, as are those in public places prone to vandalism and incidental impact and damage from maintenance machinery and mowers. Underground guying of root balled trees may be the only practical way to avoid such impact and damage and therefore be justified even at the much higher cost.

The most appropriate method will depend on site condition and the size, structure and value of the tree, but also how it was raised in the nursery (e.g. container or field grown) and whether it was removed as a root-balled or bare-root tree.

The Royal Horticultural Society (RHS) recommends use of an angled stake or a pair of stakes for container-grown and root-balled trees and a single low stake for bare-root trees. Flexible stemmed trees should receive more support during the first year from a long stake which is cut lower in the second year. Large transplanted trees are sometimes secured with guys that can be attached to the lower branches or by using an underground guying system. Angled staking is recommended for trees planted on sloping sites.

Stake length depends on height

of tree and proportion buried in the soil, as determined by stake dimensions (length and diameter) and ground condition. Tying a secured stake to a planted tree will create tensions within the stake, the tie and most importantly the tree. Position of the tie in relation to tree height is important because it creates a pivotal point from which leverage is exerted by wind and periodically by vandals.

How long for and how high?

Choosing stakes and ties for planted trees is essentially a 'horses for courses' decision which has generated a wide variety of materials, products and methods for use within the surprisingly broad and innovative mixture of art and science that is the hallmark of tree staking and tying.

Small and low value tree stock rarely justifies the cost of staking and tying. By offering less wind resistance and minimal flexibility small trees are less likely to move. It is even claimed that some wind-caused movement stimulates root growth probably by opening up otherwise compacted soil. Whips whether they be seedlings, transplants or one year hardwood cuttings, typically with a 1 metre high central stem and little or no side branching, are unlikely to require staking.

On average newly planted trees need two to three years of growth before the root-ball becomes

securely anchored in the ground. Tree stakes and ties are correspondingly required for three years at least, depending on the tree species and nature of soil in which they root. Wood for stakes and synthetics used to manufacture ties should maintain material integrity throughout this period. Position of stakes in the ground and ties around trees should be checked during regular maintenance and adjusted as appropriate.

Stakes are best made of hardwood but not all 'native' hardwoods withstand wet soils like common alder one of few that can resist extended waterlogged conditions. Given the cost and relatively short working life, compared with fence

TOP LEFT: A single stout stake and one secure tie is appropriate for this small exotic oak tree

ABOVE LEFT: Trees tied to short stakes are vulnerable to vandalism like the remains of the silver birch shown here

ABOVE: Secure support and protection is entirely appropriate for this expensive to purchase exotic flowering cherry tree

BELOW: If there is no will or way to monitor staked and tied trees then it is best to invest in a tree restraint like the one fitted to the horse chestnut shown here

ABOVE RIGHT: A triangle of support for this Robinia in a high [public] pressure location

FAR RIGHT: These hornbeams along the fairway could benefit from staking and tying





posts, tree stakes are generally made of softwood machine rounded from 'roundwood' (wood too thin for sawmill use) and treated with preservative to extend durability. Larch is widely used.

Amenity trees will invariably receive fertiliser to stimulate early growth. Such dressings are known to enhance available food substrates in root zones which stimulates and speeds up wood destroying organisms. It may be worth investing in specially treated and cured stakes to combat this problem. Scots pine which is full of natural preservative resins is particularly appropriate for making stakes which will be exposed to aggressive soil conditions.

Tree ties and tying

High ties on tall stakes are claimed to create weak points just below the crown causing trees to snap off more readily at the tie. Risk may be reduced by using short stakes and correspondingly low-positioned ties, so that the lower stem remains rigid to give root stability while allowing top of the tree to sway in the breeze. This may offer long term benefits but where vandalism is a problem trees are more frequently snapped off at low ties on short stakes.

Tree ties should be sufficiently

tight but not too tight and display the right blend of plastic and elastic stretching in response to the fast increasing girth of young trees. Ties with insufficient 'give' soon give in, rupturing under the force of increasing tree girth. Alternatively they may slacken and fail to secure the tree to its stake and at worst leading to rubbing and chaffing of the soft bark with movement.

Best compromise is adjustable/releasable tree ties. These are straps or belts fitted with buckles and spacers for release and readjustment with increasing tree girth during routine maintenance.

For such a seemingly simple task there is a huge range of materials and products on the market. 'Home-made' ties can be generated quickly and cheaply using strapping cut to length and simply stapled, pinned or nailed to the stake. Three basic choices are plastic, rubber and hessian. The main disadvantage is no practical way of adjusting ties to accommodate growth. Unless untied loss of restraint when no longer required relies on degradation, weakening of the tie and subsequent rupture through forces created by increasing tree girth. Biodegradable ties overcome this problem.

Custom-made ties come in a range of types including cable ties (releasable and non-releasable),

plastic buckled belts and highly popular plastic buckled ties custom made with hoop collar and spacer. Spacers are small but vital components of the tying process to prevent contact and damage between tree and stake. Several spacers are frequently used or collar spacers which are equivalent in length to three or four individual spacers. Super-soft ties made of very soft plastic which acts as a cushion between tree and stake eliminate the need for spacers.

Biodegradable ties made entirely of natural plant materials avoid the problem of removing and disposing synthetic plastic and rubber ties after they have performed their function. Material stability is maintained for two years, begins to breakdown after three and biodegrades soon after.

Tree restraints

Tree restraints offer an engineered solution to securing trees and a generally maintenance-free option throughout their required working life. They are double-wire devices with one end secured by stapling to the top cut surface of the stake. The other end opens out into a plastic-cushioned and flexible double wire placed around but not in contact with the tree stem about half way up its height.



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Manufacturers claim clearance between restraint ring and tree promotes natural growth responses to wind movement. They are essentially maintenance free and dispense with re-visits to release, re-adjust and sometimes refit straps. Restraints are designed to last throughout tree establishment and will continue to restrain and support trees with stem girth (circumference) up to 20 to 24 cm.

Tree-tying methods

A single low stake usually driven into the ground prior to planting is standard for bare-root trees. Stake height above ground should be a maximum one third of the height of the tree with a gap of 2.5-3cm separating tree stem and wooden stake. The single low-stake provides sufficient stability and root anchorage at the base while allowing the stem to sway and become thicker from wind-induced, growth-promotion movement.

For root-balled trees two stakes are inserted opposite each other on either side of the tree or three stakes spaced equally around the tree each secured to the tree by a tie. Sometimes a horizontal cross bar is nailed across the two stakes to provide added stability for the

structure, and the tree which is tied to the horizontal bar. All stakes must be inserted outside of the root-ball. This 'belt and braces' option is particularly useful for planting trees on windy sites.

Guying and angled stakes offer specialist options for securing large transplanted trees on difficult sites. Low stakes inserted at a 45 degree angle away from the tree and used to attach secure strong wire (the guys). A rubber hosepipe or other suitable cushion must be used where the wire is in contact with the tree stem or branches, to prevent rubbing, abrasion and cutting.

Angled stakes can also be used with tree ties. They are driven into the ground before or after planting at a 45 degree angle and always leaning into the prevailing wind. Trees are secured to the stake using flexible tree ties which should be monitored during the growing season and adjusted accordingly.

Innovations and practical problems

Innovation risks trial and error and the latter is sometimes evident. One observed innovation for a group of maple trees involved a buckled belt around two opposite stakes and the centrally positioned

tree in helical style, so the tree was restrained by the crossed over straps. It was clearly quicker than securing each stake to the tree with separate ties, but if one stake dislodged it tended to take the other one with it and deprive the tree of what was only tenuous support in the first place.

Tree staking and tying is 'bread and butter' stuff but not as basic as the need to frequently water newly planted trees. I recently observed some sensible proactive replacement planting of young trees adjacent to 50 year old red flowering horse chestnuts in terminal decline from bacterial bleeding canker. Choice of species was sensible and pleasing. No more horse chestnuts to become infected with bacterial bleeding canker but beech trees three metres high and healthy.

Each was secured by plastic buckled tie to wooden stake and protected for good measure from vandals with black painted iron/steel guard two metre high and stapled to the stake for stability. Each planting represented well in excess of £100 for each tree and its 'tackle' but no-one bothered to water the trees. The diseased horse chestnuts have since been felled to leave a line of dead beech trees and a lot of wasted time and money.

TOP LEFT: A field maple literally breaks free from its tie

LEFT: Narrow plastic cable ties are particularly appropriate for bushy conifers with low situated branches

ABOVE: Small native tree planting material sited close together in a drift pattern to produce a thicket does not need staking and tying

BELOW: The string is of no consequence to the support of this hornbeam or the English oak and moreover poses a real hazard to wildlife



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History in the making

John Deere has a heritage to be proud of but, as Scott MacCallum found out, there is no resting on laurels



John Deere's personal history goes all the way back to the early 1800s when the then soon-to-become household name from Vermont, USA, started an apprenticeship in a local blacksmith shop. The UK Turf division of the company, however, is much younger and is celebrating its silver anniversary this year.

It is interesting that 25 years on from its launch, a photograph of the John Deere UK turf pioneers displays a group of vibrant young professionals, nearly all of whom are still connected to the company – no longer quite so young, but still vibrant and professional in every way.

Included within that number is current John Deere UK Managing Director, Richard Johnson, as well as Howard Storey, Richard Charleton, Phil Tong and Ivan Millar, who all still hold key roles within the UK and European business. The other member of the team in the photograph is Graham Williams, who recently retired, having launched the European irrigation division before being fitted for his slippers.

"The people who started the business are still an integral part of the team and I think that speaks volumes," said Joedy Ibbotson, who was recently appointed Turf

Division Sales Manager for the UK and Ireland, having been with Deere for over 12 years.

"Our wealth of experience and relationship with our customers is undoubtedly our biggest asset. We've got five Territory Managers and they've been with us for an average of 15 years," said Joedy.

One of the more recent recruits, however, is Paul Trowman, National Account Manager for Turf Equipment, who took on the role two years ago.

"It's a big company but everyone is so welcoming and wants you to succeed. We are all proud to be working for John Deere," said Paul.

It may be a large multi-national company but as Joedy explains everyone who works for John Deere is aware of what the name stands for.

"We never stray away from the core values of integrity, quality, commitment and innovation. They are at the heart of everything the company does and that will never change," he explained.

Joedy has taken on his new role at a time when John Deere has set itself the task of doubling in size by the year 2018. It sounds a mountain to climb, even more so when you learn that currently Deere has a turnover of \$25 billion, and the target is to hit \$50 billion annual turnover within the next seven years.



The golf business in the UK will provide a relatively small amount of that growth, with the hard yards being made by the agricultural side, but it will still be expected to add its share.

"The agriculture business is very cyclical, and successful years tend to be driven by commodity prices. The beauty for us, as a turf business, is that it's much less prone to fluctuation," said Joedy, speaking from the UK Headquarters at Langar, near Nottingham

So where will the new growth be achieved?

"Overall it will come from the emerging markets – Brazil, Russia, India and China. The world's



population is expanding rapidly and needs to be fed, so we will need to grow more food and become more productive. That's where our agricultural business is going," explained Joedy,

Making in-roads into those new markets is made slightly easier for John Deere as it has one of the most distinctive brands in the world and its leaping deer logo is one of the most recognisable around. Very few people, in very few countries, will not be familiar with it.

"On the golf front it is very difficult to see where any huge expansion will come from. Ultimately it comes down to the number of people playing the game and how many new courses are being constructed. So it will be on market share that we will be looking to make ground."

With every aspiration, or target, must come a strategy designed to make it possible and, in John Deere's case, a two pronged attack has been identified.

"The first very much surrounds new products and innovation and the company is investing very heavily in new technologies. Globally we invest over \$3 million every single day of the year in research and development so you can see how important it is to us.

"We were first to market with Hybrid technology back in '05 and this has been extremely successful for us," he said.

"When we introduce new technology it's always a case of how quickly it will be adopted but I believe that the greenkeeping industry, as a whole, is very quick to embrace new ideas," said Joedy, who also revealed that just last year the company turned out the 500,000th model of the popular Gator utility vehicle from its Wisconsin factory.

The company recently took dealers to Portugal to show them some of the new machines in the pipeline including a robotic mower which is aimed at the domestic market but whose technology could conceivably be transferred to the golf market offering the option of silent night time mowing.

The second prong towards the 2018 target is those John Deere dealers.

"All the main manufacturers make high quality products but the real differentiator is how well you support that product," explained Joedy.

With that in mind, John Deere has created a programme named "Dealer of Tomorrow" as the key to developing this element of the strategy.

"It is a really strong programme and revolves around the support, training and development of our dealers to ensure that they have all the skills and knowledge so that John Deere customers are provided with exactly the service they expect from us."

And that is not as easy as you might think as John Deere's dealer network across UK and Europe extends to an incredible 20,000 people.

Being a division of a mighty company has its advantages when it comes to the ever-vital spare parts service.

"We have an on-line parts services so, much like Tesco and Asda, our customers can go onto the net, select a part and identify that it is correct on screen before ordering. We launched this a few years ago and we've had a lot of positive feedback.

"If we don't have a particular part here in the UK we have a plane that comes over every night from Germany which lands at Birmingham Airport. We have the part with most UK mainland dealers by 8.30am the next morning.

"In this regard we are very fortunate that we can piggyback on the back of the agriculture business. If we didn't have that there is no way as the turf business we'd be able to provide such a service. The business just wouldn't stack up. We are a large agricultural manufacturer and we are very fortunate that it means we can provide such a service to our turf customers. It's certainly not something we would apologise for.

"We utilise the scale of the agriculture business but we are rigorously focused on the turf business. We have 13 people whose core responsibility is golf but then the roles of the back room staff are shared," explained Joedy.

The irrigation side of the business was launched four years ago and John Deere can now point to the number of clubs with full systems in the UK alone as well as many others who have purchased replacement heads as to how quickly John Deere Irrigation has established itself.

But establishing is something at which John Deere is particularly adept.

"When we started out, we could only have dreamt about being involved in events like The Open Championship and the Solheim Cup but we've just come off a successful Open Championship, at Royal St George's, where we were a Preferred Supplier, and later this month it is the same with the

Solheim Cup at Killeen Castle, in Ireland," said Joedy, who also revealed that they had recently signed a machinery deal with Donald Trump for his new course in Aberdeenshire.

"That we now regularly support major tournaments is testimony to how far we've come as a division and it makes us extremely proud.

John Deere is equally keen to support BIGGA and has been a Gold Key supporter since the early days of the programme.

"We want to be involved with the learning and development side of BIGGA as it fits well with our core values and desire to build long term relationships," said Joedy.

Another event which may make a return to the golf calendar is the popular John Deere Team Championship which, for a number of years, provided additional funding for BIGGA's education programme based on the number of teams which entered, and whose last playing culminated in a spectacular final at Turnberry.

It does all make you wonder what the young Master Deere, who started his apprenticeship back in 1821, would have made of it all. Now, 190 years on, his name is known the world over and appears on the side of sophisticated, beautifully-liveried green machinery at clubs of a global sport which barely existed when he was alive.

John Deere UK may have a more modern heritage but the progress would have made their founder proud.

"We want to be involved with the learning and development side of BIGGA as it fits well with our core values and desire to build long term relationships"

Joedy Ibbotson





Smart management

Kerran Daly MG looks at how you can keep a well maintained golf course in times of austerity measures





In a profession where growth is an essential prerequisite for quality work and happy customers the last thing greenkeepers want or need is low or, even, no growth. Growth is an absolute necessity for the health of the turf and the development of smooth, true playing surfaces.

Out in the wider world of business the same rule applies. Very low or no growth in the national economy spells trouble for all. The recent recession and the current austerity measures illustrate the point well. More unemployment, less disposable income and less corporate hospitality all add up to less golf being played and less income for golf clubs. This, of course, does not apply in all cases but as a general rule times are difficult for the average golf club.

It is at times like these that golf clubs look very closely at their budgets in an effort to identify areas in which they can increase their income and reduce their costs. Greenkeeping budgets may come under even closer scrutiny with requests from clubs to reduce expenditure.

Proactive management

First and foremost the greenkeeping department must recognise that doing all they can to help the club financially is in their best, long term, interests. Trying to maintain unrealistic budget levels, which

were set in more financially sound times could be seen as negative and unhelpful by the club. On the other hand, a positive concern to assist in reducing the club's financial burden will be appreciated and gain respect. Indeed, in the most severe of cases it may also keep the club in business and protect greenkeepers' livelihoods.

Course Managers should therefore be proactive in developing realistic, sustainable budgets. Indeed the manager of any department in any business has a responsibility to produce the goods in the most efficient way possible. Under the current economic climate this has become one of the most critical aspects of the job.

Build in flexibility

It is important to note that it is not the Course Manager's job to set the budget. That duty falls to whoever is in charge of the overall finances of the club, be it the Owner, the Treasurer or the Chairman of

the Board. The job of the Course Manager is to prepare budgets for the Club to accept, reject or modify. Note the plural 'budgets'.

If you were recommending a new piece of machinery one method would be to put forward at least four options:

The most expensive, with all the bells and whistles, which you probably cannot afford.

The machine you want and think you can afford.

The cheaper option which has its disadvantages.

And finally, the 'staying as you are' option, without a new machine and the consequences for the condition of the course.

When constructing the budget the same objective should apply. While you do not need to put forward four distinct and different budgets, you should be giving as much variation and options for the club to suit its current financial position.

This may best be achieved by setting out your preferred proposal for each area of the budget in a spreadsheet as you would normally do and then listing the variations to your proposal immediately after each section, clearly stating the additional cost or the possible saving and the consequences it will have for the course.

See table.

Topdressing makes up the major part of the greens budget. If asked to make savings in the materials budget we could put forward:

Reduce topdressing for greens to 50 tonnes @£46.00 per tonne for this year only = £2,300.00. This results in a budget saving on greens of approximately 20%. This will slow down progress on soil exchange and improved surface drainage targets, but will not cause lasting damage as long as we return to optimum dressing quantities when funds become available.

Alternatively you may decide that maintaining the greens topdressing is imperative and decide not to put forward this proposal and instead suggest the necessary savings in other areas of the budget.

The four main areas of the budget are labour, materials, machinery and course improvements. Some points of note when you are being asked to make savings are:

Labour

It is clear that reductions in labour are the most crippling and will have the biggest impact on the condition and presentation of

Materials for greens budget (figures for demonstration purposes only):

Allocation	Area	Qty	Unit	Unit Cost £	Total Cost £
Greens					
Fertiliser	1 hectare	40	20kg	35.00	1400.00
Top-dressing	1 hectare	100	tonnes	46.00	4600.00
Seed	1 hectare	10	20kg	100.00	1000.00
Herbicide	1 hectare	2	litres	28.00	56.00
Wormkiller	1 hectare	4	litres	15.00	60.00
Insecticide	1 hectare	1.5	litres	25.00	37.50
Wetting agent	1 hectare	100	litres	12.35	1235.00
Fungicide	1 hectare	100	litres	15.00	1500.00
Conditioner	1 hectare	10	20 litres	41.60	416.00
					10304.50