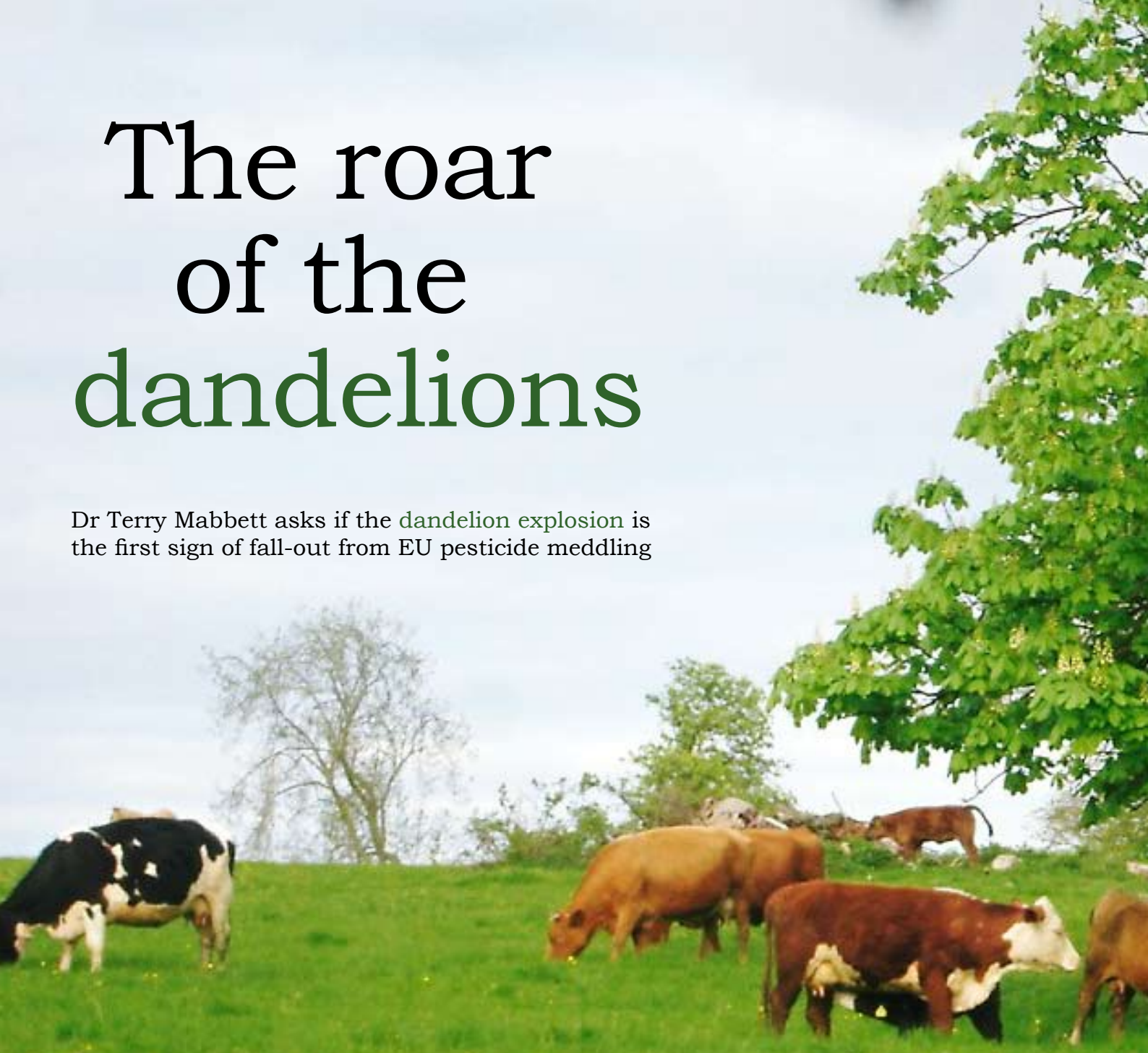
The roar of the dandelions

Dr Terry Mabbett asks if the dandelion explosion is the first sign of fall-out from EU pesticide meddling



It is naive to think you can build up a sophisticated programme of chemical pest control then dismantle it wholesale without disturbing the environmental equilibriums created over many decades.

Some observers say this is root cause of the dandelion 'explosion' seen this year and blame EU's ongoing onslaught on chemical pesticides across the amenity and agriculture sectors.

Dandelion is not a dedicated weed of sports turf, like slender speedwell, so what has this got to do with golf courses? Indirectly, a lot, because as well as being a potential weed of golf greens, tees and fairways, dandelion is ubiquitous and frequent in farmers' fields, amenity grassland in parks and sports fields, on grass verges and waste ground and actually in hard surfaces.

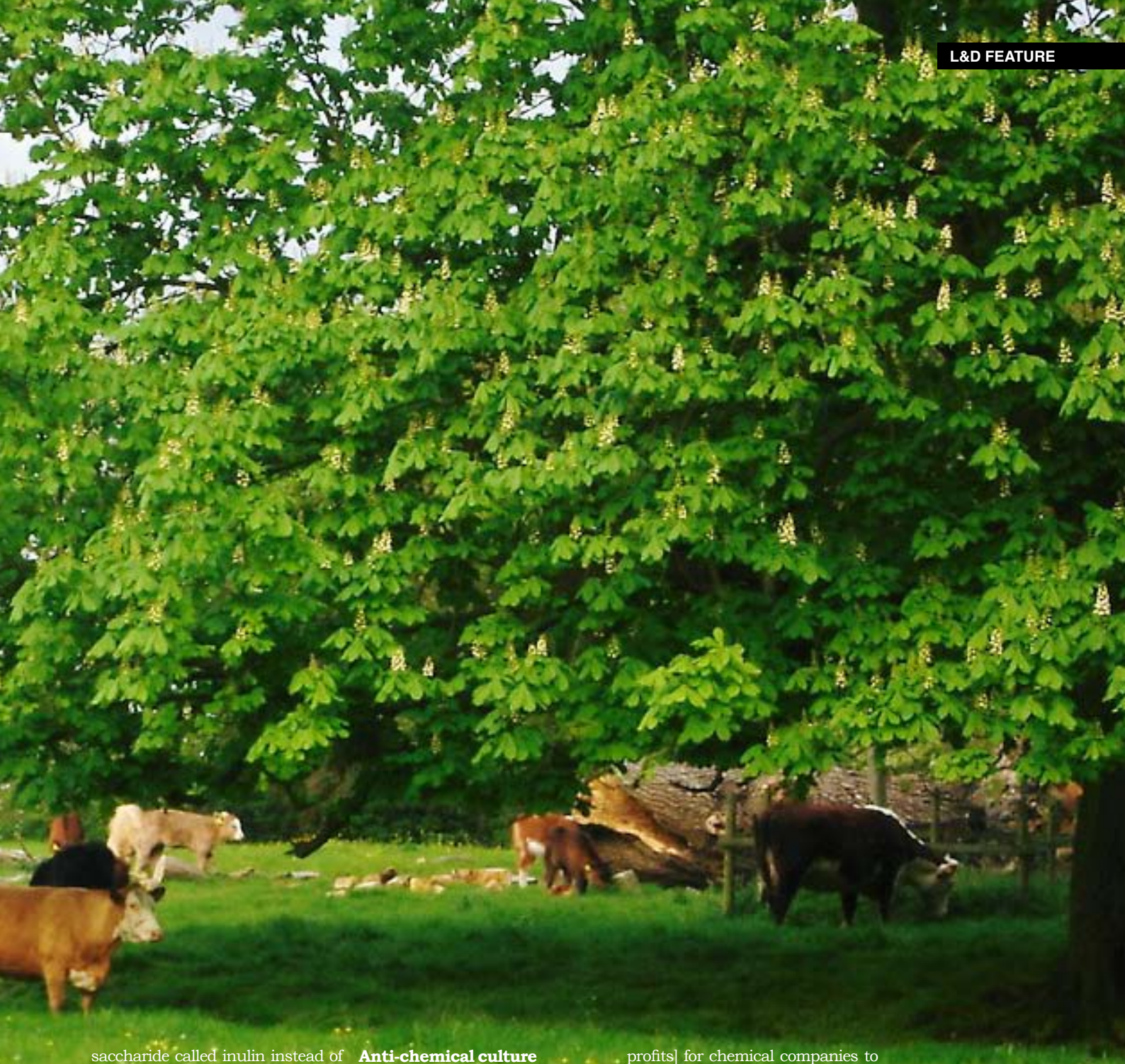
Moreover it generates a huge seed load throughout spring and summer carried 'anywhere and everywhere' by the super-efficient, wind-energised seed dispersal mechanism. The fall-out for golf courses and greenkeepers could well be a sky-full of tiny 'parachutes' (pappas') each carrying a new dandelion plant.

Dandelion escapes control

It would be ironic if first plant to escape decades of tight weed management should be the 'dear old dandelion', much loved by children for 'telling the time' and their grandmothers for making dandelion flower wine. Weeds don't come more basic than the dandelion with its nomenclature firmly established in the Norman Conquest of England. Dandelion is an old English corruption of the Norman French 'Dente de Lion' (Lion's teeth) in recognition of the sharply toothed margins of large flat rosette-forming leaves which together with long robust tap roots make dandelion a formidable turf weed.

Others say it has less to do with herbicide restriction and more to do with the tap root, enabling dandelions to survive exceptionally cold winters like 2009/2010 and gain a growth start over grass and other plants in spring. This year's exceptionally late spring, they claim, aggravated the situation by delaying amenity grass mowing and herbicide application.

Dandelion tap root is a useful organ and unusual too in the way it behaves after attempts to dig out the entire plant and also in what's inside. Dandelion tap roots contain the unusually found storage poly-



saccharide called inulin instead of commonly occurring starch. Inulin is composed of fructose sugar units instead of glucose sugar units in starch. There is some suggestion that inulin can act like an 'anti-freeze' allowing dandelions to survive exceptionally low temperatures.

Attempts to dig a dandelion out of the ground especially without a dedicated tool invariably leave pieces of tap root behind which develop into new plants. Dandelion lacks a true stem and its leaves simply sprout from positions on the taproot. Such peculiar tap root characteristics occur in other members of the plant family Asteraceae (Compositae). Ragwort behaves in exactly the same way after failed attempts to dig out the entire plant and the root tubers of Dahlia, a popular garden plant, contain inulin.

Anti-chemical culture

The undisputed 'plague' of dandelions this spring and summer is as much due to the prevailing anti-chemical culture and the economic slowdown. You don't have to look far and hard to see how local authorities and other land management organisations are forced to cut back and economise at the expense of amenity grassland management.

EU's constant chipping away at the list of approved products on both safety and environmental grounds is clearly making its mark. Range and depth of pesticide chemistry available to amenity and agriculture is progressively eroded and restricted by EU withdrawal of specific actives or curtailing the way in which others can be used. In addition it is now becoming so expensive [in relation to potential profits] for chemical companies to produce additional data that they may withdraw some of their own products.

Some have suggested aminopyralid herbicide residue in farmyard manure reported several years ago may have affected herbicide application to agricultural grassland where dandelions thrive in ryegrass pastures. Aminopyralid is a hormone-based herbicide used by farmers to control deep rooted broad-leaf weeds including dandelion, ragwort and thistles in pasture.

The anti-chemical culture, created by anti-pesticide lobbies, regards chemicals as a 'dirty word' with 'brownie points' to be won by 'coming out' against their use. Amenity managers and operators are becoming increasingly 'frightened' to use chemicals and 'everyone'

(MAIN PHOTO) There are fears that reduced use of herbicide in the agricultural sector is adding to current problems with dandelions

is scrambling to get on board the biocontrol 'bandwagon'.

Golf courses and greenkeepers in particular cannot always hang around waiting for the 'right' weather and environmental conditions to arrive to apply biopesticides according to label recommendations. And then wait around some more while these density dependent biological control agents start to work. Anyone who thinks otherwise is out of touch with the practical and commercial realities of maintaining pristine golf courses.

Opportunity knocks for dandelions

Dandelions are opportunistic weeds of turf. Seeds exploit germination sites in late summer and early autumn sports turf increasingly 'threadbare' after drought and heavy wear and tear, germinating quickly when autumn rains and early morning mists start in earnest during October. Look again in the low light conditions of January and you probably won't see the myriad of tiny weed seedlings including dandelions ready and waiting to go with the arrival of warmer spring temperatures and longer days. And go they will because come spring the under managed fairway can rapidly go from 'grass green' to 'dandelion yellow' after a few warm days in April.

Sheer speed of flowering in dandelions is phenomenal with grass verges green one day and yellow the next. As all accomplished wine makers know it is this first rush and flush of dandelion flowers in April that makes the best wine. Similarly all amenity managers, whether they are groundsman, park keepers or local authority highway managers, should realise that it also sets the scene for seed dispersal and next year's infestation. And not only for them but everybody else, including the greenkeeper on the golf course 'next door'.

Dandelion is rarely a weed problem on well tended golf greens where traditional tightness of the turf grass sward will essentially exclude this opportunistic weed. But fairways and even tees are a different matter with un-replaced divots offering an open invitation to dandelions and other 'like-minded' weeds. It is not uncommon to find otherwise well looked after tees supporting quite substantial numbers of dandelions, and other weeds like ragwort and sowthistle not normally found in fine turf, that have germinated and established quickly by taking advantage of soil exposed from 'teeing off'.

The danger from dandelions to closely cut and well groomed sports turf is the rosette of large flat leaves acting as 'light blockers' as they cover, smother and shade surrounding turf grass plants. Like many other erstwhile agricultural and garden weeds that colonise professional turf dandelions have a versatile habit. Prostrate biotypes, evolving in response to close regular mowing, lay flat on the ground so that at the leaves and the growing point, which is situated even lower, escape the mower's blades.

Greenkeepers well armed

Dandelions have a high requirement for potassium and are therefore prominent in potassium-rich swards of ryegrass (Lolium perenne) and meadow grass (Poa spp). Switching to a higher bentgrass (Agrostis spp) and fescue (Festuca spp) composition with a correspondingly lower requirement for potassium keeps dandelions in check.

Physically digging out individual dandelions is another option and there are hand-tools dedicated to this task. However, it risks more infestation from pieces of tap root left in the soil while the patch of bare soil remaining is open to even more weed infestation.

Spraying with an appropriate selective herbicide will gradually kill dandelions allowing turf grass plants time to gradually re-colonise any exposed soil.

Golf courses are still well-armed against dandelions and other broadleaf weeds in turf. Most actives come within the so called 'hormonal' grouping of herbicides because their molecular configuration is similar to that of naturally occurring plant auxins. They selectively kill broadleaf weeds like dandelion in turf through hyper-stimulation of growth to cause weed 'exhaustion' and death.

This 'grouping' includes the 'old favourites' 2-4, D and MCPA with a 1940's vintage, mecoprop and dicamba developed the 1960's and modern equivalents such as clopyralid and fluroxypr first appearing in the 1970's and 1980's. Together with more recent herbicide active additions like diflufenican and florasulam, with completely different modes of action, turf on golf courses is for the moment at least potentially well protected against weeds.

Commercial herbicide products for selective broadleaf weed control in managed turf usually contain a mixture of active ingredients ide-

ally with different modes of action and target species spectrum. This provides more breadth and balance in weed control activity and action. Dandelion is generally recognised as one of the more resilient turf weeds. Together with other 'hard to kill' turf weeds, dandelion often requires higher, more frequent or differently timed applications (according to stage of weed plant growth and development) as per recommended on the herbicide product label.

Everything may be 'dandy' for the control of dandelions and other broad leaf weeds in turf at the moment.

However, if the EU continues to squeeze the availability and use of herbicide actives across the board, meaning less chemical weed control and more weeds in the amenity and agricultural sectors, then the story ten years down the line could be completely different.

Dangerous dandelions

Anyone who thinks the dandelion is not a 'dangerous' weed should ask the Japanese how British dandelion, as an alien invasive weed, is hybridising with their native dandelion. The British dandelion (Taraxacum officinale) is more difficult to control than Japanese dandelions (Taraxacum japonicum) (called 'Kansai tampopo'), and more importantly 'crosses' with it to form hybrid plants that are essentially infertile.

Research work in Osaka's Tsurumi Ryokuchi Park showed British dandelions were 'wiping out' Japanese dandelions, although UK amenity and sports turf managers faced with Japanese Knotweed would probably argue the Japanese had got a better deal.

Anyone still not convinced about dandelions need look no further than the UK railway network where a brand new and powerful locomotive was recently 'brought to a halt' by the dandelion. In May 2010 Grand Central Trains reported a brand new train on only its second run (return trip from Kings Cross to Yorkshire) limping into Halifax Station an hour late because the filters on four of its five engines were clogged with hairy dandelion seed (pappus). Greenkeepers on golf courses alongside railways, and there are many for historical access reasons, beware.

Mention of any herbicide active is not a recommendation for its use. Users and operators should read the product label and if in doubt ask the supplier and/or manufacturer.

Prostrate dandelion biotypes lay flat on fine turf so that the growing point, leaves and sometimes even the flowers escape the mower's blades

Dandelion (top right) is not a dedicated turf weed like slender speedwell (centre)

Dandelion is an opportunistic turf weed, its seeds exploiting gaps in the sward

Turf can quickly go from 'grass green' to 'dandelion yellow' in April

This year has seen a flush of dandelions especially in uncut amenity swards

This is the fall out for greenkeepers from the dandelion explosion in the amenity sector

Dandelion taproot can penetrate weathered tarmac

A dandelion between 'a rock and a hard place'