Southern England’s middle summer months left a distinctly dry taste for turf in 2010. A succession of scorching hot and rainless days through June and July left turf dry and drought-stricken with a repeat of 1976, one of the hottest and driest summers on record, looking a real possibility.

All grades of un-watered turf across the region became brown and lifeless as turf grasses shrivelled, although many broadleaf turf weeds were still growing and outwardly unaffected. They continued to flower, fruit and seed, staking out a strong and dominant position for the return of normal growth conditions.

In the end the notoriously fickle British weather saved the day following an extremely wet August with the lowest recorded mean temperature for 17 years. Equally remarkable was the speed of turf grass recovery which by September looked lush and green as though nothing had happened, except for the weeds. At the height of the drought in mid-July turf weeds such as white clover (Trifolium repens) and yarrow (Achillea millefolium), recognised as drought-tolerant, and others like self-heal (Prunella vulgaris) and creeping cinquefoil (Potentilla reptans) which are not, were seemingly unaffected by the drought, flowering profusely with seeds ripening quickly in the hot summer sun.

UK turf generally benefits from a benign climate and environment and is relatively untroubled by biological agents (e.g. weeds) compared with turf grown in other parts of the temperate world. But for the first time since its widespread development and adoption as a playing and leisure surface, UK turf could face a double-whammy of man-made and contrived threats with a combined and related force that could change the face of golf courses.

First is the generally accepted threat of climate change and global warming which promises hotter and drier summers on a regular basis. Second is the EU blitz on turf pesticides right across the sports turf and amenity sectors. Disappearing fast are products using a long-established and traditionally-used range of sophisticated and high efficacious herbicide actives. Greenkeepers have relied on herbicides to keep their most professional playing surfaces (greens and tees) essentially weed free and to manage weeds as appropriate across the rest of the golf course. At first sight the two seem totally unrelated but nothing could be further from the truth.

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Broad leaved plants are generally better able than turf grasses to withstand drought conditions and those which grow in turf always manage a head start over grasses. They didn’t then wouldn’t be successful turf weeds. Some might argue that disappearance of established herbicides for managed turf is a ‘red herring’ in relation...
to increasingly severe summer drought conditions] because selective herbicides are never applied during extended periods of dry weather when the grass is not actively growing. But on the other side of the global warming ‘vortex’ are predicted wetter winters with the classical December-February UK winter period squeezed at both ends by extended autumns and earlier springs.

These are the seasons when weed pressure, originating during but dry summers, will be felt. You only had to look at the lush green turf in September 2010 to see how the situation had changed in a matter of weeks. Turf grass growth had recovered but weeds like white clover and yarrow didn’t need to recover and simply took over with huge patches across even professional sports turf. And if herbicides are no longer available for prompt application in September when the rain resumes there will be no way of shifting such fast moving and well-established weed growth that will persist through to spring.

The industry is preoccupied with new grass species and varieties to withstand hotter and drier summer conditions but largely ignores the inherent capacity of many native and naturalised broad leaf turf weeds to effectively withstand severe drought conditions. We are so conditioned to our inherently wet climate that we never dream to imagine that native and naturalised broad leaf weeds are drought tolerant.

What’s more those plant characteristics like finely-divided leaves with thick cuticles and underground vegetative organs, which confer general drought tolerance, are often the very same characteristics that make drought tolerant species difficult to kill with herbicides. In a rucked plant leaf shape and surface structure that makes it harder for water to escape from the plant make it equally hard for herbicide to get in.

Yarrow

Yarrow is the classic drought tolerant weed of UK turf with finely-divided leaves protected by a thick cuticle and wax bloom and providing the ideal bucranum against excessive loss of water by transpiration during hot dry conditions. These are the self-same plant characteristics that make yarrow one of the most herbicide-resistant weeds in UK turf. Yarrow thrives in undermowned low fertility soils and swards and will continue to grow when the grass cannot. The turf root zone may be brimming with nutrients but if the fine fibrous root system of turf grasses cannot enough extract water from the soil to compensate for transpiration then it [the soil] is all but useless for all intents and purposes functionally infertile.

Leguminous turf weeds

A select group of leguminous plants including white clover, bird’s foot trefoil (Lotus corniculatus), yellow sucking clover (Trifolium dubium) and black medick (Medicago lupulina) are dedicated weeds of UK turf with two essential and related things in common. All have the capacity to access their own supplies of nitrate courtesy nitrogen fixing bacteria (Rhizobium species) that conduct a symbiotic relationship with the leguminous plant from their position in the root nodules. In addition all these leguminous weeds are inherently drought tolerant.

Nitrogen is an essential major nutrient for growth which most plants including grasses can only source it as water soluble nitrate ions (NO3-) Plants which are unable to source water from soil during drought conditions will typically lose access to nitrate fertilizer. No such problem for leguminous plants which take advantage of any shortage of soil water and soil nitrogen by ‘making their own’.

Individual leguminous turf weeds may possess other characters that confer drought resistance

But parsley piert and dove’s foot cranefoot in particular with their fondness for sandy free-draining soils would be expected to have a high degree of drought tolerance. Furthermore the inherent soil structure of golf greens and tees with their distinctly sandy free-draining basen are clearly potential prime sites for these weeds whether or not water stress in summer is a problem. The clear advantage given to such weeds during June and July was evident by September with parsley piert spreading on golf tees as its common name implies like parsley fit for a salad.

That apart even those weeds like self-heal which most frequently occurs as a problem weed of persistently damp and poorly drained turf, and creeping cinquefoil typically found in wet neglected areas, can often be outgrew in the face of drought conditions. The clear advantage given to such weeds during June and July was evident by September with parsley piert spreading on golf tees as its common name implies like parsley fit for a salad.

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What’s more those plant characteristics like finely-divided leaves with thick cuticles and underground vegetative organs, which confer general drought tolerance, are often the very same characteristics that make drought-tolerant species difficult to kill with herbicides. In a nutshell, plant leaf shape and surface structure that makes it harder for water to escape from the plant make it equally hard for herbicide to get in.

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That apart even those weeds like self-heal which most frequently occurs as a problem weed of persistently damp and poorly drained turf, and creeping cinquefoil typically found in wet neglected acid turf, were doing well enough at the height of heat and drought in July 2010. They were flowering and setting seed to take full advantage of the late summer and autumn rains that would follow just a few weeks later. Even weeds like slender speedwell known to prefer damp soils did not appear to have suf-
fired. By September this dedicated turf weed was growing profusely alongside opportunistic turf weeds such as bristly ox-tongue (Picris echinoides).

Tap roots all round

Small leaved weeds may go unnoticed in the grass but there’s nowhere to hide for turf weeds from the family Asteraceae (Compositae) irrespective of whether the sward is actively-growing or static. Anumber of factors combine to make dandelion (Taraxacum officinale), cat’s ear (Hypochaeris radicata) and to a lesser extent smooth hawk’s-beard (Crepis capillaris) and mouse-ear hawkweed (Hieracium pilosella) formidable turf weeds.

The common factor which enables this group of closely related species to withstand severe drought is a tap root. Packed with polysaccharide to withstand severe drought is a tap root. Dandelion was already having a goodyear (Greenkeeper International, July 2010) and the summer drought just added to this relative advantage over turf grass, so that by September dandelions were much more prominent and frequent in fine turf than usually seen at this time of year. And especially on golf tees where dandelion seeds germinate and readily short tap roots have traditionally allowed these perennial plants to survive frozen soils of winter and get a head start over turf grass in the spring.

Fears for the future

The drought tolerance of dandelion and other members of the family Asteraceae (Compositae) like cat’s ear are evident from their success as turf weeds in South Australia, where there are four consecutive excessively hot summer months with virtually no rain. Should global warming arrive and develop at the speed and on the scale predicted five years ago for the UK then turf weeds will present a huge problem for golf courses. Not in mid to late summer, when the grass is dried out and herbicide application is not an option anyway, but certainly during the rest of the year starting in autumn, when the rain returns and still-growing weeds have a head start over turf grasses. And at the very time when on-going EU pesticide legislation seems hell bent on removing chemical herbicides from the marketplace, leaving greenkeepers with few if any proactive practical options for turf weed control.

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