

Wear and tear

Dr Terry Mabbett discusses the wider weed and disease implications of wear and tear on turf, a topic of interest to greenkeepers at all levels

2012 was supposed to be the year when wear, tear and stress on UK sports turf would reach unprecedented levels from a population fuelled and fired up into frenzied sporting activity, inspired and encouraged by the Olympics being held on home grown turf for the first time in more than sixty years.

In late March it looked almost certain that UK turf, having been well-trodden during a much heightened sporting season, would take an accompanying and related hammering from unprecedented hot and sunny weather and intensifying drought.

Grass plants were already struggling to grow and sports turf faced the looming possibility of being 'hung out to dry' to a degree not seen in living memory even during the summer of 1976. A clutch of water authorities covering southern and eastern England and parts of The Midlands completed the deteriorating picture by introducing severe water-use restrictions, including hosepipe bans, on all and sundry including the sports and amenity sectors.

Hosepipe bans and monsoons

Having reached this 'high and dry' point everything promptly started to go wrong or right whichever way you care to look at it, and in classic British style. Temperatures plunged in April so that sports and amenity turf along with every other growing system, including flowering shrubs and bedding plants, were placed in 'suspended animation' for at least one month. Consequently what appeared in March to be one of the very earliest springs on record was transformed into one of the latest.

Repercussions from this truly 'upside down' and 'inside out' weather pattern subsequently spread far and wide not least there being hardly any May Blossom (hawthorn flowers) to celebrate May Day and garland 'The Queen of the May' and something that very rarely happens. To crown it all rain started to fall within hours of the hosepipe bans coming into effect and rain it did. Apart from a pre-Jubilee week of very warm weather it feels like the rain hasn't stopped since April and for me brings back memories of trying to work in the



The 'seeds' of diseases like Fusarium Patch and Anthracnose are established on turf stressed out during mid to late summer (Photograph 2) from drought and heavy traffic. But the symptoms invariably do not show until the long shadows and fallen leaves of autumn

rainy season in Trinidad where it buckets down for days if not weeks on end.

As I pen this piece just after the Queen's Jubilee it is not so much 'Flaming June' but 'June Monsoon' but without temperatures in the 75 to 85°F range that accompany the monsoon in the hot and humid tropics. Wear and tear on turf appears to be no problem and is the last thing on most people's minds, simply because the weather is just too bad and playing surfaces too inundated to play sport. Indeed the grass looks lusher and greener

than I can ever remember for mid-June. Major and iconic sporting and amenity events including cricket matches and county shows are being cancelled.

However, there is still time. Turf and sports turf in particular is the most reactive of all terrestrial green plant surfaces. Not only does it rebound and recover growth, colour and quality quickly, even after receiving the most severe hammering from intense traffic and high-temperature low-moisture conditions, but will just as quickly regress when such conditions return.

Weather forecasters are predicting unsettled and very wet weather for the rest of June but the promise of a 'proper' summer from July onwards is on the cards. If this turns out to be true it won't take long for today's soaked and sodden turf to dry out. Following two hot dry months all this water and green grass could be a distant memory by early September.

What's more I suspect a lot of ground is still compacted, in spite of near record rainfall levels, from the prolonged winter and early spring drought. At the same time appalling weather conditions experienced since April will have disrupted a lot of 'bread and butter' turf management work designed to alleviate ground compaction and to promote grass growth.

Wider implications

The immediate implications of heavy wear and tear on turf are heightened physical damage and physiological stress, accompanied by soil compaction and the formation of hard-pan soil surfaces which simply add onto and aggravate grass plant stress. Heavy traffic and higher wear and tear is invariably accompanied by high-temperature, low-rainfall conditions for the very good reason that sunny dry weather brings out sportsmen and sportswomen in their droves.

Tunnel vision and vertical thinking has no place in the long term management of turf. Turf managers are required to understand and appreciate the bigger picture and wider implications of turf stress from wear and tear and heat and drought, and not least when it comes to turf disease and weed growth in professional sports and amenity turf.

Specific turf weeds and diseases which become prevalent during periods of summer stress are relatively easy to understand and appreciate. However, there will be



Sports turf is a highly reactive surface. Golf tee shown here (photograph 1) during the hot dry April and May of 2011 and just weeks later in June 2011 (Photograph 1A) after substantial rain

other and often more serious long term problems, the 'seeds' of which are sown during summer stress but which do not show until autumn.

For turf weeds

As wear and tear builds up and turf progressively dries out the ability fine grasses as a sward to compete with broad leaf weeds changes. Balance will be progressively and often violently tipped in favour of the clovers, tap-rooted rosette weeds that can penetrate and withstand the hard compacted upper layer, and inherently drought resistant weeds like yarrow.

Grass effectively stops growing being unable to access sufficient water and therefore soluble nitrate for leaf growth. The clovers including white clover, yellow suckling clover, black medic and bird's foot trefoil do not have this problem. They can fix their own nitrogen via bacteria in the root nodules and therefore carry on growing, flowering and setting seed at the expense of turf grass.

During periods of mid to late summer drought it is not unusual to see huge patches of these patch forming weeds in full flower. These clover biotypes are well adapted to turf by presenting a ground hugging prostrate habitat that allows flowering stems to escape the mower blades, and adding to the weed seed load that finds plenty of germination sites in the now threadbare turf.



Under drought conditions it is not unusual to encounter huge patches of white clover which is a typical matt forming weed of turf



Bird's foot trefoil has the added advantage of a sturdy and deep seated tap root enabling it to access water from a deeper position within the soil profile and to withstand the physical forces and physiological disadvantages (compressed spaces between soil particles unable to hold water) of an increasingly resistant compacted soil. Other weeds with tap roots and indicative of dry compacted soils include the plantains and a range of weeds from the plant family

Compositae (Asteraceae) including dandelion and cat's ear, and even ragwort and sowthistles where unrepaired divots provide prime germination sites.

Other weeds which thrive under these conditions include creeping cinquefoil and yarrow, the latter perhaps the ultimate drought resistant weed due largely to finely divided leaves and a thick leaf cuticle that massively restricts water loss by transpiration.

Yarrow is perhaps the summer inspired weed problem with the greatest long term effect. During

exceptionally hot and dry summers it is not unusual to see a completely dried out and 'browned off' turf grass sward with increasingly large rosettes of yarrow still green and in flower.

Come autumn, with rain and a dose of fertiliser for good measure, the highly reactive turf grass sward will bounce back, but not as fast as yarrow with its head start because the yarrow plants never stopped growing. For this reason September and October are invariably the months when yarrow is seen at its highest incidence in turf.

For turf diseases

Much has been written about climate change and how this will change the spectrum and incidence of diseases on UK turf. Given the popular scenario for hotter and drier summers followed by milder and much wetter winters, dollar spot, red thread and brown patch, which are more commonly associated with hot spells and summer conditions, would appear be among

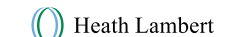


the most likely candidates.

However, after several consecutive years of cold dry winters and exceptionally cool and very wet summers these particular climate change predictions appear to have gone astray. Best that can be said is that our current climate is 'changeable' under the influence of what has recently been dubbed 'global wierding'.

As such hot and dry, high traffic spells putting turf under stress will continue to benefit the two most important classic diseases of UK turf (Fusarium patch and anthracnose). The pathogens causing these diseases are essentially put 'on their marks' in summer but don't explode off 'the blocks' until autumn.

Return of rain in September, often accompanied by heavy dews and mists, and the subsequent appearance of soft, succulent fertiliser-promoted grass growth by an inherently weakened sward provides ideal conditions for these thatch residing fungi to move up through the gears and into a full parasitic disease-causing mode.



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TOP LEFT: The strong and deep seated tap root on bird's foot trefoil allows this 'clover' to ride out drought

TOP RIGHT: Completely dried out turf with yarrow (white flowers) and creeping cinquefoil (yellow flowers) still green and in flower

BOTTOM LEFT: Tap rooted weeds of the Asteraceae (Compositae) like ragwort shown here will exploit drought stressed turf especially with unrepaired divot damage

INSET RIGHT: Yarrow is inherently drought resistant thanks mainly to its finely divided (fern-like) leaves with a thick waxy cuticle characters that minimise water loss through transpiration

INSET BOTTOM RIGHT: Heaviest infestations by yarrow invariably occur in autumn, the weed having a head start over drought stresses grass when wet weather sets in during autumn and the sward receives fertilizer.

