

You may not come across during your day to day greenkeeping but Dr Terry Mabbett reveals, such is the vicious nature of some tropical weeds, perhaps that is just as well!

Truly tropical turf weeds

Golfers could get lost in the 'rough'

Trawl the net for tropical weeds and you will find most consideration given to agriculture. It's as though turf in the tropics does not suffer from weeds, but I can assure you it does and with a vengeance. Weeds in the hot wet tropics smother turf and take over amenity grassland spreading from these sites to cover hard surfaces at phenomenal rates.

No part of the tropical sports and leisure facility escapes. Weeds will infest greens, tees and fairways, turn any 'rough' into a veritable jungle and completely clog up streams, drainage ditches, ponds and lakes.

Weed frequency, intensity and growth rate are exceptionally, high boosted by high temperature, humidity and soil moisture level. In regions lacking a dry season weeds grow and reproduce throughout the calendar year.

Facilities in regions with a distinct dry season are given some respite but instantaneous bursts of weed growth with onset of the rains has to be seen to be believed, and requires prompt sustained control. Turf Managers in temperate countries face a seasonal resurgence of weeds, but this will pale into insignificance in the humid tropics where weeds move so fast you can almost see them grow.

Many of the worst tropical weeds started life as 'ordinary' wild plants within restricted habitats and geographical distributions. Redistribution of plants by agriculture and horticulture during colonial times (18th and 19th centuries) spread lots of wild plants that subsequently acquired turf and amenity weed status throughout the tropics.

Nowhere is this more true and apparent than in the Caribbean, historically most visited part of the world by man and plant alike.

The following observations on weeds of turf and amenity grass were made in the twin island nation of Trinidad and Tobago southernmost of the Caribbean island countries and just a few miles off the coast of South America.

These islands provide an ideal location to gauge the breadth of tropical turf and amenity weeds. Not only do they support weeds native to South America, to which Trinidad was once joined, but others from across the world introduced deliberately or accidentally, especially by The Imperial College of Tropical Agriculture (now the St Augustine Campus of The University of The West Indies) with its roots way back in the 19th century.



Surface spreading tropical turf weeds

Surface spreading weeds create big problems for turf and amenity managers with a wide range of creeping and matt-forming broad-leaf herbaceous plants responding rapidly to high temperature, rainfall and humidity. The most effective and successful are those with running and creeping stems, above or below ground, especially if they root at the nodes.

Many which spread by nodal rooting, as their creeping stems elongate, can spread a metre or more across impenetrable hard

surface, still supported by root anchorages on adjacent turf.

Tropical (warm season) grasses in sports and amenity turf generally possess much broader leaves and form thicker swards than do cool temperate grasses like *Festuca* and *Agrostis*. Growth rates are much faster too but still no match for dedicated matt forming turf weeds like *Alysicarpus* and *Sida acuta* (sweet broom). And opportunistic turf weeds including *Mimosa pudica* and *Desmodium* which rapidly colonise turf in the wet season forming large unsightly patches of weed growth in a remarkably short space of time

Long reach of the legumes

Mimosa pudica, *Desmodium* species and *Alysicarpus vaginalis* are leguminous weeds of tropical turf. All three are important matt forming weeds of sports turf and savannah (parkland) grass spreading rapidly to colonise large areas in no time at all. All three will then spread out across adjacent hard surface areas for a considerable distance to cover substantial areas all supported by a root base now a good distance away.

Each spreads through creeping and ground hugging stems which freely root at the nodes. *Alysicarpus*

ABOVE LEFT: Rapidly spreading low-profile *Alysicarpus vaginalis*

ABOVE: Diminutive *Desmodium* in the long grass

ABOVE RIGHT: *Tridax procumbens* spreading from turf across a hard surface

ABOVE RIGHT (INSET): Willow leaved primrose (*Ludwigia*) is already in the UK

ABOVE FAR RIGHT: Carpet daisy is a problem on turf near the seashore

BELOW LEFT: Fast spreading *Mimosa pudica* swamps wet turf and amenity grass

BELOW: *Mimosa pudica*, *Sida acuta* and *Desmodium* have overwhelmed this turf

FAR RIGHT: Tropical turf grasses tend to have comparatively broad leaves





vaginalis is a dedicated low growing creeping herb while the others are more versatile, evolving a low profile habit in frequently cut turf and semi-erect woody stems in amenity grass. The delicate reddish purple bean-like flowers of *Desmodium* and *Alysicarpus* borne on erect stalks can be confused but are easily distinguished from the light purple/mauve pompom flowers of *Mimosa pudica*.

The best way to separate them is by the foliage. *Alysicarpus* bears simple rounded to boat-shaped leaves in alternate positions along the stem. *Desmodium* has compound leaves comprising one pair of side leaflets and a terminal leaflet each on a short stalk. Technically, it is a compound pinnate structure but at first glance looks like a three leaflet compound palmate leaf. *Mimosa* has a compound pinnate structure with leaves pinnately arranged into one or two pairs of leaflets further subdivided into 10 to 20 pairs of smaller leaflets. The leaflets are sensitive and close up when touched.

Mimosa pudica is viscosly thorny and not the sort of weed welcomed on sports grounds and other public places like parks and savannahs. On the other hand the soft leaves and stems of *Alysicarpus* (called Alyce clover by farmers in North America) provide highly nutritious animal fodder.

All three contribute to soil fertility

via nitrogen fixation by symbiotic rhizobia bacteria in the root nodules, although this will be of little consequence on fine turf that is regularly fertilized and sprayed with herbicide to maintain weed-free status.

All things to all habitats

Sida acuta (Malvaceae) is called sweet broom but there is nothing sweet about this plant as one of the most versatile amenity weeds of the wet and humid tropics. Plants develop rapidly into low-growing herbs up to one metre high in open waste places, or stay as a prostrate plants in grassland or closely mown turf, still producing the peach coloured flowers on a daily basis.

This bushy plant with woody stems has short hard hairs making it rough to touch and difficult control when fully grown. In the prostrate biotypes infesting turf the whole leaf takes on a reddish hue. Flowers are delicate and peach coloured having a translucent basal area with orange coloured 'veins' (lines or creases) extending up to the apex of the petal.

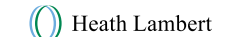
Despite its weed status sweet broom does have some positive points, apart from the beautiful flowers. The hard wiry stems can be cut and tied in bundles to make brooms for sweeping and the macerated stem and leaf tissue are traditionally used as a poultice

Willow leaved primrose (*Ludwigia*) is already in the UK (inset above) whilst carpet daisy is a problem on turf near the seashore





ABOVE RIGHT: Large butterfly populations make herbicide use a tricky business. *Euploia hegesia* (brown biscuit butterfly) shown here on *Bidens pilosa*, and ABOVE SECOND RIGHT on *Tridax procumbens*



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to alleviate the pain and swelling associated with sprains.

Daisies everywhere

The most ubiquitous and versatile weeds of temperate amenity habitats are plants from the family Asteraceae (Compositae), including dandelions, daisies, cat's ear and ragwort. The same situation occurs in the tropics where two white 'daisy-like' weeds are among the most widespread and adaptable weeds.

With its rough non-descript daisy-like flowers, *Tridax procumbens* is one of the most frequently occurring and fast spreading weeds throughout the tropics. Biggest weed problems occur in the amenity sector where it spreads quickly and efficiently rooting at the nodes into soft ground and from there across adjacent hard surfaces. Flowers are single heads 15mm wide with short widely spaced cream coloured ray florets surrounding a round central core of densely packed yellow disc florets. Leaves are very hairy and rough to touch and the flowers more resemblance to thistle heads than daisies, hence the common name of rabbit thistle. Two interesting common names have evolved in creole dialects of English speaking Caribbean islands like Trinidad with its strong historical French influence. They are 'mawgwit blan' derived from 'Marguerite Daisy' (white daisy) and 'bouton blan' derived from 'bouton blanc' (white button).

Like its temperate relatives *Bidens pilosa* crops up everywhere through prolonged flowering periods, high seed set and efficient means of fruit and seed dispersal. All opportunities and niches on disturbed ground and cracks in pavements or walls are exploited to the fullest extent.

Each flower is a capitulum consisting of 5 to 6 white petals (ray florets) surrounding a dense cluster of yellow disc florets in the centre. *Bidens pilosa* has a wide range of common names including Spanish Needle, Cobbler's Pegs and Farmer's Friend. 'Rabbit Meat' is the most commonly used name in Trinidad where its soft succulent growth available year round is traditionally used as rabbit feed.

Sand, sea and rough

Sand in bunkers is one thing but encroaching sand from the seashore which many golf courses in the Caribbean are unavoidably near is another. As such greenkeepers

invariably have to cope with weeds that are both xerophytic (adapted to the dry conditions of sandy soils) and halophytic (adapted to high salt concentrations). Classic in the Caribbean is *Wedelia trilobata* (carpet daisy) with creeping stems, leaves shaped like duck's feet and bright yellow daisy like flowers.

The 'rough' as an area of unmanaged grass does not take on the same importance on tropical golf courses and for very good reason. On temperate courses grass may typically reach a metre high during spring and summer and then die right back until the following spring. Not so in the tropics where grass grows throughout most of year with many species like elephant grass reaching three metres with ease. It is not so much the case of losing the ball but of losing the golfer.

Herbicides and environmental integrity

Three factors make herbicide use a difficult and tricky operation. First is high rainfall so timing is critical. Second there is a tradition of grazing animals on public amenity land. Last but not least, is the question of environmental integrity and preserving biodiversity. UK Turf Managers are under increasing pressure to protect and preserve wildlife including insects and especially butterflies. In variety and density the UK butterfly population pales into insignificance compared with that in the Caribbean. The most notorious weeds like *Tridax procumbens* and *Bidens pilosa* are often the most attractive to butterflies.

Wet weeds on the move

Equatorial regions are inherently wet and humid with weeds adapting to suit. Waterways, lakes, ponds, ditches and drains are continually clogged up with weeds and some are not as tropical as you might think. The willow leaved primrose (*Ludwigia* species), so called because the leaves are willow shaped and the yellow flowers resemble primroses, have been found on at least two sites in the United Kingdom – the New Forest in Hampshire and a wetland site in the City of London.

The weed is well established in France. Another nominally tropical weed of damp wet places is not too far away. *Eclipta prostrata* (false daisy) is currently causing big weed problems in southern Europe having already invaded North America reaching as far north as New England.