A fistful of five *Injurious Weeds*

Dr Terry Mabbett offers some information and advice on dealing with the famous five

Weeds are simply green plants growing in the wrong place at the wrong time. Thus dandelion is a serious weed of professional turf but a useful wildflower addition to roadside verges and other habitats.

Plants prescribed as weeds are by nature and definition harmful and injurious to other valued plants in the same environment, including grass plants in professional and amenity turf as well as agricultural grassland. The effect of some weed species, including ragwort, bracken and giant hogweed, may extend beyond these parameters to harm livestock, pets and people, while Japanese knotweed can damage civil infrastructure including concrete and tarmac pavements and roads.

Believe it or not only five plants, and all native species, are prescribed as 'Injurious Weeds' under The Weeds Act of 1959 (United Kingdom), while even more notorious weeds are conspicuous by their absence.

The five native species classed as 'Injurious Weeds' are common ragwort (Senecio jacobaea), two species of thistle, Cirsium arvense (creeping thistle) and Cirs ium vulgare (spear thistle) and two species of broad-leaved dock (Rumex obtusifolius) and curled dock (Rumex crispus).

They are proscribed as injurious weeds due to an overwhelming competitive effect on other useful plant species in agricultural and amenity situations through inherently rapid growth rates and prolific rates of reproduction.

All are invasive in nature if not by definition.

They have characteristics and features which are common to most if not all. These include deep-seated sturdy tap roots which allow good survival rates during adverse conditions, including sub-zero winter temperatures and summer droughts. And versatile vegetative reproductive systems making attempts to physically remove them not only futile but counterproductive, because any remaining root and stem fragments generate new plants. All are prolific seed producers.

Not everything about these five weeds is bad. As native plants they are important food sources for wildlife including insects, other invertebrates and birds.

Dedicated application and control

Once established and allowed to grow and spread during late spring and early summer these weeds become difficult if not impossible to shift, easily and safely, using standard 'over the top' herbicide spraying techniques. Providing these weeds are carefully targeted early in the year, while still at ground level and in a sluggish vegetative state, all can be easily, quickly and safely dispatched by spot applications of total herbicide using hand-held applicators.

These include weed-wipers with rope-wicks dispensing herbicide by direct contact with the leaf surface, and trigger operated spray applicators placed close to the weed to deliver small exact volumes and doses of herbicide onto the leaf rosettes. Advantages of hand-held applicators include targeted spot application with minimal risk of contamination from spray-run off or spray drift. They are light-weight to carry and easy to use.

Ragwort and spear thistle in particular are two of the earliest growth starters in spring.

Following an unusually early period of low temperature-induced dormancy from late November and through December 2010 ragwort responded rapidly to the much milder conditions in January and February 2011.

Having survived one of the coldest Decembers on record essentially unscathed, ragwort and spear thistle were already moving in February, especially in southern counties.

It is quite common to find some or all of these five injurious weeds growing together in the same grass sward at the same time and in clumped distributions which makes the use of hand-held applicators that more appropriate and easier. Rabbits will generally avoid these weeds, grazing around the leaf rosettes of ragwort and creeping thistle to make them much easier to recognise for spot application in spring.

But once these weeds have grown up through the sward to heights of one metre or more they can only be safely controlled using vehicle drawn 'weed-wiping' applicators which apply herbicide by direct contact with the leaves and no accompanying drips.

These applicators deliver the chemical by direct surface to surface contact between herbicide moistened pads and the weed foliage, exploiting significant height differences between these now tall full grown weeds and the grass and other useful plants at soil level.

There is no danger of damage to the grass below from drips or droplet drift which can occur during

The five famous weeds

MAIN PHOTO ON PAGE 24:
Creeping Thistle.
The seed and down produced by creeping thistle is used for food and nest building by goldfinches

THIS PAGE ABOVE LEFT:
Docks (two types).
Docks are opportunistic weeds of turf and grassland and can grow into clumps if left unchecked.

ABOVE RIGHT:
Ragwort
Ragwort rosettes are growing fast by April
Spear Thistle
Spear thistle bears viscously sharp spines

conventional spraying using tractor mounted sprayers and lever operated knapsack sprayers.

Five culprit weeds

On golf courses these five 'Injurious Weeds' are mostly confined to the rough and other areas, along fences and hedges and around trees, where ground cover may be left uncut or untreated with herbicide. Be that as it may, these weeds will establish in turf if an opportunity arises such as divot-damaged turf on golf tees, especially in close proximity to an area with a high weed seed load. Invasion of turf by ragwort on golf tees alongside railway embankments is not uncommon, the weed seeds germinating and establishing rapidly in patches of bare soil caused by turf damage during teeing-off. Now in their early vegetative state as flat rosettes of leaves they can withstand even low grass cuts to remain in turf for some time.

Thistles with no 'tears'

Creeping thistle and spear thistle are strong competitive weeds establishing and spreading quickly to smother grass plants. Both possess leaf spines and those of spear thistle are especially sharp and unpleasant.

All grassland is at risk and once established this pair of thistles is notoriously difficult to shift. Non-agricultural environmentally-sensitive grassland is one of most important areas affected by these species of thistle.

The copious quantities of seed produced by creeping thistle are largely non-viable but this thistle more than compensates with a highly efficient system of vegetative propagation. Creeping underground stems (rhizomes) spread quickly to form huge patches. Soil disturbance, including attempts at mechanical control, generally make matters worse because new plants will grow from even small pieces of rhizome.

In contrast spear thistle seed is viable and is carried far and wide by wind inside the hairy pappus (parachute type) fruits.

These are not the sort of weeds that greenkeepers and groundsmen want to see in sports turf and amenity grassland. From small seedlings in late winter they will grow at a phenomenal rate and by May are good sized spiny plants. Spear thistle in particular, as its common name suggests, has leaves ending in long, hard and ferocious spines that impart painful jolts to any sports person making contact.

It was almost certainly spear thistle which thwarted a night-time attack by the Danes at the Battle of Largs in Scotland when cries of pain from the attackers awoke the slumbering Scots.

Spines of the creeping thistle are individually less fearsome, but the capacity of this thistle, which has been called the United Kingdom's 'worst weed', to form huge clumps of bristly plants in a matter of weeks more than compensates.

Creeping thistle and spear thistle are robust perennials with underground food storage organs (rhizomes and tap roots, respectively) for successful overwintering with a quick 'getaway' in spring.

Early spring is the ideal time to hit thistles while they are still relatively small and vulnerable, but easy to identify in turf, amenity grassland and on bare ground in their vegetative leaf rosette stage.

Wildlife trusts acknowledge the weed status of creeping thistle and spear thistle.

However, both are food sources and breeding sites for many non-pest insects, including butterflies and moths, and a major food source for birds like the goldfinch which feeds on the seed heads and uses 'thistle down' for nest building. Thistles (Cirsium species) are food plants for small skipper (Thymelicus sylvestris) and painted lady (Vanessa cardui) butterflies while white-letter hairstreak (Satyrium w-album), brimstone (Gonepteryx rhamni) and peacock butterflies (Nymphalis io) nectar on the yellow flowers.

Two chances to hit ragwort

Common ragwort is an exceptionally resilient weed with a robust and deep-penetrating taproot and with prolific seed production.

This ensures continuity from its first year of vegetative growth into the second and final year of flowering and seed set characteristic of this normally biennial species.

Common ragwort is one of the first plants to re-start growth in spring although the ground hugging rosettes of leaves look completely different to how the mature plant, up to 1 metre tall and covered with yellow daisy-like flowers, will look from June/July onwards.

This can present real problems for effective early season control. Many people do not recognise ragwort in this early vegetative stage because leaf shape and form is very different (much less finely divided) to that on mature flowering plants. By the time they realise there is a ragwort problem it is too late to use hand-held applicators with good effect.

During July, August and September you cannot miss the fact that you have a ragwort problem and neither will anyone else because the toxic weed advertises its presence with swathes of golden yellow flowers on tall stems. The fast spread of ragwort is down to its prolific seed production with 150,000 seeds per plant per season and a germination rate approaching 70 per cent. What's more the seeds can lay dormant for up to 20 years.

A group of pyrrolizidine alkaloids (predominantly 'jacobine') in the plant tissue are responsible for ragwort poisoning, although their breakdown products called pyrroles actually cause the metabolic and tissue damage. Once eaten pyrrolizidine alkaloids are absorbed by the gastro-intestinal tract to strike at the very 'heart' of animal metabolism, destroying liver enzymes to cause liver cirrhosis and death. Horses and other equines are especially susceptible to ragwort poisoning.

Attempts to cut down flowering ragwort may temporarily hide the problem but only make matters worse in the long run. These normally biennial plants simply switch to a perennial life style rather than dying after seed set at the end of the second year which occurs in the normal life cycle of a biennial plant. Common ragwort will survive the severest winter thanks to its food-rich tap root resuming growth in spring and flowering during summer. What's more seeds already formed on cut down ragwort stems still mature and ripen thus adding to the seed bank in the soil.

There are essentially two chances to control ragwort with herbicide. Firstly during early spring by treating the leaf rosettes with herbicide dispensed by hand-held applicators and subsequently during late summer by using a vehicle drawn weed wiper.

PHOTOS ON PAGE 25 FROM TOP TO BOTTOM:

Ragwort
Ragwort problems become patently obvious during late summer

Creeping Thistles
Thistles are important sources of nectar for butterflies – small copper butterfly on creeping thistles shown here

Creeping Thistles
The seed and down produced by creeping thistle is used for food and nest building by goldfinches

Creeping thistle and spear thistle are robust perennials with underground food storage organs (rhizomes and tap roots, respectively) for successful overwintering with a quick 'getaway' in spring

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For all its toxic properties at least 30 species of insects and other invertebrates are totally dependent on ragwort for food. These include solitary bees and wasps, hoverflies, conopod flies which parasitize solitary bees and wasps, butterflies and about 40 noctuid moths. Ragwort flowers are major sources of nectar for gatekeeper (Pyronia tithonus) and small copper (Lycaena phlaeas) butterflies, and the plant is sole food plant for the cinnabar moth (Tyria jacobaeae).

Rumex in the dock

Broadleaveddockandcurleddock are conundrums, being classed as 'Injurious Weeds' on the one hand but reached for instinctively with the other as a leaf poultice to soothe nettle stings and rashes. Though lacking the spines and prickles of thistles or the poisonous chemicals found in ragwort, docks still have a 'toxic' effect on grassland. Their overwhelming competitive advantage from fast growth rates and overarching shading by huge broad leaves quickly dominates all other herbaceous plants (grasses and broadleaves).

Left to their own devices docks will develop into huge clumps drastically reducing the area of serviceable amenity grassland and productive pasture. Docks spread quickly on patches of bare ground and within thin swards especially in shaded areas and on nutrient enriched sites. Docks allowed to flower will generate a high seed load remaining dormant for decades.

Chemical control with herbicide is the only effective and sustainable option. Conventional spraying with the total systemic herbicides required to kill these robust and stubborn perennial weeds may cause off target chemical damage. Contamination occurs through spray droplet drift and spray liquid run off which may damage and kill adjacent grass plants and valued wild flowers in amenity swards.

Wildlife trusts acknowledge the weed status of broad-leaved dock and curled dock but also their role as native plants providing food sources and breeding sites for non-pest insects. Dock seed is relished by most finches and especially the bullfinch. Rumex species are food plants for the small copper butterfly (Lycaena phlaes).

By using hand-held applicators to spot-treat docks early in the season, environmentally aware operators can leave some plants in the sward as food plants for wildlife if they so wish. Large dock leaves offer the ideal target for hand-held weed wipers to give the best and most easily achieved coverage of herbicide across the broad flat leaves.

Application timing for docks in relation to the advent of spring can be critical. During the exceptionally late spring of 2010 advice was put out to delay the treatment of docks with herbicide for up to 4 weeks. Cold damaged and stressed dock plants, indicated by reddening of the foliage, do not show optimum uptake and translocation of herbicide.