



onto the course to look at it will be a disaster. You're never going to replace that experience and knowledge."

As an education tool, digital technology can really excel and Stewart spoke of how it is used at Myerscough for various greenkeeping courses and how far-reaching it can be: "We have a lot of provision online now particularly because you can do a BSc or foundation degree entirely online as distance learning. It's one of our biggest areas."

All the resources and materials are delivered online and you basically log onto the website, download the materials and there are videos, tests and interactive sessions. These students don't usually come anywhere near Myerscough and the first time we see them is when they arrive for graduation. Our furthest student at the moment is in Japan, but we have students all over the world including in Germany, France, Spain, Portugal, United Arab Emirates, in the USA and all over the UK and Ireland.

Also, because we do NVQ levels 2, 3 and 4 in the workplace, a lot of those students are supported by online materials. So they can download workbooks, submit work or can have a webcam chat to interact

with tutors."

Stewart spoke about a multitude of other digital methods used in learning such as video assessments and clips for portfolios and subscriptions to massive online turf databases. He also spoke about how practical skills could tie in with online learning.

"If you're studying online then you are also working in the industry and some of the modules revolve around the work that you are doing. One of these is called Work Skills Development where they create their own website and basically build their own online portfolio. It is something to show an employer as it will include such things as a CV, projects managed and courses worked at. It can also help people develop digital and computer skills if they aren't confident in that area."

We use industry resources to give students practical knowledge of such new technologies as mobile internet for irrigation. Most students coming in now already have Smartphones, iPods and knowledge in these areas, but we do consciously try."

Electric automatic mowers have been in development for some years and there are models out there on the market already, but Stewart was certain greenkeepers would

never be replaced by digitised robots in the future.

"I don't think you're ever going to remove the person from behind the mower. By the very nature of greenkeeping, it's a practical, outside, hands-on job. You need the visual, practical skills to say a green may be under stress or it has a certain disease."

All in all then, many digital technologies can not only make life easier for greenkeepers who choose to use them, but can also provide more efficient use of water, fertilisers and chemicals. Perhaps one of the greatest benefits digital technologies can offer greenkeepers is that of learning and shared knowledge. From online degrees to Smartphone applications which give practical advice, opportunities to learn are vast and expanding rapidly. Due to the practical nature of greenkeeping, digital technology will never replace greenkeepers, but as a support tool it can certainly make life easier, be used as a learning method and help with general efficiency. As Loretta Lynn sang, we've come a long way baby and it is just mind boggling to think where digital technology might take us in the coming years.

One thing is for sure: it is here to stay.

BELOW: Linkfertiliser application tool by Karl Parry. http://myfreefilehosting.com/f/96c8957a4c_0.03MB



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Weed focus

Ragwort

Graham Paul offers some practical advice on that most awkward of weeds – Ragwort and offers the opportunity of picking up some BASIS points



Rosette stage found in year 1



Common Ragwort (*Senecio jacobaeae*)

Ragwort belongs to the daisy family and along with the Groundsels is classified in the genus *Senecio*.

Common Ragwort (*Senecio jacobaea*), as the name implies, is the most frequently occurring species and is normally a biennial, having a rosette stage in the first year that overwinters and in the second year grows a hairless, leafy flowering stem that is divided at the top.

Yellow flowers 15 to 20mm across, are borne in dense, flat-topped clusters from June until November when the plant dies. However, in some instances, when the plant becomes damaged by grazing or cutting, changes in its physiology occur and it becomes a short-lived perennial, surviving for several years.

Most wild flower references list six species of ragwort found in the UK. The other five are; Hoary Ragwort (*S. erucifolius*), Oxford Ragwort (*S. squalidus*) – introduced from southern Italy and naturalised in Britain, Marsh Ragwort (*S. aquaticus*), Silver Ragwort (*S. cineraria*) – introduced from the Mediterranean and naturalised on coastal cliffs in southern England and Fen Ragwort (*S. paludosus*) a rare perennial growing to 2.0m tall in the fens in East Anglia.

Ragwort provides a source of food and nectar for around 200 invertebrate species in the UK; of these some 30 are totally dependent on the plant as their only food source, which makes ragwort an essential part of our native flora.

Ragwort contains many different alkaloids that are poisonous to animals. It is a particular problem to grazing animals such as horses, cattle and pigs, whose tolerance to these alkaloids is particularly low, causing irreversible cirrhosis of the liver when an appreciable quantity of fresh ragwort is consumed. Fortunately the plant has a very bitter taste so the fresh foliage is rarely eaten by horses and cattle but it becomes much more palatable once the plant dies.

Hay and silage contaminated with ragwort plants can be fatal to livestock as the toxic alkaloids in ragwort are not broken down by drying or by the silage process.

Spraying with herbicides to remove ragwort can also present a danger to grazing animals if they are released back into the pastures too soon after treatment. In this case it is not the herbicide residue that causes harm but the presence of dead ragwort plants that the animals will no longer avoid.

Horses will avoid ragwort in pastures

When a horse has been poisoned by ragwort, the symptoms include; yellow mucus membranes, depression, and lack of coordination. Sheep and goats have a much greater tolerance to ragwort and will eat small quantities of the plant with relish. Although they do suffer damage to the liver from consuming ragwort, it is at a much reduced rate than horses, cattle and pigs. There are reports that the alkaloids kill parasitic worms in the sheep's stomach, so in small doses they can be beneficial.

Ragwort poses little risk to the health of humans since the bitter taste precludes its use as a food. However, alkaloids can be absorbed in small quantities through the skin when the plant is handled causing an allergic reaction in sensitive individuals. Among the alkaloids found in ragwort is a group known as the sesquiterpene lactones that can cause the condition 'compositae dermatitis'. These are different from the pyrrolizidine alkaloids that are responsible for the toxic effects to the liver that result from eating the foliage.

Five Injurious Weeds

Common Ragwort is one of five injurious weeds cited in the Weed Control Act of 1959. The term injurious weed describes an invasive species that is injurious to; crops, natural habitats, ecosystems, humans and livestock such as horses and other grazing animals. Indeed, Common Ragwort is the only one of the listed species that is toxic; the others are included in the legislation because of their damaging effect on crops. They are; Spear Thistle (*Cirsium vulgare*), Creeping or Field Thistle (*Cirsium arvense*), Curled Dock (*Rumex crispus*) and Broad-Leaved Dock (*Rumex obtusifolius*)

Under the terms of the Weed Control Act of 1959, a land occupier can be required by the Secretary of State for Environment, Food and Rural Affairs to take steps to prevent the spread of one or more of the five species. However, the growth of the plant is not made illegal by the act and there is no statutory obligation for control placed upon landowners in general. It is only when the potential spread of the weed to neighbouring landowners is deemed to be harmful that the powers of the legislation are used.

Three other pieces of legislation are relevant to ragwort:

1. The Ragwort Control Act of 2003, a private members bill

introduced by Mr John Greenway MP for Ryedale.

2. A direct result of Mr Greenway's bill was the publication of 'The Code of Practice for the Control of Ragwort' by the Department for Environment, Food and Rural Affairs (DEFRA). This code defines the situations in which there is a likelihood of ragwort spreading to neighbouring land where it will present an identifiable risk of ingestions by vulnerable animals, and provides guidance on the most appropriate control measures. The Ragwort Control Act 2003 gives this Code 'evidential' status in any proceedings taken under the Weeds Control Act 1959. Failure to follow this Code is not an offence but non-compliance may be used as evidence in any legal action. Equally, owners/occupiers should be able to establish a defence if they can demonstrate that they have adopted control measures that comply with this Code's guidance.

“The high visibility marking of the moth and caterpillars is a warning for predators to leave them alone. Survival is also helped by lack of competition for their main source of food”

3. The Natural Environment and Rural Communities Act 2006 delegates the functions available to the Secretary of State under the Weed Control Act to Natural England, a DEFRA agency.

This delegation of functions enables Natural England to investigate complaints where there is a risk that injurious weeds might spread to neighbouring land. Natural England gives priority to investigating complaints where there is a risk of weeds spreading to land used for grazing horses or livestock, land used for forage production and other agricultural activities.

Control Measures

The Code of Practice for the Control of Ragwort outlines various suggested methods that can be summarised under the general headings of; cultural, biological and chemical control.

Cultural Control

Hand pulling is an ideal technique for use in areas such as grazing pastures, if there are only a few ragwort plants present. Regular removal, especially prior to



Insects feeding on the nectar





LEFT, BELOW LEFT and BELOW:
Cinnabar moth: caterpillars and adult

flowering, may be all that is needed to keep pastures free of the potential hazard to livestock. Alternatively, the whole plant can be levered out of the soil using a special tool. Hand pulling and levering out the plants are best carried out in moist soils. Gloves must be worn when pulling and handling ragwort, which can be disposed of by drying the plant material, away from access by livestock, and then burning.

Cutting down the plants to prevent the seed-heads from maturing should be regarded as an emergency treatment to halt the spread of the weed and must be followed up by some other form of control.

One factor that encourages the proliferation of ragwort in pastures is over-grazing, which results in thinning of the grass sward, leaving room for this weed to establish. Good turf management practices coupled with a sensible rotation of grazing will help to crowd ragwort out.

Biological Control

The Cinnabar moth *Tyria jacobaeae* is an interesting species that can give some degree of control of ragwort. Both the adult and caterpillar feed on ragwort plants and are not affected by the toxic alkaloids they absorb through their digestive tracts. They assimilate the toxins into their bodies as a defence mechanism against birds and other predators, who would find them unpalatable.

Cinnabar moth

The high visibility marking of the moth and caterpillars is a warning for predators to leave them alone. Survival is also helped by lack of competition for their main source of food. However, distribution of the Cinnabar moth caterpillars tends to be patchy, making control unre-

liable. It is not uncommon to see a ragwort plant totally devastated by the caterpillars and one next to it untouched.

Chemical control

'Barrier H' is an herbicide based on a natural product (citronella oil) that can be used at all stages of growth and is marketed in a ready-to-use spot treatment pack. It produces a rapid, severe scorch on ragwort and certain other weeds and will also temporarily scorch the grass but this soon recovers.

Selective herbicides containing MCPA (e.g. 'Agritox 50') will give moderate control of the rosette stage of the weed. Products containing 2,4-D (e.g. 'Depitox') will give a moderate level of control at dose rates applying 1.65kg of the active ingredient per hectare (3.3L/ha of a 500g/L amine formulation). In some situations a repeat application may be required for complete control with 2,4-D.

Mixtures containing the active ingredients MCPA + mecoprop-P + dicamba, such as 'Relay Turf' or 'Longbow' will give reasonably effective control.

Glyphosate formulations can be used as spot treatments applied with a knapsack sprayer but these will also kill the grass in the immediate vicinity of the target plant. It is possible to use a weed-wiper applicator to apply the glyphosate without damaging the grass.

With all herbicide treatments, livestock must be excluded during treatment and kept out of treated areas for at least 4 to 6 weeks until all traces of the weed have rotted away or have been removed. Animals are unable to recognise dead or dying plants and in most cases the decaying plant tissues will contain higher levels of sugars making them more palatable.

SELF ASSESSMENT

Use the questions below to check your understanding of this topic. Readers can claim BASIS points if the questions are answered correctly!

Circle the correct answer(s)

1) Which other species belongs to the same genus as Ragwort (*Senecio*)?

- a) Ground-ivy
- b) Ground-elder
- c) Groundsel
- d) Ground-pine

2) Which of the grazing animals mentioned have a much greater tolerance to the alkaloid toxins in Ragwort plants?

- a) Cattle
- b) Sheep
- c) Horses
- d) Pigs

3) Apart from Common Ragwort which other injurious weeds are cited in the Weed Control Act of 1959? More than one may apply

- a) Marsh Dock *Rumex palustris*
- b) Spear Thistle *Cirsium vulgare*
- c) Curled Dock *Rumex crispus*
- d) Giant Hogweed *Heracleum mantegazzianum*

4) Which Government Agency has specific powers, delegated by act of parliament, to investigate complaints under the Weed Control Act 1959?

- a) Environment Agency
- b) Home Office
- c) Natural England
- d) Forestry Commission

5) Which species of moth provides a biological control for ragwort?

- a) Orange swift (*Hepialus sylvina*)
- b) Cinnabar moth (*Tyria jacobaeae*)
- c) Scarlet Tiger (*Callimorpha dominula*)
- d) Brown-tail moth (*Euproctis chrysorrhoea*)

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Greens mowers ...*more choice or more confusion?*

James de Havilland casts his net over the range of greens mowers and marvels at the technology involved



Eclipse, eFlex and E-Cut. Jacobsen, John Deere and Toro. The 'big three' all have some electric trickery up their sleeves to help golf courses cut greens in a greener fashion. Or should you substitute greener for more efficient?

There are several ways in which you can approach the adoption of all-battery and hybrid power for both walk behind and ride-on greens mowers. For some, the development of some form of hybrid or full electric power is just a knee jerk reaction by manufacturers to be seen to be making an effort to reduce the production of greenhouse gasses. For others, electric power is the future and marks the beginning of the end of hydraulic drives and internal combustion engines.

At this point, however, it is

perhaps best to relish the fact that there is a choice. The best way to look at any form of alternative drive and power is to skip straight to the ability of the mower to do its job. If a given model does what you want the next step is to work out if it does it in a cost effective fashion over its whole life.

At the moment, opting for an all-battery pedestrian mower over a petrol-powered alternative will cost more up front. Hybrid versus 'mechanical' pricing is not as clear cut as manufacturers have been known to adjust hybrid prices to make them more competitive in response to supply and demand. So you need to ask before just assuming 'hybrids are too expensive' or 'battery power is 'too left field'.

One issue that is difficult to address is the life span of lithium based battery packs. All batteries

have a finite number of charge cycles and all designs will lose their ability to hold a full charge as they age. So while lead acid battery technology is now well understood, lithium based package life for mowers is something of a 'known unknown'. That said, the way in which purpose developed lithium battery chargers work is fully automatic. There are no electrolyte levels to check and the charger will 'manage' how the battery is charged to enhance its lifespan.

Power choice is nothing new

Not so long ago, courses looking to buy a ride-on greens mower would have 'only' to choose between petrol or diesel power; cheaper to buy versus cheaper to run. Now you have to think of hybrids and full battery power. Again, cheaper

It is all too easy to concentrate upon the latest greens mower developments, overlooking existing proven designs. The Baroness LM56 and LM66 pedestrian models from Kyo-eisha UK are tough 'conventional' mowers with independent gear drive to the split rear roller. Available in a contour hugging 18 inch and 22 or 26 inch cutting widths, these and other traditional designs of mower can deliver an exacting finish.

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Introducing the new Greensmaster eFlex from Toro, our first lithium-ion battery-powered electric greensmower. This revolutionary power source is far superior to lead-acid batteries, being cleaner and far more efficient. What's more, the eFlex battery is designed to last five years, cutting as many as nine typical greens on a single charge. And with minimum downtime and low maintenance costs, the eFlex will even save you money in the long run.

Of course, its superior cutting technology delivers the finest putting surface and playing experience you would expect from Toro; but added to this, the mower is clean, environmentally friendly and, crucially, incredibly quiet. All this, and more, make the eFlex the perfect choice for golf clubs looking for a green solution, especially those with hotels and guest accommodation.

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Drawing its power from a 58 volt, 35 amp-hour Lithium-Ion battery, the recently launched Toro Greensmaster eFlex offers a nominal nine-holes per overnight charge capacity. Offered in 18 and 21inch widths, the all-electric model shares its key mowing components with its petrol-powered Greensmaster Flex alternative. This means both petrol and battery powered variants can be specified with a brush or groomer and choice of cylinder.

Jacobsen offered an all-electric E-Plex back in 1997, with the company suggesting many of these original machines are still in service. Modern electronic control and improved motor and generator technology ensure current Eclipse models offer high levels of efficiency, with dependability to match.



to buy and cheaper to run? The key is to look at costs to buy and run and to also try as many machines as you can. Moving towards hybrid or full electric power suits some but not all. It also pays to talk to those who have adopted alternatives to 'just' internal combustion power. Have they had to make changes to fit a hybrid or battery powered mower into their routine?

What is perhaps of greater interest is that electric drive to cutting units is now both well proven and 'familiar'. Because electric drive to the wheels of a ride-on calls upon a different type of drive, full electric power as per the Jacobsen Eclipse 322 is more adventurous but still based around proven technology. The same applies to Jacobsen fitting electrically powered units to raise and lower the units into work and of course electric power steering.

The upshot of this is that it may well be that some ride-on mowers will soon only be offered with a hybrid drive, doing away with hydraulic hose runs and reducing the chance of hot oil spills on precious greens. But a 'conventional' pedestrian mower still has a lot of life left in the concept and for many will still be the best choice.

One final point. It is possible for a golf course to generate electricity; it is difficult to create your own petrol diesel! Cover the greenkeeper's

shed with photovoltaic panels and use these to help cut the cost of charging up a fleet of electrically powered mowers and potentially you could cut your daily operating costs.

Not so long ago this would have been considered a pipedream but now there are hundreds of companies installing photovoltaic systems. Many of these are now looking for work following the sudden announcement that the feed in tariff has been cut from 43p/kW to around 21p/kW. Time to get your calculator out?



(LEFT) Toro will offer its Greensmaster 3400 TriFlex in hybrid form. As with the walk-behind pedestrian models, a key design aim has been to reduce maintenance, using sealed bearings to cut the need for greasing. The mower also has a 'modular' design, with all the key components being shared between the various power options offered. This advanced thinking in mower design is critical in enabling manufacturers to offer a choice of power units and adapt to changes in demand.



(RIGHT) Because the electrical system powers the traction drive motors, cutting reels, steering and reel lift and lower, Jacobsen is able to offer its Eclipse 322 in both hybrid and full battery forms. Hybrid models are said to cut fuel consumption by up to 43%, the all-electric version returning claimed savings of up to 80% -based on annual operating costs. Features include programmable frequency of cut. A swing-out centre unit is carried over from existing Jacobsen greens mowers.



(LEFT) Because the electrical system powers the traction drive motors, cutting reels, steering and reel lift and lower, Jacobsen is able to offer its Eclipse 322 in both hybrid and full battery forms. Hybrid models are said to cut fuel consumption by up to 43%, the all-electric version returning claimed savings of up to 80% -based on annual operating costs. Features include programmable frequency of cut. A swing-out centre unit is carried over from existing Jacobsen greens mowers.

(BELOW) John Deere has offered its E-Cut hybrid 2500e ride-on greens mowers since 2005, with the company's commitment to hybrid power now extending to its 8000E three-wheeled ultra-light and 7500E and 8500E fairway models. A key claim for hybrids is their ability to offer a reduction in running costs. This is primarily down to the ability to run the engine at a lower speed than is needed with hydraulic drives.



Walk-behind pedestrian greens mowers like the John Deere 220 are offered in conventional and hybrid variants. As with a ride-on, it is the ability to work the mower at a reduced engine speed that will appeal to some. But it is the precision with which the cutting speed can be set that also appeals.

New SMS launching at Harrogate Week



Welcome to the new the Safety Management System (SMS) sponsored by Ransomes Jacobsen. BIGGA and the GCMA have spent the last year updating and simplifying the SMS.

Accessible through the members' area (BIGGA) or library area (GCMA) of each of the Associations' websites, the updated system allows users to download and save all of the relevant documents for using a Safety Management System.

Since golf clubs are not complex organisations the SMS is short but nevertheless robust.

Clubs need to manage health and Safety with the same degree of expertise and to the same standards as other core business activities if they are to reduce risks and prevent harm to people.

The key elements of the SMS are:

1. Policy
2. Organising
3. Planning and implementing
4. Measuring performance
5. Reviewing performance
6. Auditing occurs at each stage; and feeds back to improve performance

A new area has been added for Fire Safety.

This area includes a dedicated Fire Safety Policy downloadable from the Fire Safety home page.

The original SMS will be available until the end of April 2012 for users to have access and to download their stored Risk Profile information.

The new Safety Management System website has been made possible thanks to the continued support and sponsorship from Ransomes Jacobsen



SAFETY MANAGEMENT SYSTEM (Fire)

It is the policy of ABC Golf Club to implement the Regulatory Reform (Fire Safety) Order 2005 to ensure that all workplaces are safe for employees, visitors and Club members.

ORGANISATION

The of the Club is the appointed 'responsible person'. The specific duties of the responsible person are contained in Articles 8 to 22 of the Regulatory Reform (Fire Safety) Order 2005.