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Scott MacCallum travelled to St Andrews to discuss the preparation for the 2000 Open with the man who carries much of the responsibility for a successful week...

The Patron Saint of Opens



PHOTOGRAPHY: BRIAN MORGAN



Above: Eddie Adams

In 50 years time or so, casual golf historians may well look back in the record books - or more likely the website - to see which famous names sit beside which year and venue for The Open Championship.

If the number of "hits" per Open were monitored I would guess that those which create the biggest interest might be the very first Open in 1860 when Willie Park won at Prestwick; the 1900 Open when JH Taylor won at St Andrews and the year in which the interested party was born. In my case that would be Arnold Palmer at Troon in 1962. Another would most certainly be the 2000 Open at St Andrews. Yes the Open Championship we are about to enjoy will be one of those few which will attract attention for as long as golf is played, because of its unique time slot.

The man who carries much of the responsibility for ensuring that such a significant Championship is a true cele-

bration of the sport is the St Andrews Links Trust's Old Course Head Greenkeeper, Eddie Adams, a man who is St Andrews through and through and whose experience when it comes to Links preparation is formidable for such a young man.

His first Open Championship was in 1990 when, as an apprentice, he was responsible for cutting the 1st and 17th greens. Five years later he had risen to become Head Greenkeeper at the Old Course working under Links Superintendent Walter Woods.

"It was, as the magazine said that year, 'Walter's Swansong.' He let me do a lot in '95, but it was definitely Walter's course. He was the man at the presentation, just as in 2000 it will be me," said Eddie.

Asked if that responsibility was weighing more this year Eddie said it was quite the reverse.

"It was terrible in '95 because I always

had Walter to please and I didn't want to let myself down this year. I have got the rest of the team to think about but I know I've got a really good set of guys who are really good at their jobs. So I don't have much to worry about on that score," said Eddie who added that they work very closely with the R&A Championship Committee.

While this Open is the first of a new millennium a greenkeeper from times past wouldn't see much that would make his hair stand on end if he watched his modern day successors carrying out their work on the famous links.

"My philosophy on greenkeeping for St Andrews is minimalistic. Steve Isaacs, of the STRI, called it anorexic greenkeeping," explained Eddie.

"The tees have only had a minimal application of fertiliser - straight nitrogen with some iron - the greens haven't had any fertiliser and the fairways



Above: Greenkeepers walk over seven miles to cut this green



Above: Where fairway ends and green starts, nobody knows!



Above: The infamous 10ft high rivetted Hell bunker dwarfs even the mightiest of players

haven't had any fertiliser for 10 years now.

"Our irrigation system hasn't been used this year. The only time it has been on was when the engineer needed to test it and I don't expect to use it until after The Open to assist the reinstatement," said Eddie, who revealed that despite this a completely new irrigation system is shortly to be installed on the course.

The one thing that might have brought our time travelling greenkeeper up a little short is the use of astroturf mats to protect the fairways.

"We use these from November to April in normal years and to May in Open years and I think we'd have struggled to get this policy through ten years ago. However, it's the only way to protect the Old Course which at the end of the day is an international monument to golf and it should be protected over the winter months when there is zero recovery rate," said Eddie, who added that the Old, New and Eden courses run at virtual 100% capacity with around 41,000 rounds of golf each.

The traditional course management philosophy extends to the course set up where players will certainly be required to play links style golf to succeed.

"We want to get it fast and linky, although with 92 mm of rain in May and June starting off just as bad we are very much in the hands of the weather when it comes to that," explained Eddie.

However, there are elements within his control that can ensure conditions that can only be found on a links course.

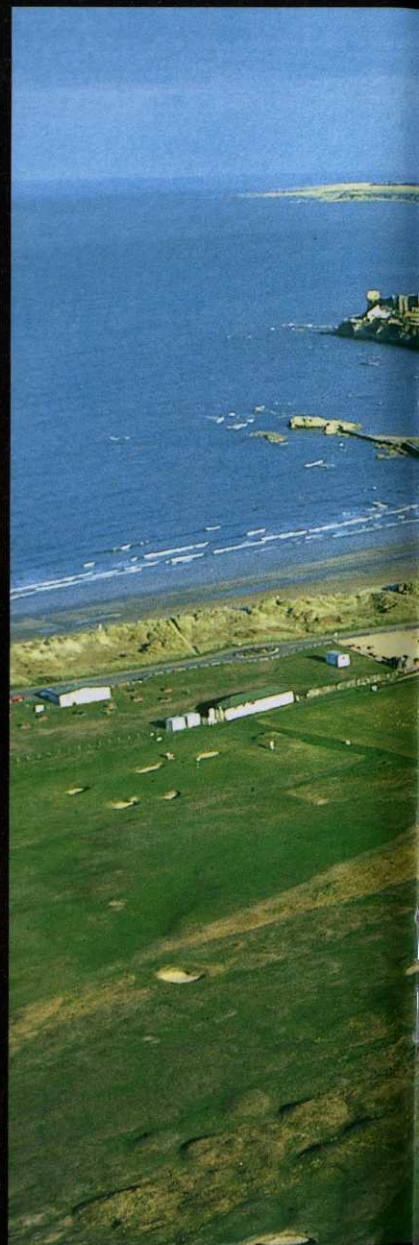
"The fairways will be kept very short - eight mil - so it will be difficult to get underneath the ball properly and hopefully the greens will be stimping about 10.5."

One element of the set-up which could perplex players is the fact that there is no definition between tee and green so that when they stand in the fairway there will be no visual reference to where the green starts or ends.

"It will make clubbing more difficult. The caddie can stand till he's blue in the face saying it's 137 to the pin but it won't look like that," said Eddie, adding that it was also causing the R&A a slight headache because of the difficulty in determining what was on or off the green for ball marking purposes.

The biggest task in advance of the Championship has been a complete bunker rebuild of all 112 on the famous Old Course.

"We did Shell and Hell bunkers last year because they were such big jobs but



we did about 100 between the end of the Dunhill Cup and this March. It's the first time we've done the whole lot in the space of 12 months with our own team and the guys did a fantastic job."

The statistics behind some of the bigger bunkers are quite mind blowing.

Hell bunker is seven feet tall on one side and 10 feet at the other and is 60 feet wide. To build a 10 feet high face takes 80 pieces of turf and the whole job takes 20,000 turfs in all and it takes two months to build.

"Greenkeepers who revet will know that building above head height is difficult as gravity takes over," said Eddie, who recalled the time in 1990 when some Canadian Superintendents were playing the course.

"My now Deputy, Billy Nicol, and I were just finishing off two month's work on Shell Bunker and Billy was giving the Canadians all the stats. I was on top, just cutting off the final row of turf, and looked down to see the bunker beginning to bulge. I jumped down and stuck my spade in to hold it but eventually had to jump out of the way and the whole face collapsed. Only about 10% was left.

"The Canadians played the loop and



PHOTOGRAPHY: EMMANUEL MORGAN

when they came back round were gobs-macked to see what what had happened. Billy told them we hadn't liked it so had pulled it down and they went off thinking what perfectionists we must have been. But we were devastated as it was two months work down the drain."

They have since learned from that and the biggest bunkers now have concrete foundations to provide a firm base for the retvetting.

The St Andrews bunkers are all very deep as, if it is particularly windy, the sand can swirl and gather in the most sheltered part of the bunker.

"It can be fine for the first 20 or so matches but after that a player can find himself in an area with no sand. We tried watering them but with so much rain recently haven't needed to," said Eddie as he sat in the £1 million maintenance facility - one of two similar buildings on the links, just part of a huge investment by the St Andrews Links Trust over the last few years.

The rough won't be any different from previous St Andrews' Opens with a three metre band of semi and the rest of it four to five inches thick.

"The Old Course rough has never

been thick and that's a deliberate ploy because we take a huge amount of play and we have to get people round the course.

"From my point of view golf is for everybody regardless of handicap or stature and they should be able to putt from tee to green if they wanted to. Hence the reason we don't have rough such as you see at a US Open venue."

Such is the strategic way the Old Course has been designed the rough adds a degree of difficulty rather than making the next shot impossible.

"If you land in the rough left off the tee at 17, although you've got a terrible line to the green, a well struck shot might get you to the front right of the putting surface and you could two putt for par. I don't have any problem with that.

"Like most of the holes, if you go right off the tee - the more dangerous line - you have a much easier shot to the green. It's all about risk and reward and that's what makes the Old Course the test it is. We'll be trying to encourage the golfer to play down the right a riskier tee shot but an easier approach."

Pin placements are vital at St Andrews and decisions on these will be taken very early on each morning of the Champi-

onship, possibly using an on-site fore-caster and done by 4am.

"St Andrews is a funny place for weather. It can be pouring everywhere else but sunny here. Forecasting is only about 50-60% accurate when it comes to St Andrews," revealed Eddie.

Pin placements are different for the first two days of the Championship than for the final two because of the famous double greens.

"Pins are further apart because of the amount of play on Thursday and Friday then come Saturday and Sunday we can come in a bit tighter."

The huge greens are another unique St Andrews feature. Where else could a slightly misjudged approach lead to an 80 yard putt?

"The 5th-13th green is 6,500 square metres and the two guys who will double cut it will walk seven miles in the morning and seven miles at night. It's tough but a guy from England gets that job," smiled Eddie.

"They need very good cutters because you need to walk 80 or 90 yards in a straight line and it's obvious if you go wrong because there will be a camera high above that green. Greenkeepers will know just how difficult that job is."

With the Old Course team of 18, plus three Interns from the States and a Wentworth greenkeeper who asked if he could join the team for the week - "We brought him in just in case it rains," joked Eddie - joined by the rest of the Links Trust greenkeeping staff bringing the total team to over 60. Eddie reckons he will be able to get the course prepared each morning in an hour and three quarters.

"Championship preparation is all about being able to do a week's work in three hours. There is no great science. It's all about extra pairs of feet to do the job - that and having enough kit to do the job and Textron have been great in providing us with whatever we need."

With the enviable man power and equipment at their finger tips the St Andrews team which will also be joined by the BIGGA Greenkeeping Support Team for the week have all of the bases covered for the third week in July and you can be sure that the 2000 Open Championship will go down in history and be remembered for all the right reasons.

Jenny Murphy, Technical and Registration Manager of Aventis Environmental Science, explains the benefits of using Selective Herbicides...

EFFECTIVE selection



All greenkeepers will have this seasonal problem: you want to kill off broad-leaved weeds without damaging the turf. The answer is the application of a Selective Herbicide. These herbicides are weedkillers which suppress or kill undesired plants without damaging valued plants. Therefore the term also applies to the control of weeds in agricultural crops, in shrub beds, and around trees.

Why do we need selective herbicides?

The use of selective herbicides allows efficient removal of weeds from large areas. To remove weeds by hand from the same area would take very much more time and effort. Selective herbicides are therefore one of the most cost-effective tools in a greenkeeper's armoury. Also, as most selective herbicides kill both the foliage and root system, the removal of the weed is complete - giving a much longer lasting kill than if the foliage only is removed by mechanical means.

How do selective herbicides work?

Inquisitive users of selective herbicides may ask the question: the product is sprayed onto both the turf and target weeds, so why is the grass not killed? Well, the term "selective" means that product has been developed to be active against broad-leaved weeds, but is selective to turf - meaning that the turf is unaffected. This selectivity results from physiological and biochemical differences between grasses and broad-leaved plants.

Selective herbicides can be divided into two major groups based on the way in which they act.

1. Contact Acting Selective Herbicides.

These act only upon those leaves which are directly sprayed. They cause scorching of treated plant tissue destroying their capability to produce energy for growth. Their main use is against annual weeds. Ioxynil is an example of a contact acting herbicide.

2. Translocated Selective Herbicides.

Upon application, translocated herbicides are absorbed by the foliage and move throughout the plant, killing both the leaves and root system. Translocated selective herbicides are therefore more effective and give longer-term treatment than contact selective herbicides.

There are many groups of selective herbicides which are translocated, each group killing the weeds by a variety of modes of action:

* Alkanoic & carboxylic acids: these are also known as "phytohormones"

because they disrupt normal plant hormone activity. Typical symptoms are inhibited and deformed growth and ultimately plant death. Examples of these compounds include MCPA, 2,4-D, mecoprop-p, triclopyr, clopyralid and dicamba.

* Anilides: disrupt the production of chlorophyll (the stuff which makes plants green!), giving characteristic bleaching symptoms. The affected leaves cannot photosynthesise (produce energy for growth) and therefore they die. Diflufenican is an anilide.

* Diphenyl ethers: inhibits photosynthesis and respiration and cause rupture of cell membranes. These compounds are quite fast-acting and scorch symptoms appear rapidly on most weeds. Bifenox is a diphenyl ether.

When should you use a selective herbicide?

Application is best carried out during conditions of active growth. This usually happens during the Spring and early Autumn. However broad-leaved weed growth may continue through the summer if conditions remain wet and mild.

Avoiding close mowing three days prior to application ensures maximum leaf area for product uptake. It is advantageous to avoid mowing for three days following application as well, to allow time for uptake and translocation of the active ingredients.

It is important to note that selective herbicides should not be applied if the turf and weeds and under stress, for example during periods of drought, waterlogging or frost, as this may impair herbicide uptake and lead to poor control.

How are selective herbicides applied?

Most are applied as liquids for use through watering cans, knapsack sprayers or tractor mounted sprayers.

Every selective herbicide has an approved label giving essential recommendations on protective clothing to be worn and precautions to be followed during application. In addition the label gives detailed use instructions including dose rates, water volumes and weed spectrum. There may be a range of rates on the product label, according to weed species. It is therefore important that you identify the weeds first then select the appropriate application rate and water volume.

The label recommendations are based on many years' research, and must be followed to ensure safe and effective product usage.

Having selected your rate of appli-

cation, the next essential step is to calibrate your sprayer. Anyone who regularly uses a knapsack or ride-on sprayer should be familiar with the calibration process. Calibration must take into account both the product dose rate, and the volume of water which is stated on the product label.

Applied in the correct dosage and under the correct conditions, selective herbicides represent the most cost-effective solution to weed control in turf.

Getting the best from the products Six point summary -

Identify The Problem

Select the right product for the job by first identifying the main weeds present. Then compare your list against the weeds mentioned on the product label. As a general rule, the more active ingredients a product contains, the wider the weed spectrum will be. For example, if clovers are predominant, you could use a product containing straight mecoprop-p. If several species are present, e.g. daisies, dandelions, buttercups and thistles, you will need a product containing two active ingredients including 2,4-D or MCPA. Three-way products also exist. These usually have a very wide weed spectrum, including difficult weeds such as speedwells. In addition three-way products can be useful if control of uncommon or unusual weeds is required.

Timing

Best results are achieved when the selective herbicide is applied to actively growing turf and weeds. The application of a fertiliser prior to treatment will improve growth, which in turn will speed up herbicide uptake and give good results.

Mowing

Mowing reduces the leaf area and consequently the weeds' ability to absorb the herbicide. Therefore mowing should be avoided for 3-4 days before application where possible. After spraying, a further period of 3-4 days without mowing will allow complete uptake of the herbicide, resulting in better control. Clippings from the first 2-3 mowings following application will contain traces of herbicide. These should not be used for composting unless allowed to rot down for at least 6 months.

Adverse conditions

If adverse conditions prevail, for example periods of drought, flood, frost or very high temperatures, both grass and weeds are under stress and therefore not actively growing. This will adversely affect the uptake of herbicide and the grass may be scorched.

Spray Drift

Avoid drift as much as possible by setting the nozzle at the recommended height and working under conditions of light breeze only. Use the correct nozzle and avoid high pressures which create small droplets that are more likely to drift. Small amounts of selective herbicide may cause damage to adjacent broad-leaved vegetation.

Calibration

Ensure equipment is properly calibrated before use.



From top: Chafer grub; Leatherjacket; Daisy; Dandelion; Wormcasts

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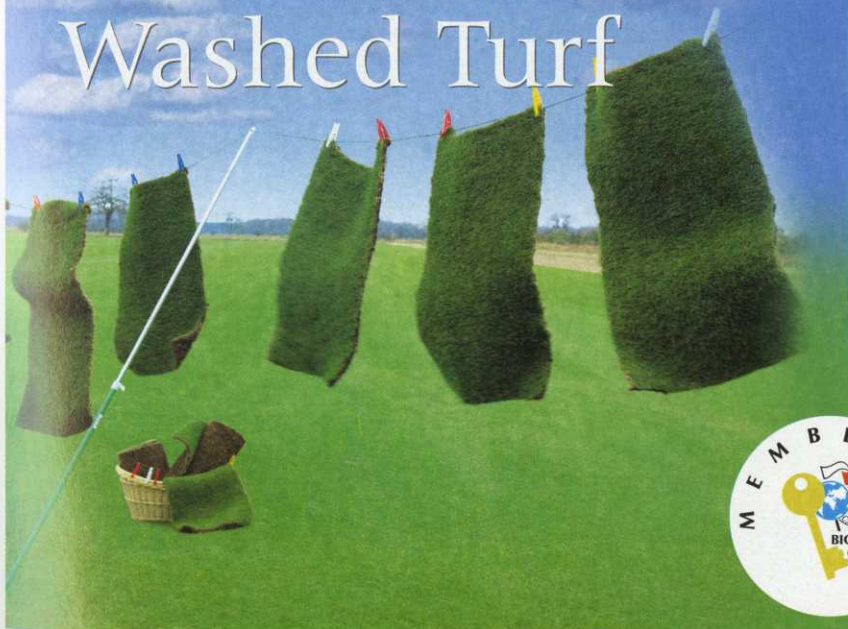
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Roland Taylor examines the issue of pest control, and how best to deal with various 'alien' elements on your Golf Course...

Pesssst!

Have you heard?

Right + far right: Unless carefully managed, badger can create havoc to golf courses, in their quest for food



Above + top: Animal faeces are unsightly and constitute real health hazards

Bottom: Molehills are obvious hazards to both greenstaff and golfers



Unlike farmers, horticulturists and gardeners, greenkeepers have relatively few pests to deal with, certainly in the insect category. However, those that do occur can cause havoc. To ensure the turf remains strong and healthy throughout the year a pest control management system needs to be in place.

Pests fall into two categories - animals (including humans) and insects. In both cases it is important to know as much as possible about them.

Rabbits

Once upon a time the rabbit was used as a mower. Apart from sheep, cattle or a strong man with a scythe (plus a lot of time!) there was no other way of obtaining a short grassed playing surface. A few centuries ago, St Andrews issued the rights for a warren on their course. Apparently the players soon got fed up with losing balls down burrows and trampling about in unpleasant substances so the powers decided it was not such a good idea.

It is estimated that at present rabbit numbers are between 35-40% of the pre-myxomatosis levels and this figure is going up about 2% each year.

As we all know, the rabbit is a prolific breeder. They do reproduce all year round, but the main period is between January and August with up to 24 young being produced in four to six litters. Each youngster is capa-

ble of reproducing at three months old, so two born in January can become 80 by autumn! Young rabbits are vulnerable and 90% will have died during the summer.

An ideal time to reduce the adult is from November to March when the population is at its lowest and before the next main breeding season. There are a number of Acts that need to be taken into consideration when dealing with rabbits.

Under the Wild Mammals (Protection Act) 1996 it is an offence to intentionally inflict unnecessary suffering on any wild mammal as specified in the Act. This legislation may need to be considered where the destruction of occupied warrens and burrow systems is being contemplated

An Order under Section One of the Pests Act 1954 which declares England and Wales "a rabbit clearance area" states that every occupier of land is responsible for destroying wild rabbits on their land. In cases where it is not practical to destroy them, steps must be taken to prevent damage

An occupier of land has the limited right under the Ground Act 1880 to kill rabbits using any legal method including gassing, trapping, ferreting, shooting, snaring and netting

CONTROL METHODS

Gassing

Under the right conditions this will have an 80% success rate.

At least two trained personnel must carry out this operation, so for most readers the answer is to call in a specialist. Some of these companies run training courses in the correct procedures and it may be a good idea to train up some of your staff.

The most commonly used compound is a sodium cyanide (Cymag). When this comes into contact with moisture or soil it produces hydrogen cyanide. It comes in a powder form, which is blown into the burrows or deposited inside the entrance with a spoon.

There are also a number of pellets or tablets now available. These contain metallic phosphides which give off phosphine gas when moistened. Like the powder forms these are introduced to the burrow entrance which is then blocked up.

Fencing or wire netting

In certain situations this could be the answer. The initial outlay is likely to be high, but in the long term it is a cost-effective preventive measure compared with carrying out other control measures on an annual bases.

Moles

Unlike the sociable Mr Mole portrayed in "Wind in the Willows" moles are very solitary, territorial animals, living most of their lives in total darkness underground. Their tunnel systems can cover an area of up to 1.6ha (4 acres) and consists of a deep permanent network and short-lived surface runs. The complex has one or two chambers within it lined with dry material, these are used as sleeping quarters and for raising the young. Molehills are created as a result of tunnel extensions or repairs and are often due to a shortage of the moles staple diet - worms. They consume large quantities, an 80gram mole requires up to 50grams of earthworms a day. During the summer they will also eat insects that fall into their tunnels. Sometimes special chambers are set up where worms are stored alive for a later feast.

Male and females remain solitary in their own domains only coming together in the spring for breeding. Litter numbers are from three to four babies and these are weaned at four-five weeks. They leave their mother's territory at about six weeks by dispersing above ground. This is the time when they are most at danger.

Control

This is best carried out between October and April and there are two main methods, poisoning with strychnine or trapping. There are other methods although some evidence suggests these are questionable. They include smoke cartridges containing pesticides, which are ignited and placed in the tunnels. This can be very hit and miss as it is difficult to make sure a sufficient toxic level is reached. A mole is no fool and can quickly block off a tunnel if it senses danger.

Where chemical repellents are used



it is often a case of pack the bags and move to another district.

A number of electronic devices, which are said to produce vibrations that make the moles life intolerable, are now available. Current evidence would suggest they have a very limited effect and the offending creatures stay put.

One method that could have the desired results is to eradicate the food supply by getting rid of the worms. A hungry mole is going to move on.

Trapping

First find the right tunnels using some form of probe - they are down there somewhere between molehills. The deep ones are what you are looking for, those near the surface are not suitable. Once located a hole is dug into them and the trap carefully lowered in.

Poisoning

Earthworms are the bait, these are mixed with strychnine and carefully introduced to the run. The bait needs to be distributed evenly throughout the tunnel system.

With strychnine a permit must be obtained from the MAFF Regional Service Centre in England and WOAD in Wales.

As with gassing, because of the measures and precautions that have to be taken with poisons it would probably be more economically viable to call in the services of a professional pest control organisation. Staff have to be fully trained before using any of these substances.

Earthworms

A major portion of any greenkeeper's turf management programme is devoted to aeration and in this he has an ally - the humble earthworm. It breaks down organic matter and excavates tunnels through which water, air and nutrients can percolate. When this creature decides to deposit casts it becomes the greenkeepers enemy. Out of the 25 species of earthworms found in the UK, three carry out this heinous crime.

The casts contain a mucous, which if wet, smears and dries rock hard. It

is an ideal site for unwanted seedlings such as poa annua and weeds to establish themselves. In addition, it forms an impenetrable crust through which nothing can permeate. On fine turf they stick out like a sore thumb.

There are some preventive measures which, while not eliminating the problem, can play a part in its control. Removal of organic material such as grass clippings and thatch reduces the food supply, which in turn affects the worm population.

The pH of the soil is another influencing factor. Worms cannot tolerate acidic levels. Applications of sulphate of iron have been a commonly practised method over the years and trials have been conducted to determine the effects of aluminium sulphate and sulphur.

Most chemical controls for worms have disappeared and today the choice is limited. At present fungicides based on carbendazim and a fungicide/insecticide thiophanite-methyl are said to prevent worm cast formation. This is only a short term answer, so repeated applications have to be made.

The quest continues to find an acceptable solution to this problem.

Badgers and foxes

They love insect grubs, and will create a battlefield, tearing up the turf in their quest for these delicacies. The answer is to remove these tantalising meals by controlling the insects that create them.

Geese

These can be a problem for some greenkeepers - they graze fine turf and leave a nasty mess behind. Electric fencing or bird-scaring devices are possible solutions. Lead pellets from a 12 bore were suggested but there could be major problems regarding the species of geese involved and the organisations that protect them.

Cattle and sheep

In years past, some courses were built on sites where the locals had (and in some cases still retain) grazing rights. Over the years, regular players will have come to accept that

they have to retrieve their balls from a cow pat. Likewise, the greenkeepers tolerate this particular pest and restrict their access to greens and other vulnerable areas with some form of fencing. They have very little choice and have to live with it.

INSECT PESTS

Leatherjackets

During the late summer and early autumn the daddy long legs or crane fly is a common sight. Like a terrorist it is plotting trouble. The female lays about 250 eggs and these become larvae within 14 days. They then spend the next nine-months chewing their way through grass leaves and roots. Bearing in mind how many eggs were laid, the numbers of larvae in a particular area will be high and as a result the devastation their feed has on the turf is very significant. Another problem is that birds such as rooks and starling have a sixth sense. They know that there is a tasty morsel lurking beneath the surface and have no respect for the turf in trying to get this meal. They are good indicators that there is a leatherjacket problem.

Finally the larvae change into a pupa and work their way to the surface and hatch into adult crane fly ready to produce more offspring, to repeat the cycle again. Sandy soils are more to their liking and they prefer a diet of fibrous turf.

Treatment should be carried out when the larvae are relatively small and this is best done about November using a chlorpyrifos based insecticide.

Fever Fly

The larvae of the Fever Fly, of which there are two species, also damage turf. They resemble the leatherjacket, but are smaller and the treatment for this pest is the same.

Chafer Grubs

The Garden Chafer Beetle has a one-year lifecycle. Adults emerge at about the beginning of June and the female burrows into the ground and proceeds to lay her eggs. These take just over a month to hatch. The grubs

feed on grass roots until the late autumn then burrow down into the soil to hibernate throughout the winter. In the spring they pupate and emerge a month later ready to procreate.

The damage is similar to that produced by leatherjackets and the presence of birds is also a sign there is 'trouble afoot' underground. Treatment is with an insecticide.

Other Pests

Most greenkeepers will inevitably encounter pests of the human variety, these come in all shapes and sizes. We have all met the so-called expert - (X an unknown quantity and spurt a drip under pressure). Whilst it would be nice to tell them to travel, the treatment has to be diplomacy and tact.

Next time you encounter a pest problem, stop and ponder this for a second: your counterpart in some far distant country could be faced with alligators or snakes all over his course. Is this not a sobering thought!



Above: Rabbits do not always dig their burrows in secluded areas

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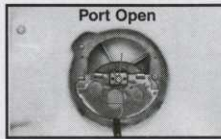
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