Finance for Mowers

Ian Henderson, Managing Director of Golf Finance Ltd on funding of Mowers and other Grass Machinery.

Q. How many Golf Clubs use finance for the funding of mowers and other grass equipment?
A. "The majority of Golf Clubs, whether Members Clubs or proprietary businesses use finance, when acquiring new machinery. There has been a very big change in attitudes towards finance in the past 10 years with most clubs now very comfortable with all forms of structured funding".

Q. There are several forms of finance talked about, such as Lease, HP and Contract Hire. What is the best type of agreement for a golf club?
A. There are great benefits to members clubs with either leasing or contract hire. With this type of agreement the club can spread the vat over the life of the agreement, rather than having to pay it all up front as with Hire Purchase. With the current vat de-minimis in place the savings made in spreading the vat can go a long way to offsetting the interest charges on the agreement.
For proprietary clubs or clubs who are out with de-minimis, Hire purchase is a good alternative.

Q. You mentioned Lease and Contract Hire, what is the main difference between these products?
A. Lease, or Finance lease to give it the correct name, is where the club agrees to hire the equipment over a set period, of say 3 or 5 years. At the end of this time the club effectively own the full value of the asset. If the club choose to sell the equipment or trade the machine back in, they would benefit from a 100% rebate of sale proceeds. If the club choose to retain the machine after the primary rental period a small "secondary" or "peppercorn" rental is normally paid on an annual basis. With Contract Hire, or Operating Lease the machine is simply returned to the supplier at the end of the period. It is fairly common to have a maintenance schedule built in with a Contract Hire agreement, which gives the club a one stop shop.

Q. Over how many years do Golf Clubs normally finance their mowers?
A. With the quality of machines which are produced by the main manufacturers today, it is quite common for clubs to finance mowers over anything up to 7 years, sometimes longer for a small or 9 hole course. The average is 5 years, which allows a manageable cost annually, but avoids any large repair bills and maintenance charges.

Q. Golf Finance talk about "Cashflow Matched Finance". what exactly is this?
A. Every club is different. We understand the income cycles within clubs vary, depending on the geography, the time of year when subscription payments are collected and visitor income levels. By studying these details we can design a package which is suited to each club's cash flow. This avoids collecting large direct debits when the club has little or no income.

Q. How do you manage to stay ahead in this competitive market?
A. As independent brokers we will negotiate the package for the club which is the best suited, and most competitive given the circumstances. Whether the deal is for a £3,000 hand mower or a £3 million pound mortgage we have a range of funding partners with whom we have worked for many years and are always keen to do business in our market place.

Q. How does a club go about arranging finance through Golf Finance?
A. Our details are in the buyers guide in Greenkeeper International each month, or you can visit our website www.golffinance.co.uk and email an enquiry, or simply call us on 01620 890200.
We have facilities for all types of new and used equipment, and would be delighted to discuss any requirements any clients may have.
Roland Taylor gets out and about and discovers what some greenkeepers feel about the cylinder mowers they use.

The principle of the cylinder mower has changed very little since Budding patented the system back in the 1830s. The main differences since those early models are the methods of propulsion, number of blades in the cylinder, the means of powering them and materials used in their construction.

Bearing in mind that the actual cutting is virtually the same on every mower. What makes one particular model a Course Manager or greenkeepers choice? To find out some of the answer to this question a number of courses have been visited to discover which machines they were using and why they chose them.

Built virtually on the beach, the Royal Norfolk Golf Club can be pretty hostile and cold with freezing northeast winds coming straight off the northern ice cap. When visiting this course it is advisable to check the tides, as there are times of the day when it is cut off from the mainland.

The fairways are on sand, so grass cover is often sparse, especially in drought conditions even though the course has its own bore hole for irrigation. The course is a continual challenge against the elements for Head Greenkeeper, Gavin Playford, and his team.

For mowing their fairways they use the latest John Deere 3235C. Gavin said they are very pleased with the machine's high output and quality of finish.

“Spending all day on a mower can be very tiring, so ergonomics regarding the driving position and layout of the controls are important. We have found on this machine that this is major feature of the design. A very comfortable seat can be adjusted to suit each operator and all the controls are within easy reach. What we do need however is a cab; it is not very pleasant out there on the course with a gale howling in from the northeast. I understand they are developing one let's hope it is sooner rather than later,” explained Gavin.

Other features they liked about the mower are the simple servicing procedure and ease of access to all moving parts.

The 3235C has a 48.5hp turbo diesel engine and servo controlled hydrostatic pump to all the wheel motors. There are five cutting units and the Royal Norfolk have the eight bladed version, which has a height of cut range from 9.5mm to 76.2mm and a frequency of cut of 2.14 km/h.
A control module enables the operator to monitor the machines performance and identify any problems.

There are a number of reasons why Gavin has chosen John Deere, but one of the most important is the outstanding after-sales support they get from their dealer, Ben Burgess, of Norwich.

"We are out in the wilds so if a machine goes down or we require replacement parts, backup is needed immediately, our dealer ensures this happens.

"This type of service is paramount to us if we are to carry out our commitment to provide the club members with the playing surfaces they expect," said Gavin.

Spalding in Lincolnshire is famous for its bulbs, horticultural and agricultural produce. One of the reasons for the soil's fertility is that this area of England was once, long ago, under water.

Rivers flowing into the sea at this point left deep silt deposits that have, over the ages, combined with fine clay to form a highly productive and moist retentive soil.

John Maskell, Head Greenkeeper of Spalding Golf Club said that when they were building an on-site reservoir, the work was stopped three times because ancient salt pans were discovered and archaeological records needed to be taken before the work could continue.

The fairways on the course considerably benefit from this type of soil base and maintain their greenness longer in drought conditions.

John, who has been involved in greenkeeping for over 28 years, joined Spalding GC 18 months ago. He said that part of their programme was to rejuvenate their tees and provide higher quality playing surfaces.

To help in this project they have recently purchased a specially-adapted new Jacobsen T-Plex MagKnife. The machine has been modified to suit their compact tee boxes.

Eleven bladed reels are used for a fine cut and to achieve better traction the wheels and tyres from a G-Plex III have been fitted. The 12" tyres will be of benefit on the steep sides of tees and also enable them to cut very close to bunker edges without damaging the lips.

Spalding has an excellent workshop where they carry out all their maintenance and repairs including regrinds.

"The MagKnives will give us considerable savings in downtime and for this reason we are considering fitting these cylinders to our Fairway 405. The units are interchangeable with the T-Plex and will give us even more flexibility," explained John.

The MagKnife, which was launched at Saltex, is claimed to have a revolutionary method of fitting bottom blades, which in the past have been held in place by a number of screws.

Removing a worn or damaged blade has always been difficult and when a new one has been fitted it has often had to be ground to ensure it is level.

The Magknife is said to eliminate these problems and where as before

and the changeover per unit has taken in the region of one and half hours the new operation is said to be completed in three minutes.

MagKnife uses powerful magnets with a force of 19kNm instead of screws to hold the bottom blade in position on locating dowels. According to Jacobsen a special tool is required to break the magnetic force and once this is done its only a matter of removing the old bottom blade and locating a new one.

Barkway Park Golf Club is a privately owned course, built 11 years ago on agricultural land in North Hertfordshire. The underlying soil is heavy clay, which makes it a difficult course to maintain and adding to this problem there is a wind factor, so drying out often occurs.

Anthony Lake is the Head Greenkeeper and has been at the club for just over eight years. For the last two years he has used a Toro Reelmaster 6500 D for the fairways.
"We like the unit very much especially its robustness and strength. For us this is important because our dry ground conditions can place a lot of stress on the machine. The high level of output is another feature that goes down well here at Barkway, as there is only two of us plus occasional help to look after the 18 holes," he said.

"We have found the Reelmaster very 'user friendly' and comfortable to operate for the long hours it is worked throughout the year. It is easy to maintain and the backup support we receive from our local Toro service dealer, Cam Mower Services, is excellent."

To maintain the standard their players expect, the fairways are mown weekly at alternative angles of cut and are fed and scarified once a year. Toro’s Reelmaster 6500 D has a mowing width of 2.44 metres, which is made up of five 56cm cylinder units mounted on a LINKS cutting system.

It is not just the grass that will be stressed by blunt or badly set cylinders all the mower’s components can be effected. In addition with the high temperatures the machines are working at the situation is compounded by placing extra loading on the engine, bearings and drive systems.

With all the machines featured, keeping the units sharp and correctly set is well catered for and relatively easy to carry out. Some would say easier on certain models than others.

Next month some other clubs will be featured with details of the types of mowing machines they are using for their fairways, tees or greens.

See Buyers’ Guide for companies that specialise in mowing equipment.

The Toro out on a very wet day at Barkway Park Golf Club

suspension. This consists of four free-floating linkage arms and individual lifting arm dampers to ensure the units hug the ground contours.

Power is provided by a 55hp Peugeot diesel engine. The data log system is available as an optional extra that enables a mechanic to find intermittent problems. There are diagnostic points on the mower for the front and rear-cutting unit drives and lift plus ones for the steering and hydrostatic transmission.

From the clubs visited it is clear that in their particular areas there has been a strong growth of grass over the last three months, although at the time of writing, temperatures are soaring into the high 20s.

Regardless to the amount of grass and the standard of the fairways one of the most important factors for producing a quality finish and smoothness of the mowing operation is the sharpness and set of the cylinders.

OTHER COMPANIES THAT SPECIALISE IN MOWING EQUIPMENT:
Claymore Grass Machinery 01789 490177
Dennis 01332 824777
Etesia UK Ltd 01926 403319
Hayter Ltd 01279 723444
John Deere 01949 860491
Lastec UK Ltd 01622 812103
Lloyds of Letchworth Ltd 01462 683031
Massey Ferguson (AGCO) 02476 851286
New Holland UK Ltd 01268 292580
Ransomes Jacobsen Ltd 01473 276223
Wessex M/C 01420 478111
Wiedenmann UK Ltd 0141 8143366
Foundation degree sports turf management

Starting from September 2004, you can gain an HNC in two years or add on an extra year to gain a foundation degree. Suitable for those aged 21+ in a supervisory or management role, the course runs for one day each week from 2pm until 8.30pm.

The course provides technical knowledge of sports turf management, and management of sports facilities. Modules include plant and soil sciences, turfgrass science, and physical resource management.

There are no formal entry requirements, but you should be able to demonstrate knowledge of turfgrass/horticulture management and a commitment to part-time study programmes.

For more information please contact us on 01926 318318, email us on enquiries@warkscol.ae.uk or write to us at the address below.

Warwickshire College
MORETON MORELL CENTRE WARWICK CV35 9BL

The grass is greener with Myerscough Sportsturf!

Developing both Sportsturf and Mechanisation training and education to Degree level, Myerscough College provide first class facilities with the opportunity to study and enjoy placements at the world's most prestigious sporting venues.

Further Education Courses (16+)
- NVQ Level II, III & IV* Groundsmanship & Greenkeeping
- First Diploma in Sportsturf
- National Certificate in Sportsturf
- National Certificate in Sportsturf Machinery
- National Diploma in Sportsturf
- National Diploma in Landbased Technology

Higher Education Courses (18+)
- BSc (Hons) Turfgrass Science
- B.A. Top Up in Sportsturf Facility Management
- Foundation Degree in Sportsturf
- Foundation Degree in Sportsturf On-Line (by distance learning)
- Foundation Degree in Landbased Technology

Now recruiting for on-line Foundation Degree September 2004!

We also provide various short course programmes and our own turf management consultancy service.
* Work-based options are available with work place tutor support.

For a prospectus and details of our regular Open Mornings call Course Enquiries on 01995 642211.
GREENKEEPER TRAINING

ABINGDON AND WITNEY COLLEGE  Warren Farm Campus, Hertton-cur-Street, Oxford OX3 19T Contact: Alan Brown or John Revis Tel: 01865 351794 Fax: 01865 358931 Email: john.revis@abingdon-witney.ac.uk Web: www.abingdon-witney.ac.uk Information: Warren Farm Campus is the base for Abingdon and Witney College's education and training in Greenkeeping. Sports turf, Amenity horticulture and allied land based courses for the whole of Oxfordshire. Courses include: - NVQ Levels 2 & 3 in Sports turf, Landscaping and Nursery. We also offer a range of short courses for the industry including Health & Safety, pesticide training and Chainsaw operation. For more information contact either Alan Brown or John Revis on Tel: 01865 351794 or Fax: 01865 358931.

ASKHAM BRYAN COLLEGE  Askham Bryan, York, North Yorkshire, Y023 3FR Contact: Central Admissions Tel: 01904 727711 Fax: 01904 727888 Email: contact@askham-bryan.ac.uk Web: www.askham-bryan.ac.uk Information: National Certificate in Horticulture, National Diploma in Horticulture (Turf Option), Higher National Certificate in Horticulture (Golf Course Management), part-time study, Higher National Diploma in Horticulture (Golf Management Option) all available full or part-time. Block release courses: NVQ Level 2 Greenkeeping, NVQ Level 3 Greenkeeping and Sports turf Maintenance, NVQ Level 4 Amenity Horticulture. Short courses: FEPA spraying, chainsaw and brushcutter courses.

BERKSHIRE COLLEGE OF AGRICULTURE  Halfpenny Green, Maidenhead, Berkshire, SL6 0AR Contact: Andy Williams Tel: 01628 824444 Fax: 01628 824495 Email: enquiries@bcac.co.uk Web: www.berkshirecollegeofagriculture.co.uk Information: Located in the Thames Valley, BCA has excellent resources for horticultural based training including a six hole golf training area provided by HIN The Duke of York. Programmes include the First Diploma, National Certificate and National Diploma in Horticulture, with Landscape Design and Greenkeeping options plus Higher National Diploma/Certificate programmes. Part-time programmes include NVQ Levels 2, 3 & 4 in Amenity Horticulture. Work based training is available for all of these programmes. Short courses available in Arboriculture/Chainsaw work, TOIL training and Pesticide application training.

BROOKSBY MILTON COLLEGE  Brooksby, Melton Mowbray, Leicestershire, LE14 2LP Contact: Student Services Tel: 01664 850850 Fax: 01664 850955 Email: course.enquiries@brooksbymelton.ac.uk Web: www.brooksbymelton.ac.uk Information: The training facility opened by HRH The Duke of York. Programmes include the First Diploma, National Certificate and National Diploma in Horticulture, with Landscape Design and Greenkeeping options. Short courses: FEPA spraying, chainsaw and brushcutter courses.

CANNINGTON COLLEGE  Cannington, Bridgwater, Somerset, TA5 1LS Contact: Steve Hunt Tel: 01282 655133 Fax: 01282 655055 Email: enquiries@cannington.ac.uk Web: www.cannington.ac.uk Information: National Certificate in Amenity Horticulture, National Certificate in Amenity Horticulture, Certificate of Higher Education in Golf Course Management, Foundation Degree in Golf Course Management, NVD Level 2 Golf Greenkeeping, NVQ Level 3 Greenkeeping and Supervisory Management, NVQ Level 4 Horticulture (Sports Turf, Farming Training, Chainsaw Certification, OP - Road Vehicle Certification, Greenkeeper Mechanics, Certificate in Irrigation (ITM) 1 week course. Note: Certificate of Higher Education is available as a part-time option.

EAST DURHAM AND HOUGHALL COMMUNITY COLLEGE  Houghall, Durham, DH1 3SG Contact: Colin Stanfield Tel: 0191 386 0419 Fax: 0191 386 0333 Email: enquiries@edhcc.ac.uk Web: www.edhcc.ac.uk Information: National Award in Horticulture, NVQ Level 1 Horticulture, NVQ Level 2 & 3 in Amenity Horticulture in Hard Landscaping, Sports Turf and Production Horticulture.

HADLOW COLLEGE  Hadlow, Tonbridge, Kent, TN11 0QX Contact: Sally Flanagan Tel: 01732 853241 Fax: 01732 853207 Email: sally.flanagan@hadlow.ac.uk Web: www.hadlow.ac.uk Information: National award and National Diploma in Horticulture, NVQ Level 1 Horticulture, NVQ Level 2 & 3 in Amenity Horticulture in Hard Landscaping, Sports Turf and Production Horticulture.

HARTPURY COLLEGE  Hartpury House, Gloucester, Gloucestershire, GL19 3BT Contact: Joe Paulin Tel: 01242 701132 Fax: 01242 700679 Email: enquiries@hartpury.ac.uk Web: www.hartpury.ac.uk Information: Courses available: College Certificate Greenkeeping, First Diploma Amenity & Landscape Horticulture, National Award Amenity Horticulture, National Award Greenkeeping & Groundsmanship, National Certificate Amenity & Landscape Horticulture, National Diploma Amenity & Landscape Horticulture, National Diploma Sports Turf (Excellence & Performance/Golf Studies). Work Based Training NVQs, RHS examinations City & Guilds, TEDB Assessor Awards as well as a full range of amateur, leisure and day release courses.

HOGGERSTON COLLEGE  North East Surrey College of Technology  Reigate Road, Ewell, Epsom, Surrey, KT17 3DS Contact: Colin Paulin Tel: 0208 394 3228 Email: info@nescot.ac.uk Web: www.nescot.ac.uk Information: NVQ Levels 1, 2 and 3 in Amenity Horticulture (Greenkeeping options). Part-time Day Release. Duration: Two years to Level 6. FEPA Spraying Courses. Also available - RHS General and Advanced Certificates in Horticulture. RHS Diploma in Horticulture.

HURSTWOOD POINT COLLEGE  Dorking, Surrey, RH5 0QX Contact: Andy Wright Tel: 01737 737060 Email: andy.wright@hurstwoodpoint.ac.uk Web: www.hurstwoodpoint.ac.uk Information: Full time courses: National Certificate in Greenkeeping and Sports turf Management. Part-time courses: leading to NVQ Level 2 & 3 Greenkeeping, Apprenticeship Training. Evening Courses: leading to NVQ Level 4. Short Courses: Pest Control, Chainsaw.

PLUMPTON COLLEGE  Distilling Road, Plumpton, Lewes, East Sussex BN7 3AF Contact: David Blackmore Tel: 01273 840454 Fax: 01273 840471 Email: enquiries@plumpton.ac.uk Web: www.plumpton.ac.uk Information: HNC Sports turf, National Diploma in Amenity Horticulture, National Award (Garden Design), First Diploma in Horticulture. Part-time courses: NVQ Level 1; NVQ Level 2 in Landscaping and Sports turf; NVQ Level 3 Landscaping and Sports turf; NVQ Level 4. Also available are RHS General and RHS Advanced: IOG National Technical and Intermediate National Diploma. Short courses are also available for FEPA spraying and chainsawing.

REASEHEATH COLLEGE  Nantwich, Cheshire, CW5 6DF Contact: Phil Starling Tel: 01270 823438 Fax: 01270 826556 Email: phil@reseheath.ac.uk Web: www.reseheath.ac.uk Information: Full-time National Certificate in Amenity Horticulture. National Diploma in Amenity Horticulture with Sports Turf Foundation Degree/ Higher National Diploma in Golf Course Management; Part-time: Higher National Certificate in Golf Course Management; NVQ Levels 2, 3, 4 in Sports Turf plus a wide range of NPTC qualifications.
This guide is not exhaustive and a full list of GTC approved training providers can be obtained from the GTC. The Greenkeepers Training Committee (GTC) are continually reviewing the approved status of training providers offering greenkeeper training courses. Anyone with a query regarding greenkeeper training should contact the Greenkeepers Training Committee at Aldwark Manor, Aldwark, Alce, York Y061 1UF; Tel: 01347 839640 or visit their website at http://www.thegtc.co.uk

Available courses guide

**England**

**The College of West Anglia**
Milton Campus Contact: Bob Young Tel: 01223 860701 Email: enquiries@col-westanglia.ac.uk
Information: The College of West Anglia offers a full range of courses for Greenkeepers including; NVQ Level 2, Sportsturf (Greenkeeping and Groundsmanship), NVQ Level 3 Sports Turf Maintenance, GTC Craft Certificate, GTC Certificate in Golf Course Supervision, TDLB Assessor awards. FEMP, Chain Savers, M01. Other Courses: National and First Diploma in Horticulture and Garden Design.

**ASHAURY COLLEGE**
Izod, County Mayo, Co. Mayo, F91 KF45 Tel: 00353 18460644 Email: paul@ashaury.ac.uk
Information: Courses offered: Level 3 Certificate in Greenkeeping Level 3 Certificate in Golf Course Management National Diploma in Horticulture (Greenkeeping Major offered).

**Carlton College**
Redditch, Worcestershire B97 6HH Tel: 01527 870490 Email: tarrant@carlton.ac.uk

**Shrewsbury College**
Uplands Park, Shrewsbury, Shropshire SY1 4QG Tel: 01743 259923 Email: r@shrewsbury.ac.uk

**Welsh College of Horticulture**
Northop Hall, Mold, Flintshire CH7 6AA Contact: Mr Gareth Philips Tel: 01322 841034 Email: gareth.philips@wcoh.ac.uk Web: www.wcoh.ac.uk Information: Full-time - Higher National Diploma in Turf Management. Part-time - Day Release Higher National Certificate in Turf Management. Block week - NVQ Amenity Sportsturf Levels 2 - 4. Briefing Days - NVQ Level 4, TDLB Award Course A1, Z1, Day Courses - FEPA, Chainsaw, Chain Sawing, First Aid, CIEH.
Sign up for this autumn

Writtle College has excellent links with the sports turf industry and boasts first class on-site facilities, including 15 hectares of sportsfield and the most up-to-date equipment for sports turf maintenance.

Bsc (Hons) degree awarded by the University of Essex
Sports Turf Science and Management

New for 2004
Foundation degree awarded by the University of Essex
Sports Turf and Golf Course Management
A new two-year study option combining work experience with academic study with the opportunity to progress to an Honours degree.

NVQ Level 2 and 3 Sports Turf

Full and part-time study options available, as well as a range of short courses in vehicles and machinery.

For details of forthcoming open events, call 01245 424200 or email info@writtle.ac.uk

Writtle COLLEGE
A partner institution of the University of Essex
Chelmsford Essex CM1 3RR www.writtle.ac.uk
developing people | building careers

OAKLANDS COLLEGE
We offer the following qualifications in GREENKEEPING, LANDSCAPING and AMENITY HORTICULTURE:

NVQ levels 1 - 4
Foundation Modern Apprenticeships
Advanced Modern Apprenticeships
National Certificates
Advanced National Certificates
RHS General Certificate
C&G Garden Design
Pesticide Training
Chainsaw Testing

01727 737 080
www.oaklands.ac.uk

NPTC Market Leaders in Land Based Qualifications

The Horticultural and allied industry's professional independent assessment service, delivering accredited certificates of competence in:

- Safe Use of Mowers
- Brushcutting Operations
- Hedge Trimmers
- ATV Handling
- Pesticides
- Turf Maintenance Equipment

For a complete list of our qualifications and further information:
Tel: 024 7685 7300 Fax: 024 7669 6128
www.nptc.org.uk Email: information@nptc.org.uk
Disease Analysis
- How can it work for you?

Dr Kate Entwistle discusses the importance of accurate disease analysis.

There are three main reasons why turf disease analysis is important:
1. Accurate and effective management relies on knowing the cause of the problem.
2. Identification of the cause will enable appropriate fungicide selection (if it are needed)
3. The cause of the problem may not be related to pest or disease activity

Diagnosing the exact cause of damage to amenity grasses can be both challenging and rewarding. Your experience as a turf manager allows many pest and disease problems to be confidently and correctly identified on the course, but there are occasions when confirmation of a tentative identification is needed, or diagnosis is uncertain and a laboratory examination of the problem can be helpful.

**INVERTEBRATE PEST, FUNGAL DISEASE OR DISORDER?**

Turfgrasses can be damaged by invertebrate pests and by fungal disease but the symptoms that develop on the sward, especially during the early stages of infection, can sometimes be quite similar for both.

In addition, certain disorders (problems not caused by a living organism but by environmental conditions or maintenance problems, e.g. water repellent rootzones, nutrient imbalance, scorch) can also produce symptoms on the turf surface that can resemble both invertebrate pest damage and disease problems.

Some of the terms generally used to describe symptoms of unhealthy turf, are given in the left hand column of Table 1 with descriptions of these terms below. The table gives an indication of when these terms can be used to describe fungal disease problems, invertebrate pest damage and disorders as they develop on amenity turf.

The '?' symbol in the table means that, for example, certain invertebrate pests can cause spots to develop on some host plants but these symptoms are not common symptoms on amenity turf.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Terms used to describe the symptoms of disease, damage and disorder on turfgrasses.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FUNGI</strong></td>
<td><strong>INVERTEBRATES</strong></td>
</tr>
<tr>
<td>Chlorosis</td>
<td>yes</td>
</tr>
<tr>
<td>Reddening</td>
<td>yes</td>
</tr>
<tr>
<td>Etiolation</td>
<td>yes</td>
</tr>
<tr>
<td>Necrosis</td>
<td>yes</td>
</tr>
<tr>
<td>Watersoaking</td>
<td>yes</td>
</tr>
<tr>
<td>Wilting</td>
<td>yes</td>
</tr>
<tr>
<td>Spots</td>
<td>yes</td>
</tr>
<tr>
<td>Pustules</td>
<td>yes</td>
</tr>
<tr>
<td>Reduced vigour</td>
<td>yes</td>
</tr>
<tr>
<td>Dieback</td>
<td>yes</td>
</tr>
</tbody>
</table>

Chlorosis: Fading to pale green/yellow; Reddening: Of entire leaf or edge; Etiolation: Yellowing/whitening of leaf + lengthening of stem; Necrosis: Death, accompanied by darkening or discoloration; Watersoaking: Plant tissues that are wet or translucent; Wilting: Loss of turgidity; Spots: Limited chlorotic/necrotic circular-oval areas on leaf; Pustules: Blister-like, usually erumpent; Reduced vigour: Reduced healthy growth; Dieback: Progressive death of leaves/roots from tip backward

Invertebrate pest problems can, on the whole, be confidently identified on the course if you know where to look for the potential cause of the damage. Depending on the time of the year, the larvae of certain flies or beetles will be found at different depths in the rootzone and the larvae of the frit fly will only be present within the plant itself.

The latter can be quite difficult to see due to their pale colour and small size (approximately 2 mm long) but a x10 hand lens should enable you to see the larvae and also the brown pupae of these flies that also develop between the stem tissues.

In addition, moth caterpillars (cutworms) have been found on courses across the UK but, given the size of these larvae (35-50 mm long), they can be relatively quickly identified (at least to a basic level) using reference textbooks.

With potential disease problems, the process of identification is not as straightforward. Although the majority of diseases on cool-season turfgrasses are known to be caused by fungi, the fungi themselves are microscopic and therefore you are not able to see them in the field.
Disease Analysis - How can it work for you?

The exceptions to this are the fruiting bodies or mushrooms of certain basidiomycete fungi that can be seen at certain times of the year and the masses of aerial mycelium that may develop on the sward during conditions of ideal growth. Individual strands of this mycelium are microscopic.

What you will be able to observe on the damaged turf are the symptoms that develop following fungal infection. To complicate the diagnosis of disease problems, the expression of the symptoms will vary depending on the grass affected, the composition of the sward, the height of cut and local environmental conditions.

**SENDING THE RIGHT SAMPLE IS IMPORTANT**

Diagnosis of the cause of any damage is essential if effective management is to be realised. In addition, if you want to use plant protection products as part of your integrated management approach, it is necessary that you identify the problem correctly.

If a problem develops on the turf and a sample of dead material is sent to a laboratory for analysis, all that is likely to be found are saprophytic secondary infections that are developing on the decaying plant material.

The best way to ensure that the pathologist has the material they need to identify the cause of the problem, is to send a sample of the turf to the laboratory that has been taken from the edge of the affected area, not the centre.

The reason for this is that most fungal disease problems will start from a central point and develop radially outwards. Since the centre of the affected area was the first part to be infected, it follows that this part of the sward will be the most heavily decayed by secondary, saprophytic infections.

As the disease progresses through the sward, it will pass in to unaffected plants around the edge of the affected area. It is these recently infected plants that are of most use in determining the cause of the damage. If you are in any doubt as to the best way of taking a turf sample for analysis of the problem, speak to the pathologist and they will be able to advise you.

**DOES SIZE MATTER?**

The size of the turf sample is important for several reasons. A large, hole cutter sized sample will show not only the sward composition but also the grasses in the sward that are affected and the symptoms of the infection on those plants (Figure 1).

Hollow tine cores and small pieces of turf pulled from the sward are not useful for disease identification (Figure 2). There will be very few intact plants and most plants will be separated from the roots when sampled in this way.

What is happening on the sward. Therefore, what you get out of any turf analysis depends largely on what you, as the turf manager, put in.