

the machines, air cushion and trimmers is expected to allow him to stock, interchange and/or cannibalise parts so extending life and reducing overall cost.

For trimming around trees and other areas where mowers cannot go the club has two E P Barrus Lawnflite SS2590s with Kawasaki motors and an Allen Pro 43 with a 41.5cc Zenoah motor. However Paul does use the chemical Touchdown to reduce the workload, he commented that it was

also good arboricultural practice to have a vegetation free area around each tree. Various types of trimmer head have been tried, unfortunately not all are interchangeable between differing makes or models, but Paul said that his preference is for manual line adjustment where each line can be adjusted independently rather than the automatic or central release systems as in his experience if you snag the line it breaks off at the drum and then

with no line exposed it cannot pull out by centrifugal force. thus you have to dismantle the unit to get more string out.

Allen Echo trimmers at Marlborough Golf Club

Two machines do all the work of bank and bunker trimming as well as hedge and sundry cutting at Marlborough. Danny Dobie, Head Greenkeeper, manages to make these machines last for about three seasons, but he

admitted that they do look after them and use the heavy duty machine for the heavy work. They have had very little trouble and apart from regular replacement of plugs little had been needed in terms of maintenance. Danny did comment that using good clean two stroke mix at the right strength was vital. He also tends to replace rather than repair as parts and labour can often exceed the cost of new. The club has very limited hedge to trim, and what they have is soft privet, so the smaller machine is used regularly with either line or blade to cut it.

Stihl FS220 Brushcutters at Wanstead Golf Club - N London

Course Manager, Peter Dawson's machinery fleet at Wanstead, includes two Stihl brushcutters and a HS61 hedgecutter as well

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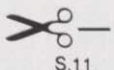
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Stihl brushcutter at work

as a chainsaw and two blowers from the same maker and two Flymo GT2 air cushion mowers. Life expectancy for the brushcutters is about four years, however they are not expected to edge bunker banks or cut large amounts of bank for which there are specific tools. In fact, not having found a really satisfactory means of trimming edges, these are still cut, about once a month, using traditional hand edging shears. Peter also sprays around his trees with a long acting herbicide so avoiding the need to trim these areas. Thus most of the trimmer work is tidying up path edges and around posts and fences.

The trimmer heads are of the two string type with a screw release for manually extending the line. The Stihl machinery has all proved extremely reliable only requiring spark plug and filter cleaning or replacement. Peter expressed himself perfectly satisfied with the performance of the Flymos – both are 21 inch professional machines with the JLO engine, but he accepts that theirs is a short life span by virtue of their use.

Husqvarna Brushcutters – Exeter Golf & Country Club

Exeter is exceptionally well organised in using its brushcutters, it has four machines of which the oldest is about five years old, and the policy is to change one every other year – thus giving a life expectancy of up to eight years.

Head Greenkeeper is John Parr and he said that the club is very disciplined in its use of the machines. For a start it has a full time mechanic and a spare machine so that he is able to maintain the machines on a regular basis and keep all in A1 condition. John commented that previously brushcutters at Exeter had short lives and less reliability, however he is happy that this is in the past, and that the current machines will have a long and virtually trouble free life.

Possibly another reason for this change is the disciplined system of use, John sends two people out with two machines when trimming round the course, they work a two hour shift when they are relieved by two other greenkeepers with the extra machine.

All four machines are fitted with monofilament two line heads with manual (screw lock) striking advance. Very little work



is carried out with a blade – perhaps only 1% in total. The machines are used around trees and on tee banks and similar, but not for bunker edges for which hand edging shears are used exclusively – Exeter buy two sets a year and consider this a cheap investment.

Outside bunkers and on other banks air cushion and hover mowers are used, all three machines using the professional rated JLO engine. Cutting these banks is a monthly task for one man and one machine. However, there are also a few other areas within the Golf and Country Club jurisdiction which have to be hand mown. The club has a limited length of hedge to cut.

Allen Power Reciprocators at Chippenham Golf Club.

Chris Sealey at Chippenham uses the Reciprocator for trimming his bunker edges, approximately

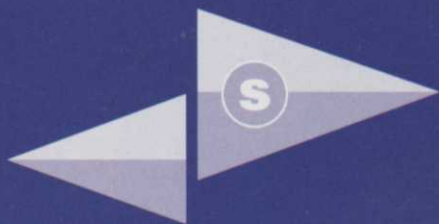
monthly. This machine is a purpose made tool which has two star shaped blades one of which reciprocates to give it a shearing action.

The unit is three or four years old and has further life ahead of it. The motor is a 22.5cc Zenoah which has proved itself reliable and of sufficient power. The blades are normally moved around to present new cutting edges every few holes, there are four positions, and once all four sectors are blunt the blades are removed and sharpened.

Chris reckons to replace these cutters annually – at a cost of about £30.

“What I like about the machine,” Chris said, “is that it gives a definite and very clean cut.”

For general trimming the club has two Allen Zenoah brushcutters and its banks are cut with Allen JLO engined hover mowers.



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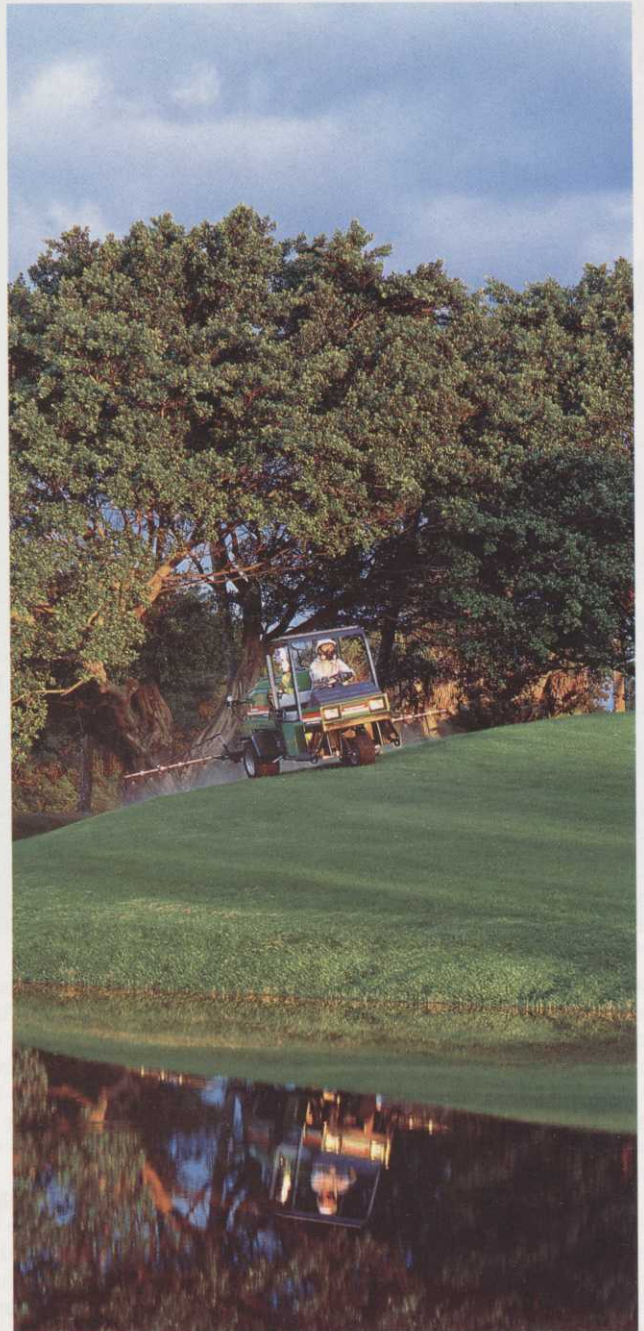
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May Day celebration for eighth annual Westurf exhibition



A visit to the new look Westurf '96 Exhibition should be incorporated into the May Day celebrations of everyone within striking distance of the Little Ashton GC involved in the turf maintenance industry on May 1.

While May Pole dancing might not be on the agenda there is plenty which is and the new layout of the eighth Westurf Show makes it far more user friendly for exhibitor and visitor alike.

The Demonstration Area has been moved into the centre of the site to become more of a focal point of the show with a PA system being used to announce demonstrations and give product information.

Many of the new products first launched at BTME 96 will be demonstrated publicly for the first time at Westurf.

Among them are the Ransomes T-Plex 185 and Ransomes Fairway 305; the Hayter Greens mower FH514 and the Toro 6500 Fair-

way Mower and Toro 3200.

Last year Pro-Seed Equipment launched and sold a brand new Core Harvester at the Show while another company Roffey Brothers took more than £30,000 worth of orders.

Don't forget to pop into the South West and South Wales Region's tent and enter the free raffle, you could be walking away after the show with £200 worth of travel vouchers. Just follow the RAC signs from the motorway and when you arrive parking and admission is free.

All the main local and national dealers will be there to answer questions and take your orders, with all the latest turf care products on show.

You can't afford to miss Westurf '96.

"It is always one of the friendliest dates on the calendar and we are looking forward to meeting many old friends and having an excellent show," said Marion Child.

A total of 67 exhibitors will be there to pass on information or display products. They are:

Amenity Technology
Avoncrop Amenity Products
Barenbrug
Bennett Engineering
Better Methods Europe
BIGGA South West and South Wales Region
Bioseed
RS Birds
Bourne Amenity
Bowcom Ltd
Boyd Golf Course Accessories
British Seed Houses
BS Mowers
Cannington College
Complete Weed Control
Course Care
Devon Turfcare Equipment (Devon Garden Machinery)
Encore Leisure
Farmura Ltd
Fleet (Line Markers) Ltd
PJ Flegg Ltd
Gannon UK Ltd
GWilliam Kellands Ltd
Handy Turf Machinery
Hartpury College
Headland Amenity Products
IOG
ISS (Irrigation Contracts) Ltd
BS Mowers
John Miller (Corsham) Ltd
Levington Horticulture
Lloyds & Co Letchworth Ltd
Lubrication Engineers Midwest
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Pro-Seed Equipment Ltd
Range Servant UK Ltd
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EAR DEFENDERS

What every
greenkeeper
should know

1. THE EFFECT OF EXPOSURE TO HIGH NOISE LEVELS

The main difference between mankind and animals is our advanced ability to communicate. Language and speech intelligibility would be impossible without a very intricate hearing mechanism. Our ability to convert the minute variations of the dynamic air pressures and frequencies of speech into electrical impulses to the brain is a wonderful process. It is without doubt one of the most important human faculties. This priceless process is at risk for millions of people who are working in a noisy environment.

Exposure to high levels of noise can permanently damage hearing. It is an insidious process because it is so gradual and frequency selective. Victims of noise induced hearing loss (NIHL) are not conscious of a general lowering of the overall sound which they hear. NIHL causes a severe notch in our hearing sensitivity in a very narrow frequency band. The overall sound in the form of

signals to the brain has only reduced by a very small amount and does not give a warning of deafness. Unfortunately the permanent damage occurs in a critical frequency band for the intelligibility of speech. Very often those who have had their hearing damaged blame the speaker for not speaking clearly. By the time they realise that their hearing is irreversibly damaged they have a severe injury which many sufferers consider to be as bad as loss of vision. Restricted ability to communicate can deprive people of the things which give them the greatest happiness and satisfaction in life. It can also detrimentally affect their work, family life and general health.

At The Noise and Man International Conference in 1993, Willy Passchier-Vermeer stated that 50% of industrial workers are exposed to potentially hazardous equivalent sound pressure levels of 80 dB(A) or above, and that similar noise exposures occur in

other occupational situations. According to ISO 1999, long term exposure to these sound levels could cause permanent hearing damage.

It is absolutely right that medical doctors, scientists and concerned people should campaign to make our elected representatives legislate to protect the hearing of employees by all reasonable means.

2. THE LAW

The main noise legislation which affects those responsible for golf courses, parks, grass verges etc are:

- The Noise at Work Regulations (1989);
- The Management of Health and Safety at Work Regulations (1992)
- The Supply of Machinery (Safety) Regulations (1992).

2.1 The Noise at Work Regulations (1989).

The most important requirements for employers in the Noise at

Work Regulations are as follows:

- Employers must do everything reasonable and practicable to reduce the exposure of employees to high sound levels so that hearing protection is not required;
- Noise assessments and investigations to reduce noise must be carried out by a competent person where there is a risk of hearing damage;
- A suitable person must be delegated to have responsibility for ensuring compliance with the legislation, including keeping records, instructing employees on ways to reduce the risk of NIHL, checking hearing defenders, etc.;
- Action levels (85 and 90 dB(A) daily exposure levels and 130 dB peak sound pressure level) are specified to control the use of hearing defenders for the protection of personnel as a means of protecting employees pending noise reduction to acceptable sound levels;
- If the first action level is exceeded employees must be warned of the NIHL risks and

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advised to wear hearing defenders which must be available;

- If the second action level is exceeded employees must be instructed that hearing defenders must be worn in the designated ear protection zone or while operating the machine; records must be kept and be available for inspection;
- Personnel should seek advice from a medical doctor before using hearing defenders if they have an ear infection or earache;
- HSE, in items 31 and 32 of their Noise Guide No.1, state that spot checks should be made for new machinery, and that the interval between check noise assessments should be a maximum of about two years.

The full details of the requirements for employers and employees are contained in the Health and Safety Executive (HSE) Noise Guides.

2.2 The Management of Health and Safety at Work Regulations (1989).

Under the Management of Health and Safety at Work Regulations (1992) employees exposed to high noise levels should be provided with health surveillance. The main objectives, concerning noise, of this legislation are to monitor the hearing health of employees and to take early precautions to reduce injury.

Health surveillance is not a substitute for measures to reduce and control noise and to inform and protect employees, as required by the Noise at Work Regulations. It is a very useful part of a hearing conservation programme and an important indication for putting into place further measures to reduce noise.

More detailed information on audiometric testing can be obtained from the HSE publications listed at the end of this article. The HSE do not consider that it is compulsory for employers to provide health surveillance. They do, however, consider that it is good practice and serves the best interests of employees and employers.

2.3 The Supply of Machinery (Safety) Regulations (1992)

The Supply of Machinery (Safety) Regulations (1992) and 1994 Amendments apply to the manufacturers, suppliers and importers of machinery for the maintenance

of golf courses and parks. The instructions for the machines must give the following information concerning airborne noise emitted by the machinery:

- The equivalent continuous A-weighted sound pressure level at workstations, where this exceeds 70 dB(A); where this level does not exceed 70 dB(A), this fact must be indicated;
- Peak C-weighted instantaneous sound pressure value at workstations, where this exceeds $130 \text{ dB re } 2 \times 10^{-5} \text{ Pa}$;
- Sound power level emitted by the machine where the equivalent continuous A-weighted sound pressure level at workstations exceeds 85 dB(A).

In the case of very large machinery, instead of the sound power level, the equivalent continuous sound pressure levels at specified positions around the machinery may be indicated.

The EU Directive states the following two essential requirements:

- Machinery must be designed so that the risks resulting from noise are reduced as much as possible, making full use of state-of-the-art technology;
- Details of the sound pressure and power levels must be made available by the manufacturers.

The acoustic performance data must be in the machine instructions before authority to use the CE mark can be obtained. Without the CE mark the equipment can be prevented from being sold in the enormous EU market area.

The original requirement to publish acoustic performance data in sales literature was deleted in the 1994 Amendment. This downgraded the importance of noise and would have the retrograde effect of decreasing the investment and effort to reduce noise at source by research and development.

Failure to comply with the machinery directive could result in prosecution and, if convicted, a fine of up to £5,000 and imprisonment for up to three months, or both.

2.4 Proposed New Legislation

The European Commission's pro-

posals on Physical Agents, published in July 1994, includes much more stringent legislation. If these proposals are ratified, employees will have to be informed of possible hearing damage risk at a daily noise exposure level of 75 dB(A). At 80 dB(A) employees will have the right to audiometric screening. At 90 dB(A) systematic audiometric screening by or under the responsibility of a medical doctor must be carried out. Employees and workers' representatives must be given copies of noise exposure assessments and the programme of measures for noise control.

3. HEARING DEFENDERS

Hearing defenders – muffs or plugs – can protect the delicate hearing mechanism from damage caused by exposure to high sound levels. However, they have many disadvantages, shortcomings and failings, including the following:

- It is not always possible for managers or supervisors to ensure that employees wear hearing defenders in conditions when the second action level is breached. This is a particular difficulty for golf course, park and grass verge maintenance staff who may be working out of sight of supervisors.

• Even when fitted by specialists in laboratory conditions there is a very large difference in the measured performance of hearing defenders for repeat tests. This could be as high as 10 dB in one of the octave bands. Hence even the assumed mean octave values minus the standard deviation could over-estimate the actual attenuation by several decibels for the BS5108 tests. In practical use in the field or shop floor the true attenuation of the hearing defenders could be considerably lower than specified by the supplier.

• Operators using hearing defenders may not hear urgent warnings of pending danger.

• Most people find wearing ear muffs or plugs very uncomfortable, especially for long periods in hot weather.

• Ear muffs are not suitable for

people with glasses or long hair.

• Ear plugs could be a risk to health if very careful hygiene precautions are not always adopted.

• Hearing defenders prevent circulation of air in the ear.

• Most medical doctors would not approve their use if the operator had an ear infection or earache.

• Sometimes it is not easy to detect damage to the ear muffs which could detrimentally affect their noise safety performance.

• Some people, particularly young men, are macho about using hearing defenders. (They do not think high noise levels could damage their hearing and are therefore reluctant to wear hearing defenders).

• Some types of hearing defenders do not allow equalisation of the pressure on either side of the plug. Hence the ear drum could be at a different pressure from atmosphere and the other ear drum.

These are some of the reasons why the use of hearing defenders is a last resort. The main effort and investment must be to reduce the machine generated sound pressure levels and the noise exposure times.

It is wrong for a manager to instruct all ground maintenance staff to wear hearing defenders while operating all the noisy machines. It is not possible to determine which machines breach the first or second action levels without careful sound measurements and an exposure assessment based on the maximum operating time per day. Taking this arbitrary approach could be forcing operators to wear ear muffs for very long periods when it is not necessary. This flawed administration policy undermines the basic strategy of the legislation.

4. GENERAL COMMENTS

It is a fallacy, and dangerous misconception, to think that the responsibilities of managers, committee members and senior executives are upheld by buying hearing defenders and telling the ground maintenance staff to use them.

To comply with the noise legislation, to make a positive contribution to noise reduction and to reduce the risks of hearing damage to acceptable levels require not just a technician who can

'These are some of the reasons why the use of hearing defenders is a last resort'

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EAR DEFENDERS

read a sound level meter, but a qualified engineer with in depth acoustic experience.

The fact that the sound pressure levels generated by many grass maintenance machines are still very high, is directly related to a poor feedback by users to the manufacturers who therefore do not consider noise to be an important factor in product sales. If HSE had sufficient funding and resources adequately to enforce the legislation, the market driven manufacturers would soon get the message and invest in research to improve the acoustic performance of their machines. They would also speed up the development of battery powered electrical machinery which is much quieter and more environmentally friendly.

The average equivalent sound pressure level at the operators head for twenty recently tested brush cutters (strimmers) was 99 dB(A). It would only take operation for one hour for the second action level (90 dB(A)) to be breached with this average sound

level. For the highest measured value of 101.4 dB(A) the exposure time to breach the second action level reduces to thirty six minutes!

Many types of strimmers, flymos, hedge cutters, chain saws, pedestrian mowers, tractors, triple mowers, turf cutters, soil shredders, aerators, top dressers, quad bikes, edgers, blade grinders, hammer drills, disc grinders, etc. cause a breach of the second action level. The operators of these machines are vulnerable to permanent hearing damage. Their risk of NIHL would be considerably decreased by properly conducted noise assessments.

Equivalent sound pressure levels should be measured near the operator's head with each noisy machine at normal speed over grass. If fitted, blades should be rotating. For at least one of each type, octave band sound pressure levels should be recorded to ensure that the hearing defenders, if required, attenuate the sound to a level which eliminates

the risk of hearing damage. Unusual or inconsistent sound measurements should be investigated.

After the supervisors have had time to read and study the comprehensive report, the acoustician/engineer consultant should spend some time explaining the results and analysis to those concerned.

The noise consultant should also provide a telephone advice service for the managers and supervisors.

It is essential that the noise consultant convinces the user to rate acoustic performance as a crucial parameter in the decisions on which machines to phase out and on which machines to buy.

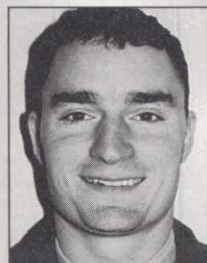
For normal golf courses the first noise assessment project would cost about one pound for each club member.

Two years later the cost of a recheck noise assessment would be much less. This is a relatively small price to pay to protect the hearing of those who maintain our parks and golf courses. It

would cost a great deal more if HSE prosecute those responsible for breaking the law or if one of the ground maintenance staff sues them for causing hearing damage.

Advanced planning and decision making on noise is not only a responsible social attitude, it is also good business practice and a substantial cost saving strategy in the long term.

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- Darren Homer, Forest of Arden
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