Integrated disease control is the complementary use of biological, cultural and chemical control methods to achieve the most effective and economical disease control possible.

Fungicides are only part of an integrated disease control programme and their ready availability must not reduce the attention paid to those practices that reduce the risk of disease. Any management practice that helps to keep the turf surface dry, such as switching, spiking or slitting, will reduce the likelihood of fusarium patch occurring.

If necessary reduce the moisture-holding thatch layer e.g. by scarification, as this will again help to keep the turf surface dry. Surface drainage may also be improved by aeration and top dressing with a sandy compost.

It is also a good idea to promote air circulation over the greens by not siting trees, shrubs or tall buildings too close as this will inhibit the removal of surface moisture by the wind. Also, greens that are shaded from the sun will dry quite slowly.

Annual meadow-grass (*Poa annua*) is very susceptible to fusarium patch and consequently a sward containing a large percentage of this grass could suffer severe damage.

Good turf management, in its aim of promoting a healthy vigorous sward of fescue/bent, both of which are much more resistant to the disease than annual meadow-grass, will consequently discourage fusarium patch.

Great care must be taken when applying fertilisers as excessive nitrogen, especially the organic types such as dried blood, applied during cool wet weather, can lead to severe disease outbreaks. An alkaline turf surface also favours fusarium patch disease. The use of lime on golf greens is only recommended under exceptional circumstances and is best avoided for, as well as encouraging fusarium patch and other diseases, it leads to invasion of annual meadow-grass, weeds and worms.

Continued on page 52
In situations of prolonged cool wet weather, despite all cultural control measures being implemented, fusarium patch disease is still likely to attack on many courses. Fortunately if the need arises, the disease can be controlled with fungicides, providing they are used wisely and according to the manufacturer’s instructions.

Fungicides should only be used carefully and judiciously, for several reasons.

Firstly, too many applications may inhibit other fungi in the turf that are antagonistic to fusarium patch and partially responsible for keeping the disease at a naturally low level. This could be the reason why disease sometimes appears more severe following a fungicide application than previously. Fungicides may also affect other fungi present in turf responsible for decomposing the thatch layer.

Secondly, the repeated use of fungicides with the same mode of action can lead to the development of strains of M. nivale resistant to the fungicide. For this reason, fungicides with different modes of action should be considered for successive applications. For example, alternate the use of a dicarboximide fungicide such as iprodine or vinclozolin with chlorothalonil; or any of the systemic fungicides (benzimidazoles) with any of the contact materials (see Table 1). Fungicide resistance is widespread in the USA (where more frequent indiscriminate fungicide applications are made) taking note of the above points will lessen the chance of significant resistance problems developing here.

When considering which fungicide to apply, the current choice of materials can be divided into two groups.

Firstly, there are systemic fungicides which are absorbed and move around in the internal tissues of the plant. Thus, they can protect new growth produced by the plant after fungicide application and consequently they can give excellent protection. As they must be absorbed into the plant before they can work, best results will be achieved during spring, summer and autumn when grass growth is active. Systemic fungicides are best applied at the first signs of the disease or as a preventative spray on occasions when the experience of the greenkeeper predicts an imminent disease outbreak. Contact fungicides are not redistributed within and will only protect plant parts they come into contact with. However, although best results are obtained when applied at the first signs of the disease, contact fungicides do have a good ‘knock down’ effect, especially when the disease is active in the winter months. Contact fungicides may give poor control in the warmer months of the year as new growth produced by rapidly growing turf is not protected.

Pink snow mould is best controlled by ensuring that the grass is cut fairly short before snow falls as long grass is particularly susceptible to attack. If the damage done by fusarium patch in the autumn is minimised, this will reduce the amount of M. nivale inoculum present for development under snow.

Contact fungicides applied before snowfall may prevent pink snow mould from developing.

<table>
<thead>
<tr>
<th>FUNGICIDE GROUP AND ACTIVE INGREDIENT</th>
<th>SYSTEMIC (S)</th>
<th>CONTACT (C)</th>
<th>PRODUCT</th>
<th>MANUFACTURER/SUPPLIER</th>
</tr>
</thead>
<tbody>
<tr>
<td>BENZIMIDAZOLES</td>
<td></td>
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<tr>
<td>BENOMYL</td>
<td>S</td>
<td></td>
<td>BENLATE</td>
<td>DUPONT</td>
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<tr>
<td>CARBENDAZIM</td>
<td>S</td>
<td></td>
<td>FICOS HORTICULTURE</td>
<td>RIBBY TAYLOR</td>
</tr>
<tr>
<td>THIAZOLENACETIC ACID</td>
<td>S</td>
<td></td>
<td>TECO</td>
<td>SYNCHRONICALS</td>
</tr>
<tr>
<td>TRIMECLOLATE Methyl</td>
<td>S</td>
<td></td>
<td>KILCHROME</td>
<td>RAY AND BAKER</td>
</tr>
<tr>
<td>DICARBOXIMIDES</td>
<td></td>
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<tr>
<td>IPRODINE</td>
<td>C</td>
<td></td>
<td>ROVRAL</td>
<td>MAY AND BAKER</td>
</tr>
<tr>
<td>VINCLOZOLIN</td>
<td>C</td>
<td></td>
<td>MASCOT</td>
<td>RIBBY TAYLOR</td>
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<tr>
<td>OTHER</td>
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<tr>
<td>CHLOROTHALONIL</td>
<td>C</td>
<td></td>
<td>DACONIL TURF</td>
<td>ICI PROFESSIONAL PRODUCTS</td>
</tr>
</tbody>
</table>

A range of new fungicides are currently under test at STRI for control of Fusarium patch disease.

Table 1: Fungicides available for control of fusarium patch disease

- **Toro Greensmaster**
  - Good condition.
  - 7 years old, complete with 4 greens units and 3 verti cut units.
  - £1,500 ono
  - Tel: 01 942 0654

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WANTED
Cash waiting for all types and makes of used professional grass machinery

Please phone:-
F.C. Jackson Ltd.
on
0526 42524
0526 52682 (Evenings)
Daconil turf is a broad spectrum fungicide which controls a wide range of turf diseases, but is especially useful against those recurrent problems Fusarium Patch, Red Thread and Dollar Spot. And because it is a contact fungicide it can be used all year round.

Daconil turf contains chlorothalonil.

READ THE LABEL BEFORE YOU BUY; USE PESTICIDES SAFELY.

'Daconil' is the registered trademark of SDS Biotech UK Ltd.
WESTON TURVILLE GOLF CLUB (nr. Aylesbury) requires ASSISTANT GREENKEEPERS. Varying levels of experience considered. Good prospects for promotion. Extension to 18 holes in hand. Please submit career details with reply. Salary negotiable. Please apply to:- The Secretary, Weston Turville Golf Club, New Road, Weston Turville, Aylesbury. HP22 5QT

TANDRIDGE GOLF CLUB require an ASSISTANT GREENKEEPER. Applicants should have some experience in greenkeeping techniques and the use of modern equipment. Apply in writing stating age and experience to:- The Secretary, Tandridge Golf Club, Oxted, Surrey. RH8 9NG

ALRESFORD GOLF CLUB Experienced greenkeeper to take charge of busy, well equipped 9 hole golf course. Salary negotiable. Please apply with C.V. to:-
The Secretary, Alresford Golf Club, Cheriton Road, Tichborne Down, Alresford, Hants. SO24 OPN

FARNHAM GOLF CLUB require an ASSISTANT GREENKEEPER. Applicants must be experienced in greenkeeping, with knowledge of modern course machinery, its use and maintenance. Apply in writing to:- The Secretary, Farnham Golf Club, The Sands, Runfold, Farnham, Surrey.

HOMBURGER GOLF CLUB 1899 BAD HOMBURG WEST GERMANY require an ASSISTANT GREENKEEPER for a period of nine months from March 1988 to specifically look after greens and tees. A knowledge of modern machinery including irrigation systems is essential and the ability to work unsupervised. Assistance in finding accommodation will be given. An attractive remuneration package will be offered. Write in confidence with full C.V. to:- Box 1003, the Golf Course, 121-123 High Street, Dovercourt, Harwich, Essex.

RICHMOND GOLF CLUB require an ASSISTANT GREENKEEPER. Applicants must be experienced in all aspects of greenkeeping and the use of modern equipment. A mature person preferred with initiative to undertake tasks once instructed. No accommodation available. Applicants should apply in writing, stating age, experience and qualifications to:- Manager/Secretary, Richmond Golf Club, Sudbrook Park, Petersham, Richmond, Surrey. TW10 7AS