

# The treatment of Fungal Diseases

*The CHIPMAN CHEMICAL COMPANY condenses much useful advice on avoiding and treating fungal disease.*

Late Summer and Autumn marks the opening of the season for uninvited and unwanted guests of British golf greens. These are the fungal diseases and the reluctant hosts are our very hardworking turf grasses. Fungi are parasitic and being unable to synthesize organic food, attack the plant material of their host, penetrating the cell wall or entering wounds or natural openings and leaving the characteristic symptoms of disease in the grass plant when the infected cells die.

Some common turf fungi depend solely upon living grasses for support, whereas others are able to continue to survive after the host has died, living on the dead plant material. Both can produce thousands of spores capable of infecting a fresh host. In addition some fungi can form a 'resting body' which is able to persist for many years, even in unsuitable conditions and carry over disease from one year to the next. There are therefore many sources of infection, and if allowed to develop and spread these fungi can cause severe damage.

By knowing the conditions which fungi find most desirable it is possible to produce a non-conducive environment by good cultural turf management practices. It is significant that the conditions which discourage fungi and also those which most favour the healthy growth of fine grasses. Worthwhile measures can be summarised as follows :-

## *Aim to reduce surface moisture*

Improve drainage where necessary.

Carry out spiking, slitting, raking, mowing regularly and at the optimum time.

Switch dew from grass.

Remove any barriers to the flow of air across the turf.

Reduce shade.

Avoid leaving grass long in winter.

Avoid smothering turf with top dressings.

## *Maintain fertility and acidity*

Use balanced fertilisers at the correct time.

Avoid the late use of fertilisers high in nitrogen as compared with other elements.

## *Avoid mechanical damage*

Remember that spores enter through the wounds.

## *Utilize preferred seed mixtures*

A mixture of different species is less susceptible than a pure sward.

## **Fungicides**

Even when all the necessary cultural precautions are taken disease still frequently develops, making the use of fungicides essential. The ideal fungicide should be able both to kill the disease organisms and to protect from further infection, without of course injuring the grass or building up toxic residues in the soil which may become detrimental to plant growth.

It should be economical in use and easy to apply. 'Verdasan' is a fungicide which answers these requirements, containing 2.5% mercury, organically combined. To control

*Fusarium Patch* 1 oz. is applied to 40 sq. yd., either in 2-8 gallons of water or in 14 lb. of sand or finely sifted soil. Treatment should be made at monthly intervals in September, October and November, or in March and April. The same quantity is adequate for *Dollar Spot* which should be treated as soon as the disease appears, usually in May or June, repeating treatments at monthly intervals until late August. *Ophiobolus Patch* requires 2 oz. 'Verdasan' per 40 sq. yd., mixed as before, applied at the end of August and again at the end of October.

The use of seed treated with a fungicide such as SAIsan (containing drazoxolon) will give protection against seed and soil borne diseases such as seed rot and pre and post emergence 'damping off' to which small seeded grasses are susceptible.

Many new fungicides are arousing a great deal of interest. One such is based on chlorthalonil, which is a broad spectrum fungicide providing excellent control.

#### **NON-TOXIC CONTROL HOECHST U.K. LTD.**

Intensive methods of turf maintenance are often predisposing factors to fungal attack. High fertiliser usage, liming, irrigation, rolling and frequent mowing can all lead to the rapid spread of fungal diseases.

The commonest and most widespread disease of turf in this country is *Fusarium Patch* (*Fusarium nivale*). The first symptoms are the appearance of small brown or yellow patches about two inches in diameter which may extend up to one foot across and eventually join together to form large irregular patterns. Under mild moist conditions the fungus can be seen on the surface as a fine pink or white cotton-like growth.

*Fusarium* can occur at any time throughout the year but is most common in Spring and Autumn or during mild periods in Winter. Severe infection of *Fusarium* can occur under snow cover.

Corticium Disease or Red Thread (*Corticium fuciforme*) is common in all parts of the country and is characterised by the appearance of pink or red threads on the grass leaves. Ugly brown patches are formed from three to five inches in diameter and the fungus spreads between the grass blades binding them together in a gelatinous matt.

Dollar Spot (*Sclerotinia homoeocarpa*) is confined to greens laid with sea marsh turf. The sward deteriorates rapidly as red fescue is killed out by the fungus in one to two inch diameter spots which enlarge and coalesce to form irregular patches.

Recognition of these diseases in quality turf in the early stages is difficult and delay in identification of the problem can lead to unsightly turf over a long period. It is therefore a wise precaution to treat all top quality turf with a fungicide as a routine precaution.

Quintozene, available as Hoechst 'Bras-sicol Super Wettable Powder', has the great advantage that, unlike mercurial fungicides, it is non toxic.

The recommended rates of use are 25 lb. per acre or for smaller areas 8 oz. in 10-14 pints of water per 100 sq. yards. The first application should be made as soon as symptoms appear and repeated at monthly intervals. Cutting should always take place before spraying and over-rolling should be avoided.

#### **SYNCHEMICALS M-C AS A TURF FUNGICIDE**

The value of Mercurial Compounds such as Mercurous Chloride as turf fungicides has long been appreciated but *not* the fact that this material is also the active ingredient in Synchemicals M-C Moss Killer.

Synchemicals M-C applied annually for moss control also reduces the risk of outbreaks of turf diseases such as *Fusarium* and Corticium (Red Thread), thus from a single application annually, it is possible not only to control moss but have the basis for a preventive control programme for turf diseases.

Treatment should commence immediately the disease is detected. Synchemicals M-C applied to affected patches at the rate of 3 measures of M-C in 6 gallons of water to treat 20 sq. yds. of turf (3 measures = 3 oz.). Treatment should be repeated at monthly intervals. Synchemicals M-C has its own wetting agent.

## CANNOCK FERTILIZERS FUNGICIDE

Fusarium Specific is the name given to the very well known turf fungicide manufactured by Cannock Fertilizers Limited of Cannock, Staffordshire. Fusarium Specific contains mercury compounds carefully blended with a suitable carrier. Bulking with sand or compost is not necessary or recommended. One application generally proves adequate, but occasionally further treatment may be necessary.

Fusarium Patch Disease can be prevented by applying 1 oz per square yard of Fusarium Specific in the spring and especially in the autumn.

Where the disease is established, the turf should immediately be dressed with Fusarium Specific at the rate of 2 oz. per square yard. The fungicide is best applied when the grass is moist with dew, but no watering should be undertaken.

## MAY AND BAKER FUNGICIDES

'Mersil', based on mercuric chloride and mercurous chloride, is a fast-acting long-lasting treatment for prevention and control of Fusarium patch, red thread (corticium) and dollar spot. Formulated for use in sprayers, the product has the added advantage of giving good control of moss.

'Maysan', an organo-mercurial preparation for use against Fusarium patch and red thread (corticium), is a more economical preparation when used at  $2\frac{1}{2}$  oz per 100 sq. yd. although heavy infections may need more frequent applications.

Full details and recommendations for these products and many others are given in a Turf Protection wallet available free of charge from May and Baker Ltd. Dagenham, Essex RM10 7XS.

The following are extracts from their Fungus Control chart :-

Disease	Season found	Predisposing conditions	Principal grasses	Cultural control
<i>Fusarium patch</i>	Autumn Winter Spring	Dull, moist weather, often under snow cover	<i>Poa annua</i> , <i>Agrostis</i> and <i>Festuca</i> spp.	Avoid heavy liming and late nitrogen applications. Improve drainage and reduce surface moisture.
<i>Red thread</i>	During growing season, but usually in late summer	High temperatures	<i>Festuca</i> spp. mainly, but other species may be severely attacked	Increase nitrogen applications in summer.
<i>Dollar spot</i>	Any season, but usually in late summer	Cool, wet periods	<i>Festuca rubra</i> spp.	Increase nitrogen applications during summer but avoid late applications.
<i>Ophiobolus patch</i>	Late summer, autumn and winter	Dry weather	<i>Agrostis</i> spp.	Remove patches and re-turf or re-sow with <i>Poa pratensis</i> or <i>Festuca rubra</i> . Use acid nitrogenous fertilizers.
<i>Fairy rings</i> (type 1)	Spring to winter	Dry environment	—	Increase fertilization in summer. Treat turf by pricking and watering.
<i>Fairy rings</i> (type 2)	Summer to early winter	Dry environment	—	Increase fertilization in summer. Irrigation will also be of benefit.
<i>Slime moulds</i>	Autumn and early winter Attacks may occur with less severity during other periods in the year	Wet and humid	—	Improve drainage. In severe cases it may help to clean turf with a stiff broom.

Dry dressing is a less common technique and is usually reserved for the application of inorganic mercury-based compounds. The active material is usually applied in a carrier, such as sand or fertilizer, to effect uniformity of spread. Dry applications should be watered into turf to avoid 'scorching' of foliage.

Fungicides in solution or suspension provide certain advantages compared with the powder forms since they make possible greater accuracy and uniformity of distribution; thus providing more precise control and guarding against severe localized damage.