

As well as the damage which may be caused to golf greens and other areas of the course by pest and disease attack, there are also many physical & chemical causes of damage/injury which may occur. Obviously it is important to be able to distinguish between physical, chemical and biological causes of damage as this has strong implications in the development of an appropriate remedy. In this article, NEIL BALDWIN, the STRI's plant pathologist describes some of the more common sources of injury to golf greens and discusses ways of minimising the damage should a problem occur.

Damage to golf greens may occur for any number of potential reasons. For example, the damage may be deliberate such as vandalism, or accidental such as chemical or fertiliser scorch due to mis-application at the wrong time or at too high a rate. The use of modern turf care machinery with engines containing mineral oil and operated by hydraulic controls can lead to accidental spillages onto the green surface. Also, animal urine from female dogs or foxes may scorch severely. These various sources of chemical damage are amplified below.

Vandalism

Unfortunately nowadays, vandalism is of common occurrence on many golf courses, particularly those in which the public has free access due to rights of way established on the course, or on inner city courses which are surrounded by housing. Vandalism may come from many sources, for example disillusioned contractors have been known to wreak havoc on the turf areas under their care, as have club members who on occasion feel hard done by, thus seeking revenge. In many cases the cause of turf injury by vandalism may be readily identified. If a burnt-out car wreck is found in the middle of a green then the cause is obvious! However, in many cases identifying the toxic substance applied is not easy. Identification of the toxic substance used, ie. whether it only lasts in the short-term or whether it is residual, is vital as this has a direct bearing on control methods (see later). One of the most difficult to solve cases I have seen is where greens were scorched using a dry ice fire extinguisher, realised only when the equipment in question was found in adjacent heather!

Machinery

Despite high standards of machinery care and maintenance being the norm on many courses, sadly accidents do happen. For exam-

DAMAGE ON THE GREENS:

CLEARING

TIP

ple, spillages of petrol or diesel (due perhaps to an over-filled tank) may be the source of the problem. Drips or spillages of hydraulic fluid from leaking or split hydraulic pipes may also occur. Field trials at STRI (Figure 2) are currently investigating the use of new organic-based oils which are claimed to be less phytotoxic than mineral oils.

Chemical scorch

Perhaps the most important consideration when using pesticides is to read the label and follow the instructions carefully. Under normal usage chemical scorch due to over application of pesticides is rare. However, over application due perhaps to incorrect sprayer calibration may cause severe problems. Certain turf treatments such as wetting agents are widely known to scorch fine turf if not watered in after application, as demonstrated in STRI field trials (Figure 4). Thus the correct use of pesticides and other chemical treatments must be emphasised. Extreme care must be taken in the use of total herbicides as these chemicals will kill any turf in

which they come into contact. For example, heavy rain shortly after application may wash the total herbicide off the path or other area to which it had been applied, especially if the treated area is on sloping ground (Figure 3).

Fertiliser scorch

Dry weather (as we have seen over the last three growing seasons) or whenever turf is drought stressed, are the conditions under which fertiliser may scorch if not watered in after application (Figure 5). As the symptoms of fertiliser scorch bear an uncanny resemblance to those of fusarium patch disease, great care must be taken to identify the problem correctly.

Animal damage

Burn marks due to animal urine, particularly during the night by foxes, may be a problem. Characteristic symptoms are of circular patches, brown or straw coloured in the centre, with a lush green peripheral ring. This scorching effect is due to the fact that animal urine contains soluble salts, urea and other compounds which

may kill or sometimes stimulate turfgrass growth (Figure 1).

Recommendations for control

The procedures to be implemented when physical or chemical damage occurs to golf greens depends very much on the exact cause of the problem. It must be stated at the outset that the best solution is in the preventative sense, ie. not to let it happen in the first place! When this is under the greenkeeper's control, ie. operations such as fertilising, spraying pesticides and machinery maintenance, then naturally prevention is the best policy. However, animal damage and vandalism cannot be predicted and consequently minimising the damage caused is the only practical solution.

With all types of chemical scorch the greatest chances of success are if the problem is identified soon after it has occurred and action taken immediately. In the case of spillages of fuel, oil, pesticide concentrate or hydraulic fluid then removing chemical deposits by blotting with absorbent paper or by using a proprietary material such as the flowable formulation of 'activated charcoal, which has recently been marketed. The next stage is to wash off the turf surface with copious amounts of water applied to the spilled material. Addition of a wetting agent may prove beneficial at this time. The wetting agent 'new improved Turfex' contains label instructions for dealing with spillages of toxic chemicals. This washing procedure may work well if done soon after the spillage has occurred, however, if one or two hours have passed before the spillage is noticed the damage will have been done and severe turf injury will be the result.

Some of the worst scorch problems are caused by total herbicides being applied to golf greens, where of course their application was not intended. The problem is at its worst when a residual herbicide, eg. simazine, atrazine or sodium chlorate, has been applied. In these situations the STRI undertakes a laboratory 'growth test' whereby grass seedlings are grown in contaminated soil. Failure of seedlings to establish or poor rooting may indicate the presence of a residual herbicide, in which case the only solution is to remove damaged turf and soil below and then repair the whole area. If, however, the problem is due to a non-residual herbicide, eg. paraquat or glyphosate, then renovation and overseeding will probably suffice.

■ The author, Dr Neil Baldwin, is the Sports Turf Research Institute's Plant Pathologist.



1. Fox urine scorch. Note the stimulated green grass around the edge of the scorched area



2. STRI field trial evaluating oil/hydraulic fluids for adverse effects on fine turf



3. Total herbicide run-off causing severe damage



4. STRI field trial evaluating wetting agents for scorch effects



5. Fertiliser scorch, sometimes confused with fusarium patch disease



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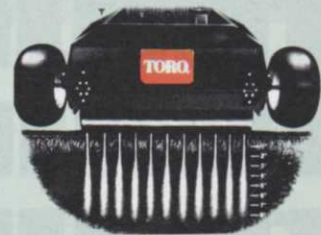
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