



FROST DAMAGE AND GOLF COURSE

Dennis Divot writes about the effects of frost on the golf course.

Secretary At Work: February 2005 (reviewed January 2012)

Q & A

Could you explain the apparent inconsistencies of Course Closure and Trolley bans due to frost?

It is surprising how few golfers comprehend what grass consists of and how it grows. A basic understanding is vital if the effect of freezing weather on the plant is to be explained.

During the process of photosynthesis the grass plant grows its leaves (green because of the presence of chlorophyll) and roots (white in its absence) by absorbing the gas, carbon dioxide from the air, and the liquid, water through the roots to form complex solid carbohydrates and at the same time releasing oxygen into the air. Soil is the medium in which the grass grows, it is not used up during the growing process. Grass growth is the absorption of mass from the air. (Figs 1 & 2)

Fig. 1

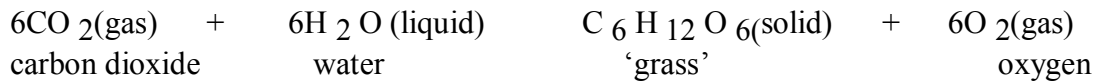
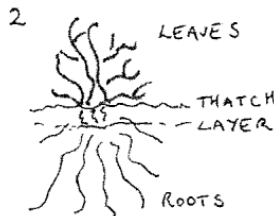


Fig. 2



The solid carbohydrates, forming the grass leaf and root, contain water within their solid structures. The plant itself is between 60 per cent and 70 per cent water. The greenkeeper will have raised his height of cut to winter settings for all areas of the course, and the insulating properties of the grass leaves is in proportion to the length of grass, making the short grass on the greens the most susceptible areas on the course to frost.

Air (Hoar) Frost

The overnight drop in temperature will cause ice crystals to form both on and within the leaves of the grass plant. If the grass is trampled by the walking golfer or worse by the golfer pulling his trolley, the leaves will be ruptured. (Fig 3) For this reason many clubs prepare “frost greens” to prevent such damage being done to the finer grasses. The main effect of such damage is to delay the recovery of the grass plant in spring. I experienced a striking visual effect of this on a newly constructed tee. The ground was covered in hoar frost for the Christmas Shotgun Competition. One wag walked onto the new tee and drew a matchstick man attending the flag in the frost. It was still clearly visible at the end of May. (Fig 4)

Fig. 3

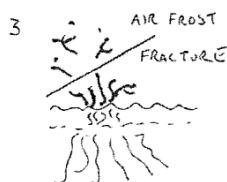
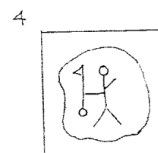


Fig. 4



Ground Frost

Because of the lack of insulation from the longer grass leaves, the depth of the frost is greater on the greens than any other area of the course. The greens freeze from the surface downwards, the ground becomes solid, sometimes to a depth of several inches. No more damage is done by playing on the course under these conditions, than by playing after an air frost. However, there may be a health and safety consideration to be taken into account because of the slippery condition on slopes.

The real problem arises when the air temperature rises and the ground begins to thaw. This thaw starts at the surface and gradually descends. Because the ground underneath is frozen, surface water cannot move down, and the top surface becomes soft. Walking on such ground, breaks the roots of the grass at the junction of the soft and frozen soil, effectively killing the grass. (Fig 5) Under thawing conditions it is essential the course remains closed. The greenkeeper will monitor the thawing of the ground with a long pointed tine, such as a knitting needle, opening the course only when all the frost is out of the ground.

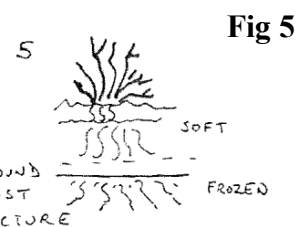


Fig 5

Ironically it is always a glorious day for golf with a warm sun in a clear sky that creates these conditions and golfers are often incensed that the course is closed. This is because the damage being done is below ground, it cannot be seen, and there is no objective way it can be measured. A delay of a couple of weeks before “good summer playing surfaces” are achieved, is usually the only evidence of such winter play damage.

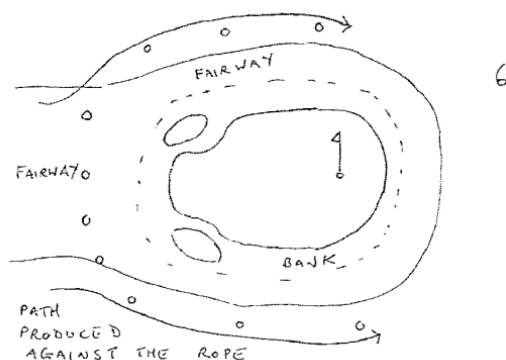
It is always a difficult decision for the person charged with the responsibility of closing and opening the course during winter on a daily basis, to weigh the loss of the facility on that particular day to the benefit of earlier and better spring and summer playing conditions. What is

essential is that the Club has a written Course Closure Policy, explaining to the members how and why decisions are made and that policy, once accepted, is fully supported by the club’s Management Committee. The more objective the criteria for winter closure, both for frost and water, the more consistent closure decisions will be. Such decisions should always be the remit of the professional greenstaff.

Caddy Car Damage

If ice crystals have formed inside the grass leaf, then allowing the use of trolleys will result in the leaves being broken as the wheels track round the course. However, because trolley users always follow the same route off tees and around greens, considerably more damage is done in these “high traffic” areas by the turning wheels as the golfers converge on the same small area. The longer the grass, the greater its insulating effect to ground frost in cold weather and the less damage is done to the grass plant by walking on it. The haphazard route of the golfer who carries his bags does little damage compared to that done on the regular routes of the man who “pulls”. It is the “fairway” outside the greenside bunkers around the greens, in particular, that suffers the most damage during winter play. It is these very areas that need to be in good condition to allow proper precision shots to be played to the greens during the summer months. If posts and ropes are used to deflect the wear from around the green and into the semi-rough, within a few days there will be a concentrated wear path by the side of the rope, produced by passage of trolleys (Fig 6).

Fig. 6



The real help to the greenkeeper would be the spreading of that wear. Members expect good summer playing conditions and complain when the staff do not produce them. However, they are not prepared to walk a few extra yards or play a shortened course for a short period during the winter months for the benefits of a course in much better condition for the rest of the season. I do not favour a blanket winter ban on caddy cars. The daily reviews should determine course closure/caddy car and buggy restrictions, based on the course conditions at inspection and the local weather forecast.

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