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WINTERKILL

PREVENTING WINTER INJURY AND SPEEDING RECOVERY WHEN DAMAGE OCCURS

In 2010, and for the first time in years, golf courses in the British Isles experienced the effects of winterkill on putting greens. This phenomenon is a common and well-understood turf management problem in the northern regions of the United States. This article will provide a quick review on ways to prevent winter damage and speed recovery of damaged turf when winter injury does occur.

Space does not allow for a complete discussion of all the possible mechanisms and types of winter injury that can occur, but the most common winterkill problem centres around ice accumulation on the turf. Ice damage is the one form of winter injury most dreaded by our turf managers.

Winterkill is a devastating problem on turfgrass. Unfortunately, winterkill is also one of the more difficult problems to manage because so much depends upon the weather and the amount of ice and snow experienced. Indeed, winter injury is invariably determined by the type of ice that develops and the length of time it stays on the grass.

ICE TYPES

There are different types of ice. The less damaging form is granular ice, which is ice that is not frozen to the crown of the grass plant or onto the soil/thatch line, rather it exists on top of the grass, leaving air separation between the ice and the grass plant. The most damaging form of ice is the type that freezes solid to the grass plant, the thatch and soil. Over time, the grass plant is damaged as a result of anoxia, i.e. the lack of oxygen. If ice of this type persists for too long, a certain amount of turf loss is likely to occur.

TYPE OF GRASS

There is a significant difference between grasses regarding ice damage. As a species, annual meadow-grass (*Poa*

Image 1

annua) is likely to be damaged, whereas creeping bentgrass (*Agrostis stolonifera*) is much more tolerant with respect to the effects of ice damage in the winter.

Image 1 illustrates the principal and most devastating form of winterkill – ice damage. Granular ice is displayed in the foreground and hard, clear ice in the background. This low spot holds water and ice, which can contribute to crown hydration. Fortunately, this green is pure bentgrass, which reduces the potential for winterkill. If this green had been *Poa annua*, a certain amount of winter damage would be expected.

CROWN HYDRATION

This damage occurs during freeze and thaw cycles when temperatures become warm during the day, the snow and ice melts, then it freezes again at night. The more frequently the freeze/thaw cycles occur, the more likely there will be winter damage. The most affected areas are shaded turf or low spots that hold water.

Turf managers in the USA and Canada monitor ice accumulations as the winter moves on. If the accumulations exist for too long, usually 30-days or more, superintendents consider ways to break up the ice (nb: be very careful to avoid mechanical damage to the turf). This usually involves removing the snow on top of the ice, attempting to crack the ice, and spreading a dark-coloured organic fertiliser, black sand or other coloured product. It's amazing how ice can be broken-up by using dark-coloured top dressings, even in sub-freezing temperatures.

If ice damage is suspected, it is important to confirm this point. Remove some plugs of turf, place them in a window or warm location and see if the grass grows. If it does – fine, if not – then you should communicate this fact to whoever needs to know.

RECOVERY

Recovery from winterkill can be agonisingly slow and seed will not germinate until the soil warms. Spot plugging and re-sodding the most damaged areas are always good options. If seed is used, there must be good soil-to-seed contact and extra fertiliser needs to be applied, especially quick-release products like ammonium sulphate and urea. There are two levels of fertility – the *maintenance level of fertility* and the *establishment level of fertility*. With winterkill, you are trying to re-establish grass - a point not to be missed.

PREVENTION

If your winter injury problems are worsened by shade, open up these areas to allow more sunlight. If low spots hold ice and water – improve surface drainage. If your turf is primarily *Poa annua*, try to increase the amount of bentgrass over time.

In summary, of all the forms of winterkill, the most common we see and the most devastating that can occur are associated with ice. A blanket of snow can be good for grass, but ice is never good.

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