

# Winter kill linked to carbohydrate levels

by BILL KNOOP, Ph.D.

**N**ow that the hottest days of summer are nearly over, it might be time, at least for those in the South, to start thinking about getting their warm-season turfgrasses through the winter. Fall management programs have a great deal to do with winter survival.

When a warm-season turfgrass dies sometime during the dormant months, the term "winter kill" is used. The term is not easy to define, and there are many points to consider. The best way to understand "winter kill" is to understand how the system works under ideal conditions.

## Carbohydrate deficiency

In the fall after the first cool days, plant growth significantly slows down. The plant is still green and is capable of manufacturing carbohydrates. When plant growth is high, the demand for these carbohydrates is very high, but in the fall the carbohydrate supply exceeds the demand so carbohydrates

are available for storage. This can be critical. The warm-season turfgrass plant must store enough carbohydrates during the fall to get it through the winter. Remember the dormant plant is not dead, but very much alive, and uses its carbohydrate reserve at a low rate. How long the plant can stay dormant has a lot to do with the stored carbohydrates.

In spring, the plant must have enough carbohydrates to grow a new set of leaves. If winter has been exceptionally long, and the spring is then cool, the plant's carbohydrates may be fully depleted before it greens up. This is called "winter kill."

This may be the case when bermuda greens are over-seeded and over-seeding is allowed to remain too long. Thick over-seeding may tend to help keep

the green cool. A slightly different form of winter kill may take place if the plant greens up in the spring, but is "killed back" by a period of below-freezing weather. If this happens once or twice, it's usually not serious but if the green up/freeze back cycle is too frequent, the plant may run out of carbohydrates and die. This may be the most common form of winter kill. The plant uses a high amount of its carbohydrate reserve to establish its leaf system. As soon as bermuda begins to green up, everything must be done to get rid of the overseeding.

## Spring dead spot

The dormant plant may be attacked by a disease sometime during the dormant period. The best example is "spring dead spot" disease.

These are areas of grass that simply do not green up. The spots

may be from a few inches in size to more than a foot. It seems to be a random disease, mostly confined to the upper south. A turf area may have spring dead spot for a few years in a row and then never have it again.

## Low temperature

Direct low temperature is another form of winter kill. It may just get cold enough to kill a warm season turfgrass. It's hard to say just how cold it has to get before a warm-season turfgrass can be killed. A lot depends on how fast it got cold. A plant that is too dry or too wet may be more susceptible to low temperature injury.

Warm-season turfgrasses that do not survive their dormant period may not have died for just one reason. Most times, several factors may combine to cause the death of the plant.

Management factors have been found to contribute to winter kill. Turf on compacted soils tends to be more susceptible. Other factors: low mowing height and too much fertilizer (especially soluble nitrogen).

Sensible management is the best way to prevent problems, including winter kill, but sometimes it just gets so cold that nothing could have been done to prevent it. **LM**

*Knoop is LANDSCAPE MANAGEMENT'S technical editor.*



Spring dead spot may appear for a few years, then never again.