

(*Poa pratensis*), and annual bluegrass (*Poa annua* var. *annua*) were allowed to fully harden well into December in East Lansing, Michigan, and then 4-inch (100 mm) turf plugs drawn. The turfs were placed in ball jars, filled with water, and slowly frozen. Then the top was capped off with a small amount of water, the cover plate with a rubber gasket ball jar sleeve screwed tight, and the ice encasement system frozen. There were four replications involved, with the turfs encased in ice being held at 25°F (-4°C) for 15-day durations up to 5 months. A set of 4 replications were removed at 15-day intervals, thawed slowly, and evaluated for turf survival in a glasshouse.

PERCENT PLANT SURVIVAL AFTER 50 TO 150 DAYS BEING ENCASED IN ICE AT 25°F (-4°C).

Turfgrass species	Days encased in ice						
	50	75	90	105	120	135	150
creeping bentgrass	0	0	0	0	0	0	0
Kentucky bluegrass	0	0	0	0	0	0	0
annual bluegrass	0	0	100	100	100	100	100

The results as summarized in the accompanying table revealed that both creeping bentgrass and Kentucky bluegrass survived 5 months or 150 days of dense ice encasement without significant injury. In contrast, the annual bluegrass was killed between the 75th and 90th days. These results revealed that ice coverage for up to 150 days should not be of concern where creeping bentgrass and Kentucky bluegrass turfs are involved. However, for annual bluegrass an ice coverage exceeding 75 days is of concern. After 75 days of ice coverage efforts should be taken to remove the ice sheet by powered mechanical means down to within 1-inch (25 mm) of the turf surface.

A common occurrence associated with ice covers is turf kill in a pattern directly associated where the ice cover that existed the previous winter. Typically, ice coverage would be in place for a much shorter time than 150 days.

The mechanism for this type of kill is direct low temperature kill as discussed in the last Turfax™. Turf kill occurs (a) prior to freeze-up of the ice cover, (b) following a period of extensive water accumulation which increases the grass crown hydration level, and (c) a subsequent very rapid freeze to below 20°F (-7°C). Turf kill also may occur during the thawing period when the resultant standing water where the ice cover existed causes increased crown hydration and is then followed by rapid freeze to below 20°F (-7°C). These crown hydration situations followed by a rapid freeze typically occur in locations where ice covers were observed during the winter. Thus, the confusion in which the ice covers are assumed to directly cause the turf injury, when in fact that is not the case.

#### UPCOMING JB VISITATIONS:

Provided for Institute Affiliates who might wish to request a visitation when I'm nearby.

- February 21 to 27 - San Francisco, Calif.
- March 6 to 9 - Sioux Falls, South Dakota.
- March 17 to April 4 - Kuala Lumpur, Malaysia.
- April 17 to 19 - Columbus, Ohio.
- May 3 to 5 - Orlando, Florida.
- May 14 to 20 - Buenos Aires, Argentina
- June 1 to 9 - Italy, Europe

#### UPCOMING INTERNATIONAL EVENTS:

February 20 to 27, 1995. GCSAA International Golf Course Conference and Show. San Francisco, California, USA. The theme is "Golden Opportunity." Host site the Moscone Center.

Contact: Golf Course Superintendents Association Conference Registration, Dept. 458, P.O. Box 419263, Kansas City, Missouri, 64193-0458, USA.

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