

Toronto compared to Evansville and Cohansey. However, this anatomical component does not explain the much greater thatch accumulation of Evansville compared to Cohansey. Data in Table 3 suggests that the extensive concentration of surface rooting or Evansville may be a major factor associated with thatching of this particular cultivar.

These studies suggest that there is no one anatomical component that is dominant in affecting the thatching tendency of creeping bentgrass cultivars. More than one component may be involved and must be evaluated in a turfgrass breeding program. These studies are continuing with measurements of the lignin content of these individual plant fractions to determine if there is any further relationship with thatching.

LOW TEMPERATURE TOLERANCE OF PERENNIAL RYEGRASS CULTIVARS

Good field differentials were obtained in the comparative low temperature hardiness of five perennial ryegrass cultivars. These cultivars were established at Traverse City, Michigan, on a loamy sand site August 19, 1969. Adequate snow cover existed during the winter period for the first two years so that low temperature kill was minimal. However, serious low temperature damage occurred during the winter of 1971-1972 to the perennial ryegrass cultivars. A very representative evaluation of the comparative low temperature hardiness among the cultivars was obtained. The plot area involved three replications in a randomized block design.

Table 4. Comparative low temperature kill of five perennial ryegrass cultivars at Traverse City

Cultivar	Percent low temperature kill* (5-9-72)
Norlea	20
Manhattan	50
Pelo	55
Linn	90
NK-100	96

*Average of 3 reps.

Earlier studies revealed that Norlea perennial ryegrass is the most low temperature hardy cultivar available for our Michigan conditions. The question arose as to whether some of the more recently released

cultivars such as Manhattan perennial ryegrass might rank as well or better than Norlea. Results of this test indicate that Norlea still remains the most low temperature hardy perennial ryegrass cultivar. Manhattan perennial ryegrass was substantially less low temperature hardy but ranked higher than the other ryegrasses included in this test. Earlier observations at East Lansing had indicated that Pennfine ranked quite poor in low temperature hardiness, being much less hardy than Manhattan. These results indicate that when considering the use of Manhattan one must recognize the potential for serious low temperature injury and thinning of stands periodically during those winters when there is a lack of winter cover in the form of snow.