CHARACTERIZING VARIETIES OF FOUR COOL-SEASON TURFGRASSES BY ISOENZYME BANDING PATTERNS

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In recent years, hundreds of new varieties have been introduced, and today, many more are being developed. With a large number of varieties of many plant kinds, it is important to develop methods which can be used to characterize and identify them. The isoenzymes are genetic markers and are not influenced to any great extent by the environment.

The objective of this research was: 1) to screen 24 enzymes for their potential to identify varieties of four grass species. Six varieties of each four grass species, i.e., Creeping bentgrass, Kentucky bluegrass, Perennial ryegrass, and tall Fescue were used as testers. Horizontal starch gel electrophoresis was used to separate isoenyymes.

Nine enzymes resulted in well-resolved and characteristic isoenzyme banding patterns. However, not all nine enzymes were of equal value for all grass species. Diaphorase banding patterns differed between varieties of bentgrass, separating all six varieties. The six varieties of bluegrass tested could be individually separated with glucose-1-phosphate transferase banding patterns. Adenylate kinase banding patterns identified the six ryegrass varieties studied, while phosphoglucoisomerase banding patterns separated the six tall fescue varieties.

Electrophoresis proved to be an excellent means of characterizing varieties of grass species. This test was repeatable, quick, consistent and inexpensive to perform compared to field tests (morphological characteristics).