

Development and evaluation of less mowing requiring perennial ryegrass , and molecular understanding of high turfgrass density
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Perennial ryegrass (*Lolium perenne* L.) is one of the most popular and important bunch types cool-season turfgrass species. Because of its rapid establishment, attractiveness, and finer leaf texture, it is grown in many diverse areas. High-quality turfgrass areas, such as on golf courses, athletic fields, and showcase lawns, require frequent mowing to maintain desired aesthetic and performance goals. However, this necessitates considerable outlays of labor, time, and fuel. If a turfgrass stand could maintain desirable density, quality, and performance characteristics without the need for frequent mowing, this would save money and labor for other activities. Currently, there is limited availability of turfgrass cultivars or selections that exhibit true dwarf characteristics. Therefore, development of dwarf perennial ryegrass will help to decrease mowing frequency requirement and therefore reduce maintenance costs. Seven dwarf perennial ryegrass cultivars were developed by using mutation breeding method. These dwarf cultivars were planted on the field for evaluating their mowing frequencies requirements. A significant reduction in mowing requirement was recorded ranging from 50-87% without compromising turf quality. This high reduction in the mowing frequency in these perennial ryegrass cultivars will save time, fuel, and money. Furthermore, RNAseq analysis was done to understand molecular basis of high turf density in the dwarf cultivars. Our data revealed that cytokinin biosynthesis pathway is involved in the high tillering of the dwarf cultivars.