

SELECTION OF TURFGRASS SPECIES FOR RECREATIONAL AREAS IN MICHIGAN

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The establishment and maintenance of a quality turf for recreational and athletic sites in Michigan depends upon the selection of adapted turfgrass species and cultivars, proper soil conditions, and proper cultural practices. The consideration of factors such as (a) climate, (b) environmental and soil conditions, (c) usage or function, and (d) intensity of culture is essential in selecting the adapted species for a given site.

Climate:

Michigan is in the cool-humid region of the United States. This region includes the northeast, north central, Appalachian, and Pacific coastal northwest areas. The cool-season grasses are best suited for this region. The optimum soil temperatures for shoot growth of cool-season turfgrasses is 60-70°F. Turfgrass species in this group grow best in the spring and fall and are generally susceptible to periods of summer dormancy. The warm-season grasses such as bermudagrass and zoysiagrass are unsuited for this region. They prefer temperatures of 80-90°F for optimum shoot growth, growing best in the summer. Bermudagrass and zoysiagrass are subject to cessation of growth and loss of color when temperatures dip below freezing.

Environmental and Soil Conditions:

Recreational and athletic turfs are exposed to various environmental and soil conditions in Michigan. Factors such as light intensity, light quality, temperature extremes, and precipitation patterns are important when selecting an adapted turfgrass species. Soil conditions such as structure, moisture and nutrient holding capacity, and pH can often be modified before establishment. An area receiving a low intensity of culture and having a minimal budget, may have to do without any soil modification. The turfgrass species chosen for this area will have to be the one that is best suited for the existing conditions.

In general, the red fescues do better on coarse soils of low fertility than the Kentucky bluegrasses which prefer well-drained, fine-textured fertile soils. Red fescues do well in shaded areas, while Kentucky bluegrasses do not. Rough bluegrass also prefers the shade with moist soil conditions, but does not tolerate traffic or high temperatures.

Usage or Function:

The usage or function is a primary consideration for selecting a particular turfgrass species. The species chosen for recreational or athletic turf must be able to withstand traffic. Traffic results in the following problems for turf:

1. Wear
2. soil compaction
3. soil displacement
4. divots

In most incidences, soil compaction and displacement can be corrected by soil modification and cultivation practices. However, the turfgrass species selected cannot readily be modified, and must have certain characteristics allowing it to withstand wear and divot damage.

The wear tolerance of a turfgrass species is associated with the degree of suberization, lignification, and silification of the leaves and stems. The recuperative potential is associated with the ability of a grass to recover from injury, usually from buds in the crown, rhizomes or stolons. Poor recuperative potential is generally associated with a bunch-type turfgrass, such as perennial ryegrass.

The warm-season turfgrasses, such as bermudagrass and zoysiagrass, have better wear tolerance and recuperative potential than do the cool-season species. Tall fescue has excellent wear tolerance in terms of the cool-season species, but is susceptible to direct-low-temperature kill in Michigan, making it unsuited for permanent turf. Most perennial ryegrasses are subject to similar shortcomings in Michigan. Manhattan perennial ryegrass has improved cold-temperature-tolerance, ranks well in terms of wear tolerance, and has a diminutive growth habit. These characteristics make it appealing as a possible component in mixtures with Kentucky bluegrasses for athletic turf.

Intensity of Culture:

Intensity of culture refers to the degree of fertilization, irrigation, and pest control practiced. Turfgrass areas in Michigan receiving a low intensity of culture should consist primarily of red fescue and Kentucky bluegrass mixtures. Those areas receiving more intense cultural systems, such as athletic turfs, should consist primarily of a Kentucky bluegrass cultivar or blend of Kentucky bluegrass cultivars.

A mixture of two or more turfgrass species, like red fescue and Kentucky bluegrass, has a chief advantage in that each species within the mixture will be better adapted to certain conditions than the other component. Shade, sandy soil, poorly drained soil, or exposed subsoil are conditions which require specific turfgrass mixtures.

Blends involve the mixing of 2 or more cultivars of the same species, such as Kentucky bluegrass. Generally, no one variety has all the attributes desired for a recreational or athletic turf, but a blend of cultivars may closely approximate the characteristics desired. A blend is usually suited to a broader range of soil conditions, environments, intensity of culture, and diseases than a single cultivar.

Conclusions:

1. The cool-season turfgrasses are most adapted for use on recreational turfs in Michigan. Kentucky bluegrass and red fescue are the most frequently used species within this group.

2. Recreational turf of low to medium cultural intensity should use mixtures of Kentucky bluegrass and red fescue.

3. Recreational turf, such as athletic fields, that receive medium to high maintenance should use a blend of Kentucky bluegrass cultivars for best results.
4. In general, the commercial available varieties of tall fescue and perennial ryegrass are not acceptable as permanent turfgrass species for recreational sites in Michigan due to their susceptibility to low temperature kill. Manhattan perennial ryegrass has improved cold temperature tolerance when compared to most other cultivars, and may be used as a component in mixtures with Kentucky bluegrass.