

TURFGRASS BREEDING UPDATE
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Dramatic progress continues to be made in the genetic improvement of cool- and warm-season grasses used for turf and soil conservation. Attractive, durable, persistent cultivars with improved disease and insect resistance, increased stress tolerance, and reduced maintenance are becoming available to the American public. However, two conditions are necessary to optimize high turfgrass performance: (i) proper management and (ii) use of species and cultivars adapted to the specific climate and the purpose of the turf been used.

Turfgrass breeding is still new compared with forages grass breeding. In the past few years, turfgrass cultivars have been developed to enhance our physical environment, conserve our soil and water resources, and provide recreation. Traditional turfgrass breeding procedures are based on manipulation of genes and chromosomes through several reproductions in whole plants. The procedures to develop a turfgrass cultivar are:

- Step 1. Goal of Variety Development
- Step 2. Identifying Breeding Material (*from least expensive to most expensive*)
 - Source 1. Existing varieties
 - Source 2. Collections
 - Source 3. Intraspecific hybridization
 - Source 4. Induced mutation
 - Source 5. Tissue and cell culture
- Step 3. Crosses Selected Parent Plants (Clones)
- Step 4. Progeny Trials
- Step 5. Verification
- Step 6. Varietal Increase

These procedures evolved from the principle of Mendelian genetics and were expanded as knowledge increased in quantitative genetics, polyploid, mutation induction, and related phenomena. These procedures also depend upon accurate screening methods and the availability of genotypes with clear-cut phenotypical characteristics. Those procedures will take from 5 to 10 years and can be a costly process.

At present, the biotechnology and new molecular application which rapidly emerging suggest that will complement not replace the traditional plant breeding practices. It will facilitate all the processes and may accelerate the generation of new cultivars and allow a plant breeder to connect the phenotype characters with their genotype.

The objectives of the turfgrass-breeding program at Michigan State University and prospective research will be discussed in detail.