

Using Somaclonal Variation to Develop New Kentucky Bluegrass Cultivars

By N.J. Ehlke, D.L. Wyse, and D.J. Vellekson

University of Minnesota

The highly apomictic nature of Kentucky bluegrass has limited the development of new cultivars that are different from existing cultivars. Apomixis is a form of reproduction where the genotype of the maternal parent is identically reproduced in the progeny. The majority of the older Kentucky bluegrass cultivars were "found" by plant breeders, often during collection trips. The newer cultivars of Kentucky bluegrass have been developed through plant breeding programs using hybridization or mutation breeding. Our research program has employed mutation breeding through the development of a successful tissue culture program. Tissue culture causes a disruption in plant growth and development often resulting in genetic changes being observed in regenerated plants. This type of variation caused by tissue culture is called somaclonal variation. Our research objective is to evaluate progeny from plants derived from our tissue culture program for the presence of somaclonal variation to develop new cultivars of Kentucky bluegrass. Our initial results show there are progeny from regenerated plants that appear to have a higher level of disease resistance and improved turf quality including better turf color, leaf texture, and growth habit from the original parental source. We have identified 36 plants from tissue

culture that warranted further evaluation. Large turf plots were established in 1999. Currently, we have selected five Kentucky bluegrass lines in seed increase in northern Minnesota for potential release.

We restarted our tissue culture program in 1996 to continue to develop potential new cultivars of Kentucky bluegrass. Approximately 3500 regenerated plants were transplanted to the field in 1998 for a preliminary evaluation of turf quality and seed production potential. In 1999, approximately 400 plants were selected for further evaluation and seed was harvested in 2000 from the selected plants. The seed from the selected plants was seeded into rows for further evaluation of turf and seed production potential. In 2002, seed was harvested from approximately 80 of the best rows based on uniformity, turf quality, and seed production. Turf plots were seeded in August, 2002 for a better evaluation of turf quality and disease resistance. The potential new cultivars of Kentucky bluegrass will be entered into the 2005 NTEP trials with a potential release date in 2007.

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(Editor's Note: N.J. Ehlke and D.L. Wyse are Professors and D.J. Vellekson is an Assistant Scientist in the Department of Agronomy and Plant Genetics at the University of Minnesota.)



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