

Somaclonal Variation as a Breeding Tool for Coffee Improvement

M. R. SOENDAHL, A. BRAGIN

Cereals and Tropical Crops, DNA Plant Technology Corporation, Cinnaminson, NJ, USA

SUMMARY

Somaclonal variation is a cell genetics technique that permits the isolation of genetically stable mutants from commercial varieties. It explores the natural and *in vitro* variability of somatic cells following plant regeneration (somaclones). This variability has been attributed to chromosome alterations (breakage, translocations, deletions, polyploidy, aneuploidy), gene amplification, transposon activation, somatic crossing-over, and point mutations.

Commercial production of coffee has been greatly improved by plant breeding. Coffee is a perennial tree that requires a minimum of 20-25 years to release new varieties. Somaclonal variation is an excellent method to shorten coffee breeding programs, since it provides access to new mutant forms in high yielding genotypes within a short period of time (4-8 years).

Somaclones of several commercial arabica varieties and a few non-commercial genotypes have been produced and are now in the fourth year of field evaluation. An overall variability of 10% has been recorded among 12,176 plants evaluated to date. Among the variants, we have observed alterations in leaf and branch morphology (leaf size and shape; angle of lateral branches), plant stature (tall to short; short to tall), cherry color (red to yellow, yellow to red), cherry size and shape (including one Maragogipe mutant), increased yield over donor control varieties, variability in maturation (early and late types), and susceptibility/tolerance to diseases (leaf rust and cercospora). Selections will continue throughout several consecutive years to permit the isolation of new stable varieties among the tall and the short stature cultivars. The use of somaclonal variation is being studied as an alternative method for coffee breeding programs.