

Title Molecular approaches for studying fruit

Author Roger Hellens

Citation Abstracts of 27th International Horticultural Congress & Exhibition (IHC 2006), August 13-19, 2006, COEX (Convention & Exhibition), Seoul, Korea. 494 pages.

Keywords molecular biology; gene technology; genetic markers; apples; anthocyanins; fruit quality; tree architecture; dwarfing; dormancy

Abstract

Domestication of fruit varieties by man has involved the selection of certain fruit phenotypes to suit the human palate, satisfy hunger, simplify cultivation, prevent disease and extend availability. Both primitive domestication and the advanced breeding techniques employed today exploit the genetic variation that exists within a plant's germplasm. Modern molecular biology involves the collection and characterization of genetic material. This can lead to the identification of the small genetic changes that are responsible for desirable fruit phenotypes. Because the DNA sequence of plant species often share many similarities, both in genes, and arrangement of genes along the chromosome, the knowledge gained from one plant can be used to understand other plants. HortResearch is using gene technology approaches starting with the sequencing and mining of ESTs and followed up with the intensive study of selected full length genes; this has resulted in a significantly greater understanding of fruit phenotype. The approach has also added to our fruit gene mapping and marker assisted breeding programmes. An overview of our molecular capability will be demonstrated by our recent characterization of genes the regulatory genes that are responsible for the diversity of anthocyanin colour distribution in apples. More recently we have been considering how the genes responsible for more challenging fruit traits such as flavour and texture, and architectural traits such as dwarfing and perennial dormancy, can be advanced with these molecular tools.