Marker assisted breeding

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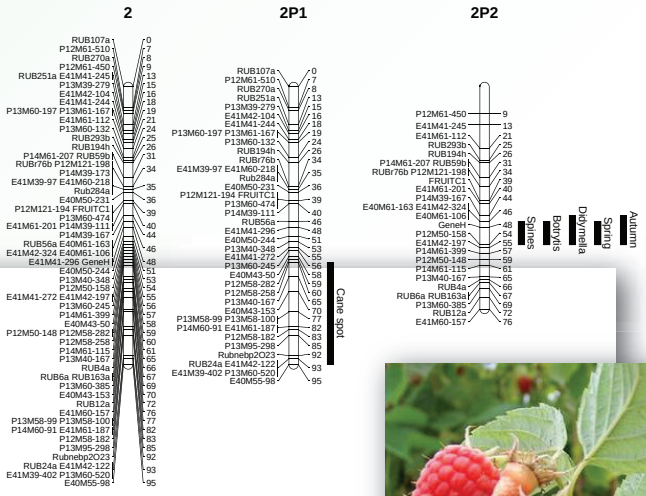
Information in living organisms is coded for by DNA which is made up of lots of genes. This information determines how a plant looks and its abilities to react to particular situations.

In a plant cell DNA is formed into groups known as chromosomes. These chromosomes can be represented by lines known as linkage groups.



A genetic linkage map is a representation of a plant's chromosomes with signposts placed along the chromosome in the form of molecular markers, to which phenotypic traits can be associated.

Such maps can facilitate the development of diagnostic markers for polygenic traits and the identification of genes controlling complex phenotypes. The availability of a map provides the basis to locate and hence manipulate quantitative traits in breeding programmes.

Molecular markers are pieces of DNA that are known to be located near genes and inherited traits of interest, allowing selective breeding and identification of progeny with desired characteristics.

The identification of genetic resistances for important traits in the available germplasm may require extensive glasshouse and field-testing over a number of years. Two examples are aphid resistance where glasshouse trials for resistance can be carried out relatively quickly and easily compared to root rot resistance which requires years' worth of field testing. . ..

. . . However, with the availability of a genetic linkage map and a population segregating for genetic resistances we can now identify resistance loci on the genetic linkage map and from here develop diagnostic markers for resistance to this disease.

This will allow future screening of progeny in breeding programmes to be conducted by a simple, quick, lab based assay which looks for the presence of the marker linked to the trait rather than looking for the trait itself through years of glasshouse and field screening.