



The Science of *by Giovanni Verlini* Plant Breeding

Agriculture is synonymous to plant domestication and trait selection. However, scientific research applied to the screening, selection and development of plant varieties has grown immensely over the last few decades. But not all techniques used in this endeavor are the same.

Mutation breeding refers to the development of plant strains using mutagens, including the irradiation of seeds. Quite simply, through this procedure the natural process of evolution of the plant's DNA is speeded up. New varieties of crops can be chosen with characteristics tailored to a particular environment, such as grains with higher yield, better nutritional value, tolerance to salty soil or resistance to a specific disease.

Smart breeding, which makes use of marker assisted selection, refers to a process whereby a marker is used for indirect selection of a genetic trait of interest. This is a similar process to traditional breeding, although it involves a far more precise knowledge, i.e., at a genetic level, of species' traits.

Genetically modified plant varieties, on the other hand, have had their genetic material altered using genetic engineering techniques. With this technology, DNA from the original plant and other sources are combined into one molecule to create a new set of genes. This DNA is then transferred into the plant, causing it to acquire modified or novel traits.