**GENETIC ENGINEERING**

AS the whole codon is composed of 4 alphabets A, T, G and C, hence we can use the genetic information from any organism and then transfer to any other organism by means of genetic engineering in this way desirable variation can be created. E.g. B.T cotton has a BT gene transferred from bacteria named *Bacillus* [*thuringiensis*](https://www.google.com/search?q=bacillus+thuringiensis&spell=1&sa=X&ved=0ahUKEwiTwuD95MXgAhVJwAIHHTPRA5gQkeECCCgoAA), this gene perforates the gut of any chewing insect that bites on the cotton plant. In this way desirable characters can be transferred from any species across the species barrier. Any gene from any species can be transferred to any other species for creating useful variation. Any organism having foreign DNA is called ***Transgenic Organism.***

### How to Exploit Transgenic Plants Bearing Somaclonal Variation

Somaclonal variation can disturb both basic and applied studies on [transgenic plants](https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/transgenic-plant). The use of transgenic plants in order to assign a role to cloned genes of unknown function may be impaired by concomitant variant traits due to somaclonal variation. For example, in the agronomic and industrial exploitation of transgenic plants, transgenic elite [cultivars](https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/cultivar) might show undesirable changes compared with the original plant. For instance, when insect-resistant, transgenic sugarcane plants were produced, they were found to be morphologically identical, but the agronomic analysis of selected plants showed changes in some [agronomic traits](https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/agronomic-traits). Rare DNA changes were also observed by [AFLP](https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/amplified-fragment-length-polymorphism) analysis.

Nevertheless, a large array of commercially exploitable transgenic plants has been produced. In fact, several different approaches can be applied to overcome the problem of somaclonal variation in transgenic plants. One may be that of using recurrent backcrossings to restore the original genotype while retaining the foreign gene. A second approach may be to utilize the best-performing transgenic plants, regardless of genomic changes. The former approach is particularly suitable for annual crops, such as rice, while the latter is suitable for plants that are commercially reproduced by cuttings, such as sugarcane or [poplar](https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/populus). But these approaches are not appropriate for all cases. For instance, in the hypothetical case of transgenic olive trees, it would not be practical to wait years before verifying that somaclonal variation had not affected flavor, yield, ripening, or other industrial traits in selected trees.