Session 6: Novel Technologies

Keynote lecture

Genome editing in grapevine: a great opportunity or only a dream?

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Abstract

Genetic improvement has been a limited experience in grapevine due to the well know difficulties to improve by traditional approaches international successful or traditional varieties. The biggest disadvantage of traditional crossbreeding is that entire sets of chromosomes are recombined, resulting in numerous undesired traits in the offspring. Through lengthy selection, the best plants are selected from these offspring and registered and marketed as a variety. Thanks to the so-called new breeding techniques (NBTs), possibilities have opened up in recent years to achieve genetic improvement of individual traits in plants. The NBTs are genetic techniques that leave point mutations in selected genes in a mutagenic approach that leverages the capabilities of the CRISPR/CAS system. Genome editing leads to the introduction of mutations via double-strand breaks in the DNA upon endogenous DNA repair. In vine breeding, the main advantage of NBTs lies primarily in the possibility of introducing desired properties into well-known and valued traditional grape varieties. Several bottlenecks must be overcome in the next years to turn this possibility into reality. *In vitro* recalcitrant varieties, specific transformation protocols, protoplast regenerations are only some of the major difficulties that must be improved to realize a dream. Other social acceptance of NBTs as “non-GMOs” does the rest.