



## Genetic improvements through the inbreeding of 3 native varieties

*Self-fertilization as a procedure to enhance the grapevine's genetic potential.*

Driven by our will to explore and enhance the native genetic assets in order to find new genotypes with promising traits regarding both their agronomic features and quality, we started a genetic improvement program based on self-fertilization and a subsequent selection of the best genotypes of the two most important red grape varieties grown in the area: Gaglioppo and Magliocco Dolce.

The use of self-fertilization allowed us to deal with the variability within those two local varieties: in fact, they were historically farmed in restricted distribution areas, suffering a substantial anthropic impact that limited their phenotypical features. Through the self-fertilization technique (or inbreeding) those features (both morphological, phenotypical, productive in the plant and regarding the grape's composition) «segregate», i.e. they arise in their phenotypic expression with greater strength than before, but without experiencing the deep changes that affect the genetic asset of crossbreeds, where two genetic makeups from two different plants are involved. Self-fertilization is therefore particularly useful when the goal of the genetic improvement is to optimize some specific features, preserving at the same time the variety's set of genetic traits, which, as in the case of our native grapevines, adapted through the decades to a specific growing site.

With respect to Gaglioppo, the main driving force for our improvement work is the scarce endowment of coloring substances in this variety. In fact, the low anthocyanin contents and the high percentage of easily oxidizable anthocyanins produce in this grapevine a coloring potential that struggles to reach the same level and stability as other varieties.

Between the other local cultivars, Magliocco Dolce shows interesting agronomic features (good endurance to environmental stress) and a high potential in stable anthocyanins.

Overall, these grapevines are definitely interesting, but they present a few problems, both agronomic (yield, dry-heat resistance) and qualitative (macrostructure, color), that we tried to bring to perfection.



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Starting 2002, we began operating a selection: through several screening cycles we analyzed and evaluated vegetative and morpho-productive features, phytosanitary aspects and the composition of the grapes in the examined genotypes. We also conducted all DNA tests required to verify the genetic identity of the selected seedlings. After this long process, of the 3000 and more self-fertilized genotypes originally implanted, we selected 22 genotypes fully recognizable as possible new varieties, and very interesting for what concerns our original goals.

We especially identified two genotypes, obtained from Gaglioppo vines, that present a good and stable amount of anthocyanins content (malvidin), by far higher than parental values, and twenty Magliocco Dolce genotypes that present an improved macro-composition (good sugar content and a more balanced acidity).

The results of this technical-scientific work have been published in the scientific essay *Un viaggio all'interno del genoma del Gaglioppo e del Magliocco (A journey through Gaglioppo and Magliocco genomes)*, Rubbettino, 2015.

As a part of the selection activity, a last stage will call for an examination of the aromatic charge of the grapes and of the enological value of the wines: a crucial evaluation.

The ultimate purpose of this long journey will be the registration of one or more new varieties to the Italian Register of Grapevine Varieties. This goal, reached through an enhancement in agronomic, productive, quality and phytosanitary features and thanks to the high adaptation degree to southern Italy environment, would represent a substantial contribution to the quality of local viticulture, meanwhile strengthening the elective link between wine and land.