A study of *Kékfrankos* (Blue Franc), the most widely cultivated grape variety in Hungary, exploring its viticultural and oenological values through clonal selection and genetic variability

Establishment of innovation operative groups and the necessary funding to implement the

innovative project – VP3-16.1.1-4.1.5-4.2.1-4.2.2-8.1.1-8.2.1-8.3.1-8.5.1-8.5.2-8.6.1-17

BLUE FRANC CLONE SELECTION

Press Release

The observation of differences between grape varieties and their variations may be as old as viticulture itself. Man has instinctively favoured varieties that are more beautiful, sweeter, better ripening and produce finer wines. With a few exceptions, the varieties grown today have been selected according to these criteria.

Over time, the selection criteria have been broadened, for example, in the case of table grapes, the emphasis has been on larger (or even huge) bunches, seedlessness or specific berry shape, while in the case of wine grapes, it is precisely the smaller berries and bunches, uniform ripening and adequate colouring that have become important. The latter are particularly important in the case of red-wine grapes, which have a wide range of oenological uses: with the right technology, blue grapes can be used to make sparkling wine, white wine, rosé wine, Schiller, light red wine and full-bodied red wine with long ageing. If the grape variety is given, the basis for these many possibilities is not only the wine-making technology but also the selection of the clones (variations) best suited to the climate and the terroir in the narrow sense of the word.

Europe's great wine-producing regions are known for their grape varieties. Clonal selection of these was carried out abroad decades ago. The largest red-wine grape variety grown in Hungary is *Kékfrankos* (Blue Franc). It is true that it is not an ancient local variety, but *Kékfrankos* has found a real home in our country, in the Carpathian Basin, and has become for us what Cabernet Sauvignon is for the French, Garnacha for the Spanish or Sangiovese for the Italians. *Kékfrankos* is now found in almost all of our historic wine regions, for the simple reason that it has stood the test of time, year after year, vintage after vintage.

However, the challenges of the new millennium (in particular the emergence of new vineyard pests and climate change) and changing consumer demands have made a review of *Kékfrankos* essential. It has become clear that the *Kékfrankos* variations that met recent mass production needs are not suitable for red wines with high organoleptic values, and that different clones are needed for modern rosés and spicy Shillers or sparkling wines. The complexity of the problem is compounded by climate change, the emergence of huge variations between vintages and the fact that in increasingly droughty vintages, the term 'ripened grapes' no longer necessarily corresponds to the term 'technologically mature grapes'.

The consortium, formed in 2018 under the leadership of Mészáros Borház Kft., aims to select the varieties of *Kékfrankos* grapes in the Szekszárd and Hajós-Baja wine regions that meet the challenges of modern times. The project was also joined by Koch Borászat Kft., as a winery, and winegrowers KISS Ferencné from Borota, MÉSZÁROS Péter from Szekszárd and SZŰCS Péter from Bátaszék.

The University of Pécs, experts Dr JAKAB Gábor and Dr DEÁK Tamás, consultant TERPÓ István and Gazda Kontroll Kft., seated in Mosonmagyaróvár, as project manager, also participated in the project. The members intended to carry out clonal selection of the *Kékfrankos* grape variety. For this purpose, 188 clonal variations of *Kékfrankos* were selected in advance thanks to the work of vine breeder Dr KOZMA Pál Jr. In the project, the quantitative and basic qualitative characteristics of the clones' yields and their oenological values were determined for three vintages between 2020 and 2022.

For each of the 188 lots, we determined the performance of the vines in terms of yield (number of bunches, bunch weight); we assessed the uniformity and size of the bunches produced on the vine, and the weight of the berries. A rapid analytical method was used to determine the basic quality parameters of the musts made separately from each batch: dry matter (°Bx), acidity and pH. A variation suitable for making rosé wine is expected to give a reliably high yield, with good acidity retention; while the ideal variation for making full-bodied, aged red wine has smaller than average berry clusters but also good yields and excellent sugar retention. During the organoleptic evaluation, particular attention was paid to identifying lots with a distinctive aroma, which can be used to make complex red wines.

The oenological evaluation of the clonal variations started with a comparison of harvest parameters and continued with a series of so-called micro-fermentations. The aim was to obtain a comparable small-batch wine sample of all 188 clones in all three vintages. Routine-analytical and large-scale tests were used to evaluate the harvest parameters and the wines: 28 variables were determined for the harvest parameters and 67 for the finished wines. In total, more than 53,000 oenological analytical data from the three vintages were processed. This was complemented by the work of a team of experts who tasted and graded the wines of the three vintages.

Based on three years of data, we have been able to select valuable lots that are suitable for different growing purposes. The next step is to propagate the selected clones and test them on a larger surface. This will give us an accurate picture of the real production value from a viticultural point of view and the quality that can be achieved with the plant technology from an oenological point of view. A further important task is the detailed assessment of the virus infestation of the selected lots, and the exclusion of any problem lots.

The yield of lot 61 is medium. Small, but produces many bunches. Berries are relatively small. Good sugar-collecting capacity, valuable wine. Promises to be an excellent red wine base.

Lot 110 has excellent productivity, with medium-sized bunches and berries. Acidity is good, flavour is full of character, with traits of sour cherry. It makes a good rosé wine.

In conclusion, in our changing climate, we cannot vote for a single clone to achieve a balanced wine quality.

Taking into account the main oenological parameters, nearly 70-80 % of the clones performed as expected in all three vintages studied (this also means that 20-30 % are not suitable for making wine on their own). However, this does not mean that all of them are suitable for making quality wine. There is less variation in aromatic components and more variation in colour across vintages. There are, however, more stable varieties of *Kékfrankos* with less such variation – they have, so to speak, taken shape every year.

The results of the sensory evaluation show that about 10 % of the samples tested are of high quality (which is still significant given the initial sample size) and 50 % are rather mediocre. Most of the clones considered oenologically stable, unsurprisingly, are in the middle category. Given the wide range of vintages, there are no clones that can be considered as podium clones or outstanding in all respects. Further studies – or, if you like, new vintages – are needed.

Based on the results obtained during the project work, it can be said that from the point of view of quality winemaking, the range of dissected *Kékfrankos* clones has been significantly narrowed down. We can come to a final conclusion after a deeper viticultural and oenological examination of these candidates.

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