THE START OF CROATIAN GRAPEVINE BREEDING PROGRAM

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Abstract:

Context and purpose of the study – Modern viticulture in Croatia and the world is mainly based on the grapevine varieties susceptible to various diseases and pests, which leads to unsustainable use of large amounts of pesticides. The sustainable development of viticulture in the future will only be possible by increasing the resistance of the grapevine through the development of new resistant varieties. Breeding programs have been launched in the leading wine-growing countries with the aim of developing resistant varieties possessing high quality level. Coratia is rich in in native grapevine varieties that are the basis of wine production, and are not included in the breeding programs of other countries. In 2015 breeding program was started at University of Zagreb Faculty of Agriculture. The long-term goal is to develop stable and durable resistance in the new varieties, using native germplasm and other sources of resistance. The developed varieties should be suitable for Croatian growing conditions.

Material and methods – Two native varities with female flowers were selected as parents, Grk and Dišeća ranina, while as sources of resistance Panonia variety (Rpv3, Rpv12, Ren3 resistant genes) and genotype SK 00-1/8 (Rpv1, Run1, Ren3 resistant genes) were used. First cross (AFZ-VV-15) was performed between native varieties and Panonia, and second one (AFZ-VV-19) using progeny from the first crossing, which inherited all three resistance genes, with genotype SK 00-1/8. Initial selection of seedlings was performed by field exposure to downey mildew, followed by marker selection for resistant gene loci detection, after which further phenotyping to powdery mildew was performed.

Results – The offspring from crossings Grk x Panonia and Dišeća ranina x Panonia were subjected to field phenotyping and marker-assisted selection (MAS), which singled out 11 genotypes inheriting three resistant genes, Rpv3, Rpv12, Ren3, alongside with female flower. After crossing these offspring with genotype SK 00-1/8, low level of seed germination occurred. Field phenotyping to powdery mildew resulted in 20 highly resistant genotypes, which were subjected to field phenotyping to powdery mildew, from which only eight highly resistant genotypes were selected. Genotyping results confirm the success of resistant gene pyramiding in the selected geotypes.

Keywords: Grapevine, resistant varieties, breeding program, downey mildew, powdery mildew