

Evaluation of phytomass yield of *Vitis vinifera* in Tokay vineyard region in the form of agroclimatical diagram of production

Ján Čimo¹, Lucia Maderková¹, Jan Horak¹, Dusan Igaz¹, Viliam Barek² and Peter Halaj²

¹Department of Biometeorology and Hydrology, Slovak University of Agriculture in Nitra, Slovak Republic
²Department of Landscape Engineering, Slovak University of Agriculture in Nitra, Slovak Republic

Autotrophic plants are significant for unique ability – to produce bioproducts i.e. biological and agronomical yield in photosynthesis process. However yield amount is eliminant by interaction of plant genetic potential and external environmental factors.

In submitted work is analyzed mathematical-statistical relation between botanical yield of *Vitis vinifera*, variety Furmit and characteristics of energetic and water balance, which is expressed by average temperature and precipitation total amount for months of vegetation period in years 2001 -2007 in Tokay vineyard region.

Biological but also agronomical grapes yield is resultant of genetic and biological potential and also external environmental factors. For the grape is elementary limiting factor for organic mass production the air temperature, which influences such vital function as transpiration, photosynthesis, nutrient income, breathing and so on. In this connection is the most used temperature characteristic the thermal vegetation constant i.e. the sum of active temperatures of air for the main vegetation period ($T \geq 10.0^\circ\text{C}$). From the characteristics of water regime is the most used the total atmospheric precipitation. On the base of analytic relation between cumulative sum of air temperature (ΣT in $^\circ\text{C}$), total precipitation (P in mm) of a grape phytomass production (U_f in $\text{kg}\cdot\text{m}^{-2}$) was created agroclimatical diagram of grape production. From diagram is possible in random part of vegetation determinate the phytomass yield and to its, according coefficient $K=0,588$ the agronomical yield (grapes). Consequently there was determined the model of phytomass and saccharides production with using mathematical-statistical analyse according the program of non-linear correlation and multiple linear regression the influence of temperature and precipitation to production process.

Acknowledgement:

This paper is a result of project realisation: Center of Excellence for Integrated Watershed Management, No. ITMS 26220120062; supported by research and development operational program financed from ERDF.



Biography

Jan Čimo has completed his PhD. study at the age of 28 on Slovak Agriculture University in Nitra, Faculty of engineering, Department of Physics. He is the professor assistant on Slovak Agriculture University in Nitra, Horticulture and Landscape Engineering Faculty, Department of Biometeorology and Hydrology. He has published more than 60 papers in reputed journals and other publications (80 citations). He is a member of the Slovak Bioclimatic Company, cooperating with Slovak Academy of Sciences. His research is oriented especially to climate change, renewable energy resources.

jan.cimo@uniag.sk