

## Effect of the different cover crops on the soil moisture in a Hungarian vineyard

Ádám Donkó (1), Tamás Miglécz (2), Orsolya Valkó (3), Balázs Deák (2), András Kelemen (2), Péter Török (3), Béla Tóthmérész (3), and Dóra Drexler (1)

(1) Hungarian Research Institute of Organic Agriculture (ÖMKi), adam.donko@biokutatas.hu, (2) MTA-DE Biodiversity and Ecosystem Services Research Group, Hungary, (3) University of Debrecen, Faculty of Sciences, Department of Ecology

Since many years it is well known that the one-sided mechanical soil cultivation of vineyard inter-rows has many disadvantages. Growers can choose from alternative tillage technologies, such as the usage of green manure, or covering the inter-rows with straw mulch. Another possible technology is to cover the inter-rows with species-rich seed mixtures. However, selection of the most suitable species is crucial; we have to take into consideration the age of the vines, and the specific characteristics of the vineyards involved. Species rich cover crop technology has many advantages: 1) it helps to prevent erosion and creates easier cultivation circumstances, 2) it has a positive effect on soil structure, soil fertility and ecosystem services, 3) we can create native mixtures from local provenance, adapted to the local climate/vine region/vineyard which enhances the nature conservation value of our site. But, they should not compete significantly with the grapevines, or negatively influence produce quality. In the year of 2012 we created, and started to study three different cover-crop mixtures in Hungarian wine regions under on-farm conditions: Biocont-Ecovin mixture, Mixture of Legumes, Mixture of Grass and Herbs. The results of the botanical surveys, yield and pruning weight were published in many papers and presentations before (e.g. Miglécz et al. 2015, Donkó et al. 2016). Besides the above measures, one key point of the effectiveness and sustainability of the living mulch vegetation is the level of soil moisture. That is why we started to investigate the soil moisture (vol %) of different treatments (Biocont-Ecovin mixture, Mixture of Legumes, Mixture of Grass and Herbs, coverage with *Lolium perenne*, and Control (spontaneous weed flora)) in at the Feind Winery in Balatonfőkajár (Hungary). The investigated variety is Welschriesling on loamy soil (Tihany Formation), planted in 2010. The seed mixtures were sown in the spring of 2013. We measured soil moisture in 2015, at two sampling dates (April and June). During sampling the soil moisture content was measured in seven different depths per sampling point in five replicates: 10 cm, 20 cm, 30 cm, 40 cm, 50 cm, 60 cm, and 70 cm. We found significantly lower indices in case of the *Lolium perenne* treatment compared to the Grass-forb, and Control treatments in 40-70 cm depth. The results are in accordance with the results of previous research, that state that the use of *Lolium perenne* in the inter-rows can be sustainable in case of at least 7-800 mm precipitation/year, or under irrigated conditions. Among the three species-rich mixtures we have not found significant differences, but the results show that the Grass-forb mixture (with *Plantago lanceolata* domination) utilized the least moisture from the soil.

### Literature

Donkó Á, Miglécz T, Valkó O, Tóthmérész B, Deák B, Kelemen A, Török P, Zanathy G, Zsigrai Gy, Drexler D (2015): Intercropping experiments in Hungarian vineyards. HUNGARIAN AGRICULTURE RESEARCH. 24 (4): pp. 31-34. (2015)

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