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Comparison of species-rich cover crop mixtures in Hungarian vineyards

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In case of vine growing, agricultural practices of the past decades – as mechanical cultivation on steep vineyard slopes – can endanger the soil of vineyards. Moreover, climate change scenarios predict heavier rainstorms, which can also promote the degradation of the soil. These are some of the reasons why sustainable floor management plays an increasingly important role in viticulture recently. The use of cover crops in the inter-row has a special importance, especially on steep slopes and in case of organic farming to provide conditions for environmental friendly soil management. Species-rich cover crop seed mixtures may help to prevent erosion and create easier cultivation circumstances. Furthermore they have a positive effect on soil structure, soil fertility and ecosystem functions. However, it is important to find suitable seed mixtures for specific production sites, consisting ideally of native species from local provenance, adapted to the local climate/vine region/vineyard. Requirements for suitable cover crop species are as follows: they should save the soil from erosion and also from compaction caused by the movement of workers and machines, they should not compete significantly with the grapevines, or influence produce quality. We started to develop and apply several species-rich cover crop seed mixtures in spring 2012. During the experiments, three cover crop seed mixtures (Biocont-Ecovin mixture, mixture of legumes, mixture of grasses and herbs) were compared in vineyards of the Tokaj and Szekszárd vine regions of Hungary. Each mixture was sown in three consecutive inter-rows at each experimental site (all together 10 sites). Besides botanical measurements, yield, must quality, and pruning weight was studied in every treatment. The botanical survey showed that the following species of the mixtures established successfully and prospered during the years 2012 and 2013: Coronilla varia, Lotus corniculatus, Medicago lupulina, Onobrychis viciifolia, Plantago lanceolata, Trifolium pratense, Trifolium repens and Vicia sativa. We found that weed cover was lower in every treatment compared to the unsown control plots, thus, cover crops suppressed weeds of the inter-rows effectively. Most examined indices of grapevines were not significantly affected by the applied cover crop. However, the tendency of the results shows that in the drier climate of Hungary every second inter-row sowing is more preferable than consecutive cover-crop application, where erosion control is not essential. The opinion of the growers about the mixtures varied. The Biocont-Ecovin mixture was praised for its early aesthetic qualities, produced by Camelina sativa, Phacelia tanacetifolia and Sinapis alba. However, it was criticized for its non-native species, the foreign provenance of some seeds, and the height of the vegetation. The other two mixtures did not produce a spectacular flowering, but developed a lower canopy, and were praised for their native species content. Due to spring sowing the grass-herb mixture, containing a number of species with autumn germination, produced the lowest coverage among the tested mixtures in the first year. However, as predicted, it performed satisfactorily in the second year of the trial. The interest of the vine-growers underlines the importance of the topic for the Central-Eastern European region, thus further examination will be continued in 2014.