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Environmental impact of crop diversification in steep vineyards

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The intensification of European agriculture leads to soil degradation, reduction of biodiversity and an increased economic risk for the farmers. An approach towards solving this problem is crop diversification and the optimized use of resources. Increasing agricultural efficiency/resilience through diversification and the associated falling environmental costs could contribute to the growth of the European agricultural sector by adapting the entire value chain.

The EU-funded project DIVERFARMING (Horizon 2020 no 728003) aims to develop and deploy innovative farming and agribusiness models based on crop diversification. Germany is involved with a broad-based study in organic steep slope viticulture in Wawern (Saar Valley).

A fundamental issue of steep slope viticulture is related to vegetation management below the vines. In order to overcome problems of soil erosion and soil organic matter depletion, an increasing number of winemakers is establishing cover crops such as grasses and legumes in driving lanes. On the contrary, the area underneath the vines is typically kept free of vegetation to avoid fungal diseases and competition on water. As cover crops do not benefit to the value chain and may compete with vines on water or have other adverse effects on vine performance, an alternative strategy for vegetation management underneath vines in steep slope viticulture is required.

Therefore, intercropping vines with perennial herbs like Thyme and Oregano growing underneath is a promising cropping practice to address the abovementioned issues. Both herbs are economically valuable and originate from dry and warm environments, which are typical for most viticultural areas. Furthermore, their relatively low need for water and flat-growing habitus is assumed to be suitable to cover the soil underneath the vines in order to protect against erosion and suppress weeds without having adverse effects on vine growth and -health. They can be marketed directly or indirectly as a concentrate for cosmetics, perfumes, nutritional supplements and food.

During the 5-year project, we will investigate impacts on and interactions between crops, soil ecological and physicochemical properties as well as erosion and emission of greenhouse gases to

evaluate ecological benefits of crop diversification. Selected results obtained within the first two years of investigation will be presented.