Activity of microorganisms in vineyard soil in different types of soil cultivations

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Abstract

Soil microorganism community contribute to soil health and are important for vineyard ecosystems. The amount of enzyme contributing to different nutrient cycles can be quantified. Soil samples were collected in 2 vineyards and the enzymatic activity was analysed. General conclusion on the influence of vegetation cover in inter-rows on the enzymatic activity could be drawn, but single analyses of enzymes provided interesting results. Urease, belonging to the nitrogen cycle, was higher in vegetation covered interrows in vineyard 8. The same hold for glucosidase. Invertase and catalase were reduced in vegetation covered interrows in vineyard 1 as compared to bare soil. Further testing is needed to draw conclusions concerning vegetation cover management. Nevertheless our results clearly showed higher enzyme contents in 0-10cm as compared to 10-20 and near the root area.

Material and Methods

Experimental design
Soil samples of 3 different soil vegetation managemens in 2 vineyards were analyzed

Location
2 vineyards in wine-growing region Kamptal

Glucosidase, Galactosidase, Invertase, Cellulase analysis
Schinner (1989)

Urease analysis
Tabatabai (1987)

Catalase analysis
Sengupta. (2015)

Soil enzymatic activity

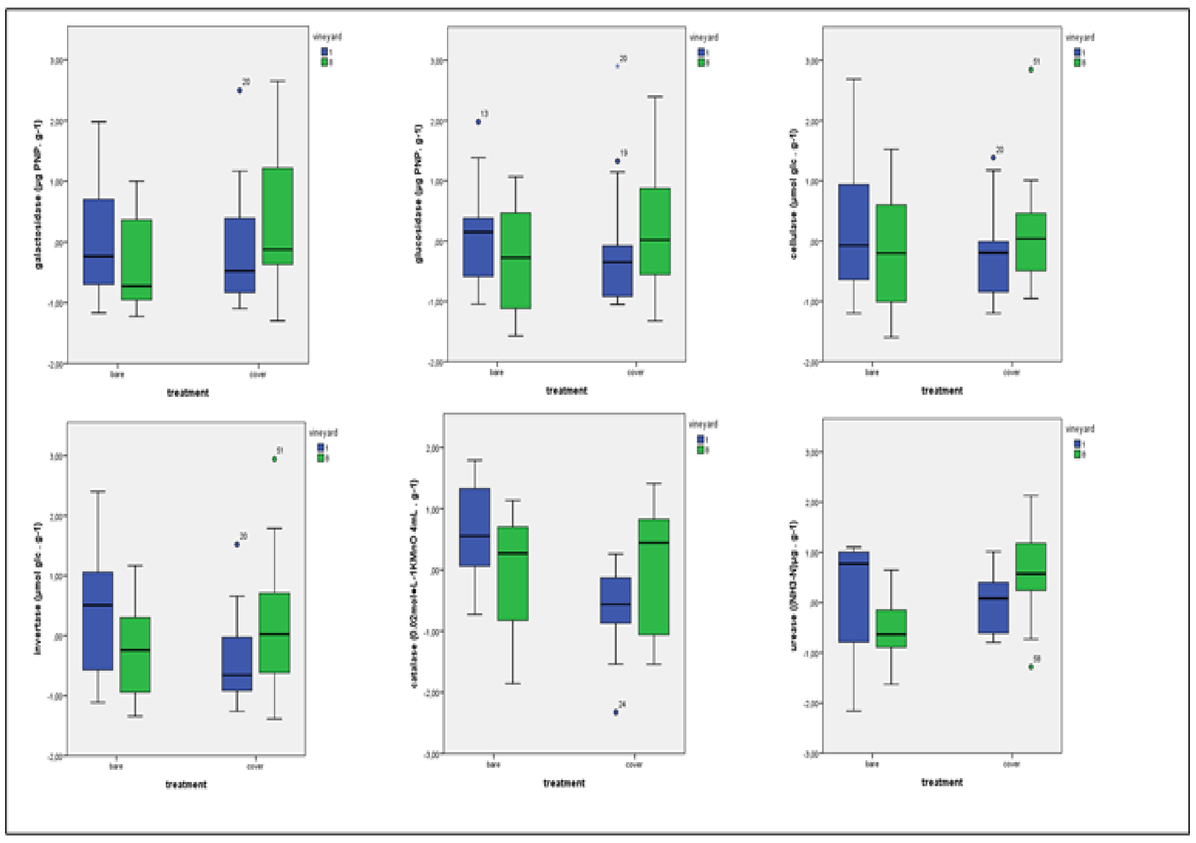

Fig 1.: enzymatic activity of 6 soil enzymes different soil treatments. Bare = no vegetation in interrow, cover = green interrow

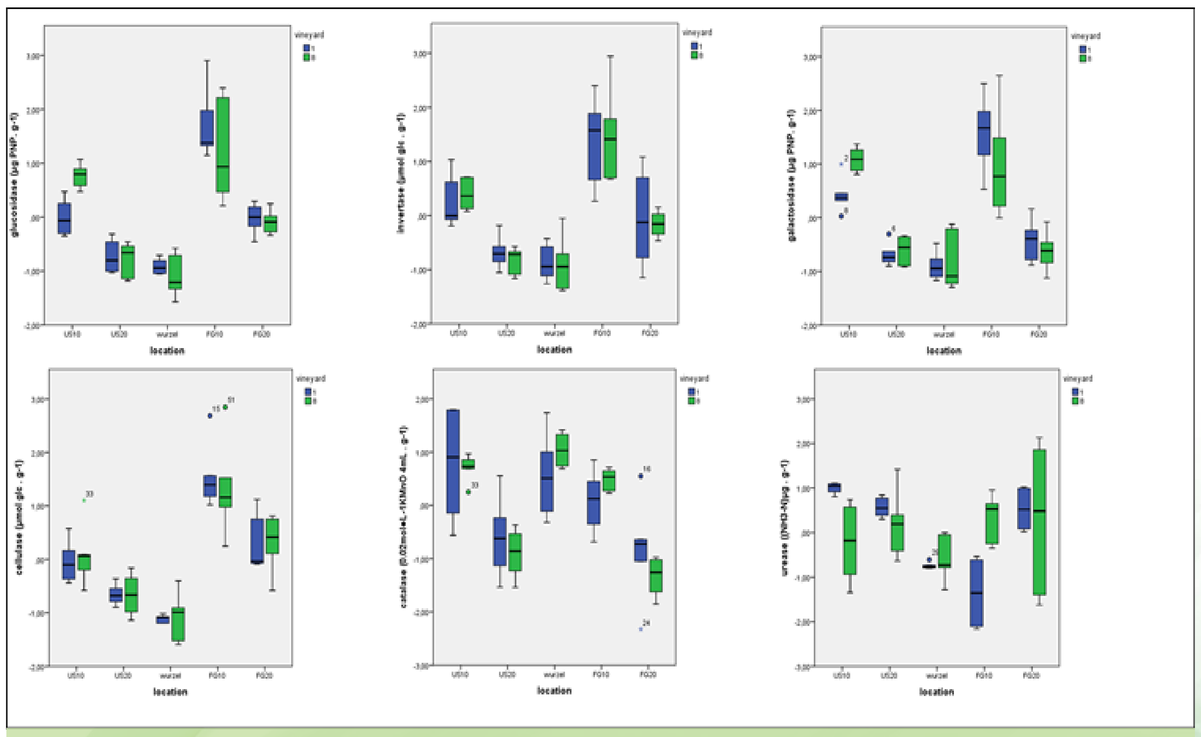

Fig 2.:enzymatic activity of 6 soil enzymes different soil depths of 0 cm -10 cm and 10 cm - 20 cm

Points of Discussion

1. Influence of soil tillage to soil microbial activity
2. Different soil management systems and the higher amount of microorganisms in vineyard soil
3. High amount of microbes and increased activity of soil enzymes
4. Connex between soil enzymatic activity and soil health

Key Results

1. Influence of vegetation management to soil enzymatic activity
2. Amount of Urease and glucosidase was higher in vegetation covered interrows
3. Invertase and Catalase were reduced in vegetation covered interrows as compared to bare soil.
4. Higher enzyme contents in 0-10cm as compared to 10-20 and near the root area

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