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## Orchard floor management effect on soil microbial community

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Soil erosion by water is a major environmental threat to sustainability and productive capacity of agriculture. The previous study had shown that soil erosion harms crops because of a reduction in the availability of water, and thus brings damage to nutrients, organic matter that may affect soil biota community. The selection of a given practice in agriculture has key impacts on the soil functioning e.g. soil degradation processes, aggregate slaking and dispersion of clay particles, which then migrate and clog soil pores immediately beneath the surface. To overcome this essential threat, it is more and more common to mulch the soil in orchards and vineyards by plant and plants residue. In the previous study showed that inter-cropping reduced the runoff maximum discharge by 60-80%, reduced the cumulative runoff by 70-90%, and decreased soil erosion and runoff by 95%. Moreover, using native vegetation as a proxy of cover crops between the rows, we were able to increase both the herbs and arthropods biodiversity, and maintain the development and health of the orchard trees. In the present preliminary study, the main objective was to assess the effect of different agricultural management practices (soil cover in an orchard) on soil microbial community structure evaluated as abundance, biomass, and functional diversity. Three different treatments were selected covering the orchard floor with: woodchips; annual winter cover crops and control (not cover). Thus, the application of different cover appears to be a sustainable management practice that enhances organic carbon, microbial biomass and activity and fungal abundances, thereby changing the microbial community structure. The present study had elucidated the importance of the interplay between soil cover and abiotic condition on soil microfloral community which during their activity may have a significant effect on nutrient supply improving yield potential.

### Recent Publications

1. Binu M Tripathi, Itumeleng Moroenyane, Chen Sherman, Jonathan M Adams and Yosef Steinberger (2017) Trends in taxonomic and functional composition of soil microbiome along a rainfall gradient in Israel. *Microbial Ecology* 74(1):168-176.
2. Ashutosh Awasthi, Kripal Singh, Audrey O'Grady, Ronan Courtney, Alok Kalra, Rana Pratap Singh, Artemi Cerdà, Yosef Steinberger and D D Patra (2016) Designer ecosystems: A solution for conservation-exploitation dilemma. *Ecological Engineering* 93:73-75
3. Molatudi R L, Steinberger Y, Meng F Y and Xie G H (2016). Effects of switchgrass plantation on soil acidity, organic carbon and total nitrogen in a semiarid region. *Journal of Soil and Water Conservation* 71(4):335-342
4. Rentao Liu, Stanislav Pen-Mouratov and Yosef Steinberger (2016) Shrub cover expressed as an 'arthropod island' in xeric environments. *Arthropod-Plant Interactions* 10:393-402.
5. Varsik Martirosyan, Adrian Unc, Gad Miller, Tirza Doniger, Chaim Wachtel, and Yosef Steinberger (2016) Desert perennial shrubs shape the microbial-community miscellany in laimosphere and phyllosphere space. *Microbial Ecology* 72:(3)659-668.

### Biography

Yosef Steinberger is a Professor of Ecology at Bar-Ilan University, Israel. One of his main interests is in the relationship of soil invertebrates and detrital food web structure to primary production in arid, semi-arid, and agroecosystems. Other interests include the monitoring of rangeland conditions (health), assessment of the success of rehabilitation efforts in disturbed rangelands and biological management of soil ecosystems for sustainable agriculture. He has supervised over 40 students in MSc, PhD, and Postdoctoral Fellows and has published over 200 publications in refereed journals.

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