

## ***Interactive comment on “Short term recovery of soil physical, chemical, micro- and mesobiological functions in a new vineyard under organic farming” by E. A. C. Costantini et al.***

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Referee comment on Costantini et al.: Short term recovery of soil physical, chemical, micro- and mesobiological functions in a new vineyard under organic farming. The paper deals with a very modern interdisciplinary problem, the reconstruction of the biological fertility of a vineyard soil planted after deep tillage, i.e. after slope reshaping by bulldozing and back hoe ploughing down to about 0.8–1.0 m. It is well known that soil fertility depends upon a wide sorting of physical, chemical and biological parameters, the most important of which have been correctly approached by the authors of the paper. Organic carbon content, C/N rate, pH, bacterial diversity and activity, humus

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proportion, texture are here interestingly coupled also with the new approach based on soil arthropod presence, recently quantified by the Parisi' QBS-ar index. This index that is still at the beginning of its scientific validation, but promises to be of relevant importance in Mediterranean and temperate soils, where the arthropod fauna is old enough to be rich of euedaphic taxa. In my opinion the introductory part of the work is well written in the parts concerning the “terroir” and the vineyards practices, the organic farming and soil treatments, only the role of arthropods in the soil is less supported by literature survey, I suggest to enclose at least the very comprehensive paper of Culliney, 2013 – Role of Arthropods in maintain soil fertility – Agriculture, 3:629-659, in my opinion an excellent review on this topic.

Concerning more technical details, I found some missing information or problems as following: Experimental sites: the situation of the old and the new vineyard aren't exhaustively described: I found no indication of the altitude, the exposition and inclination of the hill slopes, and no data are given on the herbaceous vegetation that dominates the interrows (weeds or managed herb cover?). The new vineyard has been reshaped on the site of an old field, but from 1990 to 2009 this parcel was set aside, thus a sort of organic soil layer and at least a shrub vegetation was present before slope reshaping (or not?). Arthropod sampling: soil cores of 1/3 dm<sup>3</sup> can be collected at different depths: the presence of mesofauna is strongly dependent from this factor, the exact depth in cm should be given, in most cases 1 entire dm<sup>3</sup> is collected and treated in the Berlese-Tullgren selector. Results: concerning the arthropods findings and counts, it would be highly recommendable to present a well structured table in the supplementary materials, containing individual numbers (abundance) and the taxa actually found. Mites and springtails are two extremely important groups of decomposers, but the EMI-scoring should be supported by more details and it requires a morphotype evaluation especially within the Collembola. Otherwise, the reader is forced to “imagine” or guess too many details, and these interesting results are not comparable with other studies. Conclusions: I agree with the statement that organic farming cultivation system did not speed the soil recovering process, the compost amounts are really too low, but in my

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opinion the partial grass cover of the old vineyard cannot be evaluated by such experimental data, no comparison has been made between herb covered and uncovered rows , and the sampled plots have been mixed from forehand. What I see a little surprising, is that for the future also no "third ways" are proposed, as for instance mulching with organic matter and vegetable parts, this method rises soil arthropod density faster and at lower risk.

Evaluation: if the lacking info's and arthropod table will be added, the paper can be considered "good" in most aspects and excellent for its innovative aspects.

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