

## ***Interactive comment on “Relation between hydraulic properties and plant coverage of the closed-landfill soils in Piacenza (Po Valley, Italy)” by C. Cassinari et al.***

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Dear Referee # 1,

thank you for your very precise and interesting comments; thank you also for your references. In this article we wanted to speak about a topic poorly described in the literature but very timely as it deals of the growing problem of soils desertification. We wanted to join soils with vegetation data to have an interdisciplinary approach and to give a global view of the study area. I am sorry to read that you consider it weak from a scientific point of view. I think it is, on the contrary, interesting and complete and not weak. It is the description of an area of 20 ha by soil hydraulic properties and

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vegetation. Initially we sampled 51 soils and then we analyzed them; the results of chemical-physical analysis were used for a statistical analysis, by which we can choose 11 soils as describing the area. This study is also related with a punctual and detailed vegetation analysis.

General comments:

- P. 759 L. 23 the term soil was used with reference to Anthrosols (FAO WRB): a type of soil that has been formed or heavily modified by long-term human activity, and subsequently moved from its original position. Today often we had to work with these types of soils, because a lot of soils are modified and depleted by human activity; and the consequences of human activity is sometimes the desertification.
- The use of "degraded" and "lack of depth and compacted structure" are justified looking the data of chemical-physical analyses and studying the type of vegetation in the area.
- The field capacity was calculated as the volumetric water content at suction of 0.33kPa because the soil profile was found to be homogeneous.

Specific questions:

- (\*) P. 758 L. 18-19: the use of Richards plates turns out to be very long and sometimes difficult. If the soils hydrological properties of an extended area - characterized by microenvironments diversified by different soils - has to be described using instrumental data may be very hard, so researchers sometimes use the PTFs.
- (\*) P. 759 L. 12-14: by analyzing the water retention curve it can be seen the volumetric water content at a different suction value. In a water retention curve they are presented all the intervals of suction investigated, from 0 kPa to 1500 kPa.
- (\*) P. 759 L. 19: when we analyzed these soils they are not measured the hydraulic conductivity, bulk density and particle density.

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- P. 760 L. 24: the reconstituted soils are soils produced by a method and a technology working on degraded and desertified soils for restoring their fertility. This technology, developed and patented by the research laboratory m.c.m. Ecosistemi, is based on the production of soil neoaggregates by mechanical and chemical actions working on soil structure, on organic matter in aggregates and on polycondensation of organic carbon. With the reconstitution the organic and the mineral component in soil are balanced, and the organic matter is preserved and it evolves in its more stable forms. See also New Life project: <http://www.lifeplusecosistemi.eu>

- (\*) P. 761 L. 7-8: the following statistical analysis were performed - on the 51 soils chemical-physical analyses data - to choose 11 soils as describing the area: multi-variate hierarchical cluster (UPGMA algorithm) and PCA with Box-Cox standardization data.

- 17 PTFs have been used to get an overview of different types of soils and to assess whether any of them approached our soils and also because PTFs for the administrative region where the landfill site is located have not yet been developed.

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Interactive comment on Solid Earth Discuss., 7, 757, 2015.