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Interactive comment on “An overview of the recent approaches for terroir functional modelling, footprinting and zoning” by E. Vaudour et al.

Anonymous Referee #1

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An overview of the recent approaches for terroir functional modelling, footprinting and zoning . SOIL Discuss., 1, 827–906, 2014. doi:10.5194/soild-1-827-2014

General comments The authors have made a huge effort in order to try to include many aspects of soil, vine, wine, climate relationships, environmental risks, and many new tools and methods to capture and analyse data. Due to this wide range of aims, not all the objectives have been achieved in the present version. It seems to me that it is too ambitious.

According to the objectives, the authors want to quantify the influence of terroir in plant growth, fruit composition and fruit quality (indeed a huge objective!), and - the use of new tools to unravel the biogeochemical cycles of macro and micronutrients, the latter

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related to the chemical signature of products. I think that the authors fail to go to all the points/aims of the article. They are providing many references and too many points of view that hinder the follow up of a common thread of this paper. Certain sections are too general and sometimes they are followed by very detailed explanations of a particular paper. I think that the paper needs a more balanced approach. My general rate would be 2 or 3, good or fair. This is a review paper, therefore regarding scientific significance, no novel concepts are included. Nevertheless, the topic is of importance and is addressed with a valuable interdisciplinarity.

Considering the questions provided by the journal:

Does the paper address relevant scientific questions within the scope of SOIL? yes
Does the paper present novel concepts, ideas, tools, or data?, as I mentioned this review paper do not provide novel concepts. Although it is not detrimental. They compile valuable information. Does the paper address soils within a multidisciplinary context? yes
Is the paper of broad international interest? yes
Are clear objectives and/or hypotheses put forward? No. In my opinion, the paper tries to consider too many objectives and it is impossible to include and discuss all of them as would be desirable. It might be preferable to reduce the number of objectives and expose more clearly the relationship between the soil (terroir) and the production and / or product quality. I think that in this article, the relationship remains unclear. Please see my final suggestions.
Are the scientific methods valid and clear outlined to be reproduced? Not applicable
Is the soil type/classification adequately described? Not applicable
Are analyses and assumptions valid? Not applicable
Are the presented results sufficient to support the interpretations and associated discussion? Not applicable
Is the discussion relevant and backed up? I like the section 3. I think that the authors put together the last methods to study soil (or terroirs) providing updated and organised information. I think that a general table with methods, pros, cons, examples and references would be useful.
Are accurate conclusions reached based on the presented results and discussion? I think that conclusions could be improved if the paper focus only in the questions men-

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tioned in the title. Do the authors give proper credit to related and relevant work and clearly indicate their own original contribution? Not applicable Does the title clearly reflect the contents of the paper and is it informative? The title informs about one of the sections of the paper. The influence of terroir in grapes/wines and the sustainable land management are not included in the title.

Does the abstract provide a concise and complete summary, including quantitative results? Not applicable regarding results. Most of the abstract seems to be an introduction. It is very difficult to resume the high diversity of topics that the authors want to address. Again, I recommend to focus in less topics. Is the overall presentation well structured? No. Sometimes the writing is a bit disjointed. There is no clear thread in presenting different aspects: availability of water, nutrients, salinity Most of the work refers to oenological and biochemical aspects that occur in plants, but no clear relationship between soil and plant is stated, in spite of the fact that this is one of the objectives of the paper. One single reference or example per issue is not enough to underpin a relationship between soil and vine features.

If the authors decide to maintain all the sections, the paper would improve if some structure could be introduced; i.e.: if the authors are going to discuss soil characteristics, they can organise them as sub-sections such as Water availability Macronutrients Micronutrients pH lime content Soil salinity Soil biodiversity Soil texture is not mentioned at all, being one of the most important soil parameter having influence in the rest of soil characteristics. A table regarding the effects of these soil characteristics in vine/wine output will help to provide structured vision and will respond to its aims.

Is the paper written concisely and to the point? Not really. In the present version this information is provided with certain disorder. The position of the authors regarding the current knowledge about the relationship between terroir soil parameters and vine/wine is not really clear. In fact, they mention that further research is needed but in my opinion, in a review paper the state of the art should be better rounded off. Is the language

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fluent, precise, and grammatically correct? Yes Are the figures and tables useful and all necessary? Not all of them. Please see below Are mathematical formulae, symbols, abbreviations, and units correctly defined and used according to the author guidelines? Not applicable Should any parts of the paper (text, formulae, figures, tables) be clarified, reduced, combined, or eliminated? Maybe figures 1 and 2 could be combined, the information that they provide is redundant. Figure 3 is not sufficiently explained in the text. If the information is not really relevant, it would be better to delete it. Figure 5 is not needed. Are the number and quality of references appropriate? Yes. Is the amount and quality of supplementary material appropriate and of added value? Not applicable

I recommend the authors to reduce the number of objectives. In fact the title only mentions “An overview of the recent approaches for terroir functional modelling, footprinting and zoning”. Therefore, the core of the article is the section 3. Terroir zoning at different scales using geospatial technologies

They could avoid (or only mention in the introduction) the sections regarding: 2 Quantifying the influences of terroir components on plant growth, fruit composition and wine quality 2.1 Climate-soil relationships 2.3 The perspective of climate change 4 Terroir sustainability assessment and new preservation practices

I don't mean that they are not important, just I think that this paper needs to focus on less themes to fulfill other important objectives: 1. New tools for assessing terroir footprints: metabolomics, metagenomic approach and microbial/chemical fingerprinting, 2. terroir zoning at different scales: mapping terroirs and using remote and proxy sensing technologies to monitor soil quality and manage the crop system for a better food quality; .

The rest of themes have substance enough to be considered in depth in another review article, or more. I encourage the authors to do so. I have not checked the references of the present version. Please see some other detailed comments in the pdf.

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Please also note the supplement to this comment:
<http://www.soil-discuss.net/1/C254/2014/soild-1-C254-2014-supplement.pdf>

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