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Dear Natascha Töpfer  
Copernicus Publications  
Editorial Support

November 28, 2015

*Greetings;*

Referring your decision letter on my submitted manuscript (**soil-2015-40**) and encouraging me to revise the manuscript after addressing the comments and suggestions of the respected reviewer. Here, Please find enclosed the revised version of the manuscript entitled "**Potential effects of vinasse as a soil amendment to control runoff and soil loss**" by Z. Hazbavi and S.H.R. Sadeghi. All comments and suggestions of the respected reviewers have been addressed in the revised version as detailed below. The entire revisions were highlighted by different colors. The acknowledge receipt of the same and informing me about the status of the progress in paper evaluation is much obliged in advance. Should you need to contact me, please use the address given above or in the manuscript.

## Revision Notes 4

**Response to respected anonymous referee 2**  
**Received and published: 26 October 2015**

Dear authors,

The present manuscript needs some big changes regarding the written English and the presentation. Please make sure you send the manuscript to a native speaker before submitting it again to the journal.

**Ans.** The entire manuscript was rechecked once again for any probable improvement in writing. The manuscript has been written precisely and even has been checked many times for any probable shortages in English point of view. My experiences in sending my manuscript for proofreading or editing verified that in all the cases some minor revisions were made which does not justify put more energy in this section. By the way, please let me know what parts of the manuscript need further checking and revision.

The manuscript provides interesting results, although it would need more time to understand the real benefits and impacts of vinasse (long-term experiments, different rainfall intensities, etc).

**Ans.** Thanking you very much for your promising and encouraging evaluation. As mentioned in the context vinasse is a waste which is produced now in a massive volume in southwest of Iran and cause many problems to environment. For this reason, it is essential to find the

solution for this concern. Because of reducing soil erosion is necessary for ecological balance in watershed scale. So, the present study aimed to analyze the effect of vinasse application as one of the important wastes of cane agro-industries on runoff and soil erosion components. This is an innovation of this research that didn't carry out in previous research with this specific objective. The results of the study can provide a platform for decision makers and planners to select the appropriate conservation approaches for soil and water conservation through applying industrial by-product of vinasse. As we stated in conclusion, "further researches are needed for better understanding the potential benefits and limitations of various applications of vinasse for sound management of water and soil and to allow drawing comprehensive conclusion. More and long term experiments are also needed for monitoring and evaluating long term effects of vinasse on soil hydrology and erosion processes with particular focus on environmental effects."

In the introduction (page 4, line 1- 21) the reader do not need you tell you have performed a literature review. It is already presumed. Too much information about one work. Please try to short it as you want to talk about your results and not other's.

**Ans.** Based on your consideration note, the text has been shorted. But from authors views this section of literature review is very important for land managers and soil conservation programming. To conduct any research it is necessary to draw a useful and comprehensive literature review.

In Materials and Methods (Soil properties, line 8-9), please explain how you measured the properties described and put the information on a Table.

**Ans.** The necessary details have been added to the text as follow:

"The soil samples were air-dried, crushed, passed through a 2 mm sieve and analyzed for various physicochemical properties. Soil texture was determined using the hydrometer method according to Bouyoucos (1962). Soil organic matter (SOM) obtained by multiplying total soil organic carbon by 1.724. Total soil organic carbon was measured by the Walkley and Black wet dichromate oxidation method (Nelson and Somers, 1982). Soil potential hydrogen (pH) and electrical conductivity (EC) were determined in 1:2 soil:water suspension by pH and EC meters (Hati et al., 2007). Bulk density at air dried moisture content was measured by Plaster (1985) method (clod method). Properties of the study surface soil (0-30 cm) are shown in Table 1."

Table 1 Main original soil characteristics (data are the means of 3 samples)

Variable	Description
Soil texture	silty loam (48% silt, 28% clay and 24% sand)
Organic matter	0.155%
pH	8.2
EC	137.3 $\mu\text{mohs cm}^{-1}$
Bulk density	1.3 $\text{g cm}^{-3}$

I see a lack of discussion through the manuscript. It is not clear enough why vinasse did not influenced on runoff and erosion. I can see that you discussion is mainly based on the work of Tejada et al., but you do not show new information. Your discussion is more a compilation of different hypothesis than stated results. Please revise it carefully.

**Ans.** Assessment the effect of application of waste amendments is new issue of soil conservation studies. Vinasse research is in its relative infancy and as such substantially more data are required before robust predictions can be made regarding the effects of vinasse application to soils, across a range of soil, climatic and land management factors. The authors tried to investigate and discussed the obtained results with other research which conducted on soil amendments such as Agassi et al. (1998), Madejón et al. (2001), Ojeda et al. (2003), Bakr et al. (2012) Gholami et al. (2013) , Ribeiro et al. (2013) and Sadeghi et al. (2015a,b) and etc.

Tables 2 and 4, please delete them. You do not need to show that data on your manuscript.

**Ans.** The mentioned Tables were removed.

### **Response to respected anonymous referee 3**

**Received and published: 13 November 2015**

1) Scientific or application issues that research wants to resolved should be clearly appointed out.

**Ans.** The follow text was added to the manuscript:

“Assessment the effect of application of waste amendments is new issue of soil conservation studies. Vinasse research is in its relative infancy and as such substantially more data are required before robust predictions can be made regarding the effects of vinasse application to soils, across a range of soil, climatic and land management factors.”

2) Research method and Material should be clearly described especially vinasse properties.

**Ans.** The necessary details have been added to the text.

vinasse properties added to text as follow:

“PH and EC were determined in vinasse by pH and EC meters. Organic matter determined by dry combustion method (MAPA, 1986). Calcium (ca) and magnesium (mg) determined by a atomic absorption spectrometer after nitric and perchloric acid digestion. Potassium (K) determined by a atomic emission spectrometer after nitric and perchloric acid digestion. Chemical Oxygen Demand (COD) that is determined by closed reflux, colorimetric method (APHA, 1998). The general properties of the vinasse have been summarized in Table 2.”

Table 2 Chemical characteristics of vinasse applied in the study

Variable	Description
pH	5
EC	1657 $\mu\text{S cm}^{-1}$
Organic matter	100 $\text{g kg}^{-1}$
Bulk density	1.11 $\text{g cm}^{-3}$
Ca	137.025 $\text{mg kg}^{-1}$
Mg	154.375 $\text{mg kg}^{-1}$
COD	91.4 $\text{g kg}^{-1}$

3) Discussion should be focused on your research results.

**Ans.** It was appropriately elaborated and accordingly justified.

4) English expression should be improved, and unit should be corrected.

**Ans.** The entire manuscript was rechecked once again for any probable improvement in writing. The manuscript has been written precisely and even has been checked many times for any probable shortages in English point of view. My experiences in sending my manuscript for proofreading or editing verified that in all the cases some minor revisions were made which does not justify put more energy in this section. By the way, please let me know what parts of the manuscript need further checking and revision.

5) The places that marked in the manuscript should be checked or revised.

**Ans.** All recommendation of respected reviewer was done carefully.

Comment 1:

Do you have control treatment?

**Ans.** We had already written about the control treatment, but based on suggestion of the previous reviewer it had been deleted from the text. Anyhow, the sentence is revised as follow:

“The effect of vinasse was investigated on runoff and soil loss control. Experiments were then set up as a control and two treated plots with doses of 0.5, 1, and 1.5 l m<sup>-2</sup> of vinasse subjected to simulated rainfall.”

Comment 2:

liquid or solid? for solid material, why its unit is L/m2?

**Ans.** Vinasse which used in the research was liquid. For reviewer easily understanding, vinasse treatments was shown per area unit.

Comment 3:

liquid material has a high density?

**Ans.** Yes it had high density of organic matter and other chemical materials. The sentence for better understanding is revised as follow:

“However, the direct application of vinasse is constrained by its high salinity and high density of organic matter and other chemical materials.”

Comment 4:

what is the soil: water ratio for pH and EC measure?

**Ans.** More explanation was added to text as following:

The soil samples were air-dried, crushed, passed through a 2 mm sieve and analyzed for various physicochemical properties. Soil texture was determined using the hydrometer method according to Bouyoucos (1962). Soil organic matter (SOM) obtained by multiplying total soil organic carbon by 1.724. Total soil organic carbon was measured by the Walkley and Black wet dichromate oxidation method (Nelson and Somers, 1982). Soil Potential hydrogen (pH) and electrical conductivity (EC) were determined in 1:2 soil:water suspension by pH and EC meters (Hati et al., 2007). Bulk density at air dried moisture content was measured by Plaster (1985) method (clod method). Properties of the study surface soil (0-30 cm) are shown in Table 1.

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**Comments 5 and 6:**

what is saturated water content? what does the annual average soil water content mean?  
how to get this water content?

**Ans.** The following explanation was added to manuscript:

“Based on the annual average soil moisture content reported for the real soil in the study area, the soil was also treated to produce a moisture content of 35% (Behzadfar et al., 2012; Hazbavi et al., 2013). After soil compaction, the plots were established in water ponds for 12 hours. Hence, 12 hours after exiting the plots from water ponds, the vinasse was spread over the soil surface (Hazbavi et al., 2013; Sadeghi et al., 2015, Sadeghi et al., 2016). Each experiment was also covered using new soil and vinasse.”

**Comments 7:**

why don't h have control treatment?

**Ans.** We had already written about the control treatment, but based on suggestion of the previous reviewer it had been deleted from the text. Anyhow, the below sentence was added to the end of the paragraph:

“To conduct the comprehensive comparison one control treatment (without vinasse) at three repeat also applied.”

**Comments 8:**

what is the values? please give out the detailed information about vinasse such as salt concentration (EC), pH, organic matter content and major ion concentrations.

**Ans.** Necessary information were added to the context.

**Comments 9:**

how to spray? explain it clearly.

**Ans.** More explanation was added to text as following:

” Three levels of 0.5, 1 and 1.5 l m<sup>-2</sup> of vinasse were sprayed on soil surface in three replications by a small manual pump and left for 24 h to increase the stability of vinasse layer on the soil surface and mimic the natural conditions. To conduct the comprehensive comparison one control treatment (without vinasse) at three repeat also applied. Urban tap water was used for the control treatment and the experimental setup was used similar to that for vinasse treatments (Sadeghi et al., 2016).”

**Comments 10:**

what is 10 1.3 mm size?

**Ans.** It was rectified.

**Comments 11:**

give out the full spell for IDF.

**Ans.** The intensity–duration–frequency (IDF) was replaced.

**Comments 12:**

1) how to collect runoff? from Fig. 1, I can't find it. 2) do you have drainage system?

**Ans.** To avoid any misunderstanding, the sentences were revised and more explanation was added as follow:

“For each event, the time to runoff initiation was recorded as the elapsed time between the start of rainfall and the time at which surface runoff began entering the runoff collection container at the located of the plot. Runoff was sampled at different time steps of 2 to 5 min and its volume was accordingly measured. The collection gutter at the lower end of each box was protected by a shield to prevent rainfall from directly entering the collection container. The amount of soil loss was then measured using a decantation procedure; oven-drying at 105 °C for 24 h and weighing by means of high precision scale (Gholami et al., 2013; Sadeghi et al., 2016).”

**Comments 13:**

how do you get this conclusion? from your data in Fig.2, the difference among various treatments is very few because of big standard deviation.

**Ans.** Yes, you are right. Later we say this is not significant. This conclusion also was obtained based on Table 1. The sentence was revised.

**Comments 14:**

did you check the repellency property for the vinasse or it was reported by some reference?

**Ans.** No, we didn't check the repellency. It is based on reports of related researches. We shall consider it in future researches.

**Comments 15:**

which vinasse application rate? English should be improved.

**Ans.** The figure was revised and the sentence was corrected as follows:

“vinasse (1.5 l m<sup>-2</sup>) increased the runoff commencement time about 2.25 times more compared to that reported for untreated plot (control treatment).”

**Comments 16:**

why don't compared with your control treatment? Maybe the increase of runoff commencement time after vinasse application contradict with repellency inference?

**Ans.** It has been done.

**Comments 17:**

"delaying runoff" means more water infiltration.

**Ans.** Yes, of course.

**Comments 18:**

what is the purpose for your Fig.6 because you did discuss it in the text

**Ans.** It was deleted.

**Comments 19:**

incorrect.

**Ans.** It was revised.

**Comments 20:**

repeated with other place.

**Ans.** The sentence was removed.

**Comments 21:**

how does liquid material protect the soil aggregate from direct impact of raindrop?

**Ans.** Because it is a dense liquid which adheres soil surface well. This claim was proved through anecdotal observation during experiments.

Comments 22:

how?

**Ans.** Without vinasse the soil surface was susceptible to runoff effects and soil erosion. By covering the soil surface by vinasse (based on which the author observed), surface roughness also increased.

Comments 23:

this expression is contradicted with above "negative effect" (Tejada et al, 2009)

**Ans.** This explanation was related to Tejada and Gonzalez (2008) not to Tejada et al, 2009.

Comments 24:

what did you want to express?

**Ans.** Vinasse application in some papers had negative effect because of enrichment of the cation exchange capacity by monovalent cations, such as K under vinasse application. By this result we tried to advise the applicability of soil amendments.

Comments 25:

it is not significant, but how do you get a "reduction" conclusion? the same reason for runoff.

**Ans.** We explained in the text that the reduction was not significant. This conclusion helps the managers to decide better about vinasse application condition.

Comments 26:

your "vinasse" is different to this "vinasse" or are their application conditions different to each other? which aspect? why is their influence effect on soil different?

**Ans.** The conditions under which they worked was different from those considered in the present study and preferably under real conditions and different time scale.

Comments 27:

how?

**Ans.** Vinasse, like other soil amendments, not only affected differently on hydrologic responses but also its performance was different under various conditions. However, the effect of hydrologic conditions has been rarely considered.

Comments 28:

the above sentence cannot explain your result.

**Ans.** The irrelevant sentence was deleted.

Comments 29:

does the mineral fertilizer relate with soil erosion and water loss?

**Ans.** Yes, the mineral fertilizer used to improve soil properties and finally affected the soil erosion and water loss.

Comments 30:

English or Chinese?

**Ans.** It is Chinese. But the abstract was in English.

Comments 31:

this result can found in Fig. 3.

**Ans.** Figure 3 was deleted based on another reviewer's suggestion.

Comments 32:

this data can found in Fig.6

**Ans.** Figure 6 was deleted based on another reviewer's suggestion.

Comments 33:

can be deleted.

**Ans.** It was deleted

Comments 34:

1) what is runoff? volume or rate? 2)Unit of RUNOFF is  $\text{ml m}^{-2}$ ? I hope the unit of runoff volume is expressed as L. 3) why did runoff at 30 min decrease? and at this time, rainfall is continuing.

**Ans.** Runoff volume. The suggestion correction was done. The decreasing occurred after rainfall ended.

Comments 35:

how did you get a control treatment? you did not describe it throughout the M&M.

**Ans.** Necessary explanations were added to the context.

Comments 36:

why the runoff

**Ans.** It is revised.

Comments 37:

what means for this line? and what meanings about the letters?

**Ans.** The lines show the trend of variation. Different letters indicated the significant differences between study treatments ( $P < 0.05$ )

Comments 38:

the unit is not correct. I guess it should be erosion rate other than soil loss weight in a given duration. meanwhile, your data is collected in different duration (2~5 min).

**Ans.** The necessary revisions were made.

I hope the final emendations caused to consent the respected reviewers and made my paper well qualified for final acceptance and publication.

Sincerely,

**S.H.R. Sadeghi**

Enclosure