

## ***Interactive comment on “Spatial variability of some soil properties in west coastal area of India having oil palm (*Elaeis guineensis* Jacq.) plantations” by Sanjib K. Behera et al.***

**Anonymous Referee #2**

Received and published: 19 February 2016

The manuscript “Spatial variability of some soil properties in west coastal area of India having oil palm (*Elaeis guineensis* Jacq.) plantations”, by Behera et al., cannot deserve publication in Solid Earth. I started to read the paper with great interest, although the style was a bit confused. However, when in the Materials and Methods I found that the spatial variability of tested soil properties were studied based on samples distance on average 5-7 km, I stopped to review the manuscript. The study objectives could not be achieved on proper way in practice with present sampling scheme. Given results by this study do not report interesting information which can be of interest for decision makers, and practitioners. The authors should know that “real producers” cannot make decision for variable rate fertilization according to one sample on area of approximately

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50-70 ha. The authors should be skilled enough in soil science to know the quite large variability of soils and any soil property as consequence of soil forming factors as well as extrinsic factor like fertilization. Collecting and analysing samples on large scale for variable fertilizer application is almost “ridiculous” to account for any kind of soil feature and its variation because of disturbances. This statement is supported with “poor” semivariogram model parameters. Based on the information’s from Table 3 significant number of properties almost look like a pure nugget. Spatial dependence is weak, while ranges do not cover even used sampling scheme in this investigation. Although authors did not provide semivariogram visualisation it is noticeable from their properties that sampling scheme is inappropriate. Thus kriged maps are useless for producers and show a huge uniform area for fertilizer application. This uniformity is especially pronounced in phosphorus, potassium and pH maps as properties that are most widely used for application of variable rate technology. According to maps of studied properties there is no need for any in-field variable application of inputs. I have to also underline that the authors did provide insufficient information about sampling. Are these samples representing one sample or a composite sample from lot of individual samples? Of how many individual samples consist on sample? What area covers one composite sample? In summary authors mentioned that samples are collected from each plantation. If so, why authors did use geostatistics? Then it is clear that you use composite sample from whole plantation. Nevertheless, the real preclusive fault is the first one I mentioned.

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Interactive comment on Solid Earth Discuss., doi:10.5194/se-2016-9, 2016.

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