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Interactive comment on "Planning spatial sampling of the soil from an uncertain reconnaissance variogram" *by* R. Murray Lark et al.

Anonymous Referee #2

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The authors present an useful extension of an old procedure proposed by McBratney et al (1981) for tuning the sampling effort with regard to a target level of prediction, using a prior knowledge of the variogram of the property to be mapped. The extension lies in enabling the use of uncertain variogram, which, in practices is very often encountered. They propose a nice solution based on a Bayesian approach, which allows propagating the uncertainty on the variogram parameters to the grid spacing to be chosen. The user can make his/her decision considering prior selection of a target kriging variance and of level of risk in exceeding this target variance. It must be noted however that this approach is only valid under the assumption of stationarity mean, which is all the more violated that the size of the study area increases. I do not know if the authors have

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enough material for discussing this point but it would at least merit to be recalled in the conclusion, to avoid further misuses of this approach. Beside I invite the authors to extend their approach to another cause of uncertainty of variogram that is as frequent as the lack of sites with exact measurements, and will be more and more encountered in the future. With the emergence of a lot of proxy for estimating some soil properties(soil spectroscopy, resistivimetry, etc...), the problem is less the number of sites than the uncertainty of each property estimation at each site. It seems that the Bayesian approach proposed by the authors could easily be adapted for addressing this case too.

The paper is very clear and well written. It remains some little mistakes that are listed hereafter. Page 2 line 25. this reference does not exist in the reference list. i suppose it is 2006 instead of 2007. Page 3 line 6: It would be useful to provide the size of the study area. Page 8 line 27: Figure 6(a)

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