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# *Interactive comment on* "Constraints on Enhanced Weathering and related carbon sequestration – a cropland mesocosm approach" *by* Thorben Amann et al.

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I like and welcome this paper. I think we need data from experiments of this type, which represent a major investment of researcher time, to thoroughly understand enhanced weathering. The data that are presented are really useful.

I have a few comments that in some cases could be included in a final revision, or they can enter a discussion.

1) 22kg/m2 (page 4) is a very high application rate! The plants will be growing in olivine. Is this the correct application rate or has a gremlin affected the units?



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2) I note you state the source of the olivine. Are there any references to other published descriptions of the material in the Åheim deposit? It would be good if these could be provided, as you only give basic information concerning the mineralogy and geochemistry.

3) With that in mind, a good reference to the deposit might address these queries concerning Table 1: a) why is the LOI so high?; b) could you recalculate the mineral composition that the chemical analysis represents?; c) is any asbestos associated with this material?; d) total iron is given as Fe2O3 (this should be stated), yet olivine contains divalent iron. What is the iron mineral in this material?

4) Some typos: p4 line 15 - X-ray not x-ray; p5 line 10: magnesium not Magnesium; p6 line 21: through not trough. Check once more for other typos elsewhere!

5) Back to the science: do you have Si and Mg data for the plant biomass? I think this is important to give a mass balance of removal of these elements from the soil and its constituent minerals.

6) Did you find any evidence of precipitation of Mg carbonate minerals, as reported for 'similar' rocks by Dipple's group? Did you look for these minerals?

7) Both Cr and Ni are essential nutrients for a range of biological processes. I'd prefer to avoid the use of the emotive word 'contaminant' as we'd all be dead without sufficient of these elements in our diet.

8) Again, do you have any evidence for differential uptake of these elements into the crops? If there is no significant difference between treatment and control, then you have no evidence of a problem.

9) What was the mineralogical composition of the soil that was used? This should be stated, to ensure that any confounding factors (such as preferential weathering of a soil mineral already there) can be assessed. I appreciate the design of the study would avoid such factors, but it would be very useful to know. For example, does the soil





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contain carbonate minerals?

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