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Interactive comment on “Biochar as growing media additive and peat substitute” by C. Steiner and T. Harttung

C. Steiner and T. Harttung

steiner@uni-kassel.de

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Dear anonymous Referee,

I am very grateful for your valuable comments and questions. I will revise the manuscript accordingly and will answer your questions in this response:

1. I am grateful for this additional reference. I will certainly use this work to improve the discussion and the introduction. The authors used pelleted biochar which has different physical characteristics. I found one further paper “Northup Jake. “Biochar as a replacement for perlite in greenhouse soilless substrates” (2013), Graduate Theses and Dissertations Paper, Iowa State University.

1.2 The water retention of sphagnum peat is quite good and not likely to be improved

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by biochar addition. However I noticed reduced water stress when biochar was mixed into sphagnum peat. It is likely that biochar retains the water better and improves re-wettability. However this remains speculative as not measured in this study (water stress was avoided). The low salinity is certainly an advantage compared to compost. However depends on the feedstock biochar is produced from. Adjusting the pH of sphagnum peat is easily done with lime. I am not sure if a substitute for lime is required.

2 I will certainly improve the methodology section of the paper

3 The reduced pH at 25% biochar addition is surprising. I can only assume that it is due to a different retention of fertilizers. I would appreciate any further comments and possible explanations.

3.2 The pH of the mixtures is published in figure 1, The low nutrient content of sphagnum peat is well known and the sphagnum peat used for this study was not analysed for its nutrient content. Biochar was analysed for its nutrient content and data could be added.

I would love to determine the hydrophysical properties of the biochar and the mixtures. However this study was conducted with very limited analytical equipment at a company producing biochar. The biochar is a co-product from energy generation (heat and power) and therefore the temperature is adjusted to optimize both, energy and biochar production. The resulting biochar is very “clean”. This means that it has a low content of volatiles which would influence the C/N ratio negatively. Why would you assume that a lower temperature would be better? Most negative results reported from biochar trials were caused by a high content of labile carbon causing N immobilization.

Interactive comment on Solid Earth Discuss., 6, 1023, 2014.

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