Biogeosciences Discuss., 12, C606–C609, 2015
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Interactive comment on "Phosphorus release capacity of soluble P fertilizers and insoluble rock phosphate in response to phosphate solubilizing bacteria and poultry manure and their effect on plant growth promotion and P utilization efficiency of chilli (*Capsicum annuum* L.)" *by* M. K. Abbasi et al.

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Received and published: 14 March 2015

Referee's Comments Dear Editor! The manuscript is revised according to the suggestions and following amendments have been incorporated in the revised draft by marking with blue color in the text:

Query 1) Title is very long. I recommend making it more concise. Reply:Title has been shortened as suggested

Query 2) Why were soils of a near neutral pH selected? Would you not expect the least amount of an effect of solubilizing bacteria under those conditions? Does this represent the most common soil type in the region? Please elaborate on why the specific soils were used in the experiment. a. Also, the soil used had a pH of 6.89 while the data in the experiments shows pH values starting at 7.57-8.10. What caused the basifying effect? b. I would argue that the main reason you see a strong acidifying effect is because the addition in the PSB treatments temporarily increased the pH more than other treatments. The decrease during the experiment could have just as well arisen from a "move back to equilibrium" as well as due to any microbial activity. Please revise or defend your position on your PSB acidification rational.

Reply: The soil used in the study was not selected on the basis of some specific pH. The pH of the soils in and around Rawalakot (study site) is 6.5 to 7.5, Showing that the soil used represent the most common soil type in the region.

a). The initial pH of the soil used was 7.57, correction has been made in Table 1.

b). The argument has been fully incorporated on Page 13 Lines 17-20.

Query 3): You seem to use "mineralization" and "solubilization" interchangeable. Please define the each term clearly and if they do represent the same thing use only one consistently. Reply: Yes! The term mineralization is used throughout the text. Query 4) Could you provide some more details on the selected cultures for the experiment? Why were these expected to have an effect? Reply: The inoculant used in this study was a commercialized product containing K-1 (Pseudomonas stutzeri) as a nitrogen fixer, ER-20 (Azospirillum brasilense) as IAA producer and Ca-18 (Agrobacterium tumefaciens) as phosphate solubilizer. Added in the Text on Page 5 Lines17-18. Query 5) Your discussion section is repeats a lot of the result description from the result section. Please tidy up and make more concise. For example: 1) "Application of

PSB: : :.PSK on RP" seems to just describe results and not related to a specific part of the discussion; 2) first sentence on page 1855: "The P released: : :.mineral pool"; 3) please make the first paragraph of discussion section 4.2 (page 1856) more concise. Reply: The discussion section as a whole has been re-organized, particularly the highlighted sections/paragraphs. Attempts have been made to avoid the repetition of the Results. Query 6) What is the source of the "thoroughly processed soil" on page 1847? Reply: The "thoroughly processed soil" has been deleted. Query 7) Would the logical deduction on mid page 1854 not be that RP works best in acidic soils while poorly in neutral (your study) and alkaline soils? Please include some hypothesis on why or why not you think that might be. Reply: Under acidic conditions, Organic acid anions, with oxygen containing OH–and COOH–groups, have the ability to form stable complexes with cations such as Ca2+, Fe2+, Fe3+ and Al3+, that are commonly bound with phosphate in poorly forms. By complexing with cations on the mineral surface, organic acid anions loosen cation-oxygen bonds of the mineral structure and catalyze the release of cations to solution. This is the major reason that why RP is more effective under acidic conditions. This explanation is well incorporated on Page 12 Lines 12-17. Query 8) I find the P-fixation mechanism not strong since most of your soils are near neutral. Could you provide some alternative reasoning or provide the reasoning why these soils still have such high sorption capacity. What level of sorption capacity would be expected in the soil type used? Reply: In our case, soil had a neutral pH, belong to Chinasi soil series and parent material is residum-colluvium from shales. Therefore, it is likely that kaolinite may be a dominant clay mineral present in soil composition that adsorb high H2PO4–. The other possibility may that in the presence of 24% clay content, some of the applied or native P may be fixed on the surface of the clay particles. This argument has been incorporated on Page 11-12 Lines 28 and 1-3. We did not determine the sorption capacity of the soils of this region. However, under similar environmental conditions in DG Khan Pakistan, the sorption capacity of soils amended with 20-140 μg P/ml ranged between 60-188 μg/g. Query 9) Figure 3 has only 11 bars and not the 12 needed to represent all treatments, thus, unable to assess what the

data suggests. Please correct. Reply: Figure 3 shows the P utilization of efficiency of Chilli in response to added amendments. It is determined by subtracting the values obtained from added amendments to that from the control. Therefore, the control (T0) cannot be included here. The error in the Figure caption has been removed/corrected. Query 10) The paper has a decent amount of typos. Please read carefully and correct. See specific comments for details on the once I caught. Reply: The possible corrections and improvements marked by the blue color have been made. Query: Specific Comments: Reply: All the suggested points have been fully incorporated.

We believe that the amendments and improvements suggested by the Reviewer have been fully incorporated in the revised manuscript and the revised version is in improved form than the previous submitted manuscript. Hopefully the submitted manuscript will now be accepted for publication in Biogeosciences.

Thanking in anticipation.

Regards and sincerely

Prof. Dr. Muhammad Kaleem Abbasi

Please also note the supplement to this comment:
http://www.biogeosciences-discuss.net/12/C606/2015/bgd-12-C606-2015-supplement.pdf

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Interactive comment on Biogeosciences Discuss., 12, 1839, 2015.