Biogeosciences

Discussions

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Interactive comment on "Frequency and intensity of nitrogen addition alter soil inorganic sulfur fractions but the effects vary with mowing management in a temperate steppe" *by* Tianpeng Li et al.

Anonymous Referee #1

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General comment: This paper investigated the effect of N loads on S dynamics in grassland soil and shows interesting topics. However, there are some concerns especially for data analysis. For example, the authors defined total inorganic S as HCl extractable S + PO4 extractable S. But, these fractions would highly overlap each other (See below comments). Therefore, the authors should re-analyze and revise related data and discussion. After the revision, further review on discussions is needed.

Specific comments: P.2 L11-13: This sentence is misleading because the concentrations of water-soluble S and adsorbed S did not always increase with N intensity. This

sentence would be integrated with L17-20 and described accurately.

P.5 L2: Bobbink et al., 2010 is not listed in reference section.

P.6 L9: Is mowing really common in temperate grasslands of the world? You should add a reference to support this sentence.

P.8 L10-11: The experimental design is interesting. But, readers needs to be provided with far more information on the experimental design, how to decide the intensities and frequencies of N addition and what do these correspond to?

P.8 L21: Is this sand S free?

P.10 L7: Please add a reference.

P.10 L15, 17, 20 21: Mistypes. Please put a space before a unit.

P.10 L20: What is the concentrations of H_2O_2? Does this method include extracted organic S into inorganic S?

P10 L21: What is acacia solution?

P11 L3-4: According to Roberts and Bettany, 1985, which you cited, total inorganic S was defined as HCl-extractable S and insoluble inorganic S was HCl- extractable S – water-soluble S. HCl solution can extract both water-soluble S and adsorbed S by dissolving clay minerals. It would be better that total inorganic S was defined as HCl-extractable S and insoluble inorganic S was HCl-extractable S – available S.

P.11 L9: Please add a reference.

P.11 L15: Although you did several statistical analyses, have you been checked by an expert on statistical analysis? I'm not sure these analyses are right. However, at least for the SEM model, it would be necessary to describe which data set is used for, what the initial model is and how to select the paths from the model. Is Duncan's HSD (I'm sorry but I don't know this method. Is it same to Duncan's multiple range test?)

available for proportional data?

P.12 L14: When using R, you should add a reference of "R core team".

P.18 L19 - P.19 L6: Do you have an idea why adsorbed S concentration in unmown plots at low frequency didn't increase with changes in soil pH?

P.19 L14-15: Unclear.

P.19 L19-21: How to conclude this? Soil available S is affected by various factors such as mineralization rate, plant uptake, amount of adsorption material and soil chemistry. More detailed explanation is needed.

P.20 L6-8: When discussing the effect of experimental operation, you should use the results in control plots.

P.20 L14; Compared for what?

P21 L14: Does this proportion reflect the S transformation? What is the definition of transformation rate in your study? This proportion may be affected by various factors such as mineralization rate, plant uptake, amount of adsorption material and soil chemistry. More detailed explanation is needed.

Figure 6: It is difficult to understand which pair is compered and which letter corresponds.

Figure 7: This figure too small to see. The asterisk in blue column is hard to see.

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