Biogeosciences Discuss.,
https://doi.org/10.5194/bg-2018-526-RC2, 2019

Biogeosciences Discussions
Open Access
EGU

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 #2

Received and published: 3 April 2019

Dear authors,

I reviewed this manuscript entitled "Frequency and intensity of nitrogen addition alter soil inorganic sulfur fractions but the effects vary with mowing management in a temperate steppe" by Li et al. submitted to Biogeoscicences as a discussion paper. This study assessed the responses of soil sulfur (S) dynamics to mowing, intensity of nitrogen (N) load, and frequency of N addition. The theme is interesting and data obtained from long-term extensive field experiment are valuable and I think it is suitable for the readership of Biogeoscicences. However, the manuscript was quite complicating be-

Printer-friendly version

Discussion paper

cause there were various form of S and many combinations of treatments; numbers of N addition levels, two types of frequencies of fertilizer addition (F2 or F12), and mowing or un-mowing. Unfortunately, I think most of the readers of Biogeoscicences are familiar with either N dynamics or S dynamics, so the authors should take more cares to induce readers to understand your manuscript more smoothly. Here, I provide some comments which I hope you to improve your manuscript.

Major comments

1. To support your view and/or hypotheses of S dynamics and interactions between many forms of S, Fig 1 should be more highlighted in Introduction and Methods sections, and should be involved with procedures of extraction and calculation of S forms; I think it is necessary to discriminate what form of S was analyzed directly by extraction procedure and what form of S was calculated indirectly from concentrations of analyzed forms.

2. The path structure of SEM analysis and underlying idea should be introduced in Methods section (P12 L15∼). The variables can be divided into three categories [related to practices (mowing, N rate), independent variables (pH, TIN, SOC etc.), and independent ones (forms of S)], while all of the items are boxed in same way in the current figures (Fig. 7c, d). Please explain the assumptions and/or typical, expected interactions among these items as a status of pre-analysis. It will be also effective to integrate with research hypotheses (in P7 L8∼15).

3. Are the treatments of mowing, intensity and frequency of N addition is comparable to the conventional management of the grassland in this region? How much is the amount of N added to the experimental plots compared to N deposition rate in this region and N fertilizers conventionally used for this grasslands?

Specific comments

P10 L8: “nitrite” is NO2-. Here, this may be “nitrate (NO3-)”.

Printer-friendly version

Discussion paper

P10 L20: What is “acacia solution”? Is this a kind of chemical used for stabilizing solutes?

P11 L3-4: Equations should be enumerated; one equation by one line, and numbered.

P11 L12: What is “i” in this equation? This equation should also be numbered continuously following the previous equations.

P13 L17: Fig. 1b -> Fig. 2b

P14 L8, L16: Are these percentages (55%, 43% and 40%) average among all N addition intensities?

P16 L19: characters -> characteristics

P17 L16-18: I could not understand the indirect positive effect of N rate on adsorbed S from Fig. 7c. Is it mediated by pH? Is “positive” effect derived from two negative effects, N rate -> pH and pH -> adsorbed S? From that interpretation, the direct and indirect effects of N rate on adsorbed S is strange (Fig. 7d); the indirect effects of N rate on adsorbed S mediated by pH should be positive because both arrows are negative, while the direct effects of N rate on adsorbed S is negative.

Fig. 1: It is unclear that Available S is sum of Water-soluble S and Adsorbed S. Also, I could not see the difference between hollow and solid arrows.

Fig. 4: Alphabets indicating significant difference according to multiple comparison should be added to Insoluble S in Fig. 4b.

Fig. 7c, d: “N rate” should be “N addition intensity”. Please indicate that the bars right side of Fig. 7a, b, changing color red to blue, represent correlations.

Interactive comment on Biogeosciences Discuss., https://doi.org/10.5194/bg-2018-526, 2019.