Biogeosciences Discuss., 12, C5656–C5658, 2015
www.biogeosciences-discuss.net/12/C5656/2015/

Biogeosciences
Discussions
Open Access

Interactive comment on "Isotopically enriched ammonium shows high nitrogen turnover in the pile top zone of dairy manure compost" *by* K. Maeda et al.

Anonymous Referee #2

Received and published: 23 September 2015

Manure compost is a major source of nitrogenous gases like ammonia (NH3) and nitrous oxide (N2O) in the atmosphere, and plays a role on global nitrogen cycle. Especially, N2O is a highly-efficient greenhouse, and also destroys ozone in the stratosphere. Therefore researches concerning manure compost, especially the emission of nitrogenous gases during manure compost, have important significance. This work is initiated from the phenomenon that the emission of N2O mitigated when bulking agent was adopted during manure compost, which was found in the authors' previous study. From the Introduction section, the investigation on the mechanism of N2O mitigation in dairy manure compost piles with bulking agent through isotope analysis should be the major subject of this paper. However, in the Results and Discussion sections, the au-

thors just focus on the enrichment δ15N-NH4+ at the top of dairy manure compost piles, and attribute this enrichment to high nitrogen conversion, nitrification-denitrification activity and NH3 volatilization. The mechanism of N2O mitigation with bulking agent is not interrupted. It is needed a revision to make the subject clear before publication. Besides, some expressions in this paper are unclear and inconsistent, which make it difficult to understand this paper.

Specific comments: 1. The authors use "pile with bulking agent", "pile with dried grass (pile 1)" to describe the dairy manure compost piles. From their previous paper (Maeda et al., 2013a), dried grass is the bulking agent, however, it is not illustrated in the present paper.

2. N2O mitigation with bulking agent was found in Maeda et al. (2013a). Is similar phenomenon found in the present studies? Are experiments in the two papers the same ones?

3. Line 16 of Page 7583: "Temporal decrease of δ15N value of NH4+ were observed in both piles" → "The decrease of δ15N value of NH4+ in the first two weeks were observed in both piles"

4. Line 19-21 of Page 7583: "The δ15N value of NH4+ were significantly higher in the piles with bulking agent 17.7-1.3‰ than that of the piles without bulking agent (11.8-0.9‰." → "The δ15N value of NH4+ at the end of experiments were significantly higher in the piles with bulking agent (17.7-1.3‰ than that of the piles without bulking agent (11.8-0.9 ‰.

5. Line 22-25 of Page 7583: Why more organic matter degradation cause higher δ15N value of NH4+? It seems to be inconsistent with the declaration in Line 17-18 that the ammonification of organic N supplies light NH4+.

6. Table 1: The authors annotate "C, control; T, treatment; Values followed by different letters indicate significant difference ($P < 0.05$)", however, there were no "C", "T" and

“letters following values” in the table. The authors should check this table carefully.

Interactive comment on Biogeosciences Discuss., 12, 7577, 2015.