Supplementary material

Effects of different long-term crop straw management practices on ammonia volatilization from subtropical calcareous agricultural soil

Bo-Wen Zhang[a,b], Ming-Hua Zhou[a], Hong-Yu Lin[a,b], Tite Ntacyabukura[a,b], Yan-Qiang Wang[a] and Bo Zhu[a]

[a]Key Laboratory of Mountain Surface Processes and Ecological Regulation, Institute of Mountain Hazards and Environment, Chinese Academy of Sciences, Chengdu 610041, China ;[b]University of Chinese Academy of Sciences, Beijing 100049, China

A. Measurement of soil heterotrophic respiration

In order to reflect the microbial activity, soil heterotrophic respiration (mg C m^{-2} h^{-1}) was also monitored between 8:00-11:00 a.m. during NH_3 volatilization monitoring period by using a portable soil respiration system (LI-8100, Li-COR Inc., Lincoln, NE, USA). The soil respiration chamber was mounted on a PVC pipe (15cm in height, cross sectional area of 81 cm^2) that was installed in each plot after fertilization at a depth of 13 cm (Liang *et al*., 2018).

B. Soil sampling and analysis

During the NH_3 monitoring period, top-soil (0-10 cm) samples were collected from each plot by using a soil corer, and the visible stone, roots and other litter were removed manually before mixed completely. The mixed samples were

extracted with 2M KCL solution (soil: solution =1:5), and then the filtered extracts were analyzed for NH_4^+ and NO_3^- content by using an AA3 continuous flow analyzer (SEAL, Auto analyzer 3, Germany).

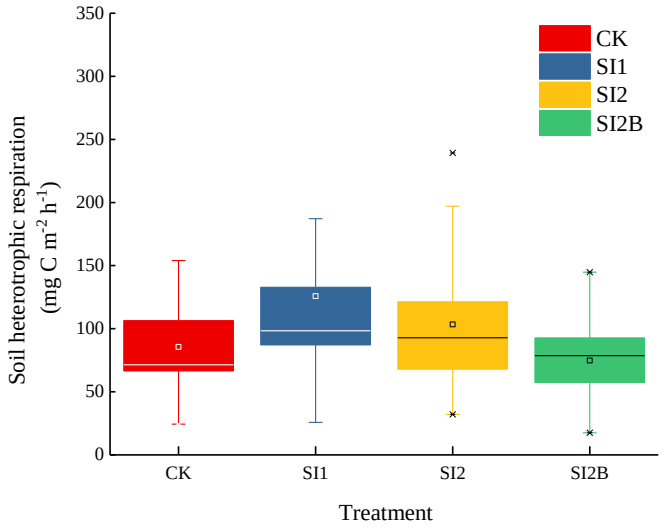

Figure S1. Boxplot of soil heterotrophic respiration during the NH_3 volatilization monitoring period throughout the wheat–maize seasons of 2019.

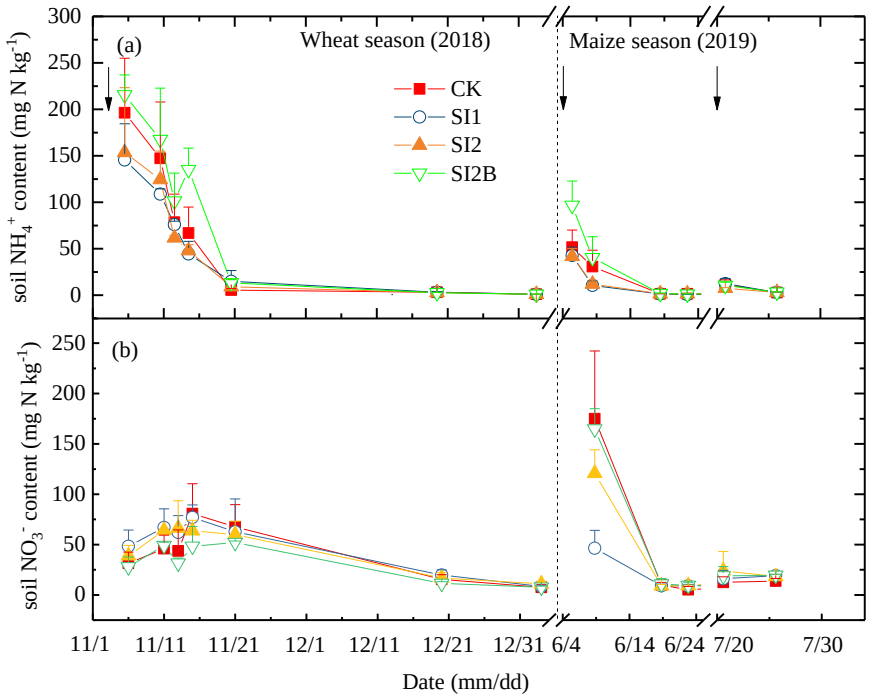

Figure S2. Seasonal dynamics of soil (a) ammonium (NH_4^+) and (b) nitrate (NO_3^-) contents during the NH_3 volatilization monitoring period in the wheat–maize seasons. Vertical bars indicate standard errors of three spatial replicates. The arrows indicate the time of fertilization.

Reference:

Liang, G.P., Wu, H.J., Houssou, A.A., Cai, D.X., Wu, X.P., Gao, L.L., Wang, B.S., Li, S.P., 2018. Soil respiration, glomalin content, and enzymatic activity response to straw application in a wheat-maize rotation system. Journal of Soils and Sediments 18, 697-707.