Supplementary material

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

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\textbf{A. Measurement of soil heterotrophic respiration}

In order to reflect the microbial activity, soil heterotrophic respiration (mg C m\textsuperscript{-2} h\textsuperscript{-1}) was also monitored between 8:00-11:00 a.m. during NH\textsubscript{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 (15 cm in height, cross sectional area of 81 cm\textsuperscript{2}) that was installed in each plot after fertilization at a depth of 13 cm (Liang \textit{et al.}, 2018).

\textbf{B. Soil sampling and analysis}

During the NH\textsubscript{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.