with the passage of time. Furthermore there were no significant differences between CT and NTS except in 2014 for maize. Some previous short-term studies had reported this similar result.However, theresult is not consistent with [38].Although during the short-term experiment there were no significant differences between CT and NTS, NTS improved crop yield more than CT. These improvements were consistent with [39; 40]. The improvements under RS and NTS were attributed to enhanced soil nutrients, soil water, and SOC.

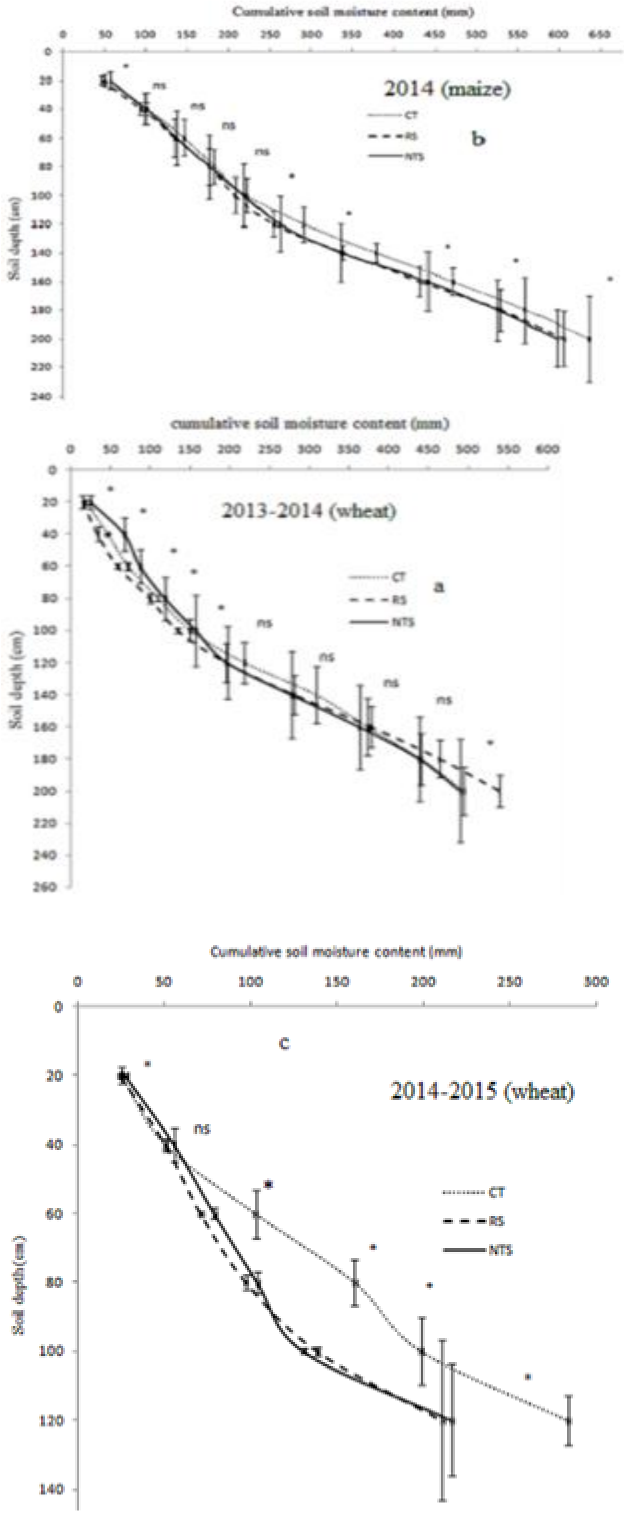

Figure 3(a, b, c): Cumulative soil water content during wheat and maize growing period (n = 6 for wheat and 5 for maize)

Table 7: Wheat and maize yield

Treatments	Wheat (Mgha^{-1})			maize (Mgha^{-1})	
Years	2013	2014	2015	2013	2014
CT	5.551b	5.603b	6.122b	4.18c	4.201c
RS	6.185a	6.235a	7.530a	4.88a	4.681a
NTS	5.735b	5.785b	6.44b	4.54c	4.424b

The numbers followed by the same letters down a column are not significantly different at $p < 0.05$
CT: rotary tillage without crop residues in winter and summer; RS: rotary tillage with crop residue incorporation into soil in winter and summer; NTS: no- tillage with crop residues use as mulch in winter and summer

4. Conclusion

In this study, the CT, RS, and NTS practices were found to have different effects on BD, SOC, CO_2 rate, TN, and AP, as well as soil CSWC. Short-term NTS practice significantly increased SOC stock, soil TN, AP at 0-40cm depth. NTS improved CSWC The adoption of conservation tillage, particularly NTS, potentially sequesters carbon in North China. The potential effects of NTS on soil quality were more apparent at 0–20 than 20-40 cm depth. The short-term effect of NTS on yield was lower than RS. This study shows that using NTS management is beneficial in North China and enhances soil quality, and the environment by reducing CO2 emissions compared with RS. However, longer-term study of the relationship between conservation tillage, soil properties, yield, and environmental conditions is needed in North China.Hence, it is better to collect more data on soil respiration that will help to identify the maximum cumulative CO_2 emitted by each treatment.

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