Supplementary material

Straw Return or No Tillage? Comprehensive Meta-Analysis Based on Soil Organic Carbon Contents, Carbon Emissions, and Crop Yields in China

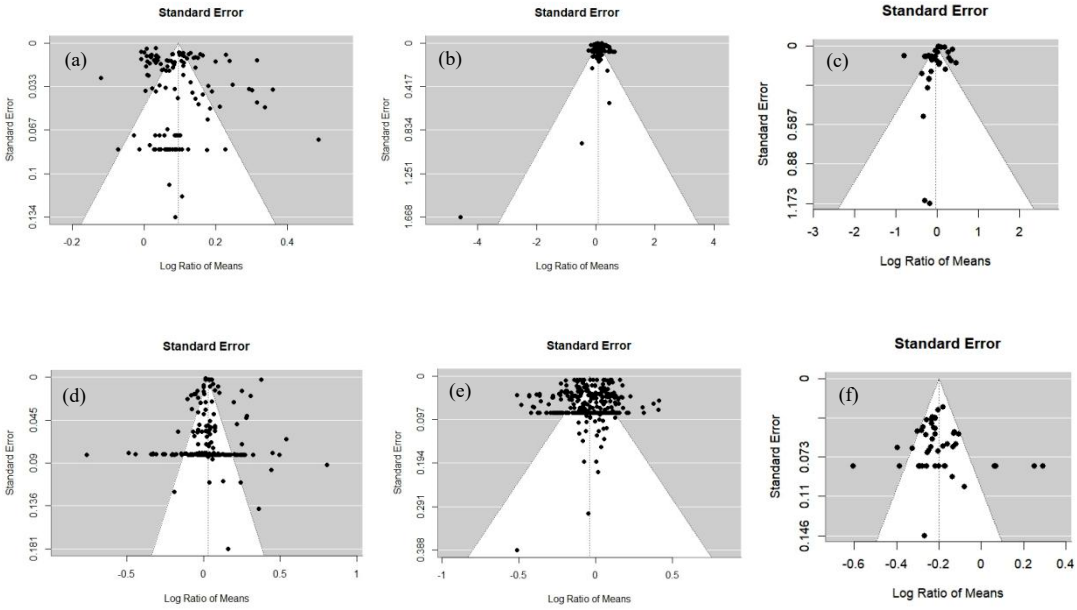


Figure S1. Funnel plot of publication bias test for (a) SOC, (b) crop yield, (c) carbon emissions under SR conditions and (d) SOC, (e) crop yield, (f) carbon emissions under NT conditions. SR, Straw return; NT, No-tillage.

Table S1 Data grouping of the influence factor in this meta-analysis. RC and CC represent rotation cropping and continuous cropping; N, N application rates; ED, Experimental duration; ES, Experimental start date; RT, DT and CT represent rotary tillage, deep tillage and conventional tillage; SRM, Straw returning method. SR, Straw return; NT, No-tillage.

Influence factor	Classification of sup-group					
Experiment region	North	Central	East	Southwest	Northwest	Northeast
Planting mode	Wheat	Rice	Maize	Rice-Wheat	Wheat-Maize	Rice-Rice
Cropping system	RC	CC				
Soil texture	Loam	Sand	Clay			
N(kg hm^{-1})	<120	120-240	>240			
ED	<3	3-7	>7			
ES	<2000	2000-2010	>2010			
Tillage method	NT	RT	DT	CT		
SRM	Covering	Digging				
SR	YES	NO				

Table S2 Regional division of provinces and cities in China

Regions	Cities
North	Inner Mongolia, Shanxi, Hebei
Central	Hunan, Henan, Hubei
East	Shandong, Jiangxi, Shanghai, Jiangsu, Zhejiang, Anhui
Southwest	Sichuan, Chongqing, Yunnan, Guizhou, Tibet
Northwest	Gansu, Ningxia, Xinjiang, Qinghai, Shaanxi
Northeast	Heilongjiang, Jilin, Liaoning

Table S3 Comparison of pre and post data of experimental groups in this meta-analysis. SR, Straw return; NT, No-tillage.

Exploring projects	Before SR	After SR	Before NT	After NT
SOC (g kg^{-1})	17	19	18	19
carbon emissions (kg ha^{-1})	4094	3678	6571	5441
crop yield (kg ha^{-1})	7281	7822	8103	7866

Table S4 Comprehensive effects and publication bias of SR and NT on SOC, carbon emissions, crop yield. 95% CI, 95% confidence interval; L_u, Upper limit; L_l, Lower limit; Z, The statistic of effect size; Q, The statistic of heterogeneity; P_Q, The significant value of Q; n, The number of effect size; P_B, The significant value of publication bias. SR, Straw return; NT, No-tillage.

Cultivation methods	Exploring projects	Increase rate	95% CI		Z	Q	P_Q	n	P_B
			L_l	L_u					
SR	SOC	10.00%	8.25%	11.78%	11.62	2683.07	<0.01	118	0.4002
	carbon emissions	-2.54%	-10.88%	6.59%	-0.56	610.28	<0.01	35	0.2580
	crop yield	8.60%	7.06%	10.18%	11.28	414244.91	<0.01	262	0.7818
NT	SOC	2.92%	0.58%	5.33%	2.45	19110.30	<0.01	188	0.5707
	carbon emissions	-18.13%	-21.17%	-14.96%	-0.24	166.20	<0.01	46	0.3011
	crop yield	-3.89%	-5.26%	-2.50%	-5.41	5101.81	<0.01	365	0.8816

Table S5 Meta regressions results and the response gradient (slope) for SOC content under climate and soil parameters under SR conditions. N, Sample size; MAT, Mean annual temperature; MAP, Mean annual precipitation; SOC, Soil organic carbon; SOM, Soil organic matter. SR, Straw return; NT, No-tillage.

Variable	SR			
	pvalue	R^2(%)	Response gradient(%)	N
MAT	<0.01**	12.37	-0.84	118
MAP	<0.01**	6.25	-0.83×10^{-2}	118
SOC	<0.05*	3.72	-0.42	112
SOM	<0.05*	4.93	-0.27	112
pH	<0.01**	61.71	1.10	82

Table S6 Meta regressions results and the response gradient (slope) for SOC content under climate and soil parameters under NT conditions. N, Sample size; MAT, Mean annual temperature; MAP, Mean annual precipitation; BD, Soil bulk density. SR, Straw return; NT, No-tillage.

Variable	NT			
	pvalue	R^2(%)	Response gradient(%)	N
MAT	0.59	0	-0.31	188
MAP	0.27	0	-0.5×10^{-2}	188
pH	<0.01**	59.68	12.73	132
BD	<0.01**	48.73	2.55	114

Appendix Dataset

Publications on straw return (soil organic carbon)

1. Akhtar, K.; Wang, W.; Djalovic, I.; Prasad, P.; Ren, G.; Ain, N.; Riaz, M.; Feng, Y.; Yang, G.; Wen, R. Combining straw mulch with nitrogen fertilizer improves soil and plant physio-chemical attributes, physiology, and yield of maize in the semi-arid region of China. *Plants.* **2023**, 12, 3308.
2. Chen, S.; Yao, F.; Mi, G.; Wang, L.; Wu, H.; Wang, Y. Crop rotation increases root biomass and promotes the correlation of soil dissolved carbon with the microbial community in the rhizosphere. *Frontiers in Bioengineering and Biotechnology*. **2022**, 10, 1081647.
3. Yang, Y.; Yu, K.; Feng, H. Effects of straw mulching and plastic film mulching on improving soil organic carbon and nitrogen fractions, crop yield and water use efficiency in the Loess Plateau, China. *Agricultural Water Management.* **2018**, 201, 133-143.
4. Gao, N.; Wei, Y.; Zhang, W.; Yang, B.; Shen, Y.; Yue, S.; Li, S. Carbon footprint, yield and economic performance assessment of different mulching strategies in a semi-arid spring maize system. *Science of The Total Environment.* **2022**, 826, 154021.
5. Hu, Y.; Sun, B.; Wu, S.; Feng, H.; Gao, M.; Ma, P.; Zhang, T.; Pi, X. Soil carbon and nitrogen of wheat–maize rotation system under continuous straw and plastic mulch. *Nutrient Cycling in Agroecosystems.* **2021**, 119, 181-193.
6. Iqbal, A.; Khan, A.; Green, S.J.; Ali, I.; He, L.; Zeeshan, M.; Luo, Y.Q. Long-term straw mulching in a no-till field improves soil functionality and rice yield by increasing soil enzymatic activity and chemical properties in paddy soils. *Journal of Plant Nutrition and Soil Science.* **2021**, 184, 622-634.
7. Li, S.; Wang, S.; Shi, J.; Tian, X.; Ye, X. Integrated mulching and nitrogen management strategies influence carbon footprint and sustainability of wheat production on the Loess Plateau of China. *Field Crops Research.* **2023**, 297, 108928.
8. Li, X.; Qu, C.; Li, Y.; Liang, Z.; Tian, X.; Shi, J. Ning, P.; Wei, G. Long-term effects of straw mulching coupled with N application on soil organic carbon sequestration and soil aggregation in a winter wheat monoculture system. *Agronomy Journal*. **2021**, 113, 2118-2131.
9. Liu, N.; Li, Y.; Cong, P.; Wang, J.; Guo, W.; Pang, H.; Zhang, L. Depth of straw incorporation significantly alters crop yield, soil organic carbon and total nitrogen in the North China Plain. *Soil and Tillage Research.* **2021**, 205, 104772.
10. Liu, W.; Hussain, S.; Wu, L.; Qin, Z.; Li, X.; Lu, j.; Khan, F.; Cao, W.; Geng, M. Greenhouse gas emissions, soil quality, and crop productivity from a mono-rice cultivation system as influenced by fallow season straw management. *Environmental Science and Pollution Research.* **2016**, 23, 315-328.
11. Liu, Z.; Zhang, M.; Wang, Z.; Shen, Y.; Zhang, D.; Zhang, S.; Qi, X. Responses of soil nutrients, enzyme activities, and maize yield to straw and plastic film mulching in coastal saline-alkaline. *Plant, Soil & Environment.* **2024**, 70.
12. Lv, S.; Li, J.; Yang, Z.; Yang, T.; Li, H.; Wang, X.; Peng, Y.; Zhou, C.; Wang, L.; Abdo, A. The field mulching could improve sustainability of spring maize production on the Loess Plateau. *Agricultural Water Management.* **2023**, 279, 108156.
13. Wang, C.; Liang, Y.; Liu, J.; Yuan, J.; Ren, J.; Geng, Y.; Shao, Z.; Zhang, J.; Cai, H. The relationship of soil organic carbon and nutrient contents to maize yield as affected by maize straw return modes. *Applied Sciences.* **2023**, 13, 12448.
14. Wang, S.; Tian, X.; Liu, T.; Lu, X.; You, D.; Shuo, L. Irrigation, straw, and nitrogen management benefits wheat yield and soil properties in a dryland agro-ecosystem. *Agronomy Journal.* **2014**, 106, 2193-2201.

15. Wang, X.; Jing, Z.H.; He, C.; Liu, Q.Y.; Qi, J.Y.; Zhao, X.; Xiao, X.P.; Zhang, H.L. Temporal variation of SOC storage and crop yield and its relationship-A fourteen year field trial about tillage practices in a double paddy cropping system, China. *Science of the Total Environment.* **2021**, 759, 143494.
16. Yang, D.; Wang, Y.; Wu, Q. Impact of tillage and straw management on soil properties and rice yield in a rice-ratoon rice system. *Agronomy*. **2023**, 13, 1762.
17. Yang, Y.; Liu, H.; Wu, J.; Zhang, S.; Gao, C.; Zhang, S. Tang, D. Soil enzyme activities, soil physical properties, photosynthetic physical characteristics and water use of winter wheat after long-term straw mulch and organic fertilizer application. *Frontiers in Plant Science.* **2023**, 14, 1186376.
18. Zhou, Z.; Zeng, X.; Chen, K.; Li, Z.; Guo, S. Long-term straw mulch effects on crop yields and soil organic carbon fractions at different depths under a no-till system on the Chengdu Plain, China. *Journal of Soils and Sediments.* **2019**, 19, 2143-2152.
19. Chen, Z.D.; Zhang, H.L.; Dikgwatlhe, S.B.; Xue, J.F.; Qiu, K.C. Tang, H.M.; Chen, F. Soil carbon storage and stratification under different tillage/residue-management practices in double rice cropping system. *Journal of Integrative Agriculture.* **2015**, 14, 1551-1560.
20. Cai, T.Y.; Huang, Y.W.; Huang, H.J.; Jia, Z.K.; Li, L.K.; Yang, B.P. Soil labile organic carbon and carbon pool management index as affected by different years no-tilling with straw mulching. *Chinese Journal of Ecology.* **2011**, 30, 1962-1968.
21. Gai, X.P.; Liu, H.B.; Zhai, L.M.; Yang, B.; Ren, T.; Wang, H. Effects of long-term additional application of organic manure or straw incorporation on soil nitrogen leaching risk. *Scientia Agricultura Sinica.* **2018**, 51, 2336-2347.
22. Gao, R.P.; Zhao, P.Y.; Han, Y.F.; Liu, X.Y.; Du, E.; Gao, Y. Effects of straw returning and nitrogen application on soil water, carbon and nitrogen coupling and crop yield. *Soils*. **2021**, 53, 952-960.
23. Han, S.; Wu, J.; Li, M.; Chen, F.; Wang, Y.; Cheng, W. Deep tillage with straw returning increase crop yield and improve soil physicochemical properties under topsoil thinning treatment. *Journal of Plant Nutrition and Fertilizers.* **2020**, 26, 276-284.
24. He, M.; Wang, Y.C.; Wang, L.G.; Li, C. Effect of different tillage managements on carbon dioxide emission and content of activated carbon in black soil. *Chinese Journal of Soil Science*. **2016**, 47, 1195-1202.
25. Ji, Q.; Sun, H.Y.; Taraqqi, A.K.; Wang, X.D. Impact of different tillage practices on soil organic carbon and water use efficiency under continuous wheat-maize binary cropping system. *Chinese Journal of Applied Ecology.* **2014**, 25, 1029 - 1035.
26. Liu, W.; Geng, M.J.; Qin, Z.G.; Zhang, Z.; Lu, J.M.; Lu, J.W. Effects of co-incorporation of green manure planting and rice straw on soil organic carbon pool and soil enzyme activity in a mono-rice cropping system. *Transactions of the Chinese Society of Agricultural Engineering.* **2020**, 36, 125-133.
27. Lu, X.L. Effect of straw returning with nitrogen application on crop yield and nitrogen use efficiency in ningxia yellow river irrigation district. *Southwest China Journal of Agricultural Sciences.* **2021**, 34, 770-776.
28. Meng, W.S.; Zhu, F.N.; Zhang, B.W.; et al. Effects of straw and biochar application on the soil physicochemical properties and corn yield in a black soil. *Journal of Jilin Agricultural University.* **2023**, 20225.
29. Nan, X.X.; You, D.H.; Tian, X.H. Li, J.; Wang, S.J; Cui, J. Effect of returning of cropland straw to field on soil organic carbon and grain yield in Guanzhong plain. *North China Journal of Agriculture.* **2011**, 26, 222-229.

30. Wang, W.Y.; Qiao, B.; Kashif, A.; Yuan, L.; Ren, G. Effects of straw returning to field on soil respiration and soil water heat in winter wheat-summer maize rotation system under no tillage. *Scientia Agricultura Sinica.* **2016**, 49, 2136-2152.
31. Wang, Y.H.; Pang, J.W.; Wei, T.; Gao, F.; Liu, E.K.; Jia, Z.K.; Zhang, P. Coupled effects of film mulching and straw-derived carbon inputs on soil aggregate characteristics and crop yields in semiarid areas. *Acta Pedologica Sinica*. **2024**, 61, 272-284.
32. Wang, Z.; Sun, J.; Du, Y.D.; Sun, D.; Gan, H.C. Niu, W.Q. Effects of mulching practices on soil carbon, nitrogen contents, and grain yield, water and nitrogen use efficiencies of summer maize. *Chinese Journal of Eco-Agriculture.* **2022**, 30, 913−923.
33. Zhang, H.L.; Bai, N.L.; Zheng, X.Q.; Li, S.X.; Zhang, J.Q.; Zhang, H.Y. Effects of straw returning and fertilization on soil bacterial and fungal community structures and diversities in rice-wheat rotation soil. *Chinese Journal of Eco-Agriculture*. **2021**, 29, 531-539.
34. Zhao, Y.L.; Guo, H.B.; Xue, Z.G.; Mu, X.Y.; Li, C.H. Effects of tillage and straw returning on microorganism quantity, enzyme activities in soils and grain yield. *Chinese Journal of Applied Ecology*. **2015**, 26, 1785.
35. Zhen, L.S.; Gu, J.; Gao, H.; Qin, Q.J. Chen, Q.L. Effect of straws, manure, and chemical fertilizer on soil properties and crop yields. *ActaBot.Boreal.-Occident.Sin.* **2012**, 32, 1811-1818.

Publications on no-tillage (soil organic carbon)

1. Chen, S.; Yang, P.; Zhang, Y.; Dong, W.; Hu, C.; Oenema, O. Responses of cereal yields and soil carbon sequestration to four long-term tillage practices in the North China plain. *Agronomy*. **2022**, 12, 176.
2. Chen, Z.D.; Zhang, H.; Xue, J.; Liu, S.L.; Chen,F. A nine-year study on the effects of tillage on net annual global warming potential in double rice-cropping systems in Southern China. *Soil and Tillage Research.* **2021**, 206, 104797.
3. Dikgwatlhe, S.B.; Kong, F.L.; Chen, Z.D.; Lal, R.; Zhang, H.L.; Chen, F. Tillage and residue management effects on temporal changes in soil organic carbon and fractions of a silty loam soil in the North China Plain. *Soil Use and Management*. **2014**, 30, 496-506.
4. Gao, L.; Wang, B.; Li, S.; Han, Y.; Zhang, X.M.; Gong, D.Z.; Ma, M.C.; Liang, G.P. Effects of different long-term tillage systems on the composition of organic matter by 13C CP/TOSS NMR in physical fractions in the Loess Plateau of China. *Soil and Tillage Research*. **2019**, 194, 104321.
5. Guo, L.; Zhang, L.; Liu, L.; Sheng, F.; Cao, C.; Li, C. Effects of long-term no tillage and straw return on greenhouse gas emissions and crop yields from a rice-wheat system in central China. *Agriculture, ecosystems & environment.* **2021**, 322, 107650.
6. Han, H.F.; Ning, T.Y.; Li, Z.J.; Cao, H.M. Soil respiration rate in summer maize field under different soil tillage and straw application. *Maydica*. **2014**, 59, 185-190.
7. He, L.; Lu, S.; Wang, C.; Mu, J.; Zhang, Y.; Wang, X. Changes in soil organic carbon fractions and enzyme activities in response to tillage practices in the Loess Plateau of China. *Soil and Tillage Research.* **2021**, 209, 104940.
8. Iqbal, A.; Khan, A.; Green, S.J.; Ali, I.; He, L.; Zeeshan, M.; Luo, Y.Q. Long-term straw mulching in a no-till field improves soil functionality and rice yield by increasing soil enzymatic activity and chemical properties in paddy soils. *Journal of Plant Nutrition and Soil Science.* **2021**, 184, 622-634.
9. Kan, Z.R.; Liu, Q.Y.; He, C.; Jing, Z.H. Responses of grain yield and water use efficiency of winter wheat to tillage in the North China Plain. Field Crops Research. **2020**, 249, 107760.

10. Li, T.T.; Zhang, J.Z.; Zhang, H.Y.; Peter, C.; Zhang, J.L. Fractionation of soil organic carbon in a calcareous soil after long-term tillage and straw residue management. *Journal of Integrative Agriculture.* **2022**, 21(12), 3611-3625.
11. Liu, W.S.; Liu, W.X.; Kan, Z.R.; Chen, J.S.; Zhao, X.; Zhang, H.L. Effects of tillage and straw management on grain yield and SOC storage in a wheat-maize cropping system. *European Journal of Agronomy.* **2022**, 137, 126530.
12. Liu, Z.; Gao, T.; Tian, S.; Hu, H.; Li, G.; Ning, T. Soil organic carbon increment sources and crop yields under long-term conservation tillage practices in wheat-maize systems. *Land Degradation & Development.* **2020**, 31, 1138-1150.
13. Liu, Z.; Sun, K.; Liu, W.; Gao, T.; Li, G.; Han, H.; Li, Z.; Ning, T. Responses of soil carbon, nitrogen, and wheat and maize productivity to 10 years of decreased nitrogen fertilizer under contrasting tillage systems. *Soil and Tillage Research.* **2020**, 196, 104444.
14. Qi, J.Y.; Yao, X.B.; Lu, J.; He, L.X.; Cao, J.L.; Kan, Z.R.; Wang, X.; Pan, S.G.; Tang, X.R. A 40% paddy surface soil organic carbon increase after 5-year no-tillage is linked with shifts in soil bacterial composition and functions. *Science of the Total Environment*. **2023**, 859, 160206.
15. Shang, Q.; Cheng, C.; Wang, J.; Luo, K.; Zeng, Y.; Yang, X. Net global warming potential, greenhouse gas intensity and carbon footprint as affected by different tillage systems from Chinese double-cropping paddy fields. *Soil and Tillage Research.* **2021**, 209, 104947.
16. Song, K.; Zheng, X.; Lv, W.; Qin, Q.; Sun, L.; Zhang, H.; Xue, Y. Effects of tillage and straw return on water-stable aggregates, carbon stabilization and crop yield in an estuarine alluvial soil. *Scientific Reports*. **2019**, 9, 4586.
17. Sun, Q.; Zhang, P.; Liu, X.; Zhang, H.; Liu, S.; Sun, X.; Jiang, W. Long-term tillage alters soil properties and rhizosphere bacterial community in lime concretion black soil under winter wheat–summer maize double-cropping system. *Agronomy*. **2023**, 13, 790.
18. Wang, H.; Wang, S.; Yu, Q.; Zhang, Y.; Wang, R.; Li, J.; Wang, L. Ploughing/zero-tillage rotation regulates soil physicochemical properties and improves productivity of erodible soil in a residue return farming system. *Land Degradation & Development*. **2021**, 32, 1833-1843.
19. Xue, L.; Khan, S.; Sun, M.; Anwar, S.; Ren, A.; Gao, Z.; Lin, W.; Xue, J. Effects of tillage practices on water consumption and grain yield of dryland winter wheat under different precipitation distribution in the loess plateau of China. *Soil and Tillage Research*. **2019**, 191, 66-74.
20. Yan, Q.; Wu, L.; Dong, F.; Yan, S.; Li, F.; Jia, Y.; Zhang, J.; Zhang, R.; Huang, X. Subsoil tillage enhances wheat productivity, soil organic carbon and available nutrient status in dryland fields. *Journal of Integrative Agriculture*. **2024**, 23, 251-266.
21. Yang, D.; Wang, Y.; Wu, Q. Impact of tillage and straw management on soil properties and rice yield in a rice-ratoon rice system. *Agronomy*. **2023**, 13, 1762.
22. You, D.; Tian, P.; Sui, P.; Zhang, W.; Yang, B.; Qi, H. Short-term effects of tillage and residue on spring maize yield through regulating root-shoot ratio in Northeast China. *Scientific reports.* **2017**, 7, 13314.
23. Zhang, D.; Hao, X.; Fan, Z.; Hu, X.; Ma, J.; Guo, Y.; Wu, L. Optimizing tillage and fertilization patterns to improve soil physical properties, NUE and economic benefits of wheat-maize crop rotation systems. *Agriculture*. **2022**, 12, 1264.
24. Zhang, W.; Li, H.; Liang, L.; Wang, S.; Lakshmanan, P.; Jiang, Z. An integrated straw-tillage management increases maize crop productivity, soil organic carbon, and net ecosystem carbon budget. *Agriculture, Ecosystems & Environment*. **2022**, 340, 108175.

25. Zhang, Y.; Tan, C.; Wang, R. Li, J.; Wang, X. Conservation tillage rotation enhanced soil structure and soil nutrients in long-term dryland agriculture. *European Journal of Agronomy*. **2021**, 131, 126379.
26. Zhong, R.; Zi, Z.; Wang, P.; Noor, H.; Ren, A.; Ren, Y.; Sun, M.; Gao, Z. Effects of five consecutive years of fallow tillage on soil microbial community structure and winter wheat yield. *Agronomy*. **2023**, 13, 224.
27. Cai, T.Y.; Huang, Y.W.; Huang, H.J.; Jia, Z.K.; Li, L.K.; Yang, B.P. Soil labile organic carbon and carbon pool management index as affected by different years no-tilling with straw mulching. *Chinese Journal of Ecology.* **2011**, 30, 1962-1968.
28. Ding, T.Y.; Guo, Z.C.; Qian, Y.Q. Effects of straw return methods on the soil organic carbon fractions and structure characteristics of shajiang black soil (Vertisol). *Transactions of the Chinese Society of Agricultural Engineering*. **2023**, 39, 71-78.
29. Dong, B.; Guo, T.W.; Zeng, J.; Bao, X. Effect of different no-tillage on the SOC, SMBC and crop yield. *Gansu Agr. Sci. and Techn*. **2010**, 10, 15-18.
30. Feng, Q.Q.; Han, H.F.; Zhang, Y.Y.; Xu, J.; Cao, Y.; Wang, S.; Ning, T.; Li, Z. Effects of tillage methods on soil carbon sequestration and water holding capacity and yield in wheat-maize rotation. *Journal of Plant Nutrition and Fertilizers*. **2018**, 24, 869-879.
31. Gao, Y.; Zhang, Y.; Zhang, C.; Chen, X.W.; Liang, A.Z. Interactive effects of tillage practices and cropping systems on the inter annual variation of soil carbon, nitrogen content and corn yield in Mollisols. *Soils and Crops.* **2020**, 9, 323-334.
32. Ji, Q.; Sun, H.Y.; Taraqqi, A.K.; Wang, X.D. Impact of different tillage practices on soil organic carbon and water use efficiency under continuous wheat-maize binary cropping system. *Chinese Journal of Applied Ecology.* **2014**, 25, 1029 - 1035.
33. Meng, T.T.; Kong, H. Effect of tillage practices on organic carbon and total nitrogen content of loess dry loess soils. *Rural Economy and Science-Technology.* **2019**, 30, 11-12.
34. Zhang, Y.P.; Wang, Z.W.; Diao, P.S.; Du, R.C.; Li, H.W.; Yao, W.Y. Short-term effects of mechanical and ecological tillage pattern on physical and chemical characteristics of soil in arid area. *Transactions of the Chinese Society for Agricultural Machinery.* **2018**, 49, 45-55.
35. Zheng, F.J.; Wang, X.; Li, S.P.; Liu, X.T.; Liu, Z.P.; Lu, J.J.; Li, Y.S. Synergistic effects of soil moisture, aggregate stability and organic carbon distribution on wheat yield under no-tillage practice. *Scientia Agricultura Sinica.* **2021**, 54, 596-607.

Publications on straw return (crop yield)

1. Akhtar, K.; Wang, W.; Djalovic, I.; Prasad, P.; Ren, G.; Ain, N.; Riaz, M.; Feng, Y.; Yang, G.; Wen, R. Combining straw mulch with nitrogen fertilizer improves soil and plant physio-chemical attributes, physiology, and yield of maize in the semi-arid region of China. *Plants*, **2023**, 12, 3308.
2. Chen, H.; Li, L.; Luo, X.; Li, Y.; Liu, D.; Zhao, Y.; Feng, H.; Deng, J. Modeling impacts of mulching and climate change on crop production and N_2O emission in the Loess Plateau of China. *Agricultural and Forest Meteorology.* **2019**, 268, 86-97.
3. Chen, S.; Yao, F.; Mi, G.; Wang, L.; Wu, H.; Wang, Y. Crop rotation increases root biomass and promotes the correlation of soil dissolved carbon with the microbial community in the rhizosphere. *Frontiers in Bioengineering and Biotechnology*. **2022**, 10, 1081647.
4. Yang, Y.; Yu, K.; Feng, H. Effects of straw mulching and plastic film mulching on improving soil organic carbon and nitrogen fractions, crop yield and water use efficiency in the Loess Plateau, China. *Agricultural Water Management.* **2018**, 201, 133-143.

5. Gao, H.J.; Chen, X.W.; Liang, A.Z.; Peng, C.; Zhu, P.; Zhang, X.Z. Combined effects of straw returning and nitrogen fertilizer application on crop yield and nitrogen utilization in the chernozem of Northeast China. *Applied Ecology & Environmental Research*, **2022**, 20, 2.
6. Gao, N.; Wei, Y.; Zhang, W.; Yang, B.; Shen, Y.; Yue, S.; Li, S. Carbon footprint, yield and economic performance assessment of different mulching strategies in a semi-arid spring maize system. *Science of The Total Environment.* **2022**, 826, 154021.
7. Hu, F.; Feng, F.; Zhao, C.; Chai, Q.; Yu, A.; Yin, W.; Gan, Y. Integration of wheat-maize intercropping with conservation practices reduces CO_2 emissions and enhances water use in dry areas. *Soil and Tillage Research*, **2017**, 169, 44-53.
8. Hu, Y.; Sun, B.; Wu, S.; Feng, H.; Gao, M.; Ma, P.; Zhang, T.; Pi, X. Soil carbon and nitrogen of wheat–maize rotation system under continuous straw and plastic mulch. *Nutrient Cycling in Agroecosystems.* **2021**, 119, 181-193.
9. Iqbal, A.; Khan, A.; Green, S.J.; Ali, I.; He, L.; Zeeshan, M.; Luo, Y.Q. Long-term straw mulching in a no-till field improves soil functionality and rice yield by increasing soil enzymatic activity and chemical properties in paddy soils. *Journal of Plant Nutrition and Soil Science.* **2021**, 184, 622-634.
10. Li, S.; Wang, S.; Shi, J.; Tian, X.; Ye, X. Integrated mulching and nitrogen management strategies influence carbon footprint and sustainability of wheat production on the Loess Plateau of China. *Field Crops Research.* **2023**, 297, 108928.
11. Li, S.; Zhang, Y.; Guo, L.; Li, X. Impact of tillage and straw treatment methods on rice growth and yields in a rice–ratoon rice cropping system. *Sustainability*. **2022**, 14, 9290.
12. Liu, N.; Li, Y.; Cong, P.; Wang, J.; Guo, W.; Pang, H.; Zhang, L. Depth of straw incorporation significantly alters crop yield, soil organic carbon and total nitrogen in the North China Plain. *Soil and Tillage Research.* **2021**, 205, 104772.
13. Liu, W.; Hussain, S.; Wu, L.; Qin, Z.; Li, X.; Lu, j.; Khan, F.; Cao, W.; Geng, M. Greenhouse gas emissions, soil quality, and crop productivity from a mono-rice cultivation system as influenced by fallow season straw management. *Environmental Science and Pollution Research.* **2016**, 23, 315-328.
14. Liu, Z.; Zhang, M.; Wang, Z.; Shen, Y.; Zhang, D.; Zhang, S.; Qi, X. Responses of soil nutrients, enzyme activities, and maize yield to straw and plastic film mulching in coastal saline-alkaline. *Plant, Soil & Environment.* **2024**, 70.
15. Lv, S.; Li, J.; Yang, Z.; Yang, T.; Li, H.; Wang, X.; Peng, Y.; Zhou, C.; Wang, L.; Abdo, A. The field mulching could improve sustainability of spring maize production on the Loess Plateau. *Agricultural Water Management.* **2023**, 279, 108156.
16. Ren, Y.; Gao, C.; Yan, Z.; Zong, R.; Ma, Y.; Li, Q. Effects of planting systems and straw mulching on carbon emissions and winter wheat grain yield in the North China Plain. *Experimental Agriculture*. **2018**, 54, 520-530.
17. Wang, C.; Liang, Y.; Liu, J.; Yuan, J.; Ren, J.; Geng, Y.; Shao, Z.; Zhang, J.; Cai, H. The relationship of soil organic carbon and nutrient contents to maize yield as affected by maize straw return modes. *Applied Sciences.* **2023**, 13, 12448.
18. Wang, S.; Tian, X.; Liu, T.; Lu, X.; You, D.; Shuo, L. Irrigation, straw, and nitrogen management benefits wheat yield and soil properties in a dryland agro-ecosystem. *Agronomy Journal.* **2014**, 106, 2193-2201.
19. Wang, X.; Jing, Z.H.; He, C.; Liu, Q.Y.; Qi, J.Y.; Zhao, X.; Xiao, X.P.; Zhang, H.L. Temporal variation of SOC storage and crop yield and its relationship-A fourteen year field trial about tillage practices in a double paddy cropping system, China. *Science of the Total Environment.* **2021**, 759, 143494.
20. Yang, D.; Wang, Y.; Wu, Q. Impact of tillage and straw management on soil properties and rice

yield in a rice-ratoon rice system. *Agronomy*. **2023**, 13, 1762.

21. Yang, Y.; Liu, H.; Wu, J.; Zhang, S.; Gao, C.; Zhang, S. Tang, D. Soil enzyme activities, soil physical properties, photosynthetic physical characteristics and water use of winter wheat after long-term straw mulch and organic fertilizer application. *Frontiers in Plant Science.* **2023**, 14, 1186376.
22. Yin, W.; Yu, A.; Guo, Y.; Fan, H.; Hu, F.; Fan, Z.; Zhao, C.; Cai, Q.; Coulter, J. Growth trajectories of wheat–maize intercropping with straw and plastic management in arid conditions. *Agronomy Journal.* **2020**, 112, 2777-2790.
23. Zhou, Z.; Zeng, X.; Chen, K.; Li, Z.; Guo, S. Long-term straw mulch effects on crop yields and soil organic carbon fractions at different depths under a no-till system on the Chengdu Plain, China. *Journal of Soils and Sediments.* **2019**, 19, 2143-2152.
24. Chen, Z.D.; Zhang, H.L.; Dikgwatlhe, S.B.; Xue, J.F.; Qiu, K.C. Tang, H.M.; Chen, F. Soil carbon storage and stratification under different tillage/residue-management practices in double rice cropping system. *Journal of Integrative Agriculture.* **2015**, 14, 1551-1560.
25. Gai, X.P.; Liu, H.B.; Zhai, L.M.; Yang, B.; Ren, T.; Wang, H. Effects of long-term additional application of organic manure or straw incorporation on soil nitrogen leaching risk. *Scientia Agricultura Sinica.* **2018**, 51, 2336-2347.
26. Gao, R.P.; Zhao, P.Y.; Han, Y.F.; Liu, X.Y.; Du, E.; Gao, Y. Effects of straw returning and nitrogen application on soil water, carbon and nitrogen coupling and crop yield. *Soils*. **2021**, 53, 952-960.
27. Han, S.; Wu, J.; Li, M.; Chen, F.; Wang, Y.; Cheng, W. Deep tillage with straw returning increase crop yield and improve soil physicochemical properties under topsoil thinning treatment. *Journal of Plant Nutrition and Fertilizers.* **2020**, 26, 276-284.
36. He, M.; Wang, Y.C.; Wang, L.G.; Li, C. Effect of different tillage managements on carbon dioxide emission and content of activated carbon in black soil. *Chinese Journal of Soil Science*. **2016**, 47, 1195-1202.
28. Hu, F.L.; Chai, Q.; Gan, Y.T.; Yin, W.; Zhao, C.; Feng, F.X. Characteristics of soil carbon emission and water utilization in wheat/maize intercropping with minimal/zero tillage and straw retention. *Scientia Agricultura Sinica.* **2016**, 49, 120-131.
29. Ji, Q.; Sun, H.Y.; Taraqqi, A.K.; Wang, X.D. Impact of different tillage practices on soil organic carbon and water use efficiency under continuous wheat-maize binary cropping system. *Chinese Journal of Applied Ecology.* **2014**, 25, 1029 - 1035.
30. Li, C.X.; Chen, H.T.; Ma, C.C. Effects of different tillage methods on carbon storage of soil and utilization efficiency of water and nitrogen in wheat. *Acta Agriculturae Boreali-Sinica*. **2016**, 31, 220-226.
31. Liu, W.; Geng, M.J.; Qin, Z.G.; Zhang, Z.; Lu, J.M.; Lu, J.W. Effects of co-incorporation of green manure planting and rice straw on soil organic carbon pool and soil enzyme activity in a mono-rice cropping system. *Transactions of the Chinese Society of Agricultural Engineering.* **2020**, 36, 125-133.
32. Liu, X.T.; Zheng, C.L.; Cao, W. Long-term positional fertilisation on soil organic matter, different forms of nitrogen content and crop yield. *Crops.* **2021**, 37, 130-135.
33. Lu, X.L. Effect of straw returning with nitrogen application on crop yield and nitrogen use efficiency in ningxia yellow river irrigation district. *Southwest China Journal of Agricultural Sciences.* **2021**, 34, 770-776.
34. Meng, W.S.; Zhu, F.N.; Zhang, B.W.; et al. Effects of straw and biochar application on the soil physicochemical properties and corn yield in a black soil. *Journal of Jilin Agricultural University.*

2023, 20225.

35. Nan, X.X.; You, D.H.; Tian, X.H. Li, J.; Wang, S.J; Cui, J. Effect of returning of cropland straw to field on soil organic carbon and grain yield in Guanzhong plain. *North China Journal of Agriculture.* **2011**, 26, 222-229.
36. Tan, Y.C.; Zhuge, Y.P.; Liu, D.X. Effect of farmland management on N_2O and CH_4 emission from winter wheat-summer maize rotation system in North China Plain. *Acta Scientiae Circumstantiae*. **2016**, 36, 2638-2649.
37. Wang, W.Y.; Qiao, B.; Kashif, A.; Yuan, L.; Ren, G. Effects of straw returning to field on soil respiration and soil water heat in winter wheat-summer maize rotation system under no tillage. *Scientia Agricultura Sinica.* **2016**, 49(11), 2136-2152.
38. Wang, Y.H.; Pang, J.W.; Wei, T.; Gao, F.; Liu, E.K.; Jia, Z.K.; Zhang, P. Coupled effects of film mulching and straw-derived carbon inputs on soil aggregate characteristics and crop yields in semiarid areas. *Acta Pedologica Sinica*. **2024**, 61, 272-284.
39. Wang, Z.; Sun, J.; Du, Y.D.; Sun, D.; Gan, H.C. Niu, W.Q. Effects of mulching practices on soil carbon, nitrogen contents, and grain yield, water and nitrogen use efficiencies of summer maize. *Chinese Journal of Eco-Agriculture.* **2022**, 30, 913–923.
40. Wu, C.F.; Xiong, C.; Han, Y.L.; Zhang, Q.B.; Li, P.P.; Zhang, L.M. Mechanism of combination of nitrogen fertilizer reduction and straw returning in regulating dryland nitrification intensity and keeping stable crop yield in long run. *Journal of Plant Nutrition and Fertilizers.* **2020**, 26, 1782-1793.
41. Zhang, H.L.; Bai, N.L.; Zheng, X.Q.; Li, S.X.; Zhang, J.Q.; Zhang, H.Y. Effects of straw returning and fertilization on soil bacterial and fungal community structures and diversities in rice-wheat rotation soil. *Chinese Journal of Eco-Agriculture.* **2021**, 29, 531-539.
42. Zhang, L.; Wang, J.; Pang, H.C.; Zhang, J.T.; Guo, J.J.; Dong, G.H. Effects of short-term granulated straw incorporation on grain yield and soil respiration in a winter wheat-summer maize cropping system. *Chinese Journal of Applied Ecology*. **2018**, 29, 565-572.
43. Zhao, H.L.; Dong, J.J.; Shi, J.L.; Xu, M.; Tian, X.H. Effect of straw returning mode on soil organic carbon sequestration. *Acta Pedologica Sinica*. **2021**, 58, 213-224.
44. Zhao, J.P.; Quan, B.Q.; Guo, P.Y. Effects of straw returning and nitrogen application on soil quality and wheat yield. *Acta Agriculturae Boreali-Sinica*. **2021**, 36, 176-181.
45. Zhao, Y.L.; Guo, H.B.; Xue, Z.G.; Mu, X.Y.; Li, C.H. Effects of tillage and straw returning on microorganism quantity, enzyme activities in soils and grain yield. *Chinese Journal of Applied Ecology.* **2015**, 26, 1785.
46. Zhen, L.S.; Gu, J.; Gao, H.; Qin, Q.J. Chen, Q.L. Effect of straws, manure, and chemical fertilizer on soil properties and crop yields. *ActaBot.Boreal.-Occident.Sin.* **2012**, 32, 1811-1818.

Publications on no-tillage (crop yield)

1. Chen, S.; Yang, P.; Zhang, Y.; Dong, W.; Hu, C.; Oenema, O. Responses of cereal yields and soil carbon sequestration to four long-term tillage practices in the North China plain. *Agronomy*. **2022**, 12, 176.
2. Chen, Z.D.; Zhang, H.; Xue, J.; Liu, S.L.; Chen,F. A nine-year study on the effects of tillage on net annual global warming potential in double rice-cropping systems in Southern China. *Soil and Tillage Research.* **2021**, 206, 104797.
3. Gao, L.; Wang, B.; Li, S.; Han, Y.; Zhang, X.M.; Gong, D.Z.; Ma, M.C.; Liang, G.P. Effects of different long-term tillage systems on the composition of organic matter by 13C CP/TOSS NMR in

physical fractions in the Loess Plateau of China. *Soil and Tillage Research*. **2019**, 194, 104321.

4. Guo, L.; Zhang, L.; Liu, L.; Sheng, F.; Cao, C.; Li, C. Effects of long-term no tillage and straw return on greenhouse gas emissions and crop yields from a rice-wheat system in central China. *Agriculture, ecosystems & environment.* **2021**, 322, 107650.
5. Guo, Y.; Yin, W.; Chai, Q.; Fan, Z.; Hu, F.; Fan, H.; Zhao, C.; Yu, A.; Coulter, J. No tillage with previous plastic covering increases water harvesting and decreases soil CO_2 emissions of wheat in dry regions. *Soil and Tillage Research.* **2021**, 208, 104883.
6. Han, H.F.; Ning, T.Y.; Li, Z.J.; Cao, H.M. Soil respiration rate in summer maize field under different soil tillage and straw application. *Maydica*. **2014**, 59, 185-190.
7. He, L.; Lu, S.; Wang, C.; Mu, J.; Zhang, Y.; Wang, X. Changes in soil organic carbon fractions and enzyme activities in response to tillage practices in the Loess Plateau of China. *Soil and Tillage Research.* **2021**, 209, 104940.
8. Kan, Z.R.; Liu, Q.Y.; He, C.; Jing, Z.H. Responses of grain yield and water use efficiency of winter wheat to tillage in the North China Plain. *Field Crops Research*. **2020**, 249, 107760.
9. Lamptey, S.; Li, L.L.; Xie, J.H.; Zhang, R.Z. Soil respiration and net ecosystem production under different tillage practices in semi-arid northwest China. *Plant soil environ.* **2017**, 63, 14-21.
10. Li, S.; Zhang, Y.; Guo, L.; Li, X. Impact of tillage and straw treatment methods on rice growth and yields in a rice–ratoon rice cropping system. *Sustainability*. **2022**, 14, 9290.
11. Li, Z.; Zhang, Q.; Li, Z.; Qiao, Y.; Du, K.; Yue, Z.; Tian, C.; Leng, P.; Cheng, H.F.; Chen, G.; Li, F. Responses of soil CO_2 emissions to tillage practices in a wheat-maize cropping system, A 4-year field study. *Field Crops Research*. **2023**, 294, 108832.
12. Liu, W.S.; Liu, W.X.; Kan, Z.R.; Chen, J.S.; Zhao, X.; Zhang, H.L. Effects of tillage and straw management on grain yield and SOC storage in a wheat-maize cropping system. *European Journal of Agronomy.* **2022**, 137, 126530.
13. Liu, Z.; Gao, T.; Tian, S.; Hu, H.; Li, G.; Ning, T. Soil organic carbon increment sources and crop yields under long-term conservation tillage practices in wheat-maize systems. *Land Degradation & Development.* **2020**, 31, 1138-1150.
14. Liu, Z.; Sun, K.; Liu, W.; Gao, T.; Li, G.; Han, H.; Li, Z.; Ning, T. Responses of soil carbon, nitrogen, and wheat and maize productivity to 10 years of decreased nitrogen fertilizer under contrasting tillage systems. *Soil and Tillage Research.* **2020**, 196, 104444.
15. Shang, Q.; Cheng, C.; Wang, J.; Luo, K.; Zeng, Y.; Yang, X. Net global warming potential, greenhouse gas intensity and carbon footprint as affected by different tillage systems from Chinese double-cropping paddy fields. *Soil and Tillage Research.* **2021**, 209, 104947.
16. Song, K.; Zheng, X.; Lv, W.; Qin, Q.; Sun, L.; Zhang, H.; Xue, Y. Effects of tillage and straw return on water-stable aggregates, carbon stabilization and crop yield in an estuarine alluvial soil. *Scientific Reports*. **2019**, 9, 4586.
17. Sun, Q.; Zhang, P.; Liu, X.; Zhang, H.; Liu, S.; Sun, X.; Jiang, W. Long-term tillage alters soil properties and rhizosphere bacterial community in lime concretion black soil under winter wheat–summer maize double-cropping system. *Agronomy*. **2023**, 13, 790.
18. Tan, Y.; Wu, D.; Bol, R.; Wu, W.; Meng, F. Conservation farming practices in winter wheat–summer maize cropping reduce GHG emissions and maintain high yields. *Agriculture, ecosystems & environment*. **2019**, 272, 266-275.
19. Wang, H.; Wang, S.; Yu, Q.; Zhang, Y.; Wang, R.; Li, J.; Wang, L. Ploughing/zero-tillage rotation regulates soil physicochemical properties and improves productivity of erodible soil in a residue

return farming system. *Land Degradation & Development*. **2021**, 32, 1833-1843.

20. Xue, L.; Khan, S.; Sun, M.; Anwar, S.; Ren, A.; Gao, Z.; Lin, W.; Xue, J. Effects of tillage practices on water consumption and grain yield of dryland winter wheat under different precipitation distribution in the loess plateau of China. *Soil and Tillage Research*. **2019**, 191, 66-74.
21. Xue, Y.; Zhou, J.; Ran, L.; Wu, H.; Wei, W.; Hu, X.; Xia, F.; Wang, J. Conservation tillage as an economic and ecological farming option for summer maize in the oasis region of Northwest China. *Plant and Soil*. **2024**, 1-15.
22. Yan, Q.; Wu, L.; Dong, F.; Yan, S.; Li, F.; Jia, Y.; Zhang, J.; Zhang, R.; Huang, X. Subsoil tillage enhances wheat productivity, soil organic carbon and available nutrient status in dryland fields. *Journal of Integrative Agriculture*. **2024**, 23, 251-266.
23. Yang, D.; Wang, Y.; Wu, Q. Impact of tillage and straw management on soil properties and rice yield in a rice-ratoon rice system. *Agronomy*. **2023**, 13, 1762.
24. You, D.; Tian, P.; Sui, P.; Zhang, W.; Yang, B.; Qi, H. Short-term effects of tillage and residue on spring maize yield through regulating root-shoot ratio in Northeast China. *Scientific reports*. **2017**, 7, 13314.
25. Zhang, D.; Hao, X.; Fan, Z.; Hu, X.; Ma, J.; Guo, Y.; Wu, L. Optimizing tillage and fertilization patterns to improve soil physical properties, NUE and economic benefits of wheat-maize crop rotation systems. *Agriculture*. **2022**, 12, 1264.
26. Zhang, T.; Cui, J.; Duan, X.; Cui, D.; Liu, X.; Feng, Q. Subsoiling reduces CO_2 concentrations in soil profile of winter wheat–summer maize rotation ecosystem in the North China Plain, a strategy to achieve carbon neutrality in farmland. *Archives of Agronomy and Soil Science*. **2023**, 69, 2833-2846.
27. Zhang, W.; Li, H.; Liang, L.; Wang, S.; Lakshmanan, P.; Jiang, Z. An integrated straw-tillage management increases maize crop productivity, soil organic carbon, and net ecosystem carbon budget. *Agriculture, Ecosystems & Environment*. **2022**, 340, 108175.
28. Zhang, X.; Sun, Z.; Liu, J. Zhu, O.; Wu, L. Simulating greenhouse gas emissions and stocks of carbon and nitrogen in soil from a long-term no-till system in the North China Plain. *Soil and Tillage Research*. **2018**, 178, 32-40.
29. Zhang, Y.; Tan, C.; Wang, R. Li, J.; Wang, X. Conservation tillage rotation enhanced soil structure and soil nutrients in long-term dryland agriculture. *European Journal of Agronomy*. **2021**, 131, 126379.
30. Zhong, R.; Zi, Z.; Wang, P.; Noor, H.; Ren, A.; Ren, Y.; Sun, M.; Gao, Z. Effects of five consecutive years of fallow tillage on soil microbial community structure and winter wheat yield. *Agronomy*. **2023**, 13, 224.
31. Dong, B.; Guo, T.W.; Zeng, J.; Bao, X. Effect of different no-tillage on the SOC、SMBC and crop yield. *Gansu Ag r. Sci. and Techn*. **2010**, 2, 15-18.
32. Gao, Y.; Zhang, Y.; Zhang, C.; Chen, X.W.; Liang, A.Z. Interactive effects of tillage practices and cropping systems on the interannual variation of soil carbon, nitrogen content and corn yield in Mollisols. *Soils and Crops*. **2020**, 9, 323-334.
33. Ji, Q.; Sun, H.Y.; Taraqqi, A.K.; Wang, X.D. Impact of different tillage practices on soil organic carbon and water use efficiency under continuous wheat-maize binary cropping system. *Chinese Journal of Applied Ecology*. **2014**, 25, 1029 - 1035.
34. Liu, D.; Zhang, X.; Li, J.; Wang, X.D. Effects of different tillage patterns on soil properties, maize yield and water use efficiency in Weibei Highland, China. *Chinese Journal of Applied Ecology*. **2018**, 29, 573-582.
35. Meng, T.T.; Kong, H. Effect of tillage practices on organic carbon and total nitrogen content of loess

dry loess soils. *Rural Economy and Science-Technology*. **2019**, 30, 11-12.

36. Zhang, Y.P.; Wang, Z.W.; Diao, P.S.; Du, R.C.; Li, H.W.; Yao, W.Y. Short-term effects of mechanical and ecological tillage pattern on physical and chemical characteristics of soil in arid area. *Transactions of the Chinese Society for Agricultural Machinery.* **2018**, 49, 45-55.
37. Zheng, F.J.; Wang, X.; Li, S.P.; Liu, X.T.; Liu, Z.P.; Lu, J.J.; Li, Y.S. Synergistic effects of soil moisture, aggregate stability and organic carbon distribution on wheat yield under no-tillage practice. *Scientia Agricultura Sinica.* **2021**, 54, 596-607.
38. Zhou, Y.J.; Xie, J.H.; Li, L.L.;. Wang, L.L; Luo, Z.Z.; Wang, J.B. Effects of long-term reduce/zero tillage and nitrogen fertilizer reducing on maize yield and soil carbon emission under fully plastic mulched ridge-furrow planting system. *Scientia Agricultura Sinica*, **2021**, 54, 5054-5067.

Publications on straw return (carbon emissions)

1. Gao, N.; Wei, Y.; Zhang, W.; Yang, B.; Shen, Y.; Yue, S.; Li, S. Carbon footprint, yield and economic performance assessment of different mulching strategies in a semi-arid spring maize system. *Science of The Total Environment.* **2022**, 826, 154021.
2. Hu, F.; Feng, F.; Zhao, C.; Chai, Q.; Yu, A.; Yin, W.; Gan, Y. Integration of wheat-maize intercropping with conservation practices reduces CO_2 emissions and enhances water use in dry areas. *Soil and Tillage Research.* **2017**, 169, 44-53.
3. Hu, F.; Gan, Y.; Cui, H.; Zhao, C.; Feng, F.; Yin, W.; Chai, Q. Intercropping maize and wheat with conservation agriculture principles improves water harvesting and reduces carbon emissions in dry areas. *European Journal of Agronomy*. **2016**, 74, 9-17.
4. Ren, Y.; Gao, C.; Yan, Z.; Zong, R.; Ma, Y.; Li, Q. Effects of planting systems and straw mulching on carbon emissions and winter wheat grain yield in the North China Plain. *Experimental Agriculture*. **2018**, 54, 520-530.
5. He, M.; Wang, Y.C.; Wang, L.G.; Li, C. Effect of different tillage managements on carbon dioxide emission and content of activated carbon in black soil. *Chinese Journal of Soil Science.* **2016**, 47, 1195-1202.
6. Hu, F.L.; Chai, Q.; Gan, Y.T.; Yin, W.; Zhao, C.; Feng, F.X. Characteristics of soil carbon emission and water utilization in wheat/maize intercropping with minimal/zero tillage and straw retention. *Scientia Agricultura Sinica*. **2016**, 49, 120-131.
7. Tan, Y.C.; Zhuge, Y.P.; Liu, D.X. Effect of farmland management on N_2O and CH_4 emission from winter wheat-summer maize rotation system in North China Plain. *Acta Scientiae Circumstantiae*. **2016**, 36, 2638-2649.
8. Zhang, L.; Wang, J.; Pang, H.C.; Zhang, J.T.; Guo, J.J.; Dong, G.H. Effects of short-term granulated straw incorporation on grain yield and soil respiration in a winter wheat-summer maize cropping system. *Chinese Journal of Applied Ecology*. **2018**, 29, 565-572.
9. Yan, C.P.; Zhang, Y.M.; Hu, C.S.; Dong, W.X.; Wang, Y.Y.; Li, X.X.; Qin, S.P. Greenhouse gas exchange and comprehensive global warming potential under different wheat-maize rotation patterns. *Chinese Journal of Eco-Agriculture.* **2016**, 24, 704-715.

Publications on no-tillage (carbon emissions)

1. Guo, Y.; Yin, W.; Chai, Q.; Fan, Z.; Hu, F.; Fan, H.; Zhao, C.; Yu, A.; Coulter, J. No tillage with previous plastic covering increases water harvesting and decreases soil CO_2 emissions of wheat in dry regions. *Soil and Tillage Research.* **2021**, 208, 104883.

2. Li, Z.; Zhang, Q.; Li, Z.; Qiao, Y.; Du, K.; Yue, Z.; Tian, C.; Leng, P.; Cheng, H.F.; Chen, G.; Li, F. Responses of soil CO_2 emissions to tillage practices in a wheat-maize cropping system, A 4-year field study. *Field Crops Research*. **2023**, 294, 108832.
3. Wang, W.; Zhang, H.; Mo, F.; Liao, Y.; Wen, X. Reducing greenhouse gas emissions and improving net ecosystem economic benefit through long-term conservation tillage in a wheat-maize multiple cropping system in the Loess Plateau, China. *European Journal of Agronomy*. **2022**, 141, 126619.
4. Xue, Y.; Zhou, J.; Ran, L.; Wu, H.; Wei, W.; Hu, X.; Xia, F.; Wang, J. Conservation tillage as an economic and ecological farming option for summer maize in the oasis region of Northwest China. *Plant and Soil*. **2024**, 1-15.
5. Zhou, Y.J.; Xie, J.H.; Li, L.L.;. Wang, L.L; Luo, Z.Z.; Wanng, J.B. Effects of long-term reduce/zero tillage and nitrogen fertilizer reducing on maize yield and soil carbon emission under fully plastic mulched ridge-furrow planting system. *Scientia Agricultura Sinica.* **2021**, 54, 5054-5067.