

Supplementary information

Grazing Decreases Soil Aggregation and Has Different Effects on Soil Organic Carbon Storage across Different Grassland Types in Northern Xinjiang, China

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Table S1. Two-way ANOVA of the impact of grassland type and grazing on grassland soil physical and chemical properties.

Factors	Grassland type			Grazing			Grassland type×Grazing		
	<i>df</i>	<i>F</i>	<i>P</i> -value	<i>df</i>	<i>F</i>	<i>P</i> -value	<i>df</i>	<i>F</i>	<i>P</i> -value
BD	2	18.889	0.000	1	16.605	0.002	2	4.454	0.036
SOC	2	717.654	0.000	1	43.524	0.000	2	17.568	0.000
TN	2	73.089	0.000	1	3.436	0.089	2	0.426	0.663
TP	2	46.209	0.000	1	0.426	0.526	2	0.128	0.881
AN	2	258.834	0.000	1	0.122	0.733	2	0.053	0.949
AP	2	6.315	0.013	1	0.772	0.397	2	5.219	0.023

Note: *df*: degree of freedom, *F*: the ratio of two mean squares.

Table S2. Two-way ANOVA of the impact of grassland type and grazing on grassland soil aggregates and stability.

Factors	Grassland type			Grazing			Grassland type×Grazing		
	<i>df</i>	<i>F</i>	<i>P</i> -value	<i>df</i>	<i>F</i>	<i>P</i> -value	<i>df</i>	<i>F</i>	<i>P</i> -value
>2mm	2	52.390	0.000	1	156.413	0.000	2	8.613	0.005
0.25-2mm	2	7.776	0.007	1	9.109	0.011	2	3.202	0.077
0.053-0.25mm	2	60.006	0.000	1	29.191	0.000	2	3.462	0.065
MWD	2	27.629	0.000	1	41.095	0.000	2	0.499	0.619

Note: *df*: degree of freedom, *F*: the ratio of two mean squares.

Table S3. Two-way ANOVA of the impact of grassland type and grazing on nutrients in different particle size aggregates.

Factors	Grassland type			Grazing			Grassland type×Grazing		
	df	F	P-value	df	F	P-value	df	F	P-value
SOC in WSA _{>2mm}	2	253.034	0.000	1	36.110	0.000	2	21.187	0.000
SOC in WSA _{0.25-2mm}	2	1413.915	0.000	1	106.431	0.000	2	64.818	0.000
SOC in WSA _{0.053-0.25mm}	2	468.685	0.000	1	21.229	0.001	2	7.398	0.008
TN in WSA _{>2mm}	2	127.955	0.000	1	11.759	0.005	2	7.586	0.007
TN in WSA _{0.25-2mm}	2	489.592	0.000	1	5.895	0.032	2	1.309	0.306
TN in WSA _{0.053-0.25mm}	2	154.556	0.000	1	1.595	0.231	2	0.168	0.848
TP in WSA _{>2mm}	2	79.517	0.000	1	13.528	0.003	2	9.910	0.003
TP in WSA _{0.25-2mm}	2	36.132	0.000	1	0.086	0.774	2	0.423	0.664
TP in WSA _{0.053-0.25mm}	2	52.829	0.000	1	0.241	0.632	2	0.126	0.882
AN in WSA _{>2mm}	2	1490.754	0.000	1	585.034	0.000	2	339.527	0.000
AN in WSA _{0.25-2mm}	2	348.138	0.000	1	7.548	0.018	2	0.413	0.671
AN in WSA _{0.053-0.25mm}	2	57.391	0.000	1	1.561	0.235	2	1.577	0.247
AP in WSA _{>2mm}	2	55.602	0.000	1	4.244	0.062	2	5.521	0.020
AP in WSA _{0.25-2mm}	2	41.045	0.000	1	0.057	0.816	2	3.675	0.057
AP in WSA _{0.053-0.25mm}	2	15.764	0.000	1	0.334	0.574	2	2.298	0.143

Note: *df*: degree of freedom, *F*: the ratio of two mean squares.

Table S4. Two-way ANOVA of the impact of grassland type and grazing on soil organic carbon density.

Factors	Grassland type			Grazing			Grassland type×Grazing		
	<i>df</i>	<i>F</i>	<i>P</i> -value	<i>df</i>	<i>F</i>	<i>P</i> -value	<i>df</i>	<i>F</i>	<i>P</i> -value
SOCD	2	18.885	0.000	1	16.558	0.002	2	4.458	0.036

Note: *df*: degree of freedom, *F*: the ratio of two mean squares.