Restoration of Grassland Improves Soil Infiltration Capacity in Water-Wind Erosion Crisscross Region of China's Loess Plateau

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Table S1. Soil mechanical composition of plots.

Plots	Depth (cm)	Soil mechanical composition/%		
		Clay particle (Φ < 0.002 mm)	Silt particle (0.02 > Φ > 0.002 mm)	Sand particle (Φ > 0.02 mm)
Aeo.f	0-10	4.16±0.57Cc	5.57±0.75Cc	90.27±1.20Aa
	10-20	5.84±0.39Bbc	7.81±0.54Bc	86.99±3.96Ab
	20-30	9.28±0.81Aab	15.21±0.95Ab	75.51±1.74Bc
Aeo.g	0-10	3.64±0.61Ac	5.61±.1.12Ac	90.75±1.70Ba
	10-20	1.82±0.12Bd	3.19±0.63Bd	94.99±0.71Aa
	20-30	3.83±0.37Ae	5.99±0.58Ad	90.18±0.85Ba
San.f	0-10	6.97±0.16ab	11.79±2.03b	80.89±1.09b
	10-20	7.35±1.42ab	12.42±1.38b	80.23±2.80c
	20-30	6.13±1.12cd	10.87±1.77c	83.01±2.84b
San.g	0-10	7.45±0.62Aab	12.30±0.29Ab	80.47±1.14bBc
	10-20	4.19±0.83Bc	8.86±1.07Bc	89.96±2.89Ab
	20-30	7.57±1.18Abc	13.91±1.24Ab	82.76±1.12Bb
Loe.f	0-10	8.29±1.88a	15.24±0.85Ca	76.21±5.27c
	10-20	8.71±0.61a	16.37±1.84BCa	74.92±2.45d
	20-30	10.41±1.01a	19.42±2.03Aa	70.17±2.96d
Loe.g	0-10	5.81±0.28b	12.52±0.52Ab	82.14±0.30b
	10-20	5.97±1.46b	11.96±0.78Ab	82.07±2.02bc
	20-30	5.31±1.25de	10.00±0.99Bc	85.26±2.26b

Note: Different capital letters indicate significant differences between the different soil depths for the same land at the *P*=0.05 level. Different lowercase letters indicate significant differences between the different land for the same soil depth at the *P*=0.05 level. This is applicable for the following figures and labels as well. Aeo. f, aeolian sandy soil cropland; Aeo. g, aeolian sandy soil grassland; Loe. f, loess soil cropland; Loe. g, loess soil grassland; San. f, Pisha sand soil cropland; San. g, Pisha sand soil grassland.

Table S2. The references of proposed mechanisms for each pathway associated with the model (see Figure S2)

Pathway	References
Soil texture ⟶ Root traits	Borden et al., 2020; Plante et al., 2014.
Soil texture ⟶ SOM	Haddix et al., 2020; Schweizer et al., 2019; Wiesmeier et al., 2019.
Soil texture ⟶ aggregates	Bronick and Lal, 2005; Ge et al., 2019; Schweizer et al., 2019.
Soil texture ⟶ Soil porosity	Regelink et al., 2015; Gu et al., 2018.
Soil texture ⟶ Infiltration	Fischer et al., 2014; Marquart et al., 2020; Zhu et al., 2020.
Root traits ⟶ SOM	Hao et al., 2020; Li et al., 2020.
Root traits ⟶ aggregates	Gould et al., 2016; Demenois et al., 2018.
Root traits ⟶ Soil porosity	Tang et al., 2018; Bodner et al., 2014; Hao et al., 2020.
Root traits ⟶ Infiltration	Lu et al., 2020; Liu et al., 2020; Jiang et al., 2018.
SOM ⟶ aggregates	Six et al., 2004; Demenois et al., 2018.
SOM ⟶ Soil porosity	Fischer et al., 2014.
SOM ⟶ Infiltration	Neris et al., 2012; Huang et al., 2016; Anderson et al., 2020.
aggregates ⟶ Soil porosity	Regelink et al., 2015; Bronick and Lal, 2005.
aggregates ⟶ Infiltration	Neris et al., 2012; Hao et al., 2020; Huang et al., 2016.
Soil porosity ⟶ Infiltration	Zhu et al., 2022; Marquart et al., 2020.

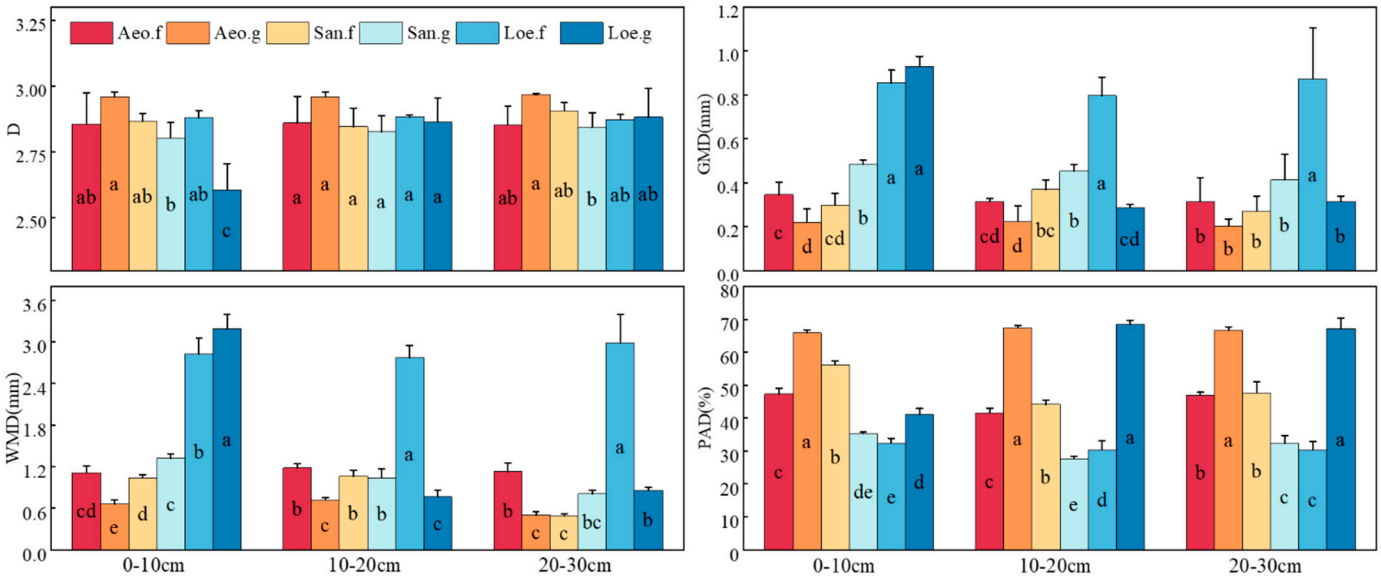

Figure S1. Characteristics of soil aggregates in various lands, D: fractal dimension; GMD: geometric mean diameter; MWD: aggregate mean weight diameter; PAD: Aggregate destruction rate; Different lowercase letters indicate significant differences between the different land at the P=0.05 level. Aeo. f, aeolian sandy soil cropland; Aeo. g, aeolian sandy soil grassland; San. f, Pisha sand soil cropland; San. g, Pisha sand soil grassland; Loe. f, loess soil cropland; Loe. g, loess soil grassland.

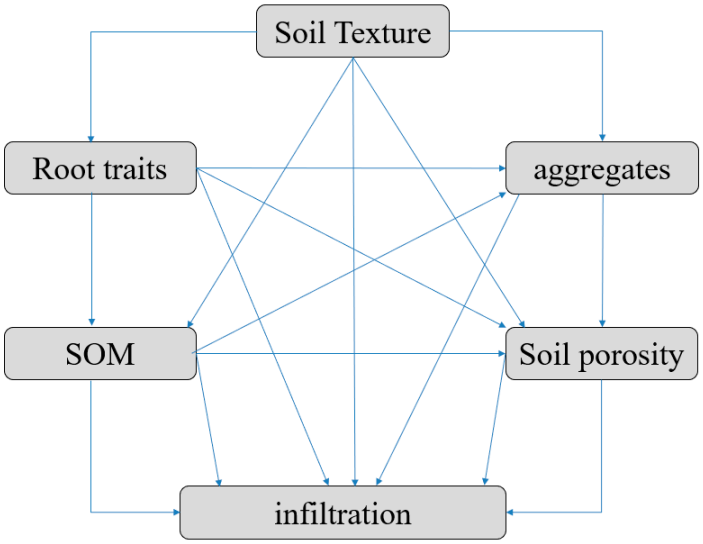

Figure S2. A structural equation modeling (SEM) of the possible pathways of these key factors on soil infiltrability during the ecological restoration. Proposed mechanisms for each path are described in Table S2

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