

Response to the Review Comments

We would like to thank you for your careful reading, helpful comments, and constructive suggestions, which have significantly improved the presentation of our manuscript.

We have carefully considered all comments from the reviewer and revised our manuscript accordingly. In the following section, we summarize our responses to each comment from the reviewer.

1. Figure caption

Please use main caption for each Figure and then use sub-title in each Figure.

Ex.) Figure

a) Sub-title

Figure 1. Figure caption etc.

Reply: Thank you very much for your advice. The revision has been made for all the figures, using main caption for each figure and then using sub-title in each figure. In accordance with the format requirements of the journal *water*, we put the Sub-title after the main caption. The revision is shown as follows:

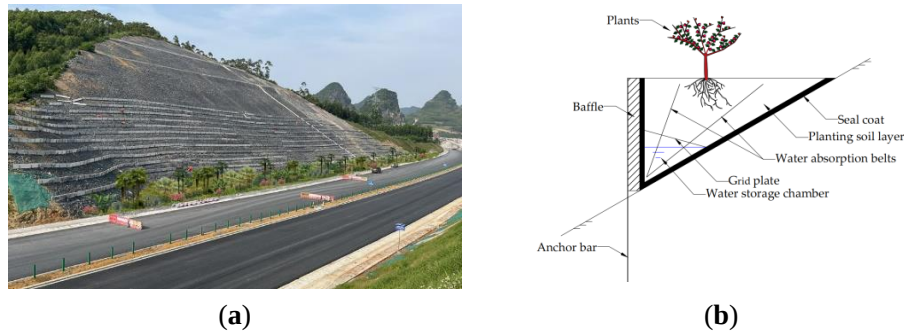


Figure 1. Slab trench arrangement and detailed structure: (a) In-situ construction of stepped slab trench on the rocky desertification slope; (b) Profile of the slab trench.

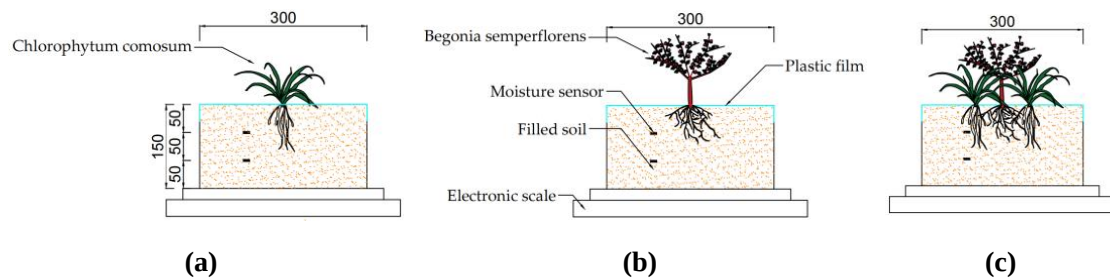


Figure 4. Side view of the models with different kinds of plants in drought state: (a) Succulent root plant; (b) Succulent stem plant; (c) Succulent root and stem plant in a mixed manner (unit: mm).

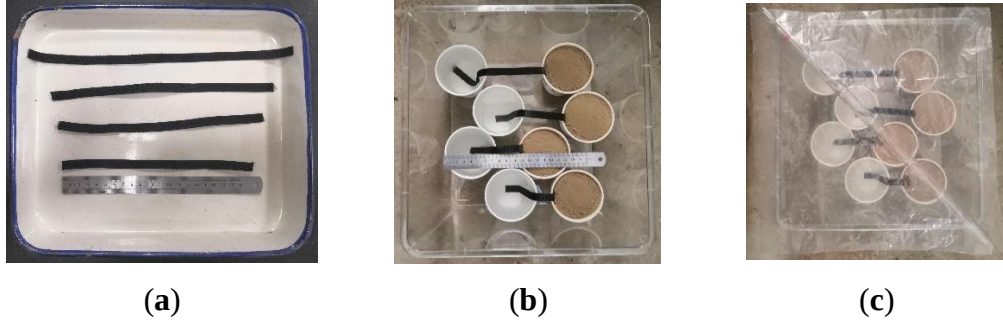


Figure 5. Water absorption model test of the absorption belts: (a) Water absorption belts used in the test; (b) Cups full of dry soil or water connected by absorption belts with different initial lengths exposed to air; (c) Model test on water absorption through belts.

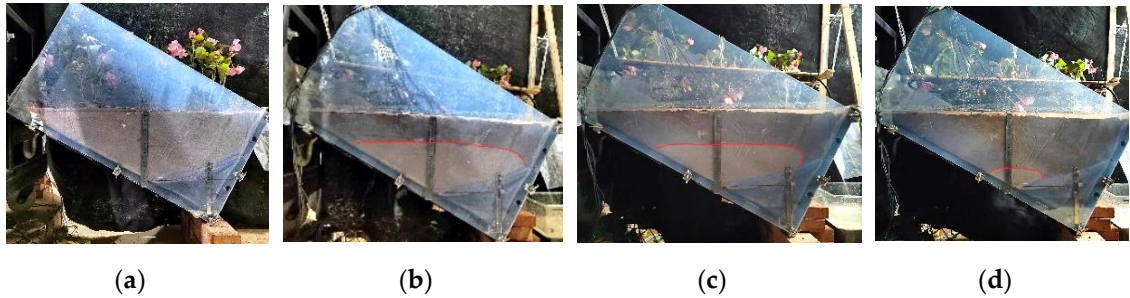


Figure 6. The wetting front observed at different moment in the model with rainfall intensity 222 mm/h and 3 strains of plants: (a) 0 min; (b) 30.0 min; (c) 50.0 min; (d) 90.0 min.

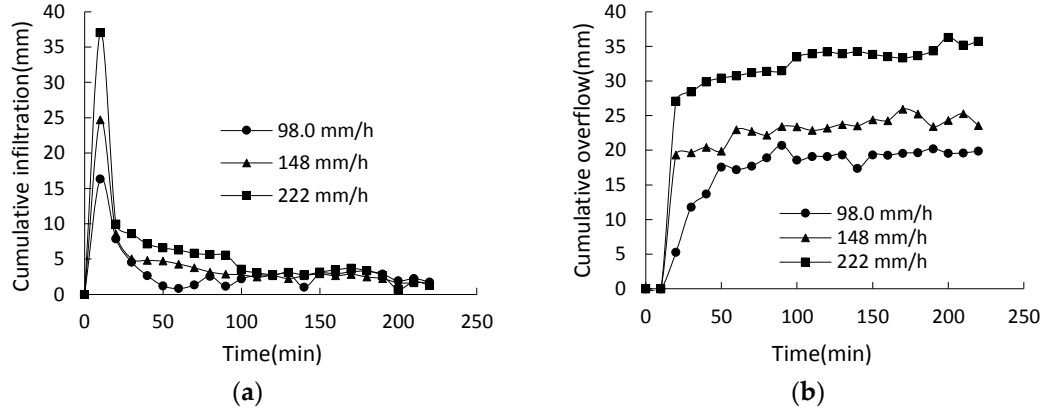


Figure 7. Time-history curves of rainfall infiltration and overflow amount under different rainfall intensities in the model: (a) Cumulative infiltration amount versus time relationship curve; (b) Cumulative water overflow versus time relationship curve.

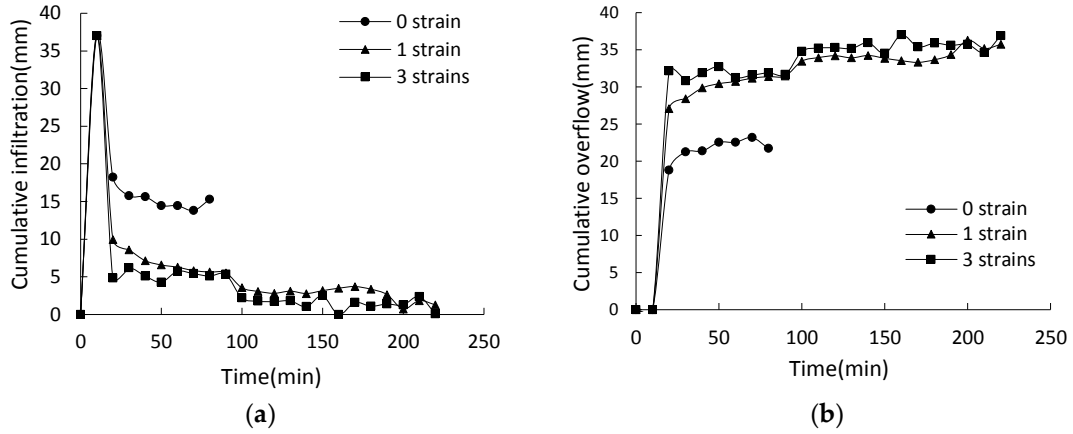


Figure 8. Time-history curves of rainfall infiltration and overflow amount under rainfall intensity 222 mm/h in the models with different number of plant: (a) Cumulative infiltration amount versus time relationship curve; (b) Cumulative water overflow versus time relationship curve.

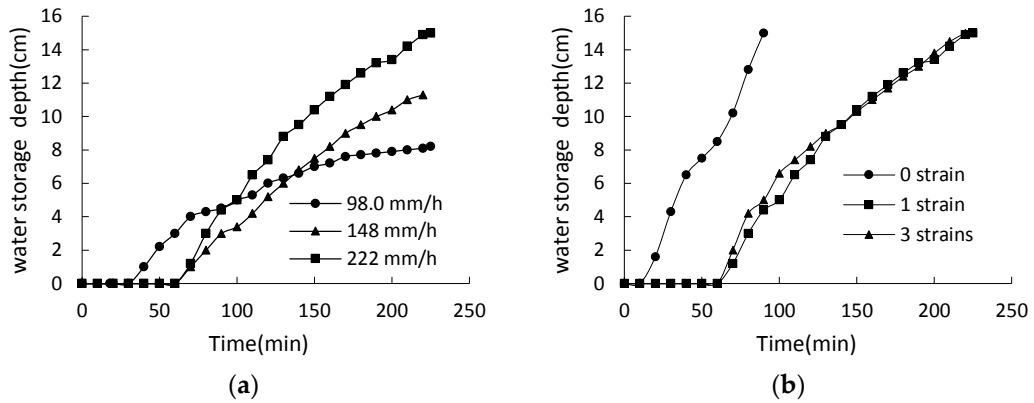


Figure 9. Variation curves of water storage depth versus time in the models with different rainfall intensity or different strains of plants in rainfall stage: (a) Water storage depth versus time relationship curve with 1 strain of plant; (b) Water storage depth versus time relationship curve under rainfall intensity 222 mm/h.

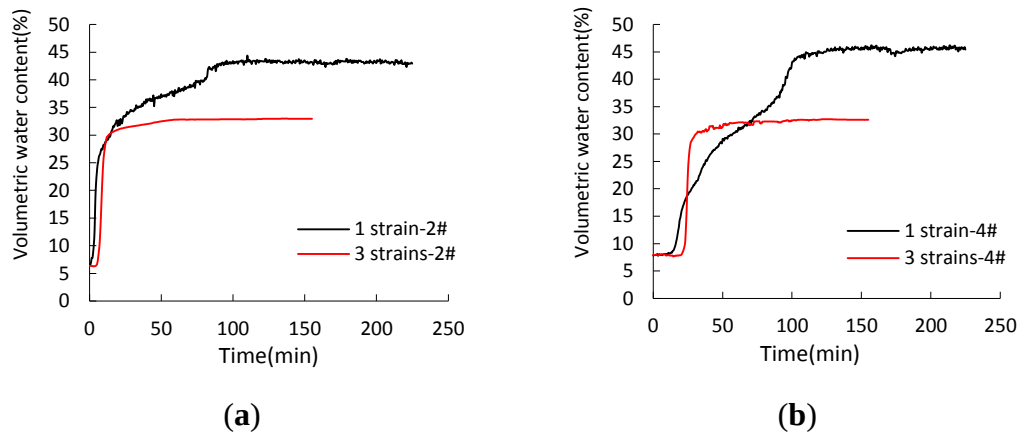
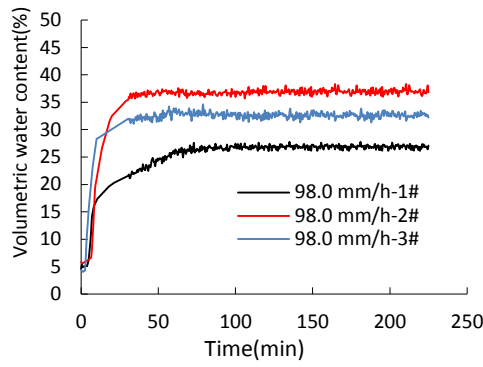
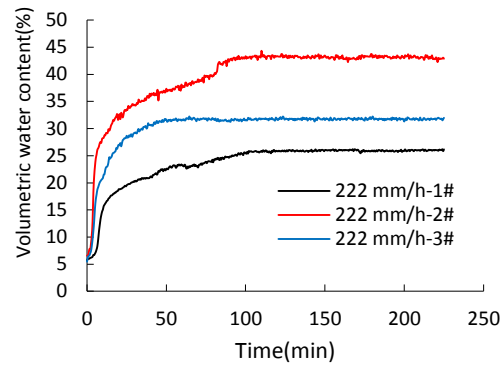


Figure 10. Response of volumetric water content along the depth of the middle axis in the model with different strains of plants under rainfall intensity 222 mm/h: (a) Volumetric water content versus time relationship curve measured by sensor 2# near the root dense area; (b) Volumetric water content versus time relationship curve measured by sensor 4# near the root tip area.

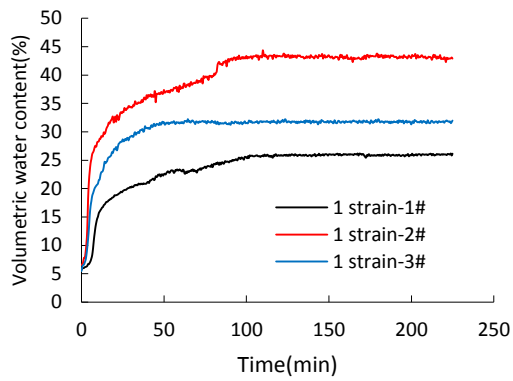


(a)

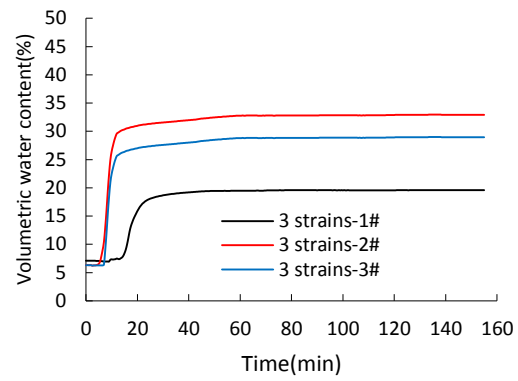


(b)

Figure 12. Response of volumetric water content at 5cm sub-surface along the width direction in the models (1#, 2#, 3#) with one strain of plant under different rainfall intensity: (a) Volumetric water content versus time relationship curve under rainfall intensity 98.0 mm/h; (b) Volumetric water content versus time relationship curve under rainfall intensity 222 mm/h.



(a)



(b)

Figure 13. Response of volumetric water content at 5cm sub-surface along the width direction in the models (1#, 2#, 3#) with different strains of plants under rainfall intensity 222mm/h: (a) Volumetric water content versus time relationship curve with one strain of plant; (b) Volumetric water content versus time relationship curve with three strains of plant.



(a)



(b)



(c)

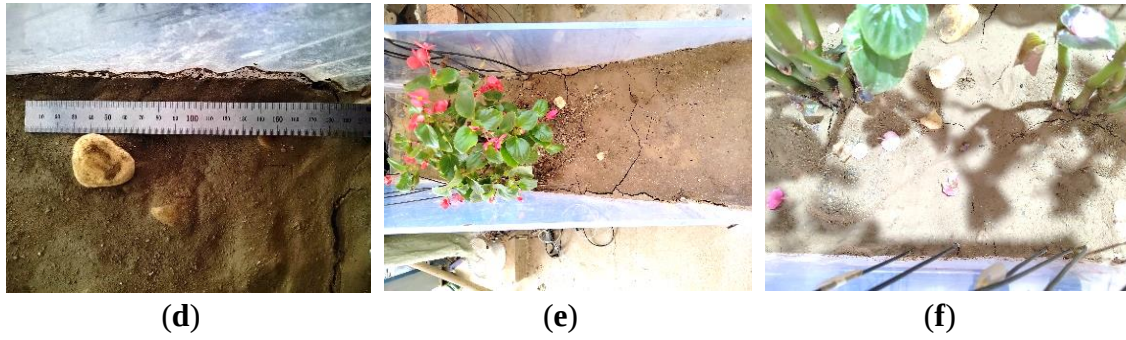


Figure 14. Crack development on the surface of soil: (a) Surface crack due to wetting collapse after rainfall; (b) Drying tiny cracks at the edge; (c) tiny cracks after further drying; (d) Shrinkage cracks at the edge; (e) Cracks in the middle; (f) Tiny cracks between plants.

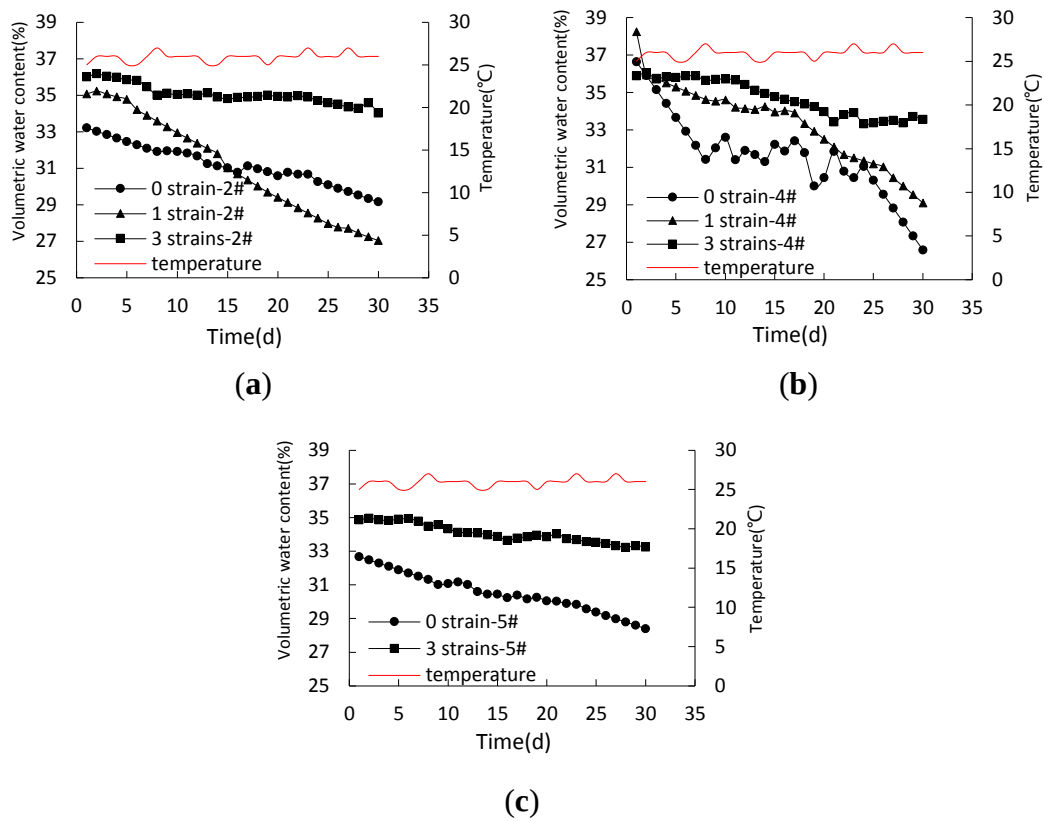
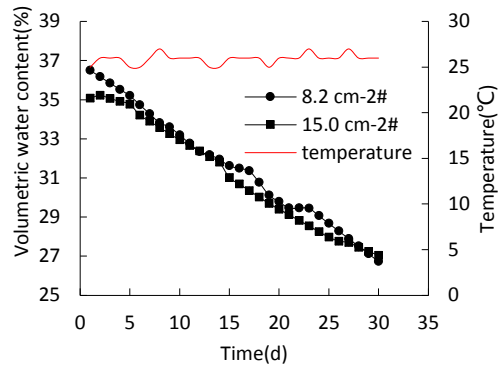
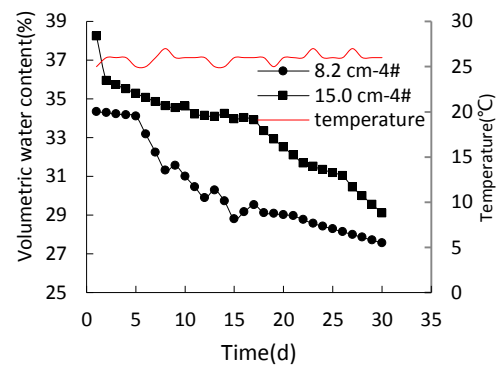


Figure 15. Response of volumetric water content along the depth of the middle axis in the models (2#, 4#, 5#) with different number of plants during DRYING period after rainfall with intensity of 222 mm/h: (a) Volumetric water content versus time relationship curve measured by sensor 2# near the root dense area; (b) Volumetric water content versus time relationship curve measured by sensor 4# near the root tip area; (c) Volumetric water content versus time relationship curve measured by sensor 5# near the area without root.

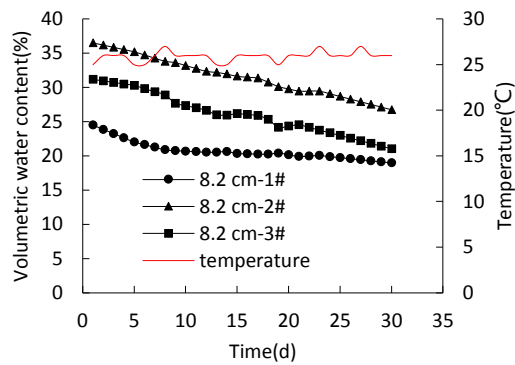


(a)

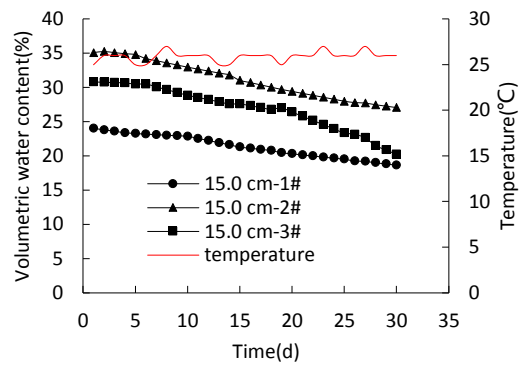


(b)

Figure 16. Response of volumetric water content along the depth of the middle axis in test groups MT1 and MT3 with one strain of plant during DRYING period after rainfall formed different initial water storage depths of 8.2 cm or 15.0 cm: (a) Volumetric water content versus time relationship curve measured by sensor 2# near the root dense area; (b) Volumetric water content versus time relationship curve measured by sensor 4# near the root tip area.

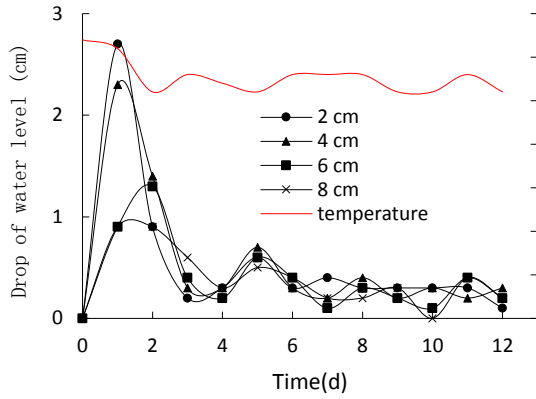


(a)

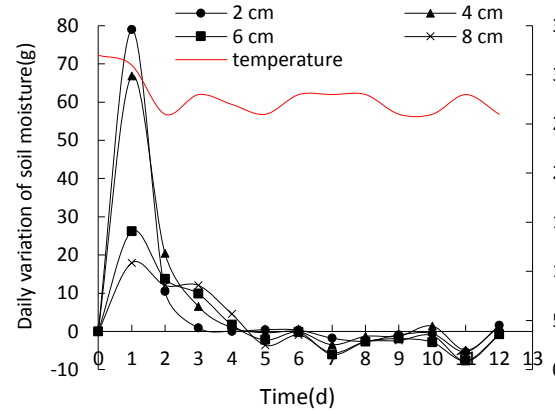


(b)

Figure 17. Response of volumetric water content at 5cm sub-surface along the width direction in the models (1#, 2#, 3#) with one strain of plant during DRYING period after rainfall formed different initial water storage depths: (a) Volumetric water content versus time relationship curve with initial water storage depth of 8.2 cm; (b) Volumetric water content versus time relationship curve with initial water storage depth of 15.0cm.

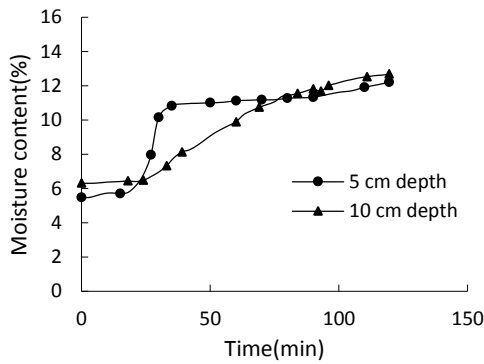


(a)

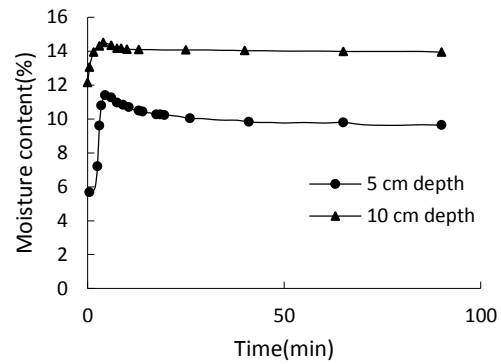


(b)

Figure 18. Results of water absorption test with different initial air-exposed lengths of absorption belts: (a) Relationship curve of water level drop in the cup and temperature changing versus time; (b) Relationship curve of daily variation of soil moisture and temperature change versus time.

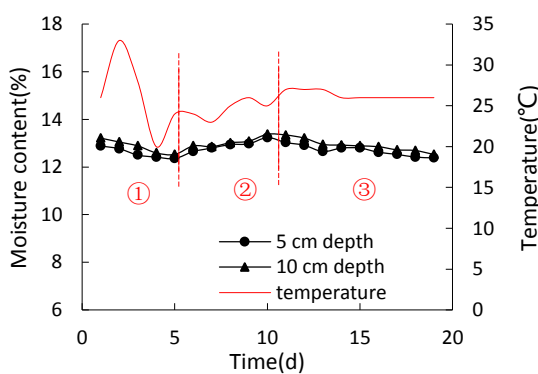


(a)

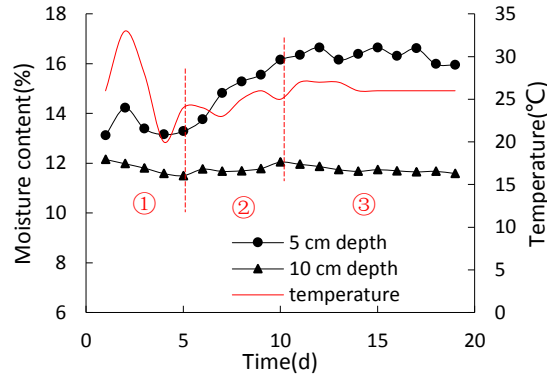


(b)

Figure 19. Response of moisture content at 5cm and 10cm sub-surface with time in RAINFALL stage with water stored in different plants: (a) Relationship curve of moisture content versus time in Group 1 with water stored in succulent ROOT plant; (b) Relationship curve of moisture content versus time in Group 2 with water stored in succulent STEM plant.



(a)



(b)

Figure 20. Response of moisture content at 5cm and 10cm sub-surface with time and temperature

in DRYING stage with water stored in different plants: (a) Relationship curve of moisture content and temperature versus time in Group 1 with water stored in succulent ROOT plant; (b) Relationship curve of moisture content versus time in Group 2 with water stored in succulent STEM plant.

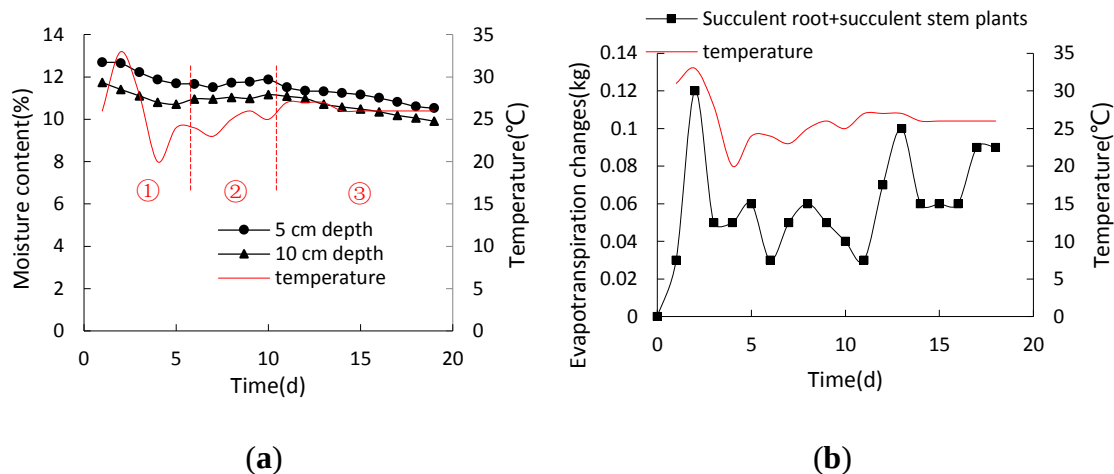


Figure 22. Response of water change with time and temperature in Group 3 with water stored in both succulent root and succulent stem plants in DRYING stage: (a) Relationship curve of moisture content and temperature versus time at 5 cm and 10 cm sub-surface; (b) Relationship curve of evapotranspiration change and temperature versus time.

2. Same effective numbers at least 3 or more
Please re-consider the concept of effective numbers.
Table 3.

Reply: Thank you very much for your advice. We have modified the table and the text.

Table 3. Model test scheme of the slab trench on rocky desertification slope under rainfall.

Test ID	Rainfall Intensity (mm/h)	Number of Plants	Rainfall Duration (min)
MT1	98.0	1.0	225
MT2	148	1.0	225
MT3	222	1.0	225
MT4	222	0.00	90.0
MT5	222	3.0	225

Thank you for the kind advice again. If you have any questions, please contact us with out hesitate.

Yours sincerely,

Prof Cheng Zhou (the corresponding author)