
**长安大学**  
 CHANG'AN UNIVERSITY

**In-situ Observation on Rainfall Infiltration in Loess**

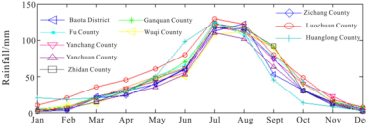
Li ping  
 Department of Geological Engineering,  
 Chang'an University, China  
 Japan  
 October, 2012

The main parts

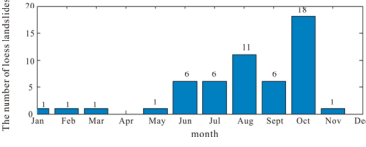
1. Introduction
2. Introduction of monitoring area
3. Monitoring site and instrument arrangement
4. Analysis of the monitoring results
5. Problem discussion

Introduction

**Rainfall distribution**




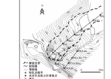
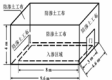



**Landslides distribution**



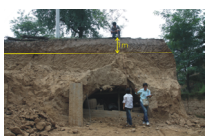
Introduction

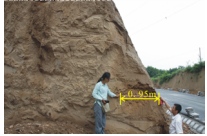
The natural and artificial rainfall tests to determine the depth of rainfall infiltration previously

	X.B.TU 2-3 m		Zhan liangtong 2 m
	A.G.Li 4 m		Li weichao, Dai fuchu 2 m
	Liu haisong 2.7 m		Ding yong, Wang jiading 4 m


Introduction


The depth of rainfall infiltration in upright loess profile

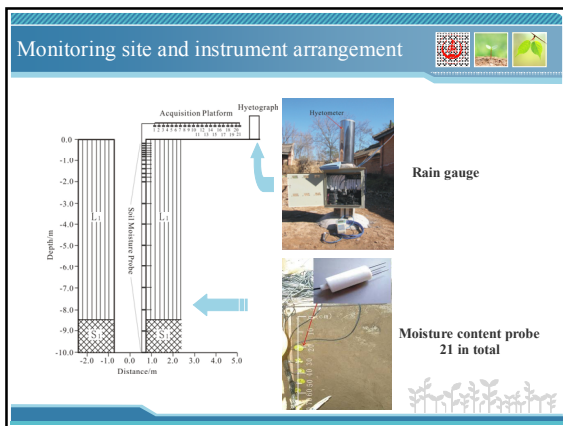
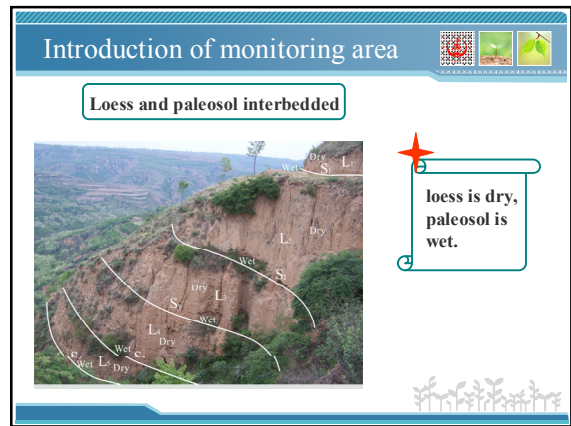
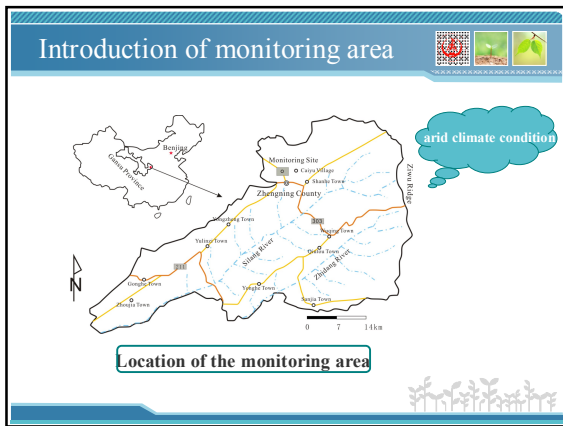

 Ganquan county, Shaanxi province  
 The vertical depth of rainfall infiltration is about 1 m we observed


 Ganquan county, Shaanxi province  
 The horizontal depth of rainfall infiltration is about 0.95 m we observed

Introduction

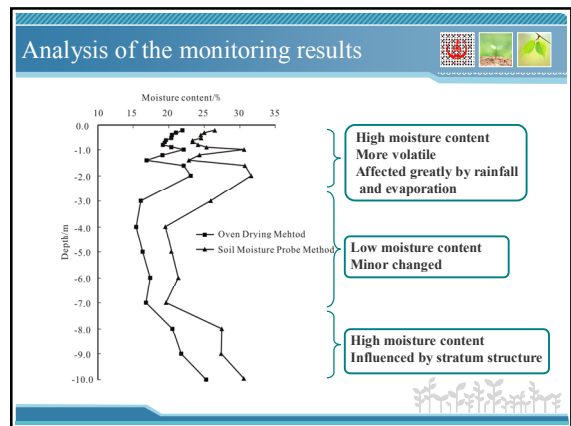
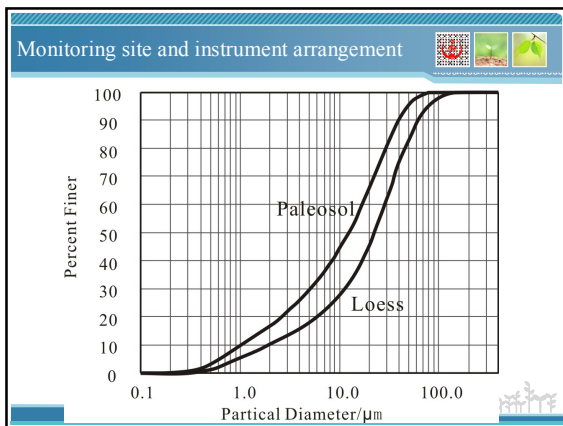

 ⇒ sinkhole  
 These water paths only occur in unloading area which always in the edge of loess tableland, but rare in the center

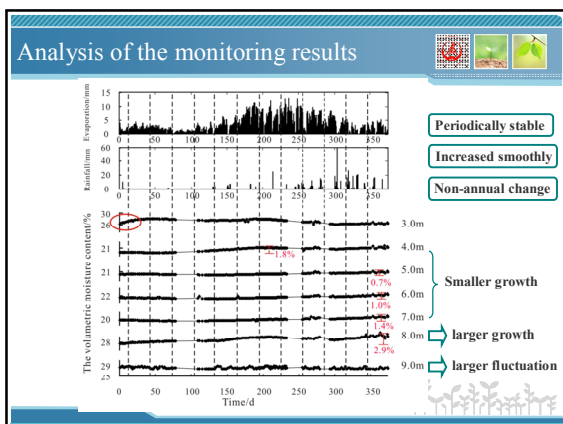
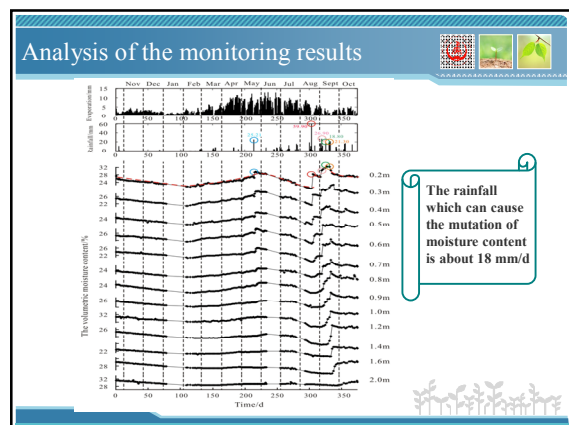
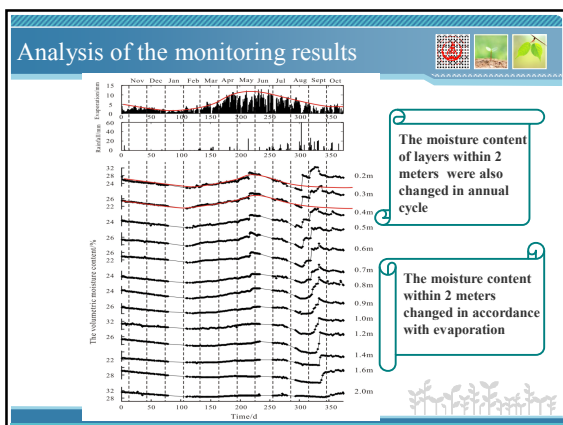
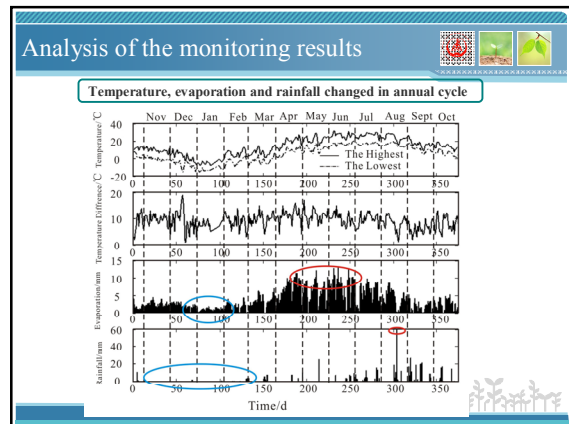
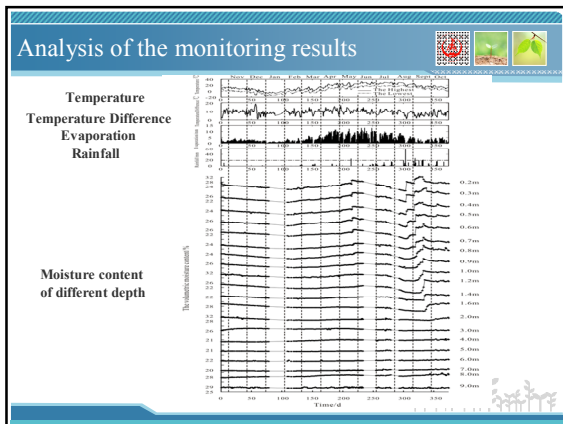

 ⇒ interconnected crack



### Monitoring site and instrument arrangement

Physical and mechanical indexes	Loess	Paleosol
Bulk density(g/cm <sup>3</sup> )	1.44	1.64
Dry density(g/cm <sup>3</sup> )	1.24	1.35
Moisture content(%)	16.3	21.9
Saturated moisture content (%)	43.6	37.2
Specific gravity	2.70	2.71
Void ratio	1.177	1.007
Plastic limit(%)	21.7	21.3
Liquid limit(%)	29.4	31.6
Compressibility coefficient(MPa-1)	0.82	0.62
Coefficient of collapsibility	0.079	0.043
Vertical coefficient of permeability (m/s)	$2.55 \times 10^{-6}$	$5.36 \times 10^{-8}$
Horizontal coefficient of permeability (m/s)	$1.72 \times 10^{-6}$	$2.12 \times 10^{-8}$
Clay content( $\leq 2 \mu\text{m}$ :%)	17.9	29.6





### Problem discussion

What is the main factor that affect the annual variation of the background value of moisture content ?

How far can the moisture migrate in unsaturated zone in loess tableland which groundwater level is often very deep? Whether it can reach the groundwater level and become the main part to supplement groundwater?