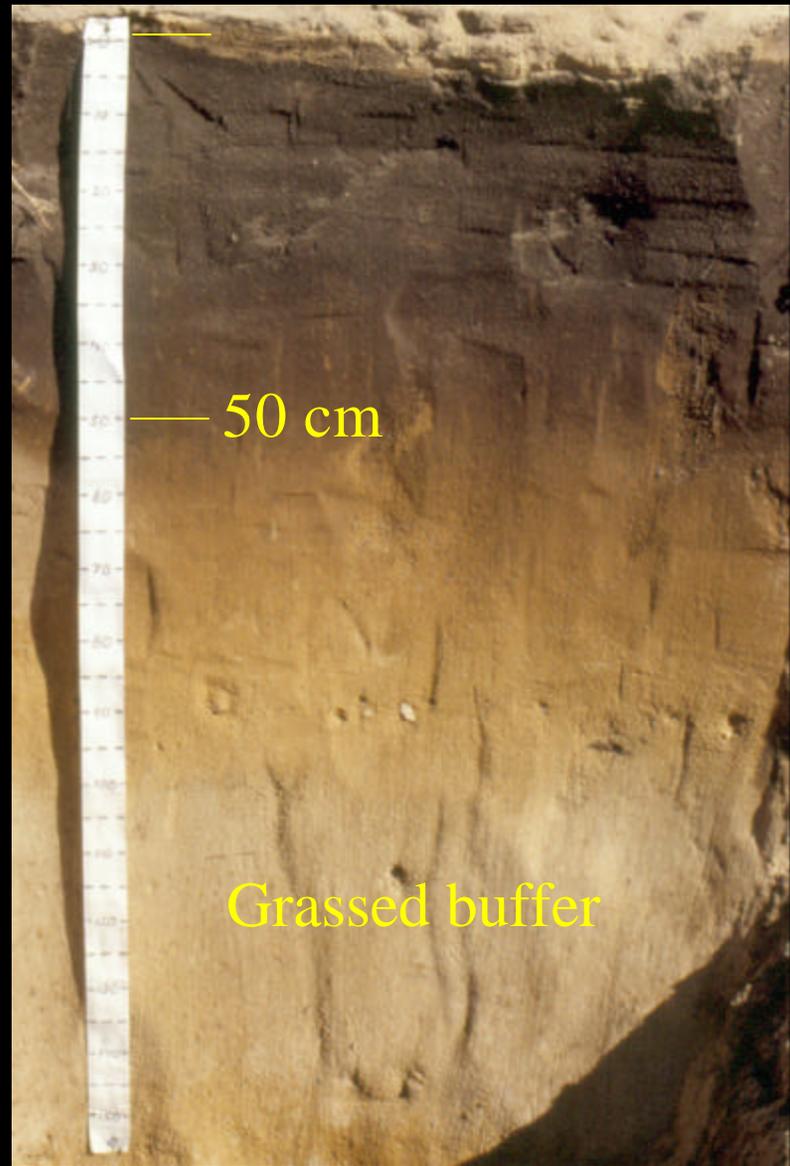
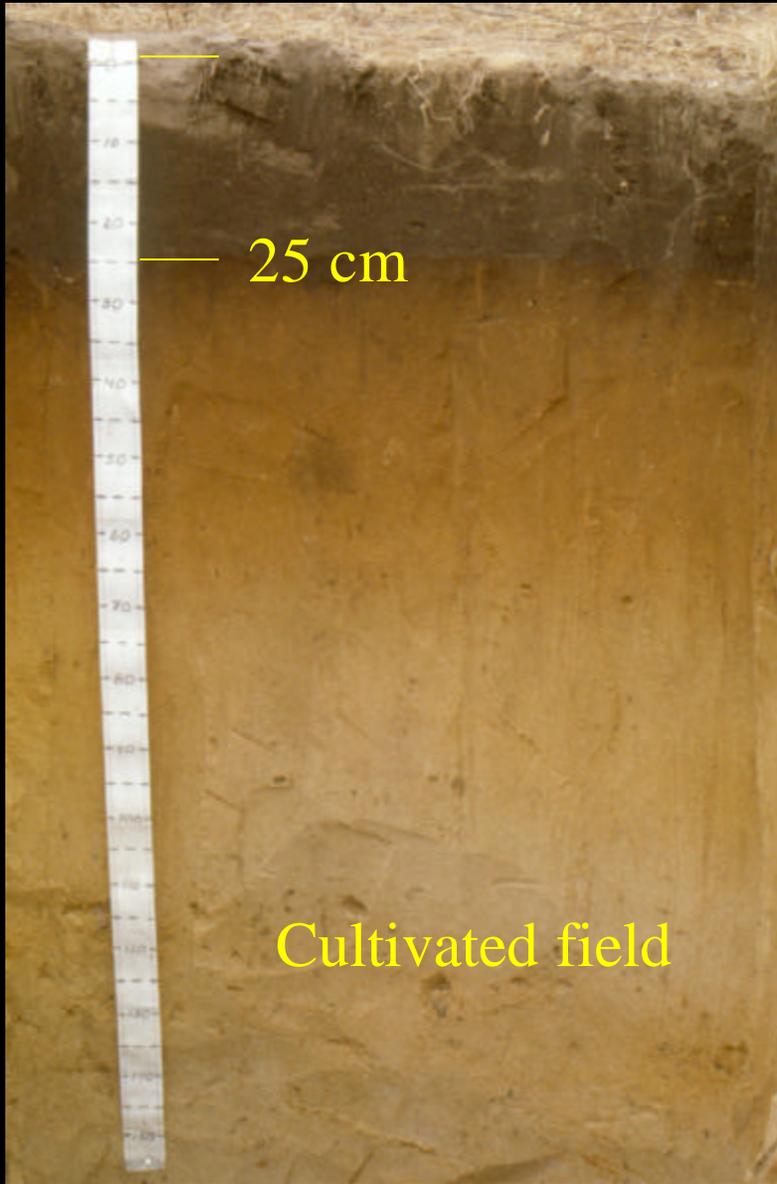
The image shows a spiral-bound notebook with a light brown, textured cover. The spiral binding is on the left side. The text is centered on the cover in a dark brown, serif font.

Measurement of Use- dependant/dynamic Soil Properties

C.A. Seybold and R.B. Grossman

NSSC

Lincoln, NE



Use-dependant Soil Properties

✍ No standard data set

– commonly measured properties

- organic matter
 - bulk density
- aggregation
- water transmission (infiltration, k-sat)
- biological

✍ No standard methods

- ### – soil type, climate, parent materials, scientist

Field Methods

bulk density
organic matter
aggregate stability
water transmission



Soil Quality Test Kit

Infiltration

Bulk Density

Water Content

Aggregate Stability

Slake Test

Nitrate

EC

pH

Soil Respiration

Earthworms



Other Field Methods

- ✍ Bulk density
- ✍ Infiltration
- ✍ Saturated hydraulic conductivity
- ✍ Penetration resistance
- ✍ Morphology index
- ✍ Aggregate stability
- ✍ Soil strength

✍ Organic Matter -
EDTA method



Bulk Density Variable Height Core Method



Variable Height Core Method



**Bulk density
SQ test kit**



**Bulk Density
Compliant cavity**



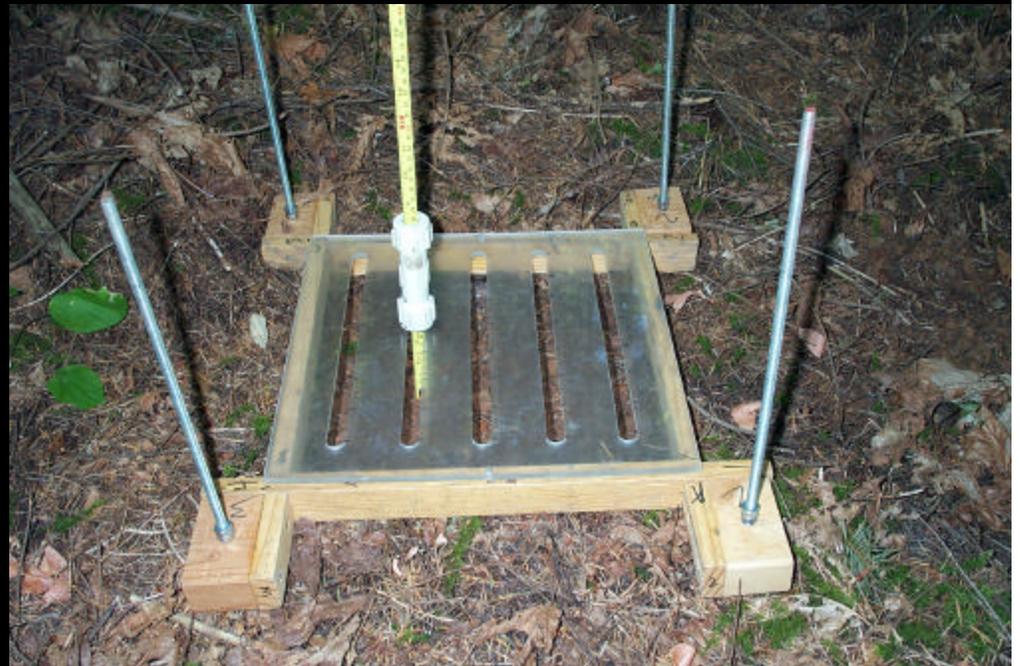
Bulk Density Compliant Cavity Method



Compliant Cavity Method



Bulk Density Frame Method



A photograph of a field with rows of green plants and a path covered in straw mulch. The plants are lush and green, and the straw is a light brown color. The path is in the center of the field, leading towards the background. The text is overlaid on the image.

Soil Organic Matter

EDTA method

Field test

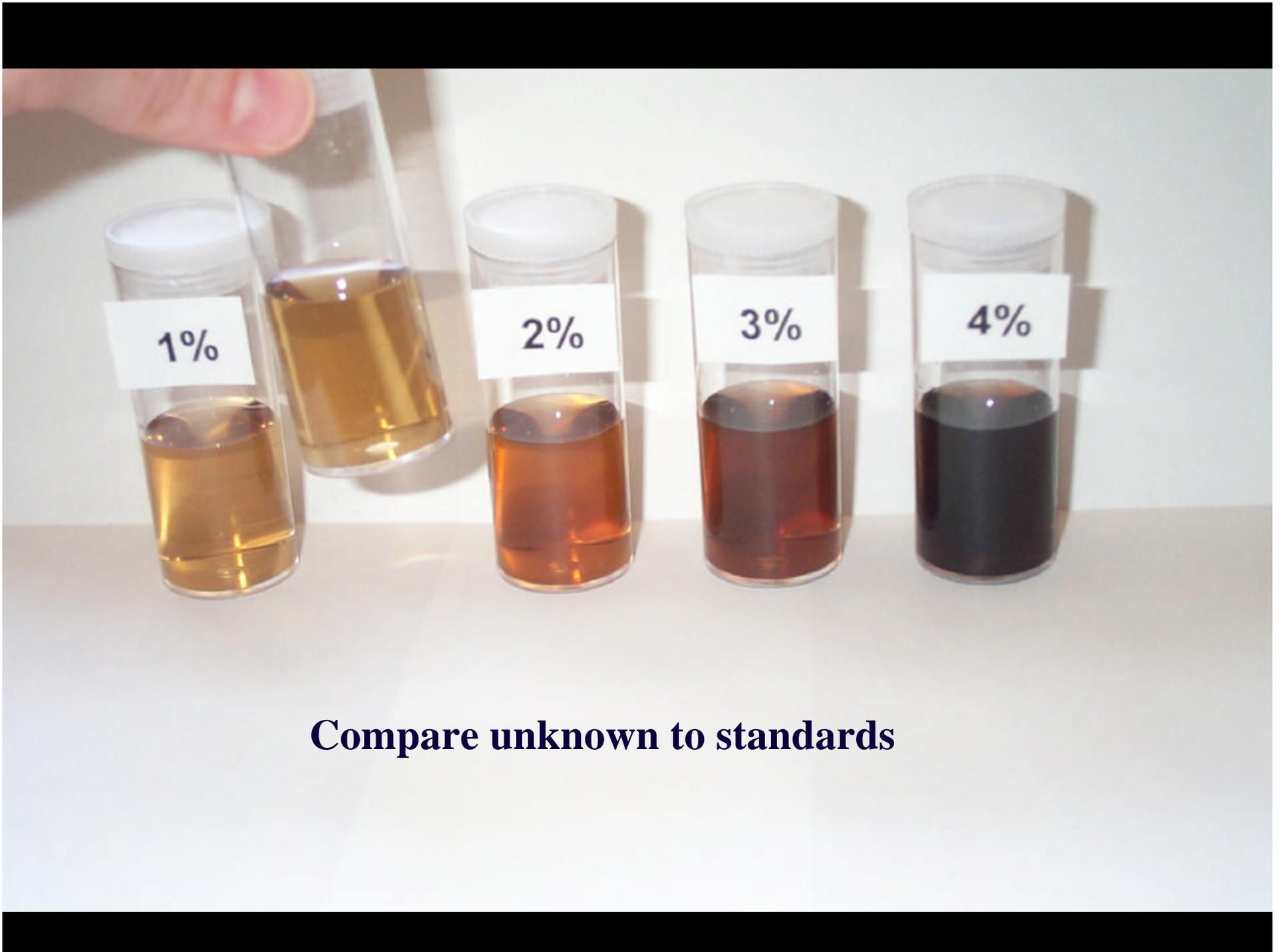
Akron, CO





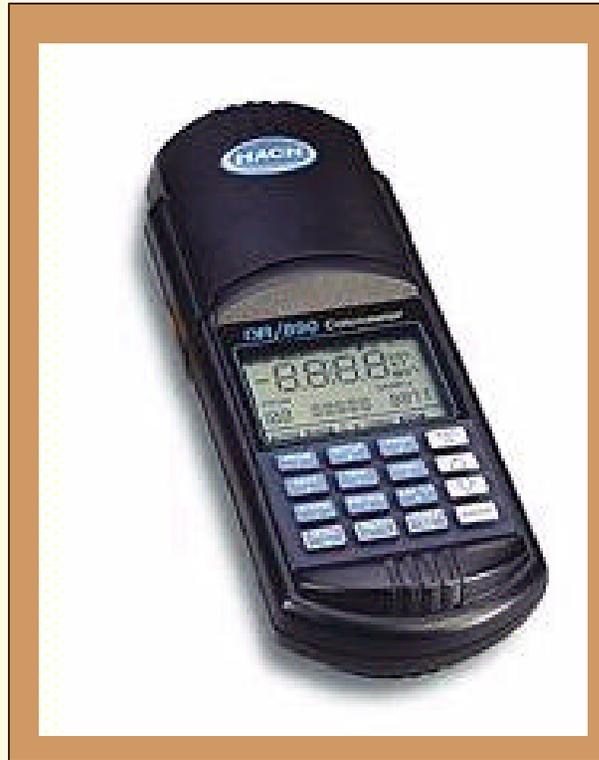






Compare unknown to standards

DR/800 Series Colorimeters



Aggregate stability

✍ SQ kit method

– 0.25 to 2 mm

✍ NSSC method

– 1 to 2 mm

✍ Related tests

– slake test

– morphology index



1- 2 mm

Aggregate Stability

SQ Kit Method

- air dry soil
- 0.25 - 2 mm aggregates
- pretreatment - slowly wets aggregates
- wet sieve, 90 up and down strokes in 3 minutes
- corrects for sand
 - measured

NSSC Method

- air dry soil
- 1 - 2 mm aggregates
- let aggregates stand in water 24 hours
- wet sieve, 20 up and down strokes in 40 seconds
- corrects for sand
 - sand content by feel

SQ Test Kit method

Aggregate Stability - pretreatment



Aggregate Stability - wet sieving



Morphological Index

Describe structure to
30 cm depth



(East Lansing, MI)

Properties

- Depth
- water state
- Texture (% clay)
- Structure
- Rupture resistance

- Crust
- Macropores
- Cracks

s-f-gr vfr

m-f-sbk vfr

m-f-abk vfr

m,s-f-sbk vfr



(Stirling, CO)

4.6

Texture-wt class	Structure class	Rupt-Res class
---------------------	--------------------	-------------------

C	s-f-gr (5)	vfr (5)
---	------------	---------

C	m-f-sbk (4)	vfr (5)
---	-------------	---------

C	m-f-abk (4)	vfr (5)
---	-------------	---------

C	m,s-f-sbk (4.5)	vfr (5)
---	-----------------	---------



cm

4

9

22

30

C = 18 - 40% clay



Cultivated

3.6

Grass

4.0

Prairie

4.6

(Twin Lakes, NE)

Morphological Index

18 year tillage study
corn-soybean rotation
Silt loam

Conventional Tillage

2.47 (0.51)

No Tillage

4.24 (0.48)

(East Lansing, MI)

Morphological Index

10 year tillage study
corn-soybean rotation
Sandy loam

Conventional Tillage

3.38 (0.11)

No Tillage

3.61 (0.34)

Water Transmission Properties

Infiltration rate

- single ring
- double ring
- constant head

Saturated hydraulic conductivity

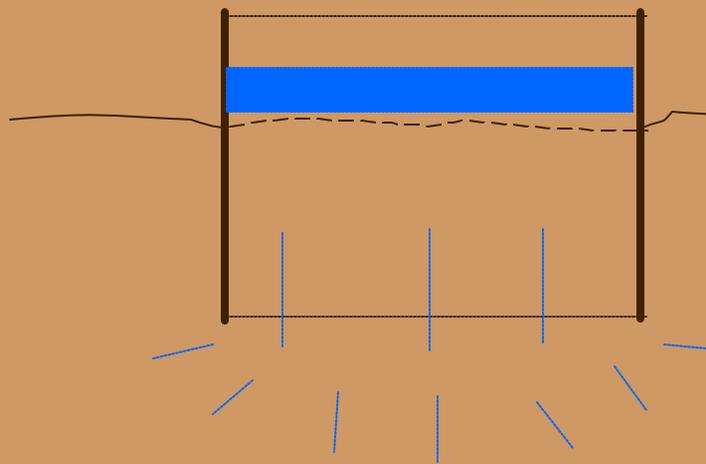
- amoozometer



Infiltration - double ring

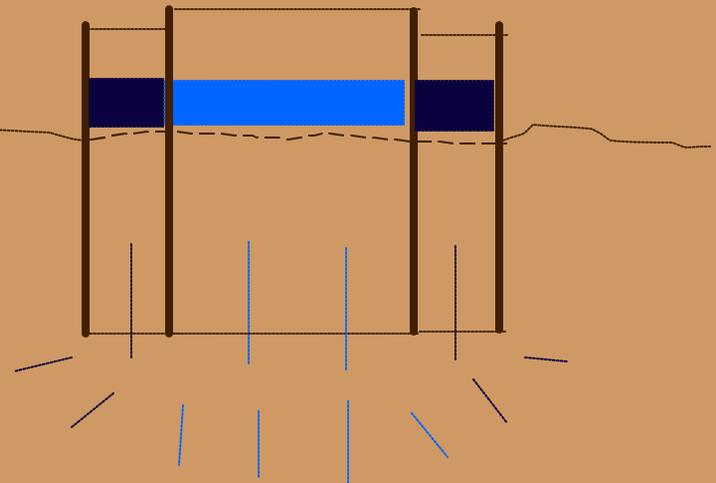


Single ring



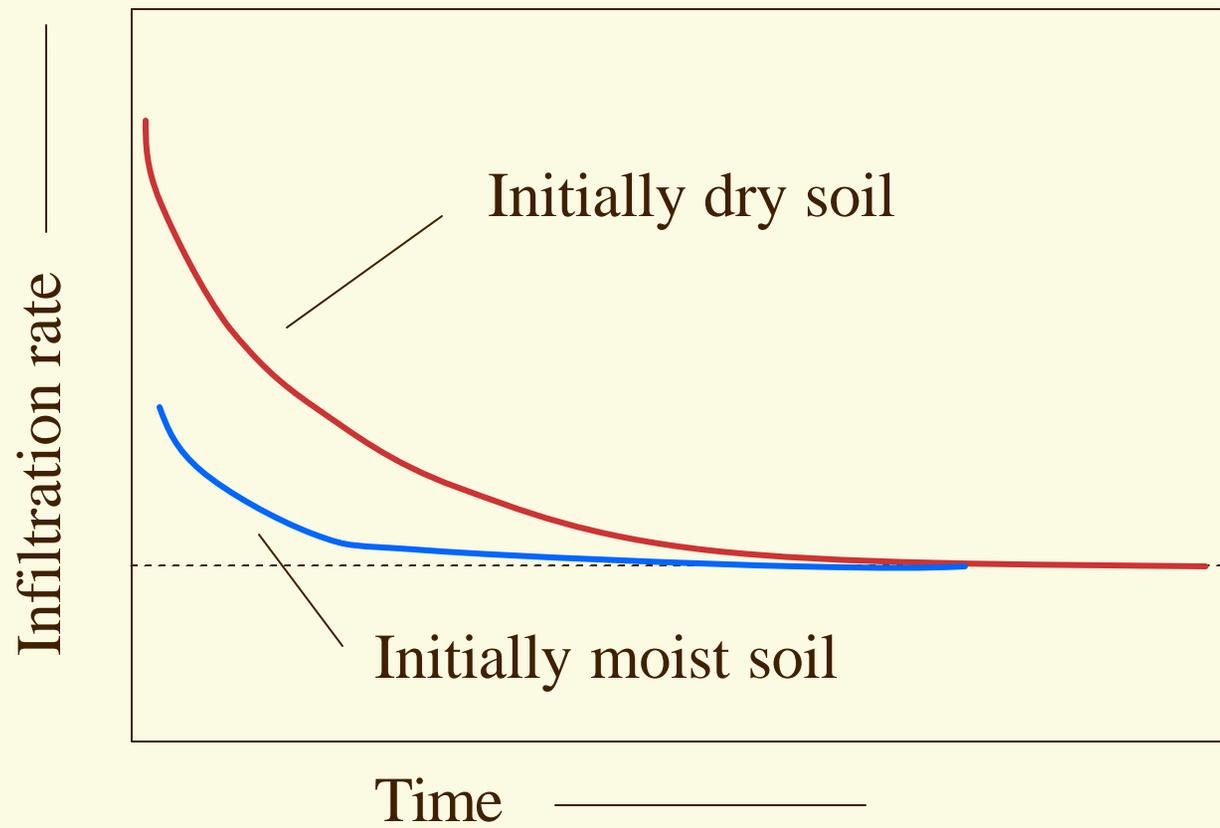
Soil surface

Double ring



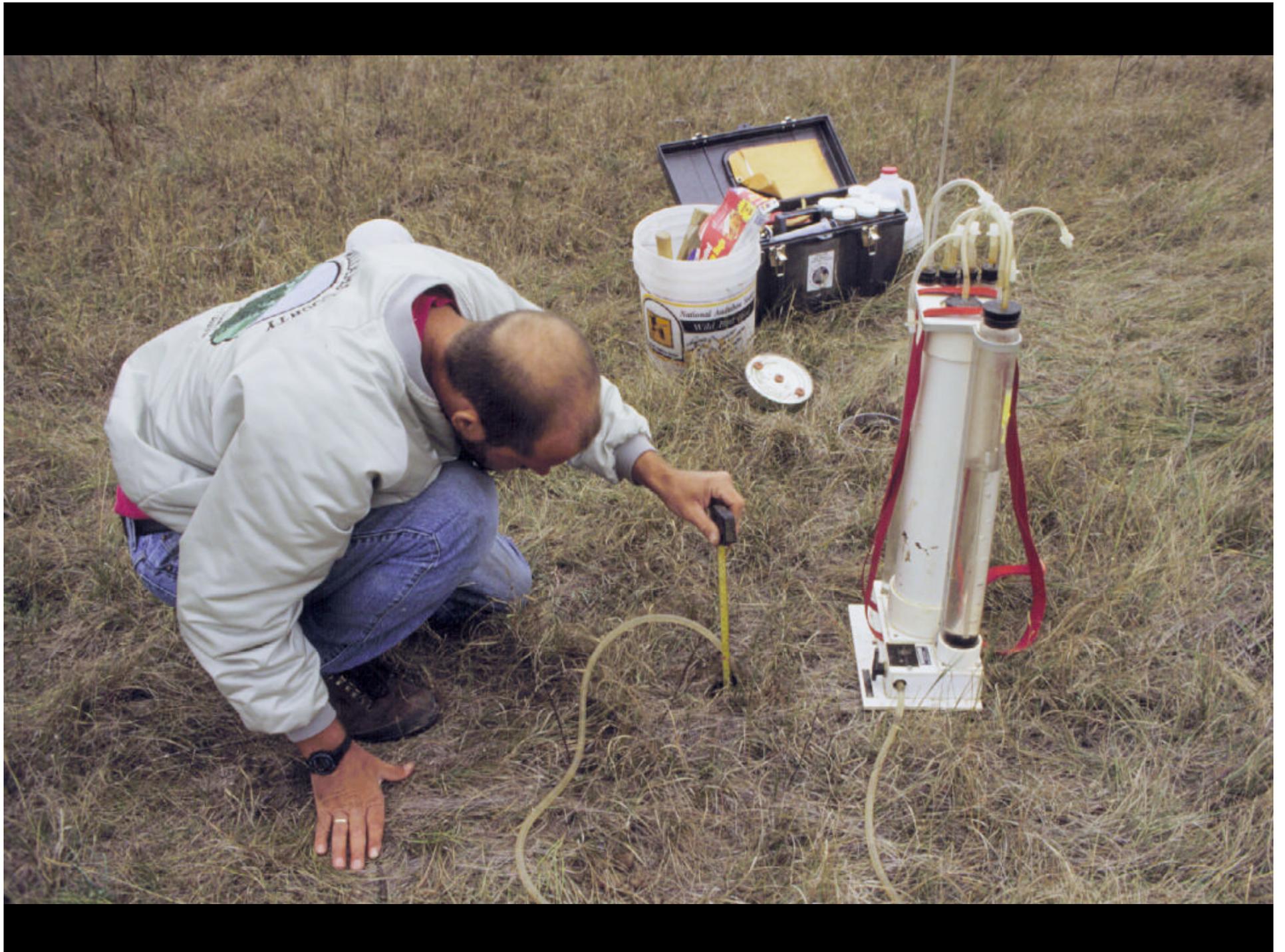


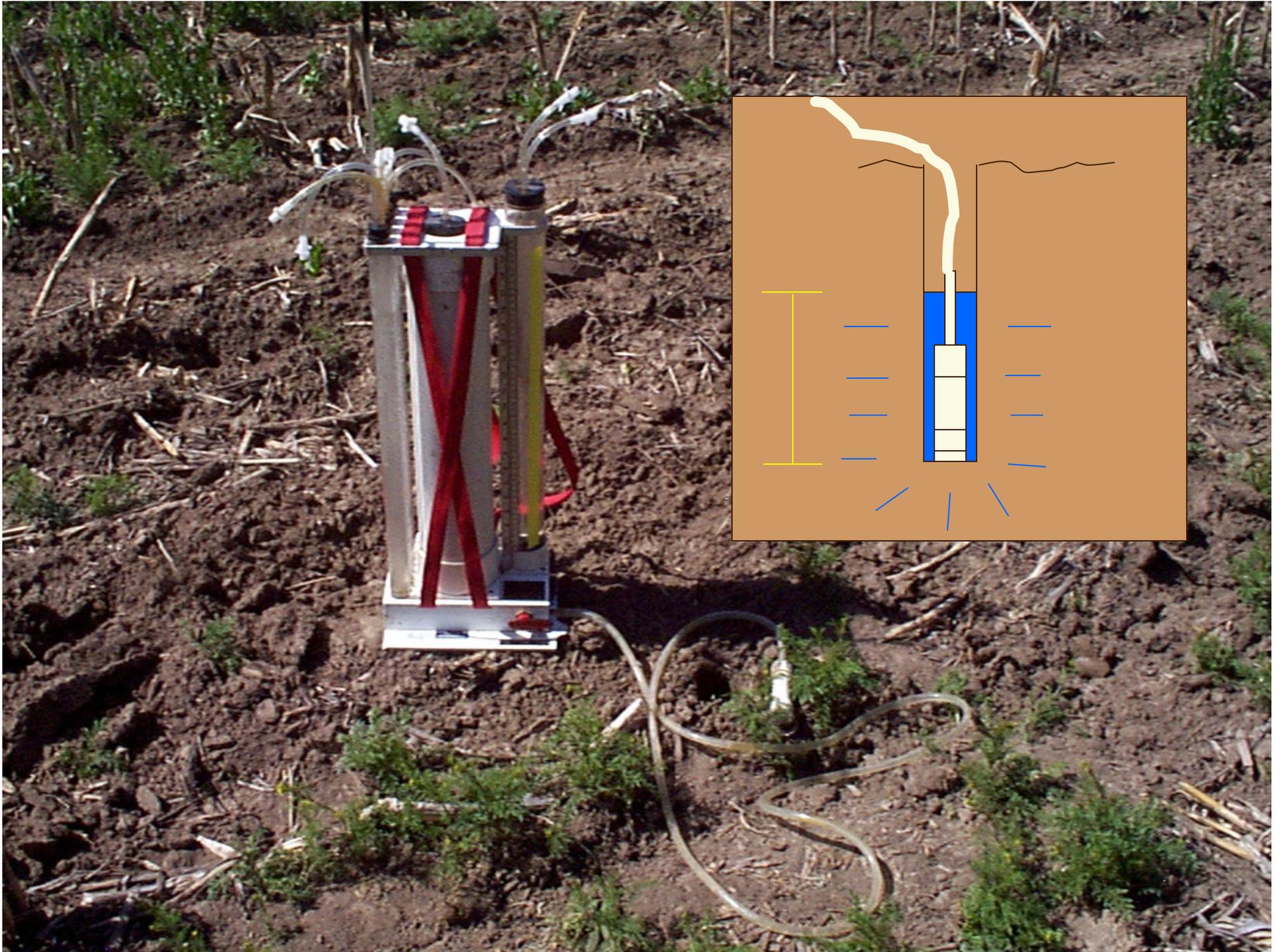




(Hillel, 1982)







Soil Strength



Resistance to compaction

