Checklist: Is my soil fit for climate change?

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1 LAND USE

Arable land	1
Forest, silviculture	4
Pasture, grassland, meadow	4
Perm. crops (e.g. orchard, vine,...)	3

MANAGEMENT

Crop rotation:	Good	1	Bad	0
Catch crops:	Yes	1	No	0
Green manure:	Yes	1	No	0
Greening:	Yes	1	No	0

Date:

Field name:

Expert/Name:

Score for 2 layers:	23 - 25	19 - 22	< 19
Score for 3 layers:	30 - 33	25 - 29	< 25
Evaluation:	++	!	!!

2 CONSIDERING THE SURROUNDINGS

Area:	Flat	1	Slightly inclined	1	Steep	0	
Topography:	Hilltop	0	Slope	0	Slope foot	1	Plain 1
Structural elements:	Hedges	1	Trees	1	None	0	
Signs of soil erosion:	Yes	0	No	1			
Plant stand:	Well developed	1	Poorly developed	0	None	0	

3 VIEW FROM THE INSIDE

	Depth [cm]	Colour	Texture	Stones	Smell	Roots	Earthworms	pH WATER	pH NEUTRAL SALT	Compaction	Turbidity
Layer 1	.....	.....	s u t l / S U T L	< 10% 1	Good 1	Many 1	Many 1	< 6.5 0	< 5.9 0	No 1	None 1
				10 - 25% 1	Bad 0	Some 1	Some 1	6.5 - 7.5 1	5.9 - 6.9 1	Yes 0	Medium 0
				> 25% 0		None 0	None 0	> 7.5 0	> 6.9 1		Strong 0
Layer 2	.....	.....	s u t l / S U T L	< 10% 1	Good 1	Many 1	Many 1	< 6.5 0	< 5.9 0	No 1	None 1
				10 - 25% 1	Bad 0	Some 1	Some 1	6.5 - 7.5 1	5.9 - 6.9 1	Yes 0	Medium 0
				> 25% 0		None 0	None 0	> 7.5 0	> 6.9 1		Strong 0
Layer 3	.....	.....	s u t l / S U T L	< 10% 1	Good 1	Many 1	Many 1	< 6.5 0	< 5.9 0	No 1	None 1
				10 - 25% 1	Bad 0	Some 1	Some 1	6.5 - 7.5 1	5.9 - 6.9 1	Yes 0	Medium 0
				> 25% 0		None 0	None 0	> 7.5 0	> 6.9 1		Strong 0

Instructions

You need: A soil profile, vessels for shaking, distilled water, pH indicator strips, pH indicator solution, tape measure, spatula

1 The first step is to record the **AGRICULTURAL MANAGEMENT** and **LAND USE** of the site. A diverse **crop rotation**, the cultivation of **intermediate crops**, and application of **green manure** have a positive effect on the evaluation.

2 **CONSIDERING THE SURROUNDINGS:** In a next step, site-specific features are taken into account. The **inclination** and topography of the site as well as the surrounding **structural elements** (hedges, trees, etc.) are evaluated. Moreover, immanent **signs of soil erosion** and **plant growth** are considered.

3 **VIEW FROM THE INSIDE:** we now take a closer look into the **soil profile** of the site. The individual soil layers (horizons) are first delimited from each other by optical characteristics. The following parameters are recorded for the respective layers (minimum 2):

Colour: What is the dominant colour of the soil layer? (e.g., black, brown, yellow, reddish, grey, etc.)

Texture: Soil texture is estimated by simple finger testing (images 1-4).

Image 1
SAND
» cannot be rolled out, gritty
» sample crumbles
» individual grains visible
» sample grinds between teeth

Image 2
SILT
» can be rolled out
» crumbles during 2nd roll-out
» single grains adhere in finger groove, sample does not stick
» sample feels velvety

Image 3
CLAY
» can be repeatable rolled out
» friction surfaces shine
» sample is greasy, sticky
» plastically malleable

Image 4
LOAM
» Mixture of sand, silt and clay (in ~ same proportions)
» can be rolled out
» sticky

Stones: The volumetric stone content (>2mm) is roughly estimated (image 5).

Smell: Does the soil have a good or rather bad (moldy, pungent) smell?

Roots: Are many, some or no roots recognizable?

Earthworms: Are earthworms present or earthworm tunnels recognizable?

pH in water: Measurement with pH indicator strips (image 6) or electrode.

pH in neutral salt: Measurement with pH indicator solution (image 7) or electrode.

Compaction: Are compactions recognizable? (compaction probe, testing with e.g. spatula).

Turbidity: The testing of turbidity allows to draw a conclusion on soil aggregate stability. Soil is mixed with distilled water (1:3), shaken and put aside to rest. After 30 minutes of sedimentation, the assessment is made. The more clouded the protruding liquid (image 8), the more unstable the soil aggregates.

Image 5

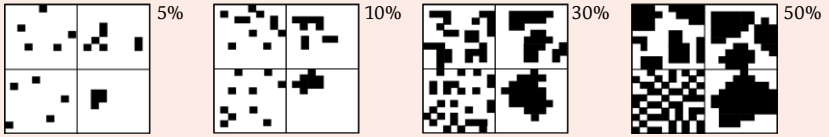
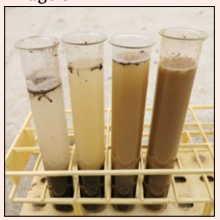


Image 6

Image 7

Image 8



Evaluation

The checklist enables the soil field assessment of a site in terms of climate fitness. The recording of the individual parameters is carried out step by step. **Points are assigned to each parameter which results in an overall evaluation score:**

++ **Climate-fit**
Continue preservation measures

! **Need for action**
Preservation and amelioration measures required

!! **Acute need for action**
Carry out amelioration measures and consider changes in management

