



Soil of the Year 2008: Cambisol/ Arenosol („Braunerde“)



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Curatorship Soil of the Year



Cambisol based on gneiss from the region
Waldviertel/ Austria
(Foto H. Bauer)



Cambisol based on granite from the region
Bavarian forest/Germany
(Foto: H. Förster)

Characteristics

International classification (WRB): Cambisol or Arenosol
German classification: Braunerde

What are Cambisols and what do they look like?

Cambisols have a humic A-horizon above a browned B-horizon, and the parent material (C-horizon). They are formed on different hard and soft sediments, e.g. drifting sands, loess or

basalt, granite, gneiss, sandstone or stone rich colluvial material. Their main characteristic is a visible brown horizon.

How are Cambisols formed?

Besides the humus forming in the A-horizon, the browning B-horizon is the dominant process to form the characteristic Cambisol profile in a moderate-humid climate. The weathering of iron containing minerals releases iron oxides, which accumulate and form the characteristic brown colour. Weathering is also linked to the new formation of clay minerals. Under forest cover, Cambisols are often acidified and develop into Podzols.

What is the functional relevance of these soils for humans and the environment?

Depending on different parent materials, Cambisols can be rich or poor in their nutrient content. Cambisols fulfil relevant soil functions for humans, crops, and animals. Due to their high stone content and their shallow rooting zone in the mountainous areas, and their low base content in the northern lowlands, they are mostly used as forest sites and serve as recreation areas.

Sandy Cambisols are also used for agriculture. In dry summers they suffer from drought, but with sufficient precipitation and fertilization input they have the potential to produce moderate to high yields. Fertile deep Cambisols are associated with para-brown earth on loess or marl material. They are rich in bases and nutrients and have a high water holding capacity due to their high silt content. In favourable climatic regions these soils provide very high yields, e.g. in the pre-Alps and the Pannonian basin in Austria.

What are the risks for these soils?

The filter and buffer characteristics of sandy and base-depleted Cambisols are relatively poor. That is why pollutants can be easily leached out to the groundwater. Depending on the region, Cambisols are endangered by water erosion, while wind erosion could be a problem on the wide open plains. Soil compaction caused by intensive tillage and management with heavy machinery influences a negative crop growth and water balance.

Where can these soils be found?

Cambisols can be found in many different forms associated with other soil types. In the lowlands, Cambisols are associated with Podzols and para-brown earth soils, or Chernozems. In mountainous regions they are associated with Ranker or Rendzina, "raw" soils without a B-horizon. Often Cambisols are found in natural deciduous forests. They show podzolic characteristics under heath vegetation and coniferous forests.

Outside Europe, Cambisols are common in North-America and southern parts of Siberia, but can also be found in Australia and New-Zealand. Relict forms occur in the desert areas of North- and South-Africa, and on the Indian sub-continent where, in former times, there was a different climate.

Where you get more information ?

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Bodenkundlich orientierte Institute an Hoch- und Fachschulen
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Boden: www.bgr.bund.de

www.dbges.de; www.bvboden.de, www.bodenwelten.de

More material (Flyer, Poster, CD's) are available: frielinghaus@zalf.de