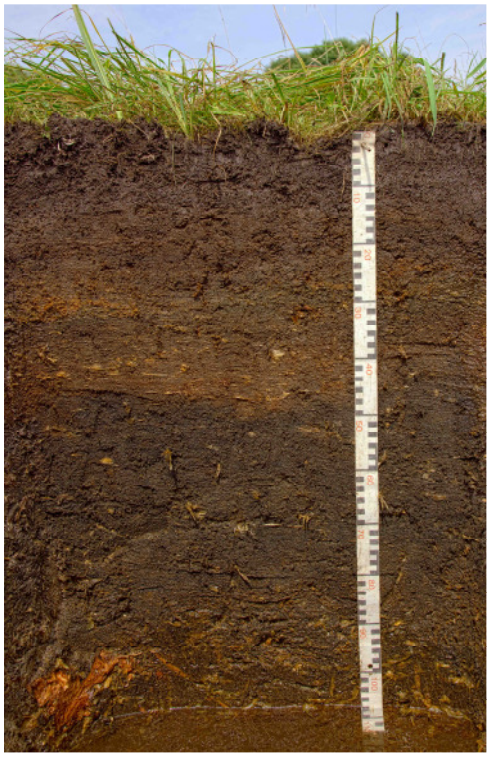
Soil of the Year 2012 – Lowland Peat Soil



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Fotos: D. Devecioglu, J. Zeitz, M. Zauft,

Characteristics

In the international classification: World Reference Base (WRB) peat soils are classified as Histosols

Characterization of peats

Peat soils contain more than 30% organic material (They show a typical dark-brown to black color. Depending on their conservation status, the peat-forming plant residues are more or less visible to the naked eye. The subsoils of peat soils can consist of sand, silt, loam and clay or of special, in lakes

deposited materials, the mud. Depending on their parent material, mud can look white (lime mud), olive green (liver mud from algae) or dark brown (clay mud).

Development and occurrence of peats

Peat soils mainly develop in groundwater-influenced lowlands or along rivers and lakes. Globally they are primarily to be found in the cool and humid climates of the northern hemisphere where excessive water occurs by more precipitation than evaporation.
In Germany peats cover a surface of about one million hectares. Most of the peats and their biggest connected areas (up to 30,000 hectares) are situated in Schleswig-Holstein, Lower Saxonia, Mecklenburg-Western Pomerania, Brandenburg, Bavaria and Baden-Württemberg. The different histosol areas (211,000 hectares) in Brandenburg are mainly used as pastureland
Usually the development of lowland peats is initiated with a paludification process by high groundwater levels or an increasing sedimentation into lakes. In paludification mires dead plant material accumulates under water saturation and air exclusion above the mineral subsoil.
In terrestrialisation mires the peat lies on the bottom of a water body above organic or mineral sediments, called muds. The peats of lowland peat soil areas are formed of dead roots, branches, leaves and sprouts of sedges, reeds, mosses, elders, willows or other swamp plants. As a consequence of an oxygen lack the decomposition processes of the permanently delivered organic materials are only slow and incomplete. Additionally special microorganisms are necessary for the decomposition process. A peat body only increases by few mm a year into the direction of the water surface or the sea centre. The peat increase occurs from the bottom to the top. With a peat layer thickness of more than 30 cm we have a lowland peat soil (Histosol).

Functions and use of lowland peat soils

Natural peat soils are ecologically very valuable. Only conformists, mostly rarities, exceptional animal and plant specialists like the Large Copper, Cotton grass and Sedges are adapted to the high water contents and special nutrient conditions.
Thick peat soils contain up to 2,000 tons of carbon per hectare. Worldwide they are the greatest carbon storages per areal unit.
Former vegetation and climate conditions can be learned from the peat composition. Often traces of settlements and a former use can be found. Therefore peats are important archives of nature and civilization.
For using peats for agriculture, forestry or human settlements, they had to be drained by ditches or drainage systems which seriously and often irreversibly changed the peat properties. With different intensity most German lowland peat soils are actually used as pasture land.
For more than 1,000 years peat has been used as solid fuel, medicine and fertilizer. Until the 1950ies peat digging was carried out industrially. Also bog iron, a formation in peats with iron-rich groundwater infiltration, and lime mud were excavated until the beginning of the 20th century. Today organic material from peat is obtained for medical use on very few sites in Germany.
Because of their rare occurrence, intact German peats close to nature have been put under nature conservation.

Possible dangers for lowland peat soils

Drainage is the main danger for peats close to nature, as drained peat shrinks and the peat soil surface collapses. Oxygen penetrates into the peat soil which until then has been water-saturated. With this process begins the mineralization of the peat. Nutrients and gases like carbon dioxide (CO_2) are released and a carbon sink changes into a carbon source. As well, a climate change can lead to desiccation and destruction of the peat soils. Intensively used peat soils can release climate-affecting gases, e. g. up to 40 tons carbon dioxide per hectare a year.
For conservation and permanent protection of intact lowland peat soils carefully elaborated development strategies are needed.

Who gives information?

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* Kuratorium Boden des Jahres, ZALF Müncheberg, Prof. Dr. Monika Frielinghaus, Tel.: 033432-82316, frielinghaus@zalf.de

* Ad-hoc AG Boden der Bundesanstalt für Geowissenschaften und Rohstoffe sowie der Staatlichen Geologischen Dienste der Länder: www.bgr.bund.de

* Deutsche Bodenkundliche Gesellschaft, AG Bodensystematik:, www.dbges.de;
* Bundesverband Boden: www.bvboden.de,

* Bodenkundlich orientierte Institute an Hoch- und Fachschulen sowie Geologische Landesämter der Bundesländer

Where you get material about the peat soils (posters, flyers)?

* Museum am Schölerberg Osnabrück
  Tel.: 0541-56003-0, info@museum-am-schoelerberg.de

Where you get all information about the Action Soil of the Year and CD's and material about the different soils (2005 – 2011)

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