

Soil of the Year 2011: Vega – brown alluvial soil



Vegen developed from alluvial sediments of the Rhine River; left: autochthonous Vega close to Bietigheim near Rastatt; right: allochthonous Vega near Mannheim.

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The Soil of the year 2011 is the Vega – brown alluvial soil

The German soil type Vega (pl.: Vegen) corresponds to Fluvic Cambisol or Fluvisol (WRB).

What are Vegen and what do they look like?

Vegen are brown, fertile soils within the flood plains of rivers; they are also named as brown alluvial soils. The name Vega originates from Iberia and means “floodplain” or “fertile plain”.

Characteristic properties: dark top soil rich in humus, grey-brown, fine-textured sub soil; the latter is layered and often contains organic matter as well. Below, gravel layers of earlier fluvial sedimentation or topsoils of former alluvial soils may occur. Vegen are flooded only sporadically and are not much influenced by groundwater in their upper part. Thus, they exhibit neither rust-coloured iron oxide accumulations nor grayish-bluish colours.

How do Vegen develop and where do they occur?

Brown alluvial soils (Vegen) exist along large river systems world-wide. They also occur along small and middle-sized rivers, particularly in hilly landscapes in which translocation of soil material by water erosion takes place. Loess regions, which are prone to erosion, are the main sources of the soil material constituting the present Vegen. Due to forest

clearance and subsequent agricultural land use – locally already since the Neolithic period – large amounts of soil material has been eroded.

Changing sedimentation environments and varying groundwater levels produced a small-scale spatial pattern of diverse soils on the alluvial plains. Besides Veges, also groundwater-affected soils (Gleysols) and bogs occur with increasing groundwater influence. If the groundwater influence decreases and episodic flooding does not continue, Cambisols (Braunerden) and Luvisols (Parabraunerden) develop. Two types of Veges are distinguished according to their development. The characteristic brown colour of the “allochthonous Vega” is derived from pre-weathered brown soil material comprised in the alluvial sediments. If the brown colour develops in place, the soil is named “autochthonous Vega”.

In which way are Veges used and what functions do they fulfill?

The soil properties of Veges vary according to the source area of the sediments, in which they have formed. A loose crumbly top soil with rich active soil fauna is mostly followed by a well rootable sub soil. Usually Veges have a high capability for chemical sorption. Thus, nutrients are stored in a form in which they are well available for plant roots, and moreover pollutants are kept from being leached into the groundwater. Besides this purification effect in the course of groundwater renewal Veges also contribute to flood prevention because of their high water storage capability. Because of the great natural fertility of the Veges and their generally sufficient water supply they are preferably used for agricultural production.

Sediment layers of alluvial soils tell, similar to historical archives, about the landscape and its use. The influence of the industrial era and historic mining is locally recorded in alluvial soils by increased values of heavy metals or organic pollutants.

What habitat functions do Veges fulfill?

Under natural conditions a species-rich riparian forest comprising ash, elm, linden, British oak, hornbeam and a diverse herbal layer develops on Veges. Alluvial soils are unique habitats for animals. For instance, earthworm population density is usually very high, and river bank break-off events create ideal hatchery sites for kingfishers.

Which dangers threaten alluvial soils?

Veges are disproportionately highly affected by land consumption because of their location on flood plains, which are generally densely populated. In addition, embankment and draw down of the groundwater table in the frame of river training, gravel mining, water catchment and intensification of agriculture bring natural alluvial dynamics to an end and hence endanger the natural soil inventory in the eco system. Projects along all major rivers, such as the Integrated Rhine Program (IRP) try to reconcile the various users, flooding prevention and flood plain restoration.

Who provide more information?

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- * Bundesverband Boden: www.bvboden.de, www.bodenwelten.de
- * Einschlägige Ämter in der Ad-hoc-AG Boden: www.bgr.bund.de
- * Bodenkundlich orientierte Institute an Hoch- und Fachschulen

Where you can get material?

- * Museum am Schölerberg Osnabrück
Tel.: 0541-56003-0, info@museum-am-schoelerberg.de
- * Kuratorium Boden des Jahres, ZALFMüncheberg, Prof. Dr. Monika Frielinghaus, Tel.: 033432-82316; frielinghaus@zalf.de