

Soil of the Year 2014 Vineyard soil (Aric/Regic Anthrosol)

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Rigosol formed on marl decomposing
(Tertiär)
St. Martiner Baron, Edenkoben,
Rheinland-Pfalz



Rigosol, formed on argillite (Devon),
Zeltingen-Rachtiger Sonnenuhr, Bernkastel-
Kues, Rheinland-Pfalz
(Fotos: LGB Rheinland-Pfalz).

According to the German soil systematics the most vineyard soils are classified as Rigosols. Following the World Reference Base for Soil Resources (WRB) they are termed as Aric Anthrosols (also Regic or Terric Anthrosols).

What are the features of Vineyard soils?

The repeated deep tillage is characteristic of many vineyard soils – the German term for this is “Rigolen”. Often abundant organic fertilizer and soil material, in earlier times also household wastes were added to the soils. Hence, a mixed soil zone developed the typical R horizon. The aim of the repeated deep tillage is the improvement of the water and nutrient supply of the grapevine. In some cases repeated deep tillage was also performed at sites with different land use such as tree nursery and horticulture.

How do Rigosols develop in vineyards?

In many cultivation regions the formation of Rigosols dates back to Roman times. Intensive deep tillage prior to replanting of vines soils were dug over and loosened down to a depth of 1 m. From the 17th century deep tillage down to a depth of 3 m has been reported. In former times this was done excavating ditches by hand every 30 to 80 years (Grabenrigolen), today every 20 to 40 years using machines working at depth of about 0.4 m. The soil is amended with fertilizer, coarse stones are picked out and soil compactions are loosened. Dry stone walls have been constructed in steep slopes on the parent rock, giving firm hold to the soil that has been filled up behind the walls. The so developed terraces were the only option to cultivate the steep rocky slopes with gradients of more than 35° (70 %). The steepest vineyards are the “Engelsfelsen” in the badische Bühlertal and “Calmont” at the Mosel river with 75° and up to 68° decline.

Where are vineyard soils occurring? Vineyard soils cover an area of 102,000 ha in Germany, corresponding to about 0.5 % of the total agricultural cultivable land. They are distributed among 13 growing areas and nine German federal states; regionally they are mostly limited to areas with favorable climatic conditions. Not all vineyard soils are Rigosols as defined by the German soil classification system. The majority of the areas planted with vines have been repeatedly deep tilled; however, also undisturbed soils are present in vineyards. The combination of geology, soil, climate and cultural landscape makes up the so-called wine terroir that determines the character of the wines grown in a specific region.

How are vineyard soils used?

Wine as a special and permanent crop has specific demands on cultivation concerning soil tillage, fertilization and plant protection. Furthermore, the natural scenery of the wine cultural landscape is impressively influenced especially by the terraces with their dry stone walls. The vineyard soils of the steep slopes combine a multifaceted natural environment with an enormous cultural achievement for the construction and maintenance of the vine-growing areas. Hence, they are a substantial part of the cultural landscape. With the soil of the year it is focused on the special soil use and formation through the cultivation of wine. Viticulture shows in an explicit way the linkage between soil cultivation, agriculture and social culture of humans.

Which functions for humans and the environment are achieved by vineyard soils?

Due to their typical position at slopes, in valleys and floodplains, vineyard soils play a key role for the decentralized water retention as well as of nutrients and harmful elements. Thus, they make a major contribution to flood protection and water protection. The soils of historical vineyards are archives of the cultural history and deserve specific protection. The same holds true for the natural scenery of terraced vineyards and the touristic recreational character through the combination of wine cultural landscape and winemaking.

What endangers vineyard soils?

The wine growing area very much declined in the last decades in Germany. Especially the steep slopes have been abandoned and are overgrown with bushes; terraces and walls deteriorate. Land consolidation and site amelioration often go along with massive earthworks. Thereby, the old soil cover and historical terraces are often completely destroyed. Furthermore, especially steep slopes are at risk by soil erosion. Traditionally, plant protection and fertilization are very intensive in viticulture. This leads in part to substantial contamination of soils.

Who provides information?

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Deutsche Bodenkundliche Gesellschaft AG Bodensystematik, www.dbges.de

Bundesverband Boden www.bvboden.de, www.bodenwelten.de

Soil scientific institutes at Universities and Universities of Applied Sciences

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Where do I get information materials?

Umweltbundesamt Dessau-Roßlau: www.uba.de/Publikationen

CD's on all Soils of the Years 2005 until 2014: frielinghaus@zalf.de



Typical viniculture landscape Berncastel-Kues, Mosel, Rheinland-Pfalz (Foto: Moselwein e.V.)



Vineyard dry wall (Foto: DLR Mosel)



Deep soil tillage (rigolen) in former time (l) and today (r) (Foto: Stadtmuseum Oberwesel und Weinland Nahe e.V.)