

The major soil types of Europe

**SOLONETZ**

Soil with subsurface horizon of clay accumulation and high sodium content (from the Russian, *sol*, meaning salt and *etz*, meaning strongly expressed).

Strongly alkaline soil with a subsurface horizon of clay minerals, strong columnar structure and high proportion of adsorbed sodium and/or magnesium ions. Solonetz are normally associated with flat lands in a climate with hot, dry summers or with former coastal deposits that contain a high proportion of salt. Solonetz soil occurs mainly in the Ukraine, Russia, Kazakhstan, Hungary, Bulgaria and Romania. Internationally, Solonetz are referred to as alkali soil and sodic soil, Sols sodiques à horizon B et Solonetz solodisés (France), Natrustalfs, Natrustolls, Natrixeralfs, Natrargids or Nadurargids (Soil Taxonomy).



*Left: Typical landscape of Solonetz with salt crystals on the surface and salt tolerant vegetation; Below: Columnar structure close to the surface of a Solonetz; The map shows the location of areas in Europe where Solonetz are the dominant soil type.*

Cover 0.5 % of Europe.



**UMBRISOLS**

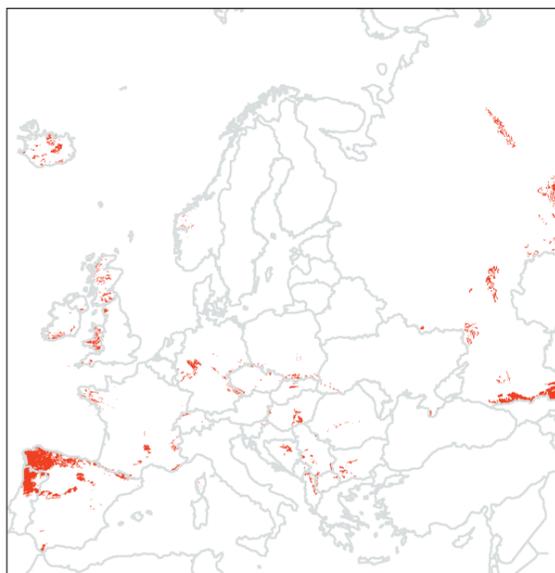
Soil with dark, acid, surface horizon rich in organic matter (from the Latin, *umbra*, meaning shade).

Umbrisols generally develop in cool and humid climates, where precipitation considerably exceeds evapotranspiration. They are usually associated with acid parent materials. In other mapping systems, these soils are classified as Umbrisols and Humitropepts (Soil Taxonomy), Humic Cambisols and Umbric Regosols (FAO), Sombric Brunisols and Humic Regosols (France).



*Left: Umbrisols generally develop under woodland; Below: Umbrisols have dark organic matter rich surface horizons; The map shows the location of areas in Europe where Umbrisols are the dominant soil type.*

Cover 2.5 % of Europe.



**VERTISOLS**

Seasonally cracking soil, rich in swelling clays (from the Latin, *vertere*, to turn).

Vertisols are rich in swelling clay minerals and occur primarily in level landscapes under climates with pronounced dry and wet seasons. Vertisols shrink and swell upon drying and wetting. Deep wide cracks form when the soil dries out and swelling in the wet season and creates polished and grooved ped surfaces (*slickensides*) or wedge-shaped or parallel-sided aggregates in the subsurface vertic horizon. The landscapes of a Vertisol may have a complex micro-topography of micro-knolls and micro-basins called "*gilgai*". Vertisols are also known as black cotton soil (USA), regur (India), vlei soil (South Africa) and margalites (Indonesia).



*Far left: Vertisols open wide cracks in the dry season; Left: Wedge-shaped aggregates and grooved ped surfaces called slickensides are common in Vertisols; Below: a highly cracked Vertisol profile showing compaction of the surface horizons due to agricultural machinery; The map shows the location of areas in Europe where Vertisols are the dominant soil type.*

Cover 0.5 % of Europe.



**Reader's Tip!**

This section of the Atlas has introduced you to the 23 major soil types of Europe<sup>1</sup>.

The **colour used in the box** surrounding the **soil group name** is the **same colour** that is **used** for that soil type in all the **maps** in the next sections of the Atlas.

In this way, when you see a **red area** (i.e. an **Andosol**) on a map then you can refer to this section find the **same colour** to see the basic characteristics of the soil, what it generally looks like and the type of landscape associated with it.

The colours used in the maps of the Atlas are based on the soil maps produced by the UN Food and Agriculture Organization (FAO) with slight modifications to clarify certain issues.

1. In this exercise, the soils of Turkey and Russia as far as the Ural Mountains were included.

All photographs in this section were provided by (EM) unless otherwise stated.