



## Soil Biodiversity And Ecoregions – Temperate Grasslands

Temperate grasslands are located north of the Tropic of Cancer and south of the Tropic of Capricorn. The main temperate grasslands include the pampas of South America, the steppes of Eurasia and the plains of North America. Grasslands are one of the most successful vegetation types on the planet comprising approximately 40 % of the Earth's terrestrial surface.

There are different grassland types usually split into three broad groups: temperate, tropical (also known as savannah) with perennial grasses being dominant; with their growth buds at or just below the surface, they are well-adapted to drought, fire and cold. The tiller, or narrow upright stem, reduces heat gain in the hot summers; the intricate root systems trap moisture. Temperate grasslands have warm summers and severe winters. Snow often serves as a reservoir of moisture for the beginning of the growing season. Seasonal drought and occasional fires help maintain these grasslands, which have played an important part in human history. Many of our commercial grains, such as wheat and barley, were almost certainly first domesticated from wild grasslands and were used for grazing livestock since animals were first domesticated over 7 000 years ago.

Grasslands generally have relatively deep soils that are rich in nutrients due to large amounts of tissue dying off each year, which builds up in the organic matter portion of the soil. Relatively few 'natural' grasslands remain as most have been turned into farms or are used for grazing livestock.

The amount of life found below the surface of grasslands dramatically exceeds that found aboveground, in both number and mass, as well as species richness, and is particularly rich even when compared to other below-ground environments. Grasslands are unique compared to virtually all other biomes in that they have a relatively simple structure but very high levels of species richness. It has been estimated that there are approximately 100 tonnes per hectare of living biomass below the surface of temperate grasslands, consisting of bacteria, fungi, earthworms, micro arthropods and insect larvae. The majority of grasslands are managed to some extent through grazing, mowing or by planting specific species of grass for a particular purpose, such as for forage or improved pasture.

A common feature of less managed, species-rich grasslands is that they have fungal-based food webs, contrary to more intensively managed grasslands that have bacterial-based food webs. Arbuscular mycorrhizal fungi (AMF) are a common component of grassland ecosystems, where they can influence plant productivity, plant diversity, and plant defense to herbivory and soil stability. Researchers report that the number of AMF species in temperate grasslands ranges from 10 to 24, thus representing one of the most diverse ecosystems in terms of this group of soil organisms. It is well known that plant diversity increases significantly with increasing AMF-species richness. Furthermore, it has been demonstrated that grazing decreases AMF spore abundance but increases AMF-species richness.

The presence of grazers may also influence other soil communities: 144 species of arthropods from cow dung were recorded in a temperate grassland. Earthworms are also very abundant in grasslands. Soil fauna data show that they form the greatest biomass (70 - 80 % of the total) of temperate grassland animals. Such an abundance has clear effects; it was found that 30 % of grass seedlings germinate from earthworm casts. This indicates that earthworm casts increase the spatial heterogeneity of grassland plant communities.

### ***Soil Lovers say: Restoring Grasslands Is Key To Soil Life***

**Ref: A Global Atlas of Soil Biodiversity p81**

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