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Soil ecological Response of various Substrates on *Fagus* Reforestations; the Role of Soil Organisms in the Development of humus Forms and the Storage of soil organic Carbon.

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In historical time the Luxembourgian landscape has been used intensively for agricultural purposes. This resulted in land degradation and soil erosion. During the last 150 years, reforestations with (among others) *Fagus sylvatica* (Beech) were realized. Today we find many scattered Beech forests in the landscape on various substrates ranging from acid sandy soils to calcareous loamy soils. After a regeneration period, the soil response of various substrates under the same forest is expected to be different. To investigate soil ecology of various systems, six forest plots have been selected which soils, differing in texture (sandy-loamy) and pH (low, intermediate and high). Samples in kubiena boxes have been taken for the production of thin sections of the humus forms.

In acid sandy soil, the decomposition of litter under *Fagus* is controlled by fungi and micro-arthropods. Under these conditions a mormoder humus form develops with dominant storage of soil organic matter in the ectorganic horizons. Under weak acid to neutral conditions, earth worms are active and a vermimull humus form develops with dominant storage of soil organic matter in the endorganic horizons. Soil organisms are responsible for the development of humic horizons, improving water and nutrient buffering of the soil. Porosity and aggregation is correlated to soil activity and humus form.

It is evident that under similar *Fagus* plantations employment for soil ecological groups as bacteria's, fungi, arthropods and earthworms is controlled by substrate characteristics. Together they are responsible for the decomposition of litter and the distribution of voids, channels, aggregates and the fabric and chemical composition of soil organic matter.