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About soil cover heterogeneity of agricultural research stations' experimental fields

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Depending on local pedo-ecological conditions (topography, (geo) diversity of soil parent material, meteorological conditions) the patterns of soil cover and plant cover determined by soils are very diverse. Formed in the course of soil-plant mutual relationship, the natural ecosystems are always influenced to certain extent by the other local soil forming conditions or they are site specific. The agricultural land use or the formation of agro-ecosystems depends foremost on the suitability of soils for the cultivation of feed and food crops. As a rule, the most fertile or the best soils of the area, which do not present any or present as little as possible constraints for agricultural land use, are selected for this purpose.

Compared with conventional field soils, the requirements for the experimental fields' soil cover quality are much higher. Experimental area soils and soil cover composition should correspond to local pedo-ecological conditions and, in addition to that, represent the soil types dominating in the region, whereas the fields should be as homogeneous as possible.

The soil cover heterogeneity of seven arable land blocks of three research stations (Jõgeva, Kuusiku and Olustvere) was studied 1) by examining the large scale (1:10 000) digital soil map (available via the internet), and 2) by field researches using the transect method. The stages of soils litho-genetic and moisture heterogeneities were estimated by using the Estonian normal soils matrix, however, the heterogeneity of top- and subsoil texture by using the soil texture matrix. The quality and variability of experimental fields' soils humus status, was studied more thoroughly from the aspect of humus concentration (g kg-1), humus cover thickness (cm) and humus stocks (Mg ha-1).

The soil cover of Jõgeva experimental area, which presents an accumulative drumlin landscape (formed during the last glacial period), consist from loamy Luvisols and associated to this Cambisols. In Kuusiku area, which landscape is characterized by till and limestone plains with thin Quaternary cover, the soil cover is more heterogeneous than in previous area. Kuusiku soil cover is more variegated by the soil texture and as well as by the genesis of soils. In addition to Cambisols, Leptosols, Gleysols and Luvisols may be found here as well. The dominating soils in Olustvere research area, which is situated on wavy upland plateau, are Albeluvisols.