



Soil physics and chemistry at two medieval ridge and furrow sites in northeastern Germany

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We present geoarchaeological findings (soil chemistry, soil physics, archeology and dendrology) from two type locations of historic ridges and furrows with loamy soils near Frehne about 100 km northwest of Berlin and with sandy soils at Grieben about 130 km southwest of Berlin. Ridge and furrow systems are common features in forested areas near historic settlements in Central Europe. These ridge and furrow systems are an anthropogenic legacy originating from the usage of non-reversible ploughs, mainly during the Middle Ages and until historic times and are preserved in present-day forest if not destroyed by later conventional ploughing. Because of the improvements of agricultural techniques, these historic agricultural sites were often abandoned and are now marginal land. At our study site Grieben the active usage of these ridge and furrow systems is well documented in historic maps of the 18th century and our pedologic and archaeologic findings suggest that at this site the intended usage of the ridge and furrow system had an administrative/ organizational background. Probably at Grieben the small furrows between the wider ridges mark the parcel boundary between neighboring ownerships. Whereas no differences in the chemical and physical soil parameters between the soils in the ridges and the furrows at Grieben could be detected, the soil parameters in the loamy substrate at Frehne clearly differ between the ridges and the furrows. At Frehne, the soils in the furrows are characterized by redoximorphic features due to the presence of shallow and slowly permeable horizon. The soils at the ridge lack redoximorphic features, although a slowly permeable horizon is also present at the ridge but at a greater depth. The trees rooting in the furrows also show stress features in their tree rings compared to neighboring trees growing on the ridges. But because these sites were only used for field crops, these differences in soil water between the ridges and the furrows may not even have influenced plant growth. Therefore, the intended use of ridge and furrow systems during medieval times may not (only) reflect specific site conditions like parent material or groundwater influence but also administrative or organizational reasons.