The aim of the planned research is the quantitative characterization of soil surface roughness formed by the selected tillage, including the soils properties, which are a particularly strongly affected. Coefficients of soil surface roughness, which will have the highest correlation with the analysed properties of soils will be searched. The research will be carried out directly in the field for about 30 selected soils with possible different: grain size, humus content, calcium carbonate and iron oxides content. Their properties will be determined under laboratory conditions, after having downloaded soil samples from each test. The variability of the soil surface shape formed by selected cultivation tools, such as a plough, disc harrow, cultivator, seeder, shaft or drag, will be analysed in a particular state of the moisture of the top level. It will also investigate the impact of precipitation and wind to reduce the soil surface roughness. The surface roughness will be observed for 2 years, at a time when the soil is not covered with vegetation. Therefore, the measurements will be carried out mainly in early spring and autumn.

Described above research will be conducted in order to deepen the knowledge on the impact of tillage and selected soil properties on the soil surface roughness, which plays a key role in agriculture, hydrology and remote sensing. The soil roughness determines the size of water erosion and wind erosion. The surface roughness determines the amount and speed of the flow surface, water infiltration affecting soil erosion and the quantity of stored water in the soil. It determines the amount of nutrients retained in the soil, which determine the productivity of the soil. The soil surface roughness significantly affects the soil image in remote sensing methods. Soil surface with aggregates appears to be darker on remote sensing images in comparison to the same soil with a smooth, uniform surface. Short-wave solar radiation reflected from the soil surface affects the temperature of the soil surface and deciding about the climate on Earth. Soil smoother reflect more of the radiation and it heat to a lesser extent as compared to the coarse soils.

Deepening the knowledge on the quantitative characterization of soil surface roughness formed by the selected tillage, including the soils properties, which are a strong influence on, can be used in the above described issues. These results can allow, i.e., more correct than ever to predict the effects of soil erosion, as well as more accurate interpretation of the soil by using remote sensing techniques and these will allow more precise conclusions about the amount of reflected shortwave solar radiation indirectly shaping the Earth's climate.