



Soil-restoration rate and initial soil formation trends on example of anthropogenically affected soils of opencast mine in Kursk region, Russian Federation

Tatiana Pigareva

Saint-Petersburg State University, Russian Federation (tanya.pigareva@gmail.com)

The mining industry is one of the main factors which anthropogenically change the environment. Mining process results in removing of the rocks and mechanical changes of considerable amounts of ground. One of the main results of mining arising of antropic ecosystems as well as increasing of the new created soils total area is technosols. The main factor controlling the soil formation in postmining environment is the quality of spoiled materials.

Initial soil formation has been investigated on spoils of the largest iron ore extraction complex in Russia - Mikhailovsky mining and concentration complex which is situated in Kursk region, Russia. Investigated soils are presented by monogenetic weak developed soils of different age (10-15-20 years). Young soils are formed on the loess parent materials (20 year-old soil), or on a mix of sand and clay overburdens (15 and 10-year-old soils).

Anthropogenically affected soils are characterized by well-developed humus horizon which is gradually replaced by weakly changed soil-building rocks (profile type A-C for 10-, 15-years old soils, and A-AC-C for 20 years old soils). Gray-humus soils are characterized by presence of diagnostic humus horizon gradually replaced by soil-building rock.

The maximum intensity of humus accumulation has been determined in a semi-hydromorphic 10-year-old soil developed on the mixed heaps which is connected with features of water-air conditions complicating mineralization of plant remnants. 20-year-old soil on loess is characterized by rather high rate of organic substances accumulation between all the automorphous soils.

It was shown that one of the most effective restoration ways for anthropogenically affected soils is a biological reclamation. Since overburdens once appeared on a day surface are overgrown badly in the first years, they are subject to influence of water and wind erosion. Our researchers have found out that permanent grasses are able to grow quickly; they accumulate a considerable quantity of top and root mass, promote accumulation of humus and accelerate soil building.