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The resource potential of peat bogs of the European part of Russia (in the case of the Arkhangelsk region)

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Currently, the interest in the development of the northern territories in the world increases. This is associated with the involvement of wetlands in the economic turnover, the degree of which reaches 40-50% in certain regions. A quarter of the industrial peat reserves of the European Russia are concentrated in the Arkhangelsk region. Bogs are traditionally used for gathering wild plants, as hunting lands, for obtaining fuel and substrates for agriculture based on peat, and, after draining, as fertile lands. Oligotrophic bogs are the most spread in the European North; therefore they are of the most interest for the assessment of the possibility of use of the peat in the region. In this case, drainage is a mandatory stage. A change in the groundwater level during drainage inevitably affects the structure and properties of the peat; therefore, the resource potential should be assessed using the example of drained but not exploited peatlands typical for the region, as in the case of the Ovechye bog (64°07'N; 41°35'E). The territory was drained in 1962-1965. Drainage ditches were laid at a distance of 100-110m and are well preserved nowadays. The bog was first assessed in 1961 (before drainage), and then (after drainage) in 2017.

The studied bog is composed mainly of high-moor sphagnum peat with underlying glacial clays. The amplitude of changes in the degree of peat decomposition as a result of drainage narrowed significantly (5-60% and 25-61% before and after drainage, respectively), the average value increased from 30% to 40%. Natural moisture content decreased from 73.3-95.6% to 60.1-74.5%. The average ash content slightly increased to 10.8%. The peat is gradually deoxidizing – the pH value changed from 3.4-3.8 to 4.4-5.9. The groundwater level during the summer low water period declines from 0-0.3m to 1.5-2.5m. The mass fraction of organic carbon is 42.2±8.5%, ammonia nitrogen – 70.1±14.2mg/100g, nitrate nitrogen – 4.5±0.3mg/100g, available potassium – 11.4±3.2mg/100g, available phosphorus – less than 2%, exchangeable calcium– 0.37±0.05%, exchangeable magnesium – 0.28±0.06%, total exchangeable bases – 27.2mEq/100g, hydrolytic acidity – 160.7±21.3mmol H/100g. Thus, the agrochemical properties of the studied peat are extremely low. Its use in agriculture requires the introduction of significant amounts of neutralizing (deoxidizing) compounds and enrichment with biogenic elements. The development

of paludiculture seems to be more promising.

The bituminous content (more than 3%) and the content of humic substances at the level of 47-54% are consistent with the increase in the degree of decomposition of peat as a result of drainage. This indicates the possibility of advanced processing of peat with the production of humic preparations and biologically active products from its bituminous part.

It should also be noted that the cellular structure of plant residues is well preserved throughout the depth of the deposit. This provides a low apparent density of the peat (65-225kg/m^3) and its high sorption capacity (for example, for kerosene 4-10g/g). Therefore, obtaining sorbents seems to be the most promising direction for using peat in the region.

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