EFFICIENT OF THE SYSTEM OF USE WASTE HOT WATER OF ENERGY FACILITIES FOR SOIL HEATING

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Introduction. Currently, the world energy policy is focused not on increasing production, but on saving energy resources, increasing their efficiency, and reducing the energy intensity of production.

One of the important components of the energy biological complex, as well as the independent directors of the use of warm wastewaters, can be the direction of thermal reclamation, which is realized through the use of warm water for heating open ground and irrigation of crops.

The aim of the work is the reduction of heat pollution of natural water objects by utilization of low-potential warm wastewaters for heating the open ground and increasing crop productivity.

Research objectives:

- study the peculiarities and regularities of temperature regime formation of light loamy typical black soils in terms of year-round heating by warm waste waters;
- set the number of heat losses by the heating system during the year at different parameters of the heating system;
- study the influence of the ground heating system on soil processes and the yield of perennial grasses.

Materials and methods. Open soil heating technology is implemented through a system of pipelines up to 50 mm in diameter, which are laid into the soil at a depth of 0,5-0,6 m at intervals of 1,0-1,5 m from each other and through which water with a temperature of 25-38°C is passed. The studies were carried out by the following variants: control, soil heating b=1,0 m, soil heating b=1,5 m (b – distance between pipelines).

Results and discussion. In the conditions of the humid zone of Ukraine on the black soils, the underground heating allows receiving 3-4 crops of perennial grasses, as compared to 2 crops on the control sites. In combination with irrigation, heating gives an increase in the yield of perennial grasses on the green mass by 66-93%. The effect of the heating on the yield is also significant and is 27-40%.

Conclusions. The waste warm waters from the power plants by their temperature regime and the volumes of discharges allow them to be used for heating the open ground. Underground heating with such waters allows not only purposefully regulates the temperature conditions of the crop growing environment, but also dissipates heat in the soil, thus cooling the water for reuse.