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DRIP IRRIGATION AS A GUARANTEE OF FOOD SECURITY OF THE REPUBLIC OF BELARUS

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Keywords: drip irrigation, food security, vegetables, productivity.

The most important criteria for efficient production in the most developed countries of the world today are the specific costs of resources and indicators of environmental safety.

One of the promising areas for increasing productivity in crop production is the development and implementation of technologies for artificial irrigation of crops to create zones of guaranteed production of vegetables and other crops, since only the use of technologies adapted to natural conditions will increase the amount of agricultural products, semi- desired per unit area, reduce its cost and improve quality.

Material and methods. Field experiments were laid on the experimental irrigated field of the UO BSHA "Tushkovo-1" of the Goretsky district of the Mogilev region. The experimental field is located on an area with leveled terrain, having a slight slope in the south-west direction. Groundwater lies at a depth of more than 8 m. The main source of the formation of moisture reserves is precipitation, the insufficient amount of which and the uneven precipitation during the growing season do not provide high productivity of crops, which determines the need for irrigation. The soils are sod-podzolic loamy. Observations of meteorological indicators were carried out directly at the experimental site using an equipped meteorological post located to the north at a distance of 150 m.

Findings and their discussion. Vegetables are an integral part of a complete diet that provides a person with vital chemical components that are completely or partially absent in many animal products.

According to the Institute of Nutrition of the Academy of Medical Sciences of the Russian Federation, vegetables can satisfy a person’s need for proteins by 15–25%, carbohydrates by 50–60% and vitamins and minerals by 60–80%. [one]

The results of studies on the assessment of national food security indicate that in 2019 the volume of agricultural production per capita corresponded to the level of developed countries.

The level of own production of vegetables was sufficient to meet the needs of the domestic market of the republic and amounted to 104,1%. [2]

The task of the State Program for 2016–2020 for the production of vegetables was completed – 9,2 million tons (114,5%). The growth of gross crop production for 2016–2020 compared to 2015 amounted to 18,3 percent.

In 2020, compared to 2015, the production of vegetables was increased in farms of all categories (growth rate – 103,8 percent), and the growth rate of gross vegetable production was reduced to the level of 2019 of 1,8 million tons (94,4%). [3]

In the same year, vegetable production per capita amounted to 187 kg, the yield was 277 centners per hectare, and the gross harvest was 1,751 thousand tons.

On irrigated lands, these indicators amounted to 39,9 centners per hectare, the gross harvest was 34,5 thousand tons.

In the Mogilev region, the gross harvest of vegetables amounted to 196,5 thousand tons, the yield was 262 q/ha.

As of 2020, the sown area for vegetables amounted to 59,3 thousand hectares, in the Mogilev region this figure is – 7,1 thousand hectares.

The sown area of vegetables on irrigated lands is 0,4 thousand hectares. [4]

At present, the Republic of Belarus has reached a certain level of development of crop production, which makes it possible to provide the country's consumer market with vegetables.

The main directions for the development of crop production are provided for by the state program "Agricultural Business" for 2021–2025.

The implementation of this program will help ensure the production of vegetables. The indicator of development is the production by the end of 2025 of vegetables in the amount of 1,9 million tons in farms of all categories, of which in the public sector – 0,6 million tons with an average yield of 335 centners per hectare, the area sown with vegetables in open ground – 14,8 thousand hectares. [3]

To achieve the set indicators, it becomes necessary to introduce innovative and resource-saving technologies in the production of vegetable products. One way to increase the yield of vegetables is irrigation

In countries with developed vegetable growing methods and modes of irrigation, irrigation equipment are constantly being improved. In addition to the traditional methods of irrigation (sprinkling), such a progressive method of irrigation as drip irrigation is developing. For vegetable crops, it is the most effective, as it can be used for fertilizing. This method is widely used in the USA, Israel and allows saving up to 50–70% of the volume of irrigation water and up to 50% of fertilizers in comparison with their spreading. [1]

In this regard, within the framework of the dissertation research, the influence of the drip irrigation regime on the yield of vegetable crops grown in open ground on soddy-podzolic soils in the northeastern part of the Republic of Belarus is being studied.

Research is being carried out in the Gorki region on the experimental fields of the BE BSAA. The experimental plot is located on lands typical for the regions of the Mogilev region in terms of geomorphological, geological, hydrological and other natural conditions.

The soil of the experimental site is loamy. The content of humus in the arable layer of 0–30 cm is 1,51%. The topsoil is characterized by an alkaline reaction, the pH of the water is 5,65. The content of mobile phosphorus is 284 mg/kg, and exchangeable potassium is 353 mg/kg.

The soil bulk density in the 0–30 cm layer is 1,305 g/cm^3, in the lower layers there is an increase in the bulk density up to 1,40–1,6 g/cm^3.

Studies have shown the effectiveness of this method to increase the yield of vegetables. The yield in areas with drip irrigation at an irrigation rate of 80% of the NV was: onion – 44,67 t/ha, radish – 36,56 t/ha, lettuce – 7,96 t/ha.

Conclusion. Despite the fact that drip irrigation is inferior to sprinkling in comparative quantitative indicators, with its local application on highly profitable vegetable crops, the greatest production and economic results are achieved with full payback in the first year of operation.

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THE ACTIVITY OF CATALASE IN THE TISSUES OF HYDROBIONTS OF THE VITEBSK REGION

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Keywords: catalase activity, pulmonary mollusks, coil horn, hepatopancreas, Vitebsk region.

At the present time for assessing the status of ecosystems using the methods of biological indication. While great attention is paid to the use for these purposes of live objects. As such objects, using freshwater mussels. Working with them is less time consuming and the most expedient in economic terms. The study of biochemical parameters of these organisms give us a theoretical basis for the qualitative assessment of the system under investigation [1]. Widely used one of the most common types of pulmonary mollusks – coil horn (*Planorbarius corneus*).

The aim of this work was to determine activity of catalase in hepatopancreas *Planorbarius corneus* depending on season and habitat.

Material and methods. The experiments were conducted on 162 individuals of *Planorbarius corneus*. Molluscs were gathered in the spring (april-may), summer (july) and autumn (september-october) from reservoirs in six districts of the Vitebsk region (table 1). The water bodies of selected districts were at a distance of no more than 30-40 km from the regional center. In each study subgroup was kept for 9 clams.