STUDY AND IDENTIFICATION OF WHEAT RESISTANCE MECHANISMS TO SALT STRESS IN THE BUKHARA REGION

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Abstract: *the article presents data on the geographical location of the Bukhara region, the processes of wheat resistance to salt stress, and the survival of plants in the saline soils of the region.*

Keywords: *salt, soil, salinity, stress, wheat.*

The study of wheat's resistance to salt stress is an important topic in agronomy and biotechnology, since salt stress, especially excessive amounts of salt in the soil, can significantly reduce the yield of wheat and other crops. The process of plant resistance to this stress involves several mechanical and biochemical adaptations that can help plants survive in conditions of increased salinity.

Bukhara region is located in the arid zone of Central Asia, where soils are often characterized by a high content of dissolved salts, especially in the lower horizons. Salt stress in this region can be caused by several factors, such as an arid climate- low precipitation, high temperature and intense evaporation of water lead to an increase in soil salinity, as well as irrigation- the use of irrigation with water containing dissolved salts can increase problems with soil salinity and groundwater

pollution- pollution of reservoirs. salts and minerals can also have a significant effect on plants.

There are several key aspects that are often investigated in such studies, for example, such as the accumulation of organic osmolators, for example, glycerin, mannitol for osmosis in cells. This helps to prevent cell dehydration at high salt levels; ion transport and excretion, since salt mainly consists of sodium Na+ and chlorine Cl- ions, which can disrupt the normal functioning of cells, one of the resistance mechanisms is the efficient transport of these ions into vacuoles or their excretion into the roots;antioxidant protection, salt stress can cause oxidative stress, leading to the formation of reactive oxygen species, plants develop protection systems against oxidative stress, including enzymes such as catalase, superoxide dismutase and peroxidase, which help reduce ROS damage; physiological changes, under the influence of salt stress, plants can alter their metabolism to reduce the effects of stress, this may include changing the rate of photosynthesis, slowing growth, and increasing root mass to improve water absorption.

The practical significance of our research is that the cultivation of salt-resistant varieties and the creation of wheat varieties that can adapt to salty conditions is crucial for ensuring food security in regions with high salt levels in soils. In addition to creating resistant varieties, it is also important to develop soil management methods, such as drainage or the addition of gypsum, which can reduce salt levels in the soil and help plants adapt.

To identify the mechanisms of wheat resistance to salt stress in the Bukhara region, several key studies need to be conducted. Resistance phenotyping is the determination of various phenotypic characteristics of wheat, such as growth, development, photosynthetic activity and root morphology under salt stress. Analysis of resistant varieties- it is important to identify varietal differences in salt resistance. This may include the selection and evaluation of varieties that show the

best productivity in the saline soils of the Bukhara region. Genetic research is the study of genes related to salt stress resistance using molecular biology techniques such as PCR, genome sequencing, and transcriptomics. Assessment of metabolic changes-conducting metabolic studies to identify changes in the metabolic profile of wheat that occur under the influence of salt stress. Soil quality monitoring - analysis of soil composition and salinity levels at different sites in the Bukhara region will help to better understand which factors affect wheat resistance and which types of salt stress prevail. The introduction of natural osmoprotectors - for example, the use of organic fertilizers or additives that help improve soil structure and increase plant resistance to salt stress.

To develop wheat varieties resistant to salt stress, it is necessary to integrate knowledge about the physiological, biochemical and molecular mechanisms of salt stress, as well as actively apply modern biotechnological approaches to create effective solutions. Studying the mechanisms of wheat resistance to salt stress in the Bukhara region is crucial for the development of effective agrotechnical solutions and breeding programs. Understanding the local features of salt stress, as well as the molecular and physiological adaptations of wheat, will make it possible to create varieties with high resistance to salt, which will contribute to improving food security and increasing yields in the region.

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