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INFLUENCE OF WHEAT VARIETIES ON SOIL SALINATION

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Annotatsiya: maqolada Buxoro viloyati sharoitida tuproqlarning sho'rlanishi va kuzgi bug'doy navlarining fiziologik va mahsuldorlik ko'rsatkichlariga sho'r stressi ta'sirining fiziologik xususiyatlari hamda bug'doyning mazkur omilga chidamliligi to'g'risida ma'lumotlar keltirilgan.

Аннотация:в статье представлена информация о разработке экспресс-физиологических методов оценки физиологических особенностей влияния солевого стресса на физиологические показатели и продуктивность сортов озимой пшеницы в условиях Бухарской области, а также определения устойчивости пшеницы к этому фактору.

Abstract:the article provides information on the development of express physiological methods for assessing the physiological characteristics of the effect of salt stress on the physiological parameters and productivity of winter wheat varieties in the conditions of the Bukhara region, as well as determining the resistance of wheat to this factor.

Kalit so'zlar:mahsuldorlik, sho'rga chidamlilik, stress omillari, fiziologik, biokimyoviy, sho'rlanish.

Ключевые слова:продуктивность, солеустойчивость, стресс, стрессовые факторы, физиологические, биохимические. соленость.

Key words:productivity, salt resistance, stress, stress factors, physiological, biochemical. salinity.

Saline soils are widespread in many countries of the world. They occupy about a quarter of the Earth's surface, including half of all irrigated land, and the area of saline soils is expanding. In arid climates, almost all irrigation water evaporates, and soil salinity is gradually increasing. Climate change will inevitably lead to a deterioration in the ecological situation, which will lead to drought and salinization of fertile soils, as a result of which the productivity of agricultural crops will sharply decrease.

Salinity of irrigated lands sharply reduces their fertility, which leads to a decrease in the total yield of cultivated crops, and primarily wheat, which is very important for food security. In such conditions, it is necessary to study and identify valuable wheat genotypes that are suitable for climate change conditions. In this regard, it is important to study the adaptive potential and mechanisms of wheat resistance to salt stress. Salt tolerance varies depending on the

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developmental stages of wheat. Young plants are intolerant to salt, especially during the flowering stage. They grow poorly due to their sensitivity to salt, and as the plant grows, its salt tolerance increases. Excessive accumulation of salts in the soil is harmful to most cultivated plants. Salt-tolerant plants called halophytes grow in saline soils.

They differ from other plants in a number of their anatomical and physiological characteristics. Excessive salinity of the soil is harmful to plants in two ways. On the one hand, the accumulation of salts increases the osmotic pressure of the soil solution. This pressure prevents the root growth and makes it difficult for plants to obtain water. At the same time, the excessive accumulation of soluble salts in the soil, in addition to the osmotic effect, also has a toxic effect on plants. Even salts that are neutral in weak concentrations become toxic in high concentrations.

The adaptation of plants to extreme environmental factors depends on the genotype, which determines the morphological, biochemical and physiological mechanisms that ensure the growth and development of plants in adverse conditions. Thus, a high concentration of salts leads to a violation of the ionic, osmotic and oxidative state of the organism. Under these conditions, homeostasis is maintained by the accumulation and distribution of ions, the synthesis of corresponding osmolytes, the accumulation and change in the activity of free polyamines.

Salt stress usually significantly slows down growth, up to its complete cessation, but in many cases this effect is accompanied by changes in other physiological processes. For example, under salt stress, the rate of transpiration may decrease, and the absorption of potassium may be replaced by its excretion. High salt concentrations, along with ionic imbalance and hyperosmotic stress, also cause oxidative stress, which is accompanied by membrane destruction and chlorophyll breakdown. Many studies have shown that varieties characterized by a high level of antioxidant activity or the ability to quickly increase it are more resistant to oxidative damage under stress, including stress caused by salinity.

Studying the effect of soil salinity on the physiological and biochemical parameters of winter wheat varieties allows us to reveal the ability of these wheat varieties to adapt to salt stress and helps to create new varieties. At the same time, it is necessary to further elucidate the physiological and biochemical aspects of the resistance of cereal crops to various types of salinity and the specific features of the effect of salt stress on the physiological and biochemical processes of wheat.

Wheat in natural conditions is often exposed to various stresses, such as drought, excessive heat, salinity. At the same time, salinity has the greatest detrimental effect. Wheat is included in the group of moderately tolerant crops in terms of salt tolerance. It can withstand up to 0.4 and 0.6% of salt in the dry mass of the soil. Salinity inhibits the growth and development of plants, disrupts water exchange and ion balance, photosynthesis and respiration processes, and as a result reduces the yield of agricultural crops.

The winter wheat varieties Starshina, Alekseevich, Krasnodarskaya-99, Antonina were used in the experiments. The experiments were conducted on areas with weak and moderately saline soil salinity of the meadow-alluvial soil type. In the course of the research, the parameters characterizing the water exchange of the varieties were determined.

Observations and biometric measurements are carried out on model plants in odd rotations. Phenological observations are carried out according to the method of inspection of varieties of agricultural crops. In all experiments, variants are arranged in three rotations and are arranged in rows on a consistent basis. Irrigation rates are determined based on the moisture

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deficit in the soil (600-700m3/ha).

According to the data obtained, the reaction of the studied wheat varieties to soil salinity levels was different. In the control variant, the growth and development of all wheat varieties grown, as well as the activation of the set of physiological processes, were determined. Such changes varied depending on the biological and individual characteristics of the varieties. In particular, it was found that the values of the above-mentioned indicators in the Starshina, Pervisa, Grom and Shams varieties are directly related to the activity of water exchange.

Thus, in conditions of saline meadow-alluvial soils of varying degrees, the negative effect of salinity on water exchange of all studied varieties was observed. Within the varieties, the strength of such a negative effect was less in the Starshina, Grom, Aleyeksevich, Vassa varieties.

References:

1. S.R. Asatov J.N. Sulaymonov Secondary salinization of irrigated lands and improvement of their reclamation status Republican online scientific and practical conference on the topic “Environmental problems in agriculture and their solutions” December 17-18, 2020. Durdona publishing house. Bukhara. 521 pages
2. Teshayeva D.R. Theoretical and scientific foundations of growing winter wheat varieties in conditions of saline soils.// Bulletin of the Khorezm Mamun Academy.-2022. №9/1.-V.53-58. (03.00.00. No. 12).
3. Holliyev A. E., Teshayeva D. R. Adaptation Characteristics of Autumn Wheat Varieties to Salinity Stresses//Ra journal of applied research.- 2022.- Volume 08.- №03.-R.-209-213. Scientific Journal Impact Factor. IF.-7.036. (№23. SJIF. IF-7,1) ISSN: 2394-6709.
4. Teshayeva D. R. Salt Resistance Characteristics of Winter Wheat Varieties in Soil and Climatic Conditions//American journal of social and humanitarian research.- 2021.- Volume 2, #10.- R.-152-153. ISSN: 2690-9626.