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# Theoretical Bases of Creation of Drought-Resistant Wheat Varieties

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***Annotation****: The article describes the scientific basis for the selection of drought-resistant wheat varieties based on the study of the processes taking place in the southern region of Kashkadarya province. Under the influence of high temperatures, pollination and fertilization slow down. A decrease in the amount of protein and gluten viscosity in the grain is observed and has a negative effect on the properties of the grain.*

**Keywords:** biological, geographical, productive genes, hybrid organism, drought, territory, resistant varieties, biotic, abiotic stresses, selection process, immunity.

**Introduction:** Around the world, about 8 million hectares of land were irrigated in the early 19th century, 40 million hectares in the early 20th century, and 100 million hectares in the middle of the century. By the 21st century, irrigated agriculture has exceeded 280 million hectares. This total arable land accounts for 16 percent of the land. The area of irrigated land in Uzbekistan today is more than 4.3 million hectares. Rising global temperature to 2 degree is leading to a decrease in precipitation and climate change. Over the past 50 years, the world's population has grown 2.2 times to 6.5 billion. The demand for water has increased 2.6 times, of which 80% (2504 km3) is used for agricultural purposes. Currently, 2 billion people in the world suffer from water shortages. By 2025, 7.5 billion people will be in dire straits due to water shortages, and grain and legume production in agriculture will fall by 25 percent, according to researchers. The population of Central Asia is estimated at 65-70 million. This is expected to increase the demand for water. It is necessary to create heat- and drought-resistant varieties under the influence of global warming (decrease in precipitation, water scarcity, temperature rise, intensive migration, acceleration of water evaporation in the soil). At the same time, in Surkhandarya and Kashkadarya regions, one of the current problems of selection is the creation of varieties and primary sources of resistance to heat during the ripening of cereals.

**Main part:** In order to increase the efficiency of use of water and other resources, to provide quality food products for national consumption, it is important to create a new generation of primary sources that combine the plastic properties of grain, fodder, oilseeds and other crops for selection. One of the main features of the climate of wheat-growing regions in Uzbekistan is dry and hot conditions. Frequent droughts have a major impact on the plant during the growing season of wheat, leading to a decrease in yield and grain quality. Drought reduces the amount of organic matter accumulation in plants, slows leaf growth, and shortens the working surface through which basic photosynthesis takes place. Therefore, one of the main requirements for new varieties created in Uzbekistan is the ability to withstand drought and heat with high productivity.

Drought-resistant varieties of wheat are characterized by low accumulation, the formation of late stems, small leaf surface, horizontal position of the leaves and thin, twisted, well-developed root system and short grain filling period, small size of cells, water evaporating openings.

Drought resistance of wheat plants is observed in the growth of root system growth. Wheat varieties with fast-growing roots are highly resistant to drought. Many researchers have noted that high-temperature-resistant varieties shorten the ripening period during the growing season less than non-hardy varieties.

Drought-resistant early maturing varieties have a high rate of dry matter accumulation along with productivity. At the same time, the number of grains in the grain was found to be large, which ensures high grain quality. Experiments have shown that in hot and dry conditions, the closed, horizontal position of the leaves and the vigorous development of the root system, the short duration of the grain filling period are the main factors in increasing productivity.

According to Mamontova V. I (1980), the correlation between the length of the spike and the number of spikes in the spike with the yield is high.

Spike length and density are a varietal feature of the plant and can vary depending on external environmental factors. Lack of moisture in the soil can have a negative, effect and positive effect when enough moisture on the length and density of the spike (Amonov A.A, Klintsevich M.N, 2001).

Nosatovsky V (1965) reported that a temperature not exceeding 20C and sufficient humidity had a positive effect on the number of spikes.

In field conditions, the number of spikes in a spike can vary from 12-20, or decrease to 7-5. In the “Ukrainka” variety, the number of spikes per spike has

even reached 46 (Nosatovsky V. 1965, Bessonova E.I. and others 1984).

Nosatovsky V. I. (1965) reported that irrigation during the formation of the spike caused an increase in the length of the spike. Irrigation during this period affected different varieties differently, for example, the length of the spike of the variety "Gordeiforma-10" increased by 7.1%, and the variety "Melyanopus-69" by 27.2%.

Ensuring that yields are consistent in any adverse conditions can be achieved by creating varieties that are resistant to biotic stresses. When creating a high-yielding wheat variety, researchers need to develop resistance to biotic stresses. In most cases, high-yielding varieties in the selection process become ill after reaching production, and their productivity decreases, that is, the resistant variety loses immunity and suffers from the disease.

In order to create new, high-yielding, high-quality wheat varieties, it is important to mix geographically distant forms of inter-varietal hybridization with biologically grain quality. As a result of mixing geographically distant forms, productive genes formed in different places in plant genetics create the basis for the emergence of a hybrid organism.

**Conclusion:** The soil and climatic conditions of Kashkadarya differ sharply from other regions of the country due to its heat and drought. The soil-climatic conditions of the northern regions differ sharply from other regions with very high salinity of soils, hot and dry air temperatures in spring and summer, and very low (-20C) in winter. Such cases have a negative impact on the yield and grain quality of autumn cereals. The formation and development of soft wheat grains (flowering, milk, wax ripening phases) coincides with a period of rising air temperature, a decrease in humidity under local conditions. Such conditions have a negative impact on grain yield and grain quality. Under the influence of high temperatures, pollination and fertilization slow down. A decrease in the amount of protein and gluten viscosity in the grain is observed and has a negative effect on the property of suitability for bread. In conditions of high air temperature and low soil moisture, the use of early spring soft wheat varieties with high yield and quality, as well as heat-resistant varieties is effective.

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