# CHARACTERISTICS OF SORGHUM RESISTANCE TO STRESS FACTORS

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Sorghum is one of the multi-purpose crops. Its grain is a nutritious fodder for livestock and a valuable raw material for the starch and alcohol industries. Grain is also obtained from it. Sorghum is grown as the main cereal crop in Africa, India and East Asia. Sorghum is the second largest food crop in the world after wheat and rice.

The blue mass of sorghum is fed to cattle or pressed into silage. Its silage is close to corn silage in terms of quality. Sorghum makes good hay if it is cut until the stalk is coarse. The sorghum then re-emerges and is used as green fodder and as a forage for grazing cattle.

100 kg of sorghum grain equals 119, blue mass 23.5, silage 22.0 and hay 49.2 nutritional units. The grain contains 15% protein and is rich in lysine. Sweet sorghum varieties contain 10-15% sugar in their stalks, which are used to make syrup. Broom brooms and brushes are made from corn dung. Sorghum can also be planted as a cover crop that protects against snow and heatstroke [1-2].

Sorghum, unlike other crops, can tolerate soil salinity of 0.6 to 0.8 percent. In corn, this indicator is only 0.4 percent. Sorghum removes sodium, calcium, and magnesium from the soil with its crop, thereby purifying the soil. In other words, while a white sorghum plant can reduce soil salinity by 0.6-0.8 percent, corn can only reduce it by 0.4 percent. Sorghum plays the role of phytoremediator by removing harmful salts from the soil.

One of the main tasks in sorghum seed production is to breed high-quality fertile seeds and maintain their yield quality. Planting high-quality fertile seeds of sorghum with fogging allows it to increase its yield by 15-20% compared to non-fogging varieties and achieve better economic results [3-4].

In world agriculture, sorghum has been considered one of the most valuable grain and fodder crops that are extremely resistant to drought. Long-term experience confirms the biological nature of this crop, that is, it is not very demanding in terms of environmental conditions. The practice of growing sorghum in arid and poorly watered areas shows that the crop is active in relation to the drying of the soil and air, the optimal course of the transpiration process and the high concentration of cell sap can easily withstand hot haremsel.

Sorghum consumes much less water per unit of dry matter than corn, cotton, sunflower or oats, and thus can produce higher blue mass and grain yield. For example, it is known that a corn crop consumes 160.6, sorghum 132.3, and millet 127 water units to produce a unit of dry matter. In this case, it is observed that sorghum can withstand hot weather compared to other crops. The transpiration coefficient of sorghum is 150-200, which is much lower than that of other cereals. Sorghum conserves moisture. 1 gram of dry matter requires 132 grams of water, 161 grams of corn, 273 grams of oats, and 377 grams of sunflower [5-9].

Observations made in the following years are related to the drought resistance of sorghum and its productivity, which shows that the plant has valuable properties from biological and economic points of view. For example, according to scientists, sorghum can even surpass corn in terms of grain and silage mass in dry years. Adaptation of sorghum to conditions in water-scarce zones is due to the well-developed root system of this plant, the surface of the leaves and stems being covered with wax dust, as well as the special structure of the mouths in the leaf apparatus (which allows saving water). The deep penetration of sorghum roots into the ground and other features have historically been the result of harsh environmental conditions. In arid regions, sorghum yields at least 48 centners of grain and 300-350 centners of green pulp and up to 120 centners of hay per hectare [10-15].

White sorghum tolerates such conditions even when the moisture content of the soil in a dry year drops to a critical level and gives a higher yield than corn. Also, sorghum can easily survive longer periods of drought than maize, and then recover and resume normal growth and development and produce abundant crops. For example, the experiment confirms that the KOS-1 variety of wheat has surpassed even the highest-yielding hybrid of corn in terms of yield. The study of drought tolerance of sorghum is of great practical importance. It is especially important for farms located in arid zones. In such zones, water was always scarce, and sorghum served as the main reserve for growing food for livestock. In order to get an abundant and high-quality harvest from any crop, it is necessary to create the necessary conditions for this crop. One of the factors providing such conditions is irrigation. It was mentioned above that sorghum is extremely resistant to drought. However, to obtain high grain and silage mass, it should be watered in time [16-21].

In order to obtain a high amount of grain, silage mass and green yield from the local breeding forms of buckwheat, it is necessary to know well the soil-climatic conditions of the district, water resources that occur in different seasons of the year, which in turn allows growing abundant crops with the least consumption of water. In order for plants to use water sparingly, it is necessary to organize their nutrition well. The development of high agrotechnical measures in irrigated agricultural zones is based on a good knowledge of the biological characteristics of each cultivated plant, soil and climatic conditions, as well as how well the area is supplied with water, and how well the water-carrying capacity of the irrigation system is. Irrigation mode (norms, periods, etc.) is developed taking into account the demand of the cultivated crop, the order of irrigation, and the characteristics of this hydro module district. This necessarily implies the rational use of irrigation water [22-28].

According to scientific achievements and best practices, on average, only 50-60 m3 of water taken from the main canal in Uzbekistan is effectively used in the fields. The rest will die due to evaporation and seepage into the lower layers of the soil. Accordingly, water conservation remains an important issue at a time when water scarcity is increasingly felt. In most farms,

irrigation rates are considered for secondary crops. For some reason, the sorghum crop is not irrigated. This has a negative effect on productivity, of course.

Experiments carried out over many years show that sorghum is a naturally drought-resistant crop, and it is possible to produce up to 400 centners of silage per hectare even with a single application of water. Therefore, wherever it is possible to create such conditions, it is recommended to include sorghum, among other crops, in the planting plan, for this purpose, in the first place, areas that are unfavourable for growing cotton and then unsuitable for crops, that is, often affected by dry heat or soil salinity, as well as the fertile lands in the foothills and mountain zones can be allocated for planting sorghum. According to the long-term data collected by scientists in this field, if salt resistance is considered to be 0.030-0.035 percent of chlorine ion at the highest level, depending on the dry state of the soil, this amount is 0.038 percent in oat.

According to the data, sorghum can withstand soil salinity of 0.6 to 0.8 percent, unlike other crops. In corn, this indicator is only 0.4 percent. Sorghum removes sodium, calcium, and magnesium from the soil with its crop, thereby purifying the soil. In other words, corn can reduce soil salinity by 0.6-0.8 percent, while corn can only reduce soil salinity by 0.4 percent. Sorghum plays the role of phytoremediator by removing harmful salts from the soil. According to the results of observations made by scientists, it is possible to use land that is unsuitable for other crops for planting corn. In this type of land, the yield of blue mass of corn is reduced and it does not produce soot. White sorghum is resistant to soil salinity and gives a relatively abundant yield due to its good resistance to surface water [29-37].

According to the calculations of scientists, the permissible level of soil salinity for cotton is 0.02-0.03 percent in the 0-100 cm layer of the soil in the lower part of the Amudarya, while in other regions with saline soil, this amount is 0.01 percent compared to the dry mass of the soil. need In the experiments carried out in the conditions of Uzbekistan, it was found that sorghum can withstand even more salinity.

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