

# GROWTH AND DEVELOPMENT OF SORGHUM VARIETIES IN SOIL-CLIMATE CONDITIONS OF KHOREZM

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## Abstract

This article gives information on the periods of development and growth processes of different varieties of sorghum in Khorezm soil and climate conditions.

**Keywords.** Sorghum, growth, development, weeding, fruiting, flowering, ripening, vegetative period.

## Introduction

Nowadays the use of plant resources is increasing significantly. Vegetable raw materials are grown to provide the growing population with food such as meat, dairy products and other products. In this context, the assessment of the physiological, biochemical and haloaccumulating properties of crops with high productivity and nutrition in saline and arid regions and their introduction into agricultural practice is of scientific and practical importance for the effective solution of several agroecological problems [2].

Therefore, the growth and development processes of different sorghum varieties were studied under the specific soil and climatic conditions of the Khorezm Oasis.

In the growth and development process, plants go through different phases depending on their biological properties. The development and growth processes of sorghum varieties consist of the following stages: weeding, budding, flowering and ripening. The weeding phase is related to the growth of the plant seeds. It has been found that seed germination depends on many factors: the quality, the fertility of the soil, the amount of water it contains and especially the salinity [1,3].

It is known that when planting various agricultural crops, the quality of seeds and the correct choice of conditions and periods are the main factors that ensure the correct germination of seeds. In order for the seeds to germinate, sufficient warmth and moisture is necessary.

Therefore, the germination of seeds of maize varieties was examined. Based on the results obtained, it can be said that the germination of sorghum varieties was 7 days for the Karabash variety and 8 days for the Daulet variety. From these data, it can be seen that there was no significant difference between the sorghum varieties at the tillering stage (Table 1).

Table 1 Development phases of sorghum varieties and lines

№	Varieties	Phases, in days			
		Lawn mowing	Fertilization	Flowering	Ripe
		Sorghum			
1	Karabash	6	57	62	112
2	Daulet	7	81	89	132

There were differences between the sorghum varieties in the fertilization phase. For the sorghum variety Karabash, the fruiting phase was recorded on the 57th day of the growing season, while for the Daulet variety it was recorded on the 82nd day.

These indicators showed that the Karabash sorghum variety belongs to the fast-cooking varieties. In this variety, the fertilization phase began 24 days earlier than in the Daulet variety.

The flowering phase of the sorghum varieties began on the 62nd day of vegetation for the Karabash variety and on the 89th day for the Daulet variety.

Ripening time is one of the indicators that determine the early ripeness of varieties. These parameters were 112 days for the Karabash variety and 132 days for the Daulet variety (Table 1). Based on the information in the table, it is possible to conclude about the early ripening of the Karabash sorghum variety.

Photosynthesis is a complex physiological process, the product of which is judged by the amount of organic matter. One of the factors that influence the process of photosynthesis is the surface height of the leaf and the associated properties (leaf length, leaf width) [3].

The data on changes in leaf surface level during the growing season in sorghum varieties are presented below (Table 2). From the data it is known that in the sorghum variety Karabash in the germination phase the leaf width is 0.50 cm, the volume of one leaf is 2.85 cm<sup>2</sup> and the amount of dry matter is 0.02 g, the volume of the leaf in one plant 5.39 cm<sup>2</sup> tall. From the data in the table it can be seen that there was no difference between the varieties during this period. Only in the Karabash variety did one leaf size predominate over other varieties. This shows that the growth process of this strain has accelerated.

In the budding phase of the growing season, the volume of a leaf was 8.53-8.81 cm<sup>2</sup> and the amount of dry matter was 0.13-0.23 g. During the flowering phase, the increase in leaf area accelerated. In this phase, the leaf area of a plant was 2722.0 cm<sup>2</sup> for the Karabash variety and 2479.1 cm<sup>2</sup> for the Daulet variety. In this phase, the increase in size of the leaf affected the extent of the leaf surface, the length and quantity of the leaf. In the germination phase, the leaf width was 0.5 cm, while in the flowering phase it was 4.80 cm for the Karabash variety and 5.28 cm for the Daulet variety. These numbers show that the leaf width increased tenfold during the flowering phase. The amount of dry matter in a plant was 0.02 g during germination and 34.74 g in the flowering phase. During the ripening period, the leaf surface area was less than during the flowering phase.

Table 2. Growth dynamics of leaf level in sorghum varieties

Navlar	Leaf width, sm	One leaf size, sm <sup>2</sup>	Dry matter content, g	One plant leaf size, sm <sup>2</sup>
When 1-2 leaves of the germination period are formed				
Karabash	0,50	2,85	0,02	5,39
Daulet	0,49	1,16	0,05	2,31
Congestion				
Karabash	0,52	8,81	0,23	25,80
Daulet	0,66	8,53	0,13	34,21
Tubing				
Karabash	1,93	41,64	3,91	242,91
Daulet	1,62	24,26	1,16	134,67
Flowering				
Karabash	4,80	335,35	33,74	2722,1
Daulet	5,28	317,90	32,78	2479,1
Ripening phase				
Karabash	4,85	335,35	107,17	1680,23
Daulet	5,32	212,98	143,7	1782,80

From the data in the table it can be seen that there was no difference between varieties during this period. Only in the Karabash variety did one leaf size predominate over other varieties. This shows that the growth process of this strain has accelerated.

In the budding phase of the growing season, the volume of a leaf was 8.53-8.81 cm<sup>2</sup> and the amount of dry matter was 0.13-0.23 g. During the flowering phase, the increase in leaf area accelerated. In this phase, the leaf area of a plant was 2722.0 cm<sup>2</sup> for the Karabash variety and 2479.1 cm<sup>2</sup> for the Daulet variety. In this phase, the increase in size of the leaf affected the extent of the leaf surface, the length and quantity of the leaf. In the germination phase, the leaf width was 0.5 cm, while in the flowering phase it was 4.80 cm for the Karabash variety and 5.28 cm for the Daulet variety. These numbers show that the leaf width increased tenfold during the flowering phase. The amount of dry matter in a plant was 0.02 g during germination and 34.74 g in the flowering phase. During the ripening period, the leaf surface area was less than during the flowering phase.

This indicator was 2722.1 cm<sup>2</sup> in the flowering phase of the Karabash variety and 1860.2 cm<sup>2</sup> in the ripening phase. The reduction in leaf surface area at the time of ripening is related to the drying of the leaves in the lower part of the plant.

The amount of dry matter in a plant of the Karabash variety was 33.74 g in the flowering phase and 107.17 g in the ripening period. It was found that the amount of dry matter in this variety increased by 73 g before the ripening period.

Because the increase in dry matter during the ripening period can be explained by the fact that the plant has reached full harvest and the crop has ripened.

The maximum leaf surface area index occurred in the flowering stage and was 2479–2722 cm<sup>2</sup> in sorghum cultivars.

In general, based on the length of the growing season, it was determined that the Karabash sorghum variety is early ripening, and the Daulet variety is mid-ripening. The Karabash sorghum variety can be used as a multi-crop crop.



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