International Journal of Modern Agriculture
ISSN: 2305-7246
Volume 10 Issue 3, 2021

# Increase and Improve Primary Seeding of New Prospective Sunflower KK-60 According to Soil-Climate Conditions in Karakalpakstan

**B. U. Aytjanov,** Doctor of Agricultural Sciences, Senior Researcher,
**A.Sayimbetov,** Doctor of Philosophy in Agricultural Sciences (PhD),Docent,
**A.I.Seytmusaev,** Candidate of Agricultural Sciences,
**R.S.Seytbaev,**Doctoral Student,
*Karakalpak Institute of Agriculture and Agrotechnology, Nukus, Uzbekistan,*
**U.E.Aytjanov,** Doctor of Agricultural Sciences, Senior Researcher,
*Karakalpak Agricultural Research Institute, Chimbay, Uzbekistan*

**Introduction.** With the development of science and technology and the introduction of new forms of management, the demand for the cultivation and creation of intensive varieties of oilseeds is growing. The role of oilseeds in the national economy is very important. The oils extracted from them are the most important food product necessary for the daily life of our people. In addition, these oils play an important role in maintaining human health. In particular, the introduction of new varieties of accelerated type in production, increasing the yield of oilseeds, is one of the important resources for improving product quality. The success of the creation of such varieties depends largely on the source material. High yields depend in many ways on how the raw materials are used. In order to provide the production with quality seeds, it is necessary to pay attention to the work of the primary and elite seed system.

Sunflower makes up 75% of the vegetable oil produced as the main oil crop. Sunflower seeds contain 50-60% of semi-dry quality oil and 16% of protein. The iodine number of the oil is 119-114. In the production of oil, its residues are used as a good valuable fodder for livestock (kunjara, shrot, baskets) because they store large amounts of protein. In the Commonwealth of Independent States, sunflower is widespread in the regions - the North Caucasus, Ukraine, Moldova, the central black soil region of Russia, the Urals, Siberia and a number of regions of Kazakhstan. Sunflower is of great importance in Uzbekistan, and its varieties are grown for oil production, silage and bites. Due to the fact that in recent years the attention to the selection of this valuable crop has declined somewhat, the varieties created under local conditions are very rare. The main factors of high yields of sunflower in modern agriculture are the choice of cultivar and seed material, as well as the technology of its cultivation.

According to D.T. Abdukarimov, T.E. Ostanakulov and M.K. Lukov [2], the yield of sunflower depends on the productivity of individual baskets and the number of plants per hectare. The productivity of a separate basket is determined by the number of seeds (pistachios) in it and the mass, weight of each seed. Here the amount of seed core output is of great importance. This figure depends on the output of the seed coat from the total mass. A 10% increase in the seed kernel (core) - leads to an increase in the amount of fat by 6-7%.

According to M.Amanov, A.Rustamov [2], after the fertilization process in the flowering phase of sunflower, a number of physiological and biochemical processes take place until the seed is fully mature. The period of complete formation of the seed consists of two stages, the first of which is the period of seed growth lasting 14-16 days. During this period, the nucleus of the seed is formed. Then in the second stage the accumulation of carbohydrates, proteins and fats of the main organic compounds from the seeds takes place in 20-25 days. Physiological maturation of the seed is characterized by the accumulation of dry matter in it and a decrease in moisture to 35%.

According to D.M.Arias, L.H.Rieseberg [4], high air temperature in sunflower at 35-370 C, humidity 18% adversely affects plant growth, development and yield, the total number of seeds in the basket is 1 plant seed weight, oil content and 1000 seeds mass decreases. It is said that as the temperature rises, the amount of protein in the seeds increases from 14 to 20%, and the amount of oil decreases.

Taking into account the above, we aim to recommend the production of quality seeds as a result of research to increase and improve the primary seed production of a new variety of sunflower KK-60, created in the natural soil-climatic conditions of Karakalpakstan.

**Research methods.** The research was conducted in the laboratory "Breeding and Seed Production" of the experimental farm of the Karakalpak Agricultural Research Institute.

The experiments began in 2016 and involved the KK-60 variety of sunflower. The experimental area consisted of 50 cell delyans. Paper labels were hung on all the plants listed. The following phenological observations were made during the growing season: 50 percent germination, plant height, basket shape, diameter, length, ripening, yield, and seed weight and type yield in boxes were determined. In the fall, typical healthy specimens were collected from each row of the sample crop. Under laboratory conditions, seed weight, core yield, and productivity traits in the basket were determined. Samples were studied under generally accepted agronomic conditions. The main morphological features of families and their offspring were identified in field observations and laboratory conditions. Variety purity was determined by the method of approbation of sunflower. This manual was approved by the Ministry of Agriculture and Water Resources of the Republic of Uzbekistan in 2002, and approbation will be conducted in August-September. In determining the fertility rate, after the plants were fully harvested in each nursery, labels were hung on 100 plants at the beginning of the mowing and basket formation period. Going into the fall, the variety rate was determined as a percentage.

Quantitative indicators of the results obtained during the study were mathematically processed using the method of statistical analysis (Dospekhov, 1985 [3]).

$$b = \frac{\sum Pax}{n} \qquad \text{b2=b x b} \qquad \text{M=A+k x b} \qquad \delta = k\sqrt{\frac{\sum Pax^2}{n} - b^2}$$

$$\delta^2 = \delta \times \delta \qquad m = \frac{\delta}{\sqrt{n}} \qquad V = \frac{\delta \times 100\%}{M}$$

n - the number of samples studied
M - the average of the combination symbols
A-the most common of the options
k - the division interval difference from the standard dispersion
m - the average error
V - the coefficient of variation

In the experiment, observations were made on the valuable economic characteristics and variety of varieties. In the experiment, the work on the sorting was carried out.

**Research results and their analysis.**In our experiments, along with the creation of elite seedlings, individual selection and sample harvesting seedlings were organized, and observations were made on the main valuable farm characteristics.

In the individual selection nursery, the new promising KK-60 variety of sunflower was analyzed for plant height; total number of leaves, seed weight per basket, fast ripening, productivity and seed yield, the results of the analysis are given below.

When we studied 25 families from the 5 cm mark on the plant height mark, there were 5 classes, i.e. 95-99 cm 1st grade, 100-104 cm 2nd grade, 105-109 cm 3rd grade, 110-114 cm 4th grade and 5th grades of 115–120 cm. It was found that in the range 100–104 cm 2nd grade, 105–109 cm 3rd grade and 110–114 cm 4th grade, most of the plants were concentrated, so these classes were considered the main part and the two classes at the two edges, i.e. 95–99 cm 1-. Class and 115-120 cm 5 classes were considered atypical classes.

When we added plants in the classes on both sides, we retained families with up to two atypical plants per family. When we added plants in atypical classes, we excluded families with more than two atypical plants in each family, i.e., 18th, 42nd, 66th families. Thus, in terms of plant height, 3 families were excluded and 22 families were retained (Table 1).

**Table 1**

**ariability of KK-60 cultivar on plant height mark in individual selection seedlings**

| № | Families | k=5 sм | | | | | N | M +m | д | V, % |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 95-99 | 100-104 | 105-109 | 110-114 | 115-120 | | | | |
| 1 | 3 | - | 8 | 27 | 14 | 1 | 50 | 107.8+0.5 | 3.5 | 3.3 |
| 2 | 4 | - | 8 | 21 | 19 | 2 | 50 | 108.5+0.6 | 3.9 | 3.6 |
| 3 | 7 | - | 10 | 21 | 18 | 1 | 50 | 108.0+0.5 | 3.9 | 3.6 |
| 4 | 9 | - | 6 | 32 | 11 | 1 | 50 | 107.7+0.4 | 3.2 | 3.0 |
| 5 | 11 | 1 | 8 | 34 | 7 | - | 50 | 106.7+0.5 | 3.2 | 3.0 |
| 6 | 12 | - | 7 | 26 | 15 | 2 | 50 | 108.2+0.5 | 3.7 | 3.4 |
| 7 | 18 | 2 | 9 | 22 | 16 | 1 | 50 | 107.5+0.6 | 4.3 | 4.0 |
| 8 | 21 | - | 8 | 23 | 18 | 1 | 50 | 108.2+0.5 | 3.7 | 3.4 |
| 9 | 23 | - | 10 | 22 | 16 | 2 | 50 | 108.0+0.6 | 4.0 | 3.7 |
| 10 | 29 | - | 8 | 24 | 17 | 1 | 50 | 108.1+0.5 | 3.7 | 3.4 |
| 11 | 34 | - | 10 | 21 | 18 | 1 | 50 | 108.0+0.5 | 3.9 | 3.6 |
| 12 | 38 | - | 11 | 23 | 14 | 2 | 50 | 107.7+0.6 | 4.0 | 3.7 |
| 13 | 42 | 1 | 7 | 22 | 18 | 2 | 50 | 108.3+0.6 | 4.1 | 3.8 |
| 14 | 44 | 1 | 18 | 21 | 10 | - | 50 | 106.0+0.5 | 3.9 | 3.7 |
| 15 | 47 | - | 8 | 23 | 18 | 1 | 50 | 108.2+0.5 | 3.7 | 3.4 |
| 16 | 50 | - | 7 | 26 | 16 | 1 | 50 | 108.1+0.5 | 3.5 | 3.3 |
| 17 | 52 | 1 | 10 | 24 | 15 | - | 50 | 107.3+0.5 | 3.8 | 3.6 |
| 18 | 55 | - | 10 | 20 | 18 | 2 | 50 | 108.2+0.6 | 4.1 | 3.8 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 19 | 59 | - | 11 | 23 | 15 | 1 | 50 | 107.6+0.5 | 3.9 | 3.6 |
| 20 | 62 | - | 8 | 22 | 19 | 1 | 50 | 108.3+0.5 | 3.8 | 3.5 |
| 21 | 66 | 1 | 8 | 26 | 12 | 3 | 50 | 107.8+0.6 | 4.2 | 3.9 |
| 22 | 67 | - | 5 | 26 | 17 | 2 | 50 | 108.6+0.5 | 3.6 | 3.3 |
| 23 | 69 | - | 9 | 28 | 11 | 2 | 50 | 107.6+0.5 | 3.7 | 3.5 |
| 24 | 70 | - | 11 | 24 | 14 | 1 | 50 | 107.5+0.5 | 3.8 | 3.5 |
| 25 | 72 | 1 | 10 | 23 | 16 | - | 50 | 107.4+0.5 | 3.9 | 3.6 |

When we studied the KK-60 variety on the basis of the total number of leaves in the individual selection nursery, the average rate ranged from 24.4 to 25.1. According to the author of the variety, the total number of leaves of this variety is 22-27.

The total number of leaves was 5 classes when we studied 25 families in 2 pieces. 20-21 grains 1st grade, 22-23 grains 2nd grade, 24-25 grains 3rd grade, 26-27 grains 4th grade and 28-29 grains 5th grade. It was found that the bulk of the plants were concentrated in the intermediate classes. Therefore, we considered these 3 classes as the main part, and the classes on both sides as atypical classes. When we added the plants encountered in the classes on both sides, we kept the families with up to 2 atypical plants in each family without subtracting the total number of leaves.

When we added the plants found in the classes on both sides, we subtracted 42 families with more than 2 atypical plants in each family. Thus, according to the total number of leaves, 1 family was excluded and 24 families were retained (Table 2).

**Table 2**

**Variability of KK-60 cultivar in the individual selection nursery on the basis of the total number of leaves**

| № | Families | k=2 pieces | | | | | N | M +m | д | V, % |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 20-21 | 22-23 | 24-25 | 26-27 | 28-29 | | | | |
| 1 | 3 | - | 8 | 24 | 17 | 1 | 50 | 24.9+0.2 | 1.5 | 9.9 |
| 2 | 4 | - | 11 | 22 | 16 | 1 | 50 | 24.8+0.2 | 1.6 | 10.6 |
| 3 | 7 | 1 | 11 | 28 | 10 | - | 50 | 24.4+0.2 | 1.4 | 9.9 |
| 4 | 9 | - | 12 | 23 | 14 | 1 | 50 | 24.7+0.2 | 1.6 | 10.6 |
| 5 | 11 | 1 | 12 | 22 | 14 | 1 | 50 | 24.6+0.2 | 1.7 | 11.4 |
| 6 | 12 | 2 | 9 | 27 | 12 | - | 50 | 24.5+0.2 | 1.5 | 10.6 |
| 7 | 18 | - | 10 | 26 | 13 | 1 | 50 | 24.7+0.2 | 1.5 | 10.0 |
| 8 | 21 | 1 | 11 | 20 | 17 | 1 | 50 | 24.7+0.2 | 1.7 | 11.5 |
| 9 | 23 | - | 9 | 20 | 19 | 2 | 50 | 55.1+0.2 | 1.6 | 10.8 |
| 10 | 29 | 1 | 8 | 31 | 10 | - | 50 | 24.5+0.2 | 1.3 | 9.2 |
| 11 | 34 | - | 8 | 22 | 20 | - | 50 | 25.0+0.2 | 1.4 | 9.6 |
| 12 | 38 | - | 13 | 17 | 19 | 1 | 50 | 24.9+0.2 | 1.7 | 11.7 |
| 13 | 42 | 1 | 10 | 19 | 18 | 2 | 50 | 24.9+0.2 | 1.8 | 11.8 |
| 14 | 44 | - | 15 | 21 | 14 | - | 50 | 24.5+0.2 | 1.5 | 10.6 |
| 15 | 47 | - | 7 | 24 | 17 | 2 | 50 | 25.1+0.2 | 1.5 | 10.1 |
| 16 | 50 | 2 | 10 | 23 | 15 | - | 50 | 24.5+0.2 | 1.6 | 11.3 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 17 | 52 | 1 | 9 | 27 | 13 | - | 50 | 24.6+0.2 | 1.4 | 10.0 |
| 18 | 55 | - | 12 | 20 | 17 | 1 | 50 | 24.8+0.2 | 1.6 | 10.9 |
| 19 | 59 | - | 13 | 22 | 14 | 1 | 50 | 24.6+0.2 | 1.6 | 10.8 |
| 20 | 62 | 1 | 10 | 24 | 14 | 1 | 50 | 24.7+0.2 | 1.6 | 11.0 |
| 21 | 66 | - | 9 | 26 | 14 | 1 | 50 | 24.8+0.2 | 1.5 | 9.9 |
| 22 | 67 | - | 10 | 27 | 13 | - | 50 | 24.6+0.2 | 1.4 | 9.3 |
| 23 | 69 | 1 | 9 | 26 | 13 | 1 | 50 | 24.7+0.2 | 1.6 | 10.6 |
| 24 | 70 | 1 | 8 | 30 | 11 | - | 50 | 24.5+0.2 | 1.4 | 9.4 |
| 25 | 72 | - | 9 | 25 | 14 | 2 | 50 | 24.9+0.2 | 1.5 | 10.4 |

When we studied the KK-60 variety in the individual selection nursery on the basis of the number of basal diameters per 1 plant, the average value ranged from 25.2 cm to 26.1 cm. According to the author of the variety, the number of baskets of this variety was 21-29 cm.

When we studied 25 families in 3 groups according to the length sign of the basket diameter in a single plant, it consisted of 5 classes, i.e. 1st class with 18-20 cm, 2nd class with 21-23 cm, 3rd class with 24-26 cm, 4th grade with 27-29 cm and 5th grade with 30-32 cm. It was found that the bulk of the plants were concentrated in the intermediate classes. Therefore, we considered these 3 classes to be the main part, and the two classes at the two edges to be atypical classes. When we added the plants encountered in the classes on both sides, we kept families with up to 2 atypical plants in each family without subtracting the basket diameter on a single plant by the number sign. When we added the plants found in the classes on both sides, we subtracted 42 families with more than 2 atypical plants in each family. Thus, 1 family on the diameter of the basket length in a single plant was excluded and 24 families were retained (Table 3).

**Table 3**

**Variability of basket diameter per plant length in single seedling of KK-60 variety**

| № | Families | k=3 sm. | | | | | N | M +m | d | V, % |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 18-20 | 21-23 | 24-26 | 27-29 | 30-32 | | | | |
| 1 | 3 | 1 | 10 | 20 | 18 | 1 | 50 | 25.5+0.3 | 2.5 | 16.3 |
| 2 | 4 | - | 12 | 19 | 17 | 2 | 50 | 25.5+0.4 | 2.5 | 16.4 |
| 3 | 7 | - | 10 | 25 | 14 | 1 | 50 | 25.4+0.3 | 2.2 | 14.6 |
| 4 | 9 | 1 | 8 | 27 | 13 | 1 | 50 | 25.3+0.3 | 2.3 | 15.0 |
| 5 | 11 | - | 8 | 22 | 18 | 2 | 50 | 25.8+0.3 | 2.3 | 14.9 |
| 6 | 12 | - | 10 | 23 | 16 | 1 | 50 | 25.5+0.3 | 2.3 | 14.8 |
| 7 | 18 | - | 10 | 25 | 14 | 1 | 50 | 25.4+0.3 | 2.2 | 14.6 |
| 8 | 21 | 1 | 10 | 23 | 15 | 1 | 50 | 25.3+0.3 | 2.4 | 16.0 |
| 9 | 23 | - | 11 | 21 | 16 | 2 | 50 | 25.5+0.3 | 2.5 | 15.9 |
| 10 | 29 | - | 10 | 26 | 12 | 2 | 50 | 25.4+0.3 | 2.3 | 15.1 |
| 11 | 34 | - | 10 | 24 | 15 | 1 | 50 | 25.4+0.3 | 2.3 | 14.7 |
| 12 | 38 | 1 | 10 | 22 | 16 | 1 | 50 | 25.4+0.3 | 2.5 | 16.1 |
| 13 | 42 | - | 7 | 21 | 19 | 3 | 50 | 26.1+0.3 | 2.4 | 15.0 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 14 | 44 | - | 8 | 26 | 14 | 2 | 50 | 25.6+0.3 | 2.3 | 14.5 |
| 15 | 47 | 1 | 11 | 23 | 14 | 1 | 50 | 25.2+0.3 | 2.4 | 16.2 |
| 16 | 50 | 1 | 11 | 19 | 18 | 1 | 50 | 25.4+0.4 | 2.6 | 16.7 |
| 17 | 52 | - | 12 | 23 | 13 | 2 | 50 | 25.3+0.3 | 2.4 | 16.0 |
| 18 | 55 | - | 11 | 22 | 16 | 1 | 50 | 25.4+0.3 | 2.3 | 15.2 |
| 19 | 59 | - | 12 | 24 | 12 | 2 | 50 | 25.2+0.3 | 2.4 | 15.8 |
| 20 | 62 | 1 | 7 | 27 | 15 | - | 50 | 25.4+0.3 | 2.1 | 14.0 |
| 21 | 66 | - | 10 | 29 | 9 | 2 | 50 | 25.2+0.3 | 2.2 | 14.6 |
| 22 | 67 | - | 8 | 21 | 19 | 2 | 50 | 25.9+0.3 | 2.4 | 14.9 |
| 23 | 69 | 1 | 10 | 22 | 16 | 1 | 50 | 25.4+0.3 | 2.5 | 16.1 |
| 24 | 70 | - | 10 | 22 | 17 | 1 | 50 | 25.5+0.3 | 2.3 | 15.0 |
| 25 | 72 | - | 10 | 25 | 14 | 1 | 50 | 25.4+0.3 | 2.3 | 14.7 |

When we studied 25 families in 2 days on the sign of early ripening in the nursery of the variety KK-60, there were 5 classes. 1st grade for 77-78 days, 2nd grade for 79-80 days, 3rd grade for 81-82 days, 4th grade for 83-84 days and 5th grade for 85-86 days. It was found that the bulk of the plants were concentrated in the intermediate classes. Therefore, we considered these 3 classes to be the main part, and the classes at the two edges to be atypical classes. When we added the plants encountered in the classes on both sides, we kept up to 2 families with atypical plants in each family without wasting them on the fast-ripening mark.

When we added the plants encountered in the classes on both sides, we subtracted 42 families with more than 2 atypical plants per family. Thus, 1 family was excluded from the fasting mark and 24 families were retained (Table 4).

**Table 4**

**Variability of KK-60 cultivar in terms of plant ripening in single-seedling seedlings**

| № | Families | k=2 days | | | | | N | M +m | d | V, % |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 77-78 | 79-80 | 81-82 | 83-84 | 85-86 | | | | |
| 1 | 3 | 2 | 17 | 22 | 9 | - | 50 | 81.0+0.2 | 1.6 | 1.4 |
| 2 | 4 | 2 | 15 | 22 | 11 | - | 50 | 81.2+0.2 | 1.6 | 1.4 |
| 3 | 7 | 1 | 16 | 25 | 8 | - | 50 | 81.1+0.2 | 1.5 | 1.3 |
| 4 | 9 | - | 14 | 26 | 10 | - | 50 | 81.3+0.2 | 1.4 | 1.2 |
| 5 | 11 | 1 | 15 | 25 | 9 | - | 50 | 81.2+0.2 | 1.7 | 1.5 |
| 6 | 12 | 1 | 13 | 22 | 14 | - | 50 | 81.5+0.2 | 1.6 | 1.4 |
| 7 | 18 | 1 | 16 | 21 | 11 | 1 | 50 | 81.3+0.2 | 1.7 | 1.3 |
| 8 | 21 | 1 | 17 | 26 | 6 | - | 50 | 81.0+0.2 | 1.4 | 1.2 |
| 9 | 23 | 1 | 11 | 28 | 10 | - | 50 | 81.4+0.2 | 1.4 | 1.2 |
| 10 | 29 | 2 | 16 | 24 | 8 | - | 50 | 81.0+0.2 | 1.5 | 1.3 |
| 11 | 34 | 2 | 13 | 26 | 9 | - | 50 | 81.2+0.2 | 1.5 | 1.3 |
| 12 | 38 | - | 8 | 25 | 15 | 2 | 50 | 81.9+0.2 | 1.5 | 1.4 |
| 13 | 42 | 1 | 11 | 22 | 14 | 2 | 50 | 81.7+0.2 | 1.7 | 1.5 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 14 | 44 | 2 | 17 | 24 | 7 | - | 50 | 80.9+0.2 | 1.5 | 1.4 |
| 15 | 47 | 1 | 16 | 23 | 10 | - | 50 | 81.2+0.2 | 1.5 | 1.3 |
| 16 | 50 | 1 | 17 | 23 | 9 | - | 50 | 81.1+0.2 | 1.5 | 1.3 |
| 17 | 52 | - | 7 | 24 | 18 | 1 | 50 | 82.0+0.2 | 1.4 | 1.3 |
| 18 | 55 | 1 | 14 | 25 | 10 | - | 50 | 81.3+0.2 | 1.5 | 1.3 |
| 19 | 59 | - | 14 | 23 | 13 | - | 50 | 81.5+0.2 | 1.5 | 1.3 |
| 20 | 62 | 1 | 15 | 24 | 10 | - | 50 | 81.2+0.2 | 1.5 | 1.3 |
| 21 | 66 | 2 | 16 | 21 | 11 | - | 50 | 81.1+0.2 | 1.6 | 1.4 |
| 22 | 67 | 1 | 15 | 25 | 9 | - | 50 | 81.2+0.2 | 1.5 | 1.3 |
| 23 | 69 | - | 7 | 26 | 15 | 2 | 50 | 82.0+0.2 | 1.5 | 1.3 |
| 24 | 70 | - | 13 | 25 | 12 | - | 50 | 81.5+0.2 | 1.4 | 1.2 |
| 25 | 72 | 1 | 11 | 28 | 10 | - | 50 | 81.4+0.2 | 1.4 | 1.2 |

When we studied 25 families per 5 grams in terms of productivity in the individual selection nursery of the variety KK-60, it was 5 classes. Grade 1 with 58-62 grams, grade 2 with 63-67 grams, grade 3 with 68-72 grams, grade 4 with 73-77 grams and grade 5 with 78-82 grams. It was found that the bulk of the plants were concentrated in the intermediate classes. Therefore, when we considered these 3 classes as the main part and considered the two edge classes as atypical classes, and added the plants encountered in these two classes, we kept the families with up to 2 atypical plants in each family without deducting in terms of productivity.

When we added the plants found in the classes on both sides, we subtracted 66 families with more than 2 atypical plants in each family. Thus, 1 family was excluded from the productivity index and 24 families were retained (Table 5).

**Table 4**

**Variability of plant productivity in the individual selection nursery of KK-60 variety**

| № | Families | k=3 grams | | | | | N | M +m | d | V, % |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 58-62 | 63-67 | 68-72 | 73-77 | 78-82 | | | | |
| 1 | 3 | - | 10 | 24 | 15 | 1 | 50 | 70.7+0.5 | 3.8 | 4.7 |
| 2 | 4 | - | 10 | 25 | 14 | 1 | 50 | 70.6+0.5 | 3.7 | 4.6 |
| 3 | 7 | - | 13 | 22 | 15 | - | 50 | 70.2+0.5 | 3.8 | 4.7 |
| 4 | 9 | - | 9 | 23 | 16 | 2 | 50 | 71.1+0.6 | 4.0 | 4.9 |
| 5 | 11 | - | 6 | 22 | 20 | 2 | 50 | 71.8+0.5 | 3.8 | 5.0 |
| 6 | 12 | - | 5 | 22 | 21 | 2 | 50 | 72.0+0.5 | 3.7 | 4.5 |
| 7 | 18 | - | 14 | 22 | 13 | 1 | 50 | 70.1+0.6 | 4.0 | 5.0 |
| 8 | 21 | 1 | 10 | 28 | 10 | 1 | 50 | 70.0+0.5 | 3.8 | 4.7 |
| 9 | 23 | - | 11 | 23 | 15 | 1 | 50 | 70.6+0.5 | 3.9 | 5.0 |
| 10 | 29 | 1 | 12 | 22 | 14 | 1 | 50 | 70.2+0.6 | 4.2 | 5.2 |
| 11 | 34 | - | 12 | 25 | 12 | 1 | 50 | 70.2+0.5 | 3.8 | 4.7 |
| 12 | 38 | 1 | 12 | 23 | 13 | 1 | 50 | 70.1+0.6 | 4.1 | 5.1 |
| 13 | 42 | - | 4 | 23 | 21 | 2 | 50 | 72.1+0.5 | 5.1 | 4.3 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 14 | 44 | - | 8 | 26 | 14 | 2 | 50 | 71.0+0.5 | 3.8 | 4.7 |
| 15 | 47 | 2 | 12 | 27 | 7 | - | 50 | 69.1+0.5 | 3.6 | 4.6 |
| 16 | 50 | 1 | 11 | 25 | 12 | 1 | 50 | 70.1+0.6 | 4.0 | 5.0 |
| 17 | 52 | 1 | 12 | 27 | 10 | - | 50 | 69.6+0.5 | 3.6 | 4.5 |
| 18 | 55 | - | 14 | 23 | 12 | 1 | 50 | 70.0+0.6 | 3.9 | 4.9 |
| 19 | 59 | 2 | 15 | 24 | 9 | - | 50 | 69.0+0.6 | 3.9 | 5.0 |
| 20 | 62 | 1 | 10 | 27 | 11 | 1 | 50 | 70.1+0.5 | 3.8 | 4.8 |
| 21 | 66 | 3 | 13 | 25 | 9 | - | 50 | 69.0+0.6 | 4.0 | 5.1 |
| 22 | 67 | - | 5 | 24 | 19 | 2 | 50 | 71.8+0.5 | 3.6 | 4.4 |
| 23 | 69 | 1 | 12 | 23 | 13 | 1 | 50 | 70.1+0.6 | 4.1 | 5.1 |
| 24 | 70 | - | 10 | 24 | 15 | 1 | 50 | 70.7+0.5 | 3.8 | 4.7 |
| 25 | 72 | - | 13 | 23 | 13 | 1 | 50 | 70.2+0.6 | 3.9 | 4.9 |

When we studied the KK-60 variety in terms of seed yield in individual seedlings, the average value ranged from 68.2% to 69.1%, according to the author of the variety, the seed yield of this variety was 67.0-69.9%.

When we studied 25 families at a rate of two per cent on this seed expenditure indicator, it consisted of 5 classes, i.e. 64-65% 1st grade, 66-67% 2nd grade, 68-69% 3rd grade, 70th. Grade 4 with 71% and grade 5 with 72-73%. It was found that the bulk of the plants were concentrated in the intermediate classes.

Therefore, we considered these 3 classes to be the main part, and the classes at the two edges to be atypical classes. When we added the plants encountered in the classes on both sides, we kept the families that encountered up to 2 plants in each family without exposing the sunflower seed to the seed mark.

When we added the plants encountered in the classes on both sides, we excluded the 18th and 66th families, which encountered more than 2 atypical plants in each family. Thus, 2 families were excluded and 23 families were retained (Table 6).

**Table 6**

**Variability of sunflower seed yield in seedling of KK-60 variety**

| № | Families | k=2% (percent) | | | | | N | M +m | d | V, % |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 64-65 | 66-67 | 68-69 | 70-71 | 72-73 | | | | |
| 1 | 3 | - | 9 | 24 | 16 | 1 | 50 | 68.9+0.2 | 1.5 | 3.8 |
| 2 | 4 | - | 11 | 24 | 14 | 1 | 50 | 68.7+0.2 | 1.5 | 3.9 |
| 3 | 7 | - | 9 | 26 | 13 | 2 | 50 | 68.8+0.2 | 1.5 | 3.9 |
| 4 | 9 | 1 | 8 | 23 | 17 | 1 | 50 | 68.9+0.2 | 1.6 | 4.1 |
| 5 | 11 | 1 | 7 | 30 | 11 | 1 | 50 | 68.7+0.2 | 1.4 | 3.7 |
| 6 | 12 | 1 | 13 | 26 | 10 | - | 50 | 68.3+0.2 | 1.5 | 3.8 |
| 7 | 18 | 2 | 10 | 25 | 11 | 2 | 50 | 68.5+0.2 | 1.7 | 4.5 |
| 8 | 21 | 1 | 10 | 24 | 15 | - | 50 | 68.6+0.2 | 1.5 | 4.0 |
| 9 | 23 | - | 11 | 25 | 13 | 1 | 50 | 68.7+0.2 | 1.5 | 3.9 |
| 10 | 29 | - | 10 | 21 | 17 | 2 | 50 | 68.9+0.2 | 1.6 | 4.2 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 11 | 34 | 1 | 10 | 29 | 10 | - | 50 | 68.4+0.2 | 1.4 | 3.6 |
| 12 | 38 | - | 7 | 24 | 17 | 2 | 50 | 69.1+0.2 | 1.7 | 4.4 |
| 13 | 42 | 1 | 13 | 25 | 11 | - | 50 | 68.3+0.2 | 1.5 | 3.9 |
| 14 | 44 | - | 12 | 25 | 12 | 1 | 50 | 68.6+0.2 | 1.5 | 3.9 |
| 15 | 47 | - | 11 | 21 | 16 | 2 | 50 | 68.9+0.2 | 1.6 | 4.2 |
| 16 | 50 | 2 | 16 | 19 | 13 | | 50 | 68.2+0.2 | 1.7 | 4.5 |
| 17 | 52 | - | 12 | 22 | 15 | 1 | 50 | 68.7+0.2 | 1.6 | 4.1 |
| 18 | 55 | - | 10 | 21 | 17 | 2 | 50 | 68.9+0.2 | 1.6 | 4.2 |
| 19 | 59 | 1 | 8 | 28 | 12 | 1 | 50 | 68.7+0.2 | 1.5 | 3.9 |
| 20 | 62 | 1 | 13 | 26 | 10 | - | 50 | 68.3+0.2 | 1.5 | 3.8 |
| 21 | 66 | 2 | 11 | 20 | 15 | 2 | 50 | 68.3+0.3 | 1.8 | 4.8 |
| 22 | 67 | - | 9 | 27 | 13 | 1 | 50 | 68.7+0.2 | 1.4 | 3.7 |
| 23 | 69 | - | 10 | 27 | 12 | 1 | 50 | 68.7+0.2 | 1.4 | 3.7 |
| 24 | 70 | - | 10 | 24 | 14 | 2 | 50 | 68.8+0.2 | 1.6 | 4.1 |
| 25 | 72 | 1 | 13 | 22 | 13 | 1 | 50 | 68.5+0.2 | 1.6 | 4.3 |

**Conclusion.** In the individual selection nursery of KK-60 variety of sunflower, all studied traits, such as plant height, total number of leaves, number of baskets diameter per bush, fast ripening, productivity and seed yield were analyzed and 18, 42 and 66 families were analyzed according to plant height, 42 families in terms of the number of baskets in a single plant, 42 families in terms of early ripening, 66 families in terms of productivity and 18, 66 families in terms of seed yield. That is, out of the 25 families surveyed, 3 families (families 18, 42 and 66) were excluded and 22 good families were separated.

## List of used literature

1. Abdukarimov D.T., Ostanakulov T.E., Lukov M.K. Breeding and Seed Workshop. // Zarafshan Publishing House. Samarkand, 1993. 150 p.
2. Amanova M., Rustamov A. High-yielding varieties of sunflower. // Journal of Agriculture of Uzbekistan. № 5. 2004. 24 p.
3.Dospekhov B.A. Methodology of field opyta. M.: “Agropromizdat”, 1985. p. 251.
4. Arias D.M., Rieseberg L.H. Genetic relationship between domesticated and wild sunflowers (Helianthus annuus, Asteraceae) // Econ. Bot. 1995, V. 49, N 3. P. 239-248.