

STUDY OF A COLLECTION OF GARLIC VARIETY SAMPLES AND ALLOCATION OF PRIMARY SOURCES FOR SELECTION WORK

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Annotation: This article highlights the results of the experiments carried out to identify promising samples with high yields, high crop quality, suitable for storage as feedstock.

Key words: garlic, standard variety, selection, cloves, bulb, inflorescence, indicator, selection, productivity.

Garlic has long been one of the favorite vegetables and medicinal crops of the population of the world, and it is cultivated in large areas not only in our republic, but also all over the world, and scientists are conducting a lot of scientific research on the creation of new varieties. In this regard, scientific research began in our republic in the 60s-70s of the last century, and research on its cultivation technology and the creation of local varieties continues to this day.

Scientific research on garlic was also carried out at the Surkhandarya Scientific Experimental Station of SPE and KITI, where studies were conducted on the study of garlic varietal samples, the allocation of primary sources for selection, and the creation of new varieties. As a result, new varieties of garlic suitable for the climatic conditions of the southern region of our republic, Chidamli, Baraka, Surkhan Ohasi, were created and included in the State Register.

In addition, the State Register of Agricultural Crops Recommended for Planting in the Republic of Uzbekistan includes the varieties of garlic Yuzhno-fioletov (1972) and Maysky VIRA (1978). Both belong to the group of winter varieties and cannot fully meet the requirements of modern market and processing enterprises in terms of yield, size of bulb and bulblets, and other important economic characteristics.

Based on the above, the goal of our research was to create a primary source for selection work, isolate promising clones, conduct selection tests of promising clones, create high-yielding and high-quality varieties suitable for natural storage, and submit them to the State Variety Testing Commission.

At the Surkhandarya Scientific Experimental Station of the Scientific Research Institute of Vegetables, Melons and Potatoes, 21 samples of garlic varieties imported from the Russian Federation and grown in local conditions were studied in 2012-2015.

The results of phenological observations in our scientific study showed that while 16-17 days were required for the bulbs to fully sprout in the variety samples, the period from full sprouting to the emergence of flower stalks in the variety samples imported from the Russian Federation was 206-211 days, while in the comparative variety, Resistant and local varieties this period was reduced by 14-15 days and amounted to 191-197 days.

The period from full sprouting of bulbs to yellowing of stems was 247-249 days in the variety samples imported from the Russian Federation, while the duration of this period was 214-217 days in the comparative Resistant varieties, K-16, K-17, K-18, K-21, K-27, and was shortened to 32-33 days. Garlic variety samples showed a sharp difference in terms of growing season and other important economic characteristics (see Table 2.1). In 2012-2015, the growing season of the comparative and Chidamli varieties, K-16, K-17, K-18, K-21 varieties was 219-222 days, and K-23, K-25, K-26, K-27 samples was 224-226 days. At the same time, the K-81 variety samples grown in local conditions and imported from the Russian Federation were relatively late-ripening, with a growing season of 254-256 days. This indicated that they ripened 27-35 days later than the comparative Yuzhno-violetovy and other studied varieties. The harvest of the comparative Yuzhno-violetovy, Chidamli and local varieties was harvested in the second decade of May, the K-81 variety in the first decade of June, and the varieties imported from Russia in the third decade of June.

Before harvesting, the garlic plant was characterized by morphobiological signs. The height of the false stem (including the length of the flower stalk) was 38-45 cm in the K-18, K-21, K-23, K-25, K-26, K-27, K-81 samples, and 49-53 cm in the comparative variety, Chidamli and K-16, K-17 varieties. This indicator (44-81 cm) was slightly higher in the samples imported from the Russian Federation. All the studied samples belong to the group of flower stalk-forming varieties. In general, whether or not plants produce flower stalks depends on the climatic conditions of the region where these varieties are grown. The length of the flower stalk in the studied varieties was around 11-43 cm. These indicators alone can give an idea of how variable this trait is. The number of leaves per plant varied greatly between the varietal samples. It should be noted that the number of leaves per plant is a varietal-specific and environmental characteristic, and it can range from 7-8 to 12-15 in garlic.

In 2012-2015, the number of leaves per plant was 8.7-9.1 in the comparative variety and experimental samples. This indicator was 11.0 pieces in K-81 and some samples from the Russian Federation, which was 1.9-2.3 pieces more than in the experimental varieties. A slight difference was also observed between the varieties in terms of leaf length. In the varieties from the Russian Federation, a slightly longer leaf plate was noted. In the comparative and local varieties, the leaf length was 43-46 cm. In the varieties from the Russian Federation, the leaf plate was slightly longer, 47-53 cm.

In terms of the width of the leaf plate, a significant difference was also observed between the varieties. In the varieties from the Russian Federation, the leaf width was around 2.7-3.0 cm. This indicator was 3.0-3.3 cm in the comparative variety, Chidamli, K-16, K-21, K-26, K-27, K-81 varieties. In the K-17, K-18, K-23, and K-25 samples, the leaf width was around 3.4-3.5 cm, which was 0.4-0.5 cm more than the comparative variety. The characteristics of the onion heads of the tested varieties are given in Table 2. One of the most important indicators is the weight of the garlic head. The weight of the head was high in such samples as K-16 (72 g), K-17 (72 g), K-18 (72 g), K-23 (72 g), K-25 (78 g), K-26 (77 g). The weight of the head of these varieties was 12-18 g higher than that of the comparative variety. It was observed that the onion head weight of the comparative variety, Chidamli, K-21, K-27, K-81, K-4/R, K-7/R samples was 60-71 g, and the onion head weight of the K-3/R, K-5/R, K-6/R, K-8/R, K-9/R, K-12/R, K-13/R samples was 45-57 g, which is 3-15 g less than the comparative variety.

The number of bulbs in the onion head is one of the important economic characteristics, and the aim of the research is to create varieties with a relatively small number of bulbs, but high weight and large bulbs. The number of bulbs in the onion head in the studied varieties ranged from 4.3 to 14.0 pieces. It was observed that there was a significant difference between the varieties according to this characteristic. In some varieties imported from the Russian Federation, this trait was highly variable within the variety. For example, some plants of the K-9/R variety sample had only 2-3 bulbs, their average weight was 20.0-38.5 g, and the bulb weight was 60.0-77.0 g. In other plants, the number of bulbs was 7-8, weighing 7.0 g, and the bulb weight was 56 g. In general, a lower number of bulbs and a higher weight were observed in the varieties imported from the Russian Federation. However, these varieties are late-ripening, with a growing season of 254-256 days or ripening 30-36 days later than the comparative and local varieties.

In our studies, the number of bulbs per bulb in the comparative variety and local varieties was 13.0-14.0 pieces. The average weight of one onion in the comparative

variety, Chidamli, K-21, K-27, K-81 samples was 4.2-4.9 g, and in the K-16, K-17, K-18, K-23, K-25, K-26 samples it was 5.0-5.5 g. It was found that the weight of onion heads in the experiment was significantly related to its height and diameter. In the largest onion heads, K-25 (78g), K-26 (77g), the onion head height was 4.2-4.3 cm, and the diameter was 5.9 -6.0 cm.

In the comparative Yuzhno-violetovy variety, the onion head weight was 60 g, the onion head height was 3.8 cm, and the diameter was 5.5 cm. According to the data provided by G.F. Khodjaev (1969), N.S. Bakuras (1973), and P.F. Sokol (1978), onion heads with a diameter of less than 2.5 cm are considered an unripe crop.

Table 2

Onion head characteristics of garlic variety samples (2012-2015)

Sample name	Onion head				Onions	
	height,h.sm	diameter,d.sm	index	weight,g	number, pieces	weight, g
Yujno-fioletoviy, qiyosiy nav	3,8	5,5	0,7	60	14,0	4,2
Chidamli, nazorat	3,9	5,5	0,7	64	13,0	4,6
K-3/R	3,6	5,1	0,7	56	13,0	4,1
K-4/R	4,0	5,3	0,7	64	7,6	8,1
K-5/R	3,7	4,6	0,8	45	11,0	3,8
K-6/R	3,8	5,1	0,7	57	13,0	4,3
K-7/R	3,8	5,5	0,7	67	13,0	5,0
K-8/R	3,6	4,8	0,7	50	10,0	4,7
K-9/R	3,8	5,0	0,8	56	7,5	7,0
K-12/R	3,5	4,7	0,7	46	6,9	6,3
K-13/R	4,0	5,2	0,8	59	4,3	13,0
K-16	4,1	5,7	0,7	72	13,0	5,5
K-17	3,9	5,7	0,7	72	13,0	5,0

K-18	4,1	5,8	0,7	72	14,0	5,0
K-21	4,0	5,8	0,7	71	13,0	4,9
K-23	4,0	5,8	0,7	72	14,0	5,0
K-25	4,3	6,0	0,7	78	14,0	5,5
K-26	4,2	5,9	0,7	77	14,0	5,5
K-27	4,0	5,7	0,7	64	13,0	4,5
K-81	3,9	5,5	0,7	63	13	4,6

In the variety samples in our study, the bulb diameter was 4.6-6.0 cm, and the index was 0.7-0.8, and the bulb was flat-round in shape.

Garlic variety samples differed sharply from each other in terms of yield and crop quality. For example, in the K-5/R sample, the yield was 17.6 t/ha, while in the K-23 sample this indicator reached 33.4 t/ha.

The highest total yield was observed in the K-16, K-17, K-18, K-21, K-23, K-25, K-26, K-27 samples and amounted to 30.2-33.4 t/ha.

The total yield of most of the varieties imported from the Russian Federation was very low, 17.6-25.5 t/ha, which is 66.4-96.2% compared to the comparative variety (see Table 2.4).

K-81 is a relatively late-ripening variety, with a growing season of 246 days, a bulb weight of 63 g, a number of bulbs of 13, and a bulb weight of 4.6 g. The yield is 24.2 t/ha.

When the bulbs were stored at room temperature, it was observed that they were well stored until February-March of the following year. In practice, the bulbs of local garlic grown in the country fully germinate and become unripe in September-October.

In 2012-2015, the onion head weight of the K-16 and K-18 varieties, which were considered promising, was 72 g, the number of bulbs was 13-14, and the weight of the bulbs was 5.0-5.5 g. The dry peel of the onion head was purple. At the same time, the onion head weight of the K-25 sample was 78 g, the number of bulbs was 14, the weight of the bulbs was 5.5 g, and the dry peel was white. It was observed that the total and marketable yields of the K-16, K-18, K-25 samples were significantly higher than those of the comparative and local varieties, and the K-81 sample was resistant to long-term storage in home conditions. Clone K-88 from the K-16 variety sample, clone K-89

from the K-18 sample, clone K-96 from the K-25 sample, and the K-81 sample itself were selected as promising due to their long-term storage resistance and were put into selection testing in 2016. In 2012-2015, the highest total yields were observed in samples K-16, K-17, K-18, K-21, K-23, K-25, K-26, K-27 and amounted to 30.2-33.4 t/ha. The total yield of most samples from the Russian Federation was low, amounting to 17.6-25.5 t/ha, which is 66.4-96.2% compared to the comparative variety.

The highest marketable yield was observed in samples K-16, K-17, K-18, K-21, K-23, K-25, K-26, K-27, amounting to 29.0-31.9 t/ha. In these samples, 95.5-96.0% of the total yield was considered marketable. Samples K-16, K-17, K-18, K-21, K-23, K-25, K-26, K-27, as well as sample K-81, due to their resistance to long-term storage in home conditions, are considered promising initial sources for creating high-yielding and storage-resistant garlic varieties in Uzbekistan.

CONCLUSION

Based on the study of garlic varieties, it was found that the total and marketable yield of K-16, K-18, K-25 samples was significantly higher than that of comparative and local varieties, and the marketable yield was observed in K-16, K-17, K-18, K-21, K-23, K-25, K-26, K-27 samples and amounted to 29.0-31.9 t/ha. Due to their resistance to long-term storage at home, K-16, K-17, K-18, K-21, K-23, K-25, K-26, K-27 samples and K-81 sample are considered promising initial sources for creating high-yielding and storage-resistant garlic varieties in Uzbekistan. The highest marketable yield was observed in these samples.

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