

Methods of Growing Pumpkin in the Conditions of Karakalpakstan

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ANNOTATION

In this article, the methods of using fertilizers and their norms in the cultivation of pumpkin varieties in the soil and climatic conditions of the Republic of Karakalpakstan were studied. Here are the data of scientific studies of the effect of the application of mineral and organic fertilizers on the growth and productivity of pumpkin varieties Spanish-73 and Kashkar-1644 in the conditions of the region according to the 5th variant.

It has been established that biohumuses from organic fertilizers have a high level of efficiency in the collection of high-quality and plentiful crops. The ways and terms of storage of the cultivated crop in the conditions of the region are given. At the end of the event, information is provided on the economic efficiency of agrotechnical measures, the methods used and methods of storage. Conclusions and recommendations for production are given on the basis of information obtained as a result of scientific research.

KEYWORDS: *Vegetable cucurbitaceae, botany, variety, chemical composition, value, sowing scheme, root mass, seed production, agricultural technology, productivity.*

Introduction. To eliminate the food problem in the world, that is, to ensure its safety, an urgent requirement is to increase the production of vegetable products, growing high-quality and environmentally friendly products. It is necessary to satisfy the population's demand for vegetable products, use land efficiently, and apply new technologies for growing vegetable crops. Today, one of the main problems is the reduction in the area of arable land, which causes an increase in the level of salinization of arable land. In the republic, special attention is paid to conducting large-scale research in the agro-industrial complex, increasing the yield of rice and vegetable crops, rational use of natural resources, and improving the structure of sown areas. In our country, vegetables are considered one of the main tasks in ensuring a culture of nutrition, health and proper nutrition. Among vegetables, it is important to grow pumpkin species, increase the species composition on the table of our people, study the morphobiology of rare pumpkin species, and fight diseases and pests. Pumpkin crops have long been the most important and beloved product of the peoples of Central Asia due to their high nutritional value and taste. Currently, in our republic it is planned to use new technologies in growing pumpkin crops, expand the sown area and obtain a high yield. Pumpkin products occupy a special place in the formation of a healthy lifestyle for our people; they have long been known for their healing properties and are rich in vitamins. The basis for its development was the Decree of the President of the Republic of Uzbekistan dated July 29, 2019 No. DP-4406 "On additional measures for deep processing of agricultural products and further development of the food industry". There are specific agricultural technologies and operational aspects of growing melons, determining the optimal planting time taking into account the soil and climatic conditions of the area, determining the optimal fertilizer rates, as well as determining the thickness of the seedlings, which is the main factor that determines the productivity index, determined by its uniqueness. Melon

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products are used seasonally, mainly in summer and autumn. In winter and early spring, melon products are a valuable product. For this reason, planting long-lived and well-stored varieties of melons and proper organization of their storage ensures the use of melons throughout the year. Although many guidelines have been developed throughout the world for the cultivation and long-term storage of pumpkin crops, in many countries there is not enough research on the types of fertilizers and the technology for their use when growing pumpkin plants. In the soil and climatic conditions of the Republic of Karakalpakstan, methods of applying various types of fertilizers to the pumpkin plant have not been sufficiently studied. In our republic, much attention is paid to the development of the agricultural sector, and a lot of work is being done in this area. When studying the climatic and soil conditions of pumpkin cultivation in Karakalpakstan for many years in some regions of our republic, vermicompost is produced from various amounts of fertilizers, which in subsequent years became widespread for agricultural crops; no special research was carried out. Studies have been conducted on the duration of fermentation and normacin, its effect on plant growth, yield, as well as measures to combat pests and diseases. In the Republic of Karakalpakstan, the area of land suitable for growing agricultural crops is more than 300,000 hectares, of which 6 thousand hectares are sown with melons and a bountiful harvest is harvested. In our region, melons, watermelons, and pumpkins are grown in large quantities from melon crops. A number of pumpkin varieties are grown from melons. Basically, in our experience, scientific research was carried out on pumpkin varieties Kashkar-1644 and Spanish-73. The root system of the pumpkin plant and melon crops is highly developed, mainly the main root and lateral roots are less developed. Pumpkin plants cluster in long, spreading panicles, creating a unique microflora in the area. At the same time, some forms of this plant are characterized by low and erect growth. It has been proven that the main stem of some varieties of large-fruited pumpkin can reach up to 10 meters. The stem of a pumpkin with large fruits is round, that of a pumpkin with a hard skin is pentagonal, and that of butternut squash is narrow-ribbed. Only the main stem of the Spanish-73 pumpkin variety was long and cylindrical. Pumpkin plants (*Cucurbita pepo*) are divided into: true semi-lianas, recumbent plants with long stems, creeping plants with long stems. Based on the length of the main stem, pumpkin plants are divided into the following types: long - 3 meters or more, medium - 1.5-3 m, short - 1.5 meters and shorter. Lateral branches are formed from the initial and subsequent segments of the main stem of the plant. Lateral branches develop from these branches. The leaves of the pumpkin plant consist of large leaf blades and long stripes that are well developed. They are formed at the junction of leaves and are arranged in a row on stems and branches. The shape of the leaf plate is round, kidney-shaped, triangular, pentagonal. Depending on the size of the leaves: large (more than 20 cm long without a band), medium (12-20 cm), small (shorter than 12 cm). Long (10-25 cm) banded and broad-laminated leaves grow from each joint. The number of leaves a plant has depends on the variety.

The flowering phase of pumpkin stems of the Spanish-73 variety, 1-1.2 m long in 1 month and 1.9-2.4 m long in the second month, coincided with the date of the first ten days of June. Pollinator flowers, the first stage of pumpkin flowering in five variants, were identified on June 15, and mother flowers began to open after 5-10 days. During the period of our experiments, the effect of various amounts of fertilizers on the growth and development of pumpkin plants was studied. The results are presented in Table 1.

It can be seen that in our scientific research we determined the growth and development of the pumpkin plant according to the 5th option for 3 planting periods. In the 1st version of our scientific research on growth, the average growth length of a plant over three periods is 220.5; 225.7; 220.1 cm; if it is established that it is equal to the number of maternal flowers formed from them - about - 4.0; 3.4; 3.1 pcs.; the number of fruits from them was 3.0; 3.2; 2.4 units.

In the 2nd version of our experiments, the growth of the pumpkin in length was 198.4; 197.5; 195.1 cm when measured over three periods; number of formed maternal flowers – 3.1; 2.8; 2.1 pcs.;

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number of ripened fruits – 2.4; 2.0; 2.0 pcs. In our studies according to our 3rd option, the average increase in plant length over three periods is 187.5; 197.1; 182.4 cm, number of maternal flowers 3.0; 2.4; 2.2 pieces, the number of fruits turned out to be about 2.1; 1.8; 1.8 units. In our next 4th option, the length of the pumpkin plant is 223.5; 226.4; 222.0 cm, number of maternal flowers 3.4; 3.6; 3.1 pieces, the number of fruits formed was 3.1; 3.3; 3.1 units. In the next 5th version of our experiments, the length of the pumpkin plant is 221.5; 224.8; 220.9 cm, number of mother flowers 3.5; 3.1; 3.1 pieces, the number of fruits turned out to be about 3.1; 3.1; 3.0 pieces.

Table 1 Results of phenological control of growth and development of pumpkin variety Spanish-73 (Nukus district, experimental farm, 2021-2022).

Options	Planting period	On average, when 10 plants were studied		
		Plant length, cm	Number of mother flowers, pcs.	Number of fruits, pcs.
Control option (N-200, P-140, K-100 kg/ha)	In the 1st ten days of May	220,5	4,0	3,0
	In the 2nd decade of May	225,7	3,4	3,2
	In the 3rd decade of May	220,1	3,1	2,4
Vermicompost, 6 t/ha	In the 1st ten days of May	198,4	3,1	2,4
	In the 2nd decade of May	197,5	2,8	2,0
	In the 3rd decade of May	195,1	2,7	2,0
Cattle manure, 12 t/ha	In the 1st ten days of May	187,5	3,0	2,1
	In the 2nd decade of May	197,1	2,4	1,8
	In the 3rd decade of May	182,4	2,2	1,8
N ₁₀₀ , P ₇₀ , K ₅₀ + Vermicompost, 6 t/ha	In the 1st ten days of May	223,5	3,4	3,1
	In the 2nd decade of May	226,4	3,6	3,3
	In the 3rd decade of May	222,0	3,1	3,1
N ₁₀₀ , P ₇₀ , K ₅₀ + Qoramol Cattle manure, 12 t/ha	In the 1st ten days of May	221,5	3,5	3,1
	In the 2nd decade of May	224,8	3,1	3,1
	In the 3rd decade of May	220,9	3,1	3,0

In this experiment, when studying the growth and development of pumpkin variety Spanish-73 in relation to fertilizers, a high result was determined according to our 4th option. Compared to the control, it was found that plant growth in this variant is 5-6 cm longer, and the number of fruits is 0.1-0.3 more.

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In our experiments, we studied the influence of the amount of fertilizers and planting time on the growth and development of the pumpkin variety Kashkar-1644. The results obtained in this regard are presented in Table 2.

It can be seen that in our scientific research we determined the growth and development of the pumpkin plant according to the 5th option for 3 planting periods. In our 1st growth option, the average growth of the plant over three periods is 210.1; 198.9; 200.4 cm; the number of maternal flowers formed from them is 3.0; 2.4; 3.0 units; the number of ripened fruits was 2.0; 1.2; 2.0 pieces. In the 2nd version of our experiments, the average increase in pumpkin length over three periods was 190.0; 187.8; 185.4 cm; the number of maternal flowers was 2.1; 2.4; 2.1 pcs.; the number of ripened fruits is about 2.0; 2.0; 1.8 pieces.

At the same time, in the 3rd version of our experiments, the growth of plants in length averaged over three periods; their growth was about 180.1; 187.0; 172.4 cm; number of mother flowers 2.0; 2.0; 2.0 pcs., the number of fruits turned out to be about 1.8; 1.8; 1.8 pcs. In our 4th option, the length of the pumpkin plant is 215.5; 216.8; 222.0 cm, number of maternal flowers 3.0; 3.0; 3.0 pieces, the number of fruits was 2.8; 3.0; 3.1 pcs. During the experiments, it was found that in this variant, compared to the control variant, the growth, number of maternal flowers and number of fruits are greater. As seen from scientific research, nutrients are more important for plant growth than abiotic factors, i.e. solar energy. From these experiments it is clear that the role of organic fertilizers among nutrients is incomparable. We ensure plant growth by applying local organic fertilizers or vermicomposts to crops during the growing season. As a result, there was a chance to collect the expected amount of harvest.

Table . Results of phenological monitoring of the growth of pumpkin variety Kashkar-1644 (Nukus district, experimental farm, 2021-2022)

Options	Planting period	On average, when 10 plants were studied		
		Plant length, cm	Number of mother flowers, pcs.	Number of fruits, pcs.
Control option (N-200, P-140, K-100 kg/ha)	In the 1st ten days of May	210,1	3,0	2,0
	In the 2nd decade of May	198,9	2,4	1,2
	In the 3rd decade of May	200,4	3,0	2,0
Vermicompost, 6 t/ha	In the 1st ten days of May	190,0	2,1	2,0
	In the 2nd decade of May	187,8	2,4	2,0
	In the 3rd decade of May	185,4	2,1	1,8
Cattle manure, 12 t/ha	In the 1st ten days of May	180,1	2,0	1,8
	In the 2nd decade of May	187,0	2,0	1,8
	In the 3rd decade of May	172,4	2,0	1,8
N ₁₀₀ , P ₇₀ , K ₅₀ + Vermicompost, 6 t/ha	In the 1st ten days of May	215,5	3,0	2,8

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	In the 2nd decade of May	216,8	3,0	3,0
	In the 3rd decade of May	222,0	3,0	3,1
N ₁₀₀ , P ₇₀ , K ₅₀ + Qoramol Cattle manure, 12 t/ha	In the 1st ten days of May	221,5	3,1	3,0
	In the 2nd decade of May	214,5	2,8	3,0
	In the 3rd decade of May	197,7	2,8	2,6

In the 5th version of our experiment, the length of the pumpkin plant is 221.5; 214.5; 97.7 cm, number of mother flowers 3.1; 2.8; 2.8 pieces, the number of fruits formed was about 3.0; 3.0; 2.6 pcs. In this experiment, when studying the growth and development of the pumpkin variety Kashkar-1644 with the use of fertilizers, the high productivity of our 4th option was established. From our experience, it is clear that organic fertilizers are of great importance in growing crops. Reducing the harmful impact on the protected environment by increasing the use of organic fertilizers in modern agriculture. One of the main issues is that the products of cultivated crops are environmentally friendly and have an effective effect on human health.

Conclusion. Three types of pumpkins are common in the regions of Karakalpakstan: hard-skinned pumpkins (*Cucurbita Pepo* L.), large-fruited pumpkins (*Cucurbita maxina* Duch) and musk pumpkins (*Cucurbita moschata* Duch). Pumpkin fruits of the Kashkar-1644 variety ripen 115-119 days after seed germination, and the fruits of the Spanish-73 variety ripen after 135 days.

The agroclimatic conditions of the Republic of Karakalpakstan are very favorable for growing melons and melons. The cultivated pumpkin plant was planted in three different periods, the effect of applied fertilizers on yield - N₁₀₀, P₇₀, K₅₀ + Vermikompost - 6 tons per hectare, the average weight of one fruit of two varieties was 4.1 kg. The best indicator of the influence of the amount of fertilizer on the yield is 260.4-280.6 c/ha for the Spanish-73 variety when using N₁₀₀, P₇₀, K₅₀ + Vermikompost 6 tons and a high yield of 250.4-260.9 c/ha was obtained for the variety Kashkar-1644. Among the biochemical substances contained in the pumpkin plant, the amount of dry matter in the Kashkar-1644 variety is 12.34%, the amount of total sugar is 8.3%, the amount of carotene is 28.70 mg/kg, the amount of dry matter in the Spanish variety is 73 - is 11.55%, total sugar is 8.4%, carotene content is about 35.75 mg/kg.

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