

Determination of High-Yielding Varieties in the Conditions of Growing the Main Crop from Patisson in the Tashkent Region

Shavkat Durkhodjaye^a, Sokhib Islamov^b and Umidjon Ismoilov^c
Tashkent State Agrarian University, 100140, University str. 2, Tashkent, Uzbekistan

Keywords: Patisson Varieties, Cultivation, Yield Analysis.

Abstract: In this article is given the results of experiment of the patisson cultivation in the climatic conditions of Uzbekistan, planting in different times, growth, development and yield capacity, and the influence of weather. Patisson – an annual plant belonging to the gourd plant family, usually grows as a shrub, in rare cases it is in the form of a whip. The stem is straight, faceted, rigidly cyst, shortened between the nodes. The length of the crooked stem is 30-60 cm. The product is oval in the form of a plate and a bell, the color is white or dark yellow. It is an early maturing variety of the pumpkin family. The period between growth and harvest is 40-50 days. According to the results of the study, we achieved high yields in the cultivation of varieties Solnishko and Fonarik, Letayushaya tarelka.


1 INTRODUCTION


Vegetables are the most valuable food product and are the main supplier of carbohydrates, vitamins, essential oils, mineral salts and phytoncides necessary for the normal functioning of the human body. According to the FAO, “belonging to the pumpkin family, in the production of cucurbit and patisson fruits in China (7,2 mln. t.), India (4,9 mln. t.), Ukraine (1,27 mln. t.), Russia (1,128 mln. t.), USA (1,05 mln. t.) and Iran (0,9 mln. t.) are grown on a large scale in these countries”. In Uzbekistan, the total area of patisson cultivation in 2020 was 20 hectares, in 2022 the total area of patisson cultivation was 34 hectares, the gross yield is 512 tons and the yield is 10,1 t/ha. There is a lot of attention paid to patisson when expanding the types of vegetables for the consumption of the population, obtaining and consuming products in the spring-summer-autumn periods (Azimov et al., 2002; Belik, 1992).


In order to expand the range of patisson varieties in the world, as well as to provide raw materials to food and processing enterprises, research works are underway in the USA, Italy, France, China, India, Japan and Russia, to create compact varieties, varieties

with patisson fruits of various colors and shapes, as well as on the technology of growing their fruits.

In Uzbekistan, scientific achievements in the field of vegetable growing, in particular new varieties with high complex value, and improved agro-technologies are being applied to increase the income of agroclusters, farmers, peasants and private households, and the production volume of processing enterprises. Despite this, comprehensive scientific research on increasing the yield and quality of patisson has not been carried out in recent years in our republic, and the existing range of production consists of foreign (Beliy 13) and local (Zarkokil) varieties. In the “Development Strategy of New Uzbekistan for 2022-2026” of the Republic of Uzbekistan, “through intensive development of agriculture on a scientific basis”, to increase the income of peasants and farmers by at least 2 times, to bring the annual growth of agriculture to at least 5%, especially by 2026, the volume of food products special attention is paid to 7,4 million tons, bringing the processing level to 28% for fruits and vegetables. In this regard, the expansion of the assortment of patisson varieties, the selection of high-yielding varieties and the improvement of the technology of growing fruits in Uzbekistan is an actual scientific direction (Dospekhov, 1985; Alimova et al., 2022).

^a  <https://orcid.org/0009-0004-2332-7425>

^b  <https://orcid.org/0009-0003-8128-7700>

^c  <https://orcid.org/0009-0007-9132-9459>

2 MATERIALS AND METHODS

The following scientists carried out scientific research works: H.S. Paris (USA) - the study of morpho-biological and economic characteristics of patisson in foreign countries, Robert Westerfield (USA), Rosie Lerner B. (USA), Michael N. Dana (USA), R.N. Rashmi (India), K. Sato-Nara (Japan), K. Yuhashi (Japan), K. Higashi (Japan) - selection of high-yielding varieties and hybrids of patisson, K. Hosoya (Japan) in growing crops in different planting periods, V.A. Ludilov, O.V. Chernyavskaya and V.I. Fatyanov, T.A. Oktyabrskaya, T.E. Lushchits, O. Ganichkina, V.F. Pivovarov, L.P. Barakhaeva, A.B. Goncharov, A.A. Kolomiets - in improving the technology of selection and cultivation of patisson varieties.

In Uzbekistan, the research works were done on creating a local variety of patisson by Sh. Jabbarov, on the selection of varieties, planting period and development of schemes by N.N. Balashev, M.N. Kulakova, V.I. Zuev and Kh. Ch. Boriev.

However, in the last 10 years in Uzbekistan, scientific and research work on improving the technology of selection and cultivation of patisson varieties has not been carried out sufficiently (Alimova et al., 2023).

Therefore: In the selection of samples of patisson varieties that are promising for cultivation in the main crop, patisson varieties "Beliy 13" and "Zarkokil" regionalized in Uzbekistan and 16 varieties belonging to Russian selection and 1 hybrid were selected for research, and Beliy 13 variety was taken as a standard variety:

The scientific novelty of the research is as follows:

- for the first time in the conditions of the Tashkent region, in the conditions of the main crops, valuable economic characteristics of 18 varieties and hybrids of patisson were determined;

- early harvesting varieties are as follows – "Kopeyka" and "Groshik" (36-37 days) as well as "Pyatachok" and "Zolotoy Medalyon" (46,8...58,5 cm) with upright growth and short stem (46,8...58,5 cm) and compact stem width it was determined that the varieties "Pyatachok" and "Groshik" (61,4...70,5 cm);

- as high yield varieties in main crop cultivation - Letayushaya tarelka with white fruits (12,2 and 9,8 t/ha); Fonarik with green fruits (15,1 and 12,0 t/ha); Solnishko varieties with yellow fruits (19,1 and 15,2 t/ha) were identified;

- in the conditions of the main crops, planting of patisson varieties until the first and second decade of April has been proven to give high results.

Table 1: Patisson varieties.

№	Variety names	Origin
1	Beliy 13 (st)	Russia (RU)
2	Beliy NLO	Russia (RU)
3	Gagat	Russia (RU)
4	Groshik	Russia (RU)
5	Disk	Russia (RU)
6	Zarkokil	Uzbekistan (UZ)
7	Zolotoy medalyon	Russia (RU)
8	Zontik	Russia (RU)
9	Kopeyka	Russia (RU)
10	Letayushaya tarelka	Russia (RU)
11	Marsianin	Russia (RU)
12	Monetki	Russia (RU)
13	Pyatachok	Russia (RU)
14	Solnishko	Russia (RU)
15	Finarik	Russia (RU)
16	Xrustik	Russia (RU)
17	Cherepakha	Russia (RU)
18	Solnechniy zaychik F'1	Russia (RU)

3 RESULTS AND DISCUSSION

The practical results of the research are as follows: - in the conditions of the main crop of patisson in the Tashkent region, early harvesting "Kopeyka" and "Groshik" (36-37 days) and upright and short-stem "Pyatachok" and "Zolotoy medalyon" (46,8...58,5 cm) and compact stem width "Pyatachok" and "Groshik" (61,4...70,5 cm) varieties were selected;

- during the growing season, the largest number of fruits of the patisson variety was observed in the "Solnishko" variety (78,1 and 49,8 pieces), and it was proved that it is possible to obtain them during the planting period;

- under the conditions of the main crop, it was determined that the high yield was in "Letayushaya tarelka" (12,2 t/ha), "Fonarik" (15,1 t/ha), and "Solnishko" (19,1 t/ha) varieties.

The number of male flowers was greater than the number of female flowers in all studied patisson variety plants. The quantitative ratio of the number of female and male flowers was found to be low in Pyatachok (1:1,2) and Cherepakha (1:1,5) varieties. This was considered to be of great importance in obtaining a high-quality harvest from the patisson plant.

Table 2: Yield of patisson varieties in different planting periods as the main crop, kg/bush.

Variety patterns	yield, kg/bush						
	V	VI	VII	VIII	IX	X	total
2020 year							
“Zarkokil” variety							
10 April	0,58	1,75	2,33	0,58	0,29	0,29	5,82
20 April (control)		0,41	1,22	1,22	0,81	0,41	4,06
30 April			0,75	1,13	1,13	0,75	3,77
10 May			0,35	1,04	1,04	1,04	3,48
“Solnishko” variety							
10 April	0,86	2,57	3,42	0,86	0,43	0,43	8,56
20 April (control)		0,60	1,79	1,79	1,19	0,60	5,95
30 April			1,11	1,66	1,66	1,11	5,53
10 May			0,52	1,55	1,55	1,55	5,15
2021 year							
“Zarkokil” variety							
10 April	0,47	1,40	1,87	0,47	0,23	0,23	4,68
20 April (control)		0,42	1,26	1,26	0,84	0,42	4,21
30 April			0,56	0,84	0,84	0,56	2,81
10 May			0,17	0,51	0,51	0,51	1,69
“Solnishko” variety							
10 April	0,79	2,38	3,17	0,79	0,40	0,40	7,92
20 April (control)		0,71	2,14	2,14	1,43	0,71	7,13
30 April			0,95	1,43	1,43	0,95	4,75
10 May			0,29	0,86	0,86	0,86	2,85
2022 year							
“Zarkokil” variety							
10 April	0,64	1,91	2,54	0,64	0,32	0,32	6,35
20 April (control)		0,57	1,72	1,72	1,14	0,57	5,72
30 April			0,76	1,14	1,14	0,76	3,81
10 May			0,23	0,69	0,69	0,69	2,29
“Solnishko” variety							
10 April	0,90	2,69	3,59	0,90	0,45	0,45	8,98
20 April (control)		0,81	2,42	2,42	1,62	0,81	8,08
30 April			1,08	1,62	1,62	1,08	5,39
10 May			0,32	0,97	0,97	0,97	3,23

According to analytical data, in 2020, compared to the Beliy 13 (st) variety, from one hectare of land - Beliy NLO (9,2 t/ha), Disk (8,2 t/ha), Zontik (6,5 t/ha), Pyatachok (5,1 t/ha); green fruits – Marsianin (10,2 t/ha), Cherepakha (7,8 t/ha); It was found that the yellow-fruited - Groshik (6,5 t/ha), Zolotoy medalyon (6,3 t/ha) and Solnechnyy Zaychik F'1 (9,4 t/ha) hybrids had low productivity.

In 2021, due to chronic rainfall in April-May, the yield of patisson variety samples was slightly lower than Beliy 13 (st) variety – 9,8 t/ha, white-fruited - Letayushaya tarelka (11,2 t/ha), green-fruited – Fonarik (14,1 t/ha), Xrustik (10,6 t/ha), Gagat (9,2 t/ha); Yellow fruits - Solnishko (17,3 t/ha), Kopeyka (12,2 t/ha), Zarkokil (12,7 t/ha), Monetka (10,0 t/ha) varieties have a high yield compared to the standard variety. Nevertheless, from the surveyed hectare, white fruits - Pyatachok (5,31 t less), Zontik (3,88 t), Beliy NLO (3,27 t), Disk (2,45 t); green fruit - Cherepakha (3,27 t), Marsianin (0,82 t), Gagat (0,62 t); low yield was formed in varieties with yellow fruits - Zolotoy medalyon (4,29 t), Groshik (2,45 t) and hybrid Solnechnyy Zaychik F'1 (1,43 t).

On the contrary, in 2022, due to the hot spring season, the yield per hectare of the studied patisson varieties was higher. In this case, one hectare of white fruit - Letayushaya tarelka (13,3 t), green fruit - Fonarik (16,1 t), Xrustik (12,4 t), Gagat (12,0 t); with yellow fruits - Solnishko (20,0 t), Kopeyka (14,7 t), Zarkokil (14,5 t) varieties are higher by 8,6-0,64 tons per hectare compared to the standard Beliy 13 (11,4 t/ha) variety if it formed a crop, the productivity of white fruits is less than 5,28-0,18 tons per hectare - Pyatachok (4,87 t).

Zontik (3,44 t), Disk (1,60 t), Beliy NLO (0,99t); green fruits – Cherepakha (3,03 t), Marsianin (0,79 t); with yellow fruits - Zolotoy medalyon (5,28 t), Groshik (3,64 t), Monetka (0,18 t) and Solnechnyy Zaychik F'1 (2,62 t) hybrid varieties.

According to the results of the research, when choosing patisson variety samples as the main crop, the highest yield from one hectare is Letayushaya tarelka variety with white fruit – 12,2 t; Fonarik variety with green fruits – 15,1 t; the yellow-fruited variety - Solnishko - was 19,1 t, while the lowest productivity was in the white-fruited Pyatachok variety (5,4 t/ha); Cherepakha variety with green fruits (7,6 t/ha); the yellow-fruited Zolotoy medalyon variety (6,0 t/ha).

When the fruit size was analyzed according to the Interstate standard “GOST 34324-2017. Patissony svejje. Technicheskie usloviya”, the total yield of the studied patisson variety samples, accordingly, to the fruit diameter of Beliy 13 (st) variety was 50 mm –

6,36 t (from the total harvest), 70 mm – 2,6 t and 100 mm – 1,59 t.

4 CONCLUSIONS

1. From the samples of the patisson varieties from the main crop conditions, it was determined that Kopeyka (36 days) and Groshik (37 days) are early varieties.

2. The highest productivity under the conditions of the main crop is Letayushaya tarelka (12,2 t/ha); Fonarik (15,1 t/ha); Solnishko (19,1 t/ha) and the lowest productivity - Pyatachok (5,4 t/ha); Cherepakha (7,6 t/ha); The highest productivity of Zolotoy medalyon (6,0 t/ha) under repeated crop conditions is Letayushaya tarelka (9,8 t/ha); Fonarik (12,0 t/ha); Solnishko (15,2 t/ha) and the lowest productivity was in Pyatachok (4,4 t/ha); Cherepakha (6,1 t/ha); Zolotoy medalyon (4,8 t/ha) varieties.

3. In the main crop conditions, the ratio of patisson variety samples to the total yield by fruit size is 50 mm – 13,56 t in Solnishko variety, 70 mm – 3,82 t and 100 mm – 1,72 t, and the lowest indicator is proportional to the Zolotoy medalyon variety respectively was 3,54, 1,62 and 0,84 t.

REFERENCES

- Alimova, F.A., Primkulov, B.Sh., Saidova, M.T., & Boboniyozov, E.A., 2022. Combined aggregate for strip tillage and simultaneous sowing of re-crops. *IOP Conference Series: Earth and Environmental Science*, 1112(1). <https://doi.org/10.1088/1755-1315/1112/1/012021>.
- Alimova, F.A., Saidova, M.T., & Primkulov, Sh.B., 2023. Pneumatic feed mechanism for accurate sowing of bare cotton seeds. *IOP Conference Series: Earth and Environmental Science*, 1231(1). <https://doi.org/10.1088/1755-1315/1231/1/012012>.
- Azimov B.J. & Azimov B.B., 2002. Methodology of conducting experiments in vegetable growing, potato growing and melon farming. - Tashkent, 121-152.
- Belik, V.F., 1992. Methodology of experimental work in vegetable growing and melon farming. M: Agropromizdat, 133-135, 226.
- Decree of the President of the Republic of Uzbekistan PF-5388 dated March 29, 2018 No. “On additional measures for the rapid development of fruit and vegetable growing in the Republic of Uzbekistan”.
- Decree of the President of the Republic of Uzbekistan PF-60 dated January 28, 2022, “On the Development Strategy of New Uzbekistan for 2022-2026”.
- Dospikhov, B.A., 1985. Methodology of field experience. - M.: Kolos, 207-223, 268-297.

Interstate standard "GOST 34324-2017. Fresh patissons. Technical conditions". -p 10.

Resolution of the President of the Republic of Uzbekistan PQ-4549 dated December 11, 2019. On additional measures to further develop the fruit-vegetable and viticulture industry and create an added value chain in the sector”.

VIR guidelines for studying and maintaining the world collection of pumpkin crops (patisson). - Moscow, 1977. - p. 11-15, 59-62.

