Modern American Journal of Biological and Environmental Sciences
ISSN (E): 3067-7920
Volume 01, Issue 07, October, 2025
Website: usajournals.org

DETERMINATION OF ACCEPTABLE PLANTING TIMES TO ENSURING HIGHER YIELD OF PUMPKINS IN REPEATED CROPPING

Turamatov Rustam Gopurovich
Researcher at the Research Institute of
Vegetables, Melons and Potato Growing

Shokirov Alisher Joraboyevich
Professor of Tashkent State Agrarian
University, Doctor of Agricultural Sciences

Abstract
In the second crop, the highest marketable yield of the “Shirintoy” and “Palov kadu 268” pumpkin varieties was formed at the sowing date of June 1 (respectively: 34.1 and 38.2 t/ha), and the highest net income and profitability were obtained at the sowing date of June 1 (respectively: 44.4 and 33.2 mln soums; 186.0 and 138.2%).

Keywords: Repeated crop, variant, cultivar, leaves, leaf height, main stem, yield, biometric, sowing date, fruit flesh, fruit quantity, marketable, net income, profitability.

TAKRORIY EKINDA QOVOQDAN YUQORI HOSILNI TA’MINLASHDA MAQBUL EKISH MUDDATLARINI ANIQLASH

To‘ramatov Rustam G‘opurovich
Sabzavot, poliz ekinlari va kartoshkachilik ilmiy-tadqiqot instituti tadqiqotchisi[1]

Shokirov Alisher Jo‘raboyevich
Toshkent davlat agrar universiteti professori, q.x.f.d.

Modern American Journal of Biological and Environmental Sciences
ISSN (E): 3067-7920
Volume 01, Issue 07, October, 2025
Website: usajournals.org

Annotatsiya
Takroriy ekinda qovoqning “Shirintoy” va “Palov kadu 268” navlarini eng yuqori tavorbop hosildorlik 1-iyun ekish muddatida (mos ravishda: 34,1 va 38,2 t/ga) shakllangan bo‘lsa, eng yuqori sof daromad va rentabellik ham 1-iyun ekish muddatida (mos ravishda: 44,4 va 33,2 mln. so‘m; 186,0 va 138,2 %) aniqlandi.

Аннотация
При повторной культуре самый высокий товарный урожай сортов тыквы “Ширинтой” и “Палов каду 268” сформировался при сроке посева 1 июня (соответственно: 34,1 и 38,2 т/га), а самый высокий чистый доход и рентабельность также сформировались при сроке посева 1 июня (соответственно: 44,4 и 33,2 млн. сум; 186,0 и 138,2%).

Kalit so‘zlar: Takroriy ekin, variant, navlar, barg eni, barg bo‘yi, asosiy poya, hosildorlik, biometrik, ekish muddati, meva eti, meva soni, tovarbop, sof daromad, rentabellik.

Ключевые слова: Повторная культура, вариант, сорта, листья, высота листа, основной стебель, урожайность, биометрический, срок посева, мякоть плода, количество плодов, товарный, чистый доход, рентабельность.

Introduction

Vegetables are among the most valuable food products and serve as the main source of carbohydrates, vitamins, essential oils, mineral salts, and phytoncides necessary for the normal functioning of the human body. Expanding the range of vegetable species and ensuring continuous production and consumption during the spring–summer–autumn seasons make pumpkin fruits especially important [2]; [3]; [4]; [5].

Pumpkin fruits and seeds are of great economic significance as food products, providing dietary and therapeutic nutrition, supplying the population with

Modern American Journal of Biological and Environmental Sciences
ISSN (E): 3067-7920
Volume 01, Issue 07, October, 2025
Website: usajournals.org

vitamins during the winter season, and serving as raw materials for the canning industry, culinary uses, and pharmacology (for the production of medicines) [13]; [14].

According to FAO data, 26.5 million tons of pumpkins are produced worldwide, with leading producers being China (7.8 million tons), India (5.1 million tons), Russia (1.22 million tons), Ukraine (1.21 million tons), and the USA (1.0 million tons). In Uzbekistan, in 2022, pumpkins were cultivated on a total area of 5,000 hectares as a main crop, yielding a gross harvest of 156.4 thousand tons with an average productivity of 206.3 centners per hectare.

The composition of pumpkin fruit includes 5.14–34.7% dry matter, 0.3–1.0% nitrogenous substances, 0.05% acids, 2.7–14.0% sugars, 2.0–24.0% starch, 3.4–12.8% fiber, up to 10% pectin substances (in dry mass), up to 42.2% vitamin C, 84.1–93.1% water, and microelements (per 100 g of raw mass: potassium – 211.7 mg, sodium – 44.0 mg, calcium – 155.0 mg, magnesium – 23.2 mg), as well as phosphorus, iron, copper, manganese, cobalt, zinc, molybdenum, fluorine, silicon, aluminum, and vitamins B1, B2, B6, PP, E. The fruit also contains proteins, carbohydrates, fats, and 0.4–0.8% mineral substances. High-carotene varieties may contain up to 50 mg% of vitamin A [9].

Pumpkin is a thermophilic plant, but it is less demanding of heat than cucumber [17]. Its seeds begin to germinate at a temperature of +9.5°C, while according to Filov (1969) and V.I. Edelstein (1953), germination begins at +13.7°C. Pumpkin is adapted to high temperatures (above +60°C), which is why it is considered heat-resistant [18].

In Russia's Non-Black Earth Zone, pumpkins are mainly grown through seedlings aged 20–25 days. Seedlings are sown from April 20 to May 10 (depending on weather conditions) in pots measuring 8×8×8 or 10×10×10 cm [10]; [16].

In Uzbekistan, pumpkins are usually planted in early April–May when the days become warmer, and their growth and development period coincides with the intense heat of summer. The growing season of pumpkin plants usually ends in October with the onset of the first frost [3]; [4]; [5]; [15].

Modern American Journal of Biological and Environmental Sciences
ISSN (E): 3067-7920
Volume 01, Issue 07, October, 2025
Website: usajournals.org

In Uzbekistan, scientific advances in vegetable and melon growing—particularly new high-value cultivars with complex economically important traits and improved agrotechnologies—are being implemented to increase the income of agroclusters, farmers, and household farms, as well as the production volume of processing enterprises. Nevertheless, despite extensive research in recent years to improve the yield and quality of pumpkins, the optimal planting dates for cultivating pumpkin as a secondary crop have not yet been scientifically determined.

Materials and methods. In field experiments, 20-day-old seedlings of the pumpkin varieties “Shirintoy” and “Palov kadu 268” were planted according to the following sowing dates: June 1, June 10, June 20 (control), and June 30. The experiments were conducted in four replications; the furrow length was 23 m, the accounting plot area was 80 m², and the planting pattern was (280+70)/2×70 cm. Each sample consisted of 30 plants.

In the field experiments, the following phenological observations, biometric measurements, and other calculations were carried out based on the methodological guidelines “Methods of Conducting Experiments in Vegetable, Melon, and Potato Growing” [1], “Методика полевого опыта в овощеводстве и бахчеводстве” [7], “Методика полевого опыта в овощеводстве” [11], and “Методические указания ВИР по изучению и поддержанию мировой коллекции тыквенных культур (тыква)” [12]. Statistical analysis of the research results was performed using the “Excel 2010” and “Statistica 7.0 for Windows” software programs, applying the dispersion method according to “Методика полевого опыта” [8], with a confidence level of 0.95%.

Results and discussion. When pumpkins of the varieties “Shirintoy” and “Palov kadu 268” were planted on June 1 as a secondary crop, they developed the longest main stems (385.8 and 437.9 cm, respectively), lateral shoots (1119.1 and 1123.2 cm), and total vine lengths (1504.8 and 1560.8 cm). Conversely, when planted on June 30, the plants showed the shortest main stems (283.8 and 313.6 cm), lateral shoots (673.8 and 656.6 cm), and total vine lengths (957.6 and 970.1 cm) (Table 1).

Modern American Journal of Biological and Environmental Sciences
ISSN (E): 3067-7920
Volume 01, Issue 07, October, 2025
Website: usajournals.org

Table 1 Biometric indicators of stem and leaf development of pumpkin varieties under different sowing dates in secondary cropping (2020–2022)

Planting dates	Main stem length, cm	Number of side branches, pcs.	Length of side branches, cm	Total stem length, cm	Leaf		
					Quantity in a bundle, pcs.	height, cm	width, cm
"Shirintoy" variety							
June 1	385,8	5,0	1119,1	1504,8	356,6	15,3	19,3
June 10	353,2	4,5	1022,2	1375,6	339,7	15,0	19,1
June 20 (nominal)	314,0	4,1	803,6	1117,6	307,4	14,0	18,0
June 30	283,8	3,7	673,8	957,6	271,4	13,5	17,4
EKF05	3,8	0,05	11,8	33,7	3,6	0,2	0,2
Sx%	1,1	1,2	1,3	2,7	1,1	1,1	1,1
"Palov kadu 268" variety							
June 1	437,9	4,4	1123,2	1560,8	311,7	16,9	20,4
June 10	419,8	4,0	992,0	1412,0	287,6	16,6	20,0
June 20 (nominal)	334,6	3,3	859,7	1194,2	224,7	15,8	19,1
June 30	313,6	3,0	656,6	970,1	205,9	15,1	18,3
EKF05	3,9	0,04	10,0	13,7	2,8	0,2	0,2
Sx%	1,0	1,1	1,1	1,1	1,1	0,9	0,9

According to the data in Table 1, when the pumpkin varieties "Shirintoy" and "Palov kadu 268" were planted on June 1 as a secondary crop, they developed the highest number of lateral branches (5.0 and 4.4 per plant, respectively) and the greatest number of leaves per plant (356.6 and 311.7, respectively). Conversely, when planted on June 30, they formed the lowest number of lateral branches (3.7 and 3.0 per plant) and the fewest leaves per plant (271.4 and 205.9, respectively). For the same varieties planted as a secondary crop on June 1, the largest leaf length (15.3 cm and 16.9 cm, respectively) and width (19.3 cm and 20.4 cm, respectively) were observed. In contrast, the smallest leaves were recorded when planted on June 30, with lengths of 13.5 cm and 15.1 cm and widths of 17.4 cm and 18.3 cm, respectively.

In terms of fruit size (length × width), the largest fruits of "Shirintoy" and "Palov kadu 268" were obtained from the June 1 planting (31.4 × 16.7 cm and 40.9 ×

Modern American Journal of Biological and Environmental Sciences
ISSN (E): 3067-7920
Volume 01, Issue 07, October, 2025
Website: usajournals.org

20.3 cm, respectively), whereas the smallest fruits were observed in the June 30 planting (21.9 × 13.3 cm and 27.3 × 16.8 cm, respectively). Similarly, the thickest fruit flesh was recorded in the June 1 planting (2.5 cm and 3.5 cm, respectively), while the thinnest fruit flesh was formed in the June 30 planting (1.9 cm and 2.6 cm, respectively) (Table 2).

Table 2 Biometric indicators of fruits of pumpkin varieties at different planting dates in repeated crops (2020-2022)

Ekish muddatlari	Meva, sm		Meva etining qalinligi, sm	Meva soni, dona	Meva vazni, kg	Bir tupdagi meva hosili, kg
	uzunligi	eni				
"Shirintoy" navi						
1-iyun	31,4	16,7	2,5	2,4	1,9	4,6
10-iyun	29,6	15,6	2,3	2,2	1,7	3,8
20-iyun (naz.)	23,7	14,5	2,1	2,0	1,6	3,2
30-iyun	21,9	13,3	1,9	1,9	1,4	2,7
EKF_{05}	0,3	0,2	0,03	0,02	0,02	0,05
Sx%	1,2	1,1	1,1	1,2	1,2	1,3
"Palov kadu 268" navi						
1-iyun	40,9	22,6	3,5	1,8	2,9	5,2
10-iyun	36,4	21,2	3,4	1,7	2,7	4,6
20-iyun (naz.)	33,5	19,1	3,2	1,5	2,5	3,8
30-iyun	27,3	16,8	2,6	1,3	2,3	3,0
EKF_{05}	0,4	0,2	0,03	0,02	0,03	0,05
Sx%	1,1	1,1	1,0	1,0	1,0	1,2

When the pumpkin varieties "Shirintoy" and "Palov kadu 268" were cultivated as a secondary crop, the greatest number of fruits per plant was obtained from the June 1 planting (2.4 and 1.8 fruits, respectively), while the lowest numbers were observed from the June 30 planting (1.9 and 1.3 fruits, respectively). Similarly, the heaviest individual fruit was produced in the June 1 planting (1.9 kg and 2.9 kg, respectively), whereas the lightest fruit was obtained in the June 30 planting (1.4 kg and 2.3 kg, respectively).

In secondary cropping, the highest fruit yield per plant for "Shirintoy" and "Palov kadu 268" was recorded in the June 1 planting (4.6 kg and 5.2 kg, respectively),

Modern American Journal of Biological and Environmental Sciences
ISSN (E): 3067-7920
Volume 01, Issue 07, October, 2025
Website: usajournals.org

while the lowest yield per plant was found in the June 30 planting (2.7 kg and 3.0 kg, respectively).

For the same varieties, the highest total yield per hectare was achieved with the June 1 planting (37.8 and 42.7 t/ha, respectively), while the lowest total yield was recorded in the June 30 planting (22.3 and 24.4 t/ha, respectively). Likewise, the highest marketable yield per hectare was obtained from the June 1 planting (34.1 and 38.2 t/ha, respectively), whereas the lowest marketable yield was observed in the June 30 planting (13.9 and 18.2 t/ha, respectively) (Table 3).

Table 3 Yield of pumpkin varieties planted at different planting dates in repeated crops (2020-2022)

Ekish muddatlari	Umumiy hosildorlik, t/ga	Tavorbop hosildorligi, t/ga					Umumiy hosildagi tovarbop hosil ulushi, %
		2020-yil	2021-yil	2022-yil	o‘rtcha	nazorat ekish muddatiga nisbatan, %	
“Shirintoy” navi							
1-iyun	37,8	33,9	36,5	31,8	34,1	153,9	90,2
10-iyun	31,3	27,1	31,5	23,6	27,4	123,8	87,6
20-iyun (naz.)	25,8	20,8	26,5	19,1	22,1	100,0	85,8
30-iyun	22,3	14,2	15,4	12,2	13,9	63,0	62,9
EKF_{05}	0,4	0,9	0,9	0,7	0,4	–	–
$Sx_{\%}$	1,3	3,8	3,5	3,4	1,5	–	–
“Palov kadu 268” navi							
1-iyun	42,7	38,2	41,8	34,5	38,2	144,9	89,4
10-iyun	37,5	33,4	35,7	29,8	33,0	125,2	87,9
20-iyun (naz.)	30,7	24,1	29,3	25,6	26,3	100,0	85,9
30-iyun	24,4	18,6	20,3	15,7	18,2	69,1	74,5
EKF_{05}	0,4	1,1	1,1	0,9	0,4	–	–
$Sx_{\%}$	1,3	3,8	3,4	3,3	1,3	–	–

In repeated crops, the highest net income of the pumpkin varieties “Shirintoy” and “Palov kadu 268” with different planting dates and schemes was determined at the planting date of June 1 (respectively: 44.4 and 33.2 million soums), while the lowest net income was determined at the planting date of June 30 (5.0 and 4.2

Modern American Journal of Biological and Environmental Sciences
ISSN (E): 3067-7920
Volume 01, Issue 07, October, 2025
Website: usajournals.org

million soums). Also, the highest profitability was demonstrated at the planting date of June 1 (respectively: 186.0 and 138.2 %), and the lowest profitability was demonstrated at the planting date of June 30 (21.7 and 18.4 %).

Conclusion

In the repeated crop, the highest marketable yield of the pumpkin varieties "Shirintoy" and "Palov kadu 268" was formed at the June 1 planting date (respectively: 34.1 and 38.2 t/ha), while the highest net income and profitability were also determined at the June 1 planting date (respectively: 44.4 and 33.2 million soums; 186.0 and 138.2%).

References:

1. Azimov B.J., Azimov B.B. Sabzavotchilik, polizchilik va kartoshkachilikda tajribalar o‘tkazish metodikasi. – Toshkent, 2002. – B. 121-152
2. Артюгина З.Д. Тыква, кабачки, патиссон // Овощные культуры (состав. Буренин В.И.) – Л.: Лениздат, 1980. – С. 116-124.
3. Ашеров И.М. Тыквы Узбекистана. – Т.: Фан, 1979. – 64 с.
4. Балашев Н.Н. Бахчеводство. – Т.: Ўқитувчи, 1976. – 148 с.
5. Балашев Н.Н., Земан Г.О. Овощеводств. – Т.: Ўқитувчи, 1972. – 325 с.
6. Белик В.Ф. Кабачки и другие тыквенные. – М.: Изд. дом «Сельская новь», 2000. – 48 с.
7. Белик В.Ф. Методика опытного дела в овощеводстве и бахчеводстве. – М: Агропрмиздат, 1992. – С. 133-135, 226.
8. Доспехов Б.А. Методика полевого опыта. – М.: Колос, 1985. – С. 207-223, 268-297.
9. Корчемная Н.А. Ценный исходный материал для селекции летних тыкв на качество плодов // Материалы IV Международной симпозума «Новые и нетрадициаонные растения и перспективы их использования». – Москва, 2001. – Т. 2. – С. 164-167.
10. Лебедева А.Т. Секреты тыквенных культур. – М.: «Фитон+», 2000. – 224 с.

Modern American Journal of Biological and Environmental Sciences
ISSN (E): 3067-7920
Volume 01, Issue 07, October, 2025
Website: usajournals.org

11. Литвинов С.С. Методика полевого опыта в овощеводстве. – М.: ВНИИО, 2011. – С. 340.
12. Методические указания ВИР по изучению и поддержанию мировой коллекции тыквенных культур (тыква). – Москва, 1977. – С. 11-15, 59-62
13. Михалев В.Ю. Особенности производства семян тыквы на фармакологические цели с применением механизированной уборки в условиях Волгоградского Заволжья // Автореф. дисс. ... канд. с.-х. наук. – Москва, 2003. – 23 с.
14. Никулина Т.М. Тыква питательна и полезна // Доклады III Международной научной конференции “Селекция, семеноводство и биотехнология овощных и бахчевых культур” посвященной памяти Б.И.Квасникова. – Москва, 2003. – С. 232-233.
15. Ostonaqulov T.E., Zuev V.I., Qodirxo‘jayev O.Q. Sabzavotchilik (darslik). – Toshkent, 2006. – 350 bet
16. Октябрьская Т.А., Разинова Л.Б. Тыквы, кабачки, патиссоны. – М.: Издательский Дом МСП, 2002. – 256 с.
17. Пивоваров В.Ф. Овощи России. – М.: АО «Российские семена», 1995. – 256 с.
18. Тараканов Г.И., Мухин В.Д. Бахчевые растения и овощные тыквы / В кн.: Овощеводство. – М.: Колос, 2002. – С. 379-395.