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Research Article

DETERMINING OPTIMAL PLANTING DATES FOR POTATOES IN THE CONDITIONS OF KARAKALPAKSTAN

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ABSTRACT

The article offers the findings of a scientific study on the most suitable times to plant early-ripening potato cultivars in the northern districts of the agrobiocenosis of Karakalpakstan.

KEYWORDS

Early maturity, variety, growth, development, air temperature, relative humidity, optimal dates.

INTRODUCTION

It is vital to consider the unique features of the Republic of Karakalpakstan's agroclimatic conditions in order to achieve a high yield from agricultural products. It is known that the rising air temperature had a negative impact on the early commencement of planting periods since the growing season is slightly constrained and spring arrives later than usual. The protocols have demonstrated that while planting early-ripening potato varieties and harvesting seedlings, it is imperative to follow suggestions with scientific backing. The reason for this is that the best planting times and recommended early-ripening potato types for these agroclimatic conditions are yet unknown.

To solve the current problem of planting early ripening potato varieties suitable for the region's agroclimatic and soil conditions, as well as to determine the optimal dates, special research in the conditions of the northern districts of the region is required in order to scientifically substantiate the problem.

RESEARCH MATERIALS AND METHOD

Planting early ripening varieties of potatoes and carrying out agrotechnical measures was implemented based on the methods of B.J. Azimov, B.B. Azimov [6], V.I. Zuev [7], T.E. Ostonakulov, Sh [8].

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Scientific research analysis and results: Regarding the agroclimatic conditions of Karakalpakstan, the guidelines for figuring out when to plant early-ripening potato types indicate that the winter months bring a little chilly air temperature and freezing of the top 80–110 cm of soil. It should be noted that during the spring and fall seasons, the average daily air temperature remains consistently above 10°C from April 6–12 to October 14–16. In the northern regions of the territory, the temperature is below 0°C for 120–140 days, and in the south for 90–100 days.

The fact that early varieties of potatoes have a vegetative period of 80–90 days and are a plant that yields its maximum amount when agrotechnical measures are applied under appropriate agroclimatic circumstances is one of the unique qualities of potatoes related to bioecological development.

The examination of the findings from the plant research indicates that the air temperature fluctuates between being slightly lower and slightly higher during the tuber ripening process because the potatoes are acclimated to the early planting of the early varieties. Additionally, the air temperature is higher during the mid-early varieties' planting and ripening periods. Research findings have been drawn with the consideration that it is slightly lower [3, 4, 5, 9].

In the research on figuring out the best times to plant early and mid-early potato types, the tubers were planted from the third ten days of March (23–27.03.) in consideration of the conditions of the northern parts of the Republic of Karakalpakstan. The second period was planted during the first ten days of April (04-07.04) and the second period (14-15.04.) respectively. The agrotechnical operations conducted during the growth season followed the guidelines suggested for application in agroclimatic conditions.

A planting pattern of 70x30 cm was used for the potato types, and 47–48 thousand bushes were planted per hectare. During the investigation, rainfall rates, average daily air temperature, and relative humidity were considered and assessed.

is thought to be one of the key elements in the germination of planted potato varieties. The average air temperature over the research years was 1.7–12°C at the end of March, 10.3–12.8°C at the beginning of April, and 14–17.2°C at the end of the year. The reason is that during this time, the temperature of the top 0–20 cm of soil rose to 16–22°C, which triggered the growth of the planted potato kinds.

The germination of seedlings and the growth of roots and stems were considered to be active during the period when the plants were planted on March 3rd and during the first ten days of April in the performed research (Table 1).

Germination of tuber seedlings when potato varieties are planted at different times, days

Karakalpakstan, Chimboy, Nukus districts, 2018-2020

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The name and origin of varieties	Dates for planting seedlings		
	23-27/III	04-07/IV	14-15/IV
	The period from planting the seedlings to germination, days		
	75%	75%	75%
Zarafshan (UZ) (st)	17,3	18,1	18,6
Arnova (NL)	18,9	17,8	18,3
Zafira (NL)	20,4	19,5	19,8
Sante (NL)	18,2	18,6	17,9
Evolution (NL)	19,5	18,4	19,1
Impala (NL)	19,8	19,3	20,1
Romano (NL)	18,6	18,1	17,2
Picasso (NL)	19,9	19,4	18,6
Dusimpalak (UZ)	19,2	19,1	18,7

Phenological observations were conducted in order to identify the best times to plant potatoes. These observations included a study of the phases from the formation of full sprouts of different potato plant varieties in the experimental fields to the full drying of the palak, which signifies the ripening of the crop, and their significance in relation to the standard.

n comparison to the conventional Zarafshan variety, the overall yield of potato varieties planted in the first ten days of April increased by / to 4.3 t/ha for the Romano variety, 4.2 t/ha for the Sante variety, 3.3 t/ha for the Zafira variety, and 2.5 t for the Dosimpalak variety. The end of March and the first 10 days of April are the best times to plant, according to an analysis of the productivity of the cultivars based on planting season (Table 2).

Table 2.

Total yield of potato varieties in different planting periods

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The name and origin of varieties	Dates for planting seedlings														
	23-27/III					04-07/IV					14-15/IV				
	2018 йил	2019 йил	2020 йил	ўрта-ча	relative to the St variety, %	2018	2019	2020	medium	relative to the St variety, %	2018	2019	2020	medium	relative to the St variety, %
Зарафшон (UZ) (st)	19,4	19,3	16,8	18,5	100,0	18,1	17,9	15,3	17,1	100,0	16,2	17,1	16,2	16,5	100,0
Arnova (NL)	18,6	23,0	19,9	20,5	110,8	16,3	20,7	20,0	19,0	111,1	17,6	19,9	18,0	18,5	112,1
Zafira (NL)	21,2	22,8	21,1	21,7	117,3	19,1	21,4	20,7	20,4	119,3	18,6	19,6	18,2	18,8	113,9
Sante (NL)	19,2	18,9	17,7	18,6	100,5	18,3	23,8	21,8	21,3	124,6	17,6	20,5	19,8	19,3	117,0
Evolution (NL)	18,1	20,9	18,9	19,3	104,3	17,6	20,1	17,8	18,5	108,2	16,9	18,6	16,1	17,2	104,2
Impala (NL)	19,2	21,8	20,8	20,6	111,4	18,3	20,7	18,6	19,2	112,3	18,0	19,2	16,5	17,9	108,5
Romano (NL)	18,9	20,8	18,2	19,3	104,3	18,1	22,5	23,6	21,4	125,1	17,9	19,8	18,1	18,6	112,7
Picasso (NL)	18,0	20,4	18,0	18,8	101,6	17,1	22,6	19,7	19,8	115,8	16,2	18,2	17,5	17,3	104,8
Dusimpalak (UZ)	19,7	23,5	19,5	20,9	113,0	20,1	19,5	19,2	19,6	114,6	18,6	19,6	18,5	18,9	114,5
EKF $_{05}$, ca	0,9	1,1	0,8	0,4	-	0,7	1,0	0,8	0,5	-	0,6	0,9	0,9	0,5	-
S_x, %	4,7	5,0	4,3	2,1	-	4,0	4,8	4,2	2,8	-	3,5	4,5	4,8	2,9	-

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The highest yield when studied in the years in which the varieties of early and mid-early potatoes planted under conditions of high agro – climate were studied in 2018 – in the varieties Doisimpalak (20.9 ca) and Impala (20.6 ca), In 2019 – Romano (21.4 ca), Sante (21.3 ca) and Zafira (20.4 ca), and in 2020-Sante (19.3 ca), while dosimpalak (18.9 ca) and Zafira (18.8 ca) varieties had, the lowest total yield was observed in evolution and Impala varieties in 2018-2020 and when planted in planting deadlines.

CONCLUSION

It was discovered through research conducted in the Republic of Karakalpakstan that planting dates have a considerable impact on the production of different potato cultivars. Planting early-ripening potato varieties under local conditions should take place between the third week of March and the end of the first week of April. It is advised to plant potato varieties Evolution, Fresco, Dosimpalak, Arnova, Picasso, Zarafshon, Kuvonch-1656 M, Umid-2, Tuyimli, Surkhon-1, Zafira, Romano, Sante, and Impala in the third and second weeks of March and April, respectively, using agrotechnical methods that take the local air temperature and relative humidity into account.

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