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DETERMINATION OF THE OPTIMAL SEEDING TIMELINES OF WHITE CABBAGE VARIETIES AND HYBRIDS IN THE WEAKLY SALINE SOIL AND CLIMATE CONDITIONS OF KARAKALPAKSTAN

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Abstract
In 2022-2023, in the slightly saline soil and climatic conditions of Karakalpakstan, the early variety of cabbage Novruz, the hybrid Magnus F1 and the mid-early variety Tashkentskaya 10, hybrids Fresco F1 (20.03; 30.03; 10.04; 20.04; 30.04.) were planted at different times and studied growth and development and impact on yield.
The yield of the early ripening variety Navruz in the variant with planting on April 10 (56.2 ha/t) is higher by 4.8-15.0% compared to all variants; the hybrid Magnus F1 in the variant with planting on March 30 (57.5 ha /t) compared to all options was relatively high up to 11.2-48.4%.
In the mid-ripening variety Tashkentskaya 10 (04/20), the yield obtained on the control variant is 11.8-34.4% higher than all variants, and in the hybrid Fresco F1 the maximum yield is 65.7 ha/t in the variant planted on April 20 th compared to other options above 3.8-48.0%.

Introduction
In the world, in China, India, Russia, and many other countries with moderate climatic conditions, the cultivation of vegetable crops in agriculture is widespread. In meeting the needs of the population for food products, as well as increasing the export potential of farmers, dehkan farms, and owners of household plots, the creation, selection, and widespread introduction of resource-saving cultivation technologies into production of early-ripening and mid-ripening varieties and hybrids resistant to various stress factors, especially for growing on saline and slightly saline lands,

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and reducing the cost of production are considered urgent issues of today.

Today, the gross volume of cabbage cultivation in the world is more than 82.8 million tons, and in terms of white cabbage production: People's Republic of China (respectively, 25.2 kg per capita, total sown area 1.0 million hectares, yield 35.0 ha/t per hectare, gross output 35.1 million tons), India (7.2 kg, 388.0 thousand ha, 23.2 ha/t, 9.56 million tons), South Korea (7.2 kg, 388.0 thousand ha, 23.2 ha/t, 9.56 million tons), South Korea (47.9 kg, 68.2 ha/t, 2.47 million tons), Russia (16 kg, 67.9 thousand ha, 34.7 ha/t, 2.35 million tons) and Uzbekistan (20.8 kg, 12.6 thousand ha, 54.0 ha/t, 680.640 tons).

In recent years, large-scale measures have been implemented in our country to ensure food security, to meet the population's need for high-quality, low-cost vegetable products, to cultivate high-yielding, export-oriented agricultural crops, especially vegetables, which are in high demand in the domestic and foreign markets, suitable for growing slightly saline and saline lands, and to make more rational use of land and water resources. In the 30th goal of the New Uzbekistan Development Strategy of the Republic of Uzbekistan for 2022-2026,..."the cultivation of export-oriented products and the development of fruit and vegetable growing" is defined as one of the priority tasks. Therefore, the selection of white cabbage varieties and hybrids suitable for cultivation in slightly saline soils, the improvement of cultivation technologies, and the correct selection of sowing dates are relevant issues.

The soil and climatic conditions of the northern territory of our republic, the Republic of Karakalpakstan, are expanding, especially in recent years due to weather conditions, water scarcity, and salinization of soils in cultivated areas. The scope of scientifically substantiated research on the selection of varieties and hybrids of white cabbage suitable for cultivation in slightly saline soils of the Republic of Karakalpakstan, the determination of schemes and optimal sowing dates corresponding to the biological and economic characteristics of varieties, is insufficient. According to this research, it is relevant to conduct scientific research on determining the optimal sowing dates of white cabbage varieties and hybrids, studying the growth and development of plants, and morphobiological characteristics under slightly saline soil and climatic conditions in the Republic of Karakalpakstan.

Research methods: Research by B.Zh.Azimov, B.B.Azimov «Methods of Conducting Experiments in Vegetable Growing, Melon Growing and Potato Growing» (2002), «Methodological Guidelines for Environmental Testing of Vegetable Crops in Open Soil» VNIISSOK, M., 1987, Methodology of Field Experiments in Vegetable Growing. Moscow: VNIIO, 2011. (Edited by S.S. Litvinov), V.F. Belik «Methods of Experimental Work in Vegetable and Melon Growing» (1992), «Methodological Guidelines for Environmental Testing of Vegetable Crops» (1987). Statistical analysis of the research results was carried out using the dispersion method of B.A. Dospekhov «Methodology of Field Experiments» (1985), using computer programs «Excel 2010» and «Statistica 7.0 for Windows,» with a confidence interval of 0.95%.

When growing vegetable crops, taking into account the soil and climatic conditions of the region, the correct choice of sowing dates and planting schemes, especially the selection of varieties suitable for specific conditions, is one of the main elements. In addition, it is advisable to correctly assess the morpho-biological characteristics of the cultivated crop type. It is known from sources that sowing seeds and seedlings very early in early spring or too late also has a significant impact on the

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growth, development, and yield of vegetables.

We conducted research in the experimental farm of the Karakalpak Institute of Agriculture and Agrotechnologies and in the farms of Nukus districts for 2022-2023 to determine the optimal sowing dates of varieties and hybrids selected from white cabbage variety samples in the spring season.

Results of the Experiment

In the experiments conducted in 2021 on the selection of varieties and hybrids suitable for cultivation in slightly saline soil and climatic conditions, the following had high indicators: early-ripening Navruz, mid-ripening Tashkentskaya 10 varieties and early-ripening Magnus F1 and mid-ripening Fresco F1 hybrids with 40-45 day seedlings on March 20; When sowing on March 30, April 10, April 20, and April 30, the influence on the growth, development, and yield of plants was studied. The experiment was conducted in 4 replications, each variant was sown in 4 rows in furrows 10 m long. Sowing scheme 70x30 cm. For early-ripening varieties, March 30 and for mid-ripening varieties, April 20 were taken as the control variant.

In the mid-season Tashkentskaya 10 variety, there was no significant difference in seedling maturity at all times, and seedlings planted on April 30 took 5 days to mature. In the Tashkentskaya 10 variety, the 2nd stage of the growing season for cabbage head formation occurred 37-40 days after planting seedlings in all variants. Compared to the control variant (38 days), in the variant sown on April 10 (37 days), it started earlier, on March 20 (39 days) - 1 day later, in the variants sown on April 20-30 (40 days) - 2 days later.

In the Fresco F1 hybrid, seedling capture also occurred in the control variant in 3 days, and in the remaining variants in 4 days. In the Fresco F1 hybrid, the cabbage spinning stage began on days 40-43, in the control (20.04) and April 10 variants on days 40, in the March 30 variant on days 41, and in the early and late-sown variants 3 days later than in the control variant on days 43.

This is due to the fact that in the variants with the earliest sowing (20.03), the soil and air temperature were relatively lower, and in the variants with the latest sowing (30.04), the temperature was relatively higher (1- table).

1- table Phenological indicators of white cabbage varieties sown at different times in spring (2022-2023).

Planting dates	Seedling capture		Beginning of cabbage rolling		Cabbage heads ripening	
	кун	сана/ой	кун	сана/ой	кун	сана/ой
Navruz variety						
20/III	4,0	24/III	35	20/IV	87	17/VI
30/III (наз)	3,0	04/IV	32	02/V	86	25/VI
10/IV	3,0	13/IV	31	11/V	86	05/VII
20/IV	4,0	24/IV	34	25/V	87	16/VII
30/IV	4,0	04/V	35	06/VI	88	27/VII
Hybrid «Magnus F1»						
20/III	3,0	23/III	29	20/IV	63	23/V
30/III (наз)	3,0	03/IV	28	28/IV	61	01/VI
10/IV	3,0	13/IV	28	08/V	61	11/VI
20/IV	4,0	24/IV	29	20/V	65	25/VI
30/IV	4,0	04/V	29	30/V	67	06/VII
Variety «Tashkent 10»						
20/III	4,0	24/IV	39	29/IV	109	08/VII
30/III	3,0	03/IV	38	08/V	106	16/VII
10/IV	4,0	14/IV	37	17/V	106	26/VII
20/IV(наз)	4,0	24/IV	40	05/VI	108	07/VIII
30/IV	5,0	05/V	40	10/VI	110	19/VIII
Fresco F1 hybrid						
20/III	4,0	24/III	43	03/V	92	21/VI
30/III	3,0	03/IV	41	10/V	91	30/VI
10/IV	4,0	14/IV	40	20/V	91	09/VII
20/IV(наз)	4,0	24/IV	40	01/VI	91	20/VII
30/IV	4,0	04/V	43	13/VI	93	02/VIII

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When calculating the ripening of cabbage heads of the studied varieties and hybrids, it took 86 days for the Navruz variety in the control variant (30.03). In the variant sown on April 10, this stage occurred in the same 86 days and corresponded to June 25-26. In the variants with the earliest sowing dates of March 20 and April 10, the ripening of cabbage heads took 87 days and was delayed by 1 day, although it practically did not differ from the control variant.

Ripening of the early-ripening cabbage heads of the Magnus F1 hybrid took 61-67 days in all variants. The control variant (30.03) and plants planted on April 10 required the same 61 days for cabbage heads to mature, which corresponded to June 1 and June 10-11, respectively. In the variant with the earliest sowing on March 20, the cabbage heads ripened on the 63rd day, and the harvest was collected on May 23-24. In the variants sown on April 20-30, the cabbage heads ripened by 65-67 days, 4-6 days later than in the control variant.

In the medium-ripening Tashkentskaya 10 variety, the ripening of cabbage heads in all variants was within 106-110 days, in the control (30.03) and April 10 variants - 106 days, in the April 20 variant - 2 days later - 108 days, in the early-planted variant - 3 days later, and in the late-planted variant on April 30 - 4 days later - 110 days.

Ripening of mid-season cabbage heads of the Fresco F1 hybrid took 91 days in the control variant 20.04 and in the variants sown on March 30 and April 10, while in the variant sown on March 20 (92 days) it was delayed by 1 day, and in the variant sown on April 30 (93 days) by 2 days.

Navruz variety 20.03; (30.03 control); 10.04; 20.04; When sown on 30.04, the cabbage heads ripened accordingly: 16-17/VI; 25-26/VI; 05-06/VII; On the dates 15-16/VII and 26-27/VII, the yield of the Magnus F1 hybrid was: 23-24/V; 01-02/VI; 10-11/VI; 25-26/VI and 06-07/VII.

When cultivating the mid-season Tashkentskaya 10 variety at these dates, respectively: 07-08/VII; 15-16/VII; 25-26/VII; 06-07/VII; The ripening of cabbage heads on the dates 19-20/VII and in the Fresco F1 hybrid was respectively: 20-21/VI; 30-31/VI; 08-09/VII; 20-21/VII and 01-02/VIII.

Conclusion

The marketable yield of the early-ripening Navruz variety of white cabbage in the variant sown on April 10 was 56.2 ha/t, which is 4.8-15.0 ha/t higher compared to the control and other variants, while in the Magnus F1 hybrid, in the variant sown on March 30, the marketable yield was 57.5 ha/t, which is 11.2-48.4% higher compared to other variants.

In the medium-ripening Tashkentskaya 10 variety (20.04), the yield from the control variant was 11.8-34.4% compared to all variants, and in the Fresco F1 hybrid, the highest yield was 65.7 ha/t in the variant sown on April 20, which was 3.8-48.0% higher compared to other variants.

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