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Determining the Optimal Planting Dates for White Cabbage in the Early Time

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ABSTRACT

in the article, the results of the research carried out in order to determine the optimal sowing dates of white cabbage in the future are presented in a state of deep scientific analysis. The article also provides valuable information on the effect of different planting dates on cabbage plant leaf number, leaf band length and leaf weight, cabbage weight and yield.

KEYWORDS: white cabbage, planting dates, number of leaves, leaf band length, leaf weight, cabbage weight, productivity.

Introduction

In the cultivation of each crop, first of all, it is necessary to study the early or late ripening of the variety, its characteristics, in which climatic conditions, in which scheme and in which periods should be planted and cultivated on a scientific basis. The reason why varieties are recommended to be planted in different periods is that if late or mid-ripening varieties are planted in the late period, their harvest will coincide with the hot period of summer, and the yield will decrease sharply, and there will be no possibility of planting repeated crops in the field. If the early varieties are planted in the late or mid-term, their biological characteristics do not correspond.

The French vegetable consulting firm "Zwaan-Pannevis" planted white cabbage "Kvisto" hybrid in 1983 in different planting schemes and reported the following: seedling May 6 60x40 cm, May 18 60x30 cm, 60x40 and 60x60 cm, June 8 60x40 cm, June 22 60x40 cm, planted on July 15 in a scheme of 60x40 cm and 60x50 cm. In the case of the option planted in the early period (May 6), after 81–94 days, the yield is 538–683 t/ha.

N.N. Khoroshikh, N.I. According to Tikhonov [5], when the "Belorusskaya-455" variety of white cabbage was planted in 4 periods (May 24-31, June 6-12), May 24 was considered the most favorable period. The yield of cabbage planted in June compared to that planted in May is 277.4 ts/ha.

I.E. According to Kitaeva [6], in order to provide the population with a new crop of cabbage until late autumn, if the "Iyunskaya" variety is planted in April, the first harvest will be made on June 15-20. The harvest of the "Number pervyy Gribovsky-147" variety ripens from the beginning of July to the middle of August, and the harvest of the "Stakhanovka-1513" variety ripens from the end of August to the beginning of September.

B.N. Krutskikh [7] noted that the time of planting is important for obtaining a high yield of cabbage. It is recommended to plant evening cabbage varieties "Zimovka-1474" and "Kharkovskaya zimnyaya" in the first

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decade of May, "Amager-611", "Moskovskaya pozdnyaya" types in the second half of May, and other evening and evening cabbage varieties in the third decade of May.

Materials and Methods

Research by B.J. Azimov and B.B. Azimov "Methodology of conducting experiments in vegetable growing, potato growing and potato growing" [1], "Experimental methods in vegetable and melon growing" [2], "Guidelines for environmental testing of vegetable crops" [3] was conducted based on the methods presented in the manuals. Statistical analysis of the research results was carried out by B.A. Dospehov "Field experiment methodology" [4] dispersion method in "Excel 2010" and "Statistica 7.0 for Windows" computer programs, with a confidence interval of 0.95%.

In our experience of selecting white cabbage varieties and samples, we selected promising varieties of white cabbage with high and high-quality harvest based on planting and testing 11 varieties and 17 hybrids of white cabbage.

In the experiment, white cabbage "Tashkent 10" variety and "Fresso F1" hybrid were used as standards. The experiment is non-reversible, each variety has 4 rows, the length of the egates is 10 m. Each variety was planted on 28 m^2. Planting scheme 70x40 cm.

Results and Discussion

As planting dates were delayed every 10 days, the number of leaves per plant increased compared to the control option. The average indicator of all planting periods was 17.9-19.2 pieces. Compared to the control period, the number of leaves was 4.4-6.6% higher in the 4th-5th planting period. The difference between options 4 and 5 was 2.2 percent (19.2–18.8 pieces).

The number of leaves on the plant increased from the 1st planting period (17.9 pieces) to the 5th planting period (18.8 pieces) in the "Navruz" variety. Compared to the control option, it was less than 0.6% in the first planting period, and increased to 2.7–3.6% in the remaining planting periods.

In the "Tashkent 10" variety, the length of the leaf band increased from the 1st planting period to the 4th planting period. This increase was 8.0–20.0% compared to the control option. Leaf band was not observed in hybrid "Magnus F1", but in hybrid "Fresco F1" it was 13.5-16.1 cm (see Table 1).

Table 1. Effect of different planting dates on cabbage plant leaf number, leaf band length and leaf weight, 2022 (before harvest)

Planting period	Number of leaves		Leaf band length		Free leaf weight	
	pieces	Comparison to control, %	sm	Comparison to control, %	g	Comparison to control, %
Navruz						
20.03	17,9	99,4	70,8	95,2	1,267,3	100,1
30.03 control	18,0	100,0	70,3	100,0	1,265,4	100,0
10.04	18,5	102,7	72,7	101,5	1,344,9	106,2
20.04	19,2	106,6	73,5	103,1	1,411,2	111,5
30.04	18,8	104,4	72,9	101,5	1,370,5	108,3
Tashkent 10						
20.03	19,3	98,9	2,6	104,0	1,833,5	89,5
30.03 control	19,5	100,0	2,5	100,0	2,047,5	100,0
10.04	20,7	106,1	2,7	108,0	2,484	121,3
20.04	21,0	107,6	3,0	120,0	2,604	127,1
30.04	20,9	107,1	2,9	116,0	2,549,8	124,5
Magnus F_1						

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20.03	16,3	103,0	-	-	366,7	97,4
30.03 control	16,8	100,0	-	-	376,3	100,0
10.04	17,5	104,1	-	-	435,7	115,7
20.04	18,1	107,7	-	-	456,1	121,2
30.04	17,6	104,7	-	-	434,7	115,5
Fresco F_1						
20.03	20,9	102,9	13,5	88,2	1745,1	92,0
30.03 control	20,3	100,0	15,3	100,0	1,896	100,0
10.04	21,7	106,8	15,7	102,6	2,126,6	112,1
20.04	23,2	114,2	16,6	108,4	2,503,2	132,0
30.04	22,5	110,8	16,1	105,2	2,407,5	126,9

The width of the leaf was 19.7 cm in the control version of "Navruz" variety, and it was 1.1 percent lower than it was observed in the 1st (20.03) planting period. Compared to the control, when the planting date is delayed by 10 days, the leaf width is 2%; It was 4% higher at 20 days late planting and 3% higher at 30 days late planting. The difference between the 1st planting period and the 4th period was 5.1 percent (see Table 2).

Table 2. Effect of different planting dates on morphological parameters of cabbage plant, 2022 (before harvest)

Planting periods	Leaf length		Leaf width		Leaf surface	
	sm	Comparison to control, %	sm	Comparison to control, %	dm^2	Comparison to control, %
Navruz						
20.03	19,3	98,9	19,5	98,9	3,76	97,9
30.03 control	19,5	100,0	19,7	100,0	3,84	100,0
10.04	19,9	102,0	20,1	102,0	3,99	106,1
20.04	20,3	104,1	20,5	104,0	4,16	108,3
30.04	20,1	103,0	20,3	103,0	4,08	106,2
Tashkent 10						
20.03	28,7	97,2	23,9	97,9	6,85	95,2
30.03 control	29,5	100,0	24,4	100,0	7,19	100,0
10.04	31,3	106,1	27,5	112,7	8,60	119,6
20.04	35,7	121,0	31,2	127,8	11,1	154,3
30.04	33,9	114,9	28,5	116,8	9,66	134,3
Magnus F_1						
20.03	20,2	107,9	22,5	95,3	4,54	88,3
30.03 control	21,8	100,0	23,6	100,0	5,14	100,0
10.04	24,1	110,5	26,3	111,4	6,33	123,1
20.04	26,0	119,2	28,0	118,6	7,28	141,6
30.04	23,3	106,8	25,1	106,3	5,84	113,6
Fresco F_1						
20.03	20,3	98,0	19,5	97,9	3,95	96,1
30.03 control	20,7	100,0	19,9	100,0	4,11	100,0
10.04	21,5	103,8	20,7	104,0	4,45	112,6
20.04	24,1	116,4	23,3	117,0	5,61	136,4
30.04	23,8	114,9	22,6	113,5	5,37	130,6

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Leaf width multiplied by leaf length was the leaf surface area. For this, cm^2 is divided by 100 and dm^2 is obtained. In the control option, the leaf surface was 7.19 dm^2 in the "Tashkent 10" variety. The indicator of the remaining options except the first planting period was higher than that of the control option: option 3 was 19.6%, option 4 - 54.3%, and option 5 was 34.3% more.

In the "Magnus F1" hybrid, the leaf area was in the range of 4.54–7.28 dm^2 according to the options. Compared to the control, the 1st option was 1.7% lower, and the indicators of the other options were in the range of 123.1–141.6% compared to the control.

Correlation coefficient between leaf length and leaf width was strong in white cabbage "Fresco F1" hybrid.

Planting times also had an effect on cabbage width. In "Navruz" variety, the width diameter of cabbage increased from the fifth planting period (15.0 cm) to the first (16.0 cm). The control option was 3.2-4.5% lower than option 4-5, and 3.3% higher than option 1.

"Tashkent 10" variety has the highest average cabbage width in the 4th option, 16.5 cm. or 133.3 percent compared to the control (see Table 3).

Table 3. The effect of planting dates on the height and width of cabbage, 2022

Planting periods	Cabbage height		Cabbage width		Cabbage index	
	sm	Comparison to control, %	sm	Comparison to control, %	height : width	Comparison to control, %
Navruz						
20.03	15,1	96,1	15,0	96,7	1,00	101,0
30.03 control	15,7	100,0	15,5	100,0	1,01	100,0
10.04	15,5	98,7	15,4	102,6	1,00	101,0
20.04	16,4	104,4	16,2	104,5	1,00	101,0
30.04	16,1	102,5	16,0	103,2	1,01	100,0
Tashkent 10						
20.03	10	83,3	12	100,0	0,83	83,0
30.03 control	12	100,0	12	100,0	1,00	100,0
10.04	13	108,3	14	116,6	0,92	92,0
20.04	16	133,3	16	133,3	1,00	100,0
30.04	13	108,3	14	116,6	0,92	92,0
Magnus F_1						
20.03	10	90,9	12	100,0	0,83	91,2
30.03 control	11	100,0	12	100,0	0,91	100,0
10.04	12	109,0	13	108,3	0,92	101,0
20.04	13	118,1	13	108,3	1,00	109,8
30.04	12	109,0	12	100,0	1,00	109,8
Fresco F_1						
20.03	15,5	97,4	14,3	97,2	1,08	100,0
30.03 control	15,9	100,0	14,7	100,0	1,08	100,0
10.04	16,7	105,0	15,2	103,4	1,09	100,9
20.04	17,4	109,4	16,5	112,2	1,05	97,2
30.04	17,2	108,1	15,9	108,1	1,08	100,0

In "Magnus F1" hybrid, the highest index of core thickness (3.0 cm) was in the 20.04 planting option, 2.5% in the 1st option, and 2.8–2.9 and 2.9 cm in the remaining planting periods, respectively.

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The stem length of the "Fresco F1" hybrid plant was 4.5 cm in the control option. It was 3.7 cm at the time of planting 1, and the length of the stem increased by 11.1–14.4% and was 5.0–5.6 cm as the time of planting was delayed in the remaining options (see Table 4).

Table 4. Effect of different planting dates on internal stem length and thickness and root wet weight of cabbage, 2022

Planting periods	inner core length		inner core width		wet root weight	
	sm	Comparison to control, %	sm	Comparison to control, %	g	Comparison to control, %
Navruz						
20.03	3,0	75,0	3,0	75,7	75,7	97,6
30.03 control	4,0	100,0	3,0	100,0	77,5	100,0
10.04	3,5	87,5	3,0	100,0	85,3	110,0
20.04	4,0	100,0	4,0	138,3	88,0	113,5
30.04	3,8	95,0	3,0	100,0	83,1	107,2
Tashkent 10						
20.03	4,0	80,0	3,0	100,0	85,8	96,8
30.03 control	5,0	100,0	3,0	100,0	88,6	100,0
10.04	6,0	120,0	3,0	100,0	108,7	122,6
20.04	7,0	140,0	3,0	100,0	110,5	124,7
30.04	7,0	140,0	3,0	100,0	108,3	122,2
Magnus F_1						
20.03	3,2	91,4	2,5	89,2	55	94,8
30.03 control	3,5	100,0	2,8	100,0	58	100,0
10.04	3,8	108,5	2,9	103,5	60	103,4
20.04	4,3	122,8	3,0	107,1	64	110,3
30.04	4,1	117,1	2,9	103,5	62	106,8
Fresco F_1						
20.03	3,7	82,2	2,9	82,8	84,3	101,2
30.03 control	4,5	100,0	3,5	100,0	83,3	100,0
10.04	5,0	111,1	3,0	85,7	88,3	106,0
20.04	5,6	124,4	3,9	111,4	115,2	138,2
30.04	5,3	117,7	3,8	108,5	94,6	113,5

In the "Tashkent 10" variety, the length of the cabbage stem was 5.0 cm in the control option, compared to it: 1- planting time is 20% lower; 20 during the 3-4-5 planting periods; 40 and 40 percent longer.

Cabbage weight was 1.1 kg in the control version of "Navruz" variety. The control was 8.4% lower than the option only in the 1st planting period. Cabbage weight increased by 4.1% in the option planted 10 days later than the control (10.04); When planted 20 days late (20.04) - 7.9% and when planted 30 days late (30.04) - 9.1% more. Compared to the control option, the yield in the following options was 59.5–62.3 t/ha (see Table 5).

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Table 5. Effect of planting dates of white cabbage varieties on cabbage weight and yield, 2022

Planting periods	Weight of cabbage, 2022		Yield t/ga
	g	Comparison to control, %	
Navruz			
20.03	1,100	91,6	52,3
30.03 control	1,200	100,0	57,1
10.04	1,250	104,1	59,5
20.04	1,295	107,9	61,6
30.04	1,310	109,1	62,3
Tashkent 10			
20.03	952,0	103,0	45,3
30.03 control	924,0	100,0	43,9
10.04	1,050	113,6	49,9
20.04	1,298	140,4	61,8
30.04	1,190	128,7	56,6
Magnus F_1			
20.03	779,0	74,1	45,2
30.03 control	1,050	100,0	49,9
10.04	925,0	88,0	44,0
20.04	1,320	125,7	62,8
30.04	1,150	109,5	54,7
Fresco F_1			
20.03	910,2	65,4	43,3
30.03 control	1,390	100,0	66,1
10.04	1,450	104,3	69,0
20.04	1,685	121,2	80,2
30.04	1,300	93,5	61,9

The yield of option 3 (59.5 t/ha) was 61.6–62.3 t/ha than that of option 4-5. The difference between the yield of options 4 and 5 was 0.7 t/ha.

In other varieties and hybrids, the highest yield was recorded during the 4th sowing period (20.04).

In the Fresco F1 hybrid, the yield in all options was as follows: 1. The yield when the planting date was 10 days late compared to the planting date (30.00 control) was 66.1 t/ha, 20 days late – 69.0 t/ha, 30 days late – 80.2 t/ha and 40 days late - 61.9 t/ha.

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