

THE EVALUATION OF PEKING CABBAGE (BRASSICA RAPA SUBSP. PEKINENSIS. LIZG) UNDER THE CONDITIONS OF THE CENTRAL REGION OF UZBEKISTAN ON THE VALUABLE AND ECONOMIC CHARACTERISTICS OF VARIETIES

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ANNOTATION

The article provides the information on the economic characteristics of 32 varieties of Chinese cabbage, namely, the number of leaves, the size of the leaves and the yield from the world's collections.

In the soil and climatic conditions of the central region of Uzbekistan, the article studied and determined the acclimatization of more than 32 collections of Peking cabbage imported from foreign countries, and identified valuable economic traits.

According to the results of the experiment, the varieties VI 033029/TB00322, VI 057716/TB00951, VI 037795/B01060, VI 032997/B01087, VI 047249/B01104, VI 047256/B01111 and VI 032995/B01085 have distinguished themselves in terms of productivity.

KEYWORDS: variety, hybrid, cabbage head, yield, early ripening, variety samples, leaf, leaf surface, cabbage weight.

Introduction

In many countries of the world, a program of selection and cultivation of non-traditional types of vegetables rich in biologically active substances is being implemented. It is known that vegetables contain more than ten vitamins, mineral salts, enzymes, phytoncides and other biologically active substances that play a significant role in increasing life expectancy and human performance [1.]; [3.].

In order to improve the nutrition of the population in our country, great importance is being paid attention to increasing the sowing of vegetable crops. The Peking cabbage is one of the vegetable crops rich in substances necessary for human health [2.]; [4.]; [5].

Peking cabbage (*Brassica rapa* subsp. *pekinensis* Lizg.) is a type of cabbage belonging to the Peking family (*Brassicaceae*). As an annual plant, it originates from China, Japan and Korea in East Asia. Its productivity part is an elongated (cylindrical or ovoid) head of cabbage, from which fried and boiled dishes are prepared: various soups, salads, pickles, marinades and jams [6.]; [7.]; [9.].

Due to the fact that it contains many vitamins, amino acids and other biologically active substances, it makes up about 80 percent of the total volume of vegetables consumed by the inhabitants of northern China in the winter. [10.].

Currently, Peking cabbage occupies 25% of all cultivated areas in East Asia and Indochina. For the cultivation of this crop, large areas have been allocated in the United States and European countries. In the Netherlands, where vegetable growing is developed, Peking cabbage is grown on an area of about 1000 hectares [11.]; [12.]; [13].

Analyzing the level of consumption of Chinese cabbage today, more than 70% (500 million tons) of the total cultivated product is consumed in Asian countries. Including China 355 million/t, European countries 85 million /t, India, Turkey, Saudi Arabia, Iran, Italy and other countries like to eat Peking cabbage [8.]; [9.]; [15].

The production of abundant and high quality products from any crop depends largely on the variety or hybrid being planted. The State Register of crops recommended for sowing on the territory of the republic of Uzbekistan includes Chinese varieties such as Khibinskaya and hybrids of Cha-Cha, Yuki, which are grown by some interested vegetable growers and farms. Grown varieties must meet the requirements of the modern market, be early maturing, productive, resistant to diseases and pests, quality products and intended for long- distance transportation, and must also have properties such as rapid adaptation to the soil and climatic conditions of the area of the place. Taking into consideration all the above, we focused our study on the assessment of economic characteristics of varietal samples of Chinese cabbage [12.]; [13]; [14]; [15].

Experience styles. A collection of Pekingcabbage varieties was tested in 2017-2018 by planting seedlings for 30 days in replication planting terms. During the study of varieties, 32 varieties of Chinese cabbage from the world Vegetable Center (Taiwan Island) were tested. In the study of varietal samples, 32 samples of varieties of Beijing cabbage were tested, which were brought from the entire Jahan Vegetable Center (Taiwan island).

Experiments on the study of variety samples were introduced in the nursery of the introduction of agricultural crops of experimental farm of the Research Institute of Plant Genetic Resources, and experiments on the selection of early, high-yielding variety samples were carried out on the training field of the Consulting Center of the Agricultural Information and Consulting Center (Extension center) at the Tashkent State Agrarian University [1]; [2]; [12]; [13]; [14]; [15].

Experimental results. The conducted phonological observations showed that the samples of the tested Chinese cabbage variety went through the stages of growth and development periods. Among the samples of the variety, it was found that there are several early ripe and high-yielding variety samples compared to the standard variety Khibinskaya.

The seeds of the variety samples participating in the test were sown in nutrient trays on July 10, their germination and the period of leaf appearance were observed (see Table 1).

Table 1

The result of observation for growing seedlings (2017-2018)

№	Variety samples	Germination of seeds		Germination of grasses, day	Appearance of the first green leaf,		Appearance of 4-5 leaves,	
		10 %	75 %		Day	Date	Day	Date
1.	Khibinskaya St.	15.07	16.07	5	10	20.07	17	27.07
2.	VI 037793/B01058	15.07	16.07	5	9	19.07	16	26.07
3.	VI 037795/B01060	14.07	16.07	4	10	20.07	17	27.07
4.	VI 045241/B01067	14.07	15.07	4	9	19.07	15	25.07
5.	VI 037802/B01075	14.07	16.07	4	9	19.07	17	27.07
6.	VI 032992/B01082	14.07	15.07	4	9	19.07	15	25.07
7.	VI 032997/B01087	15.07	16.07	5	11	21.07	16	26.07
8.	VI 047248/B01103	14.07	16.07	4	10	20.07	16	26.07
9.	VI 047249/B01104	15.07	17.07	5	11	21.07	17	27.07
10.	VI 047256/B01111	15.07	16.07	5	10	20.07	16	26.07
11.	VI 033023/TB00316	13.07	18.07	3	11	21.07	18	28.07
12.	VI 033029/TB00322	13.07	16.07	3	8	18.07	14	24.07
13.	VI 033030/TB00323	15.07	19.07	5	9	19.07	15	25.07
14.	VI 057716/TB00951	13.07	17.07	3	9	19.07	14	24.07
15.	VI 032994/B01084	14.07	17.07	4	11	21.07	16	26.07
16.	VI 032995/B01085	13.07	16.07	3	7	17.07	13	23.07
17.	VI 037791/B01056	15.07	18.07	5	11	21.07	17	27.07
18.	VI 037798/B01063	16.07	19.07	6	13	23.07	19	29.07
19.	VI 045239/ B01065	14.07	16.07	4	10	20.07	15	25.07
20.	VI 037801/B01074	13.07	17.07	3	10	20.07	14	24.07
21.	VI 032993/B01083	15.07	18.07	5	9	19.07	14	24.07
22.	VI 047245/B01100	13.07	16.07	3	8	18.07	13	23.07
23.	VI 047247/B01102	14.07	17.07	4	11	21.07	16	26.07
24.	VI 047253/B01108	16.07	19.07	6	14	24.07	20	30.07
25.	VI 047254/B01109	14.07	18.07	4	12	22.07	18	28.07

26.	VI 047258/B01113	13.07	15.07	3	8	18.07	14	24.07
27.	VI 047260/B01115	14.07	18.07	4	9	19.07	15	25.07
28.	VI 032982/B01130	15.07	18.07	5	10	20.07	16	26.07
29.	VI 045546/TB00655	13.07	18.07	3	11	21.07	16	26.07
30.	VI 045242/B01068	15.07	19.07	5	13	23.07	19	29.07
31.	VI 060641	16.07	20.07	6	14	24.07	19	29.07
32.	VI 060644	14.07	18.07	4	12	22.07	17	27.07

The seed germination of all varieties did not differ significantly. The sown seeds took 3 to 6 days to germinate.

If the Khibinskaya test varieties are sprouted after 5 days, VI 037795/B01060, VI 045241/B01067, VI 037802/B01075, VI 032992/B01082, VI 047248/B01103, VI 033023/TB00316, VI 033029/TB00322, VI 057716/TB00951, VI 032994/B01084, VI 032995/B01085, VI 045239/B01065, VI 037801/B01074, VI 047245/B01100, VI 047247/B01102, VI 047254/B01109, VI 047258/B01113, VI 047260/B01115, VI 045546/TB00655 and VI 060644 varieties took 3-4 days to germinate. On the contrary, samples of varieties VI 037798/B01063, VI 047253/B01108 and VI 060641 germinated 1 day later than the standard variety.

The first green leaf of the Peking cabbage variety samples was formed in seedlings VI 037793/B01058, VI 045241/B01067, VI 037802/B01075, VI 032992/B01082, VI 033029/TB00322, VI 033030/TB00323, VI 057716/TB00951, VI 032995/B01085, VI 032993/B01083, VI 047245/B01100, VI 047258/B01113 and VI 047260/B01115 variety samples in 7-9 days, in other variety samples in 10-14 days. The 4 green leaves on the seedling VI 045241/B01067, VI 032992/B01082, VI 033029/TB00322, VI 033030/TB00323, VI 057716/TB00951, VI 032995/B01085, VI 045239/B01065, VI 037801/B01074, VI 032993/B01083, VI 047245/B01100, VI 047258/B01113 and VI 047260/B01115 of variety samples were formed in 13-15 days, in the rest variety samples it was formed in 16-20 days.

Samples of Peking cabbage varieties VI 037795/B01060, VI 045241/B01067, VI 032992/B01082, VI 047248/B01103, VI 057716/TB00951, VI 032995/B01085, VI 033030/TB00323, VI 033029/TB00322, VI 037801/B01074, VI 047245/B01100, VI 047253/B01108, VI 047254/B01109, VI 047258/B01113 and VI 060641 had a period of formation of head 23-34 days for mature heads they needed 33-35 days.

It was observed that this indicator occurred 4-5 days earlier before the formation of head than that of the standard variety.

The results of phenological observation revealed that in the samples of the following varieties VI 037793/B01058, VI 037795/B01060, VI 045241/B01067, VI 037802/B01075, VI 032992/B01082, VI 032997/B01087, VI 047248/B01103, VI 047249/B01104, VI 047256/B01111, VI 033023/TB00316, VI 032994/B01084, VI 033030/TB00323, VI 033029/TB00322, VI 037801/B01074, VI 032993/B01083, VI 047245/B01100, VI 047253/B01108, VI 047254/B01109, VI 047258/B01113, and VI 045546/TB00655, the growing period was 70-93 days, and in the standard variety it was 96 days, which was 3-26

days earlier than the average standard variety.

On the contrary, it was found that the growth period was 97-116 days in VI 057716/TB00951, VI 032995/B01085, VI 037791/B01056, VI 037798/B01063, VI 045239/ B01065, VI 047247/B01102, VI 047260/B01115, VI 032982/B01130, VI 060641 and VI 060644 samples. The leaf formation of varietal samples that passed through the phenological phases quickly corresponded to favorable temperatures and, as a result, formed large leaf surfaces. Biometric measurements determined the number of leaves in the plants, the size of the largest leaves and their leaf surface.

The number of leaves per plant was 18 pcs. In the standard Khibinskaya variety. These pointers of the VI 045241/B01067, VI 047249/B01104, VI 033029/TB00322, VI 033030/TB00323, VI 037795/B01060, VI 047256/B01111, VI 033023/TB00316, VI 057716/TB00951, VI 032995/B01085, VI 037791/B01056, VI 037798/B01063, VI 045239/ B01065, VI 037801/B01074, VI 032993/B01083, VI 047245/B01100, VI 047247/B01102, VI 047253/B01108, VI 047254/B01109, VI 047258/B01113, VI 047260/B01115, VI 032982/B01130, VI 045546/TB00655 varieties were 19-34 pcs in samples or 1-16 more than the standard variety. Table 2.

The measurements of the largest leaf length showed that samples of VI 033029/TB00322, VI 033030/TB00323, VI 037795/B01060, VI 047256/B01111, VI 033023/TB00316, VI 057716/TB00951, VI 032995/B01085, VI 037791/B01056, VI 037798/B01063, VI 045239/B01065, VI 037801/B01074, VI 032993/B01083, VI 047245/B01100, VI 047247/B01102, VI 047253/B01108, VI 047254/B01109, VI 047258/B01113, VI 047260/B01115 and VI 032982/B01130 had long leaves. The sizes of these varieties were 5-12cm larger than the standard variety.

It should be noted that other varieties of Peking cabbage VI 045241/B01067, VI 047248/B01103 also formed large leaves.

Table 2

The yield and product quality of Peking cabbage variety samples (2017-2018)

№	Variety samples	Growth period, day	Number of leaves, pcs	Average weight of the cabbage head, g	Product quality, %.	Total productivity, t/ha	Additional productivity compared to the standard.	
							T/ ha	Percent
1.	Khibinskaya St.	96	18	600	84	33,7	-	-
2.	VI 037793/B01058	78	15	420	81	37,2	3,5	10,3
3.	VI 037795/B01060	70	21	980	75	47,5	13,8	40,9
4.	VI 045241/B01067	72	20	720	76	29,5	-4,2	-12,5
5.	VI 037802/B01075	80	18	820	74	34,2	0,5	1,5
6.	VI 032992/B01082	76	15	270	61	19,5	-14,2	- 42,1

7.	VI 032997/B01087	79	17	1150	65	51,2	17,5	51,9
8.	VI 047248/B01103	74	16	920	71	39,4	5,7	16,9
9.	VI 047249/B01104	81	22	1000	64	49,5	15,8	46,9
10.	VI 047256/B01111	71	19	1100	62	45,4	11,7	34,7
11.	VI 033023/TB00316	75	20	880	50	36,2	2,5	7,4
12.	VI 033029/TB00322	93	34	980	94	44,6	10,9	24,4
13.	VI 033030/TB00323	85	22	750	80	37,5	3,8	10,1
14.	VI 057716/TB00951	97	28	1200	92	52,7	19,0	56,4
15.	VI 032994/B01084	78	16	580	57	30,3	-3,4	-11,2
16.	VI 032995/B01085	99	32	950	92	44,6	10,9	24,4
17.	VI 037791/B01056	106	28	720	82	33,1	-0,6	-1,7
18.	VI 037798/B01063	110	30	550	76	25,3	-8,4	-24,9
19.	VI 045239/ B01065	108	27	600	74	27,6	-6,1	-18,1
20.	VI 037801/B01074	88	33	850	90	39,1	5,4	16,0
21.	VI 032993/B01083	93	29	650	73	29,9	-3,8	-11,2
22.	VI 047245/B01100	90	32	540	85	24,8	-8,9	-26,4
23.	VI 047247/B01102	113	34	480	87	22,0	-11,7	34,7
24.	VI 047253/B01108	86	26	700	84	32,2	-1,5	-4,4
25.	VI 047254/B01109	82	29	780	89	35,8	2,1	6,2
26.	VI 047258/B01113	90	31	680	77	31,2	-2,5	-7,4
27.	VI 047260/B01115	116	34	580	82	26,7	-7,0	-20,7
28.	VI 032982/B01130	102	28	490	88	22,5	-11,2	-33,2
29.	VI 045546/TB00655	88	24	380	82	17,5	-16,2	-48,0
30.	VI 045242/B01068	79	27	400	87	18,4	-15,3	-45,4
31.	VI 060641	109	32	720	75	33,1	-0,6	-1,7
32.	VI 060644	101	30	580	88	26,7	-7,0	-20,7
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It was shown that the size of the leaf surface per plant of VI 057716/TB00951, VI 032995/B01085, VI 045239/ B01065, VI 037801/B01074, VI 045241/B01067, VI 032992/B01082, VI 033029/TB00322, VI 033030/TB00323, VI 032993/B01083, VI 047245/B01100, VI 047258/B01113 and VI 047260/B01115 of variety samples was 117,5-138,2 dm², which was 23,8- 44,5 dm² higher than the standard variety.

The varieties with a large leaf area formed slightly larger heads over time.

In the measurements carried out to determine the quantity and quality of the crop, in the samples of some varieties of Peking cabbage, the average mass of a head of cabbage was established, the superiority of Peking cabbage over the medium-sized variety Khibinskaya was shown.

From samples VI 037795/B01060, VI 045241/B01067, VI 037802/B01075, VI 032997/B01087, VI 047248/B01103, VI 047249/B01104, VI 033029/TB00322, VI 057716/TB00951, VI 032995/B01085, VI 047256/B01111, VI 033023/TB00316, VI 033030/TB00323, VI 037791/B01056, VI 037801/B01074, VI 032993/B01083, VI 047253/B01108, VI 047254/B01109, VI 047258/B01113 and VI 060641 large-weight cabbage (1200 g) was obtained and it was found that their weight was up to (50-600 g) or 8.3-100 % higher, than the standard variety.

The samples of cultivars VI 033029/TB00322, VI 057716/TB00951, VI 037795/B01060, VI 032997/B01087, VI 047249/B01104, VI 047256/B01111 and VI 032995/B01085 collected the highest yield in terms of conditional area of 44,6-52,7 t/ha. The results obtained were 10,9-19,0 tons or 24,2-56,4 more than the standard variety.

Of 32 Chinese cabbage varieties tested in the field experiments, VI 037793/B01058, VI 033029/TB00322, VI 033030/TB00323, VI 057716/TB00951, VI 037801/B01074, VI 047254/B01109, and VI 032995/B01085 – samples of the varieties passed the phonological phases earlier, formed large leaf surfaces, and as a result, the yielded higher than the standard.

Conclusion

The following conclusions can be made based on the above experimental results.

1. Pekingcabbage VI 037795/B01060; VI 045241/B01067, VI 047256/B01111 samples of varieties were characterized by early ripening.
2. VI 033029/TB00322, VI 057716/TB00951, VI 037795/B01060, VI 032997/B01087, VI 047249/B01104, VI 047256/B01111 and VI 032995/B01085 varietal samples were distinguished by their yield, and their use in further selection works is expedient.

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