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Perspective Sources from the Collection of Chinese cabbage (Brassica Rapa Subsp. Chinensis L.) for Breeding

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Annotation: Chinese cabbage is an unconventional vegetable crop for Uzbekistan. In order to expand the range of vegetable crops, economically valuable traits of foreign varieties of Chinese cabbage were studied: varieties Vesnyanka, KV I047250, Vitavir, Golub, Korolla, Krasa Vostok and the Kholodok F1 hybrid in the climatic conditions of the Tashkent region. The variety Sharq guzali released in Uzbekistan was taken as a standard variety. As a result of three years of research, 6 samples of Chinese cabbage were identified as sources of early ripeninig and yield.

Keywords: Chinese cabbage, new samples, early ripening, productivity, growth period, productivity of one plant.

INTRODUCTION

Vegetable, melon and potato crops are rich in various vitamins, minerals, enzymes, light digestible protein, starch, carbohydrates and medicinal oils (in their seeds), which make up 80-85% of the products of daily human consumption. Therefore, one of the main tasks is to increase the volume and quality of vegetable products in ensuring food security in the world.

Today, 45 different types of vegetable crops are grown in Uzbekistan. While 315,42 thousand hectares of vegetables, melons and potatoes were grown in the country in 2021, 79,6% of this cultivated area consists of 10 of the following crops: potatoes (92,602 thousand.), tomatoes (57,746 thousand), carrots (36,953 thousand), onions (34,931 thousand), cucumbers (23,993 thousand), cabbage (12,863 thousand), garlic (7,438 thousand), (64,352 thousand) correspond to the share of zucchinis . On the other hand, the remaining 35 different vegetable crops are grown in an area close to the remaining 20 percent. The main reason for this is the lack of creation of early, fertile, vitamin-rich varieties of non-traditional vegetable species suitable for local conditions in our republic, and insufficient study of growing technology.

This is the subject of our study of a new type of cabbage, devoted to the study of imported varieties of cabbage leaf Chinese (Rai-tsaibrassica chinensis L) on the main economic attributes in the climatic conditions of our republic, and to the selection of promising varieties.

Methods of research. Research on the study of valuable economic traits of Chinese cabbage varieties and samples were carried out on the basis of the methodical manual of the All-Russian Research Institute of Plant Industry (VIR) "Research and restoration of the world cabbage plant collection", [4] and the method of B. A. Dospekhov [5.]; [6.]; [7.]; [8.]; [9.]; [10.]; [11.]; [12.]; [13.]; [14.].

As an object of study we used Chinese cabbage "Vesnyanka", "Vitavir", "Goluba", "Corolla", "Alyonushka", "Swallow" and sample VI047250 of the World Vegetable Center (inventory number B01105) and "Oriental Beauty" zoned in our country for comparison chose the variety.

Soil and climatic conditions of the research site. The researches were conducted on the cultivated fields of the "Training and Consultation Center" of the Tashkent State Agrarian University located in Kibray district of Tashkent province. According to the information of the Center of agrochemical analysis of Tashkent region, in arable layer (0-30 cm) of soils, where field experiments were conducted from the beginning of vegetation, humus 1,6-1,87%, nitrogen-0,135%, phosphorus-0,37%, potassium-1, was 10%.

Climate conditions. Tashkent region is located in the north-east of Uzbekistan, bordered by the Republic of Kazakhstan in the north-west, Kyrgyzstan in the north-east, Namangan region in the east, the Republic of Tajikistan in the south and Syrdarya region in the south-west. The climate of the area is sharply continental; winters are mild and wet, and summers are hot and dry.

Duration of sunny days in Tashkent viloyat during a year is 2800-2900 hours, in summer - 360-400 hours, and in winter - 90-100 hours. In rare periods, there are cloudy days, which are observed mainly in winter months, namely December, January from 10 to 25 days (Chub V.G. 2000). According to data of Kibrai district weather station "White Pumpkin", average annual air temperature in the area is 14-17 ^{0}C in March-April, May, 28,2-32,4 ^{0}C in June-August, September respectively. The average air temperature in the district is 18, which falls down to 4 ^{0}C. Kibray region is located in arid zone, where totally 250-500 precipitations fall during a year. Most of the periods of precipitation fall in the winter-spring months. March is the wettest month. Snow piles up for 25-35 days in these areas.

Research results. The research was conducted on the experimental fields of the Information and Consulting Center of Tashkent State Agrarian University (EXTENSION CENTER), on typical gray soils, and ammophos 200 kg/ha was applied to the soil before sowing the seeds.

Chinese leafy cabbage was widely cultivated in East Asian countries from the 5 th to 6 th centuries. Chinese leafy starch was also widely used in ancient Chinese medicine to treat insomnia, headaches and nervous disorders because of its richness in group C, A, V vitamins, potassium, calcium, magnesium and other nutrients.

And for our republic, Chinese leafy cabbage is a non-traditional vegetable. Chinese cabbage is an annual plant and is eaten fresh, stewed, fried and boiled.

During 2015-2021, we studied the agrobiological characteristics of 7 varieties of Chinese cabbage samples in the climatic conditions of our republic and selected varieties and samples suitable for our local conditions. As the studied varieties and samples of Chinese cabbage we used "Beauty of the East" variety zoned in our republic.

Seeds were sown in 50-cm rows, the distance between the plants was 10 cm. Experimental area was 3,5 m^2, 70 plants were planted on it. Biomass analyses were carried out on 10 plants of each variety. Fertilization of Chinese cabbage varieties and samples before sowing the seeds in the open ground was determined under laboratory conditions in special thermostats at +20 ^{0}C. Seed germination of all tested varieties and samples of Chinese cabbage was 95-97%. Seeds were sown in the first decade of March.

Germination of 10% of Chinese cabbage seeds of the variety Beauty of the East (st) was recorded when seeds were sown in sung in 5 days, while in the varieties Vesnyanka, kvi 047250, Kholodok F_1 and Beauty of the East 75% of seeds germinated in 7 days, while in the varieties 10% of seeds were observed on the 4 th day, when the seeds were Dove, on the contrary, 1-2 days later compared to other varieties and specimens, that is, the germination of 10% of the seeds sug planted 6 days later, while the germination of 75% of seeds was recorded at 8 days, while in the varieties Vitavir and Venchik, the process occurred at the same time.

In April, it was observed that air temperature averaged 18 ^{0}C and humidity was 55-0%, creating favorable conditions for rapid growth and development of Chinese cabbage. During the growing season, the effect of diseases and pests in the experimental field was not recorded.

The growth period of the template variety Oriental guzali averaged 45-50 days, the number of leaves was 7 pieces, and the height of the plant was 30 cm. Of the studied varieties and specimens of Chinese cabbage, Vesnyanka variety is the earliest, ripening in the last 32-35 days after seed germination. In the Vesnyanka variety, it was noted that although the number of leaves is 8, the height of the plant is 21 cm, the average weight per plant is 150 grams. Although this variety matures 13-15 days earlier than the template variety, Vitavir was found to be 5 days earlier, kvi 047250 and Goluba varieties 3 days earlier, and the beauty of the East variety 2 days earlier. Of the samples studied, it was observed that hybrids of variety "Corolla" and "Cholodok F_1" ripened 5 days later compared to the template variety "Beauty of the East" (Table 1).

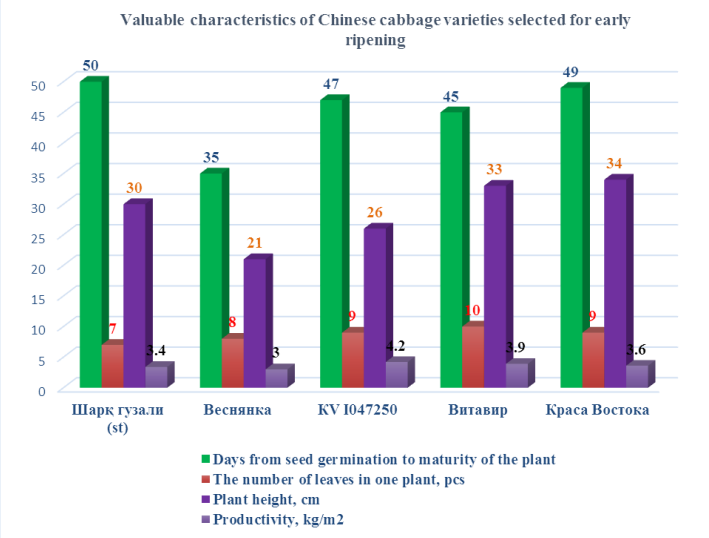
Varieties Vesnianka, Beauty of the East and Vitavir were selected according to the sign of early maturity. Variety Vesnyanka average number of leaves 8, the average height of the plant 21 cm, the average weight of a plant of 150 grams, and the variety Vitavir number of leaves 10, the average height of the plant 33 cm, and the average weight of a plant 195 grams.

Table 1 Value and economic characteristics of Chinese cabbage varieties and specimens

№	Type and samples	Germination of seeds after sowing, days		Days from seed germination to plant maturity	Number of leaves per plant, pcs.	Plant height, cm	Average weight per plant, cm	Yield, kg/m2
		10%	75%					
1	The Beauty of the East (st)	5	7	45-50	7	30	170	3,4
2	Vesnyanka	4	6	32-35	8	21	150	3,0
3	KV I047250	4	6	45-47	9	26	210	4,2
4	Vitavir	5	7	40-45	10	33	195	3,9
5	Goluba	6	8	45-47	9	34	180	3,6
6	Corolla	5	7	50-52	9	35	205	4,1
7	Kholodok F_1	4	6	54-55	10	28	215	4,3
8	The Beauty of the East	4	6	43-49	9	34	180	3,6

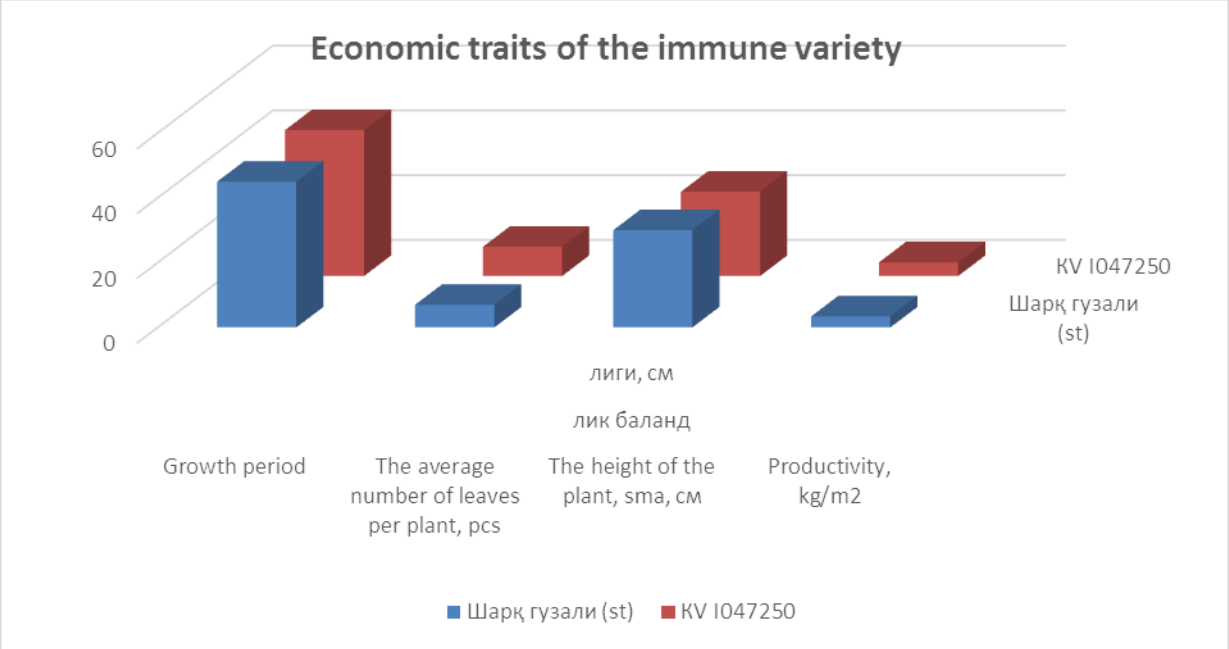
Even in the variety "Beauty of the East" the average number of leaves in one inflorescence is 9, the height of the plant is 34 cm. The growth period was 43 days (diagram 1).

Diagram 1



It was noted that the yield per plant (with the exception of the variety Vesnyanka) in varieties selected on the basis of early maturity, by 10-15 grams higher than in the template variety.

Of the studied varieties and specimens of Chinese cabbage by yield characteristics were selected hybrids KVI 047250 (4,2 kg/m^2), Venchik (4,1 kg/m^2) and Kholodok (4,3 kg/m^2). While the yield of this variety and samples averaged 4,1-4,3 kilograms per m^2 area, this was found to be 3,4 kilograms per type variety. From the varieties and specimens of Chinese cabbage by complex traits, the sample KV I047250 was selected, and during 2016-2018 breeding work was continued, and on the basis of individual selection the variety of Chinese cabbage "Immunity" was created.



Let us dwell on the economic characteristics of this sample (Figure 2).

The growing season of the variety "Immunity" was the same 45 days as in the variety " Beauty of the East ", and the number of leaves per plant was 7 units in the variety " Beauty of the East " and 9 units in the variety "Immunity". Yield per crop in " Beauty of the East " variety was 170 grams, and in "Immunity" variety this indicator was equal to 210 grams, and the average yield was 123% higher than in the pattern.

Leaf blade of the variety "Immunet" is green, the number of leaves is medium (7-8), the shape of the leaf plate is wide, inverted-ovate, the surface is slightly concave, the edge of the leaf is pointed. wavy, veining is weakly perianth, medium density. The shape of the cauline is oval, the length of the cauline is medium, the leaf surface is large, the shape of the cross-section is rounded, the porosity is medium

Conclusion:

1. As a result of a three-year study of collection samples of Chinese cabbage on early-ripening traits, 3 varieties, including Vesnyanka, Beauty of the East and Vitavir were identified. It was found that Vesnyanka variety, Vitavir variety 5 days earlier, and Beauty of the East variety 2 days earlier compared to the sample of Beauty of the East variety.
2. Among the studied varieties and specimens of Chinese cabbage by yield characteristics, the sample Kvi 047250, the variety Wencik and hybrid cholodok were selected. This variety and samples were found to have high yields from 1 m^2 area to 0,7-0,9 kelograms per 1 m^2 compared to the template variety, averaging 4,1-4,3 kelograms per 1 m^2 area.
3. From the varieties and specimens of Chinese cabbage on the basis of complex traits selected sample KVI 047250, and during 2016-2018 breeding work continued, and on the basis of individual selection created variety of Chinese cabbage "Immunet" .

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