

Article

Economic Efficiency of Cultivating the 'Yog'Du' Variety of Rarely Distributed Peking Cabbage Belonging to the Brassicaceae Family

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Abstract: The article highlights the economic efficiency of cultivating the new "Yog'du" variety of Peking cabbage. The efficiency of growing Peking cabbage in open fields and protected cultivation areas under early and mid-season planting dates was determined, including net profit and profitability indicators.

Keywords: Economic Efficiency, Unforeseen Costs, Total Production Cost, Total Expenses, Net Profit, Cost of Production, Profitability, Yield.

Introduction

Peking cabbage (*Brassica rapa* subsp. *pekinensis* L.) is considered a distinct and independent species belonging to the Brassicaceae family. It is an annual plant originating from East Asian countries such as China, Japan, and Korea [1].

However, in recent years, market demand for this crop has been increasing steadily. This is due to its high nutritional value, dietary suitability, and medicinal properties [2].

The main portion of Peking cabbage consists of water (94%). Per 100 g of fresh weight, it contains 75–80 mg% of vitamin C, vitamin B6 – 11.6%, vitamin B9 – 19.8%, vitamin K – 35.8%, vitamin A – 1.8%, vitamin B1 – 2.7%, vitamin B2 – 2.8%, and vitamin PP – 2.0%, which makes it a valuable product for healthy and balanced nutrition [3].

Another important advantage for the population of our country is that it is a rich source of carotene.

Peking cabbage is an early-maturing crop. After seed germination, its leaves can be consumed within 20–45 days, and the cabbage head can be harvested within 50–80 days.

From emergence to technical maturity, Peking cabbage has a growing period of 70–110 days, and 130–150 days until seed maturity [4].

In agriculture, any newly developed variety will not be adopted for production if it does not demonstrate high efficiency in farms and household plots. Taking this into account, among the studied

varieties of Peking cabbage, we determined the economic efficiency of the “Yog’du” variety, which possesses valuable agronomic traits and has been included in the State Register [5].

Materials and Methods

Field experiments were conducted based on the methodologies outlined in «Методика Государственного сортоиспытания сельскохозяйственных культур» (Moscow, 1975), «Изучение и поддержание мировой коллекции капусты» (VIR, 1988), and the methodological manuals «Sabzavotchilik, polizchilik va kartoshkachilikda tajribalar o’tkazish metodikasi» by B.J. Azimov and B.B. Azimov.

The experiments were carried out at the educational and experimental field of the Agricultural Information and Advisory Center (Extension Center) affiliated with Tashkent State Agrarian University [6].

Result and discussion

During the study, 0.5 kg of seeds per hectare were used for seedling production. In seedling cultivation, the cost of each seedling amounted to 200 Uzbek soums, and the total cost for preparing seedlings for one hectare was 7,000 thousand soums. Production costs for agricultural products are determined based on the technological map. To cultivate cabbage on one hectare of land, 312 liters of fuel and lubricants (F&L) were consumed, resulting in total expenses of 3,432 thousand soums [7].

For the fertilization of Peking cabbage, an average of 150 kg of nitrogen, 150 kg of phosphorus, and 100 kg of potassium fertilizers (in pure nutrient form) were applied per hectare. The cost of mineral fertilizers amounted to 2,400 thousand soums per hectare.

In the cultivation of Peking cabbage, various agrotechnical measures were carried out, including six irrigations (total irrigation cost: 1,800 thousand soums), four inter-row cultivations (total cost: 1,600 thousand soums), two hoeing operations (total cost: 1,000 thousand soums), and two insect control treatments (total cost: 600 thousand soums) [8].

Table 1. Economic Efficiency of Cultivating the New “Yog’du” Variety of Peking Cabbage, thousand soums/ha (2024–2025).

Indicators	Xibinskaya, St.	Yog’du
Costs of cultivation technologies (seeds, seedlings, fuel & lubricants, fertilizers)	17832	17832
Harvesting and transportation expenses	7680	22 000
Total expenses	25512	39 832
Unforeseen expenses, 15%	3826	5974
All expenses	29338	45806
Total production overheads, 5%	1466	2290
All Unforeseen costs	30804	48096
Markup expenses, 25%	7701	12024
Total costs	38505	60120
Yield, t/ha	38,4	110
Gross revenue (1 kg = 1,500 soums)	57600	165000

Net profit	19095	104880
Cost price per ton of product	1000	546
Profitability level, %	49,5	174

The costs for Peking cabbage cultivation technologies—including seeds, seedlings, fuel and lubricants (F&L), and fertilizers—amounted to 17,832 thousand soums. The expenses for harvesting one ton of yield were 100 thousand soums, while the costs for harvesting and transportation ranged from 7,680 to 22,000 thousand soums [9].

For total expenses including cultivation technologies, harvesting, and transportation, the “Xibinskaya” variety amounted to 25,512 thousand soums, whereas the “Yog’du” variety reached 39,832 thousand soums, which is 36.0% higher compared to the standard “Xibinskaya” variety [10].

When the costs of Peking cabbage cultivation technologies (seeds, seedlings, fuel and lubricants, fertilizers), additional unforeseen labor costs during harvesting (15%), total production overheads (5%), and markup expenses (25%) were included, the total expenses for the standard “Xibinskaya” variety amounted to 38,505 thousand soums. For the new “Yog’du” variety, this figure reached 60,120 thousand soums, which is 21,615 thousand soums higher.

The yield obtained per hectare for the standard “Xibinskaya” variety was 38.4 t/ha, while the “Yog’du” variety was 65% higher compared to it [11].

The cost of 1 kg of cultivated Peking cabbage was 1,500 soums (2023). By multiplying the yield by this price, the total value of the harvest was calculated. For the standard “Xibinskaya” variety, it amounted to 57,600 thousand soums, while for the new “Yog’du” variety, it ranged around 165,000 thousand soums [12].

To determine the net profit, total costs were subtracted from the total value of the harvest. For the standard “Xibinskaya” variety, the net profit was 19,095 thousand soums. Compared to this, the net profit from the new “Yog’du” variety was 81.8% higher [13].

To calculate the cost price per ton of product, the total expenses were divided by the yield. As the yield per hectare increased, the cost price of the product decreased [14].

To determine the profitability level, the net profit was divided by the total expenses, and the resulting figure was multiplied by 100. Its value also depended on the achieved yield.

For the standard “Xibinskaya” variety, the profitability level was 49.5%, while for the new “Yog’du” variety, it ranged around 174% [15].

Conclusion

1. The net profit for the standard “Xibinskaya” variety was 19,095 thousand soums, while the net profit from the new “Yog’du” variety was 81.8% higher.
2. The economic efficiency of cultivation was demonstrated for all varieties. For the standard “Xibinskaya” variety, profitability was 49.5%, whereas for the new “Yog’du” variety, the profitability level reached 174%.

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