

Research Article

Economic Effectiveness Assessment of Vegetable Bean Cultivation Using Various Methods: Seedling, Temporary Shelters, Open Ground

Nina Grigorievna Kazydub^{1,*}, Margarita Mikhailovna Korobeinikova²
and Marina Andreevna Kopylova³

¹Omsk State Agrarian University named after P.A. Stolypin (FSBEI HE Omsk SAU),
8-Institutskaya pl., 1644008, Omsk, Russia, E-mail: ng-kazydub@yandex.ru

²Omsk State Agrarian University named after P.A. Stolypin (FSBEI HE Omsk SAU),
8-Institutskaya pl., 1644008, Omsk, Russia, E-mail: rita.korobeinikova@mail.ru

³Omsk State Agrarian University named after P.A. Stolypin (FSBEI HE Omsk SAU),
8-Institutskaya pl., 1644008, Omsk, Russia, E-mail: marishka_ka@bk.ru

*Correspondence: ng-kazydub@yandex.ru

ABSTRACT:

In this article we address competitiveness problems of vegetable bean cultivation in the Siberian region. Economic feasibility was identified and justified of growing it in different ways to create a green conveyor. Based on the study the authors suggest a variety of vegetable beans with high profitability to create a green conveyor.

Keywords: vegetable bean, green beans, economic effectiveness, profitability, net cost, temporary shelters, seedlings, open ground, net income

INTRODUCTION

In the conditions of market relations development the role of scientific research grows, that are connected with the problem of effectiveness improvement of the national breeding and seed production of vegetable crops. Profitability of agricultural production is relevant to the population of Russia. Government support, WTO (World Trade Organization) conditions causes the best conditions for integrated production, where the components are the following: farmland, crops, livestock and final consumer. It is important to note that under new economic conditions in every shared and peasant farming the attitude to technology of culture cultivation will change significantly, as well as caring for crops during the vegetation period, harvesting, transportation, storage and sale of crop. Any technological method will be evaluated strictly by the incurred expenses: the cost of seeds, fuel, pesticides, etc. Effectiveness of crop production also directly depends on crop selection, its variety, and

production technology. Under the conditions of southern forest-steppe of Western Siberia the production increase of legumes will not only improve soil fertility, but at the same time improve the effectiveness of the entire agriculture integrated production.

Beans are a valuable product, which has all the necessary substances for normal human nutrition. Green beans have excellent taste. In cooking it is used in soups, sauces, cold dishes with spices, special dishes from immature beans and immature seeds. Beans are used for preparing drugs for blood disease treatment, as well as in folk medicine. In Russia vegetable beans are cultivated on small areas mainly in the private sector. The difficulty of crops cultivation is mainly because of the large proportion of manual labor, as well as the lack of varieties adapted to a particular climate zone. From 7 August 2014 Russia imposed an embargo on a variety of food, including beans. This seriously affects the market of both fresh

and canned vegetables, as the main part of the demand in the Russian market has been provided by imported goods. For example, according to preliminary estimates, in 2013 has been imported more than 240 000 tons of products, which is about 81% of the Russian market (including potatoes and frozen cooked vegetables). It is expected that import substitution process will take 3-4 years. Today it is important to solve the problem of obtaining early fresh products (green beans, vegetable beans) for canning industry and the population (Kazydub N. G., Kopylova M. A. (2015).

In this context it becomes relevant to conduct a comprehensive study of the best domestic and foreign varieties, identification of agronomic valuable feature sources, as well as the search of the most effective ways of selling adaptive and bioenergy crops potential (Kazydub N. G., 2015)

Purpose of the study:

provide an economic assessment of vegetable bean cultivation by different ways of cultivation to create a green conveyor of production delivery for the Siberian region population.

MATERIAL AND METHODS OF THE STUDY

The experimental part was carried out on the experimental field at the laboratory of field crops breeding and seed production, Agriculture technology faculty of Omsk State Agrarian University in 2006-2014 years.

During the research, the object of study has been vegetable bean samples that have been grown in different ways to get an early harvest, as well as to create conveyor production. These are the early-ripening varieties: Sekunda (Second) (st), Ryzhaya (Redhead), MaxiohneFaden; mid-ripening group: Zolushka (Cinderella) (st), Marion, Primel.

Seeds have been sown in four replications. The collection of green beans was carried out manually, 10 plants/1 m² from each replication in the phase of technical maturity, when the seed has reached the size of a wheat grain [Methodology of State crops testing, 1985; Guidelines for vegetables testing, 2006]. To assess the economic effectiveness of vegetable bean cultivation by different ways we have

chosen Primel variety, which was selected because of producing power, economically valuable features and quality of green beans.

RESULTS OF THE STUDY AND DISCUSSION

The main product of vegetable bean (asparagus) is the green beans. It was imported in frozen form to Russia from Poland. Because of the systematic changes in prices for vegetable raw materials, it is not possible, using modern economic methods, to provide an objective assessment of cultivation effectiveness of crops, the use of a specific technological method. To raise the production of vegetable beans it is important to highlight the fundamental elements: breeding and seed production of this crop, production and processing. The elements are combined, first of all, by the general technological scheme of the qualitative characteristics implementation of various bean samples with respect to target utilization and high economic effect (Kazydub N. G., 2013)

To evaluate the economic performance of the enterprise we use such indicators as the net cost of production, profitability and labor costs. To assess the effectiveness and economic feasibility of the company activity it is not enough to determine just the absolute performance indicators. A more objective view can be obtained by using profitability indicators. Cost of production, as well as its net cost, are related categories, as they are based on the labor expended on the production. The *net cost* is the monetary value of costs spent by a company on the means of production and salary. Economic effectiveness of agricultural production is characterized by *profitability* - it is an economic category, which means the profitability of a company or an industry as a whole (Kopylova M. A., Kazydub N. G. (2015)

The calculations were based on the factual prices of the production means and products established in 2014. Economic effectiveness improvement of crop cultivation industry is one of the most important problems of agriculture. To a great extent, this problem is currently solved by the introduction of new highly productive varieties resistant to pests and

diseases, adapted to climate zones and suitable for mechanized cultivation.

To calculate the economic effectiveness of vegetable bean cultivation we have used different ways of cultivation: seedling,

temporary shelters, open ground, and the Primel variety selected based on complex economic characteristics. The economic effectiveness calculation results are presented in table 1.

Table 1 -Economic effectiveness calculation of vegetable bean cultivation arrangements, 2014 (Primel variety)

Indicator	Technological methods		
	Open ground (monitoring)	Seedling	Temporary shelters
Productivity, tn/ha	10.2	11.0	12.6
Material and financial costs per 1 ha, thousand rub.	131.2	201.9	159.9
Net cost per 1 tn/thousand rub.	10.8	15.5	11.8
Selling price of 1 tn, thousand rub.	29.0	44.0	36.0
Products cost, thousand rub./tn	353.8	572.0	489.6
Net income, thousand rub.	222.7	370.1	329.7
Profitability rate, %	159.8	173.2	196.2

The selling price of vegetable bean is affected by product delivery time. Thus, when cultivated by the seedling method or by using temporary shelters, the first beans gathering takes place in June, at this time it is most competitive, so its price increases. The net cost of one ton of Primel variety green beans ranged from 10.8 to 15.5 thousand rubles/tn. In the net cost structure the main costs are the following: the cost of seeds, herbicides, as well as depreciation costs, maintenance and lubricants.

Net income from Primel variety production increased up to 370.1 thousand rubles, cultivated by the seedling method. The results of the study suggest that cultivating beans in southern forest-steppe of Western Siberia is profitable. Its profitability rate is from 159.8 to 196.2% depending on the cultivation method.

CONCLUSIONS

The cultivation of vegetable bean in the Omsk region is possible, profitable and cost-effective when done by open ground method, using the covering material, as well as by the seedling method. Applying the seedling method to vegetable bean allows to accelerate the time of plants fruiting, increase the productivity of varieties with a long vegetation period, reduce the seeds consumption. Large production volume of seedlings allows applying industrial technology that provides guaranteed quality of seedlings for the lowest labor cost and resources. Profitability indicator is directly connected to the size of net income, which pays

off all costs allocated to the crops cultivation. Since in this case all production is sold, sales volume depends on the productivity.

For bean cultivation in the conditions of southern forest-steppe of Western Siberia in the private sector, Primel variety can be recommended to agricultural enterprises, since it has a bush form, high productivity, suitable for canning and freezing, has high bean attachment, which makes it possible to use mechanized harvest.

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