

# Range of goods in framework of agricultural enterprise management

*Nikolay Sergeevich Bondarev, and Galina Sergeevna Bondareva*

Kuzbass State Agricultural Academy, Markovtseva st., 5, 650056 Kemerovo, Russia

**Abstract.** The study of the product range of the enterprise, in particular, the agricultural ones, is one of the priority areas. Maintaining a stable demand for reduced goods is an obligatory condition for strategizing activities, a guarantee of development. The presented research reflects the theoretical foundations of enterprise management, in terms of building a strategy; the assortment features for both commodity and trade ones are disclosed; the authors highlighted the specifics of agricultural production through strategic management and its goal setting. In the main part of the work, there is a block focused on the study of the assortment within the framework of the agricultural enterprise management, based on the product range optimization. This is supported by the conclusions that this approach is a source of diversification of an agricultural enterprise production activity and takes into account both the existing market needs and the capabilities of the enterprise itself when creating the necessary conditions for its development, ensuring competitiveness not only in local markets, but also includes a possibility to expand its market zone. The assortment of goods was studied in a separate block on the example of a specific agricultural enterprise - the greenhouse complex JSC "Sukhovskiy", a member of the Siberian agricultural complex of the brand "Em Rodnoe". The assessment of the main economic indicators of the activities of JSC "Sukhovskiy" was carried out. For the purpose of practical testing of the developed directions of strategizing the product range of JSC "Sukhovskiy", there was proposed a variant of its expansion by introducing roses into the "line" of production as the most popular and demanded flowers in high demand among the population. In addition, the agrotechnology of this production in the conditions of a greenhouse economy is shown, possible sales channels for finished products are proposed, the costs of the "rose" assortment line are structured and the predicted economic effect from the implementation of the proposed measures is calculated.

## 1 Introduction

Greenhouse activity is one of the most labor-intensive branches of agricultural production. Despite the difficulties and the presence of a number of specific features, the presence of increased demand stimulates agricultural enterprises to develop in this area [1; 9].

The process of implementing measures for development and improving the assortment strategy is aimed at the creation and implementation of new business solutions and technologies [14].

Within the framework of the study, it is proposed to apply the accumulated experience in the development of the greenhouse business based on the expansion of its assortment positions in the management system of a specific agricultural enterprise.

The object of research is the production activities of JSC "Sukhovskiy".

The subject of the research is management and technological processes and decisions in the field of production strategy.

Expected results:

1. Creation of highly competitive production;
2. Meeting the needs of population;
3. Increasing the range of products.

## **2 Research methods**

In this aspect of the study, strategic management is methodically investigated on the basis of the goal-setting processes, organic nature of resources, processes sequence, consistency of decisions and approaches, adequacy of management actions in the current situation and inherent capabilities. System management decisions can acquire their functionality only in the case of building a rational planning vector in the context of optimality of business processes [15]. The fundamental principle is the action "from the future to the present", and not "from the past to the future."

In this aspect of the study, strategic management is methodically investigated on the basis of goal-setting, the organic nature of resources, the sequence of processes, the consistency of decisions, the consistency of approaches and the adequacy of management actions in the current situation and inherent capabilities. System management decisions will acquire their functionality only in the case of building a rational planning vector in the optimality conditions of business processes [15]. The fundamental principle is the action "from the future to the present", and not "from the past to the future."

On a strategic basis, the elements of assortment management in an agricultural enterprise are investigated:

1. Setting the goal of assortment management;
2. Study of the environment for an agricultural enterprise functioning (external and internal). It should be determined assortment program in relation to the target segment and competitive environment based on the selection of potential competitors;
3. Development of a commodity strategy and the formation of a production program for an agricultural enterprise;
4. Formation of a product offer and subsequent entry into the local market;
5. Evaluation of the results of the selected assortment strategy implementation.

## **3 Data and primary analysis**

### **3.1 Strategic enterprise management**

External environment affects activities of an enterprise, incl. agricultural, significant impact and subject to constant change. The ongoing economic, political, social processes, and in the current period epidemiological one, as a result of the global pandemic COVID-19, require constant adaptation of business to building flexible management systems ready for these changes. All these conditions for the dynamism of processes, the increase in their

complexity, transformation, proceeding often unpredictably, indicate the importance of identifying the existing patterns in retrospect and, therefore, building a model of the behavior of an economic entity at the current moment and a business strategy for the future.

So, strategic management is interpreted as a modern view of organization of the enterprise management system, aimed at developing strategic decisions in order to strengthen competitive positions, team building, providing admissibly possible management tools for the implementation of the desired strategic positions and their transformation and current production and economic plans.

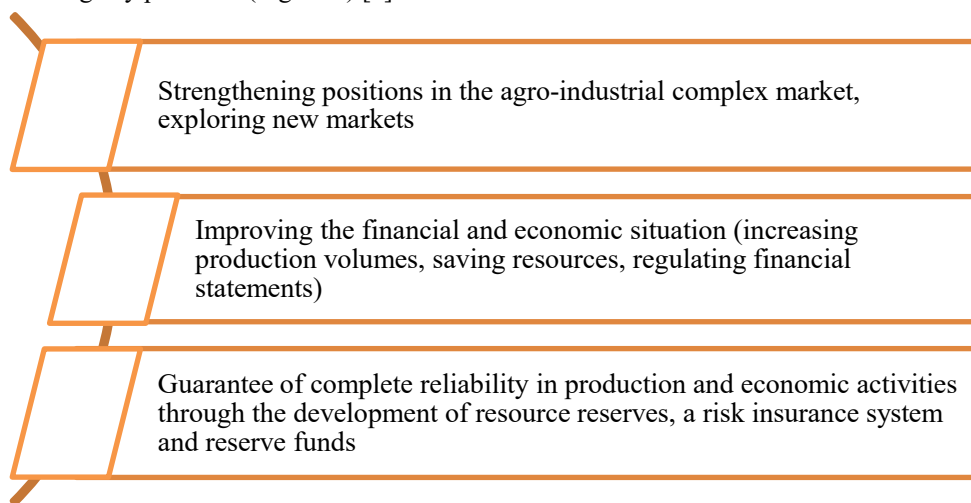
Approaches to strategizing the production activities of an enterprise imply the development of an appropriate methodology and methodology for its implementation in the face of constant transformation of the external environment, the resource capabilities of the internal environment, the existing resource potential.

Changing conditions of the external environment and lack of readiness for these changes in the internal environment form together quite specific realities of the business environment. Its functioning is carried out in conditions of uncertainty, which accordingly affects business processes in the real sector of the economy, not so much on their perception, but on their uncontrollability.

The evolution of the "strategic management" concept comes from the 60s-70s of the twentieth century, the need for which arose because of the need to "reflect the difference between management carried out at the highest level and current management at the production level. The need to make this distinction was driven primarily by changes in the business environment. As the leading idea, reflecting the essence of the transition to strategic management from operational management, was the idea of the need to transfer the focus of senior management to the environment in order to respond appropriately and in a timely manner to the changes taking place in it, to respond in a timely manner to the challenge posed by the external environment" [2].

At the moment, the scientific literature presents a fairly significant number of scientific views, practical opinions regarding the interpretation of the concept of "strategic management", the content of which comes from various organizational aspects of the management process, its complexity and versatility.

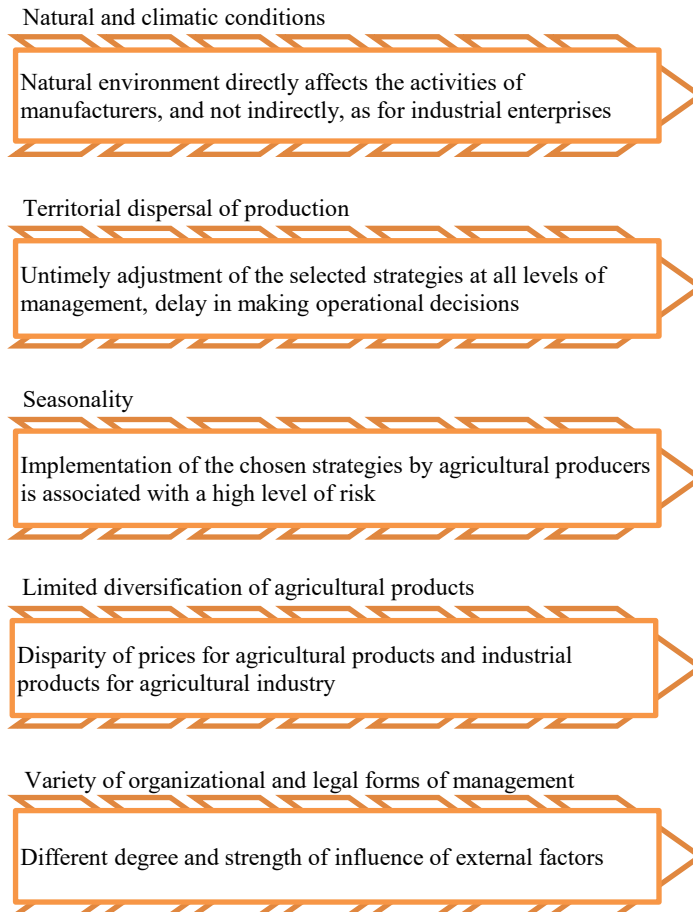
The goal-setting of the management strategy of an agricultural enterprise is based on building key positions (Figure 1) [8].



**Fig. 1.** Key positions for formation of the management strategy of an agricultural enterprise

The pointed key positions inherently reflect all organizational aspects of an agricultural enterprise with an emphasis on production activities as the most significant. Any enterprise, first of all, is a production system, the activity of which is aimed at the implementation of the main function - production.

In the process of the enterprise's functional activity, it is influenced by various factors, which significantly affects the approach to strategic management. It should be noted that agriculture is characterized by quite specific impact factors that are not inherent in other industries. Figure 2 clearly shows the factors influencing the organizational activity of an agricultural enterprise from the standpoint of strategic management [4].



**Fig. 2.** Factors affecting organizational activities of an agricultural enterprise from the strategic management standpoint

### 3.2 Assortment within the framework of agricultural enterprise management

By origin (from French), "assortment" means "selection of products of various classes and designs" and means "a list of goods or services offered by the organization to meet specific human needs"; "a set or list of goods by type, name, purpose, grade and type of raw material used" [7]; "an element that connects the enterprise and the market, acting as an object of economic exchange and a means of satisfying existing needs" [5], etc.

This list of interpretations of interpretations of the term can be expanded and expanded, but it becomes clear that it is a certain species diversity that is common: a list, a list, a variety, the name of goods (works, services).

Thus, considering the assortment, a new category "product assortment" appears, which, without losing its classification features, is also endowed with production (industrial and commercial) ones.

In the first case, it is the sectoral affiliation of the produced goods' assortment or the sectoral affiliation of the enterprise that produces the given assortment of goods. In the second case, the emphasis is placed on a certain set of the commodity list, which is presented in wholesale or retail trade enterprises, i.e. in retail or wholesale trade networks, centralized places of sale of products, spontaneous markets. A feature of the organization of the trade assortment is the inclusion in its classification of the territory of production of products - a domestic product or a product of foreign production. In this connection, it can be argued about a greater species diversity of the trade assortment, in comparison with the industrial assortment.

It should be noted that the assortment management strategy in agricultural enterprises is based on optimizing the product assortment, since this direction is a source of diversification of production activities. Thus, it is necessary to take into account that the assortment management strategy should take into account both the needs of the market and the needs of the enterprise itself in creating conditions for creating development potential and ensuring its competitiveness. The complete interdependence of these processes should be provided.

In this connection, when forming an assortment strategy, it is necessary to take into account the fact that a commodity producer in the process of his production activity must operate precisely with the needs of the market and the prevailing market situation, and his product and trade assortment must satisfy market needs, both in quality and quantity.

Thus, "the private goals of assortment management are achieved by developing and implementing a set of measures for the assortment strategy, which gives an idea of what the main stages of achieving goals are, and how the existing financial, material and labor resources of the enterprise should be used for this" [6].

### **3.3 Study of the product range of JSC "Sukhovskiy"**

JSC "Sukhovskiy" is the largest supplier of green crops and fresh vegetables of its own production in the Kemerovo region. The area of the greenhouse complex is 60,000 m<sup>2</sup>. More than 300 million rubles were invested in fixed assets; more than 250 million were invested in current assets; 381 thousand rubles - authorized capital; about 400 million rubles - long-term loans that went to modernize the complex; about 400 million rubles - annual revenue; 31 million rubles - net assets; about 30 million rubles - annual profit from sales (but even this does not allow reaching a net profit - since the previously received losses are repaid, according to the dynamics - in 3 years the first net profit will be received) [3].

According to the official website of the greenhouse complex of JSC "Sukhovskiy", the history of which is almost 34 years old (date of creation: July 27, 1987), began with the production of cucumbers and tomatoes. A modern greenhouse complex also has the opportunity to offer the consumer more than a dozen types of greens - from dill with parsley to selected types of lettuce, as well as eggplants grown in their own greenhouses (with the mastered available resources and growing technologies, these products are excluded from the product range) [3].

The main economic indicators of JSC "Sukhovskiy" are presented in table 1.

**Table 1.** Dynamics of the main economic indicators of JSC "Sukhovskiy" for 2017-2019

Indicator	Unit of measurement	2017 г.	2018 г.	2019 г.
Area of the complex	Ths. m <sup>2</sup>	60		
Yield	t/m <sup>2</sup>	0,095	0,094	0,95
Gross production	t	5700	5640	5694
Average number of employees	people	229	223	225
Average monthly salary of 1 production worker	ths. rub.	28,8	27,7	28,2
Revenue	ths. rub.	439204	383151	374 796
Cost price	ths. rub.	391904	332604	335 937
Gross profit from sales	ths. rub.	47300	50547	38 859
Product profitability	%	12	15,2	11,6
Profit margin	%	2,5	4,2	1,4

In modern conditions of the development of greenhouse vegetable growing, detailed methodological recommendations have been developed that help to choose which products to grow, both in terms of yield and in terms of economic feasibility for sale at one time or another of the year in conditions of greenhouse farms for areas that have their own specific features for conducting agricultural activities [10; 11]. The correct selection of high-yielding and unpretentious varieties serves as the basis for the rational management of greenhouse vegetable growing, and also contributes to maintaining a competitive position in the current market environment.

In the conditions of modernization of the existing equipment of the greenhouse economy, active work is being carried out to improve agricultural technologies [12; 17]. For example, practical approaches to pest control are being developed aimed at increasing the yield of crops grown, incl. due to the quality of the produced product range [16].

In modern conditions, hybrids of domestic and foreign selection are cultivated at JSC "Sukhovskiy". The species composition of the produced product range and a description of its nutritional value are reflected in table 2 [3]:

**Table 2.** Product range of JSC "Sukhovskiy"

Name	Nutritional value per 100g of product (average values)
Basil (green)	Proteins - 2.5g; fats - 0.5g; carbohydrates - 2g; calorie content - 25 kcal/100kJ.
Melissa	Proteins - 2.5g; fats - 0.5g; carbohydrates - 2g; calorie content - 25 kcal/100kJ.
Cucumber	Proteins - 0.5g; fats - 0.1g; carbohydrates - 3.5g; calorie content - 15 kcal/70kJ.
Spring onion	Proteins - 1.5g; fats - 0.1g; carbohydrates - 3g; calorie content - 20 kcal/80kJ.
Sorrel	Proteins - 1.5g; fats - 0.3g; carbohydrates - 3g; calorie content - 20 kcal/85kJ.
Salanova salad	Proteins - 1.5g; fats - 0.2g; carbohydrates - 2g; calorie content - 15 kcal/65kJ.
Arugula salad	Proteins - 2.5g; fats - 0.5g; carbohydrates - 2g; calorie content - 25 kcal/100kJ.
Cilantro	Proteins - 2g; fats - 0.5g; carbohydrates - 3.5g; calorie content - 25 kcal/110kJ.
Dill	Proteins - 2.5g; fats - 0.5g; carbohydrates - 6.5g; calorie content - 40 kcal/170kJ.
Celery	Proteins - 1g; fats - 0.1g; carbohydrates - 2g; calorie content - 15 kcal/55kJ.

**Table 2.** Continued

Romaine lettuce	Proteins – 1g; fats – 0.3g; carbohydrates – 3.5g; calorie content – 20 kcal/90kJ.
Oak leaf salad	Proteins – 1.5g; fats – 0.3g; carbohydrates – 1.5g; calorie content – 15 kcal/60kJ.
Parsley	Proteins – 4g; fats – 0.4g; carbohydrates – 7.5g; calorie content – 50 kcal/210kJ.
Mint	Proteins – 4g; fats – 1g; carbohydrates – 7g; calorie content – 70 kcal/290kJ.
Purple Basil	Proteins – 3g; fats – 0.6g; carbohydrates – 2.5g; calorie content – 30 kcal/125kJ.
Frillice salad	Proteins – 1.5g; fats – 0.2g; carbohydrates – 2g; calorie content – 15 kcal/70kJ.
Afizion salad	Proteins – 1.5g; fats – 0.2g; carbohydrates – 2g; calorie content – 15 kcal/65kJ.
Tomato	Proteins – 0.7g; fats – 0.3g; carbohydrates – 4.3g; calorie content – 20 kcal/100kJ.

Product shelf life: 10 days at temperatures from 3 °C to 6 °C and relative humidity from 90% to 95%. For a fresh cucumber: 15 days at a temperature of 10 °C to 14 °C and a relative humidity of 85% to 90%.

Also JSC "Sukhovskiy" grows a seasonal product - tulips. Seasonally (spring) two varieties have been introduced into the product range: Alcatraz (cooling period: 16 weeks, Triumph group, red color, plant height 40 cm, flowering period IV-V month), Bombita (cooling period: 16 weeks, Triumph group, color red with yellow, plant height 45 cm, flowering period IV-V month, forcing time 20 days).

The product range of the greenhouse complex is only 60% sold within the Kemerovo Region-Kuzbass, and 40% is sold to other regions of the Siberian Federal District.

Gross production of manufactured products at JSC "Sukhovskiy" is distributed in the following proportion: cucumbers 82%; tomatoes 15%; lettuce commodity group and other grown crops 3%.

## 4 Results and discussion

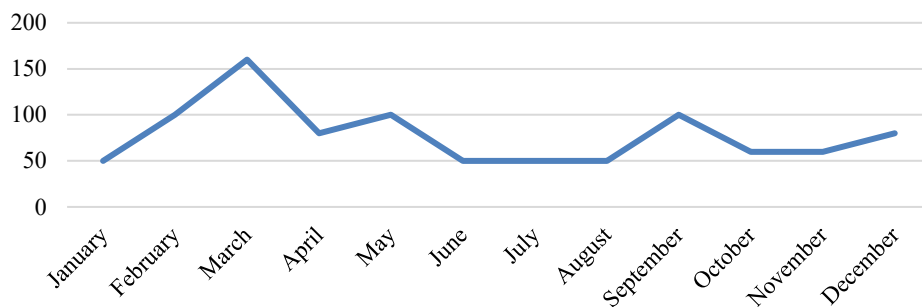
Assortment management of an agricultural enterprise implies the development of a product assortment plan [13]. In this connection, it seems relevant to develop an event aimed at expanding the range of products manufactured by JSC "Sukhovskiy".

Scientific search for various information and research of market analysts indicate that in order to improve the strategy of managing the product range, the most popular and possible direction for expanding commodity positions is the cultivation of flowers, which will significantly expand and diversify the production capabilities of the greenhouse industry.

For Siberia regions, where due to natural and climatic conditions there is an inherent peculiarity of agricultural production (including a low temperature regime in the winter season and a lack of sunlight), the greenhouse business is a rather promising direction of activity.

Expenses on gas and light take a significant share in the cost of flower production, about 60%. Other expenses are overhead costs, salaries, transportation.

To cut costs and be sure of making a profit, you need to be clear about which flowers to grow. It is also necessary to take into account the seasonal demand for this product (Fig. 3).



**Fig. 3.** Annual dynamics of seasonal demand for flowers

To expand the range of products manufactured by JSC "Sukhovskiy", it is proposed to grow roses. Since according to statistics, roses are the most popular and demanded flowers for bouquets and are always in high demand among the population.

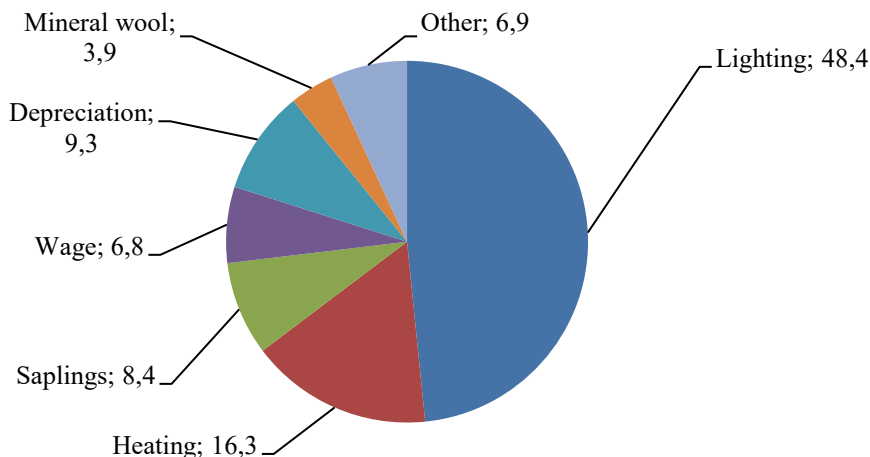
Growing roses in greenhouses includes: *preparing soil for the crop* (humus (20kg), superphosphate (30g) and ammonium sulfate (30g), peat (no more than 10kg) per 1m<sup>2</sup> are added to the soil; the soil can also consist of mullein, peat, peat (1:5:4) with a soil thickness of 80cm; before use, the mixture is kept in a pile for about a year; before planting flowers, meat and bone meal (1kg per 1m<sup>2</sup>) and mineral fertilizers are added). *Preparation of seedlings for planting* (immersion in water for 24 hours; dropping into the ground, leaving the grafting site in the air; correct and regular moistening (at the level of 70%) and spraying with a remedy containing copper from the development of diseases). *Planting roses* (scheme: 30\*30 or 40\*25, or there are no more than 12 units per 1m<sup>2</sup>; good spillage; temperature control - should not exceed 10<sup>0</sup>C before forcing, the optimal temperature to maintain the growth of roses is about 22<sup>0</sup>C, and soil - not less than 12<sup>0</sup>C).

Rhythm of the production process of growing flowers in greenhouse farms depends on a rationally organized process of selling products, its planning and dynamism through organized sales channels, both to local markets and to global ones [18]. Proposed sales channels for finished products from the greenhouse complex of JSC "Sukhovskiy": opening of its own flower shop, point of sale; making contracts with intermediaries; building contractual relationships with firms participating in the local flower market; sale through trade and retail networks; implementation via the Internet, "promoting" through popular social networks.

Forecasted cost of roses for the varieties *Ksenia* and *Proud* proposed for introduction: cost price: 50 rub. and 100 rub., selling price: 80 rub. and 120 rub., economic effect: 30 rub. and 20 rub., respectively.

The forecasted cost structure when expanding the product range of JSC "Sukhovskiy" with the introduction of roses into the "line" is shown in Figure 4.

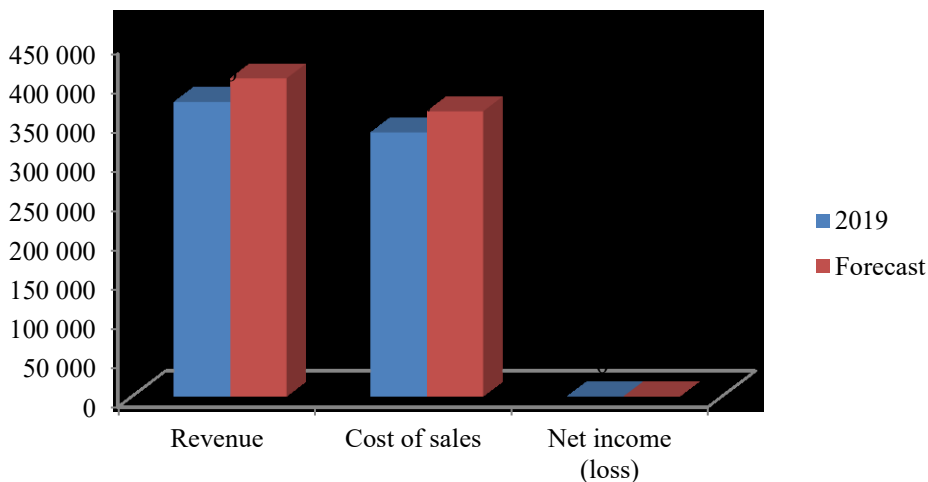




**Fig. 4.** Forecasted cost structure for the assortment line "roses", %

Based on the forecasted cost structure for the “rose” assortment presented in Figure 4, it was determined that the cost element “lighting” (i.e. energy resources) accounts for about 48%, three times lower, but no less significant for the “heating” element – 16.3%. To a lesser extent, costs are represented by the item "mineral wool" - 3.9%.

Figure 5 shows a graphical display of economic prospects for JSC "Sukhovskiy" when expanding the product range.



**Fig. 5.** Forecast economic effect of expanding the product range manufactured at JSC "Sukhovskiy", thousand rubles

## 5 Conclusion

Thus, the adoption of the proposed management decisions in the greenhouse complex of JSC "Sukhovskiy" to expand the range of products due to the new product "rose" will give opportunities to: 1) diversify production; 2) get a significant economic effect; 3) enter new sales markets; 4) increase the awareness of the brand *Em Native*; provide a trade assortment

with a new type of local production (local analogs of an industrial scale are absent in the regional market); receive additional profit in the amount of 168 thousand rubles per year.

## References

1. N.S. Bondarev, G.S. Bondareva, E.E. Khazieva, *Modern S&T Equipments and Problems in Agriculture*, **1-10** (2020)
2. H.O. Gaziev, *Economics*, **2(40)** (2019)
3. EmRodnoe: Official site of the combined agricultural complexes "Yemelyanovskiy" and "Sukhovskiy", <http://emrodnoe.ru/company>
4. E.L. Zolotareva, K.M. Konorev, *Bulletin of the Kursk State Agricultural Academy*, **4** (2010)
5. T.L. Koikova, Yu.A. Kopytina, E.L. Ralnikova, *Concept*, **10** (2017)
6. O.S. Bedskikh, *Comprehensive assortment management in the system of strategic planning of the activity of industrial enterprise structures*, **23** (2008)
7. L.V. Orlenko, *Assortment, merchandizing and examination of fur and fur products*, **272** (2019)
8. L.R. Bilalova, F.N. Mukhametgaliev, *Economy Vector*, **4(22)**, 67 (2018)
9. E. Appolloni, F. Orsini, N. Michelin, A. Pistillo, I. Paucek, G. Pennisi, G. Bazzocchi, G. Gianquinto, *International Society for Horticultural Science*, **1298**, 59-70 (2020)
10. W.A.P. Weerakkody, S.M.M.R. Mawalagedera, *Recent developments in vegetable production technologies in sri lanka* (2020)
11. A. Dudnyk, M. Hachkovska, N. Zaiets, T. Lendiel, I. Yakymenko, *Technology Cente*, **4(2-100)**, 72-78 (2019)
12. M. Eben-Chaime, A. Bechar, A. Baron, *International Journal of Production Economics*, **134(1)**, 246-254 (2011)
13. J.D. Hoskins, *Journal of Retailing and Consumer Services*, **57**, 102234 (2020)
14. A. Timonina-Farkas, A. Katsifou, R.W. Seifert, *European Journal of Operational Research*, **285(3)**, 1058-1076 (2020)
15. Y. Alan, M. Kurtuluş, C. Wang, *Manufacturing and Service Operations Management*, **21(3)**, 620-635 (2019)
16. J. Del Castillo Múnera, B. Belayneh, A. Ritsvey, E.E. Koivunen, J. Lea-Cox, C.L. Swett, *Agricultural Water Management*, **226**, 105737 (2019)
17. P. Diaz, R. Carrera, *IEEE CHILEAN Conference on Electrical, Electronics Engineering, Information and Communication Technologies*, , 8988049 (2019)
18. B.F. Cardoso, E. Giampietri, A. Finco, P.F.A. Shikida, *Agris On-line Papers in Economics and Informatics*, **9(2)**, 23-32 (2017)