UDC 663.34:631.86(477.4)(292.485)
DOI :10.37128/2707-5826-2025-2-9

ECONOMIC EFFICIENCY OF SOYBEAN CULTIVATION WITH INOCULATION AND EXTRA-ROOT NUTRITION IN THE CONDITIONS OF THE RIGHT BANK FOREST STEPPE

A.A. KOROBKO
Postgraduate student of the Department of Plant Science and Horticulture, Vinnytsia National Agrarian University

The article presents the results of studies on the influence of pre-sowing seed treatment and foliar feeding with biological products on the economic efficiency of growing the studied soybean plants of the Samorodok and Amadeus varieties. Our research is carried out at the expense of the state budget fund within the framework of scientific and research work on the topic: «Development of scientific and technological support for increasing soil fertility and rational use of the potential of biological resources» (state registration number: 0124U000444).

The economic efficiency of soybean cultivation was studied with improved elements of cultivation technology, such as pre-sowing seed treatment and foliar feeding with biological products. It was found that when treating seeds before sowing with the bio-inoculant Rizoline + Rizosave and two foliar feedings with microfertilizers Azotofit-r and Organic balance in combination with microelements HelpRost soy and HelpRost boron, the highest conditional net profit was obtained in the Amadeus and Samorodok varieties at the level of 21683 UAH and 18113 UAH, respectively. After calculations, the profitability of the Samorodok variety was 88,2%, which is 35% more than the control variant, and in the Amadeus variety 104.3%, which is 27.7% more than the absolute control, respectively.

Thus, the economic analysis of the research results confirmed the effectiveness of biologization elements in soybean cultivation, and the combination of biological products and microfertilizers of different effects not only increases the level of yield, but also creates a favorable environment in the soil that improves the absorption of nutrients by plants, increases their resistance to diseases and adverse conditions, and also ensures long-term soil fertility and leaves more nitrogen in an easily accessible form for subsequent crops in the crop rotation.

Keywords: *Varieties, sowing date, row spacing, competitiveness, feeding area, productivity, seed treatment, manufacturability, profitability, crop structure.*

Table. 4. Fig. 1. Lit. 12.

Problem statement. Soybean is one of the most valuable crops grown due to its nutritional properties, high yield potential and economic profitability. Among the features of soybean that make it popular in agriculture is its high protein content, which in terms of amino acid composition is close to animal proteins, such as eggs, milk and meat. Many original food, feed and industrial products are made from soybeans. Due to this, soy products are an ideal source of dietary protein that is well absorbed by the body, which allows them to be used not only in nutrition, but also in the production of animal feed. In Ukraine, thanks to the work of breeders, it has been possible to create a large number of high-yielding varieties adapted to local soil and climatic conditions, which are not inferior in quality to foreign varieties and at the same time remain non-genetically modified. This allows us to satisfy domestic demand for high-quality protein and oil, as well as ensure profitable exports.

The correct selection of a soybean variety for specific soil and climatic conditions and the use of modern agrotechnical methods are important for achieving maximum productivity. Therefore, improving the technology of growing the crop in accordance with the conditions of the region, taking into account the selection of high-yielding soybean varieties, seed treatment and foliar feeding with chelate microfertilizers in the conditions of climate change of the Right-Bank Forest-Steppe is an important national economic problem that requires scientific and practical justification.

An important issue remains the improvement of the quality of soils and agricultural products. Due to the irrational use of chemicals in the cultivation of agricultural plants, the number of beneficial soil microorganisms is significantly reduced and pesticides accumulate. Therefore, the problem of growing organic crop products arises. This has a positive effect on the entire agriculture. One of the safe means of protecting and nourishing plants in organic farming is the use of biological products and biofertilizers, namely the cultivation of soybeans with elements of biologization.

Analysis of recent research and publications. The formation of crop productivity, in particular soybeans, really depends on many factors, including both external factors and internal resources of the plant itself. The correct approach to cultivation technology and timely implementation of each agrotechnical measure allow you to maximize the potential of the crop. In particular, pre-sowing treatment of soybean seeds and fertilizing plants with biological products are critical for ensuring optimal development conditions. This helps to increase the yield and resistance of plants, taking into account the specifics of the variety, processing methods and climatic features of the growing region. The widespread belief about the profitability of growing GMO soybeans was based on the simplicity of weed control using herbicides. However, the development of agricultural technologies, in particular the use of soil-based herbicides and crop rotation, allows for effective weed control even when growing traditional soybeans. In addition, the significant increase in the price of glyphosate-based herbicides used to treat GMO soybeans has made its cultivation more expensive. Demand on the world market is also an important factor. European countries, the main importers of Ukrainian soybeans, prefer non-GMO products, which has a positive effect on the price of traditional soybeans. Thus, given the current economic and market conditions, growing certified traditional soybeans is more profitable for Ukrainian farmers. Market analysis shows a significant difference in price between traditional and GMO soybeans. In particular, conventional soybeans can cost 70-230 euros per ton of soybean meal more, which is due to market conditions. Given this price difference, growing conventional certified soybeans is economically more feasible [1].

As of 2021, the total volume of organic products exported from Ukraine to the world is 261,000 tons worth 222 million USD (of which soybeans take 2nd place – 65,000 tons worth 59 million USD). The total volume of exports to the EU countries is 189,200 tons worth 160 million USD (Fig. 1.). The occupation of a significant part of

the southern regions of Ukraine in 2022 led to a reduction in soybean acreage. At the same time, farmers made every effort to restore production in the liberated territories, and today agricultural activity there has almost completely resumed [2-4].

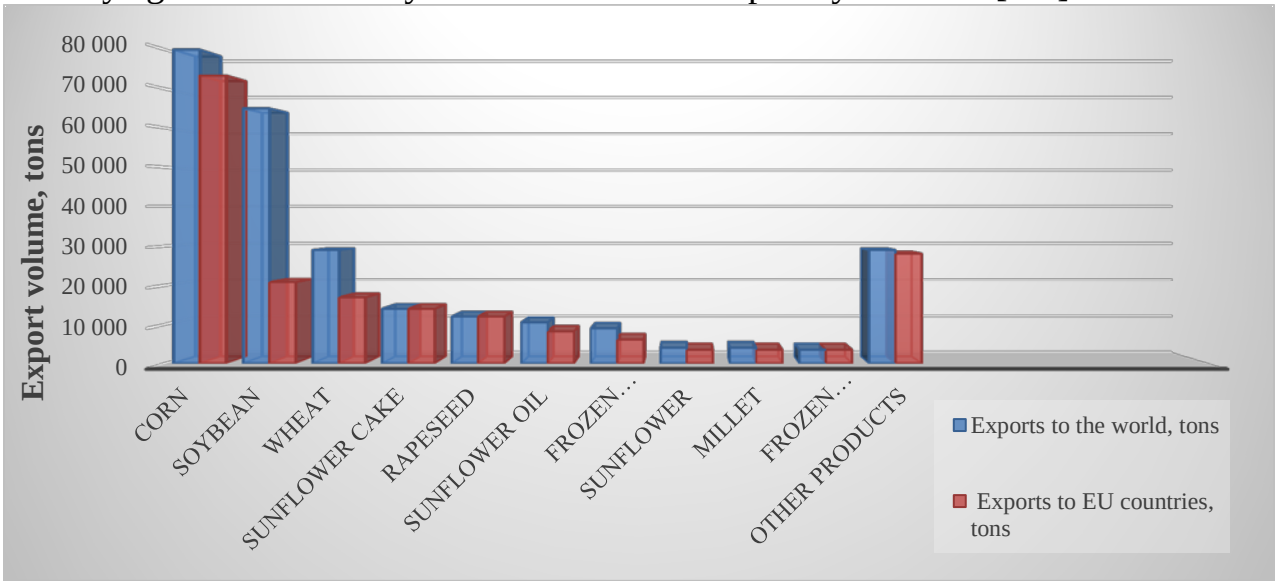

Fig. 1. **Top 10 exported organic products from Ukraine to the world and EU countries**

**Source: compiled by the author based on [3, 4].*

Despite all the challenges associated with a full-scale war, Ukrainian organic producers have demonstrated resilience and adaptability, continuing their activities and even increasing export volumes in 2022. This indicates the significant potential of organic production and its importance for the further development of the country's agro-industrial complex [5]. Organic farming involves the use of exclusively natural soil resources, organic fertilizers, biological plant protection products, high-quality seeds, etc. Environmentally safe soybean growing technologies involve reducing the impact of harmful chemicals on the environment, so in our research we used biopreparations that do not harm the environment and meet all environmental standards. The studies of Novitska N.V., Lemeshik A.V. and Babenka V.M. established that the use of chelated microfertilizers had a positive effect on the formation of grain mass and the number of beans per plant of the studied soybean varieties. The maximum value of the 1000-seed mass index was 194.0 g compared to the absolute control - 182.3 g. Thus, the experiment obtained a yield index ranging from 2.68 to 3.11 t/ha, depending on the chelated microfertilizers [6].

Organic production of soybean seeds is one of the strategic directions of accelerated development of the agro-industrial complex of Ukraine and the main goal of the European Green Deal. Our Ukrainian scientists Didur I.M. and Pantsyreva H.V. believe that this is achieved, first of all, by reducing the use of pesticides and mineral fertilizers, finding ways to expand biological measures, inoculation, reducing the

intensity of soil cultivation in accordance with the transition to eco-conserving technologies based on the selection of high-yielding varieties, which differ in maturity groups according to the sum of effective temperatures. Organic production of soybean seeds is one of the strategic directions of accelerated development of the agro-industrial complex of Ukraine and the main goal of the European Green Deal. Our Ukrainian scientists Didur I.M. and Pantsyreva H.V. believe that this is achieved, first of all, by reducing the use of pesticides and mineral fertilizers, finding ways to expand biological measures, inoculation, reducing the intensity of soil cultivation in accordance with the transition to eco-conserving technologies based on the selection of high-yielding varieties, which differ in maturity groups according to the sum of effective temperatures [7].

Studies by Didur I.M. and Tsygansky V.I. prove that the key factor affecting the final yield of soybeans is the size and weight of the grain. Optimal plant nutrition with fertilizers significantly contributes to an increase in the mass of a thousand grains, which directly affects the total yield [10]. Thus, experimental data by Yatsenko V.V. indicate that the use of inoculant for seed treatment and top dressing provided improved conditions for the growth and development of soybean plants and the formation of their productivity elements, which in turn increases the economic efficiency of growing this crop [11].

The purpose of the research was to study the economic efficiency of soybean cultivation with inoculation and foliar feeding with biological preparations of the BTU Center in the conditions of the Right Bank Forest-Steppe. The economic efficiency of soybean cultivation was determined by the calculation method using technological maps at prices that were established for the period of completion of scientific research (2024). According to the results of experimental research, the yield of soybean seeds (t), cultivation costs (UAH/ha), the cost of gross production and sales of raw materials (UAH), conditional net profit (UAH) and profitability (%).

Materials and methods of research. Field research was conducted in the field of the Agronomichne research farm during 2022-2024. The soybean varieties Amadeus and Samorodok were studied in conditions typical for the Right-Bank Forest-Steppe on gray forest medium-loam soils, but with different weather conditions. They differed significantly during the research period, with the conditions of 2023 being the most favorable for plant growth. Agricultural technology in the experiment is generally accepted for the Forest-Steppe zone, with the exception of the factors that were put forward for study. The experiment scheme is presented in Table 1. Seed treatment was carried out with modern bio-inoculants «Rizoline» + «Rhizosave» (Bradyrhizobiumjaponicum and Rhizobium leguminosarum) with a drug consumption rate of 2.0 l/t + 0.5 l/t of seed. Seeds were sown to a depth of 3-4 cm with a row spacing of 45 cm. Top dressing was carried out with multi-component chelate complex microfertilizers Azotofit-r (0.5 l/ha) and Organic Balance (0.5 l/ha) in combination

Table 1

Experimental design

(Factor A) Variety	(Factor B) Inoculation	(Factor C) Foliar fertilization of crops
1. Samorodok 2. Amadeus	1. Without inoculation (control) 2. Rizoline-r+ Rizosave	1. Without fertilizing (control); 2. Crop treatment: 1) Azotofit + Helprost Soy + Liposam; 2) Azotofit + Helprost Boron + Liposam; 3. Crop treatment: 1) Organic balance + Helprost Soy + Liposam; 2) Organic balance + Helprost Boron + Liposam; 4. Crop treatment: 1) Organic balance + Azotofit + Helprost Soy + Liposam; 2) Organic balance + Azotofit + Helprost Boron + Liposam.

**Source: compiled by the author based on his own research*

with microelements HelpRost soy (1.0 l/ha) and HelpRost boron (0.5 l/ha) in the phase of the first - third true leaf and in the phase of budding - flowering. Harvesting was carried out by direct combining. The harvest was recorded according to the Methodology for conducting a qualification examination of plant varieties for suitability for distribution in Ukraine, and the level of profitability was determined by mathematical calculations [12].

Research results. Our scientific research has confirmed the effectiveness of using biological products in soybean fertilization systems. Given the instability of mineral fertilizer prices, the use of biological products has become a relevant solution for reducing production costs and increasing yields.

According to the results of the research, it was found that the yield indicators of the Samorodok and Amadeus varieties in 2023 were slightly higher compared to the indicators of 2022 and 2024, since hydrothermal conditions were more favorable for the full realization of the genetic potential of the studied crop. It was found that the highest soybean yield was recorded in 2023 in the Amadeus variety in the variant with pre-sowing seed treatment Rizoline-r + Rizosave with a drug consumption rate of 2.0 l/t + 0.5 l/t of seed and double fertilizing with microfertilizers Azotofit-r (0.5 l/ha) and Organic Balance (0.5 l/ha) in combination with microelements HelpRost soy (1.0 l/ha) and HelpRost boron(0.5 l/ha), which amounted to 3.64 t/ha, while in 2022 this indicator was lower by 0.17 t/ha, and in 2024 - by 0.13 t/ha, respectively. On average over the years of research, the use of inoculation and foliar fertilization increased soybean yield by 28.63% compared to absolute control. According to the results of the research, the Samorodok variety showed slightly lower yield indicators compared to the Amadeus variety. The highest yield was recorded in 2023 on the variant with pre-sowing seed treatment with bio-inoculants «Rizoline» + «Rhizosave» (Bradyrhizobiumjaponicum and Rhizobium leguminosarum) and double fertilizing with chelate microfertilizers «Azotofit-r» and «Organic Balance» in combination with microelements «HelpRost soy» and «HelpRost boron» in the phase of 2-3 true leaves and in the budding-

Table 2

The effect of chelate microfertilizers and bioinoculants on the yield of soybean varieties Samorodok and Amadeus, t/ha

Factor A	Factor B	Factor C	2022	2023	2024	Average over the years of research	Increase	
							t/ha	%
S1	Without inoculation	1. Without fertilizing (control)	2,02	2,33	2,13	2,16	-	-
S2		2. Azotofit + Helprost Soy; Azotofit + Helprost Boron	2,45	2,56	2,5	2,50	0,34	13,72
S3		3. Organic balance + Helprost Soy; Organic balance + Helprost Boron	2,51	2,63	2,59	2,58	0,42	16,17
S4		4. Organic balance + Azotofit + Helprost Soy; Organic balance + Azotofit + Helprost Boron	2,64	2,89	2,76	2,76	0,60	21,83
S5i	Rizoline-r+ Rizosave	5. Without fertilizing	2,62	2,76	2,66	2,68	0,52	19,40
S6i		6. Azotofit + Helprost Soy; Azotofit + Helprost Boron	3,1	2,97	2,89	2,99	0,83	27,68
S7i		7. Organic balance + Helprost Soy; Organic balance + Helprost Boron	3,04	3,07	3,05	3,05	0,89	29,26
S8i		8. Organic balance + Azotofit + Helprost Soy; Organic balance + Azotofit + Helprost Boron	3,21	3,26	3,18	3,22	1,06	32,85
A1	Without inoculation	1. Without fertilizing (control)	2,47	2,58	2,53	2,53	-	-
A2		2. Azotofit + Helprost Soy; Azotofit + Helprost Boron	2,65	2,94	2,83	2,81	0,28	9,98
A3		3. Organic balance + Helprost Soy; Organic balance + Helprost Boron	2,74	2,98	2,9	2,87	0,35	12,06
A4		4. Organic balance + Azotofit + Helprost Soy; Organic balance + Azotofit + Helprost Boron	3,07	3,15	3,08	3,10	0,57	18,49
A5i	Rizoline-r+ Rizosave	5. Without fertilizing	2,75	2,81	2,77	2,78	0,25	9,00
A6i		6. Azotofit + Helprost Soy; Azotofit + Helprost Boron	3,17	3,4	3,2	3,26	0,73	22,42
A7i		7. Organic balance + Helprost Soy; Organic balance + Helprost Boron	3,27	3,43	3,26	3,32	0,79	23,90
A8i		8. Organic balance + Azotofit + Helprost Soy; Organic balance + Azotofit + Helprost Boron	3,47	3,64	3,51	3,54	1,01	28,63
$LSD_{0.05}$ Factor A			0,014	0,021	0,017			
$LSD_{0.05}$ Factor B			0,014	0,021	0,017			
$LSD_{0.05}$ Factor C			0,020	0,030	0,024			
$LSD_{0.05}$ Factor AB			0,020	0,030	0,024			
$LSD_{0.05}$ Factor AC			0,028	0,042	0,033			
$LSD_{0.05}$ Factor BC			0,028	0,042	0,033			
$LSD_{0.05}$ Factor ABC			0,039	0,060	0,047			

*Note: **S1 – S8i** – Samorodok variety; **A1 – A8i** – Amadeus variety*

***Source: compiled by the author based on his own research*

flowering phase, which amounted to 3.26 t/ha, while in 2022 this indicator was lower by 0.05 t/ha, and in 2024 − by 0.08 t/ha, respectively.

On average over the years of research, the use of inoculation and foliar fertilization increased soybean yield in the Samorodok variety by 32.85% compared to absolute control. During the research, the economic efficiency of seed inoculation and four options for foliar feeding of the studied soybean varieties was evaluated, taking into account the yield indicators for the years of research and the costs at 2024 prices associated with growing the studied soybean varieties in the conditions of the Right-Bank Forest-Steppe (presented in Tables 3, 4).

Table 3

Economic efficiency of growing soybeans of the Amadeus variety with inoculation and foliar feeding (average for 2022-2024)

Variety	Fertilizer option	Cultivation costs (UAH/ha)	Product cost (UAH)	Conditional net profit (UAH)	Profitability (%)
Amadeus	A1	17191	30360	13169	76,6
	A2	19044	33720	14677	77,1
	A3	19079	34440	15362	80,5
	A4	19319	37200	17882	92,6
	A5i	18670	33360	14690	78,7
	A6i	20523	39120	18598	90,6
	A7i	20558	39840	19283	93,8
	A8i	20798	42480	21683	104,3

*Note: **A1 – A8i** – elements of soybean growing technology, the decoding is given in Table 2*
**Source: formed by the author based on his own research*

According to the results of the calculations, it was found that the factors studied, namely pre-sowing seed treatment and foliar feeding, had a significant impact on the economic efficiency of soybean cultivation. On average, over the years of research, the total costs of growing soybeans of the Samorodok and Amadeus varieties ranged from 16,921 to 20,798 UAH/ha, depending on the variety and improved elements of soybean cultivation technology. In the Amadeus variety, in the control variant without inoculation and top dressing, the cultivation costs amounted to 17,191 UAH/ha, and in the experimental variant with pre-sowing seed treatment with bioinoculants in liquid form and double top dressing with multi-component chelate complex microfertilizers «Azotofit-r» and «Organic Balance» in combination with microelements «HelpRost soy» and «HelpRost boron», the maximum production costs amounted to 20,798 UAH/ha. According to the results of calculations of economic efficiency indicators of the Amadeus variety, it was found that in the absolute control, the conditional net profit was 13,169 UAH/ha, and the profitability level was 76.6%. The maximum profit was obtained in the experiment variant with inoculation and double complex fertilization in the amount of 21,683 UAH/ha, where the profitability level was 104.3%, which is 27.7% higher than the control. In terms of economic efficiency, the Samorodok variety showed slightly lower results. The cost of grown products per hectare was within 25,920-38,640 UAH. Conditionally, the net profit on the control variant was 8,999 UAH

Table 4

Economic efficiency of growing soybeans of the Samorodok variety with inoculation and foliar feeding (average for 2022-2024)

Variety	Fertilizer option	Cultivation costs (UAH/ha)	Product cost (UAH)	Conditional net profit (UAH)	Profitability (%)
Samorodok	S1	16921	25920	8999	53,2
	S2	18774	30000	11227	59,8
	S3	18809	30960	12152	64,6
	S4	19049	33120	14072	73,9
	S5i	18400	32160	13760	74,8
	S6i	20253	35880	15628	77,2
	S7i	20288	36600	16313	80,4
	S8i	20528	38640	18113	88,2

Note: S1 – S8i – *elements of soybean growing technology, the decoding is given in Table 2*
**Source: formed by the author based on his own research*

and the profitability level was 53.2%. The maximum profit of 18,113 UAH was obtained on the variant with pre-sowing seed treatment with bio-inoculants Rizoline + Rizosave and double fertilizing with microfertilizers Azotofit-r and Organic Balance in combination with microelements HelpRost soy and HelpRost boron, where the profitability level was 88.2%, which is 35% higher than the control.

Conclusions and research prospects. It can be concluded that the maximum seed yield on average over three years of research was obtained in the Amadeus variety of Canadian selection at the level of 3.54 t/ha, which is 28.63% more than the absolute control, and in the Samorodok variety of Ukrainian selection at the level of 3.22 t/ha, which is 32.85% more than the control variant, respectively. Thus, the conducted economic analysis of the obtained research results confirmed our conclusions regarding the feasibility of biologization of the soybean nutrition system. Therefore, we recommend using the most economically effective option in production, which involves pre-sowing seed treatment with bioinoculants Rizoline + Rhizosave (Bradyrhizobiumjaponicum and Rhizobium leguminosarum) in liquid form and double fertilizing with multicomponent chelate complex microfertilizers Azotofit-r and Organic Balance in combination with microelements HelpRost soy and HelpRost boron in phases 2-3 of true leaves and budding-flowering, which provided the maximum in the experiment conditional net profit of 21683 UAH/ha in the Amadeus variety and 18113 UAH/ha in the Samorodok variety, and the highest level of profitability of 104.3% and 88.2%, respectively.

Список використаної літератури/Reference

1. Rentabelnist vyroshchuvannia soi bez HMO [*Profitability of growing soybeans without GMO*]. *lidea-seeds.com.ua.* URL: https://lidea-seeds.com.ua/news/soya/rentabelnist-soyi [in Ukrainian].

2. Orhanichne vyrobnytstvo v Ukraini zalyshaietsia odnym iz priorytetiv [*Organic production in Ukraine remains one of the priorities*]. *organicinfo.ua*. URL: https://organicinfo.ua/news/organic-remains-one-of-priorities/ [in Ukrainian].

3. Top 10 eksportovanykh orhanichnykh produktiv z Ukrainy u svit [*Top 10 organic products exported from Ukraine to the world*]. *organicinfo.ua*. URL: https://organicinfo.ua/infographics/top10-exported-products-world-2021/ [in Ukrainian].

4. Top 10 eksportovanykh orhanichnykh produktiv z Ukrainy v krainy YeS [*Top 10 organic products exported from Ukraine to EU countries*]. *organicinfo.ua*. URL: https://organicinfo.ua/infographics/top10-exported-products-eu-2021/ [in Ukrainian].

5. Orhanichne vyrobnytstvo v Ukraini zalyshaietsia odnym iz priorytetiv [*Organic production in Ukraine remains one of the priorities*]. *organicinfo.ua*. URL: https://organicinfo.ua/news/organic-remains-one-of-priorities/ [in Ukrainian].

6. Lemeshyk A.V., Rudko V.O., Babenko V.M., Suk A.H., Novytska N.V. (2023). Formuvannia indyvidualnoi produktyvnosti roslyn soi za vplyvu khelatnykh mikrodobryv [*Formation of individual productivity of soybean plants under the influence of chelate microfertilizers*]. *Innovatsii ta perspektyvy suchasnoi nauky* – Innovations and prospects in modern science. *Proceedings of XI International Scientific and Practical Conference – Materialy XI mizhnarodnoi naukovo-praktychnoi konferentsii.* 23-25 October 2023. Stockholm, Sweden. 19-24. Retrieved from https://sci-conf.com.ua/wp-content/uploads/2023/10/INNOVATIONS-AND-PROSPECTS-IN-MODERN-SCIENCE-23-25.10.23.pdf#page=19 [in Ukrainian].

7. Didur I.M., Pantsyreva H.V., Holovanuk A.B., Kovalchuk V.M. (2024). Vyvchennia sortovoi tekhnolohii vyroshchuvannia soi v umovakh zminy klimatu [*Study of varietal technology of soybean growing in the conditions of climate change*]. *Ukrainskyi zhurnal pryrodnychykh nauk – Ukrainian Journal of Natural Sciences*. № 25. 150−158. https://doi.org/10.32782/naturaljournal.9.2024.15 [in Ukrainian].

8. Mazur V.A., Tepchuk O.P., Verhelis V.V. (2022). Rannostyhli sorty soi v umovakh intensyvnoho zemlerobstva ta zminy klimatu [*Early-ripening soybean varieties under conditions of intensive farming and climate change*]. *Silske hospodarstvo ta lisivnytstvo – Agriculture and forestry.* № 3 (26). 5−17. DOI: 10.37128/2707-5826-2022-3-1 [in Ukrainian].

9. Mazur V.A., Tkachuk O.P., Pantsyreva H.V., Kupchuk I.M. (2024). Rozrobka bioorhanichnykh tekhnolohii vyroshchuvannia zernobobovykh kultur zadlia vidnovlennia rodiuchosti gruntu: monohrafiia [*Development of bioorganic technologies for growing legumes to restore soil fertility*]. *Vinnytsia.* [in Ukrainian].

10. Didur I.M., Tsyhanskyi V.I. (2023). Vplyv mikoryzatsii nasinnia ta hruntovoho biodobryva na formuvannia indyvidualnoi produktyvnosti roslyn soi [*The influence of seed mycorrhization and soil biofertilizer on the formation of individual productivity of soybean plants*]. *Silske hospodarstvo ta lisivnytstvo – Agriculture and forestry.* № 4 (31). 5−15. DOI: 10.37128/2707-5826-2023-4-1. [in Ukrainian].

11. Yatsenko V.V. (2022). Formuvannia produktyvnosti soi ovochevoi za vykorystannia bioinokuliantiv ta mikoryzoutvoriuiuchoho preparatu [*Formation of productivity of vegetable soybeans usin bioinoculants and mycorrhizal drug*]. *Tavriiskyi naukovyi visnyk. Seriia: Silskohospodarski nauky – Taurida Scientific Herald. Series: Rural Sciences.* № 125. 111-118. DOI: https://doi.org/10.32851/2226-0099.2022.125.16 [in Ukrainian].

12. Tkachyk S.O., Prysiazhniuk O.I., Leshchuk N.V. (2017). Metodyka provedennia kvalifikatsiinoi ekspertyzy sortiv roslyn na prydatnist do poshyrennia v Ukraini. Zahalna chastyna [*Methodology for conducting qualification examination of plant varieties for suitability for distribution in Ukraine. General part*]. 4-te vyd., vypr. i dop. Vinnytsia: FOP Korzun D.Yu. – 4th edition, cor. and supplem. Vinnytsia: Individual entrepreneur Korzun D.Yu. 119 [in Ukrainian].

АНОТАЦІЯ
ЕКОНОМІЧНА ЕФЕКТИВНІСТЬ ВИРОЩУВАННЯ СОЇ ЗА ІНОКУЛЯЦІЇ ТА ПОЗАКОРЕНЕВИХ ПІДЖИВЛЕНЬ В УМОВАХ ЛІСОСТЕПУ ПРАВОБЕРЕЖНОГО

У статті наведено результати досліджень впливу передпосівної обробки насіння і позакореневих підживлень біопрепаратами на економічну ефективність вирощування досліджуваних рослин сої сортів Самородок і Амадеус. Наші дослідження проводяться за рахунок видатків фонду державного бюджету в рамках науково-дослідної роботи на тему: «Розробка науково-технологічного забезпечення підвищення родючості ґрунтів та раціонального використання потенціалу біоресурсів» (державний реєстраційний номер: 0124U000444).

Досліджено економічну ефективність вирощування сої за вдосконалених елементів технології вирощування, таких як проведення передпосівної обробки насіння та позакореневих підживлень біопрепаратами. Встановлено, що за обробки насіння перед посівом біоінокулянтом Різолайн + Різосейв та двома позакореневими підживленнями мікродобривами Азотофіт-р і Органік баланс у поєднанні з мікроелементами HelpRost соя та HelpRost бор у сортів Амадеус і Самородок було отримано найвищий умовно чистий прибуток на рівні 21683 грн та 18113 грн відповідно. Після обрахунків було отримано рентабельність у сорту Самородок 88,2% що на 35% більше від контрольного варіанту та у сорту Амадеус 104,3%, що більше від абсолютного контролю на 27,7% відповідно.

Отже, економічний аналіз результатів досліджень підтвердив ефективність елементів біологізації при вирощуванні сої, а поєднання біопрепаратів та мікродобрив різної дії не тільки підвищує рівень урожайності, а й створює в ґрунті сприятливе середовище, яке покращує засвоєння поживних речовин рослинами, підвищує їхню стійкість до хвороб та несприятливих умов, а також забезпечує довготривалу родючість ґрунту та залишає більше азоту в легкодоступній формі для наступних сільськогосподарських культур у сівозміні.

Ключові слова: *Сорти, строк сівби, ширина міжрядь, конкурентоспроможність, площа живлення, продуктивність, обробка насіння, технологічність, рентабельність, структура врожаю.*

Табл. 4. Рис. 1. Літ. 12.

Інформація про авторів

Коробко Аліна Анатоліївна – аспірантка кафедри рослинництва та садівництва Вінницького національного аграрного університету (21008, м. Вінниця, вул. Сонячна, 3. e-mail: alina.1912.korobko@gmail.com).

Korobko Alina Anatoliyivna – Postgraduate student of the Department of Plant Science and Horticulture, Vinnytsia National Agrarian University (21008, Vinnytsia, Soniachna Str. 3, e-mail: alina. 1912. korobko@gmail.com).