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BUSINESS OPPORTUNITIES ARGUMENTATION FOR INNOVATIVE PROJECT OF PRODUCING STEVIA AS A NATURAL SWEETENER

Statement of the problem. The rapid worldwide distribution of products based on natural sweeteners makes it necessary to increase the production of stevia by using innovative technologies. Domestic entrepreneurs can take appropriate niche not only in domestic market but also in the global market of natural sweeteners, because Ukraine is among a small number of countries where you can grow stevia. However, in a highly technological, environmental and price competitive activity companies must properly and accurately assess the possible economic consequences of implementing innovative business project for the attraction of investments, so its economic feasibility is highly important.

Analysis of recent researches and publications. Many domestic scientists study issues of innovations efficiency and methods of innovative projects proving, such as: S. Bushuev [2], B. Heyets [6], W. Gryga [8], S. Illyashenko [10], B. Malitskyy [12] and others; among foreign: P. Drucker [9], F. Clifford [11], S. Valdaytsev [20], H. Goldstein [7] and others.; methodological approaches for innovative business planning in the agrarian sector - S. Volodin [4; 5]. But the problem of making deliberate decisions for the selection of innovative projects requires further study.

The task. The aim of the research is to enhance the theory and practice of innovative business planning in plant growing as an example of the innovative project for the production of natural sweetener that will enhance the objectivity and feasibility of its practical application and increase the production of stevia in Ukraine.

To achieve this goal it is necessary to consider the innovative Business Case of proposals for the production of stevia leaves; investigate the degree of the product novelty and the possible scope of its application; analyze the market of innovative products; determine the social and economic performance of the project for stevia growing.

The object of research is business opportunities of the natural low-calorie sweetener production – stevia.

The subject of research is organizational and economic support for producing of innovative products based on stevia.

The main material of researches. In the scientific literature there are different definitions of innovative project. So Vasilenko V. considers it as a system of interrelated objectives and programs for achieving them, which are complex of scientific, research, engineering, production, organizational, financial, commercial and other well organized activities with a set of project documentation which provide an effective solution for a specific scientific and technological objectives expressed in quantitative terms and leads to innovations [3, p. 256]. However, a more precise definition is given in the Ukrainian law “Of the innovative activity” № 40- IV, 04.07.2002 (Art. 1): “an innovative project is a set of documents that defines a complex of procedures and all necessary measures (including investments) for the development and implementation of innovative product and (or) innovative production".

Business planning of the innovative project for the stevia production as a natural sweetener was conducted with the scientific and methodological recommendations which was worked out at the Institute for Innovative Providing of NAAS [16] based on the scientific researches of the Institute of Bioenergy Crops and Sugar Beet of NAAS. The project aims at the issues of growing natural sweeteners in Ukraine using a set of national scientists innovative technologies.

Implementation of innovative projects will help to create the conditions for a stable and effective growing of stevia as a raw material and its further processing into the products of the food, cosmetic and other industries, formation of market principles of its movement.

The use of products obtained by realizing the project will support the national plant production.

According to the World Health Organization, recently every inhabitant of the planet began to consume 100 grams of sugar daily [23]. Excessive sugar consumption can lead to extremely negative impact on the body and cause many serious diseases such as diabetes, hypoglycemia, atherosclerosis, obesity, hypertension, diseases of the teeth and gums. The number of diabetic patients in Ukraine is about 11% of the population and 5% are at risk and that's about 7.5 million people [15]. People become accustomed to sweet, so the search of sweeteners became recently a major topic not only in Ukraine but in the whole world. Sweeteners market today represented mainly by artificial sweeteners, but they are harmful for health which is confirmed by numerous studies. This can be prevented by using the natural sweetener from stevia leaves in human diet. This plant contains diterpene glycosides which exceed sweetness of sugar by 300 times and have a wide range therapeutic action [18].

Stevia can replace sugar in food and also help in the treatment of a number of serious diseases: diabetes, atherosclerosis, cardiovascular system, gastrointestinal tract, liver, kidney, tooth decay, gum disease and other.

In Japan stevia become the most widespread, its population consumes 90% of all world's stevia and 70% of the Japanese sweet market is stevia products [22, p. 62]. In Japan stevia declared a national importance product and it isn't possible to take it out from the country in its purest form. In the “Program of the nation survival” which Japanese government signed after Hiroshima and Nagasaki, stevia became a separate paragraph. Today the average life expectancy of Japanese is 90 years, but in sixties of the twentieth century it was 56 years [23].

The Ministry of Health registered stevia as a medicinal plant and biologically active additives In Ukraine. In almost all countries of the CIS it permitted for usage with therapeutic properties. In Kazakhstan and Uzbekistan stevia has pharmacological value.

The implementation of innovative business project will improve performance in commercial production and seed breeding for such valuable plant like stevia. Providing all types of property holdings with high quality stevia obtained by the new varieties of domestic breeding will economically facilitate the processing industry development. The widespread introduction of new technologies can solve the problem of the stevia growing and processing in a fierce competition in the market for sugar and sweeteners.

Using the capabilities of science significantly increases production efficiency and helps resolve issues of its modernization by extensive use of simulation results and improving the efficient stevia growing technologies, seed multiplication and growing, the use of intensive technology for stevia growing.

The implementation of innovative business projects aimed at the development of new advanced technologies for stevia production using new varieties created by the Institute of Bioenergy Crops and Sugar Beet of NAAS.

The result of the project will be the innovative product – dry stevia leaves. It is dried stevia leaves which contain at least 10% of diterpene glycosides. Diterpene glycosides are the basic substances that determine the therapeutic properties and sweet taste of stevia. They are complex carbohydrates that are similar in structure to human hormones and are “building material” for cell expansion (restoration), heat-resistant, pH-stable, not amenable to the process of fermentation and most importantly they do not raise the glycemic index in the human body, making them an essential component in the diet of diabetics.

Stevia leaves as an innovative product may be divided into four relative groups by quaility indicator [21, p. 17-18]:

1. High quality leaves - product contain more than 14% of diterpene glycosides.
2. Quality leaves - product contain from 10% to 14% of diterpene glycosides.
3. Average quality leaves - product contain from 7% to 10% of diterpene glycosides.
4. Low quality leaves - product contain less than 7% of diterpene glycosides.

Scientists of the Institute of Bioenergy Crops and Sugar Beet of NAAS breeded elite varieties of stevia - “Slavutich” and “Beregynya” which can be related to quality and high-quality and under favorable weather conditions can produce leaves containing 20% of diterpene glycosides [17, p. 44].

Thus, the growing and processing of stevia have the advantage because it is not only high-performance, low-calorie plant for the pharmacology of stevioside production, but also ecologically beneficial for the companies and country at all.

Innovative product of the project is thoroughly adapted to edaphic-climatic and agro-ecological conditions intensive technology for stevia growing as a natural sweetener based on a new generation of varieties and the market system of transfer for innovative technologies and products. Method of implementation - Contract with the stevia producers for innovative and technological support and Agreement for scientific and technical support.

Scientific support of innovative technologies is provided with a set of scientific and technological researches of Institute of Bioenergy Crops and Sugar Beet of NAAS.

According to the features of this valuable sweetener I put together the following Business Case of innovative proposals (Table 1).

Table 1

Business Case of innovative proposals for producing stevia leaves

Innovative proposal title	Short specification
1. Intensive technology for stevia growing	Intensive technology must provide cost reduction by minimizing technical operations, reduction of material consumption, the use of high quality fertilizers and their cost optimization
2. Technology for new varieties seed growing based on biotechnological methods	The main feature and advantage of breeding is to create new varieties high-quality seeds that make it possible to sow and grow sprouts in greenhouse conditions
3. The system for transfer of innovative technologies and production of natural sweetener	Creating a complex system that allows the efficient use of scientific and technological researches, transforming them into innovative products, capitalization and commercialization under the conditions of industrial and commercial processes of production, selling of innovative products
Applications: Typical business calculations for stevia growing and processing	

Source: compiled by the Author and based on the innovativeness criteria, developed by the Institute for Innovative Providing of NAAS.

The use of the latest innovative intensive technology for stevia growing, which is developed by leading experts of the Institute of Bioenergy Crops and Sugar Beet of NAAS, match with international trends in developed countries, which transit to high-yielding production in accordance with the innovation and integration policy . The main advantage of this technology over analogues is a complex approach to solving the economic, biological, technical, social, ecological and environmental issues.

This type of intensive technology model includes intensive complex:

- modern breeding achievements in the creation of more efficient varieties that stimulate evolution of the natural sweetener. Productivity of Ukrainian breeding varieties, especially their newest generation has a potential yield of stevia - 2 tons per hectare or even higher. Seeds of new varieties is not only a carrier of the genetic potential of the variety, but also an important element of intensive technology for stevia growing and determines by stability and adaptiveness to growing conditions;

- new approaches for the use of agro-technical and chemical germicides and interrelated mechanized technological processes; maximum biologization of technological process, such as: use as organic fertilizer chopped predecessor straw, sowing green manure crops (mustard, oil radish), use of agronomic and biological control measures against pests, diseases and weeds, preservation of soil productivity by conducting science-based crop rotation in the sowing season, etc.;

- optimization of money and material expenses and the total cost reduction due to the high quality of work, adherence to optimal timing of their implementation, improving glycosides content in the leaves, crop losses reduction by high-quality adjustment of equipment and the rational organization of production processes;

- effective system of organizational and economic measures and multidimensional contractual and technological system.

Due to the complexity of the new intensive technology of stevia growing, high level of the yield is provided at the lower money, material and labor expenses.

The high efficiency of the new intensive technology allows to extend the boundaries of growing natural sweeteners in three traditional climatic zones: central forest-steppe, south and western regions of Ukraine.

Innovative intensive technology is universal for individual and corporate producers, as well as processers and producers of stevioside, extracts and other products.

Intensive technology of stevia growing provides [17, p. 101]:

- stable yield at 1.5-2 tons of dry leaves per hectare;
- production profitability under the conditions of intensive unregulated policy in the country;
- improving the raw material quality;
- charging processers with quality raw material.

The complexity of innovative technologies and scientific resources for their implementation allows to organize production based on contraction, contractual basis, which develops commercial business in the industry.

Creative approach of the scientists of Institute of Bioenergy Crops and Sugar Beet of NAAS underly the development of intensive technology for stevia growing, opens up new prospects for its improvement. Qualified issues solution for using up-to-date breeding achievements, effective use of fertilizers and plant protection germicides, high-performance technical devices, timeliness and quality of technological operations will provide a transition to the optimal technological scheme of production that enables to achieve high yield and obtain maximum profit from the production sale.

Implementation of innovative product plans on the basis of the development and processing of mechanisms for seeds sale and made to order by specify customers on the contractual basis.

It plans to provide scientific-methodological and expert-advisory support on the contractual basis for the implementation of seeds, accompaniment of production processes by leading experts of the Institute of Bioenergy Crops and Sugar Beet of NAAS.

Currently, more than 14 countries grow stevia in order to obtain stevioside – complex of 8 substances which belong to the diterpene tetracyclic glycosides class. To reach the level of Japan (a leader in this field, 200 tons stevioside per year), Ukraine needs to grow stevia in the area of 1000 hectares [17, p. 84]. To meet the demand for seeds in the whole area we need about 10 hectares of seed-production plot. However, Ukraine needs the necessary research and technology development for stevia seeds growing starting from the crop rotation in the sowing season, tillage, fertilization, protection from disease, weeds and pests, harvesting and ending with the seeding rate, tillage depth, standards development and price formation.

The potential capacity of the Ukrainian market of stevia dry leaves is 3000 tons. The actual stevia growing today is 60 tons [17, p. 98]. In prospect the market capacity can be expanded by increasing productivity and expanding the area for the natural sweetener.

The harvest counts in the dry leaves, which is the raw material for obtaining extracts (syrup) - distilled water with 60% concentration of squeezing. Extract outcome is 1 ton from 2 tons of leaves. Dry

leaves could be used for sale. Alternatively, with appropriate investment, dry leaves could be processed into stevioside and sold via pharmacy and commercial entities.

The main suppliers of stevia on global market are China and Paraguay, but the stevia leaves grown in Ukraine are more qualitative. China grows stevia leaves (hybrids), which doesn't contain saponins and flavonoids (Table 2).

Table 2

Sale and growing index for stevia

Index	China	Paraguay	Ukrainian
	Stevia leaves		
Content of diterpene glycosides, %	8-11	to 14	to 20
Contain of saponins and flavonoids	no	yes	yes
Price per 1 kg in U.S. $ delivery conditions seller's warehouse	from 2,8 to 4,2	from 3 to 4	3,5
Casing	pressed leaves in 50 kg bales	pressed leaves in 10 kg bales	leaves in plastic bags
Qualitative indexes: - Brownish leaves,% - Harmful substances,% - Microbiological parameters - Moisture content,%	 to 16 to 0,1 occur 12	 to 12 norm norm to 10	 to 8 norm norm to 10

Source: compiled by the Author and based on [1; 14].

This innovative product is designed for domestic agricultural market. The enterprises of different categories and business pattern may be the consumers. Elaborated draft of advertising and information campaign helps to attract the potential customers of innovative products; this draft provides for participation in exhibitions, trade fairs, conferences and special-purpose articles and the Internet, prepared promotional flyers and brochures, contracts for conducting an advertising company with leading consulting companies.

Contractual basis lay the guarantees according to the draft developer guarantees to partner to obtain the indicators which are foresee by innovative draft.

Thus, a total system of organizational and economic measures with using of contract and engineering relationship mechanism provides the transfer of innovative products and stevia products on the market.

According to a business plan the draft involves preproduction costs and costs for using of innovative products (manufacturing process, new varieties, services for its production and sales). Sources of funding include: funding scientific agenda, research institutions; advancing the project by the customer; bit of the action from the draft realization.

Scope of finance according to the project, during a year is not less than 2 million., three years - 6900 thousand hryvna.

Commercial output that could be obtained in consequence of stevia' growth intensive technology using in the manufacture improves the harvest to 2,5 t/ha of dry leaves with glycoside content to 20%.

Innovative product as a result of the intellectual process in legal relations is a subspecies of intellectual property for this reason the legal protection of an innovative product is be realized by the rules of regulating the rights for intellectual capital.

Institute of Bioenergy Crops and Sugar Beet of NAAS includes a set of scientific and technological developments (STD) that have legal protection for using of stevie' growth intensive technology.

A complex of STD appears in the registry at full breath into the passport of innovative project. Thus, selection achievements are represented by the varieties which are legally protected by certificate of authorship, registration numbers and included into the State Register of Plant Varieties of Ukraine.

Cost readings for the intellectual property rights is held as consistent with "Estimation procedure of estimating and accounting of the intellectual property rights in academic institutions of UAAN" [13], developed by the National Scientific Center "Institute of Agrarian Economics" of UAAN and the "Institute of Accounting and Finance of NAAS"

The initial cost of intellectual property including all documented expenses for this intellectual property production and the cost of State registration into the State enterprise "Ukrainian institute for industrial property".

Stevia Seeds varieties have to satisfy the standard requirements, accompanied by a certificate and a quality certificate.

To consider the industry engineering of innovative products in the average world price (without goods and services tax) 32 USD. (4 $ / kg) for 1 kg of dry leaves [1] (Table 3).

Table 3

Output growing stevia

Area, ha	Yield, t / ha	The total harvest of raw materials, t	Stevia's dry leaves, t	The cost of dry stevia leaves, hr. / ton
50	20	1000	100	4 $/kg, 4000 $/t, 32 000 hrn/t

Source: compiled by the Author and based on [1; 21].

Project for growing stevia in a particular company conditions should be consistent with the project for growing other crops with direction of specialization and company's other conditions, therefore have to under definition in situ.

Of fundamental importance is a financial forecast for attracting business in this sphere of activity. Financial results forecasting is carried out in financial terms (Table 4).

Table 4

Financial results forecast of stevia growing (thousand of hryvna)

№ з/п	Showings	Year, th. hrn.			Total
		I year	II year	III year	
1	Receipts from sales of dried leaves (100 x 32 t 000 / t)	3200,0	3200,0	3200,0	9600,0
2	Manufacturing cost for the Stevia leaves (17250 € / ha x 50 ha)	862,5	862,5	862,5	2587,5
3	Profit (3200-862,5)	2337,5	2337,5	2337,5	7012,5
4	Profitability	91,0	91,6	91,0	91,0
5	Fee for innovative product	233,7	233,7	233,7	701,1

Source: compiled by the Author and based on [14; 17].

According to calculations, the payback period of innovative product is:

2337500 : 2350000 = 1 year

The project' detailed financial and economic analysis on stevia growing on the area of 50 hectares with a yield of 2 t/ha of dry leaves confirms the financial viability of stevia growing in Ukraine (Table 5).

Table 5

Financial viability of stevia growing in Ukraine

Showings	**50 ha**
The purchase price of dried leaves, UAH/t	16 000
Cost, UAH/t	8379
Profit, UAH/t	7621
Break-even level,%	91
Payback period, years	1,5

Source: compiled by the Author and based on [14; 17; 21].

The productive-economic indicators analysis confirms the effectiveness of stevia growing with using of intensive technology in Ukraine.

A project financial viability is: production prime cost reduce; competitive growth and enterprise.

Productiveness will be obtained by the use of intensive technology of stevia cultivation. The effectiveness of the research phase of the project provides by a high qualification level of the STR developers. Payback period – 1,5 years.

The project of stevia's growing provides for the introduction of significant amounts of mineral and organic fertilizers, improved tillage and crop rotations that greatly enhance the overall culture of agriculture, allow to use a fertilizer aftereffect and to raise the yield of natural sweeteners - stevia.

High technologies associated with the growing and planting of seedlings, causing the project technological complexity, in particular, suggested the greenhouses with up-to-date equipment.

As future course of events are ambiguous, which making uncertainty in obtaining of expecting return level upon sale of certain project, thats why we need to consider the risks, the main of which are:

- excessive import of conventional fuels;
- problems with high-quality seeds growing and seedlings receiving;
- bottleneck in technology is a significant proportion of employment of manual labour (seedlingsgrowing and planting, hand weeding);

- stevia's competitor is imported synthetic sweeteners (aspartame, cyclamate, saccharin), which are widely used in Ukraine.

The project social efficiency is in consequence of design and development of highly efficient models of stevia growing, profound structural and qualitative changes will create a stable base for operation of the production of ecologically clean production in the frame of the project. Thus, according to the project:

- workspaces creation for 1105 persons during 8 months, and for 200 persons in a season of seedling preparation and clearing through plantations;
- the workers average wage in the period of growing and harvesting, mainly machine operators increases to 2348 hrn. per month;
- land owners receive rent for a total sum of ~ 75 000hrn, wages and other services;
- increase the skills stuff whereas it is necessary to operation a complex equipment, chemicals using and standard agronomic problems solving.

For projects and programs ecological and economic evaluation is using a method of comparing the costs and benefits and guided by three criteria: net present value, internal rate of return and ratio of costs and future benefits. According to the calculations are developed and approved the allocations by bodies of the State Administration of ecology and natural resources.

In general, the project realization of Stevia growing will contribute: the efficient use of environmental factors; reducing negative impacts on the natural resources; combination of economical, environmental and social goals in the manufacturing; obtaining environmentally friendly and high quality products.

Project application of intensive stevia growth technology provides a significant social and environmentally-friendly products production (raw materials) for branches of industry. Stevia ecology as a natural sweetener lays in the minimal using of pesticides and chemicals. In addition, a business plan is fully compliant with laws and regulations regarding allowable environmental impact.

Conclusions and further research. Thus, stevia - a unique culture, which belongs to the most valuable crop in the world. The most valuable of stevia is that it accumulates in the leaves deterpenated glycosides, which are natural low-cal sweeteners. It is the raw material for the needs of food, medical, pharmaceutical, cosmetic and other industries.

Ukraine has the potential for the stevia industrial growth and sales. This should be the subject of the Government's actions with ministries for creation the favorable conditions of the development of natural sweeteners - stevia. Therefore, the strategic directions of innovative products realization is the searching of a stevia market outlet together with the stevia producers and traders on long-term contract conditions between the commodity producers on one side and the processors and traders on the other one. This is borne out by the proposed by the Institute of innovation providing of NAAS innovative business project for stevia growing on the base of new intensive stevia growth technology, the Institute for bioenergy crops and sugar beet of NAAS, which is a long-range and profitable, with payback period for research and innovation expenses is 1.5 year. In relation of engineering maximum using and other resources the project is the most promising and highly efficient Its annual average realization brings more then 7.000 UAH income per 1 ha in production profitability 91%. It is an example of industrial growing of natural sweeteners in Ukraine. However, its requires a hard marketing work, advertising, improving the seed production quality and production modernization in general, for this reason analysis of business opportunities stevia production in Ukraine requires further research.

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Novytskyi K.O. BUSINESS OPPORTUNITIES ARGUMENTATION FOR INNOVATIVE PROJECT OF PRODUCING STEVIA AS A NATURAL SWEETENER

Purpose. The Aim of research is to enhance theory and practice of innovative business planning in plant growing as an example of the innovative project of producing natural sweeteners.

Methodology of research. Were used general scientific and specific research methods, including monographic method for exploring the theoretical basis and scientific attitudes for systematic argumentation of business planning innovative projects; statistical-economic method for studying the current condition and prospects for production development of innovative product/products; system analysis and synthesis for establishing cause-and-effect relationships and forming conclusions and propositions; during argumentation process of the paper theoretical aspects, the abstraction methods for criteria valuation of decision making were used.

Findings. Were proved the benefits of growing and processing high-performance, low-calorie sweetener - stevia, which is the raw material for the needs of food, medical, pharmaceutical, cosmetic and other industries. Were formed a number of innovative proposals for the production of stevia.

Originality is further development of the theoretical and methodological support for creation and movement as an example of stevia an innovative product that has social and economic value, which production needs a complex and innovative technologies and attraction of otherenterprises - partners of different economy sectors on the contractual basis.

Practical value. is that the proposed theoretical principles was brought to the level of practical recommendations and may be used to increase the production of stevia. The usage of products obtained in this project will support national plant growing production manufacturer and stimulate further researches in this area.

Key words: innovative products, innovative project, innovative intensive technology, stevia.