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**(POST)WAR PROSPECTS OF GROWING
NICHE CROPS IN THE AGRICULTURAL SECTOR**

The pre-war development of the agricultural sector of Ukraine has taken place according to the model of modernization, based on specialization, intensification and expansion of the scale of production. However, European experience shows that this model is viable only in conditions of stable markets. The economic crisis caused by the hostilities forces agricultural producers to change their specialization in favor of diversified production. One of the ways to raise the economic sustainability of farms is to expand their activities through the production of niche crops.

The article reveals the relevance of the production of niche agricultural crops during the (post)war period. The authors outline the main advantages (higher sales price, better adaptability to weather and climate conditions, the possibility of balancing crop rotation, lower competition on the market, etc.) that shape the economic potential of the above mentioned crops, and highlight the risks (the need for special agricultural technologies, high production cost, high price volatility, etc.), which inhibit their cultivation.

It is noted that the expansion of crop rotation due to the inclusion of leguminous niche crops should become part of a broader (post)war strategy for the sustainable development of Ukraine's agricultural sector. Cultivation of niche vegetables is a component of resource-conserving agriculture, because crop rotation in vegetable production supports soil structure, controls soil erosion, and increases biodiversity. Obstacles to the spread of niche vegetable production are highlighted. The authors consider various new vegetables that

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are currently becoming part of the culture of consumption and have considerable prospects (sweet potato, Jerusalem artichoke, etc.), and point out the possibility of adapting the European experience of growing various vegetables in combination with the installation of solar panels (agrovoltaics).

Under the conditions of (post)war recovery, the cultivation of niche energy crops would contribute to the diversification of agricultural production, strengthening the economic stability of agricultural producers, increasing the level of environmental friendliness of the energy sector, and shaping the energy independence of rural areas. The article highlights the European experience of mapping agro-ecological technologies, which will make it easier for agricultural producers to introduce new crops, in particular the niche ones, and technologies.

Keywords: agricultural sector, sustainable development, diversification of production, niche crops, leguminous crops, vegetable crops, energy crops

For a long time, the development of agriculture in Ukraine, as well as in the rest of the world, followed a model of modernization based on specialization, intensification and expansion of production. In particular, the experience of the EU agricultural sector shows that farm modernization and agricultural policy were focused on specialization, land consolidation and lower production costs to meet the demand for cheaper food. This process was accompanied by the introduction of labor-saving and land-saving technologies [1].

However, the reduction of market support measures since 2000 led to increased price volatility, which worsened long-term investment prospects due to uncertainty about expected profits, which determine the level of investment, and generally weakened the economic sustainability of farms [2]. This forced many producers to expand their production structures and open new distribution channels to meet diversified demand from local and global consumers.

Thus, highly specialized agriculture is only viable in stable markets. While a high level of specialization allows producers to be technically efficient, acquire highly specialized production skills and apply the latest production technologies, it also makes them critically dependent on commodity markets.

In the context of inclusive development, Ukraine's agricultural sector is overcoming the raw material orientation via the intensification of market activities not only by large agricultural enterprises, but also by small and medium-sized agricultural producers. At present, large agricultural enterprises are characterized by capital expansion and narrow specialization (growing monocultures). Trends and peculiarities of the agricultural market require a quick response and reorientation of production in accordance with the current situation.

In the context of Russia's full-scale aggression against Ukraine, which began in 2022, this narrow specialization critically weakened the economic resilience of

agricultural producers, especially small ones. The focus of farms, both large and small ones, on grain production (mainly wheat and corn, which accounted for 44.3% of the sown area in 2021) and oilseeds (which accounted for 31% of the sown area) in the face of the disruption of usual logistics routes made it impossible to sell products at favorable prices. While pre-war grain prices were over USD 400 per tonne, as of early February 2023, they were USD 160-180; while sunflower price was USD 800 per tonne, now it is USD 400 [3].

The volatile market situation in the wake of the war and the public demand for more sustainable agriculture in the near future is prompting many producers to rethink their farm development strategies, including diversification as a way to reduce market risks and increase the efficiency of production and resource use.

The purpose of the study is to define the prospects for the use of niche crops to improve the structure of agricultural production on the basis of sustainable development, and to ensure the economic sustainability of farms in the context of (post)war development.

One of the ways to diversify the activities of agricultural farms, which can increase their economic sustainability, is to expand their activities by producing niche crops, which will additionally create higher added value. A range of high-quality niche products that are close to farmers' usual production activities but targeted at specific narrow market segments will help increase the overall profitability of diversified farms, avoid unequal competition with large agribusinesses, and expand markets.

The problem of diversifying production through the involvement of niche crops is the subject of research by both domestic [3-10] and foreign scholars [11-16], which examines the concept and relevance of niche crops, highlights their advantages and factors hindering production expansion, and assesses the efficiency and prospects for export.

In our opinion, the concept of niche in relation to a particular product is temporary and can change dynamically. Focusing on a niche business is a philosophy that helps understand which market niche will be most relevant in the near future, to realize that this is temporary, and therefore prepare for constant changes in the farm's production process.

Table 1 shows the dynamics of the sown areas of some crops, whose share in the sown area does not exceed 1%, which makes it possible to classify these crops as niche ones. During the pre-war period under study, the area under these crops did not change significantly, with a slight downward trend, as producers preferred to grow wheat, corn, sunflower, rapeseed and soybeans during this period. The war led to a significant reduction in the area under niche crops (except for buckwheat and flaxseed). In 2022, the sown area under sorghum, lupine, chickpea, coriander, and medicinal plants decreased by more than 50%, and that under rye, peas, millet, and vetch - by almost 40-50%.



Table 1

The dynamics of sown areas (actual) under the main niche crops in Ukraine,
thousand hectares

Indicator	2016	2018	2020	2021	2022
Total sown area	27026.0	27699.3	28147.5	28580.9	23404.6
Rye	144.3	148.7	138.5	172.0	102.0
Oats	209.3	197.2	199.6	178.1	154.0
Buckwheat	154.3	112.2	83.6	89.5	121.3
Sorghum	74.1	42.4	48.7	42.0	15.7
Millet	108.5	54.9	159.3	82.9	50.9
Beans	35.8	40.4	48.5	48.5	37.5
Peas	239.6	431.7	238.9	242.8	131.3
Vetch	12.5	4.4	3.0	2.5	1.5
Lupine	20.7	8.7	5.0	3.4	1.3
Chickpeas	7.3	46.9	11.5	8.5	3.4
Flaxseed	68.4	31.5	13.8	27.7	33.1
Mustard	45.2	57.2	24.7	20.8	19.0
Long flax	1.7	1.2	...*	0.5	...*
Hemp	2.8	1.1	1.8	2.0	1.4
Coriander	21.5	5.4	3.9	9.4	4.1
Medicinal plants	7.3	4.5	5.9	3.8	1.8

* The data is not made public to ensure compliance with the requirements of the Law of Ukraine "On State Statistics" regarding the confidentiality of statistical information.

Source: compiled according to the State Statistics Service of Ukraine.

Due to logistical difficulties during the wartime period, the situation will change - the area under the main industrial crops will increase at the expense of corn and wheat, but there is also a possibility of expanding production of niche crops.

In particular, experts expect the trend towards growing niche crops to increase in 2023. Reducing the area under grain crops and, probably, sunflower, producers will replace them with niche crops, such as mustard, flax, millet, sorghum, vegetables, etc.³. The cultivation of individual niche crops can provide a fairly high return on small areas. This line of economic activities is suitable for both small and medium-sized agricultural producers who are currently suffering from low commodity prices and logistical problems when growing traditional crops.

Export prices for these products tend to increase over the long term. The pre-war period was characterized by rising global food prices, which was also true for niche crops. In 2022, export prices for these niche crops remained high (Table 2).

³ A trend towards growing niche crops is emerging in Ukraine. 2023. Retrieved from <https://www.growhow.in.ua/v-ukraini-formuietsia-trend-do-vyroshchuvannia-nishevyykh-kultur/>

Table 2

Exports of major niche crops from Ukraine

Indicator	2016		2021		2022		The first quarter of 2023	
	Volume, cubic meters	Price, USD per 1 tonne	Volume, cubic meters	Price, USD per 1 tonne	Volume, cubic meters	Price, USD per 1 tonne	Volume, cubic meters	Price, USD per 1 tonne
Rye	6142.7	153.7	136666.4	205.5	52757.4	220.0	5191.2	216.2
Oats	41759.3	136.5	16761.1	240.9	7146.5	229.6	96.6	187.3
Buckwheat	546.7	492.2	1016.1	748.1	371.5	717.2	–	–
Sorghum	93222.9	144.2	59892.5	234.1	71224.9	237.1	39646.6	225.9
Lentils	1040.4	510.5	4196.1	704.5	1154.9	658.4	428.9	493.5
Common beans	11189.1	534.6	7226.1	956.8	19379.1	900.2	3431.0	966.5
Peas	358525.5	297.2	340540.5	340.4	165286.8	323.0	63541.0	316.4
Garlic	195.1	1466.3	406.1	2078.9	51.3	4018.2	0.2	3630.0
Chickpeas	6183.6	612.5	20634.0	580.1	4521.2	749.6	1054.8	712.1

Source: compiled by the authors based on data from the State Statistics Service of Ukraine.

Like any crops, niche crops pose both opportunities and risks for producers. When starting to produce such crops, it is advisable to assess the prospects and anticipate these risks in advance.

The main advantages of growing niche crops include the following:

- high selling price compared to traditional crops. Some crops are quite specific in terms of the knowledge of agricultural technology, but if the technology is followed, they can provide a fairly high level of profitability. This is particularly true for oilseed poppies, peanuts, spices and other niche crops;

- their relatively better adaptability to modern weather and climate conditions. For example, sorghum can be included in crop rotations as a drought-resistant crop in regions that suffer from moisture deficits (crop rotation balancing);

- low competition in the market due to a small number of producers⁴.

The main risks of growing niche crops include the following: the need for knowledge of the peculiarities of agricultural cultivation techniques and the use of new machines and tools for harvesting them; high production costs, which are

⁴ Niche crops: advantages, risks, opportunities in the season-2023. *Superagronom.com*. Retrieved from <https://superagronom.com/blog/926-nishevi-kulturi-perevagi-riziki-mojlivosti-v-sezoni-2023>



offset by the high price of their sale on the market; high price volatility due to small volumes of demand and rapid changes in supply; limited market liquidity, which makes it difficult to plan sales depending on market needs [4].

The most important groups of niche crops include pulses, vegetables, energy crops, and ornamental and medicinal plants.

Leguminous niche crops. In Ukraine, pulses are mainly niche crops and occupy a small share in the crop structure (1.1% in 2021). However, a global trend that needs to be taken into account is the growing support for pulses, with farmers around the world showing interest in growing soya beans, peas, beans and clover. Most pulses concentrate nitrogen-fixing bacteria on their roots and are an important source of chemically active nitrogen in terrestrial ecosystems. Due to this, legumes are grown both as predecessor plants and as main crops [11].

Pulses - due to their high vegetable protein content - can be a complete substitute for animal protein. That is why crops such as peas, chickpeas, beans, soybeans and lentils play a significant role in the diets of people in developing countries, while their share in the diets of people in developed countries is also growing (due to the growing demand for healthy food). As the world's population grows, so does the demand for pulses.

Ukrainian farmers are actively involved in the production of the most profitable pulses. Chickpeas may become one of the most promising crops due to strong demand in Asia and North Africa. Demand for this crop is also growing in Europe.

Chickpea is a cold-resistant crop that also grows well at high temperatures. Due to its early harvest, it is a good precursor for cereals, especially winter wheat, which yields after chickpeas almost the same as it does after fallow. Chickpeas are not yet widespread among Ukrainian farmers due to a lack of knowledge and experience in growing technology, and a lack of compliance with the required quality of the final product. However, it continues to be purchased, albeit in small volumes. In 2022, chickpea acreage was 3.4 thousand hectares.

Beans remain one of the most popular legumes. It is grown mainly by small and medium-sized farms. The quality of Ukrainian beans is quite high, so demand, including export demand, for this crop is stable. However, this is a very specific niche market that is entirely buyer-driven, depending on the color and shape of the beans⁵.

Although the agri-food sector follows Ricardo's Law of Comparative Advantage and specializes in crops that grow particularly well in the region and generate the highest profits, the case for change is strong, as the existing agricultural specialization has negative consequences for the nature and sustainability of the system. Expanding the production of niche pulses could be part of a broader sustainable development strategy, with a shift in diet in their favor setting the stage for such change. The strategic challenge is to diversify cropping

⁵ Niche crops: advantages, risks, opportunities in the season-2023. *Superagronom.com*. Retrieved from <https://superagronom.com/blog/926-nishevi-kulturi-perevagi-riziki-mojlivosti-v-sezoni-2023>

systems with pulses while avoiding negative impacts on production efficiency and food security. Therefore, when justifying the choice of pulses, one should start from the potential of their resource efficiency in each region and their competitiveness in terms of yield relative to the main crops at the level of individual farms.

Vegetable niche crops. One of the most promising areas for growing niche crops is vegetable growing, which is labor-intensive and requires significant investment. However, the introduction of mechanized procedures, such as the use of seeders, sprayers, moulders, etc., and a sustainable approach to production (e.g. growing vegetables in intercropping systems, which helps control pests of main crops), reduce costs. The sustainability inherent in vegetable production reduces the negative environmental impact of agriculture.

Growing niche vegetables is part of conservation agriculture. Crop rotation in vegetable production maintains soil structure and its organic components, reducing the number of local soil pathogens while increasing the number of nitrogen-fixing microbes, controls soil erosion and increases biodiversity [12]. Due to these benefits, the use of vegetables in crop rotation is a common practice in organic agriculture. However, the use of crop rotations can usually be carried out by large-scale vegetable producers due to their larger land areas. At the same time, the sale of niche vegetable crops does not require the formation of large commercial batches, as the demand for them is lower, which makes it possible to introduce crop rotations even on small plots.

The barriers to scaling up sustainable vegetable production, including niche vegetables, include: a lack of knowledge; high labor demand; income-related factors (purchase of equipment and its maintenance, lack of access to credit); production-related factors (yields and access to quality seeds); lack of support for extension and stimulating agricultural policies. Currently, farmers have access to quality seeds from reliable producers who create hybrids that cannot be used by farmers in subsequent production cycles [13], which increases production risks. In Ukraine, small and medium-sized farms that decide to grow niche crops can obtain information on officially registered and approved plant varieties from the State Register of Plant Varieties [17].

In the pre-war period in Ukraine, the cultivation of niche vegetable crops was associated with both common and uncommon plants. For example, such plants as indau sowing (arugula), asparagus, chard (beetroot), and sweet potato are well-known and even quite common crops in Ukraine. Okra, daikon radish, fennel, spikelet mallow, double monarda and many others are just entering the culture of consumption and have great prospects. For example, okra is a tasty and healthy vegetable plant whose fruits have a delicate taste and whose seed cultivation technology is simple, as is the case with most vegetable crops.

However, farms that want to engage in them for the first time should approach this with certain reservations - to study the sales market and prices and develop a business plan, and to develop technology and agricultural techniques for growing on small areas. In general, certain niche crops are quite high-margin, but



high revenues are possible only if cultivation technologies are followed and high yields are achieved⁶.

Demand for asparagus, sweet potatoes, and Jerusalem artichokes is growing globally. For several years, asparagus has been a trend in niche Ukrainian agricultural production, while the niche for sweet potato (yam) remains virtually empty. Today, the niche for asparagus has a smaller niche for purple asparagus, which is in particular demand among healthy eating advocates in developed countries.

Ukrainian producers are only just beginning to develop sweet potato cultivation. The root vegetable is not demanding on weather conditions and does not require any special chemical treatment, but it is picky about water supply. The experience of domestic producers shows that growing sweet potatoes is profitable. Their production is mainly suitable for small farms, as the crop requires considerable manual labor⁷.

Jerusalem artichoke, or earthen pear, is currently seen as a plant for summer residents or a niche vegetable for healthy eating, but it has a potential not only as a food crop but also as a fodder crop, bioenergy crop and technical crop. The vegetable is a promising bioenergy crop, with 1 tonne of root crops producing 100 liters of high-quality ethanol. Jerusalem artichoke can be grown both in small areas and on the scale of large agricultural enterprises⁸.

Jerusalem artichoke products are not in great demand in Ukraine, while they are in demand abroad, particularly in the pharmaceutical industry. Jerusalem artichoke tubers are used to extract inulin, which is used in the production of medicines. Despite the fact that Jerusalem artichoke is a fairly unpretentious plant, few farms grow it⁹.

In view of the above, growing niche vegetable crops may become attractive for Ukrainian small producers. For example, their experience shows that retail chains are closely linked to small vegetable growers, due to the following factors: small farms provide most of the supply and have a wide range of products, and lower labor costs, and offer less complicated contracts for the purchase of grown products [14]. Another experience is the increase in productivity with the transition from labor-intensive large-scale farming to small farms (0.2 people per 1 ha) in Eastern Europe [15].

⁶ Vegetables are the most profitable area of niche crops. *Growhow.in.ua*. Retrieved from <https://www.growhow.in.ua/ovochi-ie-na-naybilsh-dokhidnym-napriamom-vyroschchuvannia-nishevykh-kultur/>

⁷ No borders and no cost: trends in niche crops. *Raiffeisen.ua*. Retrieved from <https://raiffeisen.ua/biznesu/blog/bez-kordoniv-i-vartosti-trendi-nishevih-kultur-109>

⁸ Jerusalem artichoke fuel pays for its cultivation in full. *Kurkul.com*. Retrieved from <https://kurkul.com/spetsproekty/1429-palivo-z-topinamburu-okupovuyeye-yogoviroschchuvannya-povnistyu--sergiy-kosharuk>

⁹ Niche crops. Is it worth growing sorghum, amaranth and Jerusalem artichoke? *Agravery.com*. Retrieved from <https://agravery.com/uk/posts/author/show?slug=nisevi-kulturi-ci-varto-virosuvati-sorgo-amarant-i-topinambur>



Taking into account the European experience, growing crops, including some vegetables, in combination with the installation of solar panels may be promising in Ukraine. This area of farming development is called Agrovoltatics. This is a relatively new branch of agriculture that began to develop in the 1980s and involves the use of solar panels for agribusiness purposes: for autonomous water and energy supply for agricultural production, increasing crop yields, watering vegetables and fruits, and selling surplus electricity. Agrovoltatics requires significant investments that pay off in the long term, but the payback period may be reduced in the face of rising energy prices. In addition, it allows for the dual use of agricultural land: generating electricity and growing crops. Shaded areas under the panels can be well suited for growing some crops, which is especially true in today's climate change, when the number of sunny days is increasing and the average temperature is rising.

Energy niche crops. Growing niche energy crops can help solve several problems at once: diversifying agricultural production; strengthening the ability of agricultural producers to survive economically in today's increasingly harsh environment; improving the environmental friendliness of the energy sector and the environment; and creating energy independence for rural areas.

In rural areas, the cheapest renewable energy source is agricultural biomass, including both livestock and crop waste and the targeted cultivation of energy crops - fast-growing perennial shrubs and special annual plants with a high dry matter content for use as fuel [10].

Currently, about 20 species of fast-growing plants are known, including eucalyptus, poplar, willow, switch grass, miscanthus, and others. The harvested biomass is used to produce heat and electricity, and can serve as a raw material for the production of solid biofuels¹⁰. These crops, with a clear technology and appropriate yields, can provide a fairly high energy yield per hectare of land. Their main competitive advantage over traditional crops is that their cultivation does not require the use of agricultural land¹¹

Ukraine has about 4 million hectares of parceled out marginal agricultural land that is unprofitable for conventional agriculture, so most of these areas are optimally suited for growing energy crops¹². Energy crops generally provide a harvest for many years in a row. The minimum payback period for typical projects is 2-4 years, but you can harvest from one plot for at least 25 years, spending only on harvesting.

The main factors that hinder the development of niche energy agriculture in Ukraine include: lack of proper experience in growing niche crops; lack of appropriate information and advisory support for those interested in obtaining the necessary information on their cultivation, etc.

¹⁰ Energy plants: 2018. *Salix-energy.com*. Retrieved from <https://www.salix-energy.com>

¹¹ Kernasiuk Yu. *Agro-business.com.ua*. The Prospects for growing energy crops. 2019. Retrieved from <http://agro-business.com.ua>

¹² How much can you earn growing energy crops? *Landlord.ua*. Retrieved from <https://landlord.ua>



When choosing the type of energy crop, producers need to take into account the following factors: natural and climatic zone; annual precipitation; soil composition and quality; air temperature; terrain, etc.

Among the advantages of using energy crops are the following: the possibility to use low-productive and unproductive land for growing bioenergy crops; counteracting soil impoverishment and erosion; reducing deforestation; replacing gas and coal¹³; during the combustion of biofuels based on plant biomass, less carbon dioxide is emitted into the atmosphere than is absorbed by plants in the process of photosynthesis, 20-30 times less sulphur oxide and 3-4 times less ash is formed compared to coal; a by-product of solid biofuels combustion is organic matter that can be used as fertilizer; and low cost of biomass. The cultivation of bioenergy crops, and production and use of biofuels create additional employment for the rural population and are a source of income, particularly in rural areas where there is an acute shortage of jobs¹⁴.

Foreign scientists have studied the existing barriers to the introduction of new crops and sustainable technologies, which has led to the need to develop maps of agro-ecological technologies. Such maps will help producers diversify their production with new crops, including niche crops. The mapping will include a number of items, of which five key ones are mandatory: local agricultural problems and successful business projects; geo-climatic conditions of the region (community); assessment of crop suitability for cultivation; varieties adapted to local conditions; and the economic situation of communities. Such mapping, which includes social preconditions and general characteristics of the region, could help to identify optimal production technologies. The key to mapping is the cooperation of scientific institutions and communities that work directly in the local environment and know the peculiarities of the territory's natural resource potential. This would also facilitate the acceptance and better understanding of the crops and technologies proposed for implementation by local producers [16].

Conclusions

The (post)war development of the agricultural sector will require producers to apply innovative strategies that will involve diversification of economic activities. In the context of climate change and unstable market conditions, niche crops can be an alternative to traditional plants, and scientific assessment of the risks and benefits of growing them proves the prospects of this area.

In the sustainable development of agri-food systems, it is recommended to pay special attention to legumes, which are particularly valuable components of a healthy diet and contribute to the diversification of crops in crop rotation. Pulses make it possible to reduce the use of nitrogen fertilizers and increase the diversity of crops.

¹³ Instead of coal, gas and firewood, we have energy crops *Agroportal.ua*. Retrieved from <http://agroportal.ua>

¹⁴ Roik M.V., Hanzhenko O.M. Agro-industrial energy plantations are the way to Ukraine's energy independence. *Agroprofi.com.ua*. Retrieved from <http://www.agroprofi.com.ua>



Growing niche vegetable crops is a promising area for Ukrainian small producers due to lower labor costs and the ability to respond quickly to changes in demand, provided that their marketing activities are supported. Another important advantage of niche vegetable crops for small producers is the possibility of introducing crop rotations on small plots, as the sale of these products does not require the formation of large batches of goods, due to lower consumer demand.

In the post-war period, it is unlikely that large companies will grow niche energy crops on an industrial scale. However, for small farms looking for inexpensive but profitable crops, niche energy crops can be a reliable alternative. Moreover, in the context of the financial crisis, diversification of production allows maintaining production efficiency. Successful production of niche energy crops can help agricultural producers focus on the quality of their products.

High margins for niche crops can only be achieved if technologies are followed and yields are high. The development of agro-ecological technology maps that contain complete information on the geo-climatic conditions of the area, the suitability of crops for cultivation and their varieties adapted to local conditions would help local producers better understand the possibilities of introducing new crops and technologies.

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(ПО)ВОЄННІ ПЕРСПЕКТИВИ ВИРОЩУВАННЯ НІШЕВИХ КУЛЬТУР В АГРАРНОМУ СЕКТОРІ

Довоєнний розвиток аграрного сектора України здійснювався за моделлю модернізації, заснованої на спеціалізації, інтенсифікації та розширенні масштабів виробництва. Однак європейський

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досвід свідчить, що ця модель життєздатна лише в умовах стабільних ринків. Економічна криза, викликана військовими діями, змушує виробників сільськогосподарської продукції змінювати спеціалізацію на користь диверсифікації виробництва. Одним із шляхів, який дозволяє підвищити економічну стійкість господарств, є розширення їх діяльності за рахунок виробництва нішевих сільськогосподарських культур. У статті розкрито актуальність виробництва нішевих сільськогосподарських культур в умовах (по)військового періоду. Окреслено основні переваги (вища ціна реалізації, краща пристосованість до погоднокліматичних умов, можливості балансування сівозміни, нижча конкуренція на ринку тощо), що формують економічний потенціал зазначених культур, і висвітлено ризики (необхідність особливості агротехнологій, висока собівартість виробництва, висока волатильність цін тощо), що гальмують їх вирощування.

Визначено, що розширення сівозмін за рахунок включення бобових нішевих культур повинно стати частиною більш широкої (по)військової стратегії сталого розвитку аграрного сектора. Вирощування нішевих овочів є складовою ресурсозберігаючого сільського господарства, оскільки сівозміна в овочівництві підтримує структуру ґрунту, контролює його ерозію та збільшує біорізноманіття. Висвітлено перешкоди на шляху поширення виробництва нішевих овочів. Розглянуто нові види овочів, які наразі входять у тренд споживання та мають чималі перспективи (батат, топінамбур тощо). Вказано на можливість адаптації європейського досвіду вирощування деяких овочів у комбінації із встановленням сонячних панелей (агровольтаїка).

В умовах (по)військового відновлення вирощування нішевих енергетичних культур сприятиме забезпеченню диверсифікації сільськогосподарського виробництва, посиленню економічної стійкості сільськогосподарських виробників, підвищенню рівня екологічності галузі енергетики та навколишнього природного середовища, формуванню енергетичної незалежності сільських територій. У статті висвітлено європейський досвід картування агроекологічних технологій, що полегшить агровиробникам впровадження нових культур, зокрема нішевих, та технологій.

Ключові слова: аграрний сектор, сталий розвиток, диверсифікація виробництва, нішеві культури, бобові культури, овочеві культури, енергетичні культури