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ANALYTICAL SUPPORT OF AUDIT AS A TOOL FOR MANAGING CROP PRODUCTION AND EXPORT

Abstract. *The article examines the theoretical and practical aspects of analytical support of audit in the field of crop production and export in the conditions of the current geopolitical situation. The key analytical procedures advisable for application in the audit process within this sector are analyzed, and a systematic approach to the formation of analytical support of audit as a management tool is proposed. The impact of martial law in Ukraine on the functioning of the agricultural sector is considered. The consequences of the impact of the military conflict in the Middle East region on the import of pesticides and chemicals, as well as on the global cost and quality of crop products, are investigated. The key indicators for auditing expenditures on crop protection products have been determined. An important aspect of the article is the study of audit risks related to export operations by analyzing grain exports from Ukraine during 2021–2025. The impact of the transformation of logistics routes and the reduction in export volumes on risk assessment for the purposes of auditing the foreign economic activity of agricultural enterprises was studied.*

Keywords: *analysis, audit, analytical support of audit, crop production, management, production, agribusiness, foreign economic activity, export, import, audit of foreign economic activity, agribusiness enterprise.*

АНАЛІТИЧНЕ ЗАБЕЗПЕЧЕННЯ АУДИТУ ЯК ІНСТРУМЕНТА УПРАВЛІННЯ ВИРОБНИЦТВОМ ТА ЕКСПОРТОМ ПРОДУКЦІЇ РОСЛИННИЦТВА

Анотація. *У статті досліджено теоретичні та практичні аспекти аналітичного забезпечення аудиту у сфері виробництва та експорту продукції рослинництва в умовах сучасної геополітичної ситуації. Проаналізовано ключові аналітичні процедури, які доцільно застосовувати при проведенні аудиту в даній галузі, запропоновано системний підхід до формування аналітичного забезпечення*

аудиту як інструменту управління. Розглянуто вплив воєнного стану в Україні на функціонування аграрного сектору. Досліджено наслідки впливу воєнного конфлікту в регіоні Близького Сходу на імпорт пестицидів та хімічних засобів, а також глобальну собівартість та якість продукції рослинництва. Визначено ключові показники аудиту витрат на засоби захисту продукції рослинництва. Важливим аспектом статті є дослідження ризиків аудиту експортних операцій шляхом аналізу експорту зернових з України у 2021-2025 рр. Досліджено вплив трансформації логістичних маршрутів та скорочення обсягів експорту на оцінку ризиків для цілей аудиту зовнішньоекономічної діяльності агропідприємств.

Ключові слова: *аналіз, аудит, аналітичне забезпечення аудиту, продукція рослинництва, управління, виробництво, агробізнес, зовнішньоекономічна діяльність, експорт, імпорт, аудит зовнішньоекономічної діяльності, підприємство агробізнесу.*

Formulation of the problem. The agricultural sector in the structure of the economy of Ukraine has played a strategic role since the declaration of independence of the country and ensures the food security of the state and the region. Thanks to favorable geographical and climatic conditions, Ukraine is able to provide crop production both for its own needs and for the needs of other countries of the world, which led to the distinction of the sector as key in the structure of the state's economy and made it possible to ensure stable foreign exchange revenues to the State Budget over past decades.

However, since the beginning of the full-scale invasion of the aggressor on the territory of sovereign Ukraine in February 2022, the industry has been operating in difficult conditions and is suffering losses. If in 2021 the share of agriculture in the GDP of Ukraine was about 10.9%, and agricultural exports provided almost 40% of foreign exchange earnings, then already in 2022 the total cultivated area decreased by 20%, and the total direct and indirect losses of the industry exceeded 40 billion US dollars in the first year of the war alone [1; 5].

In addition to the problems that directly complicate the production process, in the conditions of martial law, the issue of effective control and management of enterprises in the agricultural sector is gaining relevance. As a result of constant missile and drone attacks, a large part of agricultural land was damaged, supply chains were destroyed, which led to the weakening of Ukraine's production capacity on the international market. The world community felt upheaval due to the blocking of Ukrainian ports, when grain exports stopped, and the prices of means of production and fuel underwent significant fluctuations.

In the context of these events, audit as a management tool becomes important, turning from a classic means of checking and confirming the reliability of financial statements into a strategic tool for identifying risks and their prevention, evaluating effectiveness and forming a reliable base for management decision-making. The basis of the efficient activity of the control system in the field of crop production is analytical support, which is designed to detect distortions in reporting, assess the compliance of economic activity with established norms and standards, and allows to reduce risks in the activities of enterprises in the agricultural sector.

Due to the dynamic changes in the external environment in which crop production enterprises operate today, the problem of analytical audit support in this field remains insufficiently revealed. The relevance of this study arises as a result of the lack of a comprehensive approach to the assessment of military risks, the unclear formation of analytical tools for the auditor in the agricultural sector, the need to adapt it to adverse conditions in case of disruption of global supply chains and geopolitical threats, etc.

In addition, the situation is complicated by recent instability in the Middle East region. The blocking of the Strait of Hormuz and attacks on key global centers of liquefied gas and oil production, which has led to a significant increase in energy prices around the world, as well as complicated the global supply of agrochemicals, has a direct impact on the cost of production in Ukraine.

Analysis of recent research and publications. The works of many domestic and foreign scientists are devoted to audit issues in the agricultural sector, as well as analytical support of audit activities. Among Ukrainian researchers, N. Vdovenko and V. Margasova made a significant contribution to the development of theoretical and methodical audit principles in the agricultural sector [3], as well as Negoda Yu., Kolesnikova O. [7] et al.

The problems of accounting, analysis and auditing in the agricultural sector were investigated in the works of many Ukrainian scientists. In particular, the issue of cost accounting and cost analysis of crop production was considered in the works of Orel V., Orel A., Golovnina O. [8]. The work of Mulyk Ya. is devoted to the issues of forming an internal control system at enterprises, including the agricultural sector [6].

Foreign researchers, including Arens A., Elder R., Beasley M., Hogan C., have developed fundamental concepts of audit procedures that form the basis for analytical audit support [10]. Issues of the application of

analytical procedures in auditing are reflected in International Standards on Auditing (ISA), in particular ISA 520 «Analytical procedures», ISA 315 «Identification and assessing the risks of material misstatement» and ISA 330 «The Auditor's Responses to Assessed Risks» [4; 15].

The influence of global geopolitical factors on the functioning of agricultural markets, including the consequences of grain agreements and the instability of the supply of agrochemicals, is highlighted in analytical reports of the Center for Strategic and International Studies (CSIS) and the International Institute for Food Policy Research (IFPRI), etc.

However, despite significant scientific developments, the issues of adapting the analytical support of crop production audits to the conditions of a long military conflict, radical changes in the logistics of grain exports and the instability of global supply chains of agrochemicals still remain insufficiently researched. In particular, the issue of the impact of interruptions in the supply of pesticides and chemical plant protection products from the countries of the Middle East on the formation of the cost of crop production and on the reliability of audit conclusions in this area was not sufficiently covered in the scientific literature. These gaps make further research required.

The purpose of the article is to highlight the theoretical foundations and develop practical approaches to the formation of analytical audit tools as an instrument for managing the production of crop products in the conditions of geopolitical challenges and transformations of the global economic environment caused by the instability of international markets.

The main material presentation. Audit as a form of independent financial control plays a key role in the management system of enterprises of the agricultural sector. In accordance with ISA 200 «Overall Objectives of the Independent Auditor and the Conduct of an Audit in Accordance with International Standards on Auditing», the purpose of auditing financial statements is to increase the degree of trust of intended users to financial statements [4, p. 11]. For enterprises engaged in the production of crop products, this becomes especially important in the context of attracting investments, obtaining loans and participating in state programs aimed at supporting the agricultural sector.

Analytical support of an audit is a set of methods, techniques and analysis tools used by the auditor in order to obtain sufficient and acceptable audit evidence. Accounting and analytical support is the key to effective strategic management, because this system allows to evaluate economic, corporate, and social results, affects the development of quantitative and qualitative performance indicators, and promotes the adoption of complex management decisions [9, c. 6]. In a broad sense, analytical support covers:

- methods of horizontal and vertical analysis of financial statements;
- coefficient analysis of economic activity indicators;
- trend analysis of the dynamics of production indicators;
- benchmarking with sectoral indicators and regulations;
- factor analysis of deviations of actual results and indicators from planned ones.

The specificity of crop production as a branch of agricultural production lies in the seasonal nature of activity, significant dependence on natural and climatic conditions, a long production cycle and the significant influence of external factors on the formation of the cost of production, as well as market conditions or changes in state policy [3, c. 78]. These features determine the specifics of the analytical procedures used in industry auditing.

According to ISA 520 «Analytical procedures», analytical procedures include the assessment of financial information through the analysis of plausible relationships between financial and non-financial data [15, p. 89]. In the context of the crop audit, analytical procedures are applied in three main stages:

1. At the planning stage - to understand the client's activities, identify the risks of significant distortion and determine the priority directions of the audit.

2. At the execution stage - as substantive audit procedures for obtaining evidence of the reliability of individual reporting items.

3. At the final stage - to form a general conclusion on the compliance of financial statements with the established criteria.

The key element of analytical support for crop production audit is the assessment of the cost of production. The cost structure in crop production is characterized by a high share of material components — seeds and planting material, mineral fertilizers, plant protection products, fuel and lubricants, — which collectively account for the majority of the production cost. Accrual labour costs, depreciation of fixed assets, services of outside entities and general production costs form the rest of the structure [3; 8].

Due to logistical restrictions, the enemy blocking supply logs and the destruction of infrastructure, Ukrainian agricultural exports suffered significant losses. During the three pre-war years, on average, the monthly volume of exports of grain and oil crops reached more than 5.3 million tons, and more than 90% of production was transported through Black Sea ports [12]. Already in the first year of the full-scale invasion,

the volume of exports significantly decreased due to the blockade of Ukrainian ports, the occupation of a vast part of agricultural land and the destruction of transport infrastructure, causing losses to the agricultural sector of more than 80 billion US dollars in the first years of the war. Despite this, Ukraine has maintained a strong position on the world agricultural market, in the 2024/2025 marketing year the share of world exports of sunflower meal exceeded 40%, sunflower oil – 35%, and rapeseed – almost 16% [5, p. 4].

The grain agreement concluded in July 2022 between Ukraine, Turkey, the UN and the russian federation, officially known as the Black Sea Grain Initiative, became an unprecedented mechanism for restoring part of Ukrainian agricultural exports in the conditions of active hostilities. By August 2023, when the russian federation finally refused to extend the agreement, thanks to this initiative, more than a thousand ships left Ukrainian ports, removing almost 33 million tons of grain, oil crops and other food products [12; 21].

After the withdrawal of the russian federation from the agreement, Ukraine developed its own sea corridor along the territorial waters of neighboring states to the Bosphorus. Thanks to this, the marketing year 2023-2024 ended at the level of 51 million tons of grain and oil exports - more than in the previous season. However, the marketing year 2024/2025 showed a decrease to 46.7 million tons due to a smaller harvest because of the drought and the introduction of tariff quotas for Ukrainian grain by the European Union. The current 2025/2026 season, as projected by the Ukrainian Grain Association, could return to a level of 49 million tons thanks to a better corn harvest - 32 million tons versus 25.9 million tons in 2024 - however, the implementation of this scenario depends on solving serious logistical problems [13]. As of March 2026, actual exports in the 2025/26 season were 22.32 million tons, down 24.6% from the previous season's similar figure, primarily due to russian attacks on port and railway infrastructure and a record EU wheat harvest (134.4 million tons in 2025), which reduced import demand [18; 19].

For auditors auditing crop production enterprises, the functioning and transformation of grain agreements have created a fundamentally new analytical reality. First, it became much more difficult to confirm the reality of business operations for the export of products, because logistic chains included many intermediaries, new routes and non-standard settlement conditions [21]. Secondly, fluctuations in cereal prices on world markets have acquired extreme volatility, which has made it difficult to apply analytical comparison procedures.

For audit purposes, these trends created specific risks of significant distortion in the following areas of accounting:

- Revenue recognition - the difficulty of determining the moment of risks and benefits transition under atypical conditions of transportation and cargo insurance. Attacks on vessels in the Black Sea and an increase of insurance premiums of 30% or more during crisis periods directly affect the accounting of implementation costs [21];
- Estimation of stocks - the need to reflect grain losses due to damage during storage or transportation in conditions of military operations. Ukraine's agricultural sector suffered losses of more than $40.2 billion in the first year of the war alone [1, p. 2];
- Exchange rates differences - significant fluctuations in exchange rates when settling grain contracts in foreign currency;К
- Receivables - risks of insolvency of counterparties and the difficulty of assessing the reserve of doubtful debts under contracts with new sales markets.

An analytical procedure that allows to effectively identify risks in this area is an analysis of the ratio of sales revenue to the volume of manufactured products in natural terms. Significant deviations of this indicator from the expected values calculated on the basis of market prices of the corresponding period may indicate non-recognition of part of the revenue or incorrect assessment of the sold products.

The dynamics of the volume of Ukrainian grain and oil exports in the marketing years 2020/2021 – 2025/2026 are reflected in fig. 1.

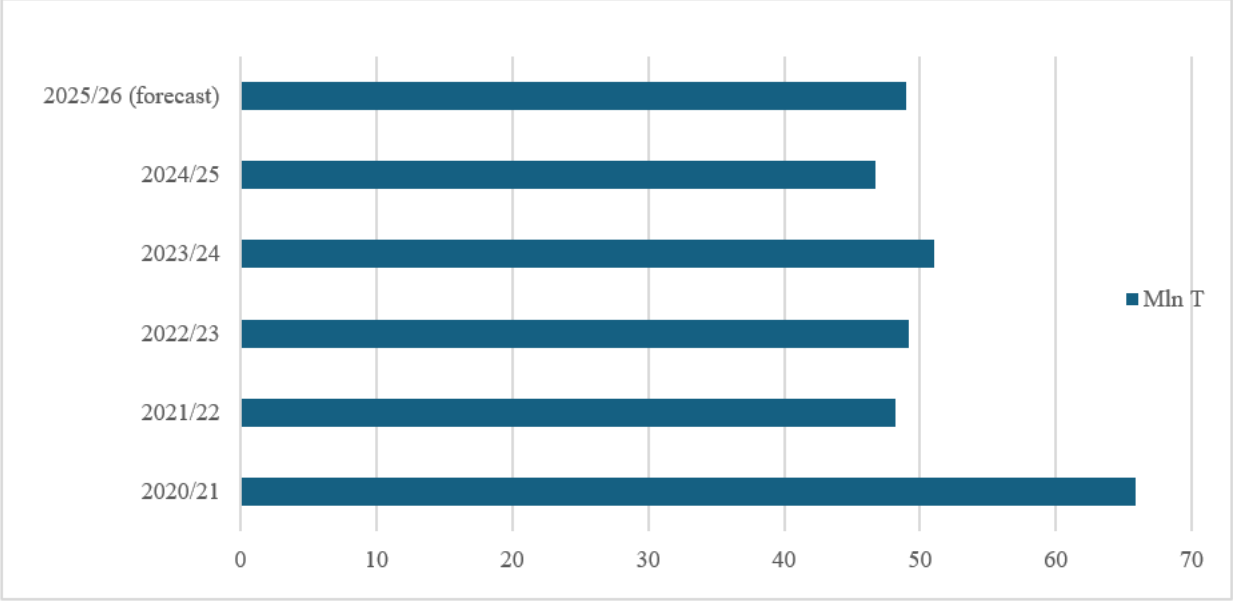

Fig. 1. Dynamics of grain export volumes from Ukraine in 2021–2026 (million tons)
Source: formed by authors on the basis of [12; 19]

The Middle East region occupies an important place in the global production and trade of agrochemical products and chemical raw materials. In particular, the Persian Gulf countries account for up to 30% of world fertilizer trade, and Iran is one of the largest exporters of urea in the region; a significant part of sea cargo flows with agrochemical products passes through the Strait of Hormuz in the direction of world markets [14].

The military conflict over Iran, escalating in 2025, has become a new factor in destabilizing the world's agrochemical supply chains [16]. Iran is one of the key transit and production hubs of the global agrochemical market, and the threat of the closure of the Strait of Hormuz - through which a large part of sea cargo flows from the Persian Gulf passes - has increased uncertainty about the availability of chemical raw materials for the production of pesticides and fertilizers around the world. In parallel, insurance premiums and logistics costs on routes running through the region have increased, which continues to put pressure on the prices of agrochemicals on the world market [16]. In general, geopolitical instability in the Middle East increasingly determines the conditions for the formation of the cost of plant products in countries importing agrochemicals, to which Ukraine belongs.

For Ukrainian agricultural enterprises engaged in the production of crop products, these trends were implemented through:

1. Increase in import prices for pesticides and plant protection products - the share of these costs in the cost structure increased from 11.2% in 2021 to 18.1% in 2024.
2. Extending the supply of agrochemical products and the need in forming larger insurance reserves, which increases the need in working capital.
3. Violation of the usual contracting schemes and change in the terms of settlements with suppliers, including the transition to advance payments.
4. Increased risk of adulteration of agrochemical products due to market penetration of substandard substitutes from non-traditional supply markets.

USDA's Foreign Agricultural Service 2025/26 MR report noted that Ukraine remains dependent on imports of agrochemicals and fertilizers, with attacks on energy and port infrastructure limiting domestic logistics and increasing the sector's vulnerability to supply disruptions [18]. From an audit point of view, these trends give rise to specific risks associated with the accounting of material costs in crop production. When conducting an inspection of industry enterprises, the auditor must take into account:

- Risk of cost overstatement - artificial overstatement of purchase prices for pesticides due to the involvement of intermediaries or the conclusion of agreements on non-market terms with related parties;
- Risk of understatement of stocks - incorrect assessment of agrochemical residues at the end of the reporting period due to violation of accounting procedures;
- The risk of incorrect display of expenses for future periods - due to the seasonal nature of the use of pesticides, part of the purchased agrochemicals may be unreasonably written off in the wrong reporting period.

Table 1 reflects the main analytical indicators used in the audit of expenditure on plant protection products.

Table 1

Key indicators for the audit of plant protection product expenditure in crop production

Indicator	Calculation formula	Critical deviation value	Possible explanation of significant deviation
Structural costs of pesticides per 1 ha	Expenditure on PPPs /Area of cultivated land	> 15% of the norm	Price overstatement, change in crop structure
Turnover ratio of PPP stocks	alue of PPPs written off/Average PPP balances	< 0.8 or > 3.0	Surplus purchases or understatement of balances
Ratio of PPP costs to revenue	PPP costs /Revenue from sales	> 20% growth y/y	Price shocks, inefficient use
Deviation of purchase prices from market prices	(Purchase price − Market price) /Market price	> 10%	Risk of related parties, falsification
Specific weight of imported PPPs in total costs	Expenditure on imported PPPs / Total PPP costs	Growth > 5 pp. y/y	Analysis of currency risks and supply chains

Source: Compiled by the authors based on the requirements of ISA 520 «Analytical procedures» [15] and approaches to cost accounting and cost analysis of crop production [3; 8].
(PPP — plant protection products)

The formation of an effective system of analytical support for the audit of crop production involves a comprehensive approach that combines the information base, methodical tools and organizational procedures.

The information base of analytical support for crop production audit includes:

- financial statements of the enterprise (balance sheet, income statement, cash flow statement);
- management reports on production activities (agronomic reports, field work logs);
- primary documents confirming business transactions (invoices, acts, contracts);
- state statistical reporting in the field of agricultural production;
- industry regulations and technological maps of crop cultivation;
- data of stock exchange trades and price aggregators on market prices for agricultural products and means of production;
- customs statistics on the import of agrochemicals;
- data of the Ministry of Agrarian Policy and Food regarding the current volumes and rates of grain exports in terms of marketing seasons.

The methodological toolkit of analytical support covers both traditional and industry-specific methods of analysis, which are systematized in Fig. 2.

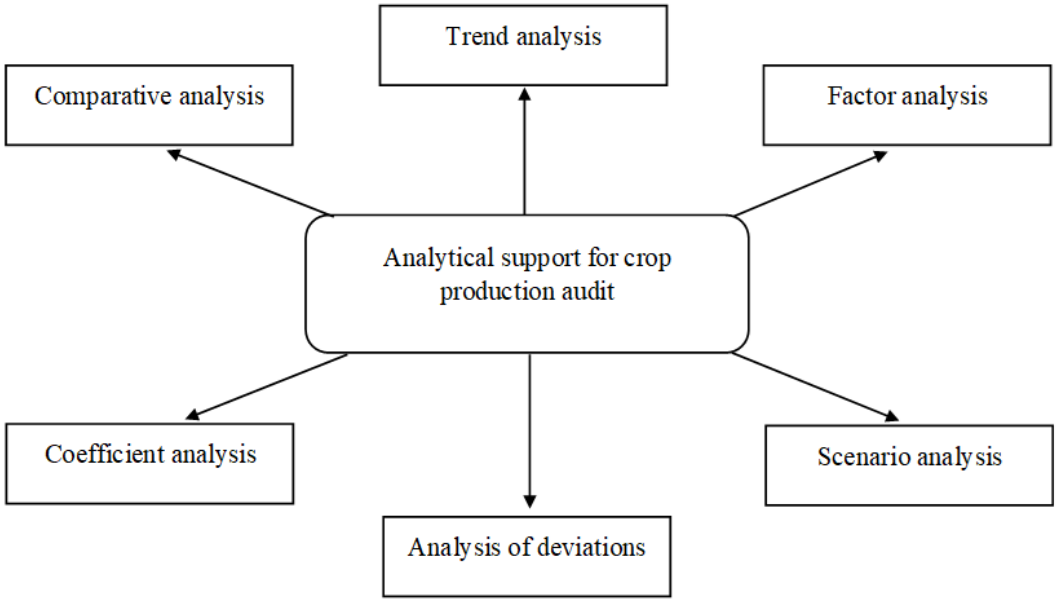

Fig. 2. The main directions of analytical support of audit in the field of crop production
Source: formed by the authors

Among analytical procedures, a special place is occupied by the analysis of deviations of actual production indicators from regulatory or planned values. Technological maps of the cultivation of individual crops determine the regulatory costs for each agronomic measure - soil preparation, sowing, fertilization, pesticide treatment, harvesting. Deviation of actual expenditure from the regulatory is a key indicator requiring verification in the audit process [3; 8].

In a formalized form, the overall deviation of the costs of production of crop products can be presented as follows:

$$\Delta V = Vf - Vn = (Cf - Cn) \times Qf + (Qf - Qn) \times Cn,$$

where:

- ΔV — total deviation of actual costs from standard costs;
- Vf — actual costs;
- Vn — standard costs;
- Cf — actual price per unit of resource;
- Cn — standard price per unit of resource;
- Qf — actual quantity of resources used;
- Qn — standard quantity of resources used.

The first component of the formula reflects the price deviation (the impact of changes in resource prices), and the second - the quantitative deviation (the impact of changes in the volume of resource use). In the face of continued pesticide price volatility caused by geopolitical conflicts in the Middle East, particularly the worsening situation around Iran in 2025, which disrupted global agrochemical supply routes, the price component of the variances assumes particular importance for the audit analysis [9; 10]. The auditor must compare price deviations under article of plant protection products with the dynamics of import prices for agrochemicals according to customs statistics and open price aggregators in order to confirm or deny their validity in the market situation.

To demonstrate the practical application of the model, let us consider a conditional example of analysing the deviation of expenditure on plant protection products (PPPs) for an agricultural enterprise cultivating winter wheat. The initial data for the calculation are summarised in Table 2. The figures are illustrative and reflect the trends described above, namely the price shocks in the agrochemical market, such as the one caused by the disruption of supply chains through the Middle East region.

Table 2

Initial data for the analysis of the deviation of expenditure on plant protection products

Indicator	Standard (Cn, Qn)	Actual (Cf, Qf)
Price per unit of PPPs, UAH/litre	1 200	1 560
Quantity of PPPs used, litres	2 500	2 650
Total cost (V = C × Q), UAH	3 000 000	4 134 000

Source: compiled by the authors (conditional data)
(PPPs — plant protection products)

The total deviation of actual costs from standard costs amounts to: $\Delta V = Vf - Vn = 4\,134\,000 - 3\,000\,000 = 1\,134\,000$ UAH. Decomposing this deviation into its components according to the formula above gives the following result. The price component equals $(Cf - Cn) \times Qf = (1\,560 - 1\,200) \times 2\,650 = 954\,000$ UAH, while the quantitative component equals $(Qf - Qn) \times Cn = (2\,650 - 2\,500) \times 1\,200 = 180\,000$ UAH. The sum of the two components (954 000 + 180 000 = 1 134 000 UAH) corresponds to the total deviation, which confirms the correctness of the calculation.

The interpretation of the obtained results is of decisive importance for the auditor. Of the total cost overrun of 1 134 000 UAH, the price component accounts for 954 000 UAH, or 84.1%, while the quantitative component accounts for only 180 000 UAH, or 15.9%, which means that the increase in expenditure on plant protection products is driven predominantly by the rise in purchase prices rather than by the excessive physical consumption of agrochemicals. The actual price exceeded the standard one by 30% (from 1 200 to 1 560 UAH per litre), whereas the physical quantity used grew by only 6% (from 2 500 to 2 650 litres). The Ratio of PPP costs to revenue and the deviation of purchase prices from market prices indicators presented in Table 1 should be applied in conjunction with this decomposition to determine whether the price deviation is justified.

The practical value of the model for the auditor lies in its ability to direct audit procedures towards the area of greatest risk. Since the price component dominates the deviation, the auditor focuses on verifying the validity of the purchase prices: comparing them with the dynamics of import prices for agrochemicals according to customs statistics and open price aggregators, and assessing whether the increase corresponds to the documented rise in world agrochemical prices caused by the disruption of supply chains through the

Middle East region. If the price growth at the enterprise substantially exceeds the market dynamics, this signals the risk of cost overstatement through the involvement of intermediaries or transactions with related parties on non-market terms. Conversely, a dominant quantitative component would prompt the auditor to examine the technological compliance of consumption with the cultivation maps. Thus, the decomposition of the deviation enables the auditor to allocate effort rationally, justify the selection of procedures in the working documents in accordance with ISA 520 «Analytical procedures», and form a reasoned conclusion on the reliability of the reported expenditure.

Organizational procedures for analytical support of the audit provide for proper documentation of the implemented analytical procedures in the auditor's working documents. According to ISA 230 «Audit documentation», the auditor is required to prepare documentation that would provide an experienced auditor who has no prior connection with the audit with an understanding of the nature, timing and scope of the audit procedures performed [4].

For the purposes of analytical support of crop production audit, it is recommended to develop various forms of auditor's working documents that will allow effective analysis of the structure of costs for the production of crop production in dynamics (including comparison with industry data for the current marketing season), compliance of actual costs for pesticides with regulatory values with an explanation of price deviations, comparison of purchase prices of agrochemicals with market analogues and customs statistics data, compliance of product sales volumes with documented shipments, taking into account the specifics of export routes of the current season, as well as analysis of receivables under product sales contracts with assessment of risks associated with new sales markets and atypical settlement conditions.

In the conditions of a long martial law, the risk management system of agricultural enterprises has undergone significant transformations. The auditor, when assessing the risks of material distortion in accordance with ISA 315 «Identifying and Assessing the Risks of Material Misstatement», must take into account the specific operating conditions of crop production enterprises in conditions of armed conflict [4]. As of the beginning of 2026, after four years of full-scale aggression, such risks have become systemic.

The key risks of significant distortion in the financial statements of crop production enterprises in wartime conditions include:

1. Asset-related risks:

- risk of non-recognition of devaluation of agricultural land in war zones. According to CSIS estimates, mine pollution covers between 1,814 and 9,652 square metres of agricultural land [12];
- the risk of incorrect reflection of crop and crop losses due to hostilities, including underestimating the effects of the 2024 drought, which significantly reduced the maize harvest to 25,9 million tonnes [17];
- risk of overvaluation of agricultural stocks under conditions of a limited sales market and reduced demand from the EU.

2. Income-related risks:

- risk of non-recognition or untimely recognition of income from the sale of products through atypical sales channels. In the conditions of a reduction of grain exports in the 2025/26 season by 24.6% y/y [19], it is especially relevant to check the compliance of the documented volumes of shipments with accounting data;
- risk of incorrect display of insurance indemnities from agricultural insurance;
- risk of underestimation of revenues from state subsidies and grants received as part of programs to support the agricultural sector in wartime conditions.

3. Cost-related risks:

- the risk of overestimation of costs for plant protection products imported under non-standard schemes in conditions of global violations of agrochemical logistics as a result of the Middle East conflict;
- risk of incorrect display of costs for restoration of destroyed infrastructure and evacuation of equipment.

Analytical assessment of the specified risks involves the application of the scenario analysis method - a comparison of actual indicators with several alternative calculation scenarios reflecting different assumptions about the impact of hostilities and external shocks on the economic activity of the enterprise [12]. Taking into account that in January–February 2026, the value of Ukrainian agricultural exports increased by 9.3% y/y with practically unchanged physical volumes [17], the auditor should pay special attention to the analysis of the price component of revenue and its compliance with the market situation.

Conclusions. Analytical support of the audit of crop production is a comprehensive system of methods, techniques and analysis tools that allow the auditor to obtain sufficient and acceptable evidence of the reliability of financial statements of industry enterprises. In the conditions of modern global challenges, this system needs significant expansion and adaptation to the specific operating conditions of enterprises, including taking into account the latest trends of the 2025/26 marketing season.

Grain agreements and their consequences significantly transformed the conditions for the sale of crop products and created new analytical challenges for auditors. The Black Sea Grain Initiative (2022–2023),

the development of Ukraine's own maritime corridor, as well as negative factors of the 2024/25 and 2025/26 seasons - a smaller harvest, EU quotas, attacks on port infrastructure - consistently changed the conditions of export operations and the requirements for their audit verification. As of March 2026, the volume of grain exports in the 2025/26 season lags behind the previous season by 24.6%, which requires increased attention of auditors to risks in the field of revenue recognition and inventory assessment.

Geopolitical instability in the Middle East, including the military conflict over Iran that began in February 2026, has significantly affected global pesticide and plant protection supply chains. The threat of interruptions in the supply of agrochemical raw materials, the growth of insurance premiums and logistics costs on key sea routes affected the prices of agrochemicals around the world. This was reflected in the steady growth of the share of these costs in the structure of the crop production cost in Ukraine. Auditors should pay increased attention to verifying the reasonableness of agrochemical costs by applying a comparative analysis of purchase prices with market counterparts and custom statistics data.

The proposed system of analytical support for crop production audit, which includes a structured information base, methodical tools and standard forms of auditor's working documents, allows to increase the efficiency of the audit and reduce the risk of non-detection of significant distortions in the financial statements of industry enterprises. Special attention is paid to the documents, which provide for the verification of sales volumes taking into account the specifics of routes and the pace of grain exports of the current season.

Future prospects for further research are related to the development of digital tools for analytical support of crop audit, in particular, the use of big data analysis methods and implementing artificial intelligence to identify anomalies in the economic activity of enterprises, as well as the introduction of technical and organizational innovations in conditions of unstable internal and external fluctuations. The introduction of modern technical, technological, organizational and institutional innovations will make it possible to increase the indicators of labor productivity, the quality of agricultural products and the socio-economic level of development of rural areas [2, p. 7]. In this context, the issue of developing auditing practice standards for agro-industrial enterprises in the conditions of martial law is gaining special relevance.

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