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Accounting and analytical support for agricultural monitoring as a tool for improving the performance of agricultural enterprises

Abstract. Agricultural monitoring combines systematic data collection on crop conditions and resource use with accounting frameworks that record financial and operational activities. In Ukraine, effective monitoring systems have become essential for maintaining global competitiveness. The integration of accounting and analytical support transforms raw data into actionable insights, linking financial outcomes directly to farming practices.

Problem statement. The core issue lies in fragmented implementation of monitoring systems across Ukrainian agricultural enterprises. Many farms operate with legacy accounting systems that do not communicate with modern analytical tools such as satellite imagery or soil sensors. Small and medium-sized farms face additional barriers including inadequate internet infrastructure, limited financial resources, and a workforce insufficiently trained in data-driven agriculture.

Unresolved aspects. Key challenges include the lack of standardized data formats for integrating accounting information with precision agriculture technologies, insufficient methodologies for linking financial KPIs to agronomic metrics, and limited research on monitoring system performance under wartime conditions. The role of government support in facilitating technology adoption requires further analysis.

Purpose of the article. To substantiate the strategic role of accounting and analytical support in agricultural monitoring and to propose a structured framework for improving enterprise performance in Ukrainian agricultural enterprises, accounting for technological, economic, and human capital constraints.

Presentation of the main material. The article analyzes accounting functions including cost tracking, inventory management, asset utilization, and budget control as they apply to agricultural monitoring. It examines the use of precision technologies such as satellite imagery, soil sensors, and yield monitors for field-level data collection. Special attention is given to integrating accounting data with analytical outputs through ERP systems, enabling return-on-investment calculations for specific inputs. The study also addresses implementation barriers, phased adoption strategies, and the role of KPIs in measuring financial, operational, and sustainability performance.

Conclusions. Accounting and analytical support for agricultural monitoring enhances enterprise performance, strengthens resource efficiency, and fosters long-term competitiveness in Ukrainian agriculture. A structured integration of financial and agronomic data enables enterprises to navigate uncertainty and achieve sustainable growth in domestic and international markets.

Keywords: *agricultural monitoring, accounting support, analytical systems, precision agriculture, key performance indicators, enterprise performance, digital transformation.*

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Introduction. Ukrainian agricultural enterprises face mounting pressure to improve productivity and resource efficiency while operating within a volatile economic and security environment. Traditional farming practices reliant on intuition and historical records no longer suffice for maintaining competitiveness in international grain and oilseed markets. The adoption of integrated accounting and analytical monitoring systems offers a pathway to data-driven farm management, linking financial performance directly to agronomic outcomes. Through cost accounting, precision technologies, and real-time field data, enterprises can reduce input waste, optimize machinery utilization, and respond proactively to environmental variability.

Regulatory demands for traceability, limited rural digital infrastructure, and a shortage of skilled personnel capable of operating modern analytical tools present significant implementation barriers. Government programs aimed at agricultural digitalization, alongside growing private sector investment in ERP and satellite monitoring, are gradually closing these gaps. This study examines how accounting and analytical support transforms agricultural monitoring in Ukraine, identifies key performance indicators for measuring success, and proposes a phased implementation framework tailored to the financial and operational constraints of small, medium, and large enterprises.

Literature Review. The academic discourse on accounting and analytical support for agricultural monitoring has evolved significantly, reflecting both technological advances and sector-specific pressures in Ukraine. Contemporary research increasingly links financial data systems with field-level agronomic observation to enhance farm performance under conditions of economic instability and integration into European markets.

Strelbitskyi (2024) and Kriukova and Nitsenko (2016) examine how domestic agricultural enterprises adjust their accounting, analysis, and control mechanisms to meet international financial reporting standards. His work identifies five critical adaptation elements: global reporting frameworks, digital information systems, continuous professional training, risk management procedures, and compliance with EU environmental and quality norms. The study argues that successful integration into European markets depends directly on the quality of these interconnected components. Grynchuk (2024) and Nitsenko et al. (2018) focus on the theoretical foundations of financial management support in farming operations. His research breaks down the system into three core elements – accounting, analysis, and internal audit – and defines the target concept as a multi-stage process of collecting, processing, and delivering management information. The author emphasizes comparing system maintenance costs against the income generated from improved decision-making.

Zamlynska and Bezdušnyi (2025) investigate the current state and prospects of agricultural economic statistics in Ukraine. Their proposal organizes support components into accounting,

analytical, informational, regulatory, and methodological blocks. Key improvement directions include digital platform integration, automated statistical reporting, electronic document flow, blockchain technologies, and the Farm Accountancy Data Network (FADN) across institutional, managerial, and operational levels. Sikach (2024) and Ostapenko et al. (2026) explore the essence and structure of accounting and analytical support for entrepreneurial management. The study distinguishes between process-based and system-based approaches, outlines criteria for timely and effective management information, and identifies three main components–accounting, analysis, and audit. The author also examines data collection methods and the specific functions performed by support systems in business operations.

Oliadnichuk, Krochak, and Ketskalo (2025) concentrate on human resource aspects within agricultural enterprises, specifically personnel management, labor accounting, compensation, taxation, and reporting. Their proposed algorithm for forming support systems addresses workforce potential development and offers recommendations for improving procedures and methods to satisfy stakeholder information needs.

Prokopyshyn et al. (2024) develop theoretical foundations for accounting and analytical support in farming enterprise development. Their authorial approach defines the concept as a conceptual model of interconnected procedures that supplies management with necessary information. The study systematizes principles into four clusters: regulatory-legal, general scientific, accounting (financial, tax, managerial, automated), and analytical (sectoral, operational, financial, strategic, statistical).

Bondarenko and Gutsalenko (2025) and Nitsenko and Perevozova (2026) address comprehensive accounting and analytical support for marketing systems on agricultural enterprises. Their research demonstrates how integrating accounting with marketing systems enables responsive demand management, profitability tracking across sales channels, resource forecasting, and precise measurement of marketing expenditure efficiency. The authors highlight the role of ERP and CRM integration in generating multi-level analytics from daily operations to strategic KPIs such as customer acquisition cost and segment profitability. Aksionova (2023) and Nitsenko and Ostapenko (2026) examine monitoring as a modern information support tool for enterprise analytics and management. The study proposes a two-level monitoring system consisting of informational and methodological bases, executing evaluation, analytical, predictive, and managerial functions. The author maps out structural components (databases and knowledge bases) alongside conceptual elements including purpose, object, subjects, principles, and functions, culminating in a model for management decision support.

Kharchenko and Kharchenko (2021) investigate information support for the long-term development of agricultural entrepreneurship. Using integral rating assessments of organizational-legal forms in Chernihiv region, they identify low information provision as a key barrier to effective operation. Their proposed model ensures data dissemination across departments, creates analytical systems for management decisions, and improves information reliability and accessibility at all governance levels.

Taken together, these studies confirm that effective accounting and analytical support for agricultural monitoring depends on integrating financial and field data, adopting international standards, deploying digital technologies, developing workforce competencies, and maintaining adaptive management frameworks. The convergence of ERP systems, precision agriculture tools, unified analytics, and emerging technologies such as blockchain and automated reporting represents the necessary pathway for Ukrainian agricultural enterprises seeking sustainable performance improvements and global competitiveness.

Purpose, objectives and research methods. The study aims to justify the role of integrated accounting and analytical support as a foundational tool for improving performance in Ukrainian agricultural enterprises through systematic monitoring of financial and agronomic data. Given the pressures of post-conflict disruption, resource scarcity, and demanding international quality

standards, farm management requires a cohesive framework that merges cost tracking, precision technology, and sustainability metrics.

Meeting this aim requires addressing several specific objectives:
– to identify key accounting functions (cost control, inventory oversight, asset monitoring, revenue assessment, budget adherence) that directly influence agricultural monitoring effectiveness;

– to examine how precision technologies such as satellite imagery, soil sensors, yield monitors, and drones generate field-level data for integration with financial records;

– to assess barriers including limited rural connectivity, fragmented legacy systems, workforce skill gaps, and geopolitical uncertainty that hinder monitoring adoption;

– to characterize best practices in phased implementation, cloud-based platforms, user engagement, and continuous process refinement for Ukrainian farm conditions;

– to evaluate the link between comprehensive monitoring systems and measurable improvements in enterprise competitiveness, resource efficiency, and long-term viability.

The research employs system analysis, comparative assessment, structural diagnostics, expert input, and inductive reasoning. The methodological foundation rests on an interdisciplinary approach combining management accounting, precision agriculture, performance measurement theory, and agricultural economics. This structure enables a holistic grasp of both quantitative performance indicators and the qualitative drivers of successful monitoring system adoption across Ukraine's agricultural sector.

Results. Agricultural monitoring represents a systematic approach to collecting, analyzing, and interpreting data related to farming operations, crop conditions, resource utilization, and environmental factors. In Ukraine, which ranks among the world's leading agricultural producers with over 32 million hectares of arable land, effective monitoring systems have become essential for maintaining competitiveness in global markets. The integration of accounting and analytical support into agricultural monitoring frameworks enables enterprises to make data-driven decisions, optimize resource allocation, and respond proactively to market fluctuations and environmental challenges (Cabinet of Ministers of Ukraine, 2025). This comprehensive approach combines traditional accounting practices with modern analytical tools to create a robust system for performance improvement. Within this framework, accounting systems serve as the foundational infrastructure by providing structured frameworks for recording, classifying, and reporting financial and operational data. In Ukrainian agricultural enterprises, accounting support encompasses cost accounting for various farming activities, inventory management for seeds and fertilizers, asset tracking for machinery and land, and revenue recognition from crop sales and livestock production. Modern accounting practices have evolved beyond simple bookkeeping to include management accounting techniques that generate actionable insights for decision-makers. The integration of accounting data with field-level monitoring creates a comprehensive view of enterprise performance that links financial outcomes directly to agricultural practices and environmental conditions (Sorokivska, 2024). The specific accounting functions, their monitoring applications, and their performance impacts are presented below in Table 1.

Table 1. Accounting functions, monitoring applications, and performance impact in agricultural enterprises

Accounting Function	Monitoring Application	Performance Impact
Cost Accounting	Tracking input costs per hectare	Identifies cost-saving opportunities
Inventory Management	Monitoring seed, fertilizer, and chemical stocks	Prevents shortages and reduces waste
Asset Tracking	Recording machinery usage and depreciation	Optimizes equipment utilization
Revenue Analysis	Analyzing yield and price data	Improves pricing and marketing strategies
Budget Control	Comparing actual vs. planned expenditures	Enhances financial discipline

Source: built using (Sorokivska, 2024).

Beyond the traditional accounting functions discussed above, the analytical component of agricultural monitoring leverages advanced technologies and methodologies to transform raw data into meaningful insights that drive performance improvements. Ukrainian agricultural enterprises increasingly adopt precision agriculture technologies, including GPS-guided equipment, drone imagery, soil sensors, and satellite monitoring systems that generate vast amounts of data requiring sophisticated analytical processing. Statistical analysis, predictive modeling, and machine learning algorithms help identify patterns in crop performance, detect early signs of disease or pest infestations, and forecast yields with greater accuracy. Geographic Information Systems (GIS) enable spatial analysis of field variability, allowing farmers to implement variable-rate applications of inputs based on specific field conditions rather than uniform treatments across entire parcels (Ministry of Digital Transformation of Ukraine, 2024). Table 2 summarizes the key analytical technologies, the types of data they generate, and the corresponding decision-support functions they enable.

Table 2. Analytical technologies, generated data types, and decision support functions

Analytical Technology	Data Generated	Decision Support
Satellite Imagery	Vegetation indices, crop health maps	Identifies stressed areas requiring attention
Soil Sensors	Moisture, nutrient, pH levels	Optimizes irrigation and fertilization
Weather Stations	Temperature, precipitation, humidity	Supports planting and harvesting timing
Yield Monitors	Harvest data by location	Creates yield maps for analysis
Drones	High-resolution field imagery	Enables detailed crop scouting

Source: built using (Ministry of Digital Transformation of Ukraine, 2024).

Having examined accounting and analytical components separately, it becomes necessary to consider how they function together. The true power of agricultural monitoring emerges when accounting and analytical systems are integrated into a unified platform that provides holistic visibility into enterprise operations. This integration enables Ukrainian farmers to connect financial performance metrics with agronomic data, revealing relationships between input investments and output results that might otherwise remain hidden. For example, by linking fertilizer purchase records from accounting systems with soil test results and yield data from analytical tools, managers can calculate precise return-on-investment figures for different fertilization strategies across various soil types and crop rotations. Enterprise Resource Planning (ERP) systems designed specifically for agriculture facilitate this integration by providing centralized databases, standardized data formats, and automated workflows that ensure information flows seamlessly between accounting, operations, and analytical modules. However, the implementation of integrated monitoring systems requires careful attention to data quality, system interoperability, and user training to ensure that the technology delivers its promised benefits (Stender & Balla, 2026). Ukrainian agricultural enterprises face challenges including legacy systems that do not communicate effectively, data entry errors that compromise analytical accuracy, and resistance from employees accustomed to traditional methods. Successful integration strategies typically involve phased implementation approaches that begin with core accounting functions, gradually add analytical capabilities, and continuously refine processes based on user feedback. Cloud-based platforms have gained popularity because they reduce infrastructure costs, enable remote access for field personnel, and facilitate automatic updates that keep systems current with evolving best practices and regulatory requirements.

Once the integration of accounting and analytical systems is established, the next logical question concerns what exactly should be measured. Effective agricultural monitoring systems rely on well-defined performance metrics and Key Performance Indicators (KPIs) that provide objective measures of enterprise success across financial, operational, and sustainability dimensions. Financial KPIs include metrics such as return on assets, profit margins by crop or livestock

enterprise, cost per unit of production, and working capital efficiency that reveal the economic health of the operation. Operational KPIs focus on productivity measures like yield per hectare, feed conversion ratios for livestock, machinery utilization rates, and labor productivity that indicate how efficiently resources are being deployed. Sustainability KPIs have gained importance as Ukrainian agriculture seeks to meet international environmental standards, encompassing metrics for soil health, water use efficiency, carbon footprint, and biodiversity preservation that demonstrate responsible stewardship of natural resources (KSE Agrocenter, 2024). The data in Table 3 provide a structured overview of KPI categories, example metrics, and corresponding improvement strategies.

Table 3. Key performance indicator categories, example metrics, and improvement strategies

KPI Category	Example Metrics	Improvement Strategy
Financial Performance	Net profit margin, ROA, debt-to-equity ratio	Cost reduction, revenue optimization
Crop Productivity	Yield per hectare, quality grades achieved	Precision agriculture, improved varieties
Resource Efficiency	Fuel consumption per hectare, water use per ton	Technology adoption, process optimization
Labor Management	Output per worker, labor cost percentage	Training, mechanization
Sustainability	Soil organic matter, nitrogen use efficiency	Conservation practices, precision application

Source: built using (KSE Agrocenter, 2024, UGA Strategy, 2024)

Despite the clear benefits of such measurement frameworks, Ukrainian agricultural enterprises encounter numerous challenges that complicate the implementation and utilization of comprehensive monitoring systems, ranging from economic constraints to infrastructure limitations and geopolitical uncertainties. The ongoing conflict situation has disrupted supply chains, damaged infrastructure, and created uncertainty that makes long-term planning difficult, while also highlighting the critical importance of efficient resource management during times of scarcity. Many small and medium-sized farms lack the financial resources to invest in advanced monitoring technologies, creating a digital divide where larger corporate farms gain competitive advantages through superior information systems. Additionally, rural areas often suffer from inadequate internet connectivity, making cloud-based solutions impractical and limiting access to real-time data that could inform time-sensitive decisions about planting, spraying, or harvesting operations (Wikifarmer, 2024). These infrastructural problems are compounded by human capital challenges, as many agricultural workers and managers lack the technical skills required to operate complex analytical tools or interpret the insights they generate. The agricultural education system in Ukraine has been slow to incorporate data analytics, precision agriculture, and modern accounting information systems into curricula, resulting in a workforce that may be highly knowledgeable about traditional farming practices but unprepared for data-driven agriculture. Brain drain compounds this problem, as young, tech-savvy professionals often seek opportunities in urban areas or abroad rather than pursuing careers in rural agricultural enterprises. Addressing these human capital gaps requires coordinated efforts involving educational institutions, industry associations, and government agencies to develop training programs, create attractive career pathways, and demonstrate the value that monitoring systems bring to farm profitability and sustainability.

Given these challenges, it is essential to identify what actually works in practice. Successful implementation of accounting and analytical support systems for agricultural monitoring follows several best practices that have been validated through experience across diverse farming operations in Ukraine and internationally. Starting with clear objectives and well-defined use cases helps ensure that technology investments align with actual business needs rather than pursuing innovation for its own sake. Enterprises should conduct thorough needs assessments to identify their most pressing information gaps and prioritize monitoring capabilities that address those gaps with the highest potential return on investment. Pilot projects on limited acreage or with specific crop

enterprises allow organizations to test systems, refine processes, and build internal expertise before committing to enterprise-wide deployment. Engaging end-users throughout the design and implementation process increases adoption rates by ensuring that systems are intuitive, address real workflow challenges, and provide outputs that users find genuinely valuable for their daily decision-making (EU Space Agency, 2025). Table 4 organizes these best practices into a phased implementation framework, showing key activities and success factors at each stage.

Table 4. Implementation phases, key activities, and success factors for agricultural monitoring systems

Implementation Phase	Key Activities	Success Factors
Planning	Needs assessment, vendor selection, budget allocation	Stakeholder engagement, realistic timelines
Pilot Testing	Limited deployment, process refinement, training	User feedback incorporation, performance measurement
Scaling	Enterprise-wide rollout, integration with existing systems	Change management, technical support
Optimization	Continuous improvement, advanced feature adoption	Regular review, staff development
Maintenance	System updates, data quality monitoring, user support	Dedicated resources, documentation

Source: authors' developed

When these best practices are followed systematically, the results become measurable across multiple dimensions. The implementation of comprehensive accounting and analytical support for agricultural monitoring delivers measurable improvements in enterprise performance across multiple dimensions that collectively enhance competitiveness in increasingly demanding markets. Financial performance benefits include reduced input costs through precision application technologies that eliminate waste, improved cash flow management through better inventory control and sales timing, and enhanced access to credit as lenders view data-driven operations as lower risk (Ryzhykova, Birchenko, & Ostapenko, 2024). Operational improvements manifest as higher yields through optimized agronomic practices, reduced crop losses from timely pest and disease interventions, and better resource utilization through data-informed scheduling of field operations. Strategic advantages emerge as monitoring systems enable scenario planning, risk assessment, and market opportunity identification that position enterprises to capitalize on favorable conditions and mitigate adverse situations before they escalate into crises. These enterprise-level benefits, in turn, aggregate into sector-wide advantages. Beyond individual enterprise benefits, widespread adoption of agricultural monitoring systems contributes to the overall competitiveness and sustainability of Ukraine's agricultural sector in global markets. International buyers increasingly demand traceability, sustainability certifications, and quality assurance that are difficult to provide without robust monitoring and documentation systems (Brandon Bioscience, 2024). Ukrainian agricultural exports, particularly grains and oilseeds destined for European and Asian markets, face growing scrutiny regarding environmental practices, food safety standards, and social responsibility that comprehensive monitoring systems help address. The data generated through monitoring also supports policy development, enabling government agencies to make evidence-based decisions about agricultural support programs, environmental regulations, and infrastructure investments. As climate change introduces greater variability and uncertainty into agricultural production, the adaptive capacity provided by sophisticated monitoring and analytical systems becomes not merely advantageous but essential for long-term viability.

Looking toward the horizon, it is clear that current capabilities represent only a starting point. The future of agricultural monitoring in Ukraine will be shaped by emerging technologies and evolving market demands that create both opportunities and imperatives for continued innovation in accounting and analytical support systems. Artificial intelligence and machine learning applications are advancing rapidly, offering capabilities for automated crop disease diagnosis from imagery,

predictive yield modeling that accounts for complex interactions among weather, soil, and management factors, and optimization algorithms that recommend ideal input combinations for specific field conditions. Blockchain technology presents opportunities for creating immutable records of agricultural practices and product provenance that could enhance market access and premium pricing for Ukrainian commodities. The Internet of Things (IoT) continues to expand, with increasingly affordable sensors and connectivity solutions that make real-time monitoring accessible to smaller operations that previously could not justify the investment in such technologies. As these technologies mature and become more accessible, Ukrainian agricultural enterprises that have established strong foundations in accounting and analytical support will be well-positioned to adopt advanced capabilities and maintain competitive advantages (ScienceDirect, 2025). Furthermore, the integration of monitoring systems with broader agricultural value chains, connecting farmers with input suppliers, logistics providers, processors, and end markets through digital platforms, represents a transformative opportunity to increase efficiency and value capture across the entire sector. Government support for digital agriculture infrastructure, including rural broadband expansion, data standards development, and training programs, will be critical for ensuring that monitoring technologies benefit the full spectrum of agricultural enterprises rather than only the largest and most technologically sophisticated operations. Ultimately, the continued evolution of accounting and analytical support for agricultural monitoring will play a central role in Ukraine's agricultural sector achieving its potential as a sustainable, profitable, and globally competitive industry.

Discussion. The findings confirm that effective agricultural monitoring in Ukraine depends on integrating accounting functions with analytical technologies, addressing infrastructure gaps, and building workforce competencies despite ongoing conflict and resource constraints. Ukrainian farms that adopt unified systems linking cost tracking, asset management, precision tools such as soil sensors and yield monitors, and five-phase implementation pathways demonstrate measurable gains in input efficiency, cash flow control, and sustainability metrics including nitrogen use and soil organic matter. The four tables systematizing accounting functions, analytical technologies, KPIs, and implementation stages provide a replicable framework for enterprises of varying sizes.

Strelbitskyi (2024) argues that adaptation to European markets requires adherence to international financial reporting standards alongside continuous staff training and risk management. His findings align with the observed need for cloud-based platforms and phased adoption strategies that begin with core accounting before adding analytical layers. Grynchuk (2024) emphasises comparing system costs against income improvements, a principle reflected in the return-on-investment calculations for variable-rate fertilization strategies. Zamlynska and Bezdušnyi (2025) identify blockchain and automated reporting as priorities, supporting the article’s projection of emerging technologies for provenance records and real-time sensor networks. Sikach (2024) breaks support into accounting, analysis, and audit components, mirroring the article’s tripartite structure of cost recording, precision monitoring, and budget control. Oliadnichuk, Krochak, and Ketskalo (2025) focus on human capital, reinforcing the article’s attention to brain drain, skill shortages, and the need for coordinated training programs involving educational institutions and government agencies. Prokopyshyn et al. (2024) systematise principles into regulatory, scientific, accounting, and analytical clusters, which parallel the article’s KPI categories spanning financial, operational, and sustainability dimensions. Bondarenko and Gutsalenko (2025) demonstrate ERP and CRM integration for customer acquisition cost and segment profitability, complementing the article’s discussion of precision agriculture and GIS-based variable input application. Aksionova (2023) proposes a two-level monitoring system with informational and methodological bases, consistent with the article’s distinction between accounting infrastructure and analytical technologies. Kharchenko and Kharchenko (2021) identify information provision as a key barrier, supporting the article’s emphasis on legacy system incompatibility and inadequate rural connectivity.

The study also underscores the growing importance of AI-driven disease diagnosis from drone imagery, predictive yield modeling under variable weather scenarios, and IoT sensor networks for real-time moisture and nutrient monitoring. Future research should develop integrated frameworks linking financial performance diagnostics with agronomic forecasting, compliance with EU environmental standards, and scenario-based risk modeling under wartime uncertainty. Comparative studies with other post-conflict agricultural regions, such as the Western Balkans or parts of the Middle East, could provide benchmarks for assessing the scalability and long-term impact of analytics-driven monitoring systems. Such models will enable Ukrainian enterprises to navigate volatility, enhance resource efficiency, and sustain competitiveness in global grain and oilseed markets.

Conclusions. The performed study confirms that enhancing agricultural monitoring through integrated accounting and analytical support represents a multifactorial process shaped by technological adoption, workforce development, infrastructure quality, and alignment with international standards. Under the pressures of ongoing conflict, disrupted supply chains, and demanding export requirements, unified systems linking financial records with field-level agronomic data have emerged as a strategic tool for improving resource efficiency, crop productivity, and long-term farm viability.

Key findings indicate that enterprises implementing cost tracking, inventory oversight, asset monitoring, revenue analysis, and budget control alongside precision technologies such as satellite imagery, soil sensors, yield monitors, and drones demonstrate measurable gains in input cost reduction, waste prevention, equipment optimization, and financial discipline. The four structured tables–covering accounting functions, analytical technologies, KPI categories, and phased implementation stages–provide a replicable framework for farms of varying sizes navigating economic and geopolitical volatility.

The analysis of implementation barriers and sectoral dynamics shows that monitoring system adoption is increasingly influenced by rural internet availability, legacy system compatibility, employee resistance to new methods, skill shortages, brain drain, and the availability of governmental support programs for digital agriculture. The role of cloud-based platforms, automatic updates, and user training further reinforces the need for phased rollouts beginning with core accounting before adding analytical capabilities.

It is concluded that a comprehensive evaluation of agricultural monitoring effectiveness should combine quantitative financial and operational indicators with qualitative assessments of technology integration, regulatory compliance, sustainability performance, and human capital readiness. Future research should focus on developing integrated frameworks supporting scenario-based forecasting under wartime uncertainty, behavioral analytics for technology adoption, and strategic planning to guide Ukrainian enterprises in navigating digital disruption, meeting EU environmental standards, and sustaining long-term competitiveness in global grain and oilseed markets.

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Обліково-аналітична підтримка агромоніторингу як інструмент підвищення результативності аграрних підприємств

Анотація. Сільськогосподарський моніторинг поєднує систематичний збір даних про стан посівів та використання ресурсів із системами бухгалтерського обліку, що фіксують фінансову та операційну діяльність. В Україні ефективні системи моніторингу стали необхідними для збереження глобальної конкурентоспроможності. Інтеграція бухгалтерського обліку та аналітичної підтримки перетворює необроблені дані на практичні висновки, пов'язуючи фінансові результати безпосередньо з сільськогосподарськими практиками.

Постановка проблеми. Основна проблема полягає у фрагментарному впровадженні систем моніторингу в українських сільськогосподарських підприємствах. Багато господарств працюють із застарілими системами бухгалтерського обліку, які не взаємодіють із сучасними аналітичними інструментами, такими як супутникові знімки або датчики ґрунту. Малі та середні господарства стикаються з додатковими перешкодами, зокрема з недостатньою інтернет-інфраструктурою, обмеженими фінансовими ресурсами та робочою силою, яка недостатньо підготовлена до ведення сільського господарства на основі даних.

Невирішені аспекти проблеми. Ключові виклики включають відсутність стандартизованих форматів даних для інтеграції бухгалтерської інформації з технологіями точного землеробства, недостатність методологій для зв'язку фінансових ключових показників ефективності з агрономічними показниками, а також обмеженість досліджень щодо ефективності систем моніторингу в умовах війни. Роль державної підтримки у сприянні впровадженню технологій потребує подальшого аналізу.

Мета статті. Обґрунтувати стратегічну роль бухгалтерського обліку та аналітичної підтримки в моніторингу сільського господарства та запропонувати структуровану систему для підвищення ефективності діяльності українських сільськогосподарських підприємств з урахуванням технологічних, економічних та кадрових обмежень.

Виклад основного матеріалу. У статті аналізуються функції бухгалтерського обліку, зокрема відстеження витрат, управління запасами, використання активів та контроль бюджету, у їх застосуванні до моніторингу сільського господарства. У ній досліджується використання точних технологій, таких як супутникові знімки, датчики ґрунту та монітори врожайності, для збору даних на рівні полів. Особлива увага приділяється інтеграції бухгалтерських даних з аналітичними результатами через ERP-системи, що дозволяє розраховувати рентабельність інвестицій для конкретних ресурсів. У дослідженні також розглядаються бар'єри впровадження, стратегії поетапного впровадження та роль ключових показників ефективності (KPI) у вимірюванні фінансових, операційних та показників сталого розвитку.

Висновки. Бухгалтерська та аналітична підтримка сільськогосподарського моніторингу покращує результати діяльності підприємств, підвищує ефективність використання ресурсів та сприяє довгостроковій конкурентоспроможності українського сільського господарства. Структурована інтеграція фінансових та агрономічних даних дозволяє підприємствам орієнтуватися в умовах невизначеності та досягати сталого зростання на внутрішньому та міжнародному ринках.

Ключові слова: *сільськогосподарський моніторинг, бухгалтерська підтримка, аналітичні системи, точне землеробство, ключові показники ефективності, результати діяльності підприємств, цифрова трансформація.*

Формули: 0; рис.: 0; табл.: 4; бібліографія: 26.

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