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Information and analytical support for management decision-making in agribusiness based on agromonitoring

Abstract. Information and analytical support are key efficiency drivers in Ukrainian agribusiness. The study examines how agromonitoring data – satellite indices, soil sensors, weather stations – shape management decisions under climate volatility and military risks.

Problem statement. The core issue is a disconnect between raw agromonitoring data and economically justified decisions. Many farms accumulate NDVI, moisture, and temperature data but lack standardized methods to calculate gross margin per hectare, water productivity, or ROI on agrotechnologies. Low digital literacy among agronomists and fragmented IT systems prevent profit-maximizing actions.

Unresolved aspects. Key gaps include the absence of unified accounting integration between IoT sensors and ERP systems, making real-time labor efficiency and technology ROI calculations impossible. The impact of military disruptions on data reliability remains unexplored. No consensus exists on risk-adjusted return metrics for agromonitoring investments.

Purpose of the article. To substantiate the economic role of agromonitoring in management decision-making for Ukrainian agribusinesses and propose an adaptive framework linking analytical indicators to financial, operational, and marketing strategies.

Presentation of the main material. The article analyzes how vegetation indices and soil data trigger specific decisions: variable rate fertilization (15–25% cost reduction), precision irrigation (20–40% water savings), and harvest logistics (10–20% cost reduction). Economic metrics – gross margin per hectare, technology ROI (150–300% over 3–5 years), risk-adjusted returns (30–40% volatility reduction) – are critically assessed. Implementation phases and organizational resistance are examined. The role of agromonitoring in quality management and export certification is highlighted.

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Conclusions. Agromonitoring enhances profitability and adaptability when linked to accounting and marketing decisions. Phased implementation with staff training ensures competitive advantages. Future priorities include AI-based prescriptive analytics and ESG compliance.

Keywords: *agromonitoring, management decisions, ROI, risk management, Ukrainian agribusiness.*
Formulas: -; fig.: -; tabl.: 4; bibl.: 28.
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Introduction. Following military disruptions, climate instability, and intensifying global competition for grain exports, Ukrainian agribusinesses face pressure to upgrade operational management for economic resilience and long-term profitability (Nitsenko, 2011). Rising fertilizer and fuel prices, dwindling water supplies in southern regions, and greater crop volatility demand a move from traditional field observations to data-driven intelligence. Agromonitoring leads this shift by merging satellite-derived vegetation indices, ground-based soil sensors, weather station networks, and IoT-enabled fleet devices. This integration supports real-time crop health assessment, predictive yield forecasting, and cross-field resource coordination. NDVI, evapotranspiration models, and machine learning algorithms improve variable rate fertilization, precision irrigation scheduling, harvest logistics, and risk mitigation across large agroholdings and mid-sized farms.

Meanwhile, Ukrainian farm managers cope with restricted field access due to combat activity, uneven rural digital infrastructure, and analytical skill gaps among agronomic staff. Government programs supporting precision agriculture together with international ESG compliance rules for grain trade aim to close the technology adoption gap. The expanding role of satellite-based crop tracking, drone surveys, and automated alert systems reshapes decision-making. This study examines agromonitoring's economic impact on management decisions in Ukraine, classifies key performance metrics from sensor data, and offers an adaptive framework for resource-efficient, risk-adjusted strategies in today's agricultural economy.

Literature Review. The digital transformation of information and analytical support in Ukrainian agribusiness is a multifaceted process that integrates remote sensing, cloud platforms, economic modeling, and institutional frameworks. Recent studies emphasize the need for integrated data systems that reflect both field-level operations and strategic management objectives.

Topov A. and Kleibatenko A. (2024) and Ryzhikova et al. (2026) examine the role and content of information-analytical support in agrarian enterprises under digitalization. They generalize the features of such support and propose improvements using cloud technologies, drones, satellite imagery, sensors, CRM systems, and artificial intelligence. Practical tools like Soft.Farm, Looker Studio, Wialon, EOSDA Crop Monitoring, and Smartcrm enable more accurate data analysis, production efficiency gains, and management process optimization.

Sumets A. et al. (2023) and Ostapenko et al. (2026) develop recommendations for modeling an information support system for agribusiness management entities. Their work applies Hamming's interference-resistant coding combined with control charts to avoid data distortions and identify needs for prompt business decision adjustments. Using binary relations and Saati's methodology, they substantiate methods for identifying optimal resource flow vectors by economic activity types. The proposed process-structural approach specifies model components and connection patterns, offering practical value for optimizing management processes and implementing reasoned choices among planning alternatives.

Grynchuk Y. (2025) provides a theoretical analysis of innovative technologies in agricultural enterprise information systems. The study highlights advantages of digital platforms, big data analytics, geographic information systems, satellite monitoring, and automated management tools. These technologies improve forecasting accuracy, optimize resource provision, and enable timely responses to market changes across economic, environmental, and social dimensions of sustainable development.

Ihnatenko M., Levaieva L., and Romaniuk I. (2020) and Nitsenko V. (2009) substantiate the special role of information support for organizational and economic priorities of farms and agricultural enterprises. They identify user groups, information types, quality requirements, and principles of database systematization. Their findings emphasize the importance of creating modern accounting-analytical systems within management structures to enhance information quality for managerial decision-making.

Kharchenko V. and Kharchenko H. (2021) and Nitsenko and Dengub (2026) investigate production efficiency of organizational-legal forms at the regional level in Chernihiv region. Their integral rating assessment identifies low information support levels as a key problem. The proposed model ensures data dissemination across departments, creates analytical systems for management decisions, and improves information reliability and accessibility at all management levels.

Okrushko D. and Pavlova O. (2024) explore an information system for optimizing crop cultivation using remote sensing data from Landsat, Sentinel-2, and PlanetScope. Their work details pre-processing techniques to remove noise and errors, then implements algorithms for extracting vegetation indices that provide insights into plant health, biomass, and crop stress detection due to nutrient deficiencies or water scarcity.

Stepanenko S. and Diachenko O. (2023) conduct analytical monitoring of information products and technologies for inclusive agribusiness. Effective tools include smart data processing, smart farms, digital precision farming, livestock technologies, smart greenhouses, UAVs, logistics solutions, HR information systems, and specialized analytical products. They argue that information systems can achieve sustainable development goals and European Green Deal objectives, provided they are supplemented by digital tools in financial, investment, and personnel management with equal access to logistics networks and supply chains.

Mytchenok O. (2022) and Ostapenko et al. (2026) examines international practices of statistical and administrative data collection with corresponding methodological and legislative frameworks. The study generalizes international recommendations on legal, organizational, financial, and institutional foundations for agricultural data processing. Problematic issues and priorities for implementing best international practices in Ukraine are identified for state and regional agricultural policy formation.

Taken as a whole, the examined works confirm that upgrading information-analytical support in Ukrainian agribusiness hinges not solely on deploying new technologies but equally on data integrity, sound economic modeling, institutional adaptability, and equitable access across farms of different sizes. Blending remote sensing, noise-resistant coding, accounting-analytical systems, and inclusive digital platforms builds resilient, data-driven governance capable of weathering military disruptions, climatic swings, and turbulent grain markets.

Purpose, objectives and research methods. The study aims to prove how satellite and sensor monitoring transforms farm management choices in Ukrainian agriculture during war, drought risks, and export market instability. With soaring diesel and chemical costs, limited irrigation water, and uneven tech adoption, rural enterprises need a decision model that merges field data, profit metrics, land accessibility issues, and worker skill levels.

To reach this aim, the following tasks are set:

– to measure key financial indicators (profit per hectare, payback on sensors, water efficiency, labor time savings) that show the value of monitoring-based farming;

– to explore practical uses of monitoring data in crop nutrition, targeted spraying, irrigation scheduling, harvest timing, and post-harvest soil management under combat restrictions and power outages;

– to evaluate how outside forces – state subsidies for precision tools, donor tech programs, and grain traceability rules – affect the spread and success of analytical systems;

– to describe new developments such as AI-driven risk alerts, drone scouting, automated machinery tracking, and blockchain lot tracing in shaping operational trust and export readiness;

– to assess barriers linked to poor rural internet, weak ERP integration, reluctance of older agronomists, and missing standards for ROI calculation from raw NDVI or moisture data.

The research uses systematic breakdown, cross-farm comparison, process auditing, practitioner interviews, and empirical synthesis. The methodological base combines production economics, management accounting, soil science, and military risk assessment. This allows a full view of both numerical thresholds and behavioral factors that shape the modern farm analytics landscape in Ukraine.

Results. Agromonitoring represents a critical technological advancement in modern agricultural management, particularly in Ukraine, one of the world's leading grain exporters. This system integrates satellite imagery, weather data, soil sensors, and crop health indicators to provide real-time insights into agricultural operations. For Ukrainian agribusinesses, agromonitoring has become essential for optimizing resource allocation, predicting yields, and managing risks in an increasingly volatile global market. The implementation of these data-driven systems enables farm managers to make informed decisions that directly impact productivity and profitability.

A detailed understanding of how agromonitoring achieves these outcomes requires an examination of its core data infrastructure. Modern agromonitoring platforms in Ukraine utilize multiple data sources to create comprehensive agricultural intelligence systems. Satellite imagery from sources like Sentinel-2 and Landsat provides vegetation indices such as NDVI (Normalized Difference Vegetation Index) and EVI (Enhanced Vegetation Index), which indicate crop health and growth stages. Ground-based sensors measure soil moisture, temperature, and nutrient levels, while meteorological stations track precipitation, temperature fluctuations, and humidity. These diverse data streams are integrated through cloud-based platforms that apply machine learning algorithms to generate actionable insights for farm managers. The key characteristics of each data source, including measured parameters, update frequencies, and primary applications, are summarized in Table 1 (Vasiliev & Ilienko, 2025)

Table 1. Data Sources, Parameters, and Applications in Agromonitoring

Data Source	Parameters Measured	Update Frequency	Primary Application
Satellite Imagery	NDVI, EVI, LAI, Surface Temperature	3-5 days	Crop health monitoring, yield prediction
Soil Sensors	Moisture, pH, NPK levels, Temperature	Hourly/Daily	Irrigation scheduling, fertilization planning
Weather Stations	Precipitation, Temperature, Humidity, Wind	Real-time	Risk assessment, disease prediction
Drone Surveys	High-resolution imagery, Thermal data	On-demand	Precision agriculture, problem area identification
IoT Field Devices	Equipment status, Fuel consumption	Real-time	Fleet management, operational efficiency

Source: constructed using (Ukraine Online Advertising Market, 2024).

Building upon this data infrastructure, agribusiness managers can implement precision agriculture techniques that optimize input usage and maximize yields. By analyzing vegetation indices and soil moisture data, managers can create variable rate application maps for fertilizers and pesticides, applying resources only where needed rather than uniformly across fields. This targeted approach reduces input costs by 15-25% while maintaining or improving yields (Sharma, 2025). Moreover, real-time monitoring of crop stress indicators allows for early detection of disease outbreaks, pest infestations, or nutrient deficiencies, enabling timely interventions that prevent significant crop losses.

Beyond nutrient management, irrigation represents another critical application of agromonitoring in Ukraine's agricultural sector. Soil moisture sensors combined with weather forecasts and evapotranspiration models allow managers to schedule irrigation with precision, delivering water only when crops need it. This is particularly valuable in Ukraine's southern regions, where water resources are limited and drought conditions have become more frequent. Data-driven irrigation scheduling can reduce water consumption by 20-40% while maintaining optimal crop growth, significantly improving both economic and environmental sustainability of farming operations (Mendes & Lee, 2025; Bohaienko, 2023).

Equally important for strategic planning is the ability to predict yields accurately, as this affects decisions about storage, logistics, marketing, and financial planning. Agromonitoring systems in Ukraine employ machine learning models that analyze historical yield data, current season vegetation indices, weather patterns, and soil conditions to forecast yields weeks or months before harvest. These predictions typically achieve accuracy levels of 85-95% at the field level, enabling managers to optimize harvest logistics, negotiate forward contracts with buyers, and arrange appropriate storage capacity (Kryvoshein et al., 2024). Early yield estimates also inform decisions about crop insurance and risk management strategies. To illustrate how monitoring parameters evolve throughout the production cycle, Table 2 links each growth stage with specific decision points and typical managerial actions.

Table 2. Growth Stages, Monitoring Parameters, and Corresponding Decisions

Growth Stage	Key Monitoring Parameters	Decision Points	Typical Actions
Planting	Soil temperature, Moisture levels	Optimal planting window	Schedule field operations, Seed rate adjustment
Emergence	Plant count, Uniformity	Replanting needs	Identify gaps, Plan corrective seeding
Vegetative Growth	NDVI, Biomass accumulation	Fertilization timing	Apply nitrogen, Assess crop health
Reproductive Stage	Stress indicators, Disease presence	Protection measures	Apply fungicides, Manage irrigation
Maturation	Moisture content, Color indices	Harvest timing	Schedule equipment, Arrange storage
Post-Harvest	Residue cover, Soil conditions	Field preparation	Plan tillage, Cover crop decisions

Source: constructed using (Kryvoshein et al., 2024; Lykhovyd et al., 2025).

The increasing climate variability faced by Ukraine's agricultural sector makes risk management a top priority for agribusiness managers, and agromonitoring systems directly address this need. These systems provide early warning capabilities for various threats including drought, frost events, excessive rainfall, and extreme heat (World Bank, 2024). By integrating weather forecasts with crop vulnerability models, agromonitoring can alert managers to potential risks days or weeks in advance, allowing time to implement protective measures. For example, frost warnings enable managers to deploy protective irrigation or wind machines, while drought predictions inform decisions about crop insurance purchases or adjustments to planting plans for subsequent seasons.

The ongoing conflict in Ukraine has added new dimensions to agricultural risk management, further expanding the role of agromonitoring data. Satellite imagery helps managers identify areas affected by military activities, track infrastructure damage, and plan safe routes for field operations. This information is integrated with traditional agricultural data to support decisions about which fields to cultivate, where to allocate limited resources, and how to adjust production plans based on actual accessible acreage (Shumilo et al., 2025). Remote monitoring capabilities have become particularly valuable when physical field access is restricted or dangerous, demonstrating the adaptability of these systems to extreme conditions.

Agromonitoring data also provides the foundation for sophisticated economic analysis that guides investment and resource allocation decisions in Ukrainian agribusinesses. By tracking input costs, yield outcomes, and market prices at the field level, managers can calculate profitability metrics for different crops, varieties, and management practices. This granular economic data reveals which fields or management zones generate the highest returns, informing decisions about land rental, equipment purchases, and technology adoption. Multi-year analysis of agromonitoring data also helps identify trends in soil productivity, enabling strategic decisions about long-term land management and crop rotation planning (Filipovic, 2024). Table 3 presents the principal economic metrics derived from agromonitoring data, along with their required inputs, decision applications, and typical impact ranges.

Table 3. Economic Metrics for Decision-Making Based on Agromonitoring Data

Economic Metric	**Data Inputs Required**	**Decision Application**	**Typical Impact**
Gross Margin per Hectare	Yield, Input costs, Prices	Crop selection, Land allocation	10-15% profit improvement
Input Use Efficiency	Application rates, Yield response	Precision agriculture adoption	15-25% cost reduction
Water Productivity	Irrigation volume, Yield	Irrigation system investment	20-40% water savings
Labor Efficiency	Operation time, Area covered	Mechanization decisions	25-35% time savings
Return on Technology Investment	Technology costs, Yield gains	Innovation adoption	ROI of 150-300% over 3-5 years
Risk-Adjusted Returns	Yield variability, Insurance costs	Portfolio diversification	Reduced income volatility by 30-40%

Source: constructed using (Filipovic, 2024).

Effective agribusiness management extends beyond the farm gate to encompass the entire supply chain, and agromonitoring data plays a crucial role in coordinating these complex operations. Yield predictions from monitoring systems inform logistics planning, helping managers arrange appropriate transportation capacity, storage facilities, and processing schedules. Real-time harvest progress tracking enables dynamic coordination with grain elevators, processors, and export terminals, minimizing delays and storage costs. For large agribusiness holdings in Ukraine managing hundreds of thousands of hectares, this integration of field-level monitoring with supply chain operations can reduce logistics costs by 10-20% while improving product quality through optimized timing (Lionwood.software, 2025).

Quality management represents another critical area where agromonitoring data supports decision-making throughout the supply chain, linking field conditions directly to market outcomes. By tracking growing conditions, stress events, and harvest timing at the field level, managers can predict grain quality parameters such as protein content, moisture levels, and test weight before harvest. This information enables strategic decisions about which fields to harvest for premium markets versus standard contracts, and how to blend production from different fields to meet specific quality specifications. Traceability systems that link agromonitoring data with grain lots also support certification requirements for export markets and specialty products, thereby enhancing competitive positioning.

Successfully implementing agromonitoring systems in Ukrainian agribusinesses requires careful attention to organizational factors beyond technology deployment, as technical capabilities alone do not guarantee improved decisions. Managers must develop new workflows that incorporate data analysis into daily decision-making processes, train staff to interpret monitoring outputs, and establish clear protocols for acting on system recommendations. Resistance to data-driven approaches is common, particularly among experienced agronomists who rely on traditional field observation methods. Effective implementation strategies combine automated alerts for critical situations with collaborative review processes that blend algorithmic insights with human expertise, gradually building trust in the system while respecting existing knowledge (World Bank, 2023). The phased nature of this organizational transformation is outlined in Table 4, which links each implementation phase with key activities, timelines, and success factors.

Table 4. Implementation Phases for Agromonitoring Systems

Implementation Phase	Key Activities	Timeline	Success Factors
Assessment	Evaluate needs, Select platforms, Define KPIs	1-2 months	Clear objectives, Stakeholder engagement
Pilot Deployment	Install sensors, Train core team, Test workflows	3-6 months	Start with motivated users, Quick wins
Scaling	Expand coverage, Integrate systems, Refine processes	6-12 months	Document best practices, Address feedback
Optimization	Advanced analytics, Automation, Continuous improvement	Ongoing	Regular training, Performance monitoring
Integration	Link with ERP, Supply chain, Financial systems	12-18 months	IT support, Cross-functional collaboration

Source: constructed using (World Bank, 2023).

Looking toward the future, the evolution of agromonitoring in Ukrainian agribusiness points toward increasingly sophisticated analytical capabilities powered by artificial intelligence and expanded data sources. Emerging technologies include hyperspectral imaging for detailed crop health assessment, autonomous field robots for ground-truthing satellite observations, and blockchain-based systems for secure data sharing across supply chains. Machine learning models are becoming more accurate at predicting not just yields but also optimal management interventions, moving from descriptive analytics to prescriptive recommendations (Latitudo 40, 2025). For agribusiness managers, staying competitive will require continuous investment in data infrastructure, analytical capabilities, and staff development to leverage these advancing technologies effectively.

Strategic positioning for Ukrainian agribusinesses increasingly depends on their ability to demonstrate sustainable and transparent production practices to international buyers and investors, and agromonitoring data provides the necessary objective evidence (Metelytsia, 2023). This documentation includes efficient resource use, carbon sequestration in soils, and biodiversity conservation measures, all of which can be verified through monitoring records. Such evidence supports access to premium markets, sustainability-linked financing, and carbon credit programs. As global agricultural markets evolve toward greater emphasis on environmental, social, and governance criteria, the analytical capabilities built around agromonitoring systems will become not just operational tools but strategic assets that differentiate leading agribusinesses in competitive international markets.

Discussion. The obtained findings verify that integrating satellite and sensor monitoring into farm governance in Ukraine hinges on three pillars: real-time data reliability, economic literacy among agronomists, and institutional support for digital tools. Despite active hostilities, irregular power supply, and restricted field access, agroholdings and mid-tier farms demonstrate adaptive capacity by deploying NDVI-based variable rate fertilization, soil moisture-driven irrigation, and AI-assisted yield forecasting. These technologies reduce chemical inputs by 15–25%, cut water use by 20–40%, and lower logistics expenses by 10–20%, while boosting technology ROI within 150–300% over three to five years.

Topov and Kleibatenko (2024) stress that cloud platforms, drone surveys, and CRM systems like Soft.Farm and EOSDA Crop Monitoring enable faster data processing and management optimization. Their conclusions align with observed efficiency gains when Looker Studio or Wialon are adopted for fleet tracking and analytical dashboards. Sumets et al. (2023) demonstrate that Hamming's noise-resistant coding combined with control charts prevents information distortion and signals when business decisions need prompt correction. This methodological pairing supports the reported need for real-time adjustment mechanisms under volatile weather and wartime conditions.

Grynchuk (2025) emphasizes that big data analytics, GIS, and satellite tracking improve forecasting accuracy and resource allocation across economic, environmental, and social sustainability dimensions. Her work reinforces the value of automated management systems for timely market response. Ihnatenko, Levaieva, and Romaniuk (2020) highlight accounting-analytical systems as essential for translating raw field metrics into actionable managerial choices, particularly for organizational and economic priority-setting in farms.

Kharchenko and Kharchenko (2021) identify low information support as a key barrier to production efficiency, proposing a model that disseminates verified data across departments. This matches the observed difficulty in calculating gross margin per hectare when ERP-sensor integration is absent. Okrushko and Pavlova (2024) detail pre-processing techniques for Landsat and Sentinel-2 imagery to extract vegetation indices that detect nutrient deficits or water stress, directly supporting the reported 85–95% yield prediction accuracy.

Stepanenko and Diachenko (2023) argue that smart data processing, UAVs, and inclusive digital platforms advance sustainable development goals and European Green Deal targets, provided financial and personnel management tools are equally accessible. Mytchenok (2022) examines international statistical data collection standards, identifying priority reforms for Ukrainian agricultural policy, which is critical for export certification and ESG compliance.

The study also reveals that military disruptions demand adaptive risk protocols: satellite-based safe route planning, infrastructure damage assessment, and remote monitoring when physical access is dangerous. These capabilities transform agromonitoring from an efficiency tool into a strategic resilience asset. Furthermore, blockchain traceability and carbon sequestration tracking are emerging as differentiators for premium grain markets and sustainability-linked financing.

Overall, the discussion supports a multi-layer transformation where sensing technologies must be paired with management accounting, staff digital upskilling, and phased implementation (assessment, pilot, scaling, optimization, integration). Future research should develop standardized methods for risk-adjusted return metrics, compare conflict-affected versus stable regions, and assess long-term ESG impacts of prescriptive analytics in Ukrainian agribusiness.

Conclusions. The performed study confirms that upgrading information-analytical support in Ukrainian agribusiness through agromonitoring systems is a multidimensional process driven by sensor integration, economic calculus, institutional flexibility, and workforce digital competence. Under military disruption, climate volatility, and grain market turbulence, remote sensing and IoT data have become strategic assets for resource optimization, risk reduction, and export readiness.

Principal findings show that farms employing NDVI-based variable rate fertilization, soil moisture-driven irrigation scheduling, and machine learning yield forecasts achieve input savings of 15–25%, water use reduction of 20–40%, and logistics cost cuts of 10–20%. Technology ROI ranges from 150–300% over three to five years, while risk-adjusted return volatility drops by 30–40%. These gains, however, materialize only when sensor data links to management accounting systems capable of calculating gross margin per hectare, water productivity, and labor efficiency.

The analysis of implementation patterns and organizational barriers reveals that agronomic decisions are increasingly shaped by data integrity, ERP integration levels, and access to donor-funded precision agriculture programs. Resistance from experienced field staff, poor rural internet, and missing standards for ROI calculation from raw NDVI or moisture data remain critical bottlenecks. Phased deployment – assessment, pilot, scaling, optimization, integration – combined with collaborative review protocols proves more effective than purely automated alerts.

It is concluded that a full evaluation of agromonitoring transformation should merge quantitative economic metrics with qualitative assessments of staff digital upskilling, military risk adaptation, and ESG compliance for grain exports. Future research should develop standardized methods for risk-adjusted return metrics, compare conflict-affected versus stable regions, and assess long-term impacts of prescriptive AI analytics on soil carbon sequestration and sustainability-linked financing in Ukrainian agriculture.

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Інформаційно-аналітична підтримка управлінського прийняття рішень в агробізнесі на основі агромониторингу

Анотація. Інформаційно-аналітична підтримка є ключовим чинником ефективності в українському агробізнесі. У дослідженні розглядається, як дані агромоніторингу – супутникові індекси, датчики ґрунту, метеостанції – впливають на управлінські рішення в умовах кліматичної мінливості та військових ризиків.

Постановка проблеми. Основною проблемою є розрив між необробленими даними агромоніторингу та економічно обґрунтованими рішеннями. Багато господарств накопичують дані про NDVI, вологість та температуру, але не мають стандартизованих методів розрахунку валової рентабельності на гектар, продуктивності води або рентабельності інвестицій в агротехнології. Низький рівень цифрової грамотності серед агрономів та фрагментовані IT-системи перешкоджають діям, спрямованим на максимізацію прибутку.

Невирішені аспекти проблеми. Ключові прогалини включають відсутність уніфікованої інтеграції обліку між датчиками Інтернету речей (IoT) та системами ERP, що унеможливлює розрахунки ефективності праці та рентабельності інвестицій у технології в режимі реального часу. Вплив військових зривів на надійність даних залишається недослідженим. Не існує консенсусу щодо показників прибутковості з урахуванням ризику для інвестицій в агромоніторинг.

Мета статті. Обґрунтувати економічну роль агромоніторингу в процесі прийняття управлінських рішень для українських агробізнесів та запропонувати адаптивну систему, що пов'язує аналітичні показники з фінансовими, операційними та маркетинговими стратегіями.

Виклад основного матеріалу. У статті аналізується, як індекси рослинності та дані про ґрунт зумовлюють конкретні рішення: внесення добрив із змінною нормою (зниження витрат на 15–25 %), точне зрошення (економія води на 20–40 %) та логістика збору врожаю (зниження витрат на 10–20 %). Економічні показники – валова рентабельність на гектар, рентабельність інвестицій у технології (150–300% за 3–5 років), прибутковість з урахуванням ризику (зниження волатильності на 30–40%) – піддаються критичній оцінці.

Досліджуються етапи впровадження та організаційний опір. Підкреслюється роль агромоніторингу в управлінні якістю та сертифікації експорту.

Висновки. Агромоніторинг підвищує прибутковість та адаптивність, якщо його пов’язати з бухгалтерськими та маркетинговими рішеннями. Поетапне впровадження з навчанням персоналу забезпечує конкурентні переваги. Майбутні пріоритети включають прескриптивну аналітику на основі штучного інтелекту та дотримання вимог ESG.

Ключові слова: *агромоніторинг, управлінські рішення, рентабельність інвестицій, управління ризиками, український агробізнес.*

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