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ARTIFICIAL INTELLIGENCE IN AGRIBUSINESS: A BIBLIOMETRIC ANALYSIS OF SCIENTIFIC PRODUCTION

INTELIGÊNCIA ARTIFICIAL NO AGRONEGÓCIO: UMA ANÁLISE BIBLIOMÉTRICA DA PRODUÇÃO CIENTÍFICA

INTELIGENCIA ARTIFICIAL EN EL AGRONEGOCIO: UN ANÁLISIS BIBLIOMÉTRICO DE LA PRODUCCIÓN CIENTÍFICA

Julia Tontini

PhD in Business Administration, Centro de Ensino Superior Riograndense (CESURG), Brazil. E-mail: juliatontini@gmail.com

Joaquim Luiz Tontini

Undergraduate student in Economics, Federal University of Santa Maria (UFSM), Brazil. E-mail: joaquimtontini@gmail.com

Ricardo Alberti

PhD in Rural Extension, Centro de Ensino Superior Riograndense (CESURG), Brazil. E-mail: r-alberti@live.com

Ana Julia Batistella Behm

Master's degree in Accounting and Business Administration, Centro de Ensino Superior Riograndense (CESURG), Brazil. E-mail: anabatistella@cesurg.com

Renan Anderson de Oliveira

Master's degree in Education, Centro de Ensino Superior Riograndense (CESURG), Brazil. E-mail: renanoliveira@cesurg.com

Silvana Bringhenti Foschiera

Specialist in Controllership, Centro de Ensino Superior Riograndense (CESURG), Brazil. E-mail: silvanafoschiera@cesurg.com

Rafael Pandolfi

Master's degree in Bioexperimentation, Centro de Ensino Superior Riograndense (CESURG), Brazil. E-mail: rafaelpandolfi@cesurg.com

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Cristian Willian Galvão

Master's degree in Physics, Centro de Ensino Superior Riograndense (CESURG), Brazil. E-mail: cristiangalvao@cesurg.com

Abstract

The integration of artificial intelligence into agribusiness has expanded the possibilities for applying digital technologies to production, management, monitoring, decision-making, and sustainability activities. Given the growing body of research on this subject, it is important to understand how this scientific field has evolved over time. This study aimed to analyze scientific production on artificial intelligence and agribusiness indexed in the Scopus and Web of Science databases through a bibliometric analysis, identifying the temporal evolution of publications, the main publication sources, the geographical distribution of scientific production, and the main research themes and trends present in the analyzed corpus. A bibliometric analysis was conducted using articles indexed in Scopus and Web of Science, accessed through the CAPES Journal Portal, with the search terms "artificial intelligence" AND "agribusiness". After applying the selection criteria and removing duplicates, 102 articles published between 2012 and September 5, 2026, were analyzed. The results showed a substantial increase in scientific output from 2022 onward, with publications from 2022 through the search date in 2026 accounting for 92.16% of the analyzed corpus. Brazil and the United States were the leading contributors in terms of publication output. The thematic analysis highlighted topics related to artificial intelligence, agribusiness, precision agriculture, sustainability, blockchain, and digital transformation. The thematic map positioned sustainability, precision agriculture, and decision-making as relatively developed and connected themes. The thematic evolution analysis revealed differences in thematic representation across the periods examined, including topics related to digital transformation, economic and social effects, and decision-support systems.
Keywords: Artificial Intelligence; Agribusiness; Bibliometric Analysis.

Resumo

A integração da inteligência artificial ao agronegócio ampliou as possibilidades de aplicação de tecnologias digitais nas atividades de produção, gestão, monitoramento, tomada de decisão e sustentabilidade. Diante do crescente volume de pesquisas sobre o tema, torna-se importante compreender como esse campo científico evoluiu ao longo do tempo. Este estudo teve como objetivo analisar a produção científica sobre inteligência artificial e agronegócio, indexada nas bases de dados Scopus e Web of Science, por meio de uma análise bibliométrica, identificando a evolução temporal das publicações, as principais fontes de publicação, a distribuição geográfica da produção científica e os principais temas e tendências presentes no corpus analisado. Foi realizada uma análise bibliométrica de artigos indexados nas bases Scopus e Web of Science, acessadas por meio do Portal de Periódicos da CAPES, utilizando os termos de busca "artificial intelligence" AND "agribusiness". Após a aplicação dos critérios de seleção e a remoção de duplicatas, foram analisados 102 artigos publicados entre 2012 e 5 de setembro de 2026. Os resultados demonstraram um aumento substancial da produção científica a partir de 2022, com as publicações de 2022 até a data da busca em 2026 representando 92,16% do corpus analisado. O Brasil e os Estados Unidos se destacaram em termos de volume de publicações. A análise temática evidenciou temas relacionados à inteligência artificial, ao agronegócio, à agricultura de precisão, à sustentabilidade, ao blockchain e à transformação digital. O mapa temático posicionou a sustentabilidade, a agricultura de precisão e a tomada de decisão como temas relativamente desenvolvidos e conectados. A análise da evolução temática revelou diferenças na representação dos temas entre os períodos examinados, incluindo tópicos relacionados à transformação digital, aos efeitos econômicos e sociais e aos sistemas de apoio à decisão.
Palavras-chave: Inteligência Artificial; Agronegócio; Análise Bibliométrica.

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Resumen

La integración de la inteligencia artificial en el agronegocio ha ampliado las posibilidades de aplicación de tecnologías digitales en las actividades de producción, gestión, monitoreo, toma de decisiones y sostenibilidad. Ante el creciente volumen de investigaciones sobre este tema, resulta importante comprender cómo ha evolucionado este campo científico a lo largo del tiempo. Este estudio tuvo como objetivo analizar la producción científica sobre inteligencia artificial y agronegocio, indexada en las bases de datos Scopus y Web of Science, mediante un análisis bibliométrico, identificando la evolución temporal de las publicaciones, las principales fuentes de publicación, la distribución geográfica de la producción científica y los principales temas y tendencias presentes en el corpus analizado. Se realizó un análisis bibliométrico de artículos indexados en Scopus y Web of Science, consultadas a través del Portal de Revistas de la CAPES, utilizando los términos de búsqueda "artificial intelligence" AND "agribusiness". Tras aplicar los criterios de selección y eliminar los registros duplicados, se analizaron 102 artículos publicados entre 2012 y el 5 de septiembre de 2026. Los resultados mostraron un aumento sustancial de la producción científica a partir de 2022, y las publicaciones comprendidas entre 2022 y la fecha de búsqueda en 2026 representaron el 92,16% del corpus analizado. Brasil y Estados Unidos destacaron en términos de volumen de publicaciones. El análisis temático puso de relieve temas relacionados con la inteligencia artificial, el agronegocio, la agricultura de precisión, la sostenibilidad, el blockchain y la transformación digital. El mapa temático situó la sostenibilidad, la agricultura de precisión y la toma de decisiones como temas relativamente desarrollados y conectados. El análisis de la evolución temática reveló diferencias en la representación de los temas entre los períodos examinados, incluidos tópicos relacionados con la transformación digital, los efectos económicos y sociales y los sistemas de apoyo a la toma de decisiones.
Palabras clave: Inteligencia Artificial; Agronegocio; Análisis Bibliométrico.

1. Introduction

The contemporary configuration of Brazilian agribusiness is related to a historical process marked by land concentration, state-led modernization, and political disputes. The formation of a production structure based on large-scale landholdings and monocultures, combined with state intervention through credit, infrastructure, financing, and public research, contributed to the consolidation of Brazilian agribusiness and its integration into the global agri-food system (Schneider; Leonardi; Belletti, 2025).

In this context, digital transformation has emerged as an important driver of change in agribusiness, influencing its capacity for innovation and fostering the development of new solutions for the sector. This process plays a significant role in agribusiness innovation by strengthening innovative capacity and improving the quality of innovations developed within the sector (Xue et al., 2024).

The adoption of innovative and disruptive technologies, such as precision agriculture, artificial intelligence, and biotechnology, has been gaining ground among

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Brazilian agribusiness startups, with the potential to promote transformation across the sector. These technologies can contribute to increased efficiency and productivity, reduced resource waste and greenhouse gas emissions, and improved monitoring and control activities. In addition, their use has the potential to enhance food security, reduce environmental impacts, and promote sustainability, thereby making agribusiness more resilient (Manganda; Sehnem; Lara, 2024).

The application of artificial intelligence in modern agriculture has received increasing attention, particularly due to its potential to automate production activities, accelerate food production, and promote greater efficiency in resource use (Amalia, 2023). This application extends to different agribusiness activities, including precision agriculture, supply chain management, and robotics, enabling data analysis, resource optimization, production forecasting, and support for data-driven decision-making (Bran et al., 2024).

Given the growing incorporation of artificial intelligence into agribusiness activities, scientific interest in its applications and implications for the sector has also increased. In this context, studies have sought to understand the use of these technologies in production and management activities, highlighting a research field that encompasses different applications, approaches, and challenges. Fuentes and Aguilar (2025), for example, conducted a systematic literature review on the use of artificial intelligence in the management of small-scale agro-industrial production, analyzing 62 articles and identifying the potential, limitations, challenges, and opportunities associated with the adoption of these technologies.

The diversity of applications and perspectives related to artificial intelligence in agribusiness highlights the need to understand how this scientific field has developed over time. Therefore, the objective of this study is to analyze the scientific production on artificial intelligence and agribusiness, indexed in the Scopus and Web of Science databases, through a bibliometric analysis, identifying its temporal evolution, the main publication sources, the geographical distribution of scientific production, and the main research themes and trends present in the analyzed corpus.

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2. Theoretical Framework

Agribusiness encompasses a set of business activities related to agricultural and livestock production, ranging from crop cultivation and animal farming to the processing, distribution, and marketing of products, integrating the different stages through which agricultural production reaches the final consumer (Kareska, 2023). Agribusiness plays an important role in economic growth, and its sustainable development is influenced by several factors. In this regard, modern agribusiness requires a multidimensional approach that considers aspects such as renewable water resources, human development, and economic growth (Bešić et al., 2022).

The pursuit of sustainable competitive advantages in the agri-food sector has been associated with the adoption of regenerative strategies and the incorporation of digital technologies. The integration of regenerative strategies with technologies such as the Internet of Things, automation and robotics, artificial intelligence, traceability, and Big Data represents an alternative for transforming agri-food systems, involving issues related to greenhouse gas reduction, waste management, biodiversity conservation, soil improvement, water resource management, and the socioeconomic development of local communities (Novak et al., 2024).

From this perspective, the growing global demand for food, projected to increase by 70% by 2050, reinforces the need for solutions capable of increasing agricultural productivity and promoting greater efficiency in resource use. Accordingly, artificial intelligence-based technologies, including machine learning, Big Data analytics, and the Internet of Things (IoT), offer opportunities for application across different agribusiness activities, contributing to the development of solutions aimed at productivity, sustainability, and resource-use efficiency (Assimakopoulos et al., 2024). Artificial intelligence encompasses techniques and algorithms capable of learning from data and performing tasks associated with human intelligence, such as pattern recognition, decision-making, and problem-solving (Santos et al., 2023).

Thus, digital transformation is reshaping commercial relationships in agribusiness by expanding opportunities for market access and interaction between producers and consumers. In a study conducted with smallholder farmers in Sub-

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Saharan African countries, digitalization made a significant contribution to market transformation by reducing the involvement of intermediaries, expanding marketing opportunities, and facilitating communication, promotion, and consumer payments (Ndekwa et al., 2023).

In the Brazilian context, the adoption of these technologies is associated with the pursuit of more efficient and environmentally responsible production models, although challenges related to unequal access to technologies, digital infrastructure, implementation costs, and professional training persist (Souza et al., 2026). Empirical evidence from Brazilian agribusiness indicates that the adoption of digital technologies can produce tangible effects on farm performance.

In a study conducted with family farms integrated into the poultry production chain in Southern Brazil, farms that adopted Industry 4.0 technologies, including artificial intelligence, achieved productivity gains, reductions in operating costs, and greater resource-use efficiency, as well as lower mortality rates and improved feed conversion. The results also revealed barriers related to connectivity, investment costs, and technical capabilities, indicating that the benefits of digital transformation depend on the conditions under which technologies are adopted (Finato; Sehnem; Bertoglio, 2026).

With regard to artificial intelligence, it has been incorporated into agribusiness through different applications involving machine learning, robotics, and data analytics. These technologies are used in areas such as precision agriculture, resource management, and supply chain optimization, enabling real-time monitoring and decision-making support (Bhat et al., 2025). Generative artificial intelligence also has applications in agribusiness related to crop improvement and agricultural productivity. Through the analysis of large genomic and ecological datasets, this technology can contribute to the generation of new crop varieties with desirable characteristics, such as disease resistance, higher productivity, and improved nutritional content (Da Cunha et al., 2025).

Agriculture is undergoing a process of technological transformation in which artificial intelligence plays a relevant role in addressing challenges such as climate variability, resource scarcity, and pest outbreaks. In this context, artificial intelligence-

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based solutions offer new possibilities for precision agriculture, real-time monitoring, and data-driven decision-making. Identified applications include disease detection, irrigation management, and supply chain optimization, using machine learning models, remote sensing, and autonomous systems. These technologies have the potential to reduce waste, optimize resource use, and increase agricultural productivity (Patel; Joshi, 2026).

The application of artificial intelligence has also been investigated in coffee production, with uses in activities such as weather forecasting, pest and disease detection, and the optimization of water and fertilizer use. A systematic review identified that the main applications are related to the early detection of diseases, particularly coffee leaf rust, through computer vision and convolutional neural networks, as well as smart irrigation and the use of agricultural robotics. In the studies analyzed, irrigation systems integrated with sensors and algorithms achieved reductions of up to 20% in water consumption, while robotics was associated with improved operational efficiency and reduced dependence on labor. These applications were also associated with the adoption of more sustainable practices and improved traceability in the coffee supply chain (Hernández-Salazar; Estrada; González-Silva, 2024).

Artificial intelligence applications also encompass activities related to the management and monitoring of agricultural farms. Identified possibilities include the use of imaging sensors for yield mapping, labor management, production optimization, and decision-support systems for farmers. The incorporation of artificial intelligence is also associated with the development of automated systems, including agricultural robots, which are transforming production practices.

Despite this potential, the widespread adoption of artificial intelligence remains constrained by factors such as high implementation costs, limited technological infrastructure, and low levels of awareness in rural communities. Addressing these barriers requires collaborative efforts among researchers, policymakers, and agribusiness firms to develop artificial intelligence tools that are accessible, economically viable, and adapted to the different needs of agricultural farms (Patel; Joshi, 2026).

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The use of artificial intelligence also involves issues related to data privacy, algorithmic bias, and the equitable distribution of benefits, which need to be considered to ensure responsible and fair implementation in agribusiness (Da Cunha et al., 2025). Akter et al. (2024) likewise highlight challenges related to accessibility, information privacy, and the potential displacement of jobs.

Given this scenario, it is relevant to systematically understand how scientific knowledge on artificial intelligence in agribusiness has been developed by identifying its evolution, the main topics investigated, publication sources, and countries with the greatest participation. In this regard, bibliometric analysis makes it possible to map the structure and dynamics of scientific production within a given field of study, enabling the identification of research patterns and trends. Accordingly, the following section presents the methodological procedures adopted to conduct this study.

3. Methodology

This study is characterized as descriptive research conducted through a bibliometric analysis of scientific production related to artificial intelligence in agribusiness. The bibliometric approach was selected based on the objective of identifying characteristics of scientific production, its evolution over time, and the thematic structure of research developed in the field. For data processing and analysis, the Bibliometrix package was used in RStudio through the Biblioshiny interface. The package was compiled under R version 4.5.3. Microsoft Excel was also used as a complementary tool for data organization, tabulation, and systematization, as well as for the preparation of supplementary tables and graphs.

The bibliographic search was conducted in the Scopus and Web of Science (WoS) databases, accessed through the CAPES Journal Portal. The searches were performed on September 5, 2026, without a predefined temporal restriction. The search strategy used the descriptors "artificial intelligence" AND "agribusiness", applied to the title, abstract, and keyword fields. The search query was defined as follows: ("artificial intelligence" AND agribusiness). The initial search in Web of Science returned 48 records, while Scopus returned 591 records. Subsequently,

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publication type criteria were applied, retaining only scientific articles. After this procedure, 94 articles remained in Scopus, while the Web of Science database contained 32 articles.

The records obtained from both databases were exported and imported into RStudio for integration using the mergeDbSources() function from the Bibliometrix package. The integration initially resulted in 126 records. During this process, 24 duplicate records were identified and removed. After deduplication, the final corpus consisted of 102 unique articles, which constituted the dataset used in the bibliometric analyses conducted in this study.

Based on the final corpus, analyses were conducted to characterize and identify the thematic structure of scientific production on artificial intelligence in agribusiness. First, the annual evolution of publications, the main publication sources, and the geographical distribution of the articles were examined. Next, the keywords used by the authors were analyzed to identify the most recurrent terms in the literature. Subsequently, a thematic map analysis was conducted based on the centrality and density indicators, allowing the themes to be classified according to their relevance and degree of development. Finally, the thematic evolution of keywords was analyzed to examine the continuity and reorganization of the main themes throughout the period analyzed.

4. Results analysis and discussion

4.1 Characterization of scientific production

The bibliometric analysis covered the period from 2012 to September 5, 2026, comprising 102 articles published across 89 scientific sources and involving 403 authors. Only five articles were single-authored, while the average number of coauthors per article was 4.05, indicating a predominance of collaborative authorship in the analyzed corpus.

The dataset included 369 author keywords. The average age of the articles was 1.97 years, and the average number of citations per article was 10.32. The

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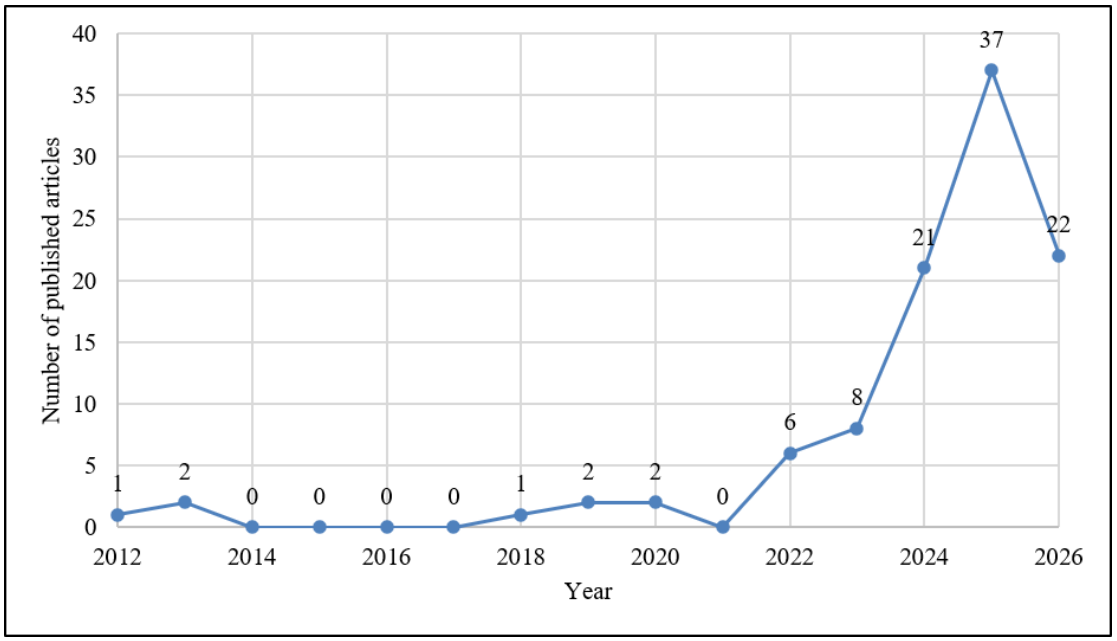
annual growth rate of scientific production was 24.71%. However, this rate should be interpreted in light of the low number of publications recorded in the initial years and the concentration of articles in the most recent period. International coauthorship represented 7.84% of the articles analyzed, indicating that publications involving authors affiliated with different countries constituted a relatively small share of the corpus. Figure 1 presents the annual evolution of the publications included in the analysis.

Figure 1 – Evolution of scientific publications by year (2012–2026)



Source: Research data (2026).

The temporal evolution of scientific production shows a significant increase in research related to artificial intelligence in agribusiness in recent years. Between 2012 and 2021, few scientific articles were published, with periods in which no publications were recorded and a maximum of two publications in 2013, 2019, and 2020. From 2022 onward, an acceleration in scientific production can be observed, increasing from six articles in that year to eight in 2023 and 21 in 2024. The highest volume was recorded in 2025, with 37 publications, while 2026 had 22 articles recorded up to the data collection period (September 2026).

Considering the period from 2022 to 2026, 94 scientific articles were identified,

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corresponding to approximately 92.16% of the total scientific production analyzed. This finding demonstrates that the expansion of research on artificial intelligence in agribusiness is predominantly recent, with particularly pronounced growth from 2022 onward. In this context, the sources with the highest number of articles published during the analyzed period were considered, as presented in Table 1.

Table 1 – Main publication sources on artificial intelligence in agribusiness

Publication sources	Articles
COMMUNICATIONS OF THE ASSOCIATION FOR INFORMATION SYSTEMS	3
FRONTIERS IN SUSTAINABLE FOOD SYSTEMS	3
NONGYE JIXIE XUEBAO/TRANSACTIONS OF THE CHINESE SOCIETY FOR AGRICULTURAL MACHINERY	3
AGRIBUSINESS	2
EKONOMIKA APK	2

Source: Research data (2026).

The distribution of articles across scientific sources reveals a relatively diverse publication landscape, as none of the sources accounted for a large number of articles within the analyzed dataset. The three sources with the highest number of publications are Communications of the Association for Information Systems, Frontiers in Sustainable Food Systems, and Nongye Jixie Xuebao/Transactions of the Chinese Society for Agricultural Machinery, with three articles each. Next, Agribusiness and Ekonomika APK each recorded two articles. Considering that the dataset comprises 102 articles distributed across 89 sources, the presence of only two or three publications in the most productive sources reinforces the dispersed nature of the scientific production analyzed.

This distribution also shows that research related to artificial intelligence in agribusiness is published across different fields, reflecting the breadth of the topic. The identified sources encompass perspectives related to information systems, sustainable food systems, agricultural activities, and issues associated with agribusiness. Thus, scientific production is not concentrated exclusively in journals specializing in technology or artificial intelligence but is also represented across

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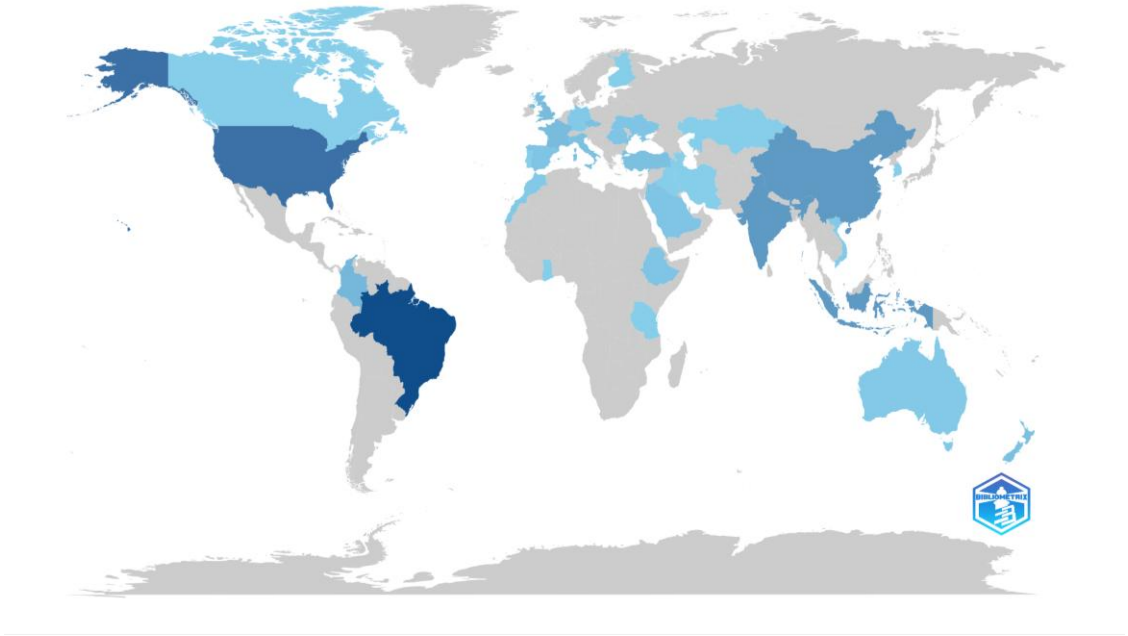
different fields related to the applications of these technologies in the sector. Figure 2 presents the distribution of scientific production across the countries represented in the analyzed dataset, highlighting the presence of the topic in different regions of the world.

Figure 2 – Distribution of scientific production by country



Source: Research data (2026).

The geographical distribution of the publications shows the countries represented in the analyzed corpus. Brazil had the highest number of publications, with 32 articles, followed by the United States, with 23. China, India, and Indonesia each accounted for 13 articles, while Colombia accounted for six. Among European countries, France and the United Kingdom each had five articles, followed by the Czech Republic and Italy, with four each. These results identify the countries with the highest representation in the dataset, based on the country-counting procedure adopted in the bibliometric analysis.

Brazil's prominent representation in the analyzed corpus may be related to the country's importance in the international agricultural and livestock sector. Brazil

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is among the world's largest agricultural and livestock producers, benefiting from the availability of arable land, a tropical climate, and abundant water resources, as well as an agribusiness sector strongly oriented toward international trade (Gaboardi; Candiotto; Panis, 2023). However, this relationship should be interpreted as a possible explanation rather than a causal relationship established by the bibliometric results.

4.2 Thematic structure of scientific production

Following the characterization of scientific production in terms of its temporal evolution, publication sources, and geographical distribution, it is necessary to analyze the main themes associated with research on artificial intelligence in agribusiness. To this end, the keywords used by the authors in the articles comprising the analyzed dataset were examined, allowing the identification of the most recurrent terms and the main thematic areas represented in the literature, as presented in Figure 3.

Figure 3 – Most frequent keywords in the analyzed articles



Source: Research data (2026).

The author-keyword analysis identified recurring terms that characterize the

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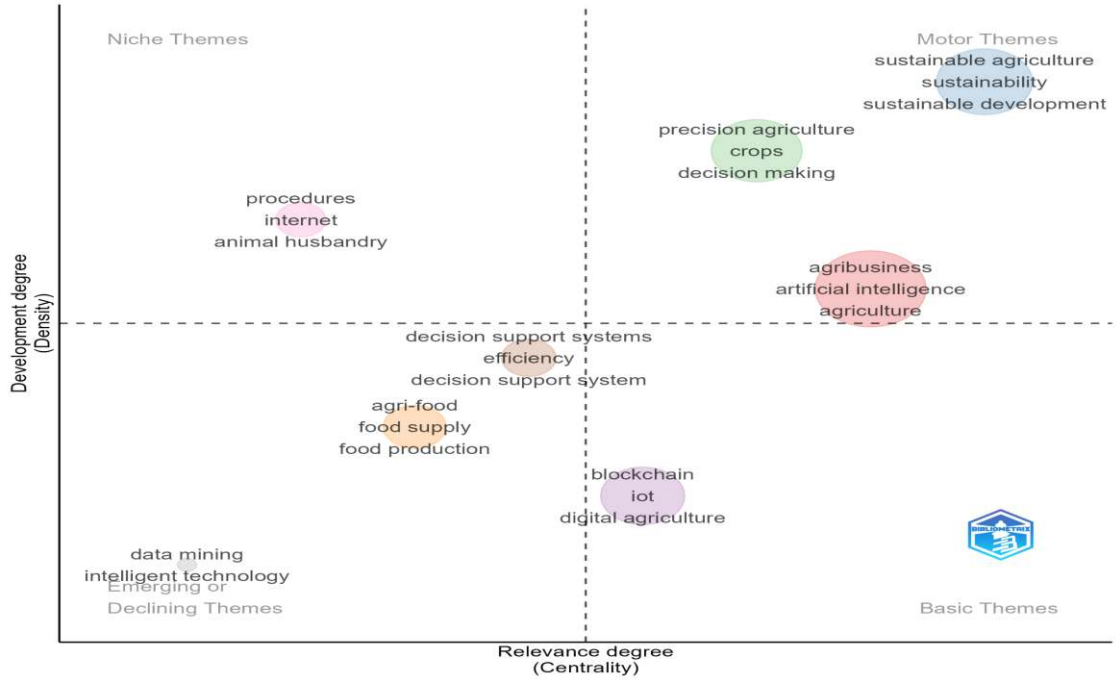
publications retrieved by the search strategy. As expected, “artificial intelligence” and “agribusiness” were among the most frequent terms, reflecting the central concepts used to define the search scope. Other recurring keywords included “precision agriculture”, “blockchain”, “sustainability”, “agriculture”, “digital transformation”, “smart farming”, and “machine learning”. These terms suggest that the analyzed publications address artificial intelligence in connection with agricultural technologies, sustainability, and digital transformation. Nevertheless, keyword frequencies should be interpreted in light of the search strategy, which may favor the occurrence of the concepts used to retrieve the records. In this regard, the thematic map makes it possible to analyze the themes according to their relevance and degree of development, as presented in Figure 4.

Figure 4 – Thematic map of research on artificial intelligence in agribusiness



Source: Research data (2026).

The thematic map organizes the keyword clusters according to two bibliometric dimensions: centrality, represented on the horizontal axis, and density, represented on the vertical axis. Centrality reflects the degree of connection of a theme with other themes in the analyzed network, whereas density reflects the

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internal development of the corresponding cluster. Their combination positions the clusters in four quadrants: motor themes, niche themes, basic themes, and emerging or declining themes.

The motor-themes quadrant contains clusters with relatively high centrality and density, indicating that they are well connected to other themes in the network and internally developed according to the indicators used. In the analyzed map, the clusters associated with “sustainable agriculture”, “sustainability”, and “sustainable development”, as well as “precision agriculture”, “crops”, and “decision making”, occupy this quadrant. Their positions suggest that sustainability, precision agriculture, and decision-making are comparatively developed and connected thematic areas within the analyzed corpus.

Niche themes are characterized by relatively high density and low centrality, suggesting internally developed clusters with more limited connections to the broader thematic network. In the analyzed map, the cluster comprising “procedures”, “internet”, and “animal husbandry” occupies this quadrant. Its position indicates a more specialized thematic configuration within the analyzed corpus, although further examination of the underlying articles would be required to characterize its substantive focus.

Basic themes exhibit relatively high centrality and lower density, indicating connections with other areas of the thematic network but comparatively lower internal development as represented by the map. The cluster containing “blockchain”, “IoT”, and “digital agriculture” appears in this quadrant. This position suggests that these topics are connected to broader research themes in the analyzed corpus, but it does not by itself establish their level of adoption or practical importance in agribusiness.

The emerging-or-declining quadrant comprises clusters with relatively low centrality and density. In the analyzed map, these include “data mining” and “intelligent technology”, the clusters associated with “decision support systems” and “efficiency”, and the cluster comprising “agri-food”, “food supply”, and “food production”. Their positions indicate comparatively limited integration and internal development within the mapped network. However, a single thematic map cannot determine whether these topics are gaining or losing attention over time.

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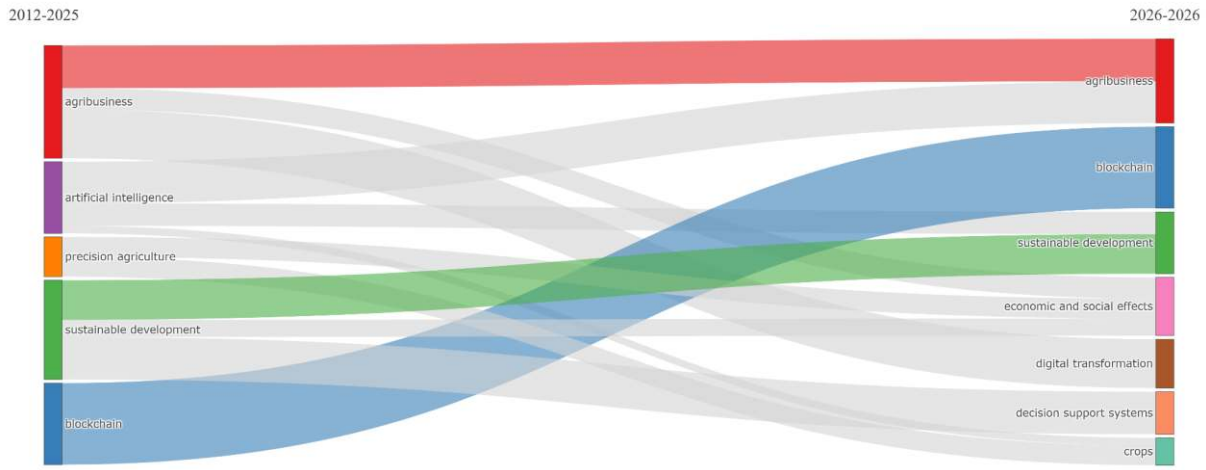
Overall, the thematic map reveals a diversified research structure, with different levels of thematic development and interconnectedness. Greater prominence is observed for sustainability, precision agriculture, and decision-making, while artificial intelligence, agribusiness, and agriculture appear close to the region of highest centrality, reinforcing their relationship with the overall structure of the field. The results also reveal the presence of technologies such as blockchain, IoT, and digital agriculture, suggesting connections between artificial intelligence and broader technological transformations in agribusiness.

Figure 5 – Thematic evolution of research on artificial intelligence in agribusiness (2012–2026)



Source: Research data (2026).

Figure 5 presents the thematic evolution of the analyzed corpus by comparing publications from 2012 to 2025 with those retrieved for 2026 up to September 5. The first period includes themes such as agribusiness, artificial intelligence, precision agriculture, sustainable development, and blockchain. In the partial 2026 period, agribusiness, blockchain, and sustainable development also appear among the identified terms. This overlap suggests continuity in the vocabulary represented in the corpus, particularly in relation to agribusiness, sustainability, and digital

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technologies.

At the same time, the 2026 period presents new terms or clusters, such as economic and social effects, digital transformation, decision support systems, and crops. This connection with digital transformation is also evidenced by recent studies analyzing the adoption of Industry 4.0 technologies, such as artificial intelligence, blockchain, and the Internet of Things, in the agri-food supply chain (ShalekBriski; Loy; Malone, 2026). The presence of these terms indicates that the publications retrieved for 2026 addressed a range of perspectives related to economic and social effects, digital transformation, decision-support systems, and crop production. However, these differences should be interpreted cautiously because the 2026 period covers only part of the year.

The comparison between the periods also highlights the continuity of decision-support applications in the literature. Untaru, Rotarescu, and Dorneanu (2012), for example, used artificial neural networks to support decisions related to the cultivation of energy crops and the prediction of financial outcomes. More recently, Bran et al. (2024) discussed applications of artificial intelligence in precision agriculture, pest and production forecasting, and data-driven decision-making. These examples show that decision support is not an entirely new application of artificial intelligence in agribusiness. Rather, its representation in the thematic analysis may reflect changes in the terminology, clustering, and range of applications covered by the publications retrieved in different periods.

Overall, the thematic evolution analysis indicates differences in the representation of themes across the periods examined, while also showing continuity in topics related to agribusiness, sustainability, and technological applications. The results suggest that artificial intelligence is discussed in connection with multiple dimensions of agribusiness, including precision agriculture, decision-making, digital transformation, and economic and social issues.

5. Conclusions

This study analyzed scientific production on artificial intelligence in

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agribusiness retrieved from the Scopus and Web of Science databases using the search strategy defined for this research. The final corpus comprised 102 articles published between 2012 and September 5, 2026, distributed across 89 scientific sources and involving 403 authors. The results showed a concentration of publications in the most recent years, with articles published from 2022 to the data collection date in 2026 accounting for 92.16% of the corpus. This pattern characterizes the retrieved dataset.

The thematic map showed that themes associated with sustainability, precision agriculture, and decision-making occupied relatively developed and connected positions within the analyzed network, while technologies such as blockchain, the Internet of Things, and digital agriculture also appeared in the thematic structure.

The thematic evolution also revealed changes in the composition of research throughout the analyzed period. Terms related to agribusiness, artificial intelligence, precision agriculture, sustainability, and blockchain were present in the initial period, while the scientific production in 2026 included terms related to economic and social effects, digital transformation, decision-support systems, and crops. However, the comparison between 2012–2025 and the partial year of 2026 does not allow definitive conclusions about the emergence or decline of research topics. The results should therefore be interpreted as an overview of the thematic patterns identified in the retrieved corpus.

The findings contribute to research on the relationship between artificial intelligence and agribusiness by providing a systematized overview of the evolution and thematic organization of this scientific field. Identifying the most developed themes and the different perspectives represented in the literature may support the definition of new research agendas, particularly in areas related to sustainability, precision agriculture, decision-support systems, and digital transformation. Future studies may further investigate these relationships through analyses of more recent periods, comparisons across countries, and specific investigations of artificial intelligence applications in different segments of agribusiness.

This study had limitations related to the search strategy, database coverage,

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and analytical procedures. The selected terms may have excluded relevant studies using alternative terminology, while the results depended on Scopus and Web of Science coverage and keyword organization. In addition, the 2026 data covered only publications up to September 5. Future studies could broaden the search strategy, include additional databases, standardize keywords, and compare more balanced time periods.

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