



TAG Insight Report: Overview of AI for Agriculture and Farming Commercial Market

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Introduction

This TAG Insights Report on *Artificial Intelligence (AI) for Agriculture and Farming* is intended to help companies, managers, practitioners, researchers, investors, and commercial vendors better understand current trends, issues, and market opportunities in this area. A list of representative commercial vendors working in various areas of AI for agriculture and farming is included. The five specific areas covered in this report include:

1. Precision Agriculture
2. Intelligent Predictive Maintenance
3. Advanced Yield Management
4. AI-Based Disease and Pest Control
5. Intelligent Livestock Monitoring

This report is intended for general and unrestricted use, but interested readers are encouraged to connect with the TAG research and advisory team for more information on the private [TAG Research as a Service \(RaaS\)](#) community that covers, discusses, and shares information on these topics in more depth and includes a wider range of startups, vendors, and companies.

TAG Taxonomy

We organize this TAG Insights Report as per our updated TAG Taxonomy which includes twenty categories of modern solution areas where stakeholders and buyers can find suitable commercial products and services for purchase and use. Each category has five subcategories

that correspond to the main areas in which practitioners can focus. These subcategories are discussed below.

TAG Artificial Intelligence (AI) Taxonomy V0.0

1 Agriculture and Farming 1.1 Precision Agriculture 1.2 Intelligent Predictive Maintenance 1.3 Advanced Yield Management 1.4 AI-Based Disease and Pest Control 1.5 Intelligent Livestock Monitoring	6 Conversational AI 6.1 AI Chat Interfaces 6.2 AI Bots 6.3 Intelligent Text Analysis 6.4 Virtual Assistants 6.5 AI-Based Search	11 Entertainment 11.1 AI-Based Sports Analysis 11.2 AI Support for On-Line Dating 11.3 AI-Generated Multimedia Content 11.4 AI-Based On-Line Gaming 11.5 AI Support for Gambling	16 Manufacturing 16.1 AI-Based Predictive Maintenance 16.2 Advanced 3D Printing 16.3 Smart Robotic Assembly 16.4 AI-Based Factory Operations 16.5 AI-Assisted Product Design
2 Autonomous Vehicles 2.1 Intelligent Fleet Management 2.2 Smart Manufacturing and Design 2.3 AI-Assisted Mobility Services 2.4 AI-Based Delivery Services 2.5 Next Generation Ride Sharing	7 Core Technology 7.1 AI and Machine Learning Algorithms 7.2 Natural Language Processing 7.3 AI Software Platforms and Tools 7.4 Intelligent Computing Devices 7.5 Smart AR/VR Devices	12 Finance 12.1 Intelligent Fintech 12.2 AI-Based Insurance Business 12.3 Smart Investment Support 12.4 AI-Assisted Loan Reviews 12.5 AI-Based Credit Process	17 Marketing and Sales 17.1 AI-Assisted Advertising 17.2 Intelligent Support for Sales 17.3 AI-Based Marketing 17.4 Smart Social Media Marketing 17.5 Advanced Predictive Modeling
3 Biotechnology 3.1 AI-Assisted Drug Discovery 3.2 Personalized Medicine 3.3 Intelligent Medical Diagnostics 3.4 AI-Based Health Analytics 3.5 Intelligent Clinical Trial Support	8 Customer Service 8.1 Smart Help Desk 8.2 AI-Based Product Support 8.3 AI-Assisted Customer Success 8.4 Personalized Customer Support 8.5 Smart Customer Crowd Management	13 Human Resources 13.1 Intelligent Career Support 13.2 AI-Based Personal Coaching 13.3 AI-Based Performance Reviews 13.4 Smart Recruiting and Workforce 13.5 AI-Based Compensation Management	18 Military and Security 18.1 Advanced Surveillance 18.2 AI for Cybersecurity 18.3 AI-Based Law Enforcement 18.4 AI Support for Warfighter 18.5 AI-Based Weapons and Deep Fakes
4 Business Operations 4.1 Smart Supply Chain Optimization 4.2 Intelligent Inventory Optimization 4.3 AI-Based Demand Forecasting 4.4 Intelligent Quality Control 4.5 Smart Contracts	9 Data Analysis 9.1 AI-Based Predictive Modeling 9.2 AI-Based Business Intelligence 9.3 AI-Based Data Normalization 9.4 Intelligent Big Data Analytics 9.5 Smart Simulated Data Generation	14 Information Technology 14.1 AI-Based IT Support 14.2 AI-Based IT Design 14.3 Advanced AI-Based Search 14.4 AI-Powered Apps 14.5 AI-Generated Websites	19 Software Process 19.1 AI-Based Coding Support 19.2 Smart Software Lifecycle Support 19.3 AI-Based Software Quality 19.4 AI-Based Test Case Generation 19.5 Intelligent Software Test and Analysis
5 Commerce 5.1 AI Support for Retail 5.2 AI Support for Warehousing 5.3 Intelligent Product Exchanges 5.4 Smart Auctions 5.5 AI-Based Professional Services	10 Education 10.1 AI-Based Remote Learning 10.2 AI-Based Remote Teaching 10.3 Smart Tailored Education 10.4 Smart Learning Management 10.5 AI-Based Standardized Testing	15 Machines 15.1 Next Generation Robots 15.2 Computer Vision 15.3 Computer Speech 15.4 Autonomous Internet of Things 15.5 Agricultural Robots	20 Transportation 20.1 AI-Based Transportation Logistics 20.2 Personalized Transportation 20.3 Smart Mapping Tools 20.4 AI-Based Flight Operations 20.5 AI-Based Rail Operations

Figure 1. TAG AI Taxonomy

Overview of AI for Agriculture and Farming

The following emerging global commercial opportunities involving AI for agriculture and farming solutions are covered in this report, including the listing of several viable commercial entities providing solutions on the market today:

- Precision farming benefits directly from AI-driven analytics and the ability to tailor the technology the farmer's specific needs. The automation of farm equipment, driven by AI, holds immense potential for labor-saving and productivity gains.
- Intelligent predictive maintenance benefits from AI by supporting the need to reduce maintenance costs proactively. Waiting for equipment to fail is a much more expensive option.
- Advanced yield management enables farmers to optimize resource allocation, enhancing crop yields and reducing wastage. Advancements in weather forecasting will aid in risk mitigation and yield optimization.
- AI-based disease and pest control are enabled by AI-powered analytics that focus on reducing the negative impacts of such problems.
- Intelligent livestock monitoring systems are improving animal welfare and productivity, while AI-based pest and disease detection systems minimize pesticide usage, fostering sustainable practices.

The combination of modern, advanced AI-based technology with the traditional practice of agriculture and farming provides excellent opportunities to improve business results and profitability while also creating new opportunities for more sustainable practices driving advances such as climate mitigation.

Focus Area: Precision Agriculture

Precision agriculture represents a paradigm shift in modern farming. AI applications in precision agriculture uses data-driven insights to optimize resource management, increase yields, and promote sustainable practices.

AI-driven analytics enable farmers to make informed decisions about irrigation, fertilization, and pesticide use, reducing waste and environmental impact. Remote sensing technologies, such as drones and satellites, equipped with AI algorithms, provide real-time data on crop health and soil conditions, aiding in early detection of diseases and pests.

AI also enhances livestock management by monitoring animal health and behavior, improving productivity and welfare. As the agriculture sector faces growing challenges due to climate change and population growth, AI for precision agriculture offers a path towards resilient and efficient food production. This technology continues to evolve, promising even greater precision and sustainability in farming practices for the future.

Focus Area: Intelligent Predictive Maintenance

In agriculture, where machinery is the backbone of operations, the implementation of AI for intelligent predictive maintenance is driving increased efficiency and cost-effectiveness. AI-enabled systems use sensor data to continuously monitor the condition of farming equipment, such as tractors, harvesters, and irrigation systems.

Through predictive analytics, AI algorithms can detect subtle anomalies and wear patterns, thus allowing farmers to schedule maintenance before critical failures occur. This proactive approach reduces downtime, lowers repair costs, and ensures that machinery operates at peak performance, ultimately increasing overall farm productivity.

As AI technology advances, the predictive maintenance models will become more precise, optimizing resource allocation, and extending the lifespan of expensive agricultural machinery. With AI-driven intelligent predictive maintenance, farmers can embrace sustainable practices, streamline operations, and navigate the modern agricultural landscape with greater confidence and efficiency.

Focus Area: Advanced Yield Management

The use of AI for advanced yield management is a good example of how technology can improve the business conditions for farmers. AI's capabilities are now optimizing crop production, ensuring resource efficiency, and mitigating risks.

By leveraging data from sensors, satellites, and historical records, AI-powered systems provide real-time insights into soil conditions, weather patterns, and crop health. This data-driven approach enables farmers to make informed decisions about planting, irrigation, and fertilization. Machine learning algorithms analyze vast datasets to predict crop yields accurately, helping farmers optimize production and minimize waste.

As farmers and agriculture face increasing challenges due to climate change and a growing global population, AI's role in advanced yield management is pivotal in ensuring food security and sustainable farming practices. One can only hope that the technology truly advances the prospects for the farming and agricultural sector.

Focus Area: AI-Based Disease and Pest Control

AI is revolutionizing disease and pest control in agriculture, ushering in a new era of precision and sustainability. Farmers can use AI to combat threats more effectively to their crops while minimizing the use of harmful pesticides. AI-driven systems analyze vast amounts of data, including climate conditions, soil health, and pest populations, to predict disease outbreaks and pest infestations with unprecedented accuracy. This early warning system allows farmers to take targeted and timely actions, reducing crop damage and production losses.

Furthermore, AI enables the development of automated pest control solutions, such as robotic devices equipped with cameras and AI algorithms that can identify and selectively target pests, reducing the need for widespread chemical treatments. In an era where sustainable agriculture is important, AI-based disease and pest control offer not only economic benefits but also a path towards environmentally friendly and responsible farming practices.

Focus Area: Intelligent Livestock Monitoring

AI-based intelligent livestock monitoring is transforming the way farmers manage their animals, enhancing both productivity and animal welfare. Through a combination of sensors, cameras, and machine learning algorithms, this technology offers real-time insights into the health and behavior of livestock.

Monitoring systems can detect subtle changes in vital signs, allowing early identification of illnesses or distress, which leads to prompt intervention and reduced mortality rates. AI can also effectively and accurately predict breeding cycles and optimize feeding schedules, improving overall farm efficiency.

Beyond health and production benefits, intelligent livestock monitoring systems promote ethical farming practices. They ensure animals are treated humanely, with environmental conditions tailored to their needs. As agriculture evolves to meet global food demands while minimizing its environmental footprint, AI-based livestock monitoring stands as a crucial tool for modern, sustainable farming practices. It enhances animal well-being, boosts farm efficiency, and contributes to a more responsible and productive agricultural industry.

Companies and Contributions

The companies listed below emerged as part of our research at TAG. Our goal in listing these fine firms is to provide a starting point for buyers, advocates, stakeholders, and researchers trying to make sense of the commercial landscape for artificial intelligence as a means for driving toward improved methods for agriculture.

Precision Agriculture Vendors

1. [Agremo](#) - Agremo uses AI and drone technology to analyze aerial imagery of fields and provide actionable insights for precision agriculture.
2. [AgShift](#) - AgShift uses computer vision and AI to automate quality inspection and grading of agricultural produce, as well as helping with disease or pest-related issues.
3. [Blue River Technology](#) (a John Deere Company) - Blue River Technology uses computer vision and AI to create smart farming equipment, such as See & Spray weed control.
4. [Bushel Farm](#) – Bushel Farm uses AI and data analytics to provide farmers with tools for managing and optimizing their operations.
5. [Corteva](#) – Corteva provides advanced solutions for agriscience with a portfolio of different solutions for farmers.
6. [FarmWise](#) - FarmWise develops autonomous weeding robots powered by AI to help reduce the need for herbicides and increase crop yields.
7. [Gamaya](#) - Gamaya uses hyperspectral imaging and AI to provide insights on crop health, allowing farmers to optimize their use of resources.
8. [Prospera](#) - Prospera offers AI-driven solutions for monitoring and optimizing crop health, providing real-time insights to farmers.
9. [Taranis](#) - Taranis provides an AI-powered precision agriculture platform using satellite imagery, weather data, and machine learning to monitor and optimize crop health.

Intelligent Predictive Maintenance Vendors

1. [Agrivi](#) - Agrivi offers AI-driven farm management software that includes predictive maintenance features to help farmers anticipate and prevent equipment breakdowns.
2. [Arable Labs](#) - Arable Labs offers predictive analytics for agriculture, using AI to monitor and manage crop health and environmental conditions.
3. [Ceres Imaging](#) - Ceres Imaging uses AI to analyze aerial imagery and provide predictive insights for crop health and irrigation management.
4. [Farmers Edge](#) - Farmers Edge uses AI and machine learning to provide predictive analytics for agriculture, including equipment maintenance and weather forecasting.
5. [Farmwave](#) - Farmwave offers AI-powered software for agriculture, including predictive maintenance tools to keep farm equipment running smoothly.
6. [Quantified Ag](#) - Quantified Ag (owned by Merck) utilizes AI to monitor livestock health and behavior, helping farmers predict and prevent illness or issues.
7. [Regrow](#) - Regrow combines AI with remote sensing technology to offer predictive insights into crop health and potential issues, including equipment maintenance needs.

8. [Tule Technologies](#) - Tule Technologies utilizes AI and IoT sensors to provide predictive irrigation management for agriculture, helping farmers optimize water usage.

Advanced Yield Management Vendors

1. [CropX](#) - CropX uses AI-driven soil sensor technology to help farmers optimize irrigation and increase crop yield while conserving water.
2. [Farmers Business Network \(FBN\)](#) - FBN uses data analytics and AI to provide farmers with insights on crop yield performance, input costs, and market intelligence.
3. [Hiphen](#) - provides AI-powered drone-based analytics for agriculture, helping farmers optimize crop yield through data insights.
4. [Nutrien AG](#) – offers AI-driven insights to help farmers optimize yield by providing weather, crop modeling, and field-specific recommendations.
5. [Prospera](#) - Prospera (Valmont Company) offers AI-driven solutions for monitoring and optimizing crop health and yield, providing real-time insights to farmers.
6. [Sentera](#) - Sentera offers AI-powered analytics for precision agriculture, including drone and satellite imagery analysis to optimize yield.
7. [Trace Genomics](#) - Trace Genomics uses AI to analyze soil microbiomes and provide recommendations for improving soil health and increasing crop yield.

AI-Based Disease and Pest Control Vendors

1. [AgroScout](#) - AgroScout uses AI and machine learning for early detection of diseases, pests, and nutrient deficiencies in crops through scouting and imaging.
2. [Blue River Technology](#) (a John Deere Company) - Blue River Technology's See & Spray system utilizes computer vision and AI to identify and target weeds in real-time, reducing the need for herbicides.
3. [Burro](#) - Burro develops autonomous robots for tasks like weeding and pest control, utilizing AI to target specific problem areas in the field.
4. [FieldIn](#) - FieldIn offers an AI-powered platform for pest and disease management, allowing growers to monitor and optimize pesticide use.
5. [Proagrica](#) – Proagrica solutions incorporate AI for crop disease and pest management by providing data-driven insights to farmers.
6. [Spornado](#) - Spornado uses AI and sensors to detect and monitor fungal diseases in crops and provides real-time alerts to farmers.
7. [SwarmFarm Robotics](#) - SwarmFarm Robotics uses AI-powered robots for precision spraying and targeted pest control in agriculture.
8. [XAG](#) – Chinese company, XAG, combines AI with drones to identify and address disease and pest issues in crops by delivering targeted treatments.

Intelligent Livestock Monitoring Vendors

1. [Afimilk](#) - Afimilk uses AI to monitor and manage dairy herd performance, including health, reproduction, and nutrition.
2. [Connecterra](#) - Connecterra offers an AI-driven platform called "Ida" that monitors cow behavior and health to optimize dairy farm operations.

3. [CowManager](#) - CowManager uses AI and IoT devices to monitor cow health and fertility, assisting farmers in making data-driven decisions.
4. [EasyKeeper](#) - EasyKeeper offers an AI-driven livestock management platform for small and medium-sized farms, covering health, reproduction, and records.
5. [Ever.Ag](#) – Ever.Ag employs computer vision and AI to monitor livestock behavior and health, providing insights to farmers for better management.
6. [Livestock Water Recycling \(LWR\)](#) - LWR employs AI and sensor technology to monitor and optimize water usage and waste management in livestock operations.
7. [Moocall](#) - Moocall offers an AI-powered calving sensor that predicts when a cow is likely to give birth, allowing for timely assistance.
8. [Sencrop](#) - While initially focused on weather monitoring, Sencrop has expanded to provide livestock monitoring solutions that utilize AI for better herd management.
9. [SomaDetect](#) - SomaDetect uses AI and sensors to analyze milk quality and cow health, providing dairy farmers with real-time data for better herd management.
10. [Vence](#) - Vence develops AI-powered virtual fencing solutions for livestock, allowing farmers to control and monitor their animals' movements.

About TAG

TAG is a trusted research and advisory company that provides insights and recommendations in cybersecurity, artificial intelligence, and climate science to thousands of commercial solution providers and Fortune 500 enterprises. Founded in 2016 and headquartered in New York City, TAG bucks the trend of pay-for-play research by offering unbiased and in-depth guidance, market analysis, project consulting, and personalized content—all from a practitioner perspective.

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