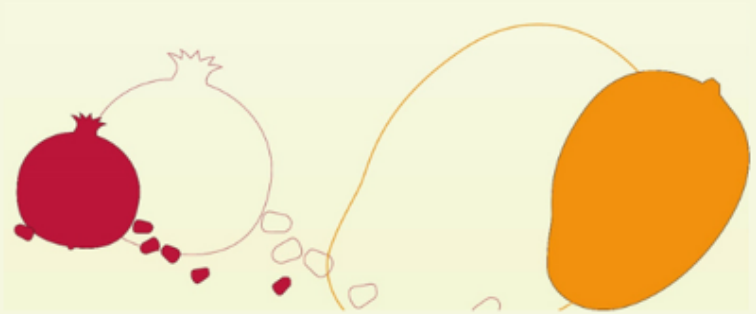
THE FRUITS AND VEGETABLES INDUSTRY SERIES

12 May 2026

The role of AI in the fruit and vegetable sector



Funded by the European Union

Harnessing artificial intelligence for sustainable productivity growth in agriculture

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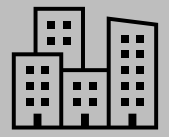
May 12th 2026

Agricultural and Resource Policies Division
Trade and Agriculture Directorate

Food systems: global macro trends and challenges

POPULATION DYNAMICS	CHANGING DEMANDS	CLIMATE CHANGE	TECHNOLOGICAL CHANGES	INCLUSIVENESS
9.7 billion **2/3 living in urban areas** 	**Healthier** **Environmental awareness** 	**Increasing extreme weather events** **Agriculture pressuring the environment**	**Digitalisation** **Associated changes in skills** **Innovation** 	**Migration, gender** **Improve income earning** **Opportunities in rural areas**

OECD countries face a triple challenge

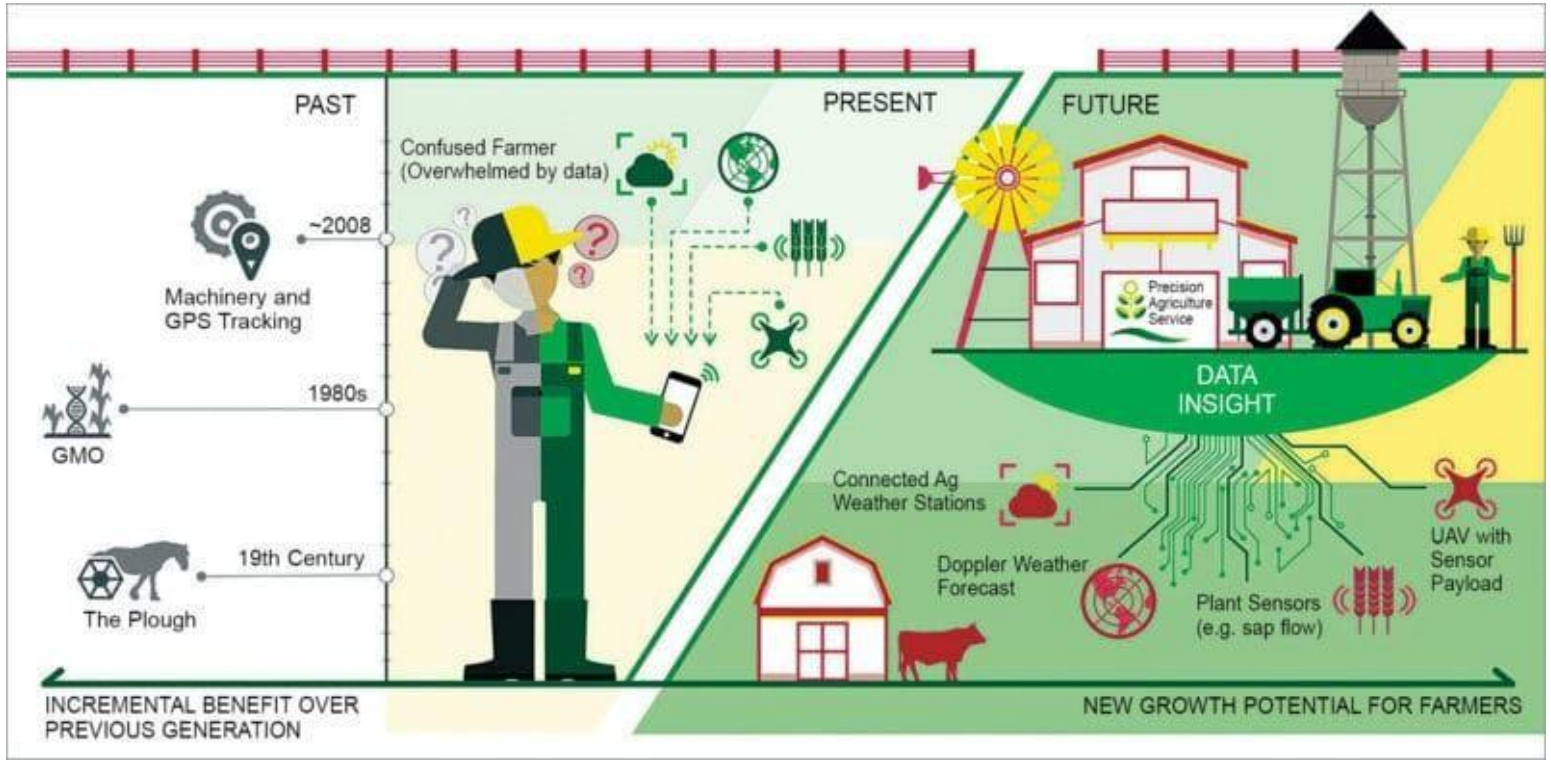
Ensuring **food security and nutrition** for a growing global population

Addressing **environmental** challenges

Providing **opportunities for livelihoods for all farmers**

A growing role for AI in agriculture

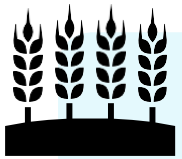
- **Data, digital technologies and AI** are central to drive **innovation** in agriculture**,** contributing to **sustainable productivity growth**
- **Value chain:** crop production, post-harvest quality control, reducing food loss and waste, and logistics and market analysis



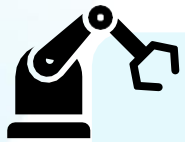
Source: Ayushee Sharma (2020). Industry 4.0 Driving Agricultural Revolution.

AI is a key enabler to address agricultural challenges

Foster sustainable farming practices



Enable data-driven decision-making throughout the agricultural lifecycle



Reduce manual labor through task automation and resource optimisation

Tailored solutions to support small farms overcome resource & knowledge constraints

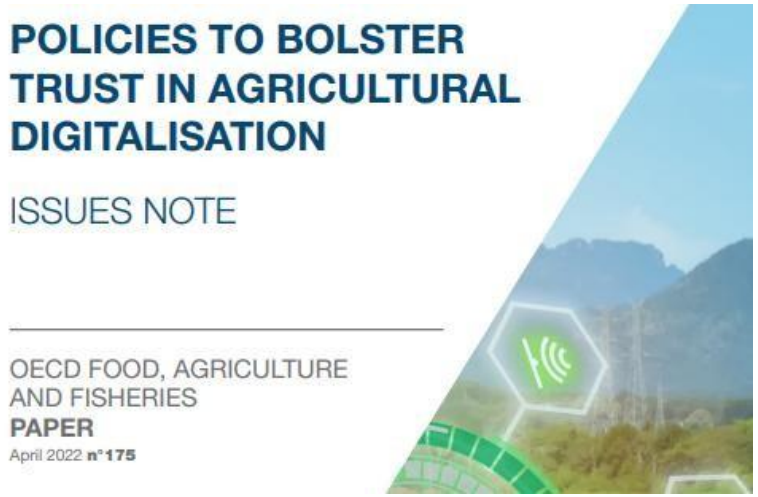
AI potential benefits: productivity and the environment

- More precise irrigation, input use and pest control
- Reduced nutrient losses and chemical application
- Improved monitoring of crop health and disease risks
- Development of better inputs (plant breeding)
- Higher and more stable yields with lower environmental impact
- Optimised harvest timing and quality grading
- Reduced food loss and waste along value chains
- Better matching of supply with market demand
- Lower environmental footprint

Social benefits: AI and digital tools can improve farmer wellbeing and attract new entrants

- **Safer work**: Automation reduces exposure to chemicals and arduous tasks
- **Better work-life balance**: More flexibility, less labour-intensive
- **Supports on-farm diversification**: Enables agri-tourism and other rural ventures
- **Stronger social ties**: Reduces isolation, builds networks

- Makes agriculture more attractive for new generations and dynamic entrepreneurs



AI is a tool for improving data and guiding policy

- Identify and provide new data from unstructured information
- Track patent activity and technology diffusion
- Analyse and compare policy approaches
- Support evidence-based policies aligned with sustainability goals

Potential database

Machine learning classification

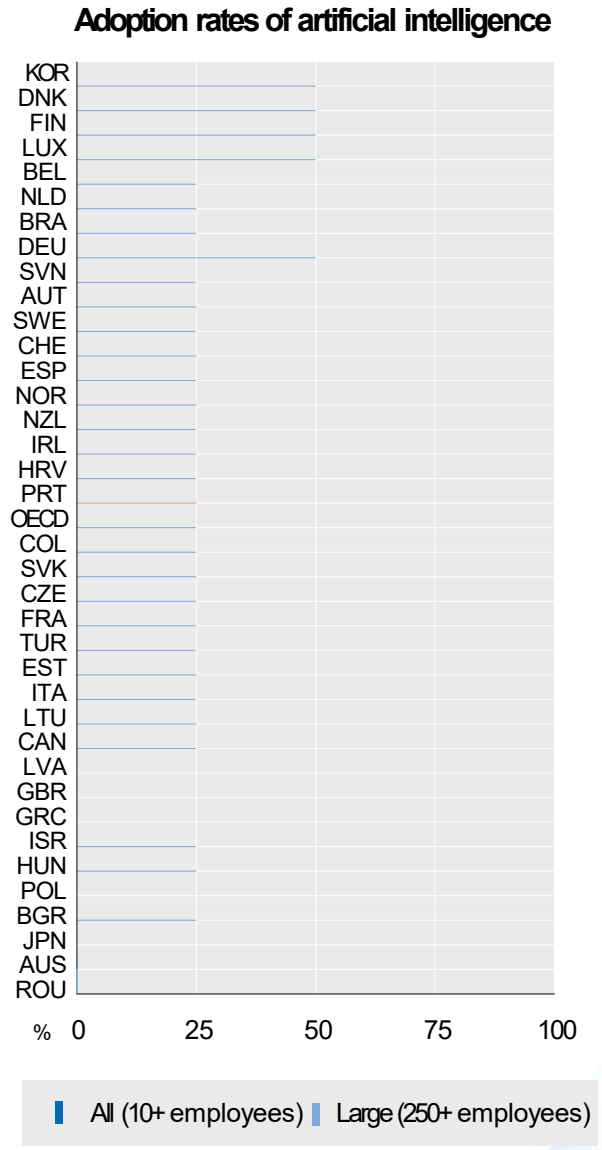
Characterisation and interpretation of the results

Barriers to AI adoption

- Limited digital infrastructure and connectivity
- Fragmented, low-quality or inaccessible data
- High upfront costs and uncertain return on investment
- Integration challenges and skills gaps
- Lack of interoperability and lock-in issues

Especially difficult for smallholders and SMEs

- Limited investment capacity and data volumes
- Lower ability to absorb organisational and technical change
- Solutions often designed for large farms
- Risk of widening digital divides in the F&V sector



Source: OECD Going Digital Toolkit; OECD Main Science and Technology Indicators database.

Current level of uptake and barriers in the EU

AI-powered agricultural robots

Primarily on high-value crops farms; Robotic systems for milking, seeding, weeding, spraying, and harvesting

Predictive analytics

Large, tech-savvy farms and specialised operations

Crop, soil, and livestock monitoring

Uneven, primarily for high-value crops or pilot projects

BARRIERS

- High upfront costs
- Limited availability of and access to harmonised, high-quality data across farms and regions
- Limited digital infrastructure
- Uncertain return on investment
- Difficulty to integrate AI tools into existing farm management systems
- Lack of awareness and skills

Progress in Implementing the European Union Coordinated Plan on Artificial Intelligence (Volume 2)

Uptake in High-Impact Sectors

Key policy recommendations

Infrastructure and connectivity

Data availability and access

Regulatory and policy frameworks

Skills, trust and collaboration

Thank you very much!

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THE FRUITS AND VEGETABLES INDUSTRY SERIES

Thank you

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FRUIT AND VEGETABLES SCHEME

FIT FOR MARKET+

Funded by the European Union

The OECD-COLEAD Fruits and Vegetables Industry Series focuses on market access conditions and opportunities for the fruit and vegetable sector, especially for fruit and vegetables producers and exporters from ACP-countries. This activity is supported by the Fit For Market Plus (FFM+) programme, implemented by COLEAD within the framework of development cooperation between the Organisation of African, Caribbean and Pacific States (OACPS) and the European Union (EU)