USDA Economic Research Service
U.S. DEPARTMENT OF AGRICULTURE

Ag Innovation Forum 2024
Artificial Intelligence (AI) Panel

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What is ERS and What Do We Do?

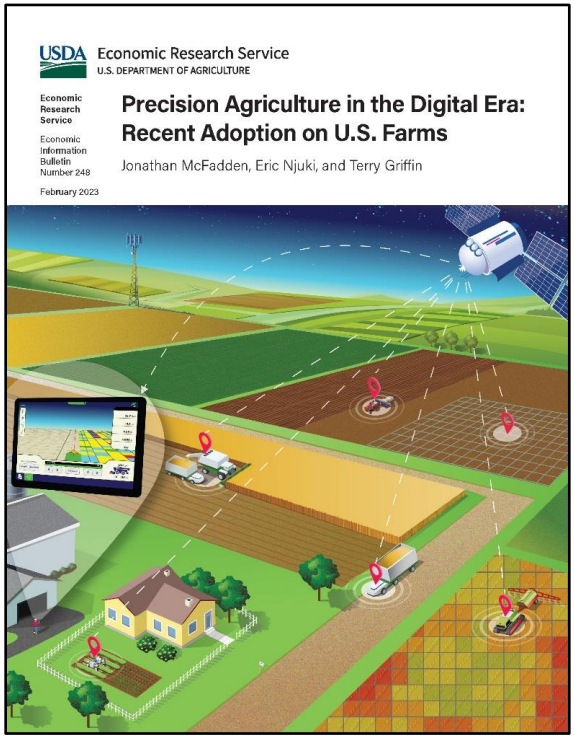
- A large part of the ERS mission, as one of the Federal government's 13 **principal statistical agencies**, is "to conduct **high-quality, objective** economic research to inform and enhance public and private decision making."
- ERS shapes its research program **to serve those who regularly make or influence public policy** and program decisions.
- Our research and analysis covers a **broad range** of economic and policy topics, including precision agriculture and increasingly AI—important inputs in agricultural production.

Context: Challenges and Solutions

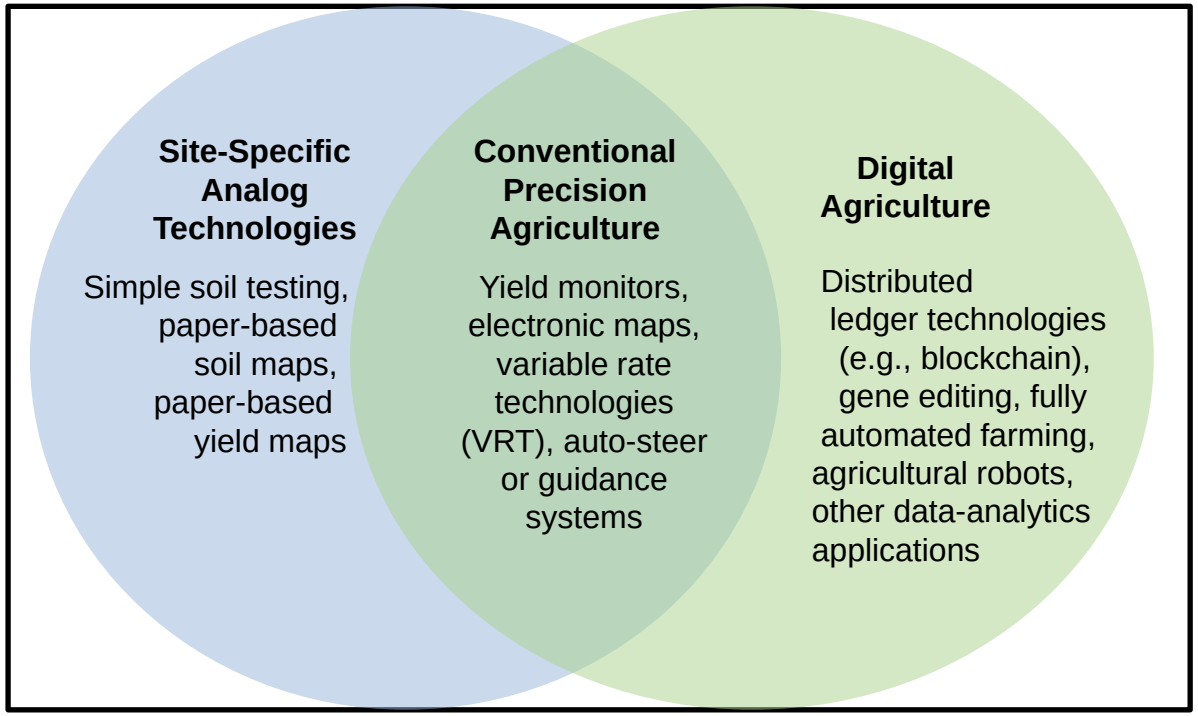
- U.S. agriculture faces **challenges** due to several factors, including:
  - Rising production costs
  - Labor shortages
  - Climate change
  - Population growth
- Increasing awareness of these issues has led to further calls for the agricultural sector to develop **innovative solutions**.
- **Digital agriculture**—increasingly reliant on **artificial intelligence (AI)**—presents an important opportunity to respond to many of these challenges.

ERS study:
Precision Agriculture in the Digital Era

- The goal of the report was twofold:
  1. Document **trends in farmers' use of PA technologies** between 1996 and 2019 for **six key field crops**: corn, soybeans, cotton, winter wheat, rice, sorghum
  2. Explore several **main drivers** of farmers' PA adoption
- Our findings derive from two data sources, though the main source is the Agricultural Resource Management Survey (ARMS)
  - ARMS is a key source of information to the USDA about **production practices and inputs** used on farmers' fields
  - We emphasize **adoption in the four most recent years (2016-19)** but also include data during 1996-2007, 2009-13, and 2015.



How Does AI Relate to Digital Agriculture?

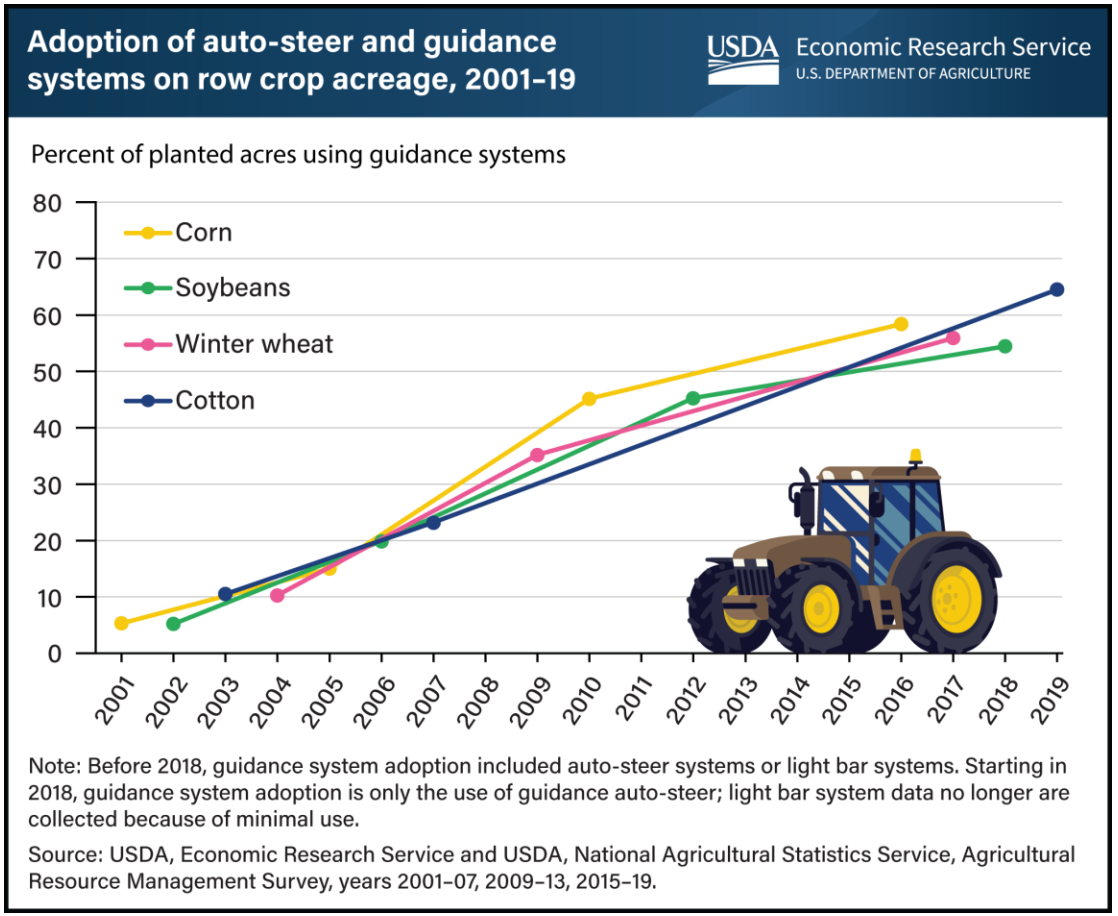


Source: McFadden, Njuki, and Griffin (2023), *Precision Agriculture in the Digital Era: Recent Adoption on U.S. Farms*. USDA, Economic Research Service, EIB No. 248, February.

- Precision technologies are becoming increasingly **complex**.
- The term **precision farming** encompasses several ideas, and in many cases, **AI applications.**
- No single **definition of AI** is universally agreed on, but this framework can help us think about relevant areas for AI.

Most U.S. Row Crop Acreage is Now Managed Using Auto-Steer and Guidance Systems

- Adoption of **auto-steer and guidance systems** has **risen sharply** the past 20 years.
- Since the early 2000s, manual systems have been replaced with more **sophisticated technologies**—in part because they **are easier to use and more accurate**.
- What might this trend tell us about farmers' use of **AI technologies**?



Thank you

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