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USDA to launch AI challenge for faster crop breeding using germplasm data

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Planned national competition will leverage artificial intelligence, high-performance computing and multi-source agricultural data to accelerate the development of resilient crop varieties

The U.S. Department of Agriculture (USDA) is preparing to launch a nationwide artificial intelligence initiative aimed at transforming crop breeding by enabling researchers to extract insights more rapidly from the agency's extensive germplasm and plant genetics datasets. Expected to be introduced later in 2026, the Agricultural National Science and Technology Challenge will encourage researchers, technology developers and interdisciplinary teams to create AI-powered tools capable of accelerating plant breeding and crop improvement.

The initiative forms part of the federal government's broader effort to integrate advanced computing and artificial intelligence into agricultural research to strengthen food security, improve crop productivity and enhance resilience to climate-related stresses.

AI to Unlock Value from Complex Agricultural Data

Under the proposed challenge, participating teams will develop analytical platforms capable of processing multiple forms of agricultural data simultaneously. The AI systems are expected to combine information from crop imagery, field observations, laboratory analyses and germplasm datasets to identify valuable genetic traits and plant characteristics with greater speed and accuracy than conventional research methods.

By improving the interpretation of complex biological data, the initiative aims to shorten breeding cycles and help scientists identify promising crop traits more efficiently, supporting the development of higher-yielding, disease-resistant and climate-resilient crop varieties. The USDA believes advanced AI models could significantly reduce the time required to translate genetic information into practical breeding outcomes for agricultural producers.

National Research Infrastructure to Support Participants

Teams selected for the competition will receive access to the American Science and Security Platform, a national scientific infrastructure led by the U.S. Department of Energy. The platform connects high-performance computing resources, advanced research facilities, scientific datasets and artificial intelligence tools, providing participants with large-scale computational capabilities for analysing complex agricultural information.

The infrastructure is designed to encourage collaboration among federal laboratories, universities, research institutions and private-sector technology companies working on next-generation scientific applications.

Part of the Federal Genesis Mission

The AI challenge will be delivered through the Agriculture Advanced Research and Development Authority (AgARDA) in collaboration with the federal Genesis Mission, an initiative established by executive order in November 2025 to accelerate scientific discovery through advanced computing and cross-sector collaboration. The Genesis Mission seeks to apply artificial intelligence and high-performance computing across multiple scientific disciplines, with agriculture emerging as one of its priority application areas.

For crop science, the programme is expected to strengthen the integration of computational biology, genomics and plant breeding, enabling researchers to analyse increasingly complex biological datasets that were previously difficult to process at scale.

Competition Details Expected Later This Year

While the USDA has confirmed plans to launch the competition during 2026, additional programme details—including funding levels, eligibility criteria, submission requirements and application timelines—have yet to be announced. The department is expected to release further information as the challenge moves toward implementation.

As governments worldwide increasingly invest in AI-driven agricultural innovation, the USDA's planned initiative highlights the growing role of machine learning and advanced data analytics in modern plant breeding. By combining large-scale germplasm resources with next-generation computational tools, the programme aims to accelerate the development of crop varieties capable of meeting future food production and climate resilience challenges.