Whitepaper Request:
Informing a National Framework for Digital Agriculture, AI and Research Data Infrastructure

Background

Digital agriculture is the convergence of agricultural science, data science, engineering, and advanced digital technologies to collect, integrate, analyze, and communicate information across the agricultural value chain. Through technologies such as precision agriculture, remote sensing, unmanned aviation systems, artificial intelligence, machine learning, robotics, data analytics, cyberinfrastructure, interoperable data systems, and decision-support platforms, digital agriculture is transforming the ability of the research enterprise to generate discoveries, deliver solutions, and address the nation's most pressing agricultural, environmental, economic, and food system challenges. The nation's Land-grant universities and their affiliated state agricultural experiment stations must be positioned to lead this transformation.

On behalf of agInnovation, the National Research Support Project (NRSP) Review Committee, recognizes that digital agriculture represents a major long-term research priority in the agricultural sciences. The digital agriculture priorities is reinforced by the nation's priority to ensure and enhance American AI dominance, USDA's research agenda, and by the evolving needs of producers-centered decision tools, and the increasing importance of shared data systems, reproducible research workflows, and coordinated national research infrastructure.

To ensure Land-grant Universities are the national and global leaders in digital agriculture and the trusted source for digital agriculture innovation, advancement, and transformation, we must work collaboratively to establish shared standards, data management expectations, organizational structures, governance models, and supporting infrastructure. These foundational elements are essential to enable agricultural data, artificial intelligence, and other digital tools to be developed, validated, integrated, shared, reused, and continuously improved across institutions. By aligning our efforts, we can accelerate innovation, maximize the value of public investments, and create a more connected and impactful digital agriculture ecosystem.

agInnovation has identified a need for clear, expert-driven guidance to define a national framework for the future research landscape for digital agriculture, with particular emphasis on artificial intelligence, data sharing, software interoperability, and research data governance. Specifically, there is a need to articulate:

- The most pressing, foundational research gaps in digital agriculture and artificial intelligence over the next 10 years;

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- The data management requirements, including the FAIR Data Principles (findable, accessible, interoperable and reusable) and including, data sharing, metadata expectations, programming practices, data access, interoperability requirements needed for AI, and data governance should be structured to enable transformative agricultural research;
- What cyberinfrastructure, software architecture, partnerships, and institutional capacities are required to support a national digital agriculture research enterprise;
- How Land-grant institutions and State Agriculture Experiment Stations, USDA and other federal agencies, commodity groups, industry partners and other stakeholders can collectively and efficiently support and leverage current resources supporting shared research and data infrastructure, and
- How future NRSP proposals, competitive grant programs, and institutional investments can support the development of a coordinated digital agriculture and AI research ecosystem.

To address these critical questions, agInnovation is issuing this "Request for Proposals" inviting a qualified team of thought leaders, researchers, data scientists, technology experts and practitioners to develop a comprehensive whitepaper. The whitepaper will assess the current landscape and identify the research, data, software, infrastructure and governance needs required to advance digital agriculture and artificial intelligence applications in agriculture. The resulting framework should provide a strategic roadmap that positions LGUs as national and global leaders in digital ag innovation, transformation and impact.

Proposals

The selected team will develop a forward-looking whitepaper that provides agInnovation with a foundational reference document for future planning, investment and coordination. The document should not simply summarize current digital agriculture activities. Instead, it should define what is needed to create a coordinated national research framework that supports artificial intelligence, shared data resources, reproducible workflows, interoperable systems, and multi-institutional collaboration in agriculture.

The whitepaper should provide actionable guidance on the standards, structure, and investments needed to support AI-enable agricultural research across the land-grant system. This includes both technical and institutional recommendations.

Proposals should not exceed 3 pages (excluding CVs) and must include the following:

- Cover page with team lead, institutional affiliation, and contact information;
- Project narrative describing the team's approach to the whitepaper, proposed structure/outline, and key themes to be addressed;
- Description of team qualifications and experience,
- Brief biographies or CVs (2 pages per person maximum) for each proposed contributor;
- Statement describing how the proposed work extends beyond the ongoing research activities of team members and their home institutions;

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- Description of how the team will engage relevant stakeholders, including Land-grant researchers, data scientists, USDA Experiment Station leaders, industry partners, and other appropriate groups
- Budget narrative describing how the stipend will be used.

Proposals must be submitted electronically to Rick Rhodes, agInnovation Northeast Executive Director (rcrhodes@uri.edu) by **TBD**, at 5:00 PM ET. Late submissions will not be considered. The team selected to draft the whitepaper will be notified on **TBD**, 2026.

Desired Team Expertise

AgInnovation is seeking a team with demonstrated expertise across several areas essential to the future of digital agriculture and artificial intelligence. Competitive teams should include, or demonstrate access to, expertise in the following areas:

- Agricultural research systems, including crop, livestock, natural resources, environmental or food system research;
- Artificial intelligence, machine learning, predictive analytics and computational modeling;
- Research data management, data governance, metadata standards, and data stewardship;
- Software development, programming standards, reproducible workflows, and open-source or shared-code environments.
- Cyberinfrastructure, cloud computing, high-performance computing, data storage and secure data access;
- Precision agriculture, robotics, remote sensing, sensory systems, automation or decision-support tools;
- Multi-institutional collaboration, research networks and national research infrastructure;
- Extension, producer engagement or applied decision support systems.

Funding

agInnovation will provide a stipend of $50,000 to support the selected team in the whitepaper development effort. This is a stipend award, not a research grant and hence, there is no associated indirect cost return. The proposal should include a description of how funds will support the effort (e.g., personnel time, travel for team coordination, writing support).

The stipend is intended to support development of the whitepaper and associated deliverables. It is not intended to support primary research, software development, equipment purchase, or creation of a functioning data platform.

Whitepaper Objectives and Deliverables:

agInnovation is seeking a select team that can provide strategic, technical, and institutional guidance for the future of digital agriculture and artificial intelligence management and sharing in agricultural research.

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The selected whitepaper team is expected to develop a comprehensive white paper that will:

- Define the scope and boundaries of digital agriculture as a research discipline, including the role of artificial intelligence, machine learning, robotics, automation, sensing systems, decision-support tools and data-driven research;
- Identify the most critical unanswered research questions in digital agriculture
- Recommend data standards, metadata expectations, documentation practices, and data quality requirements needed to support AI-ready agricultural research data;
- Address data management, data sharing, data access, data governance, data security, data ownership, intellectual property, and ethical use of agricultural data;
- Recommend programming and software development practices that support reproducible research, shared code, model validation, interoperability and long-term reuse;
- Identify the infrastructure needed to support AI-enabled agriculture, including high-performance computing, cloud systems, data repositories, sensor networks, model hosting, and secure data environments;
- Describe how agricultural datasets, AI models, decision-support tools and software resources should be archived, cited, versioned and maintained;
- Assess current capacity, human capital, infrastructure, and institutional collaboration with the agricultural research community.
- Identify gaps in expertise, infrastructure, governance, and coordination that limit national progress.;
- Recommend structures for multi-institutional collaboration that go beyond current activities of any single institution;
- Identify opportunities for coordination with USDA, federal agencies, commodity groups, industry partners and other stakeholders;
- Provide actionable recommendations that could inform future NRSP proposals, competitive grant priorities, institutional investments and national research coordination.

The selected team is expected to deliver the following within 6 months of award:

- A draft whitepaper submitted to agInnovation for internal review;
- A revised final whitepaper incorporating reviewer feedback, suitable for public distribution and publication;
- A concise executive summary (2–3 pages) highlighting key findings and recommendations, formatted for distribution to agInnovation;
- A proposed framework for digital agriculture and AI research data standards, including recommended metadata, documentation, interoperability, and data-sharing practices;
- A prioritized roadmap for future NRSP proposals, competitive grant opportunities and institutional investments;
- A presentation of findings to be delivered; and
- All data, references, and supporting materials in a format suitable for archiving.

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The whitepaper and associated materials will become the property of agInnovation and may be made publicly available. The writing team will be recognized as authors.

Review Criteria
Proposals will be evaluated using the following criteria:

1. Relevance to the Purpose of the RFP
   The proposal clearly addresses the need for a national framework for digital agriculture, artificial intelligence, data standards, software practices, data governance, and research infrastructure

2. Team Expertise and Qualifications
   The proposed team demonstrates appropriate diverse scientific, technical, and institutional expertise, including agricultural research, AI or machine learning, data management, software systems, cyberinfrastructure, and multi-institutional collaboration.

3. Quality of Proposed Approach
   The proposal presents a clear and feasible approach for developing a thoughtful, technically informed, and actionable whitepaper.

4. Breadth and National Perspective
   The proposal demonstrates an ability to address the needs of the broader agriculture research community and emphasized value of a collaborative, synergistic approach, rather than focusing primarily on the activities or priorities of a single institution.

5. Actional of Expected Product
   The proposal demonstrates that the final whitepaper will provide clear recommendations that can inform future NRSP proposals, competitive funding priorities, institutional investments, and national coordination.

6. Feasibility
   The proposed timeline, team structure, and use of funds are appropriate for completing the required deliverables.

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