

Unlocking Agricultural Resilience: An Independent Review of ROAR’s Innovations and Impact

When agriculture faces crises—whether a livestock disease outbreak or an invasive pest infestation—rapid solutions become essential. The Rapid Outcomes from Agricultural Research (ROAR) program, funded by the Foundation for Food & Agriculture Research (FFAR), plays a vital role in addressing these challenges by providing swift, high-impact funding for research that mitigates emerging threats. Since its launch in 2017, ROAR has supported innovative projects to build resilience across the agricultural sector.

The program’s scope and scale demonstrate its importance in supporting urgent agricultural research. ROAR has funded 24 research projects across 21 U.S. states, addressing 16 species of plants and animals. With an average funding duration of just over 1.35 years and a matching cost ratio of 1:1.05, the program ensures that federal dollars are maximized through co-investment with institutional partners. The following table summarizes key metrics of the ROAR program:

Table 1. Overview of the ROAR funding program.

METRIC	VALUE
No. of awarded grants	24
No. of FFAR challenge area/initiative	3
No. of investigators (grantees)	23
No. of grantee organization	20
Avg. years of funding	1.35
Avg. total ROAR project amount (including matching fund)	\$266,513.69
Matching cost ratio	1:1.05
No. of species	16
No. of states	21

These figures reflect the program's breadth and reach. The average total project amount, including matching funds, exceeds \$266,000, providing essential support for time-sensitive research that addresses emerging agricultural challenges. ROAR’s matching fund model extends the impact of federal dollars and fosters strong partnerships across institutions, agencies, and industry stakeholders.

Recognizing the growing importance of this initiative, an independent external evaluation provided a thorough and unbiased assessment of the program’s structure, processes, and outcomes. The review highlighted ROAR’s significant contributions to agricultural innovation while identifying key areas for growth.

Dr. Jane Payumo, an expert in quantitative analytics and program evaluation and Director of the Research Evaluation and Data Analytics of MSU AgBioResearch, who led the review, observed, *“Our findings show that ROAR fosters high-quality research and promotes collaborations that often exceed global benchmarks. However, there are opportunities to enhance its processes further to maximize its impact.”*

The Evaluation Process: Identifying Strengths and Opportunities

The evaluation provided a detailed analysis of ROAR's operation—from the proposal submission phase to project implementation and reporting. The program's defining strength is its ability to respond quickly to emerging threats, enabling researchers to address time-sensitive issues before they escalate. This rapid deployment of funds ensures that research begins when needed, often in high-stakes situations such as outbreaks of invasive pests or livestock diseases.

The evaluation team combined data mining, quantitative analysis, stakeholder interviews, and a case study to assess the program comprehensively. While many aspects of ROAR's structure were praised, the evaluation identified several challenges that could be addressed to strengthen the program's effectiveness further. These included complex application guidelines, occasional delays in fund disbursement, and limited communication support for securing co-funding partners. Dr. Prema Arasu, a global development expert, explained, "*The matching fund requirement has catalyzed partnerships that wouldn't have happened otherwise, but simplifying the application process and extending timelines could help researchers achieve even greater results.*"

The evaluation recommended introducing standardized submission templates, extending project timelines, and enhancing communication between ROAR administrators and researchers to improve efficiency. These adjustments would allow for more comprehensive research and greater scalability of research outcomes.

Research Outputs and Practical Solutions

Despite these process challenges, the evaluation confirmed that ROAR has significantly contributed to agricultural research. Specifically, ROAR-funded grants focused on generating the various outputs in Figure 1, highlighting the breadth of research products. These include diagnostic tools, pest management strategies, and biocontrol agents, all aimed at addressing critical agricultural challenges such as Coffee Leaf Rust, Spotted Wing Drosophila, and corn tar spot fungus.

Regarding research productivity, ROAR grants have resulted in 124 peer-reviewed publications, many of which rank among the top 12% globally in agriculture and food systems. Beyond publications, the program has produced 47 practical knowledge products and technologies, ranging from early detection tools for Coffee Leaf Rust to predictive pest management models. These outcomes underscore ROAR's practical impact on solving real-world agricultural problems. Most ROAR grants focus on optimizing production systems, as classified using the USAID framework (see Figure 2). While optimizing production is a central goal, many grants utilized innovative plant and animal improvement technologies, such as genetic sequencing and CRISPR, to enhance disease resistance, boost productivity, and increase resilience to environmental challenges. Additionally, ROAR grants integrated social science tools—including decision support systems, econometric models, and stakeholder engagement. Surveyed grantees identified

various technologies from ROAR funding, including data analysis tools, predictive models, and genetic research methods. These innovations can transform plant and animal health management by improving forecasting and enabling more targeted interventions.

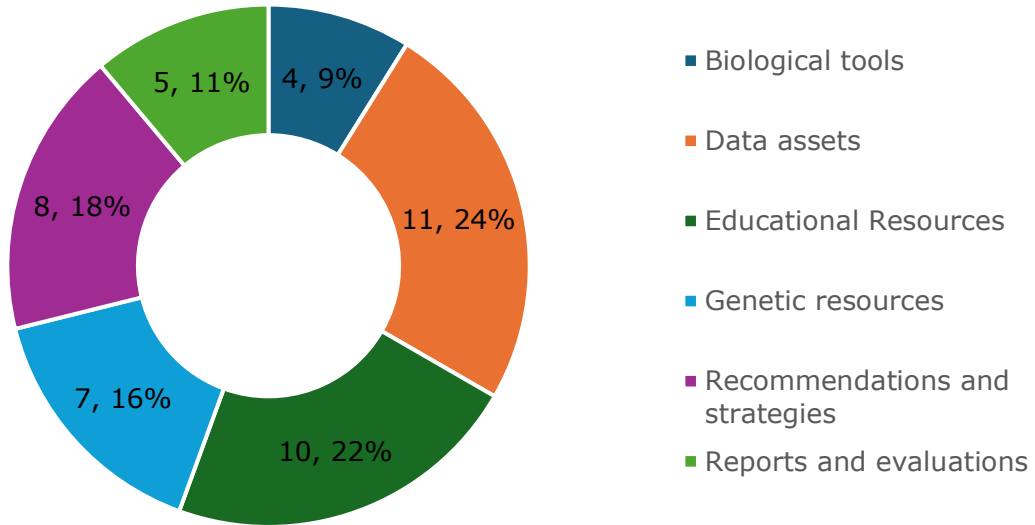


Figure 1. Specific output from ROAR-funded grants.



Figure 2. Types of ROAR innovations (n = 25).
 Note: Hover over the chart to explore the details of ROAR innovations.

Economic Potential and Return on Investment

One of the evaluation's most compelling findings is the potential return on investment in ROAR-funded research. Public agricultural research has historically delivered up to \$20 in benefits for every dollar invested. If this return holds true for ROAR, the \$6.4 million invested in the program could generate \$128 million in long-term economic benefits.

Several ROAR projects show clear promises for commercialization and broader adoption. For example, developing an African Swine Fever (ASF) vaccine could protect the \$120 billion U.S. pork market from devastating losses. Similarly, diagnostic tools for Coffee Leaf Rust could save Hawaiian coffee growers millions annually in recovery costs. Innovations in pest management for wheat stem sawfly and cocoa offer early signs of reducing crop losses and improving yields, which could strengthen rural economies and enhance food security.

Dr. Payumo highlighted the importance of these findings: *"ROAR's innovations show promising pathways to commercialization and broad adoption. Once fully realized, these solutions could benefit farmers and the broader agricultural economy."*

Collaboration and Capacity Building

Another key success of ROAR is its emphasis on collaboration and workforce development. Nearly 90% of ROAR-funded projects involve interdisciplinary teams, bringing together experts from fields such as plant pathology, veterinary medicine, and economics to address complex agricultural challenges. This collaborative approach fosters innovative solutions that address problems from multiple angles.

Dr. Amy Jamison, an expert in qualitative analysis, co-director of Michigan State University's Alliance for African Partnership, and a key contributor to the external review, emphasized the critical role of collaboration in the ROAR program's success. With experience in fostering international research networks and cross-sector partnerships, Dr. Jamison underscored how the program's interdisciplinary approach drives innovation and real-world impact:

"ROAR's success lies in its ability to break traditional silos and bring together experts from different fields. This interdisciplinary approach creates holistic solutions that are far more impactful than individual efforts, ultimately improving outcomes for the agricultural sector."

These cross-disciplinary collaborations have advanced research far beyond academic boundaries, fostering stronger networks among academic institutions, industry leaders, and government agencies. By integrating expertise across fields such as plant pathology, veterinary medicine, economics, and social science, ROAR-funded projects address agricultural challenges from multiple perspectives, resulting in more robust and practical solutions.

ROAR has also significantly contributed to building future research capacity by supporting early-career scientists. Many projects involve graduate students and

postdoctoral fellows, offering them invaluable hands-on experience in solving real-world problems. Invited experts of this review indicated: *"By engaging young researchers, ROAR is helping cultivate the next generation of agricultural scientists. These experiences prepare them with the skills they need to tackle tomorrow's challenges with confidence and expertise."*

Looking Ahead: A Vision for the Future

FFAR's ROAR funding program has established itself as a critical funding agency, enabling U.S. researchers to respond swiftly to urgent agricultural threats while supporting long-term, transformative solutions. ROAR strengthens agricultural resilience by fostering interdisciplinary collaborations, advancing cutting-edge technologies, and promoting stakeholder-driven approaches. It also ensures that critical research has a practical, real-world impact. With continued investment and strategic improvements, the program will remain a cornerstone of agricultural innovation, safeguarding global food systems from future challenges.

Extending project timelines, improving communication, and simplifying application procedures will enhance ROAR's ability to achieve greater results. Continued support for collaborative research and capacity building will solidify the program's role as a catalyst for ongoing innovation and resilience in agriculture.

"ROAR is not just about short-term solutions," the External Review Team concluded. *"It is part of a larger strategy to prepare agriculture for future challenges. By investing in practical research and fostering collaboration, the program is helping build a more secure and sustainable future for the agricultural sector."*

As agriculture faces increasing pressures, ROAR's role will be more critical than ever in ensuring that the U.S. food systems can adapt, thrive, and remain resilient for future generations.