

USDA Agricultural Research Service
National Program 216
Sustainable Agricultural Systems
External Panel Retrospective Review: 2018-2022

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Executive Summary

On December 20, 2021, committee heard several helpful presentations from ARS scientists who are part of NP216, reviewed the provided documents, and learned from ARS National Program Staff Sarah Beebout and Dave Knaebel about the general goals, structure and approaches within NP216. Based on the information provided, each of the problem statements or focal areas was reviewed for impact. Comments on each of these focal areas and the impact rating of high, medium, or low, is provided in the committee's report. The committee also indicated the degree of confidence we had in our rating, given that our evaluation was limited both by our time available and the depth of information we had access to.

In reviewing the information provided and discussing the impacts of research done in relation to each of the ten problem statements, the committee felt it was generally a challenge to accurately rate impact. Much of the information provided pertained more to outcomes than actual impact, which admittedly can be hard to know in relation to research. We recognized some impacts may take place some years after the research is done.

Generally, we felt the research we evaluated for NP216 had good relevancy to the sustainable agriculture systems area and is of high quality. Impact for the ten focal areas generally was considered to be in the medium to high range. Just one focal area was rated low, which was focal area 2A under production economics; this rating was lower because the examples provided seemed of limited scope and impact. However, the committee feels strongly that economics is an essential aspect of the sustainable agriculture systems work, so the low rating did not in any way indicate that economics is not important for NP216.

The focal areas that seemed to have the highest impact, again based just on the limited amount of information we reviewed, were as follows:

- Problem Statement 1A: Sustainable & Resilient Cropping Systems
- Problem statement 1B: Sustainable and resilient grazing land systems
- Problem Statement 1d: Long Term Agroecosystem Research (LTAR) network

Of these three areas, the committee was particularly enthused about the long-term potential impact of the LTAR network. We recognized that some of that impact has yet to occur. In fact, the research done in problem areas 1A and 1B may be having more immediate impact, but we felt the LTAR work is of pivotal importance for ARS and the U.S. agriculture research system going forward. We did wonder how well LTAR research outcomes are being shared with people doing technical outreach, such as land-grant university extension partners.

Another common question we had was about the information sharing among ARS projects, particularly where new technology or decision system approaches are being developed. For example, part of the research involves development of new sensors. We wondered if other ARS staff were being trained on use of these new sensors and wider use being made of the

technology. National program staff subsequently shared several examples of where new ARS-developed sensor technology is being utilized by additional ARS locations.

We also wondered about the scalability of the research and the applicability for other relevant agricultural systems. Most ARS work is by its nature targeted to a particular geographic area. We asked about efforts being made to share insights from one location with other relevant production regions in the U.S., and in follow up information provided by national program staff, concluded that such insights are generally being shared; we encourage continued emphasis on sharing of results where relevant among similar production regions. We also recommend considering how data can be used to populate modeling efforts that extend experimental insights from one region of the country to another

Generally, the committee felt the NP216 area of ARS is doing important work with significant impact. We particularly valued projects where systems analysis is being used and decision tools or other practical management guides are developed as part of the research deliverables. With some research topics presented, impacts appear to be amplified through collaboration with other organizations like USDA-NIFA, University, and Extension partners. We encourage NP216 and ARS leadership to explore and encourage mechanisms of collaboration that can efficiently translate research outputs into societal impacts.