

November 9, 2020

Acting Deputy Secretary
United States Department of Agriculture
1400 Jefferson Dr. SW
Washington, DC 20250

Re: Docket No. USDA-2020-0008

Dear Acting Deputy Secretary:

On behalf of the American Society for Microbiology (ASM), thank you for the opportunity to comment on the Agriculture Innovation Agenda. As one of the oldest and largest life science societies with more than 30,000 members in the United States and around the globe, our mission is to promote and advance the microbial sciences. ASM is committed to advocating for public policies that are rooted in science.¹ ASM supports policies that respect and enhance the integral role of plant, animal, soil, and

Yet while further research will be necessary to identify new practices and improve existing technologies and practices in pursuit of the AIA goals, ASM notes in these comments several practices with strong records of success that engage microbiomes in maintaining and improving yields and the environmental performance of American and global agriculture, including with regards to climate change. Microbiomes are communities of microorganisms, or microbes bacteria, archaea, viruses, fungi, prions, protozoa, and algae that live on, in, and around people, plants, animals, soil, oceans, and atmospheres. Some of the most important developments in modern medicine have resulted from harnessing the power of microbes, including a vaccine against smallpox and the discovery of penicillin. While applications of microbiome research in human health have seen rapid expansion, microbes also play key roles in animal and plant health and the stability of ecosystems. As a core part of its missions, ASM leads, collaborates and galvanizes scientists, stakeholders and the public across multiple sectors.⁴ ASM encourages the USDA, through the AIA, to support farmers and agriculture stakeholders to adopt the technologies and practices discussed below, and continue to collect and assess data resulting from these practices, in order to accelerate technology and practice deployment, and agricultural research investments, moving forward, including increasing coordination of microbiome research across federal agencies.

...e support among its agencies can accelerate deployment of technology and practices that are already known to maintain or enhance agricultural production while reducing pollutants released into the environment. While there are many technologies and practices already known to increase yields and improve the environmental footprint of agricultural production, ASM specifically asks USDA to support the deployment and use of technology and practices:

- to enhance farmland and microbial research data collection and utilization;
- promote use of inoculants that can improve the health of agricultural soils and plant production; and
- encourage conservation tillage and pasture management or grazing practices that enhance soil health.

Technologies

The AIA goals will require expediting deployment of technologies in farm fields and among

example. In particular, ASM supports encourage the equitable and transparent collection, aggregation and interpretation of farming and microbial research data with robust protections of anonymity (which ensures data quality and encourages (ARS) cooperative agreements and research projects funded through the National Institute of Food and Agriculture's data collection, assessment, and sharing to support individual farmers, research scientists in agriculture, and other agricultural stakeholders in achieving AIA goals. In addition to the direct participation in building out computing infrastructure that can process farming and microbial data, ASM also encourages USDA to share data freely, but securely and with the protection of anonymity for farming data, among its various agencies.

In addition to enhancing production and conservation through advising on-farm decision making, computer infrastructure that can effectively assess massive quantities of farming and microbial research data will also be key to identify and develop new microbial soil inoculant products that enhance farm production and reduce its environmental impact, and to effectively monitor and combat antimicrobial resistance that jeopardizes productivity as well as human health (ASM supports establishing a global surveillance system to inform realistic, defensive action plans to combat the spread of antimicrobial resistant organisms and to evaluate the impact of these intervention measures).⁵ ASM encourages USDA to leverage existing infrastructure, such as the National Microbiome Data Collaborative, to the extent practicable for these purposes.⁶ Integrating accurate, anonymous, high-quality data from farms with other sources can help farmers improve yields and avoid unproductive fertilizer applications, consider different uses for fields that require intense tillage or input applications to be productive, and anticipate production complications arising from climate change.⁷ As data technology improves, it will allow farmers and agricultural stakeholders to make additional improvements that will further the AIA goals.

Microbial Inoculants

The plant-soil-microbiome interaction in the rhizosphere requires significantly more research in order to more fully understand and maximize its environmental and productive benefit. However, at this time there is significant evidence that conservation tillage practices can reduce

resilience to drought and flood. Conservation tillage minimizes disturbance of topsoil when planting, managing and harvesting field crops. When properly managed, conservation tillage practices can improve water retention in farmland, reduce the need for fertilizer applications, and prevent nutrients from leaving farm fields and entering surface water (where they can have a negative impact on aquatic ecosystems and human drinking water quality and cannot have a

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livestock and humans alike.