Science Societies

Antimicrobial resistance in integrated agroecosystems

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Students in the department of Agricultural and Biosystems Engineering at Iowa State University.

Students in the department of Agricultural and Biosystems Engineering at Iowa State University. Photo courtesy of Iowa State University of Science and Technology on behalf of University Relations.

As the *Journal of Environmental Quality* celebrates 50 years of publication, significant advances in understanding of the interconnected microbial community and impact of the microbiome on natural and designed environmental systems have occurred. A new review, authored by researchers from Iowa State University, highlights the intractable challenge of antimicrobial resistance (AMR) on humans, animals, and the environment with particular emphasis on the role of integrated agroecosystems.

The review reflects on the state of the science and emphasizes future opportunities. First, integration of phenotypic and molecular tools for assessing environmental spread of AMR and human health risk continues to be an urgent research need for a "one health" approach to AMR. Second, monitoring AMR levels in manure is

recommended to understand inputs and potential spread through agroecosystems. Third, it is important to gather baseline knowledge of AMR levels to realize the impact of manure inputs on water quality and public health risk; this can be achieved through background monitoring or identifying the source-related genes or organisms. Finally, conservation practices designed to meet nutrient reduction goals should be explored for AMR reduction potential.

Dig deeper

Howe, A.C., & Soupir, M.L. (2021). Antimicrobial resistance in integrated agroecosystems: State of the science and future opportunities. *Journal of Environmental Quality*. **https://doi.org/10.1002/jeq2.20289**

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