



Agricultural Systems

USDA PHOTO BY JANE JOHNSON

Healthy soils sustain food security

Researchers at the nation's land-grant universities are studying the health of soils to increase agricultural production and decrease the use of agrochemicals used to grow food. Their work will contribute to our ability to meet the world's growing demand for food.

Here are a few examples of that work:

- Agricultural researchers in **Pennsylvania** are studying how soil salinity and soil nitrogen concentrations alter soil microbiome development in high tunnel environments. Their work will provide important information to farmers who use high tunnels to extend the growing season. *Pennsylvania State University; USDA competitive, Hatch (See [full statement](#)).*
- Researchers in **Wisconsin** are using statistical theory to inform open-source software that can analyze, model and explain soil and plant health data. Their work will inform the development of tools that can be used by scientists worldwide to understand the effects of microbes, climate change, agricultural practices and more on soil health. *University of Wisconsin-Madison; Hatch (See [full statement](#)).*
- In **Pennsylvania**, plant scientists and agricultural engineers designed a low-cost automated irrigation system to help small, diversified farms save water while producing greater crop yields. By monitoring soil moisture, the system improved the yield of overall marketable fruit by 15% to 22%. *Pennsylvania State University; Other USDA competitive, Hatch Multistate (See [full statement](#)).*
- A partnership between the American Farmland Trust with **New York's** Cornell Cooperative Extension and the Western New York Crop Management Association is demonstrating the economic, water quality and climate benefits associated with adopting soil health practices. This information can be used to provide farms with practical, cost-effective practices they can adopt to not only increase farmer income but also decrease nitrogen, phosphorus and sediment losses in soils as well as decrease greenhouse gas emissions. *Cornell University; Smith-Lever (3b&c) (See [full statement](#)).*

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ABOUT LANDGRANTIMPACTS.ORG | This website documents the individual and collective impacts of the national Land-grant University System of joint research, education and Extension. Much of this work is supported by capacity and competitive funds through the USDA's National Institute of Food and Agriculture.

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- Researchers in **Connecticut** are investigating the use of nanosized materials in addition to conventional nutrients to increase nutrient efficiency in soils. The results are showing increased yield in wheat grain and increased biomass in lettuce, as well as decreased nutrient loss in tomatoes. *University of Connecticut; other USDA competitive, Hatch* (See [full statement](#)).
- Crop and soil scientists in **Georgia** are studying regenerative soil health practices and how to integrate these into existing cropping systems. They found that addition of poultry litter to row crops can have a \$77.3 million impact on Georgia corn and cotton crops each year. *University of Georgia; state appropriations, private grants and contracts* (See [full statement](#)).
- Researchers and Extension educators in **Virginia** are bringing together partners across the state of Virginia through the 4 the Soil Initiative to leverage market opportunities, reinforce ecological soil management priorities, increase communication and build capacity. Through a podcast, community presentations and social media the initiative raises broader awareness of soil as an agricultural and natural resource critical to current and future social, economic and environmental health. *Virginia Tech.* (See [full statement](#).)
- The Soilborne Disease Research Program at the **New Mexico** Agriculture Experiment Station is providing New Mexico agricultural producers and industries with information on the use of microbial formulations, bioactive crop residues, cover crops and genetic soil disinfestation in managing soilborne diseases and improving soil health. This work reduces the risk of crop failure in crops such as chile, onion, peanut, cucurbits, alfalfa, cotton and pecan, which generate more than \$300 million dollars a year in New Mexico. *New Mexico State University; Hatch Multistate.* (See [full statement](#).)