

ARS National Research Programs in Genomics

The Agricultural Research Service is a leader in developing and using genomic data to improve agriculturally important livestock, crops, ornamentals, insects, and microorganisms.

ARS genomics research is concentrated in two National Programs: Food Animal Production (#101) and Plant Genetic Resources, Genomics, and Genetic Improvement (#301). But genomics research has very broad applications, and research projects often involve extensive collaborations with other ARS National Programs, such as Food Safety (#108), Bioenergy and Energy Alternatives (#307), and others.

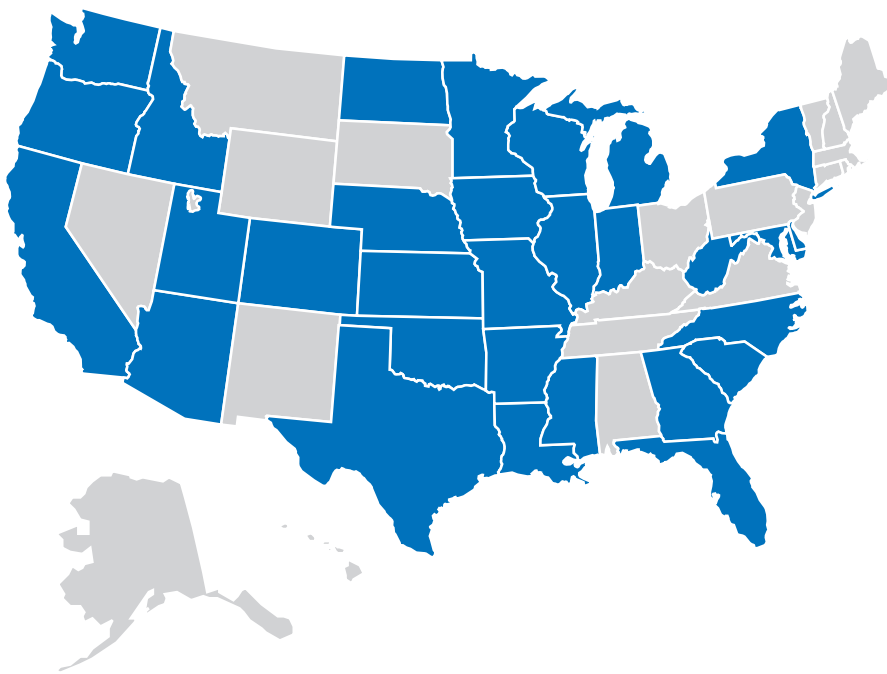
Because of the huge potential that genomics offers for improving crops, ARS recently set a goal of developing genomic libraries with genotypic and phenotypic information for all accessions in the National Plant Germplasm System. This massive, but achievable, task will open a vast array of possible crop improvements.

On the livestock and poultry side, ARS is putting genomics to work to improve efficiency of animal production—especially feed use—to reduce costs for producers and consumers and to reduce the environmental impact of agriculture. Researchers will also use genome sequence data to study host-pathogen relationships for the most dangerous animal pathogens. A better understanding of the immune response could lead to improved vaccines and postvaccine technologies.

ARS genomics programs are also coordinating development of new informatics tools to collect, store, retrieve, and analyze the large data sets that are being generated by genomics. This includes promoting the integration of “-omics” data with large-scale phenotypic studies and software to incorporate genome-level data into national and international genetic evaluation programs. ARS is also supporting standards of data validation and quality assurance as well as promoting accessibility of published data.

The goal is to maximize use and usability of genomics data, avoid duplication, and leverage developments from other research communities. ARS is also promoting development and evaluation of technologies for rapid assessment of genomic diversity to guide the choice of candidates for whole-genome sequencing. *

■ = STATES WHERE ARS DOES GENOMICS RESEARCH



■ = STATES WHERE ARS DOES ANIMAL GENOMICS RESEARCH

