

Director

CGIAR Genomics Back Office

We seek a project director who will lead a \$20M global initiative to extend the application of high-density genotypic information to cultivar development for staple food crops. Crop improvement in the developing world has lagged substantially behind the developed world, threatening the lives and health of billions of people. One of the avenues for improving this situation is to accelerate breeding efforts by integrating the use of genomics and natural variation to increase the rate of genetic gain.

The CGIAR Genomics Back Office (CGBO) is the first large-scale public-sector effort to systematically apply high-density genotypic information to the breeding of staple crops in the developing world. The project will develop and implement genomic data management systems to enhance the capacity of public-sector breeding programs to deliver increased rates of genetic gain in South Asia and Sub-Saharan Africa. The genomic data management systems will include databases, imputation systems, and decision support tools for plant breeders. In the last ten years, genotyping costs have dropped from \$2 to \$0.00002 per data point, making feasible powerful new breeding approaches that take advantage of the vast amounts of genomic data that have been generated in staple crops such as rice, wheat, maize, sorghum, and chickpea. The CGBO will build the bioinformatics support needed by CG breeders to assay and efficiently select genetic variants of interest, for only a few dollars per sample.

Position Responsibilities: The Director will be located in Ithaca, NY and will oversee a multi-disciplinary project team of over a dozen members, comprised of engineers, programmers, breeding specialists, instructors, and support staff located at Cornell University and the Boyce Thomson Institute (BTI) in Ithaca, NY, at the International Rice Research Institute (IRRI) in the Philippines, the Centro Internacional de Mejoramiento de Maiz y Trigo (CIMMYT) in Mexico, and the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) in India.

The project team in Ithaca will be responsible for rapid cycle development of algorithms and software. Tool development will be structured around a clear development cycle. Teams in the CG centers will be responsible for integration of the new tools into information systems and breeding pipelines for each of the five crop species. Tool deployment will be followed by feedback from the breeders for further customization and improvement, mediated by application specialists. The success of the project will depend on tools and algorithmic solutions becoming fully integrated into the CGIAR breeding programs. Long-term success will be based on evidence of a measureable increase in the rate of genetic gain in the breeding programs. Funding and manpower for the effort is approximately equally split between tool development and implementation.

The Director will be responsible for overall management and coordination of the project. S/he will oversee the activities of the engineering team to ensure timely release of software, develop and implement effective communication protocols linking software developers and breeding teams, strengthen the capacity to share information and leverage experience across crops and CGIAR centers, and critically evaluate overall progress toward short-term and long-term project goals.

Background and Experience: The Director should have experience in applied plant breeding, a proven track record of productive management performance, and familiarity with the use of information technology. An advanced degree in plant or animal breeding, quantitative genetics, statistical genomics, or related field is required. Knowledge of specialized computing methods for big data and/or of statistical genomic analysis methods is preferred. Experience coordinating activities of multi-location and multi-cultural teams would be highly beneficial.

Application: Please send a CV and statement of interest to Sara Miller (sjm336@cornell.edu). Review of applications will begin by mid-November and continue until filled.

Partnering Institutions:

The **CGIAR** is a global partnership that unites organizations engaged in research for a food secure future. CGIAR research is dedicated to reducing rural poverty, increasing food security, improving human health and nutrition, and ensuring sustainable management of natural resources. It is carried out by 15 Centers, which are members of the CGIAR Consortium, in close collaboration with hundreds of partners, including national and regional research institutes, civil society organizations, academia, development organizations, and the private sector.

Collectively, the Centers employ ~10,000 scientists and staff and provide unparalleled research infrastructure and dynamic networks across the globe. The CGIAR had overall system expenditures of \$986M in 2013. The collections of genetic resources maintained in CGIAR centers are the most comprehensive in the world.

Much of the impact of the CGIAR centers has come from crop genetic improvement. The high-yielding wheat and rice varieties that were the foundation of the Green Revolution were the beginning of a long line of successes. An assessment of the impact of crop breeding efforts at CGIAR centers between 1965 and 1998 showed that 65% of the global area planted to ten crops addressed by the CGIAR—wheat, rice, maize, sorghum, millet, barley, lentils, beans, cassava, and potatoes—was planted to improved varieties derived from CGIAR germplasm.

For more information, please see <http://www.cgiar.org/who-we-are/>.

Cornell University is a privately endowed research university and a partner of the State University of New York. It is broadly organized into seven undergraduate colleges and seven graduate divisions at its main campus in Ithaca, NY. It is the federal land-grant institution in NY State, and is the only school of agriculture in the Ivy League. Cornell is a recognized center of excellence for crop genomics, international agriculture, engineering, and computer science, with National Research Council rankings of #1 in Plant Breeding, #3 in Systems Engineering and Industrial Engineering, and #4 in Computer Science.

The Boyce Thomson Institute (BTI) is a private, non-profit research institute located on the Cornell campus in Ithaca, NY. The institute is well-known internationally for research excellence in plant biology and for discoveries that benefit society, particularly in the areas of agriculture, environment, and human health. BTI has 12 faculty investigators conducting plant research and training graduate students and post doctoral fellows and close ties between BTI and Cornell scientists foster productive collaborative relationships.

The Agricultural Research Service (ARS) is the principal in-house research agency of the **United States Department of Agriculture (USDA)**, and it is charged with extending the nation's scientific knowledge and solving agricultural problems. ARS has locations across the country, including at the Robert W. Holley Center for Agriculture and Health, located on the Cornell campus in Ithaca, NY. ARS research complements the work of state colleges and universities, agricultural experiment stations, other federal and state agencies, and the private sector.