

April 4, 2023

Ms. Michele Simmons
Program Support Coordinator
NAREEE National Genetic Resources Advisory Council
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Dear Ms. Simmons and NGRAC Members:

The Crop Science Society of America (CSSA) represents scientists in academia, industry, and government. Our researchers and practicing professionals are dedicated to addressing what we see as the greatest challenge facing agriculture – supporting and enabling increased food production to feed a growing human population while promoting environmental quality, all in the face of a changing climate. To meet this demand, we believe that preserving, improving, and utilizing crop genetic resources require critical actions.

Plant breeding and crop improvement research lacks sufficient public support. In the face of climate change, improved crop varieties will be a critical management tool for maintaining agricultural productivity, yet public sector plant breeders do not have the support needed to efficiently make use of the wealth of diversity conserved in our gene banks. A recent report by the USDA Agricultural Marketing Service highlighted two outcomes that have resulted from decreased public support for plant breeding. First, the shift to predominantly private support for plant breeding has been linked to decreased on-farm diversity for major commodity crops worldwide.¹ The report also stated that the Bayh-Dole Act of 1980, which allows universities to retain title to market innovations from publicly funded research, has led to the development of more varieties for large markets and fewer varieties for organic and non-genetically-engineered markets.² USDA must find ways to increase funding for public sector plant breeding efforts, including pre-breeding, in order to improve global genetic crop diversity for major and minor crops.

In addition to decreased on-farm diversity, there is less effort targeted for vegetable and fruit crops adapted to many, smaller production areas with variable climates. This has led to further concentration of crop production in larger and fewer production environments and exacerbates food production risks. Use of diverse plant genetic resources and modern plant breeding technologies are essential to address reducing risks to food production.

¹ Khoury CK, Brush S, Costich DE, Curry HA, de Haan S, Engels J, Guarino L, Hoban S, Mercer KL, Miller A, Nabhan GP, Perales HR, Richards C, Riggins C, and Thormann I (2021) Crop genetic erosion: understanding and responding to loss of crop diversity. *Tansley review. New Phytologist* 233(1): 84-118. doi: 10.1111/nph.17733.
<https://doi.org/10.1111/nph.17733>

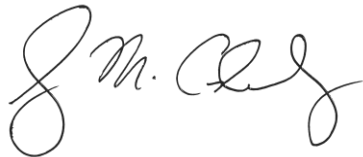
² NGRAC, "Report and Recommendations of The National Genetic Resources Advisory Council," (2015), 11.
nareeeab.ree.usda.gov/sites/default/files/2017-07/2%202015%20NGRAC%20Report%20Final.pdf.

As genetic resources are maintained, USDA must preserve more than standard accessions. Certain genetic stocks, such as mapping populations, recombinant inbred lines (RIL), fast-neutron populations, and tagging populations are critical to support breeding efforts, yet not all stock centers handle these stocks. Further, it is critical to attach metadata to accessions to assure that the accession will be used. Currently, photos and other phenotypic data may or may not be attached to any accession. USDA must also improve genomic data associated with an accession, such as DNA sequences, RNAseq, and mapping populations.

Finally, the scope of support for publicly funded plant breeding must include support for federal research and facilities, such as the U.S. National Plant Germplasm System. The 2018 Farm Bill directed the USDA to “develop and implement a national strategic germplasm and cultivar collection assessment and utilization plan that takes into consideration the resources and research necessary to address the significant backlog of characterization and maintenance of existing accessions considered to be critical to preserve the viability of, and public access to, germplasm and cultivars.” To date, it is our understanding that this plan has not been released, so we would encourage the National Genetic Resources Advisory Council to request an update on the publication timeline and recommendations resulting from this assessment.

Thank you for the opportunity to submit written comments for consideration by the National Genetic Resources Advisory Council. We applaud the council’s efforts to promote the collection, maintenance, and utilization of genetic resources. We urge the council to recommend increased support for public plant breeding and the National Plant Germplasm initiatives as part of this charge.

Sincerely,

A handwritten signature in black ink, appearing to read "J.M. Cudahy". The signature is fluid and cursive, with the first and last letters of each name being capitalized and prominent.

Jim Cudahy
CEO, Crop Science Society of America