Executive Summary

The goal of this retrospective review was to assess the relevance, overall quality and impact of USDA-ARS National Program 301 (NP301) in the context of its Action Plan https://www.ars.usda.gov/ARSUserFiles/np301/NP%20301%20Action%20Plan%202018-2022%20FINAL.pdf, and to provide recommendations to assist with program planning and priorities for the next program cycle. A diverse panel of scientists with expertise in the areas of food science, plant genetics, genomics, breeding, and germplasm collection/curation was assembled to conduct a five-year (2016 to 2020) retrospective review of NP301. In addition to their knowledge in these research areas, panel members were representatives from a US land grant university, US agriculture industry companies, and from Plant Gene Resources of Canada (PGRC). Panel members had individual research experience with various row and commodity crops such as maize, soybean, peanut, wheat, tree fruits, and horticultural crops.

This panel convened and participated in well prepared virtual presentations made by program leaders of NP301 over two days, July 7-8, 2021. The presentations summarized the achievements and outcomes from research projects covering four component areas of NP301. In addition, the panel received supplementary information on NP301, including appendices to the presentations and requested budget and staffing statistics that enabled it to make comparisons to the budget and staff resources available to NP301 in the prior five-year period.

NP301 program leads presented research making it clear to the panel that it met its mission and action plan objectives. The summary of these achievements as documented herein is aligned with the four NP301 research component areas. In the context of these components, this report highlights the panel consensus that NP301 achieved its goals, which were the development of: 1) Traits, 2) Enhanced germplasm and cultivars, 3) Tools, techniques, and analytical approaches, 4) Data and breeding research information, and 5) Genetic resource management capacities. Furthermore, the panel assessed if NP301 research was of relevance to its partners and stakeholders and addressed whether program research was responsive to emerging issues in agriculture. It also assessed if the research was of high scientific quality as well as innovative in its design and/or implementation. The panel agreed that in general, NP301 met this quality standard and did so while often putting forth innovative solutions to address emerging issues in many parts of the agriculture industry.

This final report also includes a series of aligned recommendations that are also tied to the four research component areas. These recommendations are not meant to provide a critical assessment of the five-year performance of NP301, but rather to offer a “roadmap” to consider for future research. The recommendations are intended to help NP301 continue to be a global leader in how it impacts US agriculture, whether that be in

providing the scientific basis for directing agriculture policy and regulations, or in providing next-generation technologies to support changes taking place in the industry.