Sensory Quality and Composition of Germplasm Resources in the North Carolina State University Peanut Breeding Program

J.C. DUNNE*, R.J. ANDRES, and A.T. OAKLEY, Department of Crop and Soil Sciences, North Carolina State University, Raleigh NC, 27695; L.L. DEAN, USDA Market Quality and Handling Research Unit, Raleigh, NC; J.P. CLEVENGER, HudsonAlpha Institute for Biotechnology, Huntsville, AL; E.J. DOWD and V. NWOSU, Mars Wrigley, Chicago, IL

To keep the sensory improvement objective of the NCSU peanut breeding project moving forward, sensory panel and other chemical analysis data needs to be collected on germplasm from the NCSU peanut breeding project. This project was developed to evaluate sensory quality and composition of the germplasm seed bank collected by the North Carolina State University (NCSU) peanut breeding project. Currently, there is a collection of ~740 plant introductions (PI) and/or accessions in the NCSU germplasm seed bank. A subset of these lines (210) were selected as samples to submit for flavor, sensory and other chemical evaluations. The samples were roasted to a common color, ground to a paste and submitted to the USDA Market-Quality and Handling Research Unit (MQHRU) in the Department of Food, Bioprocessing and Nutrition Sciences. Flavor score data was returned by the USDA-MQHRU for analysis by the NCSU peanut breeding project. When selecting genotypes for crossing, a priority is placed on roasted peanut flavor and/or sweetness; however, these high priority traits are often negatively or positively associated with other traits of interest or unwanted traits, respectively. Therefore, a multivariate approach was used to categorize the data into flavor profile groups based on the correlations among the sensory attributes. The resulting principal components and cluster analysis segregated the flavor samples into three distinct groups with one group showing superior roast peanut flavor, sweetness and roasting color and a reduced bitterness score. These data will be used in making decisions on which germplasm to utilize in future crossing programs for the development of breeding lines with superior flavor and sensory quality attributes.