

Phenotypic Variation in Seed Quality of Wild *Arachis* Species

B. D. TONNIS*, M. L. WANG, A. FANCHER, T. WARE, and S. P. TALLURY, USDA-ARS, Plant Genetic Resources Conservation Unit, Griffin, GA, 30223.

Plant genetic resources offer great potential for crop improvement through breeding. Genetic variation exists which can be used for increasing yield, improving seed quality, and boosting resistance to biotic and abiotic stresses. Additional genetic potential is available in closely-related wild relatives of cultivated crops. In particular, the USDA National Plant Germplasm System (NPGS) maintains a large collection of peanut germplasm including accessions from over 70 different *Arachis* species at the Plant Genetic Resources Conservation Unit (PGRUC) in Griffin, GA. While several of these wild relatives are valued for their potential disease resistance, they and others should also be considered for their variability in seed quality/nutritional traits. To assess some of this variation, we measured seed weight, oil content, fatty acid composition, and protein content in 194 accessions covering 42 *Arachis* species as well as 25 additional, unclassified *Arachis* accessions. Oil content ranged from 30-60% with a mean of 50%, while protein content ranged from 19-37% with a mean of 27%. Oil content was negatively correlated with protein content ($R^2 = 0.54$). Seed weight ranged from 4-32 g/100 seeds with an average of 14 g. Finally, high levels of variation were observed in the oil composition of these species, most notably in the long-chain fatty acids. Behenic acid (C22:0) ranged from 1.5-18%, while lignoceric acid (C24:0) ranged from 1-8%. The highest values for these fatty acids were much greater than what was observed in cultivated peanut accessions, and they were also species specific. In summary, these data indicate that wild *Arachis* species may be additional useful genetic resources for cultivated peanut seed quality improvement.