Predicting Shelling Rate of Peanut Genotypes from the Uniform Peanut Performance Tests

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The rate, or rapidity, of shelling is an important factor in acceptance of a peanut cultivar by the shelling industry, but breeding programs do not have an easy way to measure or predict the shelling rate of breeding lines. This is because of the large volume of pods needed and the time-consuming nature of the process. Fortunately, the USDA-ARS National Peanut Research Laboratory working with public plant breeding programs within the cooperative Uniform Peanut Performance Tests (UPPT) evaluates breeding lines from multiple locations and seasons for their shelling characteristics in machines designed to mimic commercial shellers. Using UPPT information from one location (Marianna, FL), over four years 2015-2018, we evaluated regression equations for potential to predict the total shelling rate (TSR) and the initial shelling rate (ISR) from common grade factors such as other kernels (OK), sound splits (SS), medium kernels (Med), jumbo kernels (ELK), seed count per pound, and meat content. These common factors are obtained in the grading process for most breeding programs. Market types were not uniform in their response, so separate analyses were conducted for runner and Virginia types. The total shelling rate (TSR), defined as the total grams shelled per minute in all stages of the shelling process was not predicted by the same variables as the initial shelling rate (ISR), which is the grams shelled per minute on the first stage of shelling. This preliminary analysis suggests that the percentage of sound splits is loosely predictive of both TSR and ISR with varying degrees of precision. Other grade factors such as OK, ELK and seed count per pound were sometimes beneficial in predicting TSR and/or ISR. Results of regression analyses will be presented.