

Potential Use of RAMAN Spectroscopy for Trait Identification in Peanut (*Arachis hypogaea* L.)

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In the past, trait identification of peanut germplasm for breeding was performed by expensive, time and labor-intensive and in some cases destructive hand sampling techniques as well as field trials and hand selection. These constraints often lead to under-representative trait identification due to limited sampling and limited time, as well as the introduction of possible human errors. There is a significant need for time saving non-destructive and non-invasive methods to identify traits in peanut breeding lines. With the introduction of Raman spectroscopy (RS), these hurdles can be overcome. Studies show that this chemometric analysis can be used to evaluate levels of protein, starches, oils, and nutrients in peanuts. Preliminary data shows that RS can also be used to identify value added traits such as nematode, leaf spot and drought resistance, and has been used to identify NPK deficiencies. Trait identification data was collected on peanut by the Texas A&M AgriLife Research peanut breeding program located in Stephenville, TX. Raman spectra were collected with a hand-held Resolve Agilent spectrometer equipped with an 830-nm laser source. PLS_Toolbox (Eigenvector Research Inc.) was used for statistical analyses of the collected Raman spectra. Initial results are encouraging and demonstrates the potential for Raman spectroscopy to become a valuable tool for peanut research. These attributes will be presented and discussed in a poster seminar presentation.