Comparing Three Methods Used to Determine the Oleic/Linoleic Acid Ratio in a Single Peanut Seed.

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Peanut varieties with high oleic/linoleic acid ratios have become preferred by the peanut industry due to their increased shelf life and improved health benefits. Many peanut breeding programs are trying to incorporate the high oleic trait into new and improved varieties and are in need of diagnostic tools to track its inheritance early in development and at the single seed level. This study compares the methods of capillary electrophoresis (CE), near-infrared spectroscopy (NIR) and Real Time PCR (RT-PCR) with regards to their ability to determine whether a peanut seed is high oleic. Three hundred and ninety samples of individual peanut seed inclusive of all four market types were processed by all three methods and the seed were characterized as being either “high” or “normal” in oleic acid content. Since the CE method is the only one used that will define an exact O/L ratio, results from the other two methods were judged as either being in agreement or disagreement with the CE result. Although completely non-destructive, NIR was deemed the least accurate of the three methods at a rate of 92%. RT-PCR agreed with CE in 98% of the samples. Interestingly, there were 1.4% of the samples where both NIR and RT-PCR disagreed with the CE results. The results from this study will allow researchers to make informed decisions regarding ease, limitations, seed preservation, speed and accuracy when choosing a method for O/L analysis of single peanut seed.