Peanut seed that are high in oleic acid have been found to have superior stability to oil rancidity when compared to seed with normal oleic acid values. As such, breeding programs have in the past several years been increasing the number of new cultivars with this trait. Buyers of peanuts have begun demanding that shellers supply them with seed that is exclusively high-oleic in many instances. This has increased the pressure on shellers to ensure that high-oleic seed contains minimal percentages of low-oleic acid seed. Several studies using gas chromatography have been performed to look for variations in the amounts of different fatty acids in seed lots, across plants within a single row and even within seeds themselves. This research has shown that lots of seeds can vary not only with high-oleic lots containing some low oleic seed, but also low or normal oleic lots containing some high-oleic seeds. Often the variability within lots is attributed to problems with keeping loads segregated, but since the peanut plant itself is indeterminate flowering, it may also be a consequence of maturity since fatty acid profiles of peanuts change with maturation. Variations within single plants across a range of oleic to linoleic acid ratios of 4 to 50 were seen. It is also known that the fatty acid profiles of the embryo and the cotelydons in a peanut seed are different and our results show that the O/L ratio across the cotelydon itself with vary depending on the area sampled by several percent. These findings will have impact on all facets of the industry involved with peanut lipid quality.