

## **The Influence of Digging Date on Fatty Acid and Tocopherol Expression in Normal and High-Oleic Virginia Peanut Cultivars Grown in North Carolina**

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Due to the indeterminate growth of the peanut crop, there can be a wide range of maturity within pods on individual plants at the time of harvest. For high-oleic (HO) cultivars, this wide range in maturity can result in harvested peanuts that are inadequately expressing the HO trait for the commercial trade. This study explored the expression of fatty acid and tocopherol content in three HO cultivars (Emery, Sullivan, and Wynne) and one normal-oleic (NO) cultivar (Bailey). These cultivars are Virginia market types. Two fields were planted in Lewiston-Woodville, NC during 2017 in a randomized complete block design with four replications. One field was planted in mid-May and harvested four times throughout the season at approximately 110, 120, 130, and 140 days after planting. The second field was planted in early June with harvest dates at approximately 100, 110, 120, 130, and 140 days after planting. After peanut was harvested, pods were hand-picked off plants and the hull scrape method was used to determine maturity of individual pods. Color-sorted pods were then dried using ambient air temperature prior to analytical testing for chemical composition.

Data collected included percent maturity (as determined by color) per plot, whole pod and seed weights, total oil content, fatty acid profile, and tocopherol expression. The results suggest that although immature pods were shown to have reduced amounts of overall total oil content and fatty acid expression, some of the pods from the HO cultivars still exhibited the required 9:1 oleic to linoleic fatty acid ratio to be considered HO. When averaging the colors of an individual peanut cultivar, oleic acid content was 75% of the total fatty acid profile. This indicates the oleic acid content of early harvested peanuts may satisfy industry standard despite having greater proportions of immature pods contributing to the overall sample. The impact of early digging dates on overall peanut yield was not recorded, but the reduced mass of peanut crop associated with an early digging date would negatively impact economic return at the farmer level. Delaying digging to optimum pod mesocarp color (approximately 70% for combination of brown and black categories) ensures the greatest yield, market grade attributes, and economic return as well as expression of the high oleic trait.