

## **Xylem Anatomy Features in Peanut (*Arachis hypogaea* L.) Root**

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Plant roots are central elements in the soil–plant–atmosphere water uptake system. Root traits, such as root distribution and anatomy, may contribute to improve plant ability to uptake water and nutrients. The architecture of root systems has been previously studied in peanuts. However, root anatomy of different peanut genotypes has not been clearly investigated. The anatomical structures of roots may be an essential component to assist understanding their efficacy to uptake water and nutrients. Therefore, the objective of this study was to investigate the root xylem anatomy of different peanut genotypes. To this end, three peanut genotypes were grown in rizoboxes in a rainout shelter. The experimental design was a completely randomized design with three replications. Plants were watered daily until 35 days after emergence, followed by rizoboxes disassembling and root sampling. Root samples were taken at approximately 5 cm from the root tip at 0-20 cm below soil surface for anatomical analysis. Anatomy measurements were obtained using the first order lateral roots. The structure of root xylem vessels varied depending on the peanut genotype. At 5 cm, cell division of vascular parenchyma cells was not observed in the vascular cambium tissue at the growth stage samples were taken. Root vascular bundles were displayed as an almost triarch arrangement. Pith tissue was absent in the central part of first order lateral roots. Average diameter of root vessels ranged from 4.50 to 50.2  $\mu\text{m}$ . The average xylem vessel diameter across the three genotypes was 17.4  $\mu\text{m}$ . The genotype ICGV 98324 had the largest diameter and area of xylem vessels, whereas the Tifton 8 generally had smaller diameter and area of vessels per cross section. Genotypes with larger diameter and area of xylem vessel per cross-section are more likely to have improved ability to uptake water and nutrients from the soil and increased water flow throughout the vascular system.