

## **Physiological Responses of Peanut Varieties to Mid Season Drought Stress**

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Peanut is an economic cash crop mainly planted in arid and semi-arid regions where the drought causes around 20% loss of peanut production every year. Researches suggested that crops have various physiological mechanisms against drought stress, such as reduction of photosynthetic rate, closure of stomatal, amelioration of water use efficiency (WUE), and differences in the partitioning of dry matter to pods. There are few field studies about which physiological characteristics are responsible to drought tolerant traits in the Southeast United States due to the fact that severe rain events can happen during the season. To study the physiological effects of drought stress on peanuts, a 2-year experiment carried out in rain-out shelters in which planted different peanut varieties with different drought resistant performances. Plants were grown under irrigated conditions until 60 days after plant (DAP), moment at which the drought treatment started and lasted until 100 DAP, later re-irrigated until harvested. Photosynthetic rate, leaf relative water content, and specific leaf area were measured 4 times at different development stages in 2019 but measured 7 times in 2020. After harvest, leaf area, pod yield, pod number, and HI were collected. <sup>13</sup>C and <sup>15</sup>N isotope discrimination and N content measured for pods and aboveground biomass. Different varieties have significant differences in photosynthetic rate, pod yield and carbon isotope discrimination. In order to increase and stabilize peanut yield under drought conditions, integrated application of physiology-genetic methods is needed to be further explored.