

Adjusting In-Season Trigger Levels for Maximizing Peanut Growth, Yield, and Managing Aflatoxin**PIs: Wesley Porter, Cristiane Pilon, Bob Kemerait, and Tim Brenneman**

Objectives: The main objective of this study was to use soil moisture information to determine optimal in-season trigger levels for irrigation and quality management in peanut. This objective was accomplished by the following sub-objectives: Use commonly planted peanut varieties in Georgia such as 06-G and 18-RU to determine optimum trigger points during the season, determine optimal crop physiological stages for adjusting in-season soil moisture levels, the collection of agronomic and physiological samples during critical crop growth stages to determine the effects of varied trigger levels on peanut growth and development, and the evaluation of the varied irrigation trigger level effects on final crop yield, water use efficiency (WUE), seed quality, and aflatoxin development. **Methods:** The trial was completed under a VRI lateral system at UGA's Stripling Irrigation Research Park. Crop growth stages of 0-40, 40-110, and 110-140 days after planting (DAP), were selected for adjusting the in-season soil moisture sensor trigger levels. Three different trigger levels were selected based on their effect on soil condition. The levels were 20 kPa (wet), 45 kPa (optimal) and 70 kPa (dry). Soil water tension sensors at depths of 4, 8, and 16 inches deep were installed in two of the three replicatons of each treatment. An Excel spreadsheet was used to average soil moisture data by treatment and make an irrigation scheduling decision each day. If the treatment triggered 0.75 inches of irrigation was applied to all plots in the treatment. The center two rows of each plot were harvested at the end of the season and weighed. Sub-samples were collected from each of the plots at the time of digging to evaluate seed quality based on soil moisture treatment. **Results:** The table below shows the treatments, irrigation applied, yield and IWUE for both 06-G and 18-RU for both the 2022 season. Overall peanut yields were low in 2022. It is important to note that 20.7 inches of rain were received in 2022. There were not differences in the treatments or varieties, but the main point that can be observed from this trial is that applying too much irrigation at the wrong time reduces IWUE. The excessive amount of water also negatively affected seed quality. There was no difference in seed quality among the treatments, but overall quality was lower in seeds produced this year than those produced in previous years for this same project.

These data from this study have shown that in-season trigger level does have an effect on both end of season yield and IWUE and can also have an effect on seed quality. Thus, more research is needed in this area.

Soil Water Tension	Irrigation Amount (in)	Total Water (in)	06-G Yield (lb/ac)	06-G IWUE (lb/in)	18-RU Yield (lb/ac)	18-RU IWUE (lb/in)
Dryland	0.50	21.20	4379	N/A	4425	N/A
45 / 45 / 45 kPa	2.75	23.50	4563	1660	4229	1538
70 / 45 / 70 kPa	3.50	24.20	4632	1324	4586	1310
70 / 45 / 45 kPa	2.75	23.45	4794	1743	4523	1645
70 / 45 / 20 kPa	4.25	24.95	4684	1102	4535	1067
45 / 45 / 70 kPa	2.00	22.70	4610	2305	4679	2339
70 / 20 / 45 kPa	7.25	27.95	4347	600	4379	604
20 / 70 / 45 kPa	4.25	24.95	4857	1143	4742	1116
45 / 70 / 70 kPa	1.25	21.95	4828	3863	4494	3595