1-Page Report for:
Adjusting In-Season Trigger Levels for Maximizing Peanut Growth and Yield
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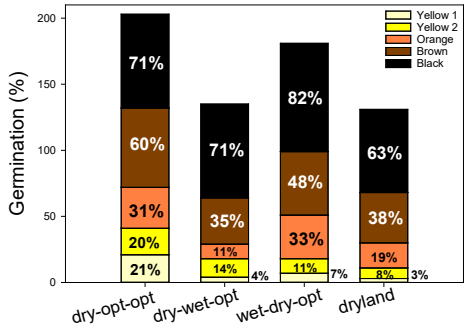
Objectives: The main objective of this study was to use soil moisture information to determine optimal in-sesason trigger levels for irrigation management in peanut. This objective was acclomplished by the following sub-objectives: Use commonly planted peanut varieties in Georgia such as 06-G and 18-RU 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 vaired irrigaiton trigger level effects on final crop yield, water use efficiency (WUE), and seed quality.

Methods: The trial was completed under a variable rate lateral irrigaiton 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 averge 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 it. 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 mositure treatment.

Results: The table below shows the treatments, irrigation applied, yield and IWUE for both 06-G and 18-RU. Unfortuantely overall peanut yields were very low compared to previous years. There were not differences in may of the treatments, but the main point that can be observed from this trial is that keeping peanuts too wet early during the season caused an end of season reduction in yield.

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	1.00	21.98	3054	N/A	3601	N/A
45 / 45 / 45 kPa	8.50	29.48	4327	509	4938	581
70 / 45 / 70 kPa	6.30	27.27	4033	641	4350	692
70 / 45 / 45 kPa	7.00	27.98	4333	618	4638	663
70 / 45 / 20 kPa	8.50	29.48	4419	520	4851	571
45 / 45 / 70 kPa	7.04	28.02	4160	591	4264	606
70 / 20 / 45 kPa	12.25	33.23	4575	373	4748	388
20 / 70 / 45 kPa	7.00	27.98	4016	574	3763	538
20 / 45 / 45 kPa	4.75	25.73	3647	768	3342	704

From the perspective of see quality there were interactions that showed increases in seed germination from the black and brown maturity classes when seeds were kept dry during the first 40 days and optimal the rest of the season. Even though yield was not the highest, the highest overall emergence from the black class was 82% for the wet-dry-optimal treatment. The treatments with the major differences are shown in the figure below.



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.