Compare GA-06G to other peanut cultivars for physiological trait relationships for seed germination, vigor, stand establishment, and production: year 2.

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ABSTRACT

Over 50% of U.S. peanut (*Arachis hypogaea)* production can be credited to Georgia. The growing season for peanut can extend up to 150 days, it is essential to manage weeds in such a manner as to achieve maximum yield potential. This includes applications of PRE herbicides. Numerous PRE herbicides are registered for peanut including pendimethalin, diclosulam, and flumioxazin. Emerging peanuts will inevitably come into contact with these PRE applied herbicides. A study was performed in Ty Ty and Plains, GA in order to record the physiological effects of emerging peanut to PRE herbicides. A 3x2 factorial RCBD comprising of 3 herbicide treatments and 2 seedling germination rates with 4 replications was utilized at both locations in the 2019 growing season. Treatments included a nontreated control, 107 g ai ha^{-1} (3 oz/ac) of flumioxazin PRE, and diclosulam at 27 g ai ha^{-1} (0.45 oz/ac)PRE. All plots received an application of pendimethalin at 4480 g ai/ha. Physiological measurements included photosystem II efficiency, photosynthesis, and electron transport using a Li-COR 6800 (LI-COR Inc., Lincoln, NE 68504) to record these measurements. Peanut stand counts and diameter measures were also recorded.

Data was analyzed by location in SAS 9.4. Both locations noted no treatments differences with respect to electron transport. Peanuts at Ty Ty also noted no differences in PSII, yet flumioxazin was noted to be lower than the NTC at the 284 growing degree day mark of plant date 3. The flumioxazin treated peanuts were also noted to have lower photosynthetic rate when compared to the NTC at the 271 and 485 growing degree day mark of plant date 2. Finally, numerous differences were noted in Plains with respect to the peanut photosynthetic rate. During plant date 1, differences were recorded at 252 and 556 growing degree days in which flumioxazin treated plants noted a lower photosynthetic rate than the NTC. Plant date 2 plants noted differences at all 4 measurements. These differences can be explained as Plains had a significant rainfall event in which soil surface flumioxazin was splashed onto growing plant matter injuring the plant, therefore reducing the photosynthetic rate. Stand counts were not affected, while plant diameter did have treatment differences in Ty Ty at plant date 2 and 3, and Plains at plant date 3.

Though differences were noted for PSII quantum yield and photosynthesis, a trend was not noted, indicating that flumioxazin is safe to apply as a PRE herbicide in peanut production. Though injury may be noted at specific times and after rainfall events with exposed green plant matter, this injury is transient and will not affect crop yield.