

Effect of Fungicide on Gas Exchange in Peanut

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Peanut (*Arachis hypogaea* L.) plants are susceptible to several air- and soil-borne diseases throughout the season. Different fungicide chemistries have been used to control these diseases. However, information on short- and/or long-term effects of these fungicides on physiological processes and pod maturity of peanuts is scant. A field experiment was conducted in 2017 at the Lang Farm in Tifton, GA to determine the effects of fungicides on gas exchange and pod maturity of peanut cultivars. The treatments consisted of six fungicides, an untreated control, Bravo Weather Stik (chlorothalonil), Abound (strobilurin), Orius 20AQ (tebuconazole), Elast (dodine), and Prophyt (potassium phosphite), and two cultivars, Georgia-06G and TifNV High O/L, with seven replications. The first treatment application was performed at 30 days after planting (DAP) with 14-day interval between applications for a total of four applications. For the three consecutive application times, Bravo Weather Stik was used on all plots to prevent excessive defoliation and enable plants to be conducted until harvest. Measurements of pigment concentration (chlorophyll a, chlorophyll b, and carotenoids) and gas exchange and fluorescence (photosynthesis, stomatal conductance, intercellular CO₂, actual quantum yield of photosystem II, and electron transport rate) were taken at 3, 7, and 13 days after each application from the first to the fourth applications. At 127 DAP, pod samples were collected for maturity assessment using the peanut profile board. Plants were harvested at 130 DAP for yield. Preliminary analysis of the results suggests that fungicide applications did not affect gas exchange and pigments concentration in peanut plants. Differences in the photosynthetic parameters were observed between the two cultivars, with generally higher gas exchange and pigments concentration for GA-06G than TifNV High O/L. Application of all fungicides delayed pod maturity compared to the untreated control. Abound, Elast, Orius, and Prophyt resulted in higher yields, while lower yield was observed for the untreated control. Further research is required to clarify the effects of single fungicide applications in the photosynthetic process of peanut leaves.