

Development of Trifludimoxazin for Use in Peanut

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Trifludimoxazin is a new protoporphyrinogen oxidase-inhibiting (PPO) herbicide under possible development for preemergence (PRE) use in peanut (*Arachis hypogaea* L.). Because of its altered binding site, trifludimoxazin may have potential to combat PPO-resistant weeds. Numerous field trials have been conducted in Georgia to evaluate peanut cultivar tolerance and weed control efficacy. Irrigated, small-plot field trials were conducted at the UGA Ponder Research Farm near Ty Ty, Georgia. Weed-free, peanut cultivar trials, conducted in 2019, 2020, and 2021, included 3 cultivars (GA-06G, GA-16HO, and GA-18RU) and 4 PRE applications of trifludimoxazin at 0, 25, 38, and 75 g ai/ha. Trifludimoxazin efficacy trials were conducted on in 2020 and 2021 with the same rates applied PRE in various weed control programs. All PRE treatments were applied 1 day after planting (DAP) using a CO₂-powered, backpack sprayer calibrated to deliver 140 L/ha at 275 kPa with 11002AIXR nozzles. Data collected in the variety trials included trifludimoxazin effects on peanut density (stand), leaf necrosis, stunting, and yield. Data collected from the efficacy trials included weed control (%), peanut stunting, peanut leaf necrosis, and yield. All data were subjected to ANOVA and means separated using the Tukey-Kramer HSD Method (P=0.05). No interactions between peanut variety and trifludimoxazin rate were observed. Peanut stand/density was not reduced by any rate of trifludimoxazin. Trifludimoxazin @ 75 g ai/ha resulted in an increase in both peanut stunting (5%) and leaf necrosis (9% necrosis). When averaged over trifludimoxazin rate, there was a significant difference in yield between varieties. GA-16HO yielded 5%-7% less than GA-06G and GA-18RU. When averaged over variety, peanut yields were not reduced by any rate of trifludimoxazin. Herbicide treatments that included trifludimoxazin provided ≥ 83% weed control and was similar to treatments that included flumioxazin. Peanut yield was not significantly different between any trifludimoxazin treatments and current standards. In summary, the peanut varieties evaluated in these studies were not sensitive to trifludimoxazin and trifludimoxazin herbicide treatment combinations provided weed control similar to comparable standards.