

## **Anthem Flex Herbicide Systems for Weed Management in Peanut** **M.W. MARSHALL\***, Clemson University

Palmer amaranth, sicklepod, Texas panicum, and annual morningglory are important weeds in peanut production fields in South Carolina and they rank among the most common and troublesome weeds in the Southern US. Attributes including rapid growth, high seed production, drought tolerance, and delayed and/or extended emergence throughout the growing season allow these weeds to persist in peanut production fields. Resistance to herbicides, including the ALS-inhibitor group, are common in Palmer amaranth populations in South Carolina. Anthem Flex was recently introduced to the peanut market by FMC. Anthem FLEX efficacy data resistant weeds, such as Palmer amaranth, and other common broadleaf/grass weed in peanuts is lacking. This research project seeks to generate new control data on Palmer amaranth, sicklepod, Texas panicum, and annual morningglory. Field studies were conducted at Clemson University's Edisto Research and Education Center near Blackville in 2021. The study area contained a naturally high density of broadleaf and grass weeds. The herbicide treatments for the field study are shown in Table 1. The experiment design was a randomized complete block design with 4 replications and plot dimension of sizes will be 4 rows by 40 ft long. Standard production practices were followed prior to peanut planting (disking the field followed by strip till the peanut rows). Herbicide treatments were applied at planting, 5/25/21, POST1 6/10/21 and POST2 6/25/21 at the optimum weed growth stage, most weeds ranged in size of 2 to 4 inches in height. Adjuvants (Crop oil or NIS) were added to each herbicide program according to the recommended label requirements for optimum activity. Percent visual weed and crop injury ratings will be collected 14, 28, and 42 days after each application (DAA) timing. At the end of the season, peanuts were dug, inverted, and harvested 5 days later. Visual control ratings for Palmer amaranth, pitted morningglory, and Texas panicum were collected at 14, 28 and 42 DAA. Overall, the herbicide programs provided excellent (98-100%) control of all three weeds at the selected rating periods. In terms of peanut response to the herbicide treatments, there was significant injury observed in the paraquat and Anthem Flex at 3.5 fl oz/A applied at the POST1 application timing. However, this visual injury was not observed at 42 DAA. No stunting was observed with Anthem Flex PRE. The at-plant residual treatments were similar in efficacy (Valor, Prowl, and Anthem Flex) on Palmer amaranth, pitted morningglory and Texas panicum. These herbicide programs demonstrated the benefits and utility of overlapping residuals in peanut weed management programs. Peanut yield, overall, was numerically higher across the treatments in 2021 compared to 2020 (some were close to 3 tons per acre). In treatment 5, 6, and 9, we observed a significant reduction in peanut yield (however, there was high variability in the yield data). In the remaining treatments, there were no differences observed which were significantly greater than the untreated check (1690 lb/A). More research is needed to understand the effects of Anthem Flex on end of season peanut yield. The overlapping residuals are the key to effective and sustainable herbicide programs in peanut production. Anthem Flex contains two modes-of-action in one product. This aids in resistance management. When targeting broadleaf weeds and grasses, size is important. Treat these weeds when they are small and actively growing.