

Evaluation of Selected Herbicide Programs for Broadleaf Weed Management in Peanut

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Palmer amaranth, sicklepod, and morning glory have characteristics that allow them to thrive in peanut production fields in South Carolina and rank among the most common and troublesome weeds in the Southern US. These attributes include rapid growth, high reproductive capabilities, drought tolerance, and extended emergence throughout the growing season. In addition, herbicide resistance is prevalent in Palmer amaranth in South Carolina. For example, Palmer amaranth biotypes resistant to Cadre are common in South Carolina peanut production, but it is still an effective option on other broadleaf weeds found in peanut production fields. To manage ALS-resistant Palmer amaranth and other problem weeds, growers rely on a series of over-lapping soil residual and postemergence herbicides to maintain weed free fields. Correct spray timing is critical for the management of these weeds. If not sprayed according to label instructions, these broadleaf weeds can be very difficult to control in peanut after exceeding a given growth stage. In addition, if these weeds are not properly controlled, the weed seed bank can increase over time making future production challenges for subsequent crops. Therefore, a total program approach is needed to manage these weeds in South Carolina peanut production. Research plots were established at Clemson University's Edisto Research and Education Center near Blackville in 2020. The study area was supplemented with Palmer amaranth, sicklepod, and annual morningglory seed scattered over the plot area. The herbicide treatments for the field study are presented in Tables 1. The experiment design was randomized complete block design with 14 treatments and 4 replications. The plot dimensions were 4 rows by 40 ft long. Conventional production practices were followed according to Extension recommendations prior to peanut planting (disking the field followed by strip till the peanut rows). Peanuts were seeded on June 2, 2020. Preemergence treatments were applied shortly after planting. Postemergence herbicides were applied on June 16 (POST1), July 1 (POST2), July 16 (POST3), and August 3, 2020 (POST4) when most of the broadleaf weeds were 2 and 4 inches in height. Adjuvants (Crop oil or NIS) were added to each herbicide program according to label requirements for optimum activity. Percent visual weed and crop injury ratings were collected 14, 28, and 42 days after each postemergence application. Disease and other in-season production practices were followed according to current Extension recommendations. Peanuts were inverted and harvest for yield on November 20, 2020. The plots received supplemental irrigation throughout the season. In terms of the preemergence treatments, All preemergence products (Brake, Valor, and Spartan Charge) provided excellent control prior to the postemergence 1 treatment (6/16/20). Peanut injury was minimal except for the Cobra and 2,4-DB treatment which showed significant injury (20-36%) 14 days after application (7-16-20). Treatments 2 and 11 were significantly lower in yield compared to the other treatments in the study. In the remaining treatments, there were no difference observed. These differences were not attributed to herbicide injury. Palmer amaranth control was very good at the 2 to 4-inch plant height with the Gramoxone + Storm, Cobra, Storm, and Basagran herbicides in the greenhouse. Palmer amaranth control did decrease as weed height increased, typically by 6 to 8-inch height Basagran and Storm alone did not adequately control Palmer amaranth. The tank mix of Gramoxone plus Storm did cause more injury to the larger Palmer amaranth sizes and regrowth was more pronounced. The overlapping residuals is key to effective herbicide programs in peanut production.