

The Effects of Paraquat Use on Peanut in the Southwestern United States

Z.R. TREADWAY*, J.L. DUDAK, T.A. BAUGHMAN, Oklahoma State University, Ardmore, OK; P.A. DOTRAY, Texas Tech University and Texas A&M AgriLife Research and Extension Service, Lubbock, TX; W.J. GRICHAR, Texas A&M AgriLife Research, Yoakum, TX.

Weed pressure in peanut [*Arachis hypogaea* (L.)] is a problem that persists throughout the growing season. Peanut compete with weeds for sunlight, water, and nutrients, leading to plant stunting and yield loss. During harvest, increased weed density can have a negative effect on the entire harvest process from digging to threshing. yield losses in excess of 40% have been observed under heavy weed densities. Timely weed control is vital to maximum peanut yield. One herbicide option available to peanut producers for controlling troublesome weeds is paraquat. Paraquat is labeled for application within 28 days after emergence, but not afterwards due to the possibility for crop injury. Trials were conducted in 2021 in Oklahoma and two locations in Texas to evaluate the response of peanut to paraquat. Treatments included paraquat applied at either 10.8 fl oz/A or 21.6 fl oz/A alone or applied in combination with S-metolachlor (Dual Magnum) applied at either 1.33 pt/A or 2.66 pt/A. Treatments were applied 14 days after cracking (DAC), 28 DAC, or 14 DAC followed by 28 DAC. Stand reduction never exceeded 5% with any treatment at any location throughout the growing season. The only treatment applied 14 DAC that injured peanut less than 10% (6 weeks after crack) was Gramoxone alone (1X) at both Fort Cobb and Lubbock. Gramoxone (2X) was the only 28 DAC applications that exceeded 10% at Fort Cobb. While injury was 20% or more at Lubbock with all 28 DAC treatments except Gramoxone + Dual Magnum (1X). Applications made at both 14 and 28 DAC injured peanut 11-20% at Fort Cobb and 40-70% in Lubbock. Visual injury was a combination of necrosis and stunting. Injury at Fort Cobb (8 weeks after crack) did not exceed 10% for any treatment applied at 14 or 28 DAC. Peanut injury exceeded that at Lubbock (15-40%) with all treatments except for Gramoxone (1X) applied 14 DAC. Applications at both 14 and 28 DAC injured peanut 9% (Gramoxone 1X) to 25% (Gramoxone + Dual Magnum 2X) at Fort Cobb and 33% (Gramoxone 1X) to 72% (Gramoxone + Dual Magnum 2X) at Lubbock. Injury at Yoakum was 15% or greater, 6 weeks after crack, and 20% or greater, 8 weeks after crack, with all treatments. Yields at Fort Cobb were not significantly different among treatments, with the exception of Gramoxone applied at a 2X rate alone and in combination with Dual Magnum, both yielding lower than the weed free check. No yield difference between treatment was observed at Lubbock. This research indicates that while visual injury may be observed with paraquat this does not necessarily translate to yield losses. These same trials are being conducted at for a second year to confirm the results from the 2021 growing season.