GUAR [*Cyamopsis tetragonoloba* (L.) Taub.] TOLERANCE TO THREE POSTEMERGENCE HERBICIDES. T. A. Baughman, P. A. Dotray, R. B. Westerman, B. L. S. Olson, J. W. Sij, J. D. Everitt, J. W. Keeling, C. L. Trostle, D. T. Smith, and D. S. Murray. Texas A&M University, Vernon, Lubbock, and College Station; and Oklahoma State University, Stillwater.

ABSTRACT

Guar [*Cyamopsis tetragonoloba* (L.) Taub.] produces a binder and stabilizer used in numerous food products and industrial materials. The only guar processing facility in the United States is located near Vernon, TX. During the early 1970's, guar production exceeded 100,000 acres in the Rolling Plains region of Texas and Southwestern Oklahoma. However, this acreage diminished due to cheaper imports from the Indo-Pakistan subcontinent. However, recent developments have resulted in favorable production economics for growers to reconsider guar as part of their overall cropping system. The added benefit is that guar works well as a rotational crop with cotton and wheat in the semi-arid southwest. Currently there are no postemergence broadleaf herbicides labeled in guar. Therefore, experiments were established at three locations in Texas and Oklahoma to evaluate guar tolerance to three postemergence herbicides that are currently labeled in soybean. Experiments were established as a factorial arrangement of treatments in a randomized complete block design. The factors were herbicides (2,4-DB, Pinnacle, and Raptor) and rate (1X, 2X, and 4X of the current labeled use rate in soybean). The application rates for 2,4-DB were 0.25, 0.50, and 1.00 lb ai/A; Pinnacle 0.004, 0.008, and 0.016 lb ai/A; and Raptor 0.04, 0.08, and 0.16 lb ai/A. All herbicides were applied with crop oil concentrate and Pinnacle and Raptor were also applied with ammonium sulfate. All plots were maintained weed-free for the entirety of the experiments. Experiments were established near Chillicothe and Lubbock, TX, and Perkins, OK. Herbicides were applied 4 weeks after emergence. Guar was evaluated for injury 14 and 28 days after postemergence treatment (DAPT). Plant heights and yield were also documented.

There was an interaction between locations, herbicides, and rate for crop injury. Crop injury consisted mainly of stunting. At Chillicothe, injury was less than 10% with all rates of 2,4-DB at 14 DAPT. Injury was 15% or greater with all rates of Pinnacle and the 2X and 4X rates of Raptor. At 28 DAPT, injury was less than 10% with all treatments except Pinnacle at the highest rate applied. Crop injury at 14 DAPT was greater than 50% with all rates of Pinnacle and Raptor, and at least 20% with all rates of 2,4-DB at Lubbock. Injury was 20% or greater with Pinnacle irregardless of rate and with the 2 and 4X rate of Raptor at 28 DAPT. Crop injury of 15% or greater was observed at Perkins with all rates of Pinnacle, the 2 and 4X rate of Raptor, and the 4X rate of 2,4-DB when evaluated at 14 DAPT. At 28 DAPT, only Pinnacle resulted in injury of 15% or greater. Plant height and yield were combined over rate. Pinnacle was the only herbicide that reduced plant heights when compared to the weed-free control at all locations. 2,4-DB reduced heights at both Lubbock and Perkins, and Raptor also reduced heights at Lubbock. No yield reductions were observed with any of the treatments applied at Chillicothe. All herbicides resulted in yield losses at Lubbock and Perkins when compared to the weed-free control. Guar yields were quite low at all three locations. Conditions were extremely hot and dry during this past growing season. These conditions may have resulted in the yield losses observed. Injury was most likely more severe and plants may not have adequately recovered from early season injury due to the poor growing conditions after application. Continued experiments will be conducted with these herbicides, along with other potential postemergence broadleaf options in guar.