Flumioxazin (Valor SX) was registered for use in peanut in 2001. Valor SX may be applied prior to planting or preemergence (within 48 hours after planting and prior to peanut emergence). In 2008 and 2009, several studies were conducted in grower fields across the Texas Southern High Plains to evaluate peanut response to Valor SX in large plot replicated trials. In 7 studies over 2 years, Valor SX at 2 oz/A did not reduce peanut yield relative to the non-treated control. In 11 of 12 studies over 2 years, Valor SX at 3 oz/A did not cause a peanut yield reduction; however, in one of four experiments in Dawson County, yield loss in Flavorrunner 458 following Valor SX at 3 oz/A was observed. Although peanut injury has been observed in other states, in the High Plains when rates exceeded labeled recommendations, and at one location (following Valor SX at 3 oz/A) in these studies, this herbicide is a valuable option for peanut growers with minimal risks and will provide effective early-season weed control for four to six weeks. Studies were initiated in 2009 and 2010 to determine peanut response to Valor SX at 0, 2, and 3 oz/A and Gramoxone Inteon at 0, 8, and 16 oz/A applied alone and in tank mixture applied preemergence (PRE) or at ground crack (AC). In 2009, peanut stand ranged from 9.2 to 10.8 plants per 3 feet of row and no treatment caused a reduction in stand relative to the non-treated control (9.7 plants/3 feet). Only Valor SX applied AC at 2 and 3 oz/A injured peanut, but this injury was no greater than 5%. Yield from Valor-treated plots ranged from 3424 to 3608 lb/A, and were not reduced relative to the non-treated control (3297 lb/A). Results from this study suggest that Valor SX alone or in tank mix with Gramoxone Inteon is a safe herbicide option to peanut producers in our region. The current Valor SX label states that applications must be made within 48 hours of planting. There is a risk of peanut injury if Valor SX applications are delayed and peanuts are emerging.