Fomesafen (Reflex) is a herbicide that has effectively controlled broadleaf weeds and woollyleaf bursage [Ambrosia grayi (A. Nels.) Shinners] in cotton (Gossypium hirsutum L.). In Texas, Reflex was recently labeled for use in cotton west of I-35 as a fall or spring preplant use only, but a recent 24C will allow applications up to 14 days before planting and use postemergence-directed. There is currently no label for use in peanut and the minimum rotational interval before planting peanut is 10 months. The objective of this research was to examine peanut tolerance to Reflex 2SL applied at 0, 0.19, 0.25, 0.38, and 0.50 lb ai/A (0, 12, 16, 24, and 32 oz/A) preemergence (PRE), at ground-crack (AC), and early postemergence (EPOST, 21 days after planting). This study was conducted under weed-free conditions at Lamesa, TX in 2008 (Flavorunner 458) and 2009 (Tamrun OL02) and under weedy conditions at Yoakum in 2009 (Tamrun OL02). In 2008 at Lamesa, Reflex applied PRE at 12 to 32 oz/A caused up to 59% peanut injury 47 days after application (DAA). More injury was observed as Reflex rate increased. Late-season (Sep 26) injury was still apparent following PRE applications. Reflex applied AC or EPOST caused up to 50 and 54% injury, respectively. More injury was observed as the Reflex rate increased and injury was still apparent late-season. Peanut yield was reduced following Reflex applied PRE at all rates, AC at 24 and 32 oz/A, and EPOST at 16, 24, and 32 oz/A relative to the non-treated control (5196 lb/A). In 2009 at Lamesa, Reflex applied PRE at 16 to 32 oz/A caused 6 to 15% peanut injury 21 DAA, 6 to 23% injury 35 DAA, and 8 to 46% injury mid-season (July 2). As in 2008, injury increased as Reflex rate increased. Late-season (Sep 25) injury up to 44% was still apparent following PRE applications. Reflex applied AC or EPOST caused up to 36 and 15% injury, respectively. More injury was observed as the Reflex rate increased and injury following 16 to 32 oz/A treatments was still apparent late-season. Peanut yield was reduced following Reflex applied PRE at 16 to 32 oz/A rates; AC at 12, 16, and 32 oz/A; and EPOST at 24 oz/A. In 2009 at Yoakum, peanut injury 34 days after planting (DAP) with Reflex applied PRE ranged from 8 to 23% while Reflex injury from AC applications ranged from 22 to 38%. No injury from Reflex applied EPOST was noted at the 34 DAP rating since this was only 12 days after application. When evaluated 76 DAP, peanut injury with Reflex applied PRE, AC, or EPOST ranged from 17 to 53% and increased as the rate of Reflex increased. Results from this study suggest that Flavorunner 458 (2008) and Tamrun OL02 (2009) are very susceptible to Reflex applied PRE, AC, and early postemergence at rates from 12 to 32 oz/A. Although Reflex provided good to excellent control of certain broadleaf weeds, peanut injury with PRE, AC, or EPOST applications was unacceptable. Future label changes that would allow Reflex use in peanut seem unlikely based on this data collected on the Texas High Plains (Flavorunner 458 and Tamrun OL02), south Texas (OL02 and previously in OL01 and OL07), Georgia (Georgia Green), and Florida (SunOleic 97R).