Significant resources are being dedicated to the development of herbicide-resistant crops. 2,4-D resistance is currently being developed in cotton and soybean. Peanut is often grown in close proximity to cotton and soybean in southern states. The use of 2,4-D resistant crops will likely increase the risk of 2,4-D damage to peanut through drift and/or spray tank contamination. The objective of this study was to evaluate peanut response to simulated drift rates of 2,4-D. Two field trials were conducted in 2011 at Ponder Research Farm and Attapulgus Research & Extension Center. Peanut variety ‘GA-06G’ was planted in early May at both locations and grown under weed-free conditions. 2,4-D amine (Agristar® 2,4-D 3.8SL) at rates of 0, 2, 4, 8, 16, and 32 oz/A was applied at 30, 60, and 90 days after planting (DAP). Herbicides were applied using a CO2-pressurized backpack sprayer calibrated to deliver 15 GPA. Treatments were replicated 4 times in a split-plot design. Whole-plots were time of application and sub-plots were 2,4-D rates. Data collected included visual estimates of peanut injury, yield, 100 pod weights, and 100 seed weights. Only yield data are reported herein. Data were combined over location and subjected to ANOVA. A significant interaction between time of application and 2,4-D rate was observed. Regression analyses were conducted for 30 and 60 DAP treatments using Sigma Plot 11. When 2,4-D was applied at 30 DAP, estimated peanut yield losses were 0, 4, 3, 6, 11, and 34% at rates of 0, 2, 4, 8, 16, and 32 oz/A, respectively. When 2,4-D was applied at 60 DAP, estimated peanut yield losses were 0, 12, 13, 16, 23, and 36% at rates of 0, 2, 4, 8, 16, and 32 oz/A, respectively. There was no relationship between rate and time of application for 90 DAP treatments.