Development and utilization of dicamba, glufosinate, and 2,4-D resistant crop cultivars potentially will have a significant influence on weed control in the southern United States. However, off-site movement to adjacent non-tolerant crops is a concern in many areas of eastern North Carolina, especially where peanut and tobacco are produced. Cotton, peanut, soybean, tobacco, and many vegetable crops not resistant to these herbicides are often grown in close proximity to one another, and practitioners will need to consider potential adverse effects on these crops. Research was initiated in 2009 to determine response of these crops to simulated drift rates of dicamba, glufosinate, and 2,4-D when applied at two locations for each crop in early June to crops planted in early to mid May (cotton, peanut, soybean) or when tobacco was transplanted in April. The highest rate of these respective herbicides was 0.125 lb ai/acre, 0.27 lb ai/acre, and 0.24 lb ai/acre. Herbicides were applied at four additional rates going as low as 0.000488 lb/acre (dicamba), 0.017 lb/acre (glufosinate), and 0.00093 lb/acre (2,4-D). Peanut yield was reduced by only the highest rate of either glufosinate or 2,4-D. Dicamba at 0.125 lb/acre reduced pod yield at one location while rates of 0.125 and 0.03125 lb/acre reduced yield at a second location. Although not reported here, yield of cotton, soybean, and tobacco generally were affected more than yield of peanut. Results from these experiments will be used to emphasize the need for diligence in application of these herbicides in close proximity to adjacent crops that are susceptible as well as the need to clean sprayers completely before spraying sensitive crops. Additionally, these data will be used to correlate visual injury with yield loss when these herbicides damage susceptible crops.