

Quantifying Impact of Glufosinate Drift on Peanut Using Unmanned Aerial System

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The herbicide drift can negatively impact peanut growth and yield. The off-target movement of herbicides applied in LibertyLink cotton, soybean, and corn can result in a significant yield reduction in peanut. The research was conducted to evaluate the impact of herbicide-drift on peanut using NDVI measured from an unmanned aerial system (UAS). The study evaluated the impact of 50%, 12.5%, 3.14%, 0.79%, and 0.2% of the label rate of glufosinate applied at 25 and 60 DAP peanut. NDVI, peanut injury, yield, height, width, and leaf area index (LAI) were measured at 4 weeks after herbicide application. The NDVI was calculated from data collected with a multispectral camera mounted on a UAS. Among different glufosinate rates, 50% of the label glufosinate rate caused the highest peanut injury and resulted in NDVI reduction, height, weight, LAI, and yield. The average peanut injury from 50% glufosinate rate applied at 25 DAP and 60 DAP were 70 and 51%, respectively. Moreover, the 50% glufosinate rate reduced the NDVI by 51.9 and 33.8% when applied at 25 DAP and 60 DAP, respectively. Similarly, the peanut yield was reduced by 68% with glufosinate applied at 50% of label rate. NDVI showed a strong correlation with peanut injury, yield, height, and canopy width with R^2 of 0.83 to 0.96, 0.64 to 0.90, 0.63 to 0.93, and 0.75 to 0.93, respectively. Therefore, UAS derived NDVI could be a good parameter to quantify peanut injury and yield reduction caused by the glufosinate herbicide drift.