

EFFECT OF GLYPHOSATE CONTAMINATION ON CONVENTIONAL CORN AND SOYBEAN.

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Field research was conducted at Urbana, IL in 2003 and 2004 for corn, and in 2005 for soybean to evaluate the effect of glyphosate contamination and or simulated drift on non-glyphosate-resistant corn and soybean. Non-glyphosate-resistant corn and soybean were planted in 30-inch rows and maintained weed free. Various rates of glyphosate were applied with proportional rates of ammonium sulfate. The soybean trial also included combinations of fomesafen and imazamox with glyphosate. Crop injury, height, photographs, and yield were taken. In corn, plant samples from roots and leaves were also analyzed for glyphosate content by APT Labs Inc., Wyomissing, PA. Rates applied were based on a 1X in crop application of 0.75 lb/acid equivalent (a.e.). Multiple rates were applied ranging from 0.001X to 0.2X in corn and 0.01X to 0.33X in soybean. For corn minimal injury and no yield loss occurred from glyphosate at 0.01X or less. However, glyphosate rates of 0.1X or greater resulted in significant injury and yield loss of 50% or more. Glyphosate concentration in the plant was less than 0.5 parts per million (ppm) with 0.01X rates or less, while concentrations for rates of 0.1X or greater were 0.6 ppm or higher. Yield reducing injury tended to occur on 4 to 8 inch corn plants with detectable amounts of 0.1 ppm or greater. Extracted plant concentrations less than 0.3 ppm, or more than 0.6 ppm, appear to be the threshold range between recoverable and permanent injury for 12 to 36 inch tall corn, respectively. For soybean minimal injury and no loss of yield occurred with glyphosate alone at rates of 0.1X or less, or 0.04X or less when tank-mixed with fomesafen and/or imazamox at field use rates. Season-long injury that reduced yield significantly occurred with glyphosate alone treatments at 0.167X or greater, or at 0.01X or greater when tank-mixed with fomesafen. Soybean maturity was delayed from 6 to 12 days when yield loss was significant.