

# Fate of atrazine in sandy soil cropped with sorghum

## **Abstract:**

A field study was conducted to determine the fate of atrazine (6-chloro-N<sub>2</sub>-ethyl-N<sub>4</sub>-isopropyl-1,3,5-triazine-2,4-diamine) within the root zone (0 to 90 cm) of a sandy soil cropped with sorghum [*Sorghum bicolor* (L.) Moench] in Gainesville, Florida. Atrazine was uniformly applied at a rate of 1.12 kg ai. ha<sup>-1</sup> to a sorghum crop under moderate irrigation, optimum irrigation, and no irrigation (rainfed), 2 d after crop emergence. Bromide as a tracer for water movement was applied to the soil as NaBr at a rate of 45 kg Br ha<sup>-1</sup>, 3 d before atrazine application. Soil water content, atrazine, and Br concentrations were determined as a function of time using soil samples taken from the root zone. Atrazine sorption coefficients and degradation rates were determined by depth for the entire root zone in the laboratory. Atrazine was strongly adsorbed within the upper 30 cm of soil and most of the atrazine recovered from the soil during the growing season was in that depth. The estimated half-life for atrazine was 32 d in topsoil to 83 d in subsoil. Atrazine concentration within the root zone decreased from 0.44 kg ai. ha<sup>-1</sup> 2 days after application (DAA) to 0.1 kg a.i. ha<sup>-1</sup> 26 DAA. Negligible amounts of atrazine (approximately 5 microg kg<sup>-1</sup>) were detected below the 60-cm soil depth by 64 DAA. Most of the decrease in atrazine concentration in the root zone over time was attributed to degradation. In contrast, all applied bromide had leached past the 60-cm soil depth during the same time interval.