

SOIL FACTOR AND SPRAY TIMING EFFECTS ON SULFENTRAZONE PHYTOTOXICITY TO TWO SOYBEAN VARIETIES. Kristel L. Reiling, F. William Simmons and Dean E. Riechers, Graduate Research Assistant, Associate Professor and Assistant Professor, Department of Crop Science, University of Illinois, Urbana, IL 61801.

Sulfentrazone is a phenyl-triazolinone herbicide registered for preemergence use in soybean systems to control many small-seeded broadleaves and some grass species. Field experiments were conducted in 2001 and 2002 at three Illinois locations to: (1) evaluate what effect soil factors (pH and organic matter (O.M.)) have on sulfentrazone phytotoxicity to soybeans, and (2) determine the crop response of sulfentrazone application timings. Soil types at the three locations were a Flanagan silt loam with 3.6% O.M., a Drummer silt loam with 4.5% O.M., and a Cisne silt loam with 2.1% O.M. These studies were conducted on established pH plots where the pH was adjusted to 1 of 5 set target levels. The target pH levels were <6.0, 6.0-6.5, 6.5-7.0, 7.0-7.5, and >7.5. Sulfentrazone treatments consisted of 0.22 kg a.i. ha⁻¹ (1X) and 0.44 kg a.i. ha⁻¹ (2X) sprayed at three timings; 7-day early preplant (EPP), preemergence (PRE), and 50% soybean hypocotyl emergence (VE). Varieties 'Pioneer 94B01' (sulfentrazone sensitive) and 'Pioneer 93B53' (sulfentrazone tolerant) were used to evaluate crop response across all locations and years. Visual injury ratings were taken 14, 28, and 56 days after planting (DAP). Final stand counts were recorded in late spring and yield data was collected in the fall. At Brownstown, injury increased as soil pH increased for 'Pioneer 94B01' at the 1X VE treatment. Injury levels at the 2X EPP, 1X PRE, 2X PRE, and 1X VE application treatments were significantly higher than the injury levels at the 1X EPP treatment for 'Pioneer 94B01'. 'Pioneer 93B53' injury was significantly higher at the 1X VE treatment compared to the 1X EPP treatment. Although significant injury levels were recorded, there were no differences in yield among the treatments for either variety. At DeKalb, injury levels increased as soil pH increased at the 1X VE treatment for both varieties. Injury levels were significantly higher at the PRE and VE application treatments for 'Pioneer 94B01'. Injury levels were significantly higher at the 2X PRE treatment for 'Pioneer 93B53'. There were no differences in yield among the treatments for 'Pioneer 94B01'. For 'Pioneer 93B53', there was a significant yield decrease at the 1X VE treatment. At Urbana, 'Pioneer 94B01' injury levels increased with increasing soil pH at the 2X EPP and 2X PRE treatments. There was also a yield decrease as soil pH increased at the 2X EPP treatment for 'Pioneer 93B53'. For 'Pioneer 93B53' there were no difference in injury levels among the application timing treatments. At the later treatments of 2X PRE and 1X VE, there was a significant increase in injury for 'Pioneer 94B01'. Although there were significant differences in injury levels, there were no differences in yield. There was an increase in injury with increasing soil pH at all locations. Soil pH level accounted for 20-27% of the variability in soybean injury. Soybean injury ranging from 5-25% occurred at all locations, but yield was only reduced at Urbana at the 2X EPP treatment. In general, even the sulfentrazone sensitive soybeans did not suffer yield reductions even when early season injury symptoms occurred.