

Influence of pH on Carryover of Triketone Herbicides in Missouri No-till Corn and Soybean Rotations

Missouri Fertilizer and Lime Council

Progress Report, 2009

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Accomplishments in 2009:

- Based on soil pH levels tested in late winter/early spring, there was no need for additional lime and iron sulfate applications to be made to the plots in 2009 in order to maintain the desired range in soil pH levels. The soil pH treatments in this experiment are: 1) high lime, 2) low lime, 3) high acid (iron sulfate), 4) low acid (iron sulfate), and 5) 'no amendment' (limed just enough to maintain initial pH).
- One-half of the research area was no-till planted into corn while the other half of the research area was no-till planted into soybeans. Due to poor planting conditions that were experienced throughout the spring, corn was not able to be planted until May 14th, approximately 4 weeks behind normal planting for the Columbia location. The experiments were arranged in a split-plot design with four replications of four herbicide treatments and five soil amendment treatments/pH ranges. Soon after corn planting, a preemergence application of Dual II Magnum[®] (S-metolachlor) was made to reduce early season weed competition and reduce overall weed pressure. Dual II Magnum[®] is also labeled for use in soybean, thus there is no chance of carryover injury to soybean in 2010 as a result of applications of this herbicide. A Roundup Ready[®] corn and soybean hybrid was also utilized in these experiments in order to keep all plots weed-free throughout the season with applications of glyphosate (Roundup[®]).
- Herbicide treatments evaluated for carryover potential in 2010 were applied on June 17th to V6 corn that was 30-inches tall. The herbicide treatments applied to each soil amendment treatment were 1) Callisto[®] at 3 fluid ounces per acre, 2) Impact[®] at 0.75 fluid ounces per acre, 3) Laudis[®] at 3 fluid ounces per acre, and 4) an untreated control.
- Visual ratings of soybean injury were taken at regular intervals after soybean emergence. Soybean height was also recorded in each plot to determine the effects of the previous season's herbicide applications on soybean growth.
- Corn and soybean were harvested from all plots with a small plot combine and grain yields determined.

1st Year Herbicide Carryover Results

- There was not a significant effect of Impact, Laudis, or Callisto applications in the previous corn crop on soybean visual injury, height reduction after planting, or soybean yield. This may be at least partially due to the extremely wet conditions experienced throughout 2008 and 2009.

- There was a significant effect of soil pH on corn and soybean yield, and these results are shown in the table below.

Treatment	Yield ^a	
	Corn	Soybean
	----- Bu / A -----	
Low Lime (avg. pH _s 6.6)	74.9 ab	53.6 ab
High Lime (avg. pH _s 7.1)	83.5 a	54.3 a
Low Acid (avg. pH _s 5.0)	78.7 ab	51.9 b
High Acid (avg. pH _s 4.3)	73.1 b	47.5 c
No Soil Amendment (avg. pH _s 5.9)	75.6 ab	53.2 ab

^aMeans followed by the same letter are not different, $P \leq 0.05$.

Objectives for 2010:

- All corn plots from 2009 will be rotated into soybeans. A Roundup Ready[®] soybean variety will be no-till planted and early-season soybean stunting and injury in response to the previous corn herbicide treatments and pH levels will be evaluated visually and by measuring the heights of soybeans in response to each treatment. All soybean plots will be maintained weed-free throughout the season and yields determined.