

Planting corn immediately after anhydrous ammonia application, am I in for trouble?

Carrie Laboski, Department of Soil Science

The weather conditions this spring have kept corn growers out of the field until this past week. A few growers are concerned about germination and seedling injury because they will be applying preplant anhydrous ammonia (NH₃) only a few hours before planting. The questions are: what should they do to prevent or minimize injury; and what should they expect the crop to look like?

To answer these questions, we'll look at University of Illinois research where corn was planted on top of NH₃ injection bands at a depth of 2 inches on a Flanagan silt loam (Colliver and Welch, 1970). In this study, there were three NH₃ injection depths (4, 7, and 10 inches), three dates of planting (0, 1, and 2 weeks after NH₃ application), and two nitrogen (N) application rates which are applicable to our current conditions (100 and 200 lb N/a). There was also a control treatment where no NH₃ was applied.

The 100 lb N/a rate showed no reduction in stand compared to the control 27 days after planting for any injection depth or date of planting. The 200 lb N/a rate showed significant stand reduction at a 4-inch NH₃ injection depth, but no stand reduction at the deeper depths when planted the day of NH₃ injection. Plant height was slightly stunted 41 days after planting when 100 lb N/a was injected the same day as planting at a 4- or 7-inch depth; if injected at 10 inches there was no stunting apparent. While, the 200 lb N/a showed sever, slight, and no stunting for the 4, 7, and 10 inch NH₃ injection depths, respectively. Overall depth of NH₃ injection was more important in reducing injury than was the amount of time between NH₃ application and planting.

Another observation in the Illinois study was phosphorus (P) deficiency even though the soil test was optimum (22 ppm Bray P). At 22 days after planting deficiency symptoms were greater at shallower injection depths and larger N application rates. The P deficiency likely occurred because the root system was restricted by ammonia toxicity. Remember, the results in this study are an extreme case because corn was planted directly on top of the NH₃ injection band.

To prevent or minimize injury when planting corn a few hours after NH₃ application.

1. Inject NH₃ at least 7 inches deep and perhaps as deep as 10 inches if possible.
2. Do not plant the corn row directly on top of the injection bands. Perhaps the best way to insure that a corn row is not directly on top the injection band is to apply the NH₃ at a slight angle relative to the corn rows. Some plants will end up on top of an injection band, but an entire row will not.
3. Lower N application rates will minimize risk of injury.
4. Insure that the soil closes behind the knife openings to limit N loss and movement upwards towards the seed.

So are you in for trouble if you plant corn immediately following NH₃ application? The answer is no, as long as you follow the guidelines listed above. And as always, when working with NH₃ follow all safety precautions.