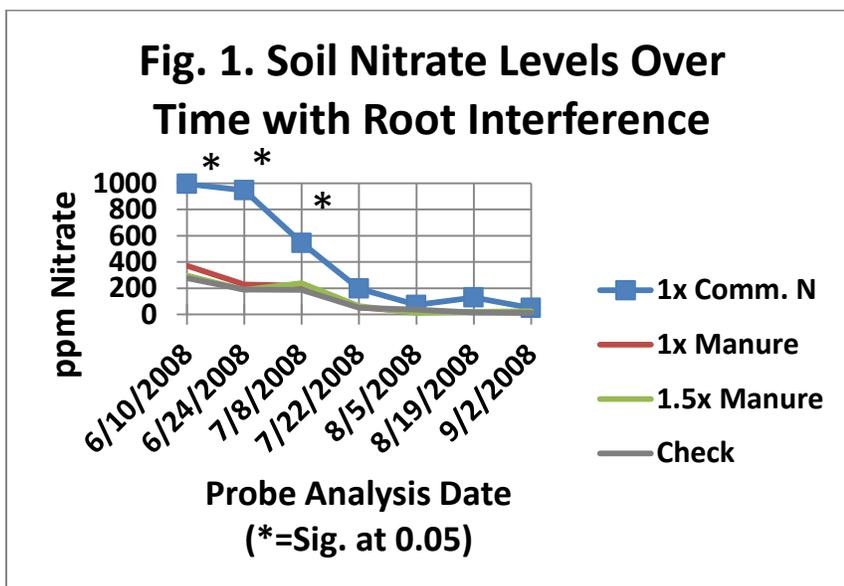


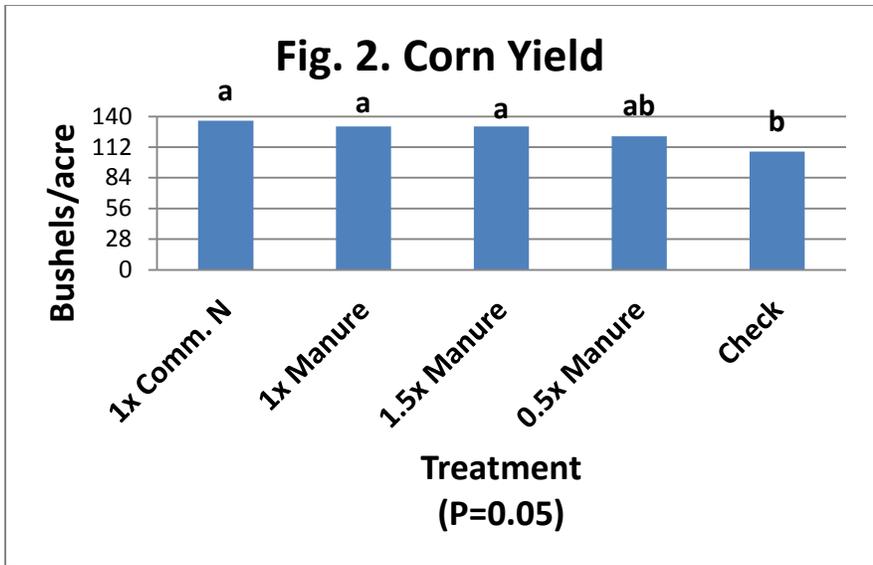
Using PRS™ Probes (Ion Membrane Probes) to Determine Nitrogen Mineralization

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Introduction: A study with five treatments: no fertilizer; commercial N at a 1x rate; and manure N at a 1x, 1.5x and 0.5x rate was established to determine N mineralization of manure N versus commercial N. Three sets of PRS™ probes were placed in the soil at a 3" depth in each plot. The probes were retrieved every 14 days. The probes were initially placed in plots on May 27 and replaced every 14 days for 8 burials with the last set retrieved on September 2, 2008. There were two sets of probes per plot, a set with and a set without root interference. Root exclusion was accomplished by inserting three, 2', 8" irrigation pipes into the soil down the middle of each plot. The goal of the study was to explore the performance of the probes and get a first look at the behavior of commercial and manure N over the growing season.

Results: Figure 1 shows the results of soil nitrate levels over the growing season with root interference or the net amount of N available for crop uptake. The data shows that commercial N supplied a significantly higher level of N for crop uptake early in the growing season compared to manure. However, all treatments followed a similar pattern with decreasing levels of available N over the cropping season. The interesting outcome of this research is the crop yield response to available N. According to Figure 2, there was no difference in corn yield when manure N was applied at the same or higher rate than commercial N. When no N was applied or a less than commercial N level of manure N was applied, there was a significant drop in corn yield. Table 1 outlines the soil nitrate level when root interference is excluded or the gross amount of N that would be available to crops. According to Table 1, the commercial N had a significantly higher level of gross N in the soil throughout the growing season compared to any of the other treatments. This data would suggest that crop utilization of manure N is similar to commercial N even though commercial N gross or net levels in the soil are higher than manure N.





Numbers with the same letter are not different at p=0.05.

Table 1. Total season nitrate levels with root exclusion.

Treatment	Nitrate ($\mu\text{g}/10\text{cm}^2$)
Check	340 c
1x Comm N	618 a
1x Manure N	368 c
1.5x Manure N	464 b
0.5x Manure N	332 c

Numbers with the same letter are not different at p=0.05.