Evaluation of NZone Max Nitrogen Aid in Corn

Olga S. Walsh, Jordan McClintick-Chess, and Steven M. Blanscet
University of Idaho, Parma Research & Extension Center

OBJECTIVES

The study's objective was to access potential benefits of NZone Max in corn for improving N use efficiency and grain production.

SEED TREATMENTS

NZone Max (AgXplore International, Parma, MO) with CrossLink Technology is a nitrogen (N) aid with the following proposed advantages:

- ✓ increased N availability and uptake,
- ✓ reduced N loss, flexible in regards to application practices and weather conditions, and
- ✓ user- and environmentally-friendly (non-corrosive and no detrimental effects on soil).

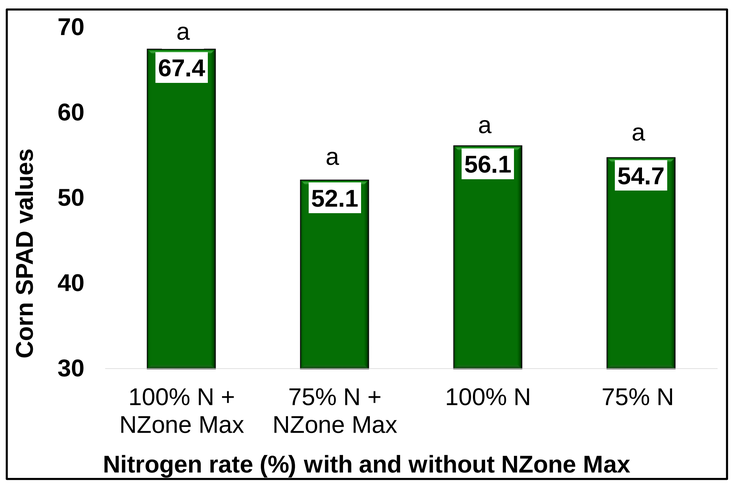
MATERIALS AND METHODS

- ✓ The field experiment was established in the spring of 2016 at University of Idaho (UI) Parma Research & Extension Center.
- ✓ Corn (var 3499VT3P/RIB) was seeded at 86,450 plants ha^{-1} seeding rate into 4.5 x 18.3 m plots.
- ✓ One week after planting, 4 fertilizer treatments (2 N rates treated or untreated with NZone Max) replicated 4 times were applied to research plots.
- ✓ Based on preplant soil test results, N fertilizer was applied as granular urea (46-0-0) to achieve a target rate of 308 kg ha^{-1} for 100% rate and 231 kg ha^{-1} for 75% rate.
- ✓ Mid-season (V8), for 5 plants per plot, SPAD values and plant height was determined.
- ✓ At maturity, corn ear weight (5 plants per plot), and by-plot corn grain yield was determined. The effect of N fertilizer rate and NZone Max treatment on corn ear weight and grain yield was evaluated.

DISCUSSION - Biomass

- ✓ Corn responded to N fertilizer application, which was reflected in both physiological and grain production characteristics. Although SPAD values were not statistically different ($p>0.05$), NZone Max treatment coupled with the 100% N rate application resulted in notable higher chlorophyll accumulation (Figure 1A). The 100% N rate with NZone Max had much higher SPAD values compared to the 100% N rate without NZone Max, suggesting that NZone Max has aided in N uptake and accumulation in aboveground biomass.
- ✓ As expected, corn plant height was significantly affected by N application rate (Figure 1B); 100% N rate resulted in taller plants, compared to 75%. NZone Max treatments produced taller plants for both N rates, compared to plants not treated with NZone Max, although the differences were not statistically significant ($p>0.05$).

PRELIMINARY RESULTS



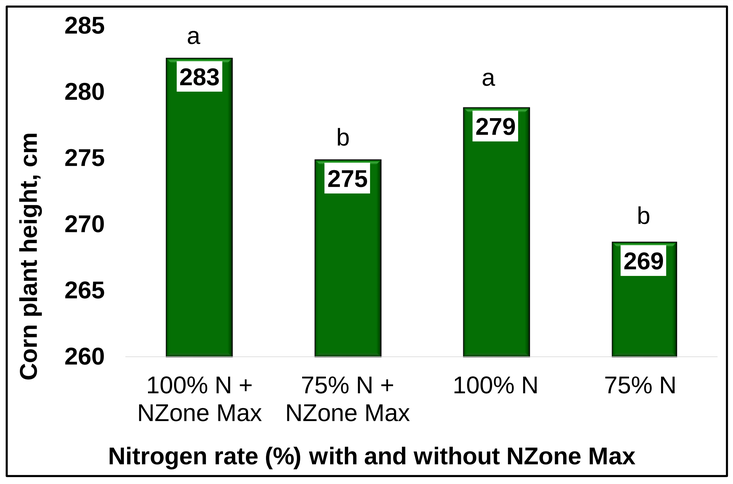
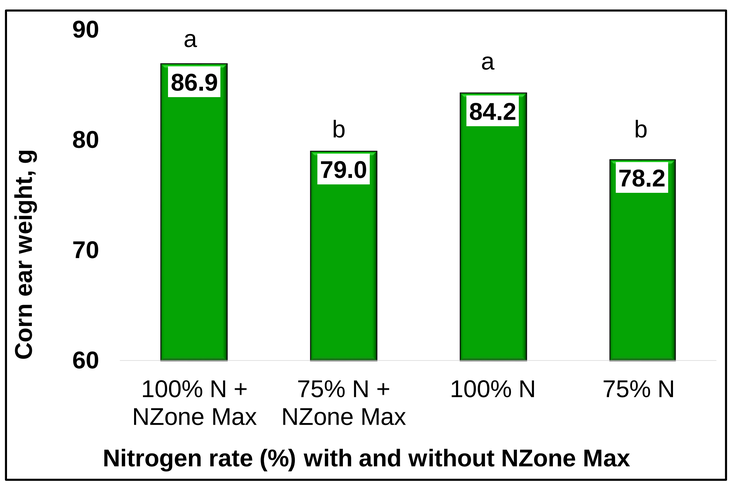


Figure 1. Effect of N rate and NZone Max N aid treatment on corn chlorophyll (SPAD) values (1A) and plant height (1B), Parma, ID, 2015-16.



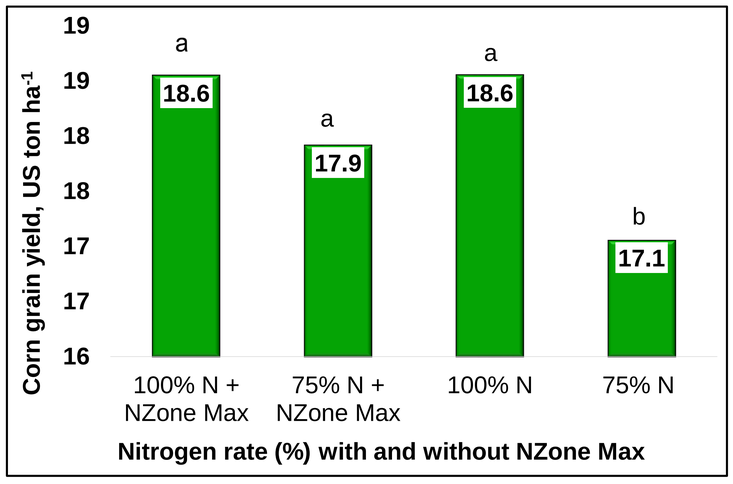


Figure 2. Effect of N rate and NZone Max N aid treatment on corn ear weight (2A) and grain yield (2B), Parma, ID, 2015-16.

DISCUSSION – Grain Production

- ✓ Corn ear weight was significantly ($p>0.05$) affected by N% rate (Figure 2A). Significantly greater weight was achieved with 100% N application rate, compared to 75%. For both N rates, NZone Max treatment resulted in a slight, non-significant corn ear weight increase.
- ✓ Corn grain yields ranged between 17.1 and 18.6 US ton ha^{-1} (Figure 2B). At 100% N rate, NZone Max had no affect on grain yield. NZone Max treatment significantly increased corn grain yield at 75% N rate ($p>0.05$).
- ✓ . Furthermore, 25% reduction in N fertilizer application coupled with NZone Max treatment enabled to achieve comparable grain yields as the full, 100% N rate without NZone Max treatment.

Idaho Crops & Soils Blog

Twitter: @IDCrops

We are grateful to AgXplore International and Idaho Agricultural Experiment Station for supporting this project.

Contact : Dr. Olga Walsh, University of Idaho, Parma Research & Extension Center; Address: 29603, U of I Lane, Parma, ID 83660; Telephone: (208)722-6701