

# FOLIAR NITROGEN APPLICATIONS WITH FULVIC ACID RESULTS - 2020

**Background:** Fulvic acid is of particular interest as it is a natural chelator and thus helps facilitate nutrient mobilization across tissue membranes. It also retains many properties that make it ideal for foliar tank mixes, such as high solubility under different pHs, high cation exchange capacity, and no recorded antagonistic effects with nutrients or pesticides. Owing to its low molecular weight (a few hundred Daltons), it can easily cross plant tissue membranes, and remains in solution even at high salt concentrations. All of which are considered ideal for foliar nutrient applications. Moreover, the capacity of fulvic acid to increase nutrient uptake has been reported in both horticultural and field crop production systems. The aim of this trial was to assess the spring wheat yield response to foliar application of liquid nitrogen (N) tank-mixed with fulvic acid (BioLiNE® Gold). Treatments adhere to a randomized complete block design with 4 replicates each. The experimental treatments were as follows:

## i.) Control

Banded dry N fertilizer at 35 lbs of N/ac (76 lbs of urea/acre). Urea was not treated.

## ii.) Soil Applied N Fertilizer + Fulvic Acid

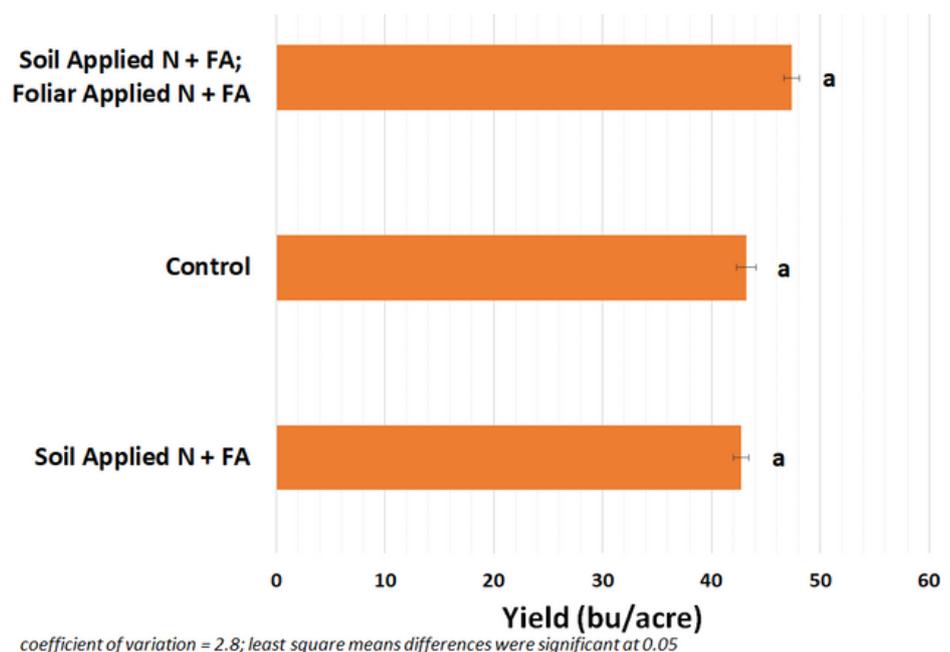
Banded dry N fertilizer at 24 lbs of N/ac (52 lbs of urea/acre). Dry urea was treated with fulvic acid (BioLiNE® Gold) at 300 mL/ac rate.

## iii.) Soil Applied N Fertilizer + Fulvic Acid and Foliar Applied N Fertilizer + Fulvic Acid

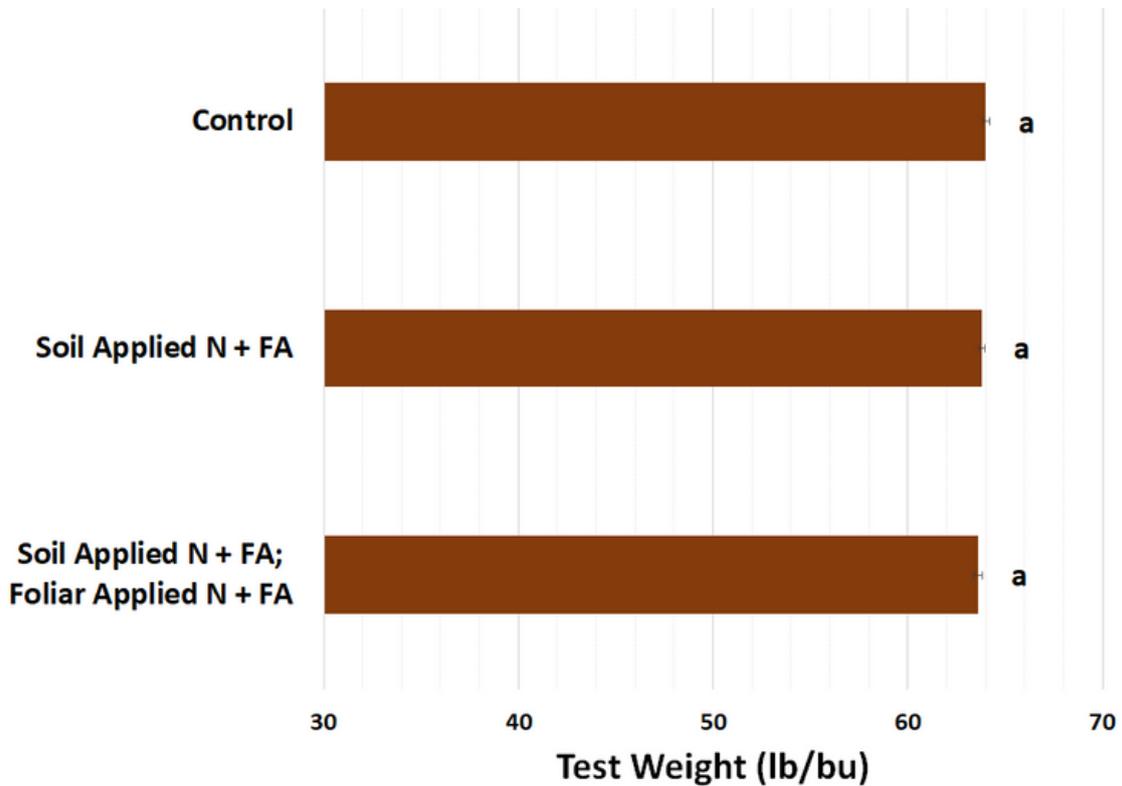
Banded dry N fertilizer at 26 lbs of N/ac (57 lbs of urea/acre). Dry urea was treated with fulvic acid (BioLiNE® Gold) at 300 mL/ac rate. Foliar N application was sprayed at 1st tiller, and consisted of 18-0-0-3Ca at 30 L/ac, DeltAg Boron at 0.12 L/ac, and fulvic acid (BioLiNE® Gold) at 1 L/ac rate.

**Overview:** This trial compares wheat subject to differing combinations of in-furrow and foliar applied nitrogen (N) and fulvic acid (FA). Yield, test weight, and protein content was assessed. This trial will be repeated in 2021 and 2022.

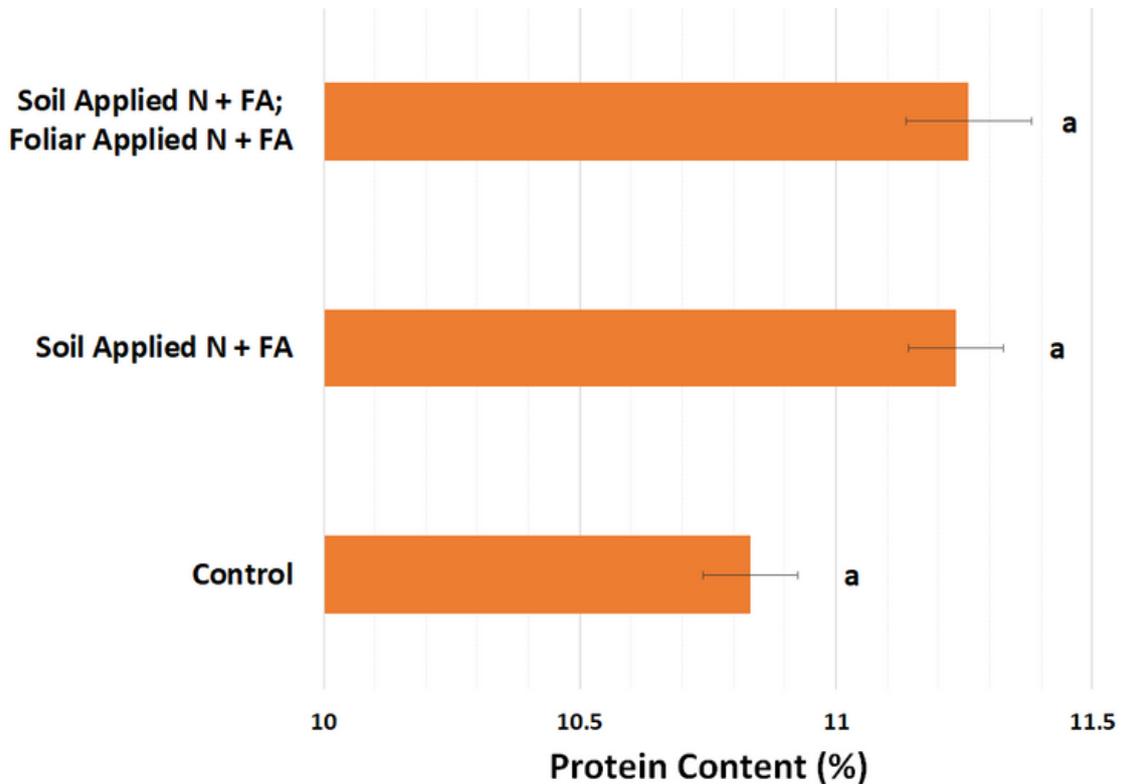
**Conclusion:** There were no significant differences between the measured yields ( $P=0.04$ ). Similarly, all treatments (control; soil applied nitrogen + fulvic acid; soil applied nitrogen + fulvic acid AND foliar applied nitrogen + fulvic acid) exhibited test weights too similar to be regarded as different by the statistical analysis. Test weight ( $P=0.52$ ) values ranged only one lb/bu, that is, between 63.5-64 lb/bu. No significant differences were found in protein content ( $P=0.09$ ).



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*coefficient of variation = 0.4; least square means differences were significant at 0.05*



*coefficient of variation = 1.5; least square means differences were significant at 0.05*

**Seeding Date:** May 19; **Seeding Depth:** 1 in.; **Seeding Rate:** 10 plants/sq. ft.;

**Harvest Date:** Sep. 30

**Applications:** May 15: Glyphosate - 0.66 L/ac; May 19: 13-33-0-15S - 120 lb/ac; Jun. 5: Prestige A - 0.32 L/ac and Prestige B - 0.81 L/ac; Jun. 25 - Pardner - 0.4 L/ac; Jul. 3: Foliar treatments applied.