

# *Field Test Results (Wheat)-2013*



## ***CHI Liquid Fulvic (Concentrate) Increased Crop Production of Wheat***

**Objective:** *To use organic matter (fulvic acid) to increase yield of wheat*

**Collaborator:** *Battle River Research Group, Camrose, Alberta, CANADA*

**Financial supports:** *National Research Council (Industrial Research Assistant Program), Agriculture & Agri Food Canada (Canadian Agriculture Adaptation Program), and Canada Revenue Agency (Scientific Research & Experimental Development)*

**Period:** *May to September, 2013*

**Tested products:** *CHI Liquid Fulvic (Concentrate) - source of fulvic acid and micronutrients (copper, iron, and zinc)*

**Tested crop:** *Wheat - "Harvest" variety*

**Location:** *Camrose, Alberta, CANADA*

**Soil:** *Loam, solonetzic clay underneath, OM = 6%, pH = 6.1, EC = 0.3 mS/cm*

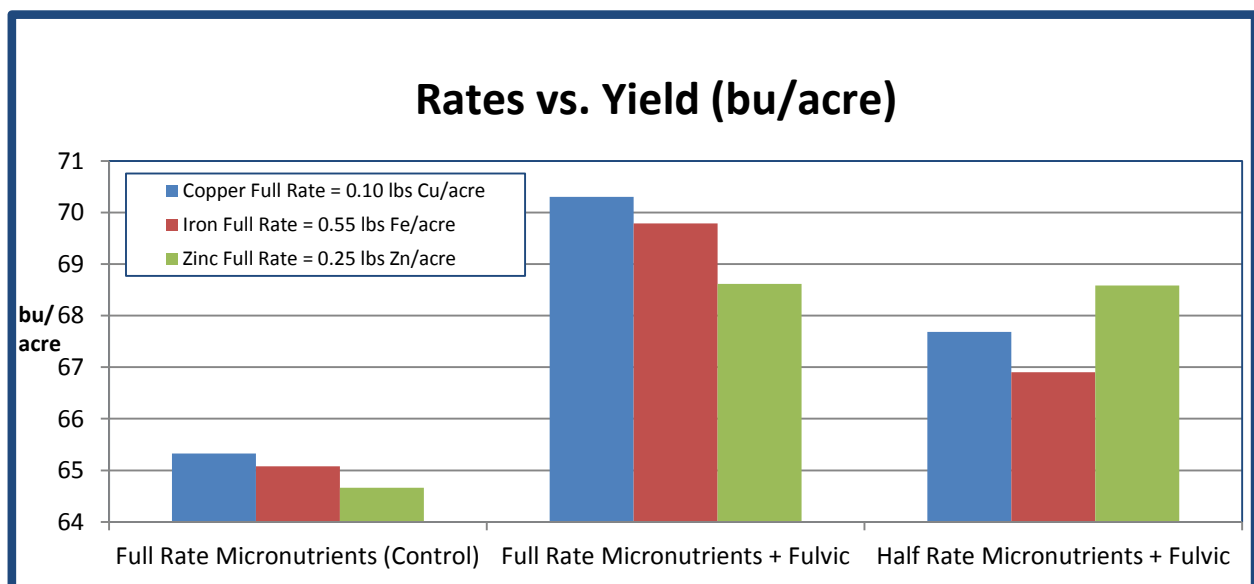
**Test plot:** *4.5 x 22 ft<sup>2</sup> (1.4 x 6.6 m<sup>2</sup>)*

## Design of Experiments

- Macronutrients (60 lbs N/acre + 20 lbs P<sub>2</sub>O<sub>5</sub>/acre) were applied for each treatment during seeding
- Micronutrients (copper, iron, and zinc) and CHI Liquid Fulvic (Concentrate) were foliarly applied on seedlings, i.e. 2 weeks after seeding
- Copper sulfate micronutrient treatments:
  - Treatment 1 (Control): 0.10 lbs Cu/acre
  - Treatment 2: 0.10 lbs Cu/acre + 6 ounces (170 mL) Liquid Fulvic (Concentrate)/acre
  - Treatment 3: 0.05 lbs Cu/acre + 6 ounces (170 mL) Liquid Fulvic (Concentrate)/acre
- Iron sulfate micronutrient treatments:
  - Treatment 4 (Control): 0.55 lbs Fe/acre
  - Treatment 5: 0.55 lbs Fe/acre + 6 ounces (170 mL) Liquid Fulvic (Concentrate)/acre
  - Treatment 6: 0.28 lbs Fe/acre + 6 ounces (170 mL) Liquid Fulvic (Concentrate)/acre
- Zinc chloride micronutrient treatments:
  - Treatment 7 (Control): 0.25 lbs Zn/acre
  - Treatment 8: 0.25 lbs Zn/acre + 6 ounces (170 mL) Liquid Fulvic (Concentrate)/acre
  - Treatment 9: 0.13 lbs Zn/acre + 6 ounces (170 mL) Liquid Fulvic (Concentrate)/acre
- Each treatment was replicated 3 times, i.e. 3 test plots per treatment
- Yield for each test plot was measured, and results from 3 test plots of the same treatment were averaged. Yields were presented as bu/acre (1 bushel = 60 lbs)
- Note: Liquid Fulvic had no significant amount of macro/micronutrients

## Results

At the same rates of micronutrients, foliar application of Liquid Fulvic (Concentrate) resulted in 6.0 to 7.7% yield increases. At 50% reduced rates of micronutrients, 2.8 to 6.0% yield increases were observed. This indicated that Liquid Fulvic (Concentrate) increased micronutrient uptakes by plants.



## Conclusions

Small amount of organic matter (fulvic acid) increased yield of wheat significantly. Even at 50% reduced rates of micronutrients, yield increases were still observed. Recommended foliar rate for Liquid Fulvic (Concentrate) was 6 ounces (170 mL)/acre.