

# FIELD TEST RESULTS

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# LENTILS



2016

## CHI LIQUID CARBON INCREASED CROP PRODUCTION OF LENTIL

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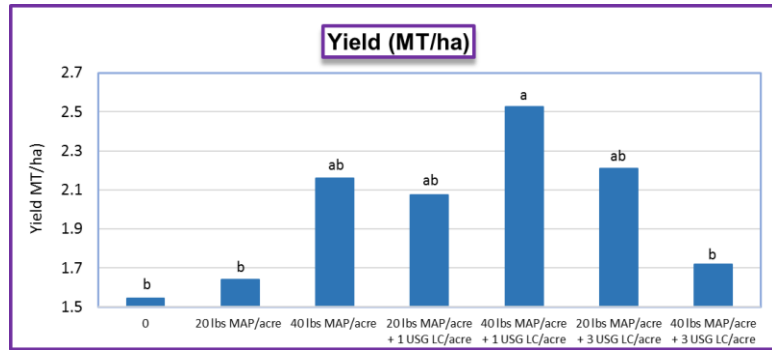
- **Objective:** To use organic matter (humic acids) to increase yield of lentil
- **Period:** May to September, 2016
- **Tested product:** CHI Liquid Carbon
- **Tested crop:** Lentils
- **Location:** Forreestburg, Alberta, CANADA
- **Background soil:** loam with solonetzic clay underneath, 6% organic matter, pH = 5.4, EC = 0.2 mS/cm, CEC = 9.33 meq/100 g; nutrients (all in lbs/acre): nitrate-N = 21, P = 32, K = 599, sulfate-S = 36, Cu = 1.4, Mn = 36.6, Zn = 12.0, B = 1.9, Fe = 467, and Cl = 4.
- **Test plot:** 6 x 20 ft<sup>2</sup> (1.8 x 6.0 m<sup>2</sup>)

### ■ DESIGN OF EXPERIMENTS

- Each plot was direct seeded in May 2016. Mono ammonium phosphate (MAP) was broadcasted during seeding. MAP contained 11-52-0 nutrients.
- CHI-Liquid Carbon (LC) was applied on seedlings, two weeks after seeding. LC contained 12% humic acids and 0-0-1.8 nutrients. This amount of potassium was compensated for each trial (including controls).
- Each trial was replicated 4 times. The design of experiment was as follows:
  - **Control 1:** None
  - **Control 2:** 20 lbs MAP/ acre
  - **Control 3:** 40 lbs MAP/acre
  - **Treated 1:** 20 lbs MAP/acre + 1 USG LC/acre
  - **Treated 2:** 40 lbs MAP/acre + 1 USG LC/acre
  - **Treated 3:** 20 lbs MAP/acre + 3 USG LC/acre
  - **Treated 4:** 40 lbs MAP/acre + 3 USG LC/acre
- Harvest was completed in Sep 2016, and yield for each plot was calculated in MT/ha. All data were analyzed using Minitab<sup>TM</sup> for means, standard deviations, and ANOVA (P = 0.05). Fisher's least significant difference ( $\alpha = 0.05$ ) was completed among all trials.

## RESULTS

The lowest yield (1.54 MT/ha) was recorded when no nutrients or humic acids was applied to soil. MAP at 20 and 40 lbs/acre increased yields by 6 and 40%, respectively. LC at 1 USG/acre improved yields by 26 and 17%, respectively over controls at the same MAP rates. LC at 3 USG/acre increased



yield by 34% over control at 20 lbs MAP/acre, but reduced it by 20% below control at 40 lbs MAP/acre. At 50% reduced nutrients, yields were maintained with the addition of humic acids, i.e. 2.16 MT/ha at 40 lbs MAP/acre, 2.07 MT/ha at 20 lbs MAP/acre + 1 USG LC/acre, and 2.21 MT/ha at 20 lbs MAP/acre + 3 USG LC/acre (all were statistically not different). These findings were consistent with those of other trials that humic acids performed best for soil with low nutrients and/or poor conditions. Too much nutrients and humic acids were not beneficial for the plant.

## CONCLUSIONS

Humic acids increased yields of lentil by up to 26% over control. The most benefits were observed for soil with low nutrients, in which humic acids maintained yields of lentil at 50% reduced MAP application. Optimum rates for CHI-Liquid Carbon were between 1 and 3 USG/acre. Too much nutrients and humic acids were not beneficial for the plant. This product was practical, economical, and compatible with most nutrients.