

## Meeting Corn Nutrient Needs with LysteGro Fertilizer

2015-2017 Georgian Central Soil & Crop  
Improvement Association Project



*From 2015-2017, Lystek International participated in a trial with the Georgian Central Soil and Crop Improvement Association (GCSCIA) to evaluate the effectiveness of LysteGro, in comparison to commercial fertilizer.*

### WHAT IS LYSTEGRO®?

Lystek utilizes its innovative technology to process biosolids and other organics to produce a high quality, pathogen free, CFIA-registered fertilizer product, LysteGro.

LysteGro has proven to be extremely popular due to the high concentrations of Nitrogen (N), Phosphorus (P) and Potassium (K) (6-8-2 on a dry weight basis OR 73-88-23 lbs/1,000 imperial gallons). Approximately 75% of the N is in organic forms, which will be slowly mineralized over time (40% of organic N mineralized in year 1, OMAFRA). LysteGro also contains a variety of other micro and macronutrients (Sulfur, Calcium, Magnesium, Zinc), as well as organic matter.

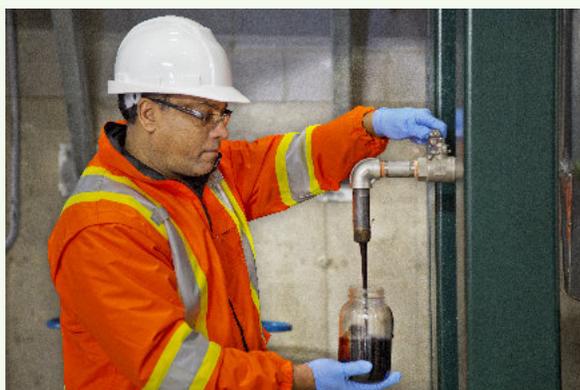


Figure 1. LysteGro® sampling

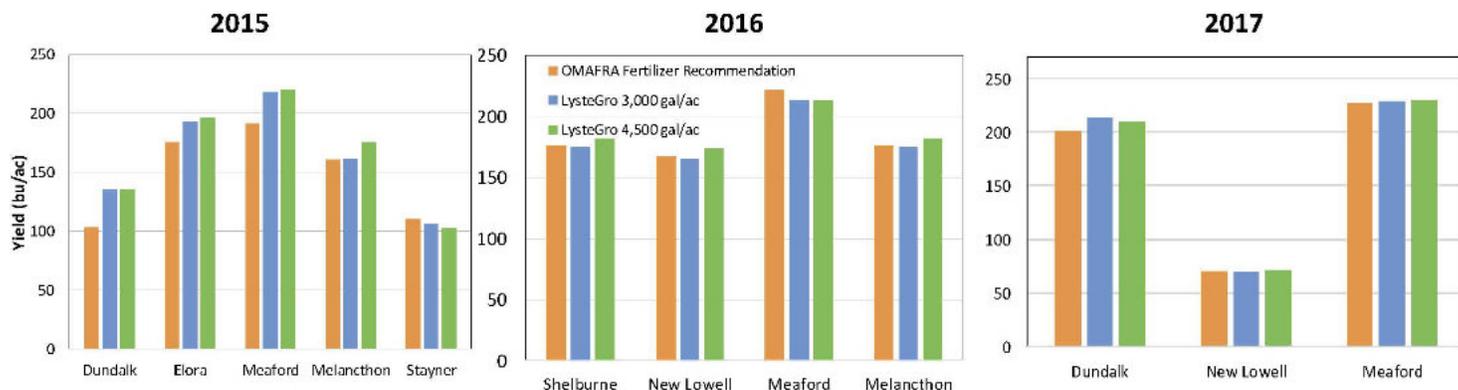
### THE TRIAL

The project evaluated yield, grain protein content and late season stalk nitrate content of corn fertilized with 2 rates of LysteGro fertilizer (3,000 and 4,500 imperial gallons/acre) injected pre-plant compared to commercial fertilizer. The trial was undertaken at 12 separate sites over the 3-year period in Wellington, Grey, Simcoe, and Dufferin counties. Each site had corn planted, and samples were taken throughout the year for soil N status and plant nutrients. Yield was measured using a weigh wagon for each replicate individually to determine a mean yield for each treatment at each site.

### RESULTS

In in both 2015 and 2016, with the exception of 1 site, stalk nitrate concentrations were highest in the 4,500 gal/ac LysteGro application rate, and lowest in the commercial fertilizer treatment. In 2017, both rates of LysteGro had adequate stalk nitrate levels at tasseling across all sites. According to Christine Brown (Ontario Ministry of Agriculture, Food and Rural Affairs – Field Crops Sustainability Specialist), “A stalk nitrate value under 200 ppm suggests more N may have helped the crop yield or that there was significant losses (i.e. denitrification from saturated soils) while a value over 2,000 ppm indicates more N was available at the end of the season compared to crop needs.”

In all years, grain protein was higher in LysteGro treatments than in commercial fertilizer treatments when averaged across all sites. The corn grain protein content and stalk nitrate tests clearly demonstrate that there was more nitrate available later in the year in the LysteGro treatments in comparison to the commercial fertilizer treatment. This is an indication that the organic N in LysteGro is providing a slow release source of N, later in the season when the crop requires it.



**Figure 2.** Yield data across 12 sites in Ontario from 2015-2017. Treatments were commercial fertilizer at OMAFRA recommended rates for 160 bu/ac corn (orange), LysteGro at 3,000 gallons/ac (blue) and LysteGro at 4,500 gallons/ac (green).

Overall, the results indicate that LysteGro at both application rates provided the nutrients required by the corn crop in all 3 years. LysteGro out-yielded the commercial fertilizer treatments by an average of 16.5 bushels/acre in 2015, 1 bushel/acre in 2016 and 4 bushels/acre in 2017. Field and weather conditions varied across the sites as evidenced by the wide range of yields. The 2015 and 2017 growing season was generally wet, with significant rainfall during the growing season, whereas 2016 was extremely dry, particularly in May and June during crop establishment. Nutrient loss and availability varies widely with soil moisture content, so the difference in precipitation may explain some of the variability in yield data between years.

## CONCLUSIONS

As Christine Brown discusses in her report on this project, “these results demonstrate that LysteGro can function as a commercial fertilizer replacement for corn in Western Ontario. The corn grain protein and stalk nitrate content results also indicate, as expected, that one likely reason for the success of LysteGro is the organic N component (75% of the N in LysteGro is in the organic form), which mineralizes and releases available inorganic forms of N throughout the growing season, when the crop actually needs it. Because the useable N is released later in the year, when corn has its largest demand for the nutrient, the crop benefits as the yield potential is less likely to be limited by N availability, as can be the case with crops fertilized with conventional fertilizer” Christine also concludes that “In addition to the positive effects of the organic N within LysteGro, these trials by proxy also demonstrate that LysteGro provides the full suite of nutrients required by a corn crop, while also adding valuable organic matter and micronutrients that commercial fertilizers typically do not contain.”



**Figure 3.** Harvesting plots in Wellington County Nov. 2017

## ACKNOWLEDGEMENTS

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If you have any questions related to the trial or the product, or you wish to see the full report for this project, please

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