

## Meeting Wheat Nutrient Needs with LysteGro® Fertilizer in Northern California



Since 2017, the University of California Cooperative Extension has been working on field trials to evaluate the effectiveness of LysteGro relative to commercial fertilizer for wheat production in Solano County, California.

### WHAT IS LYSTEGRO?

LysteGro® is a fertilizer produced by treatment of biosolids and organics through the patented LystekTHP® thermal hydrolysis system. LysteGro is a Class A biosolids, and a registered fertilizer with the California Department of Food and Agriculture (CDFA). The fertilizer contains valuable concentrations of Total Nitrogen (N) (50 lbs), Phosphorus (P) (50 lbs as P<sub>2</sub>O<sub>5</sub>), and Potassium (K) (35 lbs as K<sub>2</sub>O) per 1,000 US Gallons. LysteGro also contains a variety of other micronutrients (Calcium, Magnesium, Sulfur, Iron, and Zinc) as well as organic matter.

### 2017 - 2020

In 2018, the trial took place at a dryland site in the Montezuma Hills of Solano County on upland soils. The treatments in 2018 were: LysteGro at 1,750 and 2,750 US gal/acre (61 lbs and 96 lbs plant available N<sup>1</sup>/acre), anhydrous ammonia at 90 lbs N/acre and a control (starter fertilizer only).

Wheat yields were significantly higher in the LysteGro treatments than in the control. Mean yields of LysteGro treatments trended higher but were not significantly different from the anhydrous treatment. The anhydrous treatment was not significantly different from the control.

In 2019, the trial site was located on irrigated ground on valley soils near Dixon, California. The treatments were: LysteGro at 2,000, 2,500 and 3,000 US gal/acre (70, 88, 105 lbs PAN/acre), UAN at 120 lbs N/acre and an untreated control applied prior to seeding.

In 2019, the yield for the highest application rate of LysteGro (3,000 US gal/acre) was similar to the UAN treatment. All LysteGro treatments and the fertilizer treatment had significantly higher yields than the untreated control. Yields trended higher with increasing application rates of LysteGro but were not significantly different among those rates.

### RESULTS

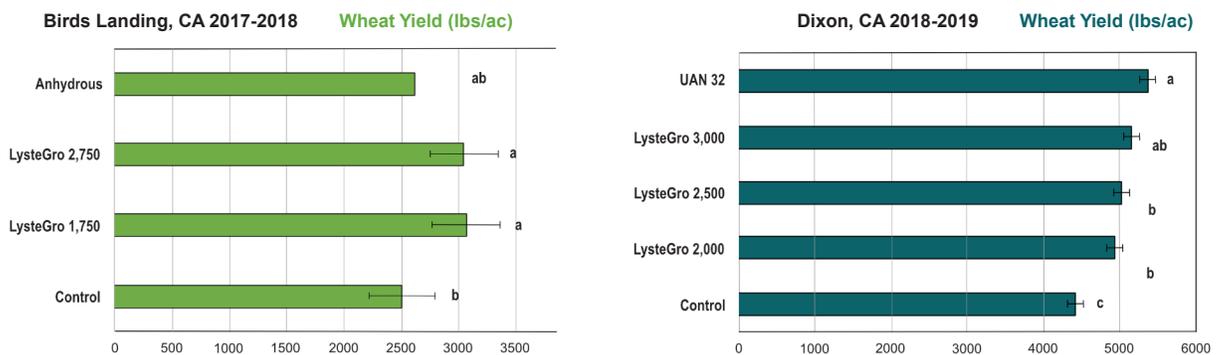


Figure 1. Wheat yield in 2018 harvest (left) and in 2019 harvest (right). Bars represent estimated marginal means of replicates (accounting for block effects). Error bars represent standard error (2017-2018 n=3, 2018-2019 n=4). Significant differences between treatments are indicated by different letters.

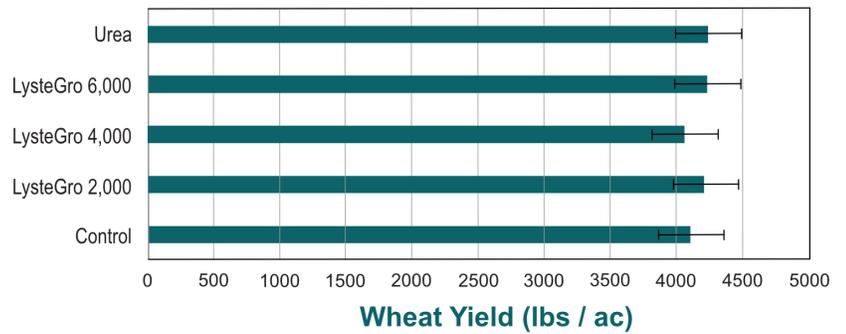
<sup>1</sup>Plant-available nitrogen is based on 40% mineralization rate.

The 3<sup>rd</sup> year trial, 2019-2020, suffered from severe drought stress on non-irrigated ground. Soil data was recovered, which will contribute to overall understanding of the mineralization behavior of these types of biosolids, but yields were not collected.

## Recent Results – 2020-2021

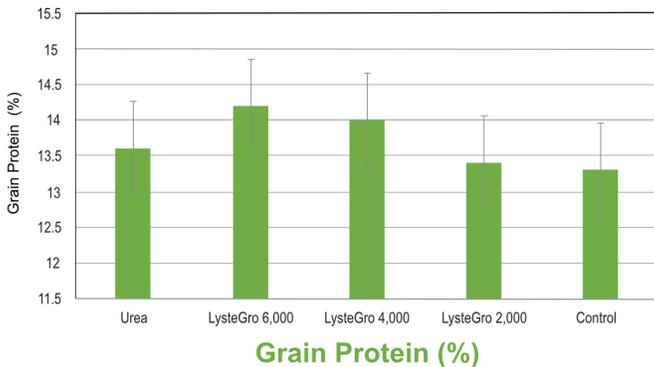
Plots were established in October 2020 at a non-irrigated site in the Montezuma Hills. The treatments were urea (130 lbs/ac N), LysteGro at 2,000 (73 lbs/ac N), 4,000 (146 lbs/ac N) and 6,000 (219 lbs/ac N) gal/ac, and an untreated control.

No significant difference was found in yield between any of the treatments. A lack of water may have been the yield limiting factor rather than nutrients, as it was a very dry year and the site was rainfed. Alternatively, the soil may have provided sufficient N from organic pools to make up for any N deficiencies in any of the treatments.



## Protein

Grain protein was significantly higher in the Lystek 4,000 and Lystek 6,000 treatments compared with any of the other treatments. This is notable because the amount of N applied to the Lystek 4,000 treatment was nearly the same as the amount applied as urea. It may have been the case that more nitrogen was available to the plant later in the season relative to the urea treatment.



Overall, wheat yields have been similar between LysteGro and synthetic fertilizers applied at similar rates of N per acre for each year of the trial. This demonstrates that LysteGro can be used as a replacement for synthetic fertilizers for wheat production in this region.

Lystek will continue to participate in the annual biosolids wheat trials in Solano County run by UCCE. There are additional benefits of applying LysteGro, such as providing micronutrients and organic matter to build soil biology and improve soil physical properties over time. Additional results will be included as they become available.



LysteGro Trial Application



Photo of wheat field before harvest (2019)

## ACKNOWLEDGMENTS

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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 contact:

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