Study Shows TerraNu Improves Nutrient Efficiency, Early Growth

SUMMARY: *Results from a 2016 study at the University of Wisconsin-Hancock Agricultural Research Station in Hancock, Wisconsin, show TerraNu fertilizers improve nitrogen-use efficiency, leading to early season plant height advantages and improved yield potential. The study also confirmed micronutrients in TerraNu fertilizers improve soil- and plant-tissue levels of micronutrients (B, Mn and Zn).*

Research from a 2016 study at the University of Wisconsin-Hancock Agricultural Research Station shows fertilizers blended with TerraNu products perform better or similarly to blends made with traditional fertilizer sources (10-20-20 starter, ESN®, 0-46-0 and 0-0-60).

Results show TerraNu-treated plots benefited from superior nitrogen-use efficiency and generated the highest recorded yield in the study (239 bu/ac), while also providing an early season height advantage over other treatments in the study.

Study Design & Treatments

The study compared TerraNu fertilizer blends to UW-Extension recommendations on irrigated sand in Hancock, Wisconsin. The design included four treatments, which were replicated across five blocks.

The study was overseen by The Jackson Lab and Dr. Gregg Sanford of the University of Wisconsin-Madison. Dr. Sanford, study director, is an expert in soil carbon cycling and sustainable agriculture.

Nutrient application rates were determined using soil assay results and UW-Extension recommendations for corn: 45 lbs/ac of phosphorus (P_2O_5), 200 lbs/ac of nitrogen (N) and 65 lbs/ac of potassium (K_2O).

TerraNu-treated plots received the majority of nutrients from fertilizer manufactured with TerraNu Nutrient Technology™. All remaining N and K needs were met using 10-20-20 as starter, ESN and 0-0-60. The UW-Extension treatment received all nutrients from 10-20-20 as starter, and a blend consisting of ESN, 0-46-0 and 0-0-60. Nutrient application rates are detailed in Table 1 below.

Better Nutrient Efficiency

While all treatments were initially designed to supply equivalent amounts of N, P and K, small differences in N, P and K application occurred due to variance in early TerraNu test products. Interestingly, the highest reported yield in the study (239 bu/ac) resulted from the TerraNu 2 treatment, which received seven pounds less N and P than the UW-Extension treatment.

This suggests that TerraNu fertilizers improve nutrient

Table 1: Nutrients Applied by Treatment

Treatment	N (lbs/ac)	P (lbs/ac)	K (lbs/ac)	B (lbs/ac)
TerraNu 1 (750 lbs/ac TerraNu)	193	78	73	3
TerraNu 2 (750 lbs/ac TerraNu)	193	78	73	3
TerraNu 3 (1,500 lbs/ac TerraNu)	200	85	80	2
UW-Ext. (no TerraNu)	200	85	65	0

Table 1: *Fertilizer was applied to research plots on May 2, 2016. All treatments were initially designed to supply equivalent amounts of N, P and K. However, small differences in N, P and K application occurred due to variance in early TerraNu test products.*

Table 2: Corn Grain Yield	
Treatment	**Yield (mean, bu/ac)**
TerraNu 1 (750 lbs/ac TerraNu)	221
TerraNu 2 (750 lbs/ac TerraNu)	239
TerraNu 3 (1,500 lbs/ac TerraNu)	210
UW-Ext. (no TerraNu)	238

Table 2: *TerraNu 2 treatment generated the highest yield in the study, despite receiving seven pounds less N and P.*

efficiency of applied nutrients, despite the slow-release nature of the product itself. Yield data from the study can be found in Table 2.

More Micronutrients

Tissue analysis also showed TerraNu application resulted in higher soil- and plant-tissue levels of micronutrients (B, Mn and Zn), a direct response from the micronutrients included in all TerraNu fertilizers.

Early Season Advantage

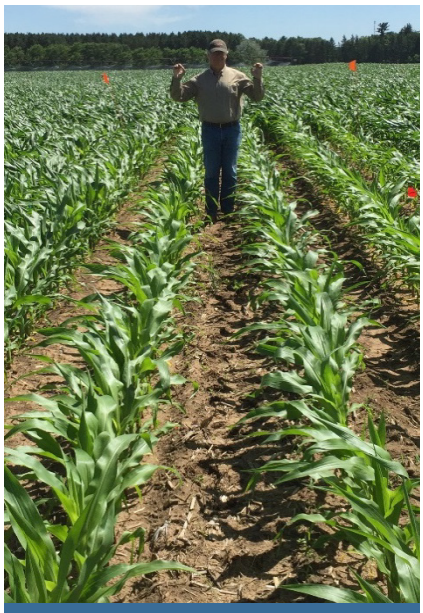
Plants were evaluated on June 20 for plant height and development stage. Compared to the UW-Extension treatment, all TerraNu treatments in the study were more advanced, with a greater number of plants at stage V6. Increasing early season growth in corn carries multiple benefits, including quicker canopy cover, less weed competition, reduced soil evaporation and improved yield potential.

Differences in plant response among treatments can be seen in Figure 1 below.

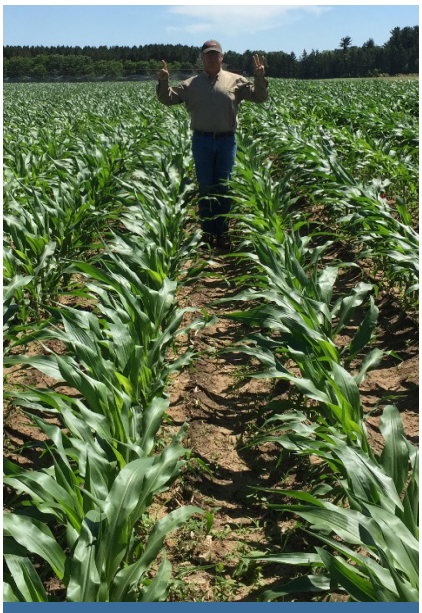
Future Projects

Research on TerraNu's impact on nutrient efficiency, plant uptake and crop yield will continue in 2017 at various sites across the Midwest. 2017 studies and farm trials will specifically evaluate the product's impact on plant response and soil capacity, as the added organic matter from the manure matrix in TerraNu fertilizers should significantly influence fertilizer performance in the field.

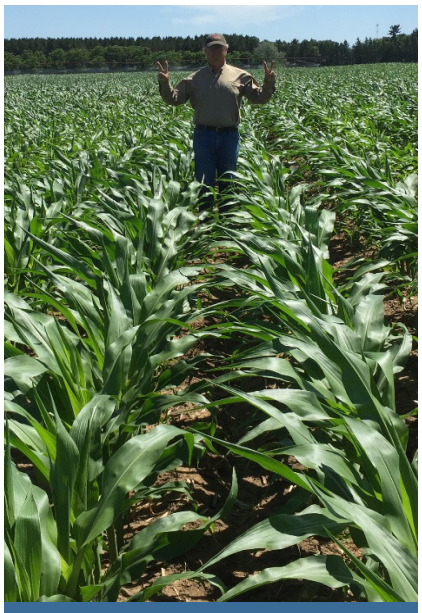
For more information on TerraNu fertilizers, product research and the TerraNu Nutrient Technology manufacturing process, go to www.MidwesternBioAg.com/TerraNu. ☐



10-20-20 Starter Only



UW-Ext. Recommendations



TerraNu Test Product

Figure 1: *Plant height measurements were taken on June 20, 2016. Early season height advantages were evident on all TerraNu-treated plots. Increasing early season growth can lead to many benefits, including quicker canopy cover, less weed competition, reduced soil evaporation and improved yield potential.*

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