2023 REPORT

EarthGen215 Bio Corn Trial

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Materials and Methods

Study Design

A trial was conducted to determine the impact of applications of EarthGen215 applied prior to planting to corn in comparison to a standard fertilizer program. The test was conducted on the Tidewater Research Station near Roper, NC on a Cape Fear silt loam. The test field was divided into 16 blocks with ½ of the field (8 of the 16 blocks or 10 acres) randomly selected to receive Earthgen215 applied at the recommended rate and the other ½ (remaining 8 of the 16 blocks or 10 acres) did not receive an application of Earthgen215. In making the Earthgen215 application the material was mixed with distilled water and allowed to set for 48 hrs prior to application. This liquid material was then applied to the surface of the treated field area using a conventional sprayer using flat fan nozzles spaced every 20 inches. In both the applied area of the field and the untreated check area 'Pioneer 1847 YHR' was planted at a seeding rate of 33 000 seeds acre^{-1} on 15 May.

Fertilizer Application:

In the area of the field where Earthgen215 was applied plots (10 by 40 ft) were planted without any fertilizer applied either at planting or at layby. In the area of the field where no Earthgen215 was applied plots (10 by 40 ft) were planted using starter fertilizer consisting of 10-27-0 + Zn at 10 gal acre^{-1} which was placed in a 3 x 2 x 2 band and 30% UAN was broadcast at planting at a rate of 15.6 gal acre^{-1}. On 26 June 30% UAN was applied to these plots at a rate of 56.2 gal acre^{-1}.

In both the treated and untreated plots acetachlor plus atrazine (2 qt acre^{-1}) was applied at planting and Steadfast Q (1.5 oz acre^{-1}), atrazine (1 qt acre^{-1}) and Status (2.5 oz acre^{-1}) were applied at V6. Excellent season-long weed control was noted as a result of these herbicide applications.

Measurements

The center two rows of each plot were harvested on 3 Oct. using a Kincaid 8XP Combine with a HarvestMaster^{tm} H2 high capacity grain gauge that recorded grain weight, moisture, and test weight.

Statistical Analysis

For each measurement (grain moisture; test weight; and yield) a statistical analysis was performed using the Proc Mixed split plot models procedure in SAS. When significant differences were determined at a probability level of 0.05 then comparisons were made among the individual treatments using individual contrast statements.

Results

Weather in 2023

Table 1 shows rainfall amounts for each period from early April through early August. The driest period of the season stretched from early May to mid-June. Over 4 inches of precipitation received during the first week of July which was critical in producing the yields that were recorded.

Table 1. Precipitation accumulated during different periods of the growing season at the field site near Roper in 2023.

Time Interval	Tidewater Research Station
April 1 – 15	1.89
April 16 – 30	2.82
May 1 - 15	0.34
May 16 - 31	1.85
June 1 - 15	0.78
June 16 - 30	3.1
July 1 - 15	4.33
July 16 - 31	1.89
Aug 1 – Aug 15	1.26

Impact of Treatments on Grain Moisture, Test Weight, and Yield

Yield results for the eight blocks where EarthGen215 was applied without added fertilizer and the eight blocks where only fertilizer was applied are shown in Table 2. Statistical analysis found significant differences between the EarthGen215 and fertilizer treatments for grain moisture and test weight but not for grain yield. EarthGen 215 treatments resulted in greater grain moisture at harvest but lower test weight. While not significant at the 95% probability the EarthGen215 treatment did produce slightly greater yield of 179.5 bu acre^{-1} compared to using fertilizer which yielded 173.3 bu acre^{-1} (Figure 1).

Economic Comparison Between Fertilizer and EarthGen215

A partial budget comparison between using EarthGen215 and a standard fertilizer program shows the impact of using a low rate of a biological material compared to a standard fertilizer program (Table 3). The biological program using EarthGen215 cost $143.75 less per acre. On this highly fertile soil with very high amounts of nutrients already in the soil the biological program produced more yield (6.2 bu acre^{-1}). The end result was a $173.51 increase in economic return.

Table 2. Grain moisture, test weight and yield measured in each block within the EarthGen215 and fertilizer treatments at the Tidewater Research Station.

	Tidewater Research Station		
Treatment	Moisture	Test weight	Yield
	%	Lbs bu^{-1}	Bu $acre^{-1}$
EarthGen215			
Block 1	18.1	55.1	169.2
Block 2	18.2	54.0	186.0
Block 3	17.5	55.3	173.2
Block 4	17.6	52.9	189.1
Block 5	16.8	54.8	174.7
Block 6	17.8	54.8	183.8
Block 7	17.3	55.0	174.8
Block 8	18.1	54.1	185.1
Average	17.7	54.5	179.5
Fertilizer			
Block 1	17.8	54.6	174.5
Block 2	17.5	55.1	172.4
Block 3	16.0	57.2	175.1
Block 4	16.1	57.4	161.3
Block 5	15.6	58.0	172.2
Block 6	16.9	58.0	179.0
Block 7	15.7	57.3	172.3
Block 8	17.1	57.5	179.3
Average	16.6	56.9	173.3

Summary

1. On soils with high levels of soil fertility the use of the biological treatment (EarthGen215) produced similar corn yield compared to a standard fertilizer program with lower input cost. This resulted in a large economic advantage. Future testing should be done to determine if the use of the biological treatment over time will be able to maintain soil fertility levels when used without added fertilizer.

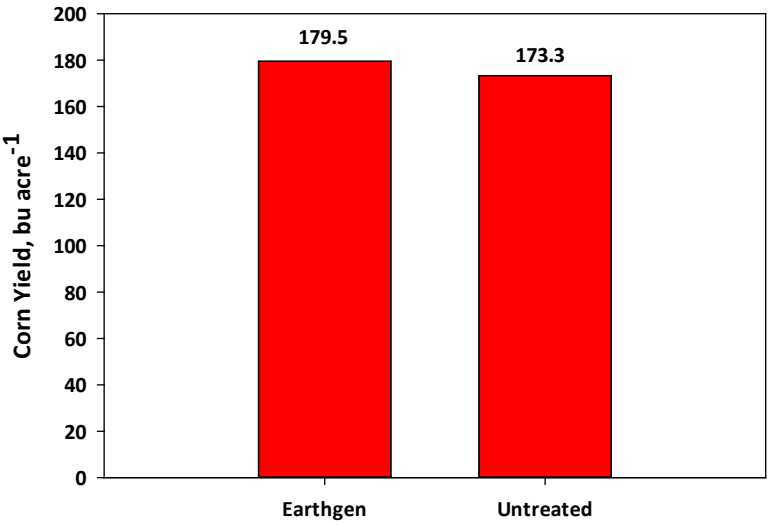

Figure 1. Comparison of corn yield between unfertilized plots where Earthgen215 was applied and fertilized plots where no EarthGen215 was applied.

Table 3. Partial budget comparing costs, yield and economic return from the use of the biological treatment EarthGen215 with the use of a standard fertilizer program on a highly fertile soil.

Partial Budget					
Treatment	Amount applied	Treat Cost	Grain Yield	Grain Price	Return To Treatment
		$ acre^{-1}	Bu acre^{-1}	$ bu^{-1}	$ acre^{-1}
EarthGen215		$40.00	179.5	$4.80	$821.60
Fertilizer					
10-27-0	10 gal acre^{-1}	$39.00			
Plant: 30% UAN	15.6 gal acre^{-1}	$31.45			
Layby: 30% UAN	56.2 gal acre^{-1}	$113.30			
Fertilizer Total		$183.75	173.3	$4.80	$648.09
Difference		$143.75	6.2		$173.51