SECTION 1. INTRODUCTION & VERIFICATION

1.1 **Product Claim**

PrimAgro C-Tech facilitates nutrients to the plant to improve crop yield.

Proposed Mode of Action

Literature has mentioned the synergistic effects of Fulvic acid and Plant growth-promoting bacteria and their impact on crop yield.

Fulvic acid has a small molecule size capable of passing through micropores of biological membranes[1], as a result, it can displace metal ions as chelated species facilitating the uptake of these nutrients and increasing the yield of crops[2,3,4,5].

Plant growth-promoting bacteria or microbial inoculants increase the supply of nutrients by increasing root biomass and increasing the nutrient uptake capacity of the plant[6].

The outcome of the interaction of Fulvic acid and microbial inoculants is observed in improved efficacy of the plant metabolism to induce yield increases and enhanced crop quality[6].

PrimAgro C-Tech combines beneficial microbes and Fulvic acid with AgroLiquid's proprietary formulation technology to stimulate root growth and uptake of minerals resulting in an improved yield.

PrimAgro C-Tech may be applied by itself or combined with a variety of other fertilizer products. Flexible application methods make this product easy to apply without requiring extra time or energy.

Literature References

1.Calvo, P., Nelson, L., Kloepper, J.W. "**Agricultural uses of plant biostimulants**", *Plant Soil* 383, **(2014)**, 3-41.

2. Lv, D., Sun, H., Zhang, M., Li, Ch., "**Fulvic Acid Fertilizer Improves Garlic Yield and Soil Nutrient Status**". G*esunde Pflanzen* **(2022)**, 74, 685–693.

3. da Silva M., dos Santos B., da Silva, C., da Silva C., Antunes L., dos Santos R., Santos C., Rigobello E. " **Humic Substances in Combination with Plant Growth-Promoting Bacteria as an Alternative for Sustainable Agriculture**". *Frontiers in Microbiology **(2021)***, 12, 1-14.

4. Zhang, P., Zhang, H., Wu, G., Chen, X., Gruda, N., Li, X., Dong, J., Duan, Z. "**Dose-Dependent Application of Straw-Derived Fulvic Acid on Yield and Quality of Tomato Plants Grown in a Greenhouse**". *Frontiers in Plant Science* **(2021)**, 12, 1-12.

5..Zhao, X., Zhuo, D., Tan, J., Wang, R., Qi, G. "**Cooperative Action of Fulvic Acid and *Bacillus paralicheniformis* Ferment in Regulating Soil Microbiota and Improving Soil Fertility and Plant Resistance to Bacteria Wilt Disease**" *Microbiology Spectrum* **(2023)**, 11:2, 1-22

6. Kilic, N. "**Synergistic Effect of Organic and Biofertilizers on Strawberry Cultivation**", *Sustainability* **(2023)**, 15, 8206, 1-11.

Product Benefits

- Restores beneficial soil bacteria.
- Promotes retention of plant-usable nutrients in the soil
- Improves the soil nutrient profile
- Improves crop yield.

Target crop(s) for product use:

PrimAgro C-Tech may be applied to any growing crop or active soil to promote microbial activity, and plant and soil health.

Target geographic location(s) to use this product:

PrimAgro C-Tech has been tested in different crop soils located in:

Michigan (Hart, Unionville, Saint Johns), California (Santa Maria), Ontario (Tillsonburg), New York (Watertown), Maryland (Quantico and Upperco), and Kansas (Halstead and Sedgwick). It is intended for all US states and Canadian provinces where it is labeled.

If the product is for a target environment or stressor, please identify climatic or soil conditions for this product:

- Any type of climate and any type of soils

1.2 Verification Method:

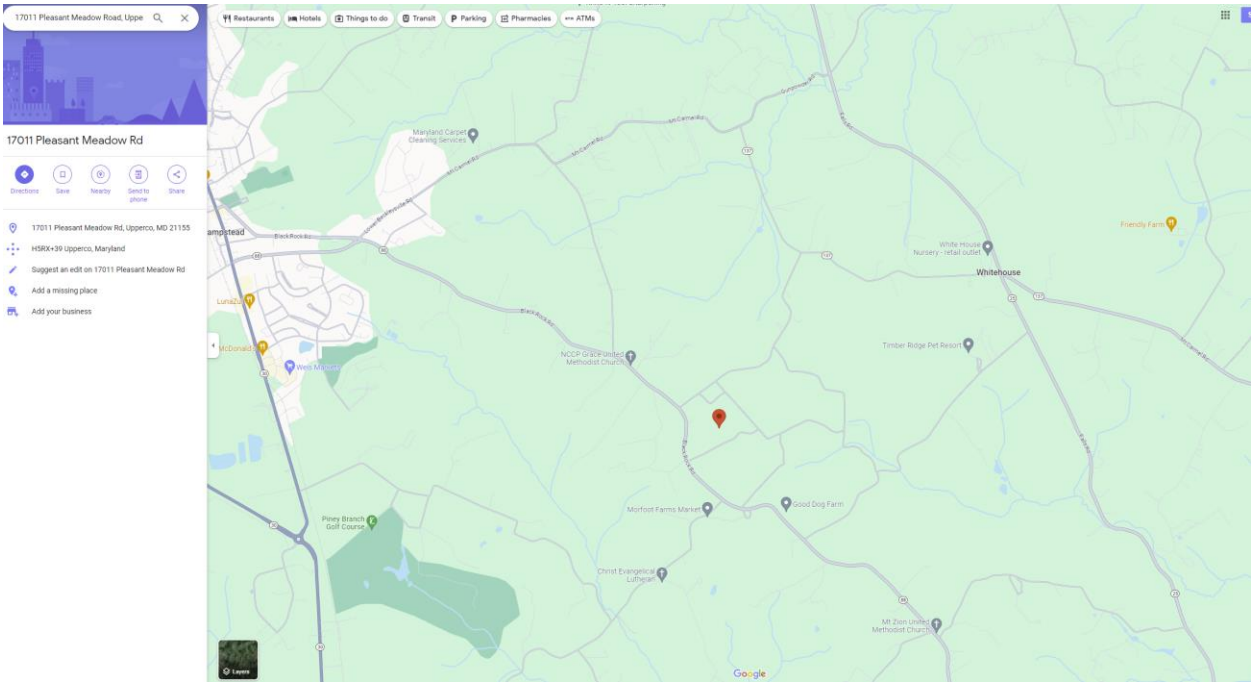
Original Research with Internal/in-house research

SECTION 2. MATERIALS & METHODS

2.1 Description of the Study Areas

2.1.1 Trials and Locations

The product was tested over two site years at one location. The trials were conducted at Gunpowder Game Farm by Mulford Agronomics near Upperco, MD. The trial type was field trials. The location is one, with 2 years of 4 replicates per treatment. This means 2 site years with 4 reps on each treatment.



2.1.2 Climatic Information

Table 1 Climatic normals and weather conditions for locations and site-years

	Min Temp °F	**Max Temp °F**	**Precipitation in.**	**Growing Degree Days GDD**
15-year climate normal				
Site 1	26	88	21.92	2543
Trial Weather information				
Location 1	41	88	23	3062

Historically, Upperco MD has an average High Temperature of 88 °F, with a record of 97°F and a low temperature of 26 °F.

Section 2.1.3 Soils Information

Table 2. Soil Type, Taxonomy and Texture for trials

Site-year	**Soil Type**	**Taxonomic class**	**Soil texture**
Site year1/Study 1	Glenelg	Fine-loamy, mixed, semiactive, mesic Typic Hapludults	Silt loam topsoil

Site year 2 /Study 2 is the same as Site year 1/Study 1

Table 3, Soil chemical properties for all site-years/trials. Include mean and standard deviation

Site-year	P	K	OM	pH	CEC	Other elemental analysis
Site-year/Study 1	84	168	3.5	6.9	7.2	11S, 13.9Mg, 78.5 Ca, 3.4 Zn, 158 Mn 0.4 B

The Glenelg series consists of very deep, well-drained soils formed in residuum weathered from micaceous schist. Slopes range from 0 to 55 percent. Saturated hydraulic conductivity is moderately high in the subsoil and moderately high to high in the substratum. The Taxonomic class is Fine-loamy, mixed, semiactive, mesic Typic Hapludults

2.1.5 Cropping System

The trial area is maintained in a no-till corn-soybean rotation. For clarification, the 2018 field plot area had soybeans growing on it in 2017. No irrigation was applied to the trials.

2.2 Experimental Design

2.2.1 Study Design

The trials were conducted using a Randomized Complete Block Design with four replicates per treatment. Each treatment consisted of a 15-ft wide by 30-ft long plot per replicate.

To discover the proper application and the correct rate of C-Tech, an experiment consisting of 10 treatments was conducted in 2018. The rate of C-Tech applied was 0.25 and 0.5 gal/A and the treatments were Side Dress and In-Furrow as it is shown in Table 4. The corn variety used was: Dekalb DKC64-35 RIB. The target population at harvest was 32,000. The corn was planted with a John Deere 6-Row Planter with Finger pick-up units. All treatments except #10 received the same planter fertilizer application consistent in the following blend of Agroliquid products: PrimAgro P 6 gal/A+ Kalibrate 4 gal/A+ Micro 500 2 qt/A. All the treatments received eN-30 (30% UAN + eNhance at 2.25 gal/ton N) at 72 gal/A (20 gal PRE, 52 gal Side Dress). The Side dress application was V5-V6. The Nitrogen rate applied was 234 lb/A based on a 200 bu/A yield goal. The corn was planted on May 17, 2018, and harvested on October 24, 2018, with a Gleaner K2 Combine equipped w/Harvest Master Grain Scale.

In 2019, an experiment was conducted to evaluate the performance of PrimAgro P at three use rates compared to competitive phosphorous products and also evaluate the performance of C-Tech in combination with PrimAgro P. Each treatment received 200 lb of nitrogen. Treatments 2 – 7 received various combinations of PrimAgro P, PrimAgro K, Micro 500, MicroLink Boron, MicroLink Iron, and C-Tech. C-Tech was applied at a rate of 0.25 and 0.5 gal/A. Treatments 8 – 10 received one of three competitive fertilizer products for comparison. The trial was planted on May 9, 2019, and harvested on October 15, 2019. The planting and harvesting methods were the same as those used in the 2018 trial.

2.2.2 Controls

Site year 1/Study 1:

Controls used: Treatment 1 in Table 4

Yield is the response variable.

Site year 2/Study 2:

No positive controls were used from the Biological standpoint

Controls used: Treatment 4 (for T7) and Treatment 3 (for T5 and T6) in Table 5

Yield is the response variable

2.3 Statistical Analysis

The data in Tables 4 and 5 were organized by treatment group and were compared with one-way repeated-measures ANOVA with Tukey's comparison or multiple t-test comparison for ANOVA with datasets that satisfied normality criteria. Values are presented as means ± SE. Significance was determined when $P<0.05$.

ANOVA within and between treatments was evaluating treatments, analyzing factors that impact the response variable, and for comparison of the means across multiple treatments.

SECTION 3. RESULTS & DISCUSSION

3.1 Description of the Dataset

a) Table 4. Description of the Treatments, and yields for the experiment conducted in 2018.

					Corn Yield bu/a			
Treatment				Rep 1	Rep 2	Rep 3	Rep 4	Ave.
	Product	**Gal/acre**	**Placement**					
1	PrimAgro P	6	In-Furrow					
	PrimAgro K	4	In-Furrow					
	Micro 500	0.5	In-Furrow					
	eN30	20	b'cast PRE					
	eN30	52	Side Dress					
				230.4	**225.6**	**227.5**	**231.2**	**228.7**
2	PrimAgro P	6	In-Furrow					
	PrimAgro K	4	In-Furrow					
	Micro 500	0.5	In-Furrow					
	MicroLink Boron	0.125	In-Furrow					
	eN30	20	b'cast PRE					
	eN30	52	Side Dress					
				217.7	**225.4**	**223.6**	**220.3**	**221.8**
3	PrimAgro P	6	In-Furrow					
	PrimAgro K	4	In-Furrow					
	Micro 500	0.5	In-Furrow					
	MicroLink Boron	0.25	In-Furrow					
	eN30	20	b'cast PRE					
	eN30	52	Side Dress					
				202.7	**222.7**	**214.2**	**209.7**	**212.3**
4	PrimAgro P	6	In-Furrow					
	PrimAgro K	4	In-Furrow					
	Micro 500	0.5	In-Furrow					
	MicroLink Boron	0.125	Side Dress					
	eN30	20	b'cast PRE					
	eN30	52	Side Dress					
				224.7	**233.2**	**231.6**	**225.7**	**228.8**
5	PrimAgro P	6	In-Furrow					
	PrimAgro K	4	In-Furrow					
	Micro 500	0.5	In-Furrow					
	MicroLink Boron	0.25	Side Dress					
	eN30	20	b'cast PRE					
	eN30	52	Side Dress					
				223.8	**225.1**	**226.7**	**217.6**	**223.3**

6	PrimAgro P	6	In-Furrow					
	PrimAgro K	4	In-Furrow					
	Micro 500	0.5	In-Furrow					
	C-Tech	0.25	In-Furrow					
	eN30	20	b'cast PRE					
	eN30	52	Side Dress					
				235.9	**228.1**	**236.8**	**230**	**232.7**
7	PrimAgro P	6	In-Furrow					
	PrimAgro K	4	In-Furrow					
	Micro 500	0.5	In-Furrow					
	C-Tech	0.5	In-Furrow					
	eN30	20	b'cast PRE					
	eN30	52	Side Dress					
				228.2	**219.9**	**226.6**	**223.9**	**224.7**
8	PrimAgro P	6	In-Furrow					
	PrimAgro K	4	In-Furrow					
	Micro 500	0.5	In-Furrow					
	C-Tech	0.25	Side Dress					
	eN30	20	b'cast PRE					
	eN30	52	Side Dress					
				210.6	**225.6**	**214.8**	**222.5**	**218.4**
9	PrimAgro P	6	In-Furrow					
	PrimAgro K	4	In-Furrow					
	Micro 500	0.5	In-Furrow					
	C-Tech	0.5	Side Dress					
	eN30	20	b'cast PRE					
	eN30	52	Side Dress					
		Yields		**222.7**	**220.9**	**218.7**	**224.8**	**221.8**
10	(No Planter Fertilizer)							
	eN30	20	b'cast PRE					
	eN30	52	Side Dress					
				198.2	**200.3**	**195.8**	**202.9**	**199.3**

b) Experiment conducted in 2019

Table 5. Description of the Treatments, and yields for the experiment conducted in 2019.

					Corn Yield bu/a		
Treatment				Rep 1	Rep 2	Rep 3	Rep 4
	Product	**Gal/acre**	**Placement**				
1	eN30	20	b'cast PRE				
	eN30	52	Side Dress				
				248.1	**240.7**	**244.5**	**255.2**
2	PrimAgro P	1.5	In-Furrow				
	PrimAgro K	3	In-Furrow				
	Micro 500	0.5	In-Furrow				
	MicroLink Boron	0.03125	In-Furrow				
	Iron	0.25	In-Furrow				
				235.3	**290.6**	**235.4**	**249.2**
3	PrimAgro P	2.5	In-Furrow				
	PrimAgro K	3	In-Furrow				
	Micro 500	0.5	In-Furrow				
	MicroLink Boron	0.03125	In-Furrow				
	Iron	0.25	In-Furrow				
				252.5	**286.6**	**233.3**	**271.6**
4	PrimAgro P	5	In-Furrow				
	PrimAgro K	3	In-Furrow				
	Micro 500	0.5	In-Furrow				
	MicroLink Boron	0.03125	In-Furrow				
	Iron	0.25	In-Furrow				
				230	**242.7**	**228.7**	**235.3**
5	PrimAgro P	2.5	In-Furrow				
	PrimAgro K	3	In-Furrow				
	Micro 500	0.5	In-Furrow				
	MicroLink Boron	0.03125	In-Furrow				
	Iron	0.25	In-Furrow				
	C-Tech	0.5	In-Furrow				
				262.4	**277**	**260**	**272.4**
6	PrimAgro P	2.5	In-Furrow				
	PrimAgro K	3	In-Furrow				
	Micro 500	0.5	In-Furrow				
	MicroLink Boron	0.03125	In-Furrow				
	Iron	0.25	In-Furrow				
	C-Tech	0.25	In-Furrow				
				263.6	**250.6**	**256.7**	**259.8**

7	PrimAgro P	5	In-Furrow				
	PrimAgro K	3	In-Furrow				
	Micro 500	0.5	In-Furrow				
	MicroLink Boron	0.03125	b'cast PRE				
	Iron	0.25	Side Dress				
	C-Tech	0.25	In-Furrow				
				233.5	**248**	**233.3**	**244.2**
8	Monty's	5	In-Furrow				
				258	**254.3**	**245.6**	**255.1**
9	Helena	5	In-Furrow				
				256.6	**244**	**237.3**	**250.8**
10	Willard	**5**	In-Furrow				
				262.6	**269.8**	**254.4**	**260.1**

3.2 Statistical Testing Results

For the treatments in 2018:
A one-way between-treatment subjects ANOVA was conducted to compare the effect of PrimAgro C-Tech on yield in corn at different rates and placement. Data was organized into 10 treatment groups from Table 4 where T1 = PrimAgro P + PrimAgro K + Micro 500 + eNhance, T2= PrimAgro P + PrimAgro K + Micro500 + Microlink Boron + eNhance, T3= PrimAgro P + PrimAgro K + Micro500 + MicroLink Boron + eNhance, T4= PrimAgro P+ PrimAgro K+Micro 500 + Microlink Boron+ eNhance, T5= PrimAgro P + PrimAgro K + Micro 500 + Microlink Boron + eNhance, T6= PrimAgro P+ PrimAgro K+ Micro500 + C-Tech + eNhance, T7= PrimAgro P + PrimAgro K + Micro 500 + C-Tech + eNhance, T8= PrimAgro P + PrimAgro K + Micro 500+ C-tech + eNhance, T9= PrimAgro P + PrimAgro K+ Micro 500 + C-Tech + eNhance, T10 = No Planter fertilizer, just eNhance.

The findings show a significant effect of C-Tech applied in addition to other planter fertilizers on yield crop at the $p<0.05$ level for the 10 conditions [$F(9,30)= 16.94$, $p=1.75E-09$].
Post hoc comparisons using the Tukey HSD test (Table 10) indicated that the mean score for C-Tech In-furrow T6 (M=232.7, SD=4.30) and T7 (M=224.64, SD=3.62) or side Dress T8 (M=218.37, SD=6.89) and T9 (M=221.77, SD=2.59) was significantly different than the T10, which did not include any planter fertilizer (M=199.3, SD=3.023). T10 did not include PrimAgro P, PrimAgro K, or Micro 500 applications which were included in all C-Tech Treatments. However, corn yields of the control, T1, (M=228.67, 2.59) which included PrimAgroP, PrimAgroK, and Micro 500 planter fertilizer, but no C-Tech product, did not significantly differ from corn yields with the C-Tech Application In-Furrow or Side Dress.
Taken together, these results suggest that planter fertilizer application does affect corn yield.

Though it was not significantly different, there was a 6 bushel increase when using C-Tech in-furrow at a rate of 0.25 gal/A (T6) when compared to the check without C-Tech (T1). All other applications of C-Tech when compared to the check (T1) reduced yield, but not significantly ($p < 0.05$). This indicates an application of C-Tech at a rate of 0.25 gal/A in-furrow provided the

greatest opportunity for yield increase in 2018. These results were very useful in establishing the experimentation for 2019.

For the treatments in 2019:
A one-way between-subjects ANOVA (Table 13) was conducted to compare the effect of PrimAgro C-Tech In-Furrow on yield in corn at different rates and placement. There was a significant effect of C-Tech applied with other planter fertilizers on yield crop at the $p<0.05$ level for the 10 conditions [$F(9,30)= 2.72$, $p=0.01874$].
All treatments with C-Tech also included PrimAgro P, PrimAgroK, Mirco 500, MicroLink Boron, and Iron. Post hoc comparisons using the Tukey HSD test (Table 15) indicated that the mean score for C-Tech In-furrow T5(M=267.95, SD=8.07) was significantly different than T4 (M=228.8, SD=4.22). T4 did not include C-Tech, and PrimAgro P was applied at a higher rate of 5 gal/A. The use of C-Tech (T5) compared to the check (T3) was not significantly different.
Our results suggest that C-Tech applied In-Furrow at a rate of 0.5 gal/A (T5) or 0.25 gal/A (T6) in combination with PrimAgro P at 2.5 gal/A led to the highest corn yields though neither were significantly different than the control T3. T5 and T6 both resulted in a 10 and 11 bushel increase respectively in comparison to the control (T3), though this was not significant

SECTION 4. TABLES & FIGURES

Kolgomorov-Smirnov and Shapiro-Wilk tables are added for both series of experiments to demonstrate normality in the data. Tables 6 and 7.

Table 6. Test of Normality for 2018 Treatments

Test of Normality

	Kolgomorov-Smirnov(a)			Shapiro-Wilk		
treatment	statistic	df	Sig.	Statistic	df	Sig
1	0.1615	4	0.5269	0.9307	4	0.8136
2	0.2053	4	0.7983	0.9691	4	0.9909
3	0.1615	4	0.9708	0.9977	4	1
4	0.2683	4	0.3922	0.8702	4	0.41
5	0.3	4	0.2304	0.881	4	0.4718
6	0.2716	4	0.3732	0.8748	4	0.436
7	0.2044	4	0.8032	0.9588	4	0.9674
8	0.2253	4	0.6724	0.9445	4	0.904
9	0.1392	4	0.9967	0.9983	4	1
10	0.142	4	0.9951	0.998	4	1

(a) Lilliefors Significance Correction

Table 7. Test of Normality for 2019 Treatments

Test of Normality

	Kolgomorov-Smirnov(a)			Shapiro-Wilk		
treatment	statistic	df	Sig.	Statistic	df	Sig
1	0.1873	4	0.8897	0.9769	4	0.998
2	0.3021	4	0.2215	0.7926	4	0.142
3	0.1752	4	0.9352	0.9876	4	1
4	0.2442	4	0.545	0.9102	4	0.6691
5	0.254	4	0.4809	0.9119	4	0.6816
6	0.1796	4	0.9201	0.9861	4	0.9999
7	0.2978	4	0.2396	0.2396	4	0.272
8	0.3279	4	0.1344	0.8751	4	0.4374
9	0.1678	4	0.956	0.9899	4	1
10	0.1955	4	0.8512	0.99	4	1

(a) Lilliefors Significance Correction

Table 8. ANOVA results for 2018 data:

T1 = PrimAgro P + PrimAgro K + Micro 500 + eNhance, T2= PrimAgro P + PrimAgro K + Micro500 + Microlink Boron + eNhance, T3= PrimAgro P + PrimAgro K + Micro500 + MicroLink Boron + eNhance, T4= PrimAgro P+ PrimAgro K+Micro 500 + Microlink Boron+ eNhance, T5= PrimAgro P + PrimAgro K + Micro 500 + Microlink Boron + eNhance, T6= PrimAgro P+ PrimAgro K+ Micro500 + C-Tech + eNhance, T7= PrimAgro P + PrimAgro K + Micro 500 + C-Tech + eNhance, T8= PrimAgro P + PrimAgro K + Micro 500+ C-tech + eNhance, T9= PrimAgro P + PrimAgro K+ Micro 500 + C-Tech + eNhance, T10 = No Planter fertilizer, just eNhance.

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	3316.701	9	368.5223	16.94589	1.75E-09	2.210697
Within Groups	652.41	30	21.747			
Total	3969.111	39				

Table 9. Mean and Standard deviation of the treatments applied in 2018

	treatment									
	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10
Mean	228.675	221.75	212.325	228.8	223.3	232.7	224.65	218.375	221.775	199.6
SD	2.59406	3.42783	8.38028	4.22769	3.98079	4.30116	3.62997	6.89076	2.59663	3.02324

Table 10. Tukey HSD/Tukey Kramer for treatments applied in 2018. In green is shown C-Tech treatment vs appropriate control.

Tukey HSD / Tukey Kramer

Pair	Difference	SE	Q	Lower CI	Upper CI	Critical Mean	p-value
x1-x2	6.925	2.3317	2.97	-4.3234	18.1734	11.2484	0.5413
x1-x3	16.35	2.3317	7.0121	5.1016	27.5984	11.2484	0.0009474
x1-x4	0.125	2.3317	0.05361	-11.1234	11.3734	11.2484	1
x1-x5	5.375	2.3317	2.3052	-5.8734	16.6234	11.2484	0.8233
x1-x6	4.025	2.3317	1.7262	-7.2234	15.2734	11.2484	0.963
x1-x7	4.025	2.3317	1.7262	-7.2234	15.2734	11.2484	0.963
x1-x8	10.3	2.3317	4.4174	-0.9484	21.5484	11.2484	0.09463
x1-x9	6.9	2.3317	2.9592	-4.3484	18.1484	11.2484	0.5461
x1-x10	29.375	2.3317	12.5982	18.1266	40.6234	11.2484	2.65E-08
x2-x3	9.425	2.3317	4.0421	-1.8234	20.6734	11.2484	0.1625
x2-x4	7.05	2.3317	3.0236	-4.1984	18.2984	11.2484	0.5171
x2-x5	1.55	2.3317	0.6648	-9.6984	12.7984	11.2484	1
x2-x6	10.95	2.3317	4.6962	-0.2984	22.1984	11.2484	0.06143
x2-x7	2.9	2.3317	1.2437	-8.3484	14.1484	11.2484	0.996
x2-x8	3.375	2.3317	1.4475	-7.8734	14.6234	11.2484	0.9883
x2-x9	0.025	2.3317	0.01072	-11.2234	11.2734	11.2484	1
x2-x10	22.45	2.3317	9.6282	11.2016	33.6984	11.2484	6.036E-06
x3-x4	16.475	2.3317	7.0657	5.2266	27.7234	11.2484	0.0008546
x3-x5	10.975	2.3317	4.7069	-0.2734	22.2234	11.2484	0.06039
x3-x6	20.375	2.3317	8.7383	9.1266	31.6234	11.2484	0.00003337
x3-x7	12.325	2.3317	5.2859	1.0766	23.5734	11.2484	0.02302
x3-x8	6.05	2.3317	2.5947	-5.1984	17.2984	11.2484	0.7093
x3-x9	9.45	2.3317	4.0529	-1.7984	20.6984	11.2484	0.1602
x3-x10	13.025	2.3317	5.5861	1.7766	24.2734	11.2484	0.01358
x4-x5	5.5	2.3317	2.3588	-5.7484	16.7484	11.2484	0.804
x4-x6	3.9	2.3317	1.6726	-7.3484	15.1484	11.2484	0.9696
x4-x7	4.15	2.3317	1.7798	-7.0984	15.3984	11.2484	0.9554
x4-x8	10.425	2.3317	4.471	-0.8234	21.6734	11.2484	0.08724
x4-x9	7.025	2.3317	3.0128	-4.2234	18.2734	11.2484	0.5219
x4-x10	29.5	2.3317	12.6518	18.2516	40.7484	11.2484	2.42E-08
x5-x6	9.4	2.3317	4.0314	-1.8484	20.6484	11.2484	0.1649
x5-x7	1.35	2.3317	0.579	-9.8984	12.5984	11.2484	1
x5-x8	4.925	2.3317	2.1122	-6.3234	16.1734	11.2484	0.8843

x5-x9	1.525	2.3317	0.654	-9.7234	12.7734	11.2484	1
x5-x10	24	2.3317	10.293	12.7516	35.2484	11.2484	1.718E-06
x6-x7	8.05	2.3317	3.4524	-3.1984	19.2984	11.2484	0.3385
x6-x8	14.325	2.3317	6.1436	3.0766	25.5734	11.2484	0.004912
x6-x9	10.925	2.3317	4.6855	-0.3234	22.1734	11.2484	0.06248
x6-x10	33.4	2.3317	14.3244	22.1516	44.6484	11.2484	1.45E-09
x7-x8	6.275	2.3317	2.6912	-4.9734	17.5234	11.2484	0.6672
x7-x9	2.875	2.3317	1.233	-8.3734	14.1234	11.2484	0.9963
x7-x10	25.35	2.3317	10.872	14.1016	36.5984	11.2484	5.85E-07
x8-x9	3.4	2.3317	1.4582	-7.8484	14.6484	11.2484	0.9877
x8-x10	19.075	2.3317	8.1808	7.8266	30.3234	11.2484	0.00009838
x9-x10	22.475	2.3317	9.639	11.2266	33.7234	11.2484	5.914E-06

Treatments that show a significant difference

x1-x3, x1-x10, x2-x10, x3-x4, x3-x6, x3-x7, x3-x10, x4-x10, x5-x10, x6-x8, x6-x10, x7-x10, x8-x10, x9-x10.

Treatment 10 shows an interesting comparison because it is significantly different but does not show any significant effects of the biostimulant.

Tables 11 and 12. t-Test results

T10:T6			T10:T7		
	Variable 1	*Variable 2*		*Variable 1*	*Variable 2*
Mean	199.3	232.7	Mean	199.3	224.65
Observations	4	4	Observations	4	4
Hypothesized Mean Difference	0		Hypothesized Mean Difference	0	
df	5		df	6	
t Stat	-12.706		t Stat	-10.73231216	
P(T<=t) one-tail	2.68E-05		P(T<=t) one-tail	1.9328E-05	
t Critical one-tail	2.015048		t Critical one-tail	1.943180281	
P(T<=t) two-tail	5.37E-05		P(T<=t) two-tail	3.8656E-05	

T10:T8			T10:T9		
	Variable 1	*Variable 2*		*Variable 1*	*Variable 2*
Mean	199.3	218.375	Mean	199.3	221.775
Observations	4	4	Observations	4	4
Hypothesized Mean Difference	0		Hypothesized Mean Difference	0	

df	4		df	6	
t Stat	-5.06991		t Stat	-11.279	
P(T<=t) one-tail	0.003565		P(T<=t) one-tail	1.45E-05	
t Critical one-tail	2.131847		t Critical one-tail	1.94318	
P(T<=t) two-tail	0.007131		P(T<=t) two-tail	2.9E-05	

Table 13. ANOVA results for 2019 data

T1= eNhance, T2= PrimAgro P + PrimAgro K+ Micro500 + Microlink Boron + Iron, T3= PrimAgro P + PrimAgro K+ Micro500 + Microlink Boron + Iron, T4= PrimAgro P + PrimAgro K+ Micro500 + Microlink Boron + Iron, T5= PrimAgro P + PrimAgro K+ Micro500 + Microlink Boron + Iron + C-Tech, T6= PrimAgro P + PrimAgro K+ Micro500 + Microlink Boron + Iron + C-Tech, T7= PrimAgro P + PrimAgro K+ Micro500 + Microlink Boron + Iron + C-Tech, T8= Monty's, T9= Helena, T10= Willard.

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	3896.056	9	432.8951	2.727702	0.01874	2.210697
Within Groups	4761.098	30	158.7033			
Total	8657.154	39				

Table 14: Means and Standard deviation for treatments applied in 2019.

	treatment									
	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10
Mean	247.125	252.625	261	234.275	267.95	257.675	239.75	253.25	247.25	261.725
SD	6.17326	26.14503	23.14635	6.38664	8.07692	5.49629	7.49511	5.34197	8.24035	6.8403

Table 15. Tukey HSD/Tukey Kramer for treatments applied in 2019. In green is shown C-Tech treatment vs appropriate control.

Pair	Difference	SE	Q	Lower CI	Upper CI	Critical Mean	p-value
x1-x2	5.5	6.2989	0.8732	-24.8867	35.8867	30.3867	0.9997
x1-x3	13.875	6.2989	2.2028	-16.5117	44.2617	30.3867	0.8574
x1-x4	12.85	6.2989	2.04	-17.5367	43.2367	30.3867	0.9034
x1-x5	20.825	6.2989	3.3061	-9.5617	51.2117	30.3867	0.3956
x1-x6	10.55	6.2989	1.6749	-19.8367	40.9367	30.3867	0.9693

x1-x7	7.375	6.2989	1.1708	-23.0117	37.7617	30.3867	0.9975
x1-x8	6.125	6.2989	0.9724	-24.2617	36.5117	30.3867	0.9994
x1-x9	0.125	6.2989	0.01984	-30.2617	30.5117	30.3867	1
x1-x10	14.6	6.2989	2.3179	-15.7867	44.9867	30.3867	0.8188
x2-x3	8.375	6.2989	1.3296	-22.0117	38.7617	30.3867	0.9935
x2-x4	18.35	6.2989	2.9132	-12.0367	48.7367	30.3867	0.567
x2-x5	15.325	6.2989	2.433	-15.0617	45.7117	30.3867	0.7758
x2-x6	5.05	6.2989	0.8017	-25.3367	35.4367	30.3867	0.9999
x2-x7	12.875	6.2989	2.044	-17.5117	43.2617	30.3867	0.9024
x2-x8	0.625	6.2989	0.09922	-29.7617	31.0117	30.3867	1
x2-x9	5.375	6.2989	0.8533	-25.0117	35.7617	30.3867	0.9998
x2-x10	9.1	6.2989	1.4447	-21.2867	39.4867	30.3867	0.9884
x3-x4	26.725	6.2989	4.2428	-3.6617	57.1117	30.3867	0.1225
x3-x5	6.95	6.2989	1.1034	-23.4367	37.3367	30.3867	0.9984
x3-x6	3.325	6.2989	0.5279	-27.0617	33.7117	30.3867	1
x3-x7	21.25	6.2989	3.3736	-9.1367	51.6367	30.3867	0.3686
x3-x8	7.75	6.2989	1.2304	-22.6367	38.1367	30.3867	0.9963
x3-x9	13.75	6.2989	2.1829	-16.6367	44.1367	30.3867	0.8635
x3-x10	0.725	6.2989	0.1151	-29.6617	31.1117	30.3867	1
x4-x5	33.675	6.2989	5.3462	3.2883	64.0617	30.3867	0.02073
x4-x6	23.4	6.2989	3.7149	-6.9867	53.7867	30.3867	0.249
x4-x7	5.475	6.2989	0.8692	-24.9117	35.8617	30.3867	0.9998
x4-x8	18.975	6.2989	3.0124	-11.4117	49.3617	30.3867	0.5221
x4-x9	12.975	6.2989	2.0599	-17.4117	43.3617	30.3867	0.8984
x4-x10	27.45	6.2989	4.3579	-2.9367	57.8367	30.3867	0.1034
x5-x6	10.275	6.2989	1.6312	-20.1117	40.6617	30.3867	0.974
x5-x7	28.2	6.2989	4.477	-2.1867	58.5867	30.3867	0.08645
x5-x8	14.7	6.2989	2.3338	-15.6867	45.0867	30.3867	0.8131
x5-x9	20.7	6.2989	3.2863	-9.6867	51.0867	30.3867	0.4037
x5-x10	6.225	6.2989	0.9883	-24.1617	36.6117	30.3867	0.9993
x6-x7	17.925	6.2989	2.8457	-12.4617	48.3117	30.3867	0.5976
x6-x8	4.425	6.2989	0.7025	-25.9617	34.8117	30.3867	1
x6-x9	10.425	6.2989	1.6551	-19.9617	40.8117	30.3867	0.9715
x6-x10	4.05	6.2989	0.643	-26.3367	34.4367	30.3867	1
x7-x8	13.5	6.2989	2.1432	-16.8867	43.8867	30.3867	0.8754
x7-x9	7.5	6.2989	1.1907	-22.8867	37.8867	30.3867	0.9971
x7-x10	21.975	6.2989	3.4887	-8.4117	52.3617	30.3867	0.3251
x8-x9	6	6.2989	0.9526	-24.3867	36.3867	30.3867	0.9995
x8-x10	8.475	6.2989	1.3455	-21.9117	38.8617	30.3867	0.993
x9-x10	14.475	6.2989	2.298	-15.9117	44.8617	30.3867	0.8258

Treatments that show significant difference: x4-x5

Table 16. t-Test results

T4:T5		
	Variable 1	*Variable 2*
Mean	234.275	267.95
Variance	40.78917	65.23667
Observations	4	4
Hypothesized Mean Difference	0	
df	6	
t Stat	-6.54081	
P(T<=t) one-tail	0.000305	
t Critical one-tail	1.94318	
P(T<=t) two-tail	0.00061	
t Critical two-tail	2.446912	