Efficacy Report

07/22/2024

Study Title : Efficacy of "NanoGraphene Fertilizer – NEUTRALIZER" at Corn Farm & Electrical Conductivity Measurement Test in China

Product Identity : Graphene, nano calcium , nano magnesium , nano iron

Data Requirements : Proof of Crops Growth & Electrical Conductivity Value Reduction of the soil

Author : Sang-cheol Lee _ Researcher at Smartnano Co., Ltd.

Study completion date : 07/17/2024

Testing Facility
700 meters east of Wangying Village, Dongying District, Dongying City, Shandong Province, China
Corn Farm

Laboratory Project Number : ER 018

GOOD LABORATORY PRACTICE COMPLIANCE STATEMENT

SUBMITTER : Sang-cheol Lee [Smartnano Co., Ltd.]

(Signature) _____ Date: 07/17/2024
Typed Name : Sang-cheol Lee
Title : Director

Research Director : Li shufang [Shandong Yehsun Biological Science and Technology Co., Ltd.]

(Signature) Li shufang Date: 07/17/2024
Typed Name : Li shufang
Title : Senior Researcher

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A. EFFICACY STUDY SUMMARY

STUDY TITLE: Efficacy of "NanoGraphene Fertilizer – NEUTRALIZER" at Corn Farm & Electrical Conductivity Measurement Test in China

LABORATORY PROJECT #: ER 018

TESTING FACILITY: 700 meters east of Wangying Village, Dongying District, Dongying City, Shandong Province, China

STUDY DATES:

STUDY INITIATION DATE: (03/30/2024)

STUDY COMPLETION DATE: (07/17/2024)

TEST SUBSTANCE:

DESCRIPTION: Dilute 1 bottle of 500ml 'NEUTRALIZER' 1,000 times with water and used for irrigation application to an area of 660m^2

INGREDIENT: Graphene G3: 6g, nano Ca&Mg: 0.4g, nano Fe: 0.1g

DILUTION: Diluted 1,000 times with general groundwater and apply as the irrigation fertilization

TEST CONDITIONS:

WATER: Groundwater, hardness: 1,000 mg/L or less

CONTACT TIME : Not used

TEMPERATURE : **20℃ ~ 40℃ (68°F ~104°F)**

TEST RESULTS :

'NEUTRALIZER'

1. Electrical Conductivity (EC) value decreased by 5-7 from 8-11 to 3-4 after 30 days of application
2. Confirmed reduced salt content from the soil as a result of applying "NEUTRALIZER"
3. The average height of corn is higher by about 30 cm(12 inchs) as a result of applying "NEUTRALIZER".
4. Corn farms irrigated with graphene fertilizer were able to overcome high temperatures and grow well even during heat waves exceeding 40 degrees for more than 10 days.
5. Shortened germination time for the experimental group (5 days faster than the control group)
6. The growth rate of the experimental group is faster (10 days difference compared to the control group)

Corns Farm in Shandong Province, China

Improvement in corn size is evident.

Without graphene fertilizer NEUTRALIZER

With graphene fertilizer NEUTRALIZER

B. QUALITY ASSURANCE STATEMENT

Study Title: Efficacy of "NanoGraphene Fertilizer – NEUTRALIZER" at Corn Farm & Electrical Conductivity Measurement Test in China

Study #: ER 018

Quality assurance audits of this study were conducted and reported to management and the director as listed below:

(signature) _____ DATE: 07/17/2024 _____
Typed Name: Lib Kim
Director of Quality Assurance

C. STUDY REPORT - Detail

STUDY TITLE: Efficacy of "NanoGraphene Fertilizer – NEUTRALIZER" at Corn Farm & Electrical Conductivity Measurement Test in China

TEST FACILITY : 100 meters east of Wangying Village, Dongying District, Dongying City, Shandong Province, China

TEST SUBSTANCE IDENTIFICATION

TEST SUBSTANCE NAME: (Graphene: Cas No:1034343-98-0, Nano Calcium & Magnesium hydroxide : Cas No: 39445-23-3, Nano iron hydroxide : Cas No: 11113-66-9)

① Graphene G3: Cas No: 1034343-98-0; Graphene Layer - Median of 5 layers ranging from 1 to 10 layers; Graphene size - median size of 50nm; Water-based

② Nano Calcium & Magnesium hydroxide: Cas No : 39445-23-3; median size of 5nm

③ Nano iron hydroxide: Cas No: 11113-66-9; median size of 5nm

DESCRIPTION OF TEST SUBSTANCE:

'NEUTRALIZER': It is a black liquid fertilizer manufactured by mixing highly concentrated Graphene G3 with nano calcium & magnesium hydroxide and nano iron hydroxide.
It can be stored at room temperature for 2 years and is supplied in various containers ranging from 500ml to 20kg.

CHEMICAL CHARACTERIZATION:

'NEUTRALIZER' : We added a high concentration of Graphene G3 and nano calcium, nano magnesium and nano iron as described above the "test substance name". These are our proprietary materials. Graphene has inherent functions of being a drug delivery system, catalyst and having a chelating effect. Therefore, it delivers a high concentration of molecular-sized nano calcium, nano magnesium, nano iron and other essential trace elements to growing points within plants throughout a plant's growth cycle.

STUDY OBJECTIVE: We reduce the use of chemical fertilizers, increase immunity, strengthen cell walls, confirm increased production, and reduce salt content from the soil.

TEST METHOD: Cultivation test conducted according to general farming methods

D. STUDY MATERIALS & TEST METHOD

PREPARATION OF TEST SUBSTANCE
Dilute 1 bottle of 500ml 'NEUTRALIZER' 1,000 times with water and apply irrigation application to an area of 660m^2

PREPARATION OF TEST SYSTEM/STRAINS
Use of 3,000 liter plastic water tank for 1,000-fold dilution

EXPOSURE CONDITIONS
'NEUTRALIZER' 1,000 times with water and irrigate 1 bottle of 'NEUTRALIZER' 660m^2 immediately after rotary work in the field , and add 1 bottle after 1 month.

TEST SYSTEM RECOVERY
It improves the soil to one in which plants can grow better (reduced Electrical Conductivity value) by resolving salt accumulation pollution, which prevents crops from growing well due to the accumulation of salts.

PROTOCOL CHANGES

'NEUTRALIZER' Dilute water 1,000 times in 500ml and irrigate 660m^2 of farmland after rotary work before planting. If additional fertilizer spraying is necessary depending on the crop, additional irrigation is performed.

PROTOCOL DEVIATIONS
There is no reason for the protocol to change.

E. CONTROLS

PREPARATION OF CONTROL(S)
Testing was conducted under the same conditions, dividing fields into two parts; one field irrigated with fertilizer and the other field without fertilizer.

F. STUDY ACCEPTANCE CRITERIA

STUDY REQUIREMENTS

Dilute 1 500ml bottle of 'NEUTRALIZER' 1,000 times in water and irrigate an area of 660 ㎡.

Afterwards, soil samples are collected from the front, center, and back of the test land, and then the electrical conductivity of each is measured and the average value is checked.

G. DATA ANALYSIS

CALCULATIONS
Measure the electrical conductivity value of cucumber cultivation soil and compare the measured values before and after cucumber cultivation, respectively.

STATISTICAL ANALYSIS
Statistical analysis was conducted by summing the yield based on the area of a 660m^2 cucumber greenhouse.

H. STUDY RETENTION

Data Retention
Prepare and preserve research reports.

Specimen Retention
Testing facility is permanent. However, agricultural products are not preserved. Therefore, they are replaced with photos and reports.

I. STUDY RESULTS

1. Electrical Conductivity (EC) value decreased by 5-7 from 8-11 to 3-4 after 30 days of application
2. Confirmed reduced salt content from the soil as a result of applying "NEUTRALIZER"
3. The average height of corn is higher by about 30 cm(12 inchs) as a result of applying "NEUTRALIZER".
4. Corn farms irrigated with graphene fertilizer were able to overcome high temperatures and grow well even during heat waves exceeding 40 degrees for more than 10 days.
5. Shortened germination time for the experimental group (5 days faster than the control group)
6. The growth rate of the experimental group is faster (10 days difference compared to the control group)

J. STUDY CONCLUSION

1. NEUTRALIZER improves the structure of the soil and revitalizes the soil by breaking down accumulated salt from the soil. It also stimulates nitrogen (N), phosphorus (P) and potassium (K) within the soil.

2. NEUTRALIZER promotes the healthy growth of plants and increases resistance to diseases by maximizing the movement of nano calcium, nano magnesium, nano iron and other trace elements precisely and continuously. It is a comprehensive bioactive plant agent that helps plants overcome various physiological disorders under adverse growing conditions. Taste of plants and productivity of plant growth are also increased with NEUTRALIZER.

REPORT SUBMITTED BY:

Sang-cheol Lee
Study director

Study completion date: 07/17/2024

Appendix 1. 06/05/2024 Photo

Without graphene fertilizer NEUTRALIZER

With graphene fertilizer NEUTRALIZER

Appendix 2. 07/05/2024 Photo

Without graphene fertilizer NEUTRALIZER

With graphene fertilizer NEUTRALIZER

Appendix 3. 07/05/2024 Photo

Field visit to a corn farm where the soil has been improved and corn is growing well by resolving salt-accumulation through the use of graphene fertilizer.

Discussions were held with agricultural officials in Dongying District, Shandong City regarding the effect of improving salt-accumulated soil.

옥수수 재배실험 결과보고서

수　　신 : 스마트나노
실험기관 : 산동예선생물과학기술유한공사 (책임연구원 : LI SHUFANG)
실험개요 :　1) 일시 : 2024.3.30 - 2024.7.17
2) 실험장소 : 중국 산동성 동영시 동영구 왕영촌 서쪽 700미터 옥수수밭 (2000평)
3) 실험방법 : 실험군(염류프리2회사용) : 대조군(염류프리미사용)
4) 옥수수품종 : 찰옥수수18호(중국품종)
5) 실험결과 :　실험군의 발아시간 단축(대조군 대비 5일 빠름)
실험군의 생장속도 빠름(대조군 대비 10일 차이)
토양내의 EC농도 현저히 감소(시작시8-11:현재3-4)

실험내용 :	2024.3.30	2000평 전체 염류프리(3,000ml)물에 500배희석하여 뿌림	EC : 8.6-11.3	대조군 7.6-8.5
	2024.5.13	토양20cm깊이로 뒤집어 줌		
	2024.5.15	옥수수 종자 심음		
	2024.520	실험군 종자발아 및 묘출현 (대조군은 5.25일 종자발아 및 묘출현)	EC : 6.5-7.1	대조군 7.1-7.4
	2024.6.20	염류프리(3,000ml)물에 500배 희석하여 뿌림		
	2024.7.17	옥수수열매 출현됨	EC : 3.7-4.1	대조군 6.1-6.8

Corn cultivation experiment result report

Recipient: Smartnano
Experimental institution: Shandong Yeseon Biological Science and Technology Co., Ltd. (Chief researcher: LI SHUFANG)

Experiment overview:
1) Date: 2024.03.30 - 2024.07.17
2) Experiment location: Corn field 700 meters west of Wangying Village, Dongying District, Dongying City, Shandong Province, China (6,600m^2)
3) Experimental method: Experimental group (using 2 salt-free products): Control group (using no salt-free products
4) Corn variety: Waxy corn No.18 (Chinese variety)
5) Experiment results: - Shortened germination time for the experimental group (5 days faster than the control group)
- The growth rate of the experimental group is faster (10 days difference compared to the control group)
- EC concentration in soil significantly decreased (8-11 at start: 3-4 now)

Experiment details:

2024.03.30 : Dilute 500 times in salt-free (3,000ml) water and spray on the entire 6,600m^2 area.	EC : 08.06-11.03	Control group 07.06-08.05
2024.05.13 : Turn over soil to a depth of 20cm		
2024.05.15 : Corn seeds planted		
2024.05.20 : Seed germination and seedling emergence in the experimental group. (Seed germination and seedling emergence in the control group on 5.25 days)	EC : 06.05-07.01	Control group 07.01-07.04
2024.06.20 Dilute 500 times in salt-free (3,000ml) water and spray.		
2024.07.17 Corn fruits appear	EC : 03.07-04.01	Control group 06.01-06.08