

# Efficacy Report

06/23/2024

**Study Title** : Efficacy of "NanoGraphene Fertilizer – BOOSTER" in UAE

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

**Data Requirements** : Proof of crops growth effect

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

**Study completion date** : 06/03/2024


## Testing Facility

2HRF+5R Lahbab - Dubai, United Arab Emirates

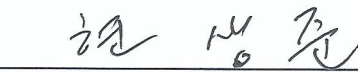
**Laboratory Project Number** : ER 017

## GOOD LABORATORY PRACTICE COMPLIANCE STATEMENT

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

(Signature)  Date: 06/03/2024  
**Typed Name** : Sang-cheol Lee  
**Title** : Director

**Co-Researched by** : Nature Technology , Inc\_UAE

(Signature)  Date: 06/03/2024  
**Typed Name** : Sang-jun Hyun  
**Title** : Director (COO)

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## A. EFFICACY STUDY SUMMARY

**STUDY TITLE:** Efficacy of “NanoGraphene Fertilizer – BOOSTER” in UAE

**LABORATORY PROJECT #:** ER 017

**TESTING FACILITY:** 2HRF+5R Lahbab Test Farm - Dubai, United Arab Emirates

**STUDY DATES:**

**STUDY INITIATION DATE:** (03/10/2024)

**STUDY COMPLETION DATE:** (06/03/2024)

**TEST SUBSTANCE:**

**DESCRIPTION:** Dilute 1 bottle of 500ml ‘BOOSTER’ 1,000 times with water and apply foliar application to an area of 3,300m<sup>2</sup>

**INGREDIENT:** Graphene G4: 0.75g, nano Ca&Mg: 0.6g, nano Fe: 0.15g

**DILUTION:** Dilute 1,000 times with general groundwater and apply as the foliar fertilization

**TEST CONDITIONS:**

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

**CONTACT TIME :** Not used

**TEMPERATURE :** 30°C ~ 37°C (86°F ~ 99°F)

**TEST RESULTS :**

1. An increase in production of approximately 30% was confirmed.
2. The crops are larger and tastier.
3. ‘BOOSTER’ prevents hardening of leaves and promotes healthier growth.
4. Absorption of calcium and trace elements enhances immunity and improves overall health of plants.
5. Enhancement of activity of photosynthesis and transpiration.
6. All expected effects of calcium, including crop health, quality, disease resistance, and increased yield, were confirmed.
7. Various crops such as melons, watermelons, and lettuce grow healthy without problems caused by calcium deficiency even in harsh environments such as high temperatures and dry climate.

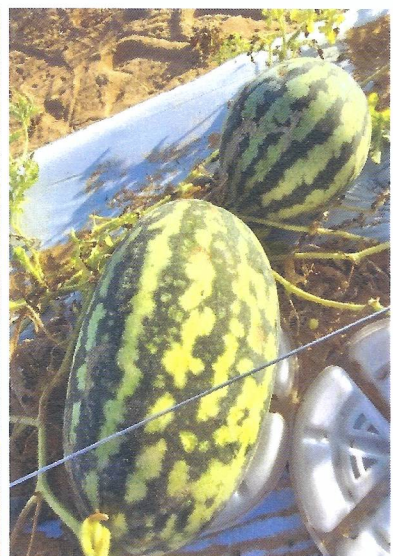
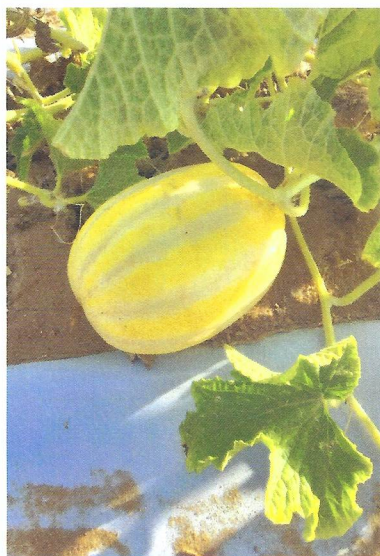
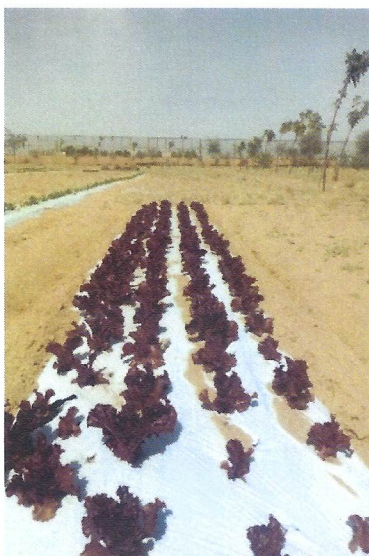


### Photos at Testing Facility

1) Improvement in crop size is evident.



2) Fruits are larger and tastier.



## B. QUALITY ASSURANCE STATEMENT

**Study Title:** Efficacy of "NanoGraphene Fertilizer – BOOSTER" in UAE

**Study #:** Project Number: ER 017

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

(signature)  \_\_\_\_\_  
Typed Name: Lib Kim  
Director of Quality Assurance

DATE: 06/10/2024 \_\_\_\_\_



## C. STUDY REPORT - Detail

**STUDY TITLE :** Efficacy of “NanoGraphene Fertilizer – BOOSTER” in UAE

**TEST FACILITY :** 2HRF+5R Lahbab - Dubai, United Arab Emirates

### 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 G4: Cas No: 1034343-98-0; Graphene Layer - Median of single layer ranging from 1 to 5 layer; Graphene size - median size of 20nm, Glycerin-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:

‘BOOSTER’: It is a transparent gold-color liquid fertilizer manufactured by mixing highly concentrated Graphene G4 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 from 500ml to 20kg.

### CHEMICAL CHARACTERIZATION:

‘BOOSTER’: We added a high concentration of Graphene G4 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, and confirm increased production.

**TEST METHOD:** Cultivation test conducted according to general farming methods

## **D. STUDY MATERIALS TEST METHOD**

### **PREPARATION OF TEST SUBSTANCE**

Dilute 500ml of 'BOOSTER' 1,000 times with water and apply foliar application to 3,300m<sup>2</sup> of cropland using a sprayer.

### **PREPARATION OF TEST SYSTEM/STRAINS**

Use a 100 liter plastic container for 1,000-fold dilution.

### **EXPOSURE CONDITIONS**

Dilute 500ml of 'BOOSTER' 1,000 times with water and apply for foliar application to 3,300m<sup>2</sup> of cropland twice a month, 4 times in total.

### **TEST SYSTEM RECOVERY**

'BOOSTER' is consumed naturally throughout the foliar application, so there is no need for system restoration.

## **PROTOCOL CHANGES**

'BOOSTER' is diluted 1,000 times with water applied for to 3,300m<sup>2</sup> cropland twice a month. If calcium deficiency occurs due to high temperature, additional foliar application maybe performed, so there is no change in the protocol.

### **PROTOCOL DEVIATIONS**

If the plant's nutrient movement is not good due to high temperatures, additional foliar application of 'BOOSTER' is necessary. Other than that, there is no reason to change the protocol.

## **E. CONTROLS**

### **PREPARATION OF CONTROL(S)**

Testing was conducted under the same conditions, dividing the whole cropland; one field sprayed with the fertilizer and the other field without the fertilizer.

## **F. STUDY ACCEPTANCE CRITERIA**

### **STUDY REQUIREMENTS**

Dilute 500ml of 'BOOSTER' 1,000 times with water and apply foliarly to an area of 3,300m<sup>2</sup>

## **G. DATA ANALYSIS**

### **CALCULATIONS**

The amount of increased production is calculated by measuring the weight of crops harvested in fields with and without fertilizer.

### **STATISTICAL ANALYSIS**

Statistical analysis was conducted by summing the yield based on the area of 3,300m<sup>2</sup> of one greenhouse.

## **H. STUDY RETENTION**

### **Data Retention**

All research data are preserved.

### **Specimen Retention**

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

## I. STUDY RESULTS

1. An increase in production of approximately 30% was confirmed.
2. The crops are larger and tastier.
3. 'BOOSTER' prevents hardening of leaves and promotes healthier growth.
4. Absorption of calcium and trace elements enhances immunity and improves overall health of plants.
5. Enhancement of activity of photosynthesis and transpiration.
6. All expected effects of calcium, including crop health, quality, disease resistance, and increased yield, were confirmed.
7. Various crops such as melons, watermelons, and lettuce grow healthy without problems caused by calcium deficiency even in harsh environments such as high temperatures and dry climate.

## J. STUDY CONCLUSION

'BOOSTER' 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 'BOOSTER'.

### REPORT SUBMITTED BY:

Dr. Sang-cheol Lee \_\_\_\_\_  
Study director

\_\_\_\_\_  
Study completion date: 05/31/2024



Appendix 1. Photos at Testing Facility

