# HARVAST™
## Carbon Quantum Dots Photosynthesis Enhancer

PI2016703467

TRL 7 - Demonstration of prototype








## BRIEF TECHNOLOGY

- *Carbon Quantum Dots (CQD), are tiny fragments of carbon with sizes typically lessthan 10 nm, which render them photoluminescent.*
- *Our green and acid-free process of producing CQD leaves no toxic residue on the material, making it biocompatible and suitable for biological applications.*
- *The facile and scalable process of producing CQD also means that it is feasible, practical and cheap to produce a photosynthesis enhancer for plants.*

## PROBLEM/CURRENT ISSUES & SOLUTION

*Due to the growing population and higher food demands, optimization has been done on soil and fertilizers to increase crop yield. However, plant growth is limited by the inefficient photosynthesis process. Harvast™ enhances the photosynthesis rate by 30% via our patent-pending technology. Our indirect competitors focus on optimization of growth via nutrients and genetics but none of them have tried to change how plants photosynthesize. We help plants optimize the abundant solar energy for their growth.*

## INVENTIVENESS & NOVELTY

*Photosynthesis is a process whereby green plants use light energy to convert water and carbon dioxide, into oxygen and sugar for growth. However, photosynthesis is an inefficient process; only 2-4% of the available energy in light is converted into new plant growth. With the availability of non-toxic CQD, a novel innovation, has been produced to enhance photosynthesis. Harvast™ contains CQD and when applied on to leaves, their small size enables them to enter the leaves and interact with chloroplast. Due to their unique photoluminescent properties, CQD are able to assist in the electron transfer mechanism during photosynthesis.*

## BENEFITS OF THE TECHNOLOGY

*Increases plant growth rate and shortens plant growth cycle*

*Encourages new leaf growth, hastens flowering and fruiting*

***CQD Photosynthesis Enhancer***

*Supports outstanding plant development when used under optimal conditions*

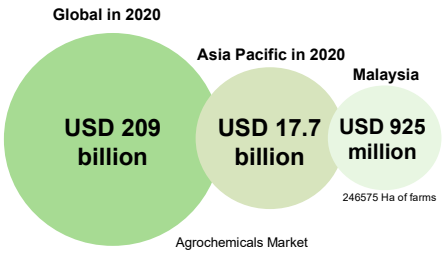
*Non-toxic, biocompatible and affordable*

## USEFULNESS & APPLICATION

*Harvast™ improves the efficiency of photosynthesis. This translates to **30% increase in plant growth**, **25% reduction in crop cycle**, and **20% increase in sweetness of fruits**. Harvast ™ can help to optimize fertilizer usage and avoid pollution due to over-fertilization. With all these, the income of smallholder farmers can also be increased by 10% to 30%.*

## MARKET POTENTIAL

*With 250,000 hectares of farms in Malaysia, the market size is as huge as USD925 million.*





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