From Lab

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To Farmers
Carrageenan
plant
growth
promoter
Palay Crops Estimate, Philippines
January – December, 2015-2019
Eucheuma Cottonii (Kappaphycus alvarezii)

Raw Material
Effect of Irradiation
Radiation effects on carrageenan
Cobalt-60 multipurpose irradiator

Electron beam accelerator
Increase in yield

Resistance to tungro virus

Extensive root growth

Sturdy stems

Increased number of tillers

NCPC, UPLB Field trial

Pulilan, Bulacan after Typhoon “Lando”

Standing rice
(Carrageenan-treated field)

Lodged rice
(Farmer’s practice)
Field application

FOLIAR SPRAYING

40,000 ha. rice field across the Philippines

At least 20% increase in yield
PNRI’s Capacity to Produce Carrageenan PGP

Co-60 source

1,200L /4 days

Good only for 133 ha.
Electron Beam Facility

**EB Accelerator Specifications:**
- **Model:** EB Tech ELV-8
- **Maximum Energy:** 2.5 MeV
- **Maximum Current:** 50 mA
- **Maximum Power:** 100 kW
UTILIZATION OF ELECTRON BEAM MACHINE

Fabrication of the LIQUID HANDLING SYSTEM for irradiation of carrageenan

Diagram of the fabricated liquid handling system
E-beam production of Radiation-Modified Carrageenan as Plant Growth Promoter

Seaweed → \( \kappa \)-carrageenan → Electron beam Irradiation → Degradation of \( \kappa \)-carrageenan

Production Rate: 1,700 L/hr

If 8 hrs. operation / day
13,600 L/day

Good for 1,500 ha.
DOST Region2 2017 Annual Report

One farmer in Solana, Cagayan reported her harvest data through weight of rice seeds per sack and average yield per hectare and income. It is reported that rice applied with CPPS have heavier seeds with a difference of 9 kg/sack.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Weight of Rice (kg/sack)</th>
</tr>
</thead>
<tbody>
<tr>
<td>With Carrageenan</td>
<td>56 kg/sack</td>
</tr>
<tr>
<td>Without Carrageenan</td>
<td>47 kg/sack</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Average Yield (cavans/hectare)</th>
<th>Weight of Rice (kg/sack)</th>
<th>Price per kilogram</th>
<th>Total Income (Pesos)</th>
</tr>
</thead>
<tbody>
<tr>
<td>With Carrageenan</td>
<td>107</td>
<td>56</td>
<td>17</td>
<td>Php 101,864.00</td>
</tr>
<tr>
<td>Without Carrageenan</td>
<td></td>
<td>47</td>
<td></td>
<td>Php 85,493.00</td>
</tr>
</tbody>
</table>

US$ 300
A Proud 
CARRAGEENAN-PGP 
Technology Adapter

Technology Applied in 
Sugarcane Farm 
Located at Alfanib, Lantak 
Bukidnon since August 
up to August 2018

BEBETH RARA 
Farmer-Entrepreneur

More hands in 
every bunch

Well sized 
Bananas

Increased in 
Productivity

TECHNOLOGY TRANSFER: 
Carrageenan-PGP

Technology Applied in a 
Cacao Farm located at 
Calinan, Davao City 
since June 2018 
up to present

Farmer-Entrepreneur: 
FR. BONG GONZAGA

Enhanced Plant Resiliency 
to extreme weather condition 
and pests infestations

IN-SITU 
APPLICATION OF 
THE TECHNOLOGY
Bring our technologies from the research lab to the marketplace

From Lab to Farmers