TECHNOLOGY: *BioMeg-Microbial Inoculant*

# Biostimulant for improved yield and nutritional quality of sweet potato and purple yam

Edgardo E. Tulin, Anabella B. Tulin, Maria Theresa P. Loreto, Ea Kristine Clarisse B. Tulin, Jo Jane D. Atok, Miguel Francisco B. Abulencia, Katrina Dela Fuente, Christian Art L. Chua, April Joy S. Vergara
Philrootcrops, Visayas State University

# Technology: BioMeg microbial inoculant

**TECHNOLOGY:** ***BioMeg-Microbial Inoculant***

**DESCRIPTION:**

***BioMeg*** *is a microbial inoculant containing* ***Bacillus megaterium*** *as the active ingredient. Its subsequent nutrient uptake by plants with the use of the product in the* ***presence of macrofertilizers*** *was found to* ***increase yield and improve nutritional quality****. Only a trace amount of BioMeg is applied a few days after planting to effect the desired benefit. The expected yield increase in crop production will translate into a corresponding* ***increase in income*** *and provide a* ***sustainable livelihood*** *for our farmers.*

**TANGIBLE OUTPUT(S):**

***Microbial Inoculant*** *for production of sweet potato and purple yam*

**STATUS:**

*The technology can be adopted by the Department of Agriculture. It will be distributed to sweet potato and purple yam farmers through the technology brochures and guidebooks. Training will be conducted in order to capacitate the farmers in their understanding and application of the principles and practices in sweet potato and purple yam production more specifically in the application of BioMeg.*

**TECHNOLOGY:** ***BioMeg-Microbial Inoculant***

## TECHNOLOGY FEATURE:

- *Low-cost*
- *Environment-friendly*
- *Organic-based*
- *Improves yield, nutritional quality, and income*
- *Use of locally sourced materials*
- *More sustainable*

## FARM-LEVEL APPLICATION:

*2 Field trials (area less than 1 ha)*

# Application

## APPLICATION TABLE

| Crop's type | Age of crop | NPK *Usage/ plant* | Bioinoculant *Usage/ plant* | Frequency |
|---|---|---|---|---|
| **Sweet potato** | 2 weeks after planting | 60-60-60 kg/ha | 12 kg/ha | Once |
| **Purple yam** | 1 month after planting | 75-25-75 kg/ha | 6 kg/ha | Twice |
| | 1 month after first application | 75-25-75 kg/ha | 6 kg/ha | |

## Way of Application

*Storage:* Store in cool dry place and away from direct sunlight or heat.

*Type of Soil:* Neutral soil (pH 6.5-7.5)

1. Make four holes around each plant having a distance of 5 cm from the soil surface.
2. Add the exact amount for each corresponding fertilizer treatment (as shown in Application table). Two holes for the bioinoculant and the other 2 holes for the complete fertilizer. Equally divide it into the holes.
3. Cover the holes with soil to prevent the volatilization of N-containing fertilizers.

# Production Cost

Basis: **5 kg Dried Product**

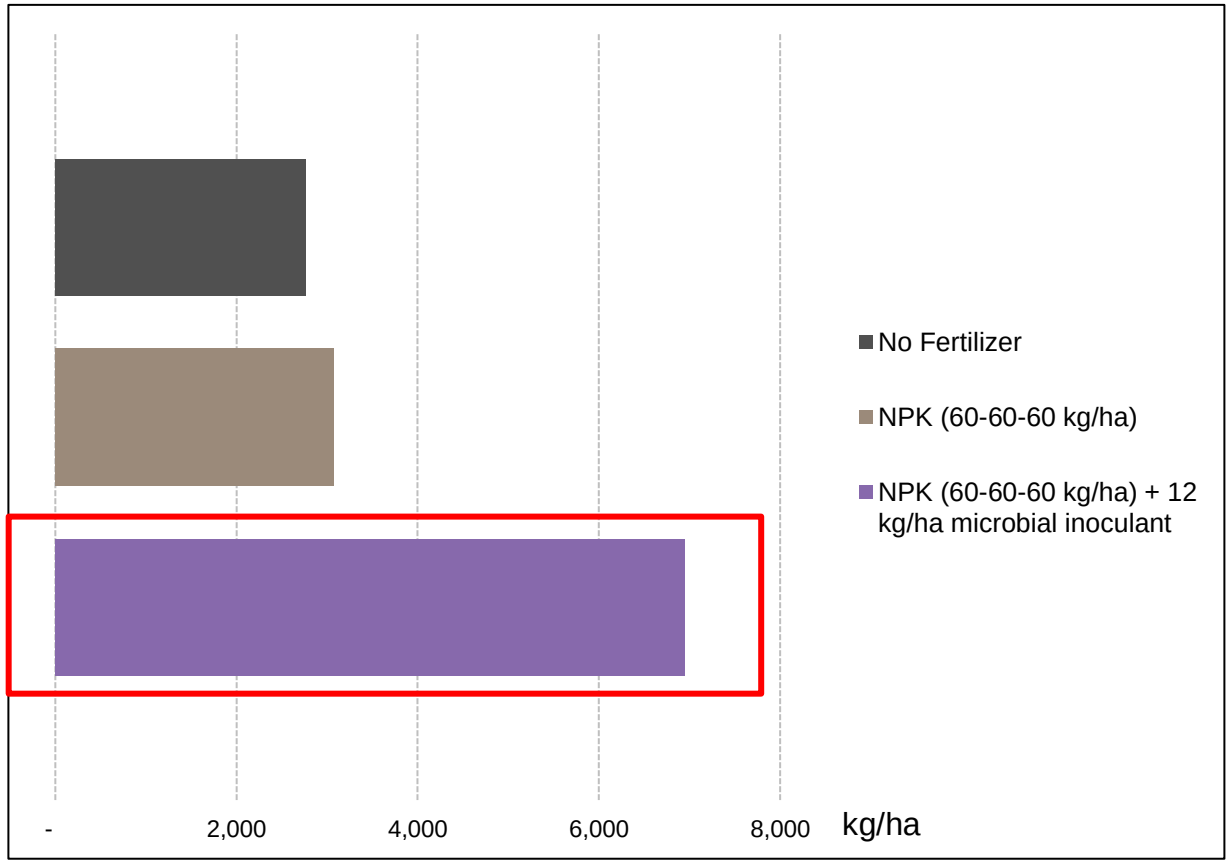
| Type | Item | Unit Price (Php) | Amount (Php) |
|---|---|---|---|
| Material Cost | Ipil-ipil Leaves, 1.67Kg | 5/Kg | 8.00 |
| | Cassava Peeling, 3.37Kg | 1/Kg | 4.00 |
| | Empty water container used as incubator, 3pcs | 95/pc | 288.00 (recyclable) |
| | Pure culture stock | 100/tube | 250.00 |
| | Other lab supplies | 200/set-up | 200.00 |
| Utilities | Gas for substrate sterilization | 100/set-up | 100.00 |
| | Electricity | 100/set-up | 100.00 |
| | Water | 50/set-up | 50.00 |
| | Laborer (3man days) | 350/day | 1,050.00 |
| **Total** | | | **2,050.00** |

Unit price:
**PhP 218.00/ kg bioinoculant**

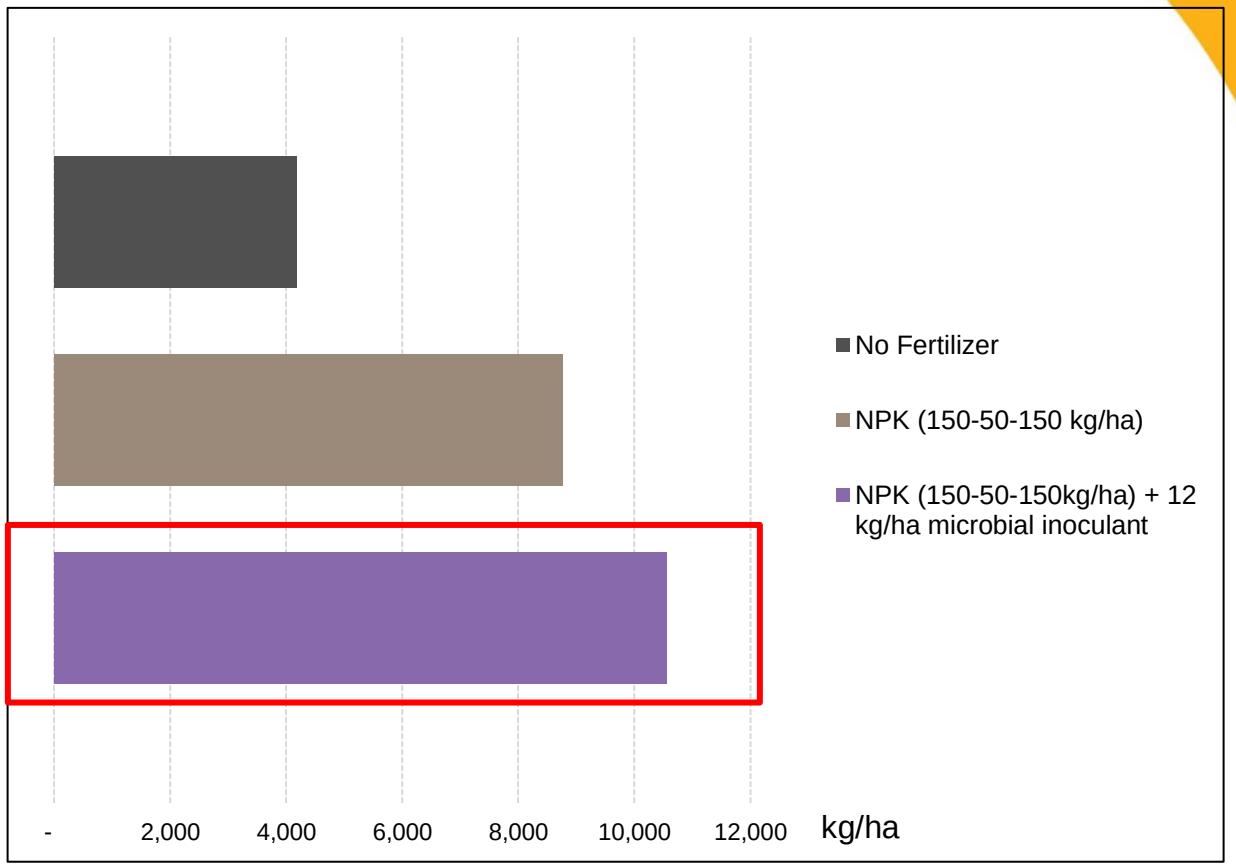
# Test Results

- ✓ Marketable Yield
- ✓ Cost-benefit Analysis
- ✓ Anthocyanin (Nutritional value)

# Marketable Yield




Comparison of sweet potato tuber yield (kg/ha) grown under neutral soil

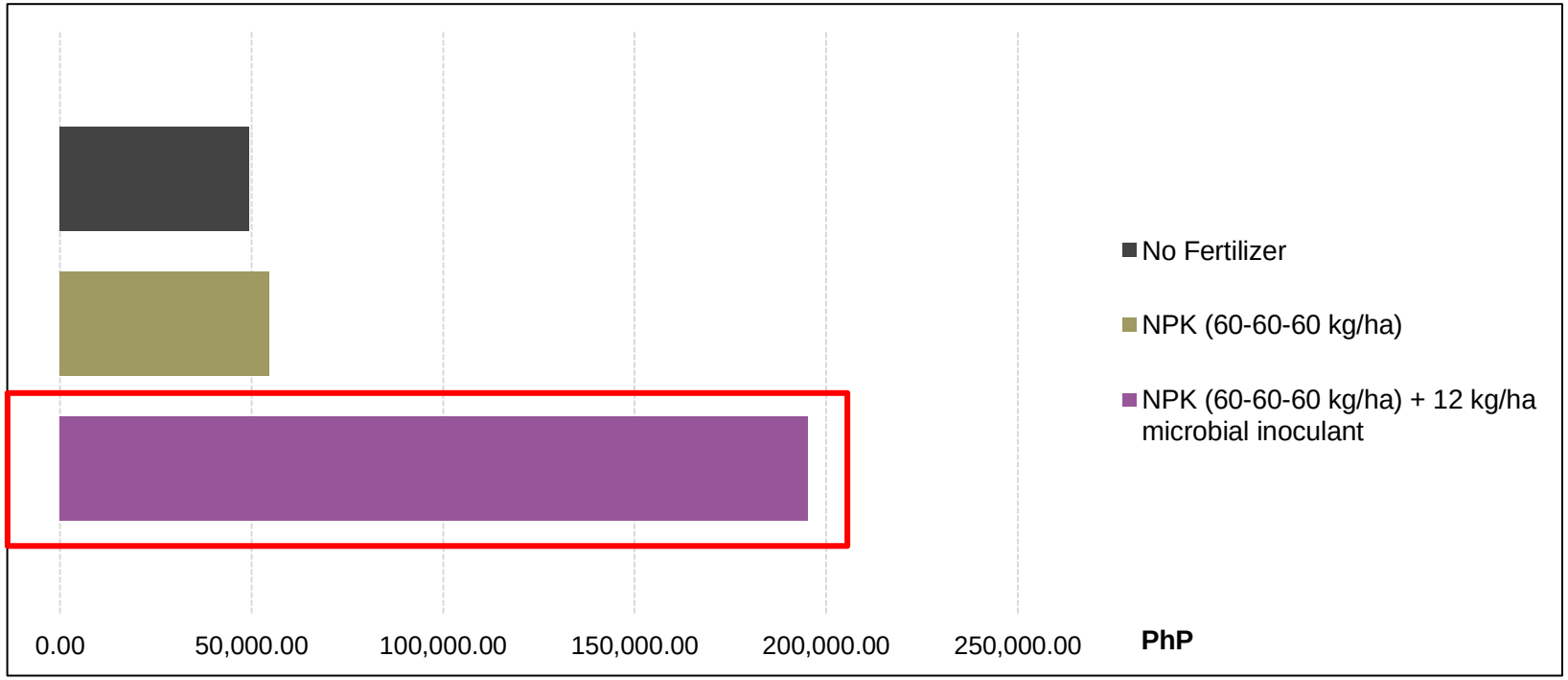



Comparison of purple yam tuber yield (kg/ha) grown under neutral soil

# Cost-benefit Analysis

## Sweet potato

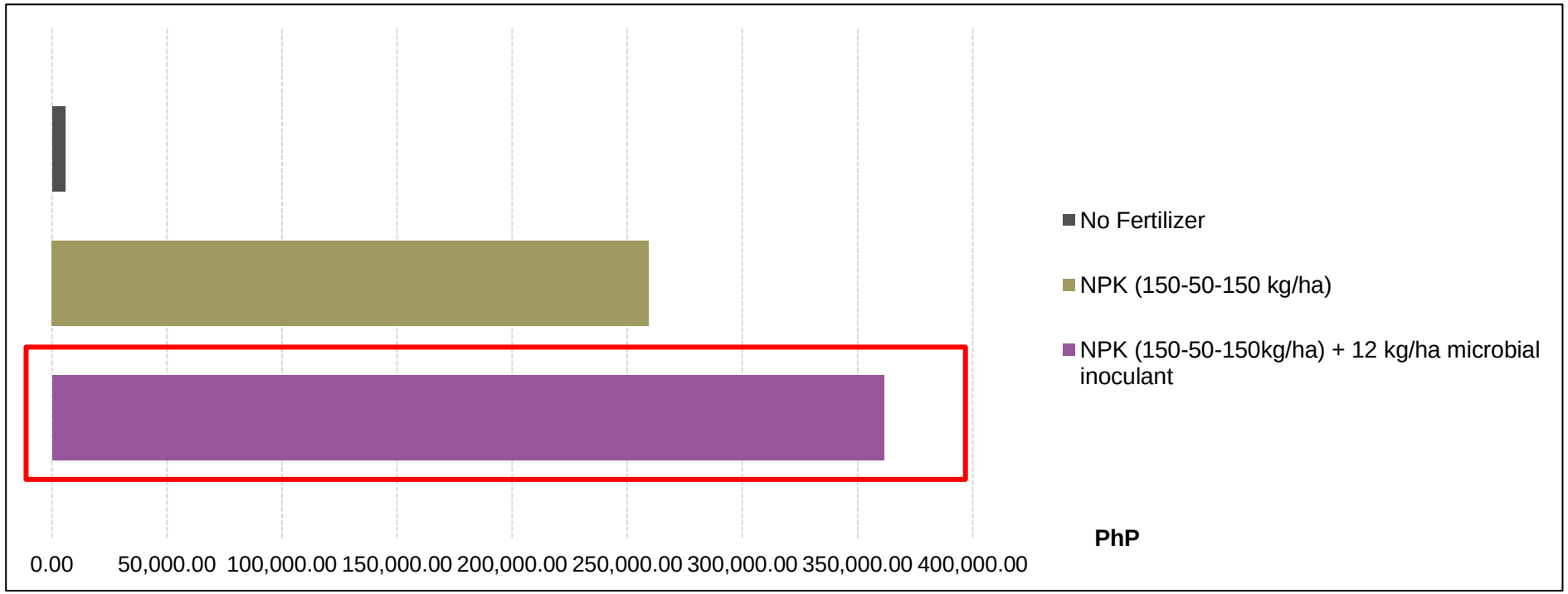
| Treatment | Plant population | Potential total yield (Kg/ha) | Selling Price/kg, PhP | Gross Income, PhP | Total Production Cost, PhP | Net Income, PhP |
|---|---|---|---|---|---|---|
| No fertilizer | 40,000 | 3,776 | 30 | 113,283 | 64,000 | 49,283 |
| NPK | 40,000 | 4,257 | 30 | 127,709 | 73,178 | 54,531 |
| NPK + 12 kg microbial inoculant/ha | 40,000 | 9,106 | 30 | 273,176 | 77,978 | 195,198 |



# Cost-benefit Analysis

## Purple yam

| Treatment | Plant population | Potential total yield | Selling Price/kg, PhP | Gross Income, PhP | Total Production Cost, PhP | Net Income, PhP |
|---|---|---|---|---|---|---|
| No fertilizer | 30,000 | 4,185 | 60 | 251,089 | 245,250 | 5,839 b |
| NPK | 30,000 | 8,770 | 60 | 526,222 | 266,798 | 259,424 |
| NPK + 12 kg microbial inoculant/ha | 30,000 | 10,551 | 60 | 633,054 | 271,598 | 361,455 |



# Anthocyanin

| | No fertilizer | NPK | NPK + 12kg/ha microbial inoculant |
|---|---|---|---|
| **Sweet Potato** |  |  |  |
| **Purple Yam** |  |  |  |

**TECHNOLOGY:** ***BioMeg-Microbial Inoculant***

## IMPACT:

### *Global Competitiveness*

*The use of this technology would significantly increase the production of sweet potato and purple yam. This would provide an adequate supply of sweet potato and purple yam for the development of their local value chains and industries that will provide sustainable livelihood or income opportunities to sweet potato and purple yam farmers, processors, and other stakeholders in the locality. The generated products can also be exported given the rising popularity of sweet potato and purple yam worldwide.*

### *Food Security*

*The subsequent nutrient uptake by sweet potato and purple yam with the use of the technology in the presence of macrofertilizers was found to increase yield and improve nutritional quality. Only a trace amount is applied a few days after planting to effect the desired benefit. The expected yield increase in crop production would ensure sustainable food security.*

**TECHNOLOGY:** ***BioMeg-Microbial Inoculant***

## IMPACT:

### *Climate Change*

*The technology that will be generated in this project uses sweet potato and purple yam enriched naturally by nutrients through proper nutrient management using natural microorganisms present in the soil. These crops grow in almost all soil types and are found to withstand the adverse effects of climate change. Since it can be easily cultivated, the crops are highly accessible to farmers.*

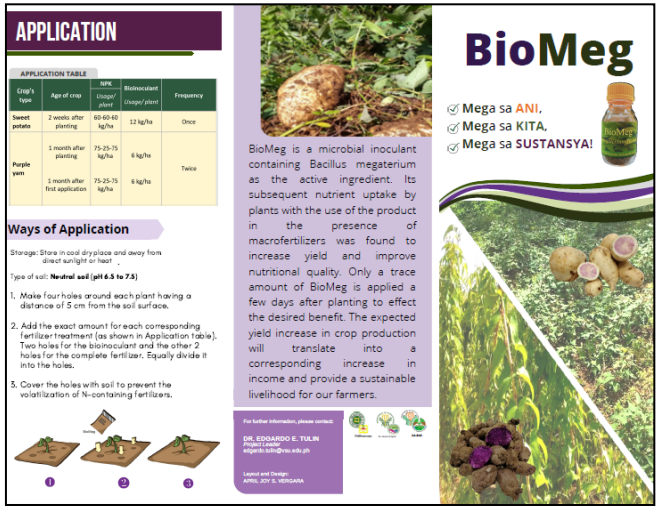
### *Environmental Protection*

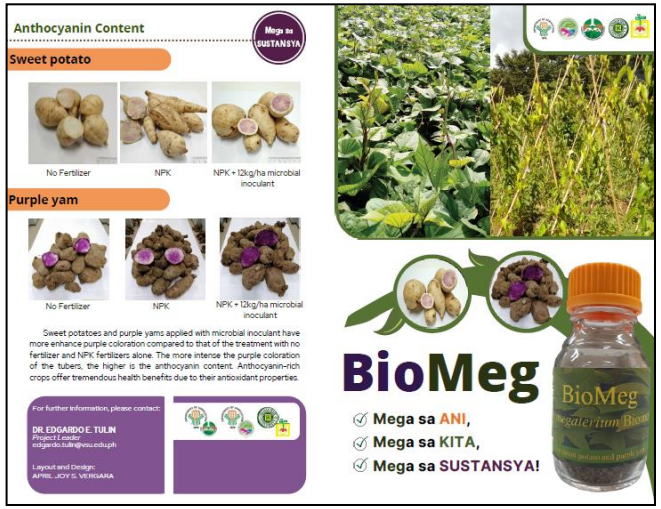
*This technology help increase the yield of purple yams without damaging the environment. Realizing the deteriorative effects of synthetic and chemical fertilizers in improving soil fertility, the technology employs a useful microorganism responsible for the continuous availability of nutrients from natural sources to revive soil health and improve soil quality.*

# Conclusions

- The release of micronutrients and subsequent uptake by plants with the use of the product in the presence of macrofertilizers was found to **increase yield and improve nutritional quality**.
- Only a **trace amount of BioMeg** is applied a few days after planting to effect the desired benefit.
- The expected yield increase in the presence of micronutrients in crop production will translate into a corresponding **increase in income and provide a sustainable livelihood for our farmers**.

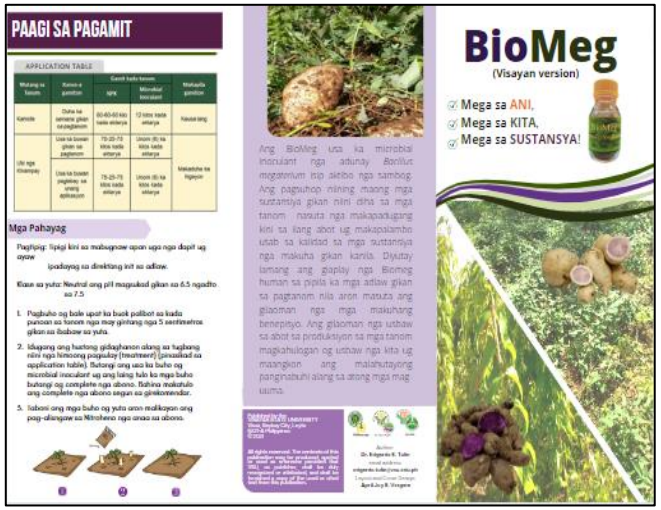
# *IEC Materials*




Visayan short and long brochure

English short and long brochure




# Brochure

Print Trifolds

## TEST RESULTS

### Anthocyanin

*Sweet Potato* *Purple Yam*

No Fertilizer

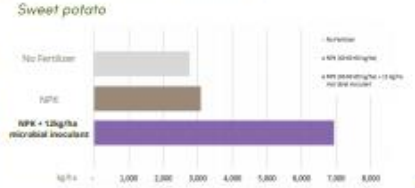
NPK

NPK + 12kg/ha microbial inoculant

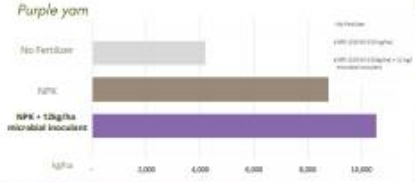
### Field Trials PhillRootcrops, VSU

**Marketable Yield**

*Sweet potato*

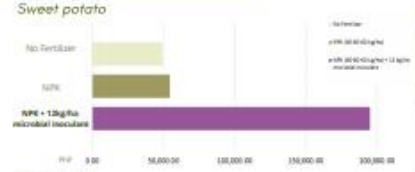



*Purple yam*

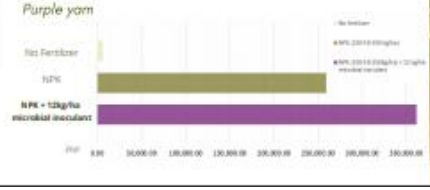



**Profit**

*Sweet potato*




*Purple yam*




## BioMeg

- Mega sa **ANI**,
- Mega sa **KITA**,
- Mega sa **SUSTANSYA**!


## ABOUT

### The Product

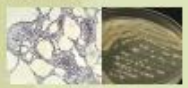

**BioMeg**
(Bioinoculant- dried product)

**Contents**

Organic Substrates

Ground Ipil-ipil leaves (N-source) and Cassava Peeling (C-source) with 2:1 Carbon Nitrogen Ratio

Microorganism



*Bacillus megaterium*

A rod-shaped, fast-growing spore-forming bacteria for micronutrient mobilization.

### Production Cost

| Type | Item | Unit Price (Php) | Amount (Php) |
|---|---|---|---|
| Material Cost | Ipil-ipil Leaves, 1.67Kg | 5/Kg | 8.00 |
| | Cassava Peeling, 3.37Kg | 1/Kg | 4.00 |
| | Empty water container used as incubator, 3pcs | 95/pc | 288.00 |
| | Pure culture stock | 100/tube | 250.00 |
| | Other lab supplies | 200/set-up | 200.00 |
| Utilities | Gas for substrate sterilization | 100/set-up | 100.00 |
| | Electricity | 100/set-up | 100.00 |
| | Water | 50/set-up | 50.00 |
| | Laborer (1man days) | 350/day | 1,050.00 |
| Total | | | 2,050.00 |

Basis: **5 kg Dried Product**

Unit Price: **PhP 410.00/kg bioinoculant**

## APPLICATION

APPLICATION TABLE

| Crop's type | Age of crop | NPK Usage/ plant | Bioinoculant Usage/ plant | Frequency |
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### Ways of Application

Storage: Store in cool dry place and away from direct sunlight or heat

Type of soil: **Neutral soil (pH 6.5 to 7.5)**

1. Make four holes around each plant having a distance of 5 cm from the soil surface.
2. Add the exact amount for each corresponding fertilizer treatment (as shown in Application table). Two holes for the bioinoculant and the other 2 holes for the complete fertilizer. Equally divide it into the holes.
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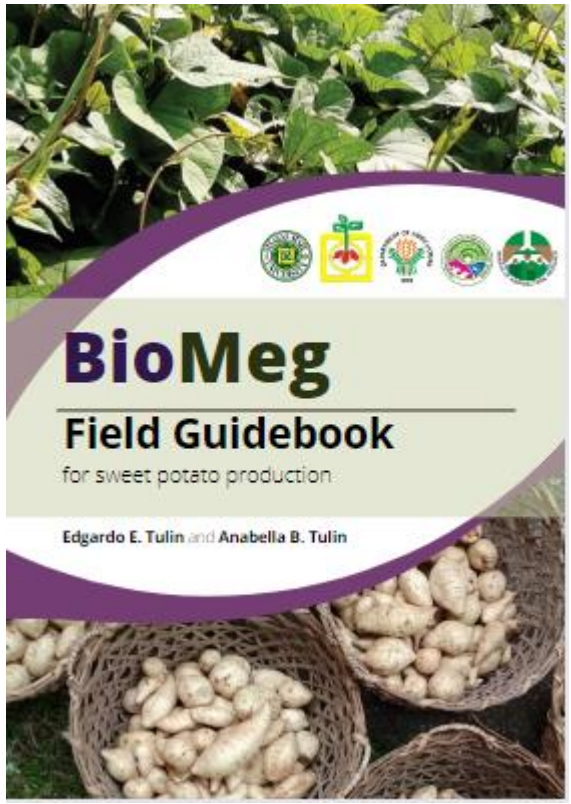
**BioMeg** is a micronutrient-mobilizing bioinoculant containing *Bacillus megaterium* as the active ingredient. The release of micronutrients and subsequent uptake by plants with the use of the product in the presence of macrofertilizers was found to increase yield and improve nutritional quality. Only a trace amount of BioMeg is applied a few days after planting to effect the desired benefit. The expected yield increase in the presence of micronutrients in crop production will translate into a corresponding increase in income and provide a sustainable livelihood for our farmers.

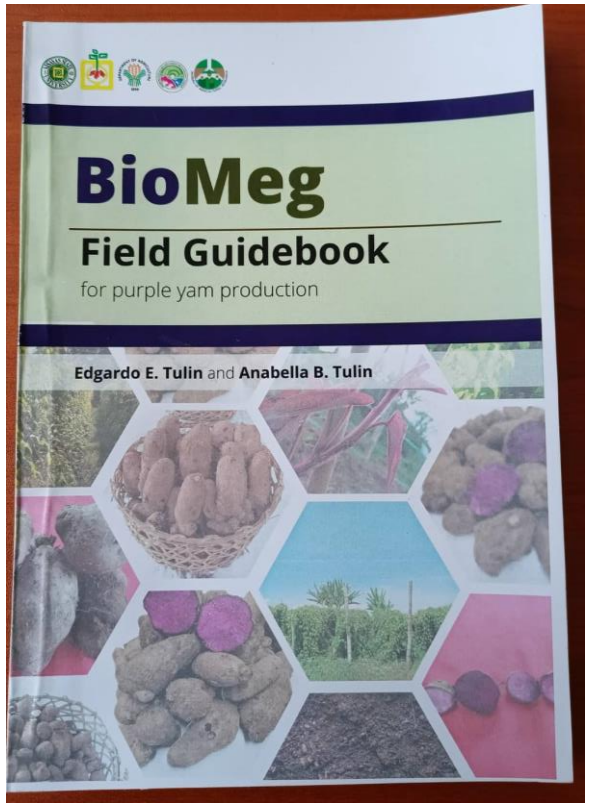
For further information, please contact:
DR. EDGARDO E. TULIN
Project Leader
edgardo.tulin@vsu.edu.ph

Layout and Design:
APRIL JOY S. VERGARA

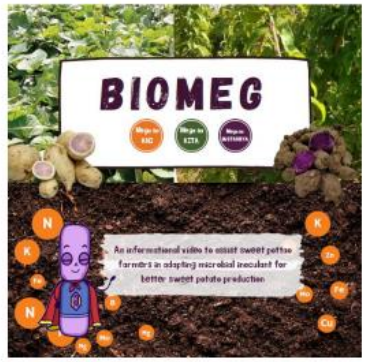
**Front** **Back**

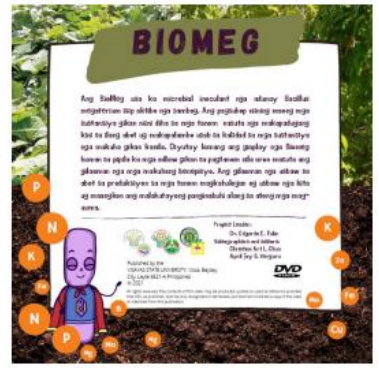
# *IEC Materials*



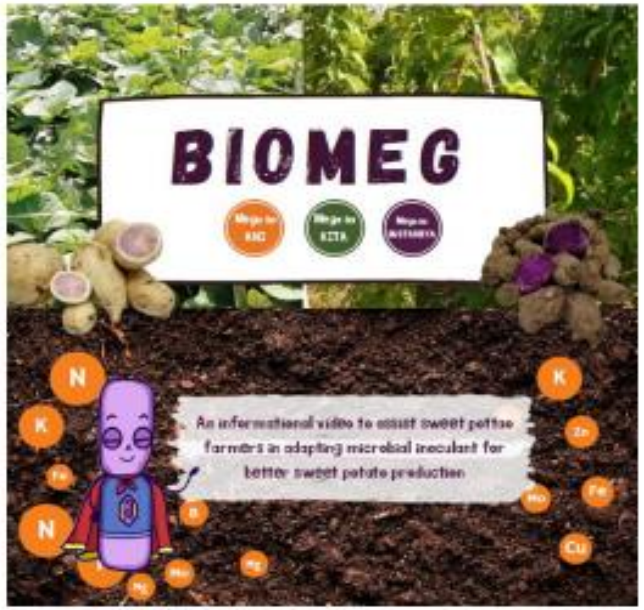

BioMeg Field Guidebook for sweet potato and purple yam production

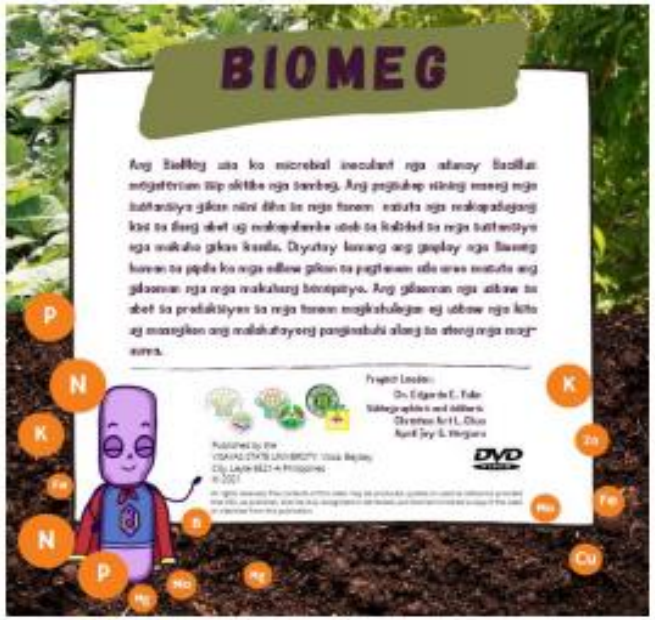




CD (promotional video)


BIOMEG
An informational video to assist sweet potato farmers in adopting microbial inoculant for better sweet potato production


BIOMEG
DVD


BIOMEG
Presented to you by:

# Thank you.