19th

FNCA

Forum for Nuclear Cooperation in Asia

Ministerial Level Meeting

PHILIPPINES

COUNTRY REPORT

ISO 9001

Mutation Breeding

PROJECT

Improvement of Traditional Rice Varieties by Gamma Irradiation

Different potential mutant lines at M_4 generation

Umangan #8 is a potential early-flowering mutant line

Radiation Oncology

PROJECT

Workshop on Radiation Oncology Project
November 4 – 7, 2018 · Dhaka, Bangladesh

Miriam Joy C. Calaguas, M.D., FPROS
Department of Radiation Oncology
St. Luke's Medical Center and
José R. Reyes Memorial Medical Center (JRRMMC)

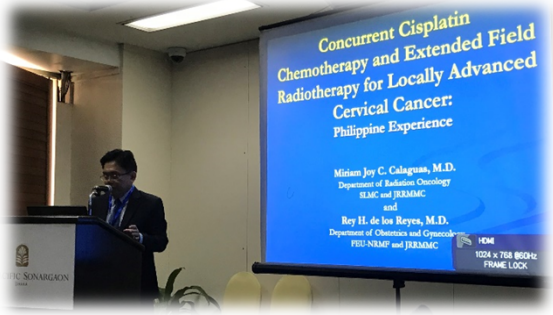
Rey H. de los Reyes, M.D., FSGOP
Department of Obstetrics and Gynecology
Far Eastern University Nicanor Reyes Medical Foundation and
JRRMMC

Jaemelyn Marie O. Fernandez, M.D., DPROS
Department of Radiotherapy
JRRMMC

Jerickson Abbie S. Flores, M.D.
Department of Radiotherapy
JRRMMC

Presentation of Philippine Data and Session Chairs

Phase II Study of Concurrent Chemoradiotherapy with Extended-Field Radiotherapy for Locally Advanced Cervical Cancer (CERVIX-IV) – Philippine data presented by Dr. Rey de los Reyes (Co-chaired the session)



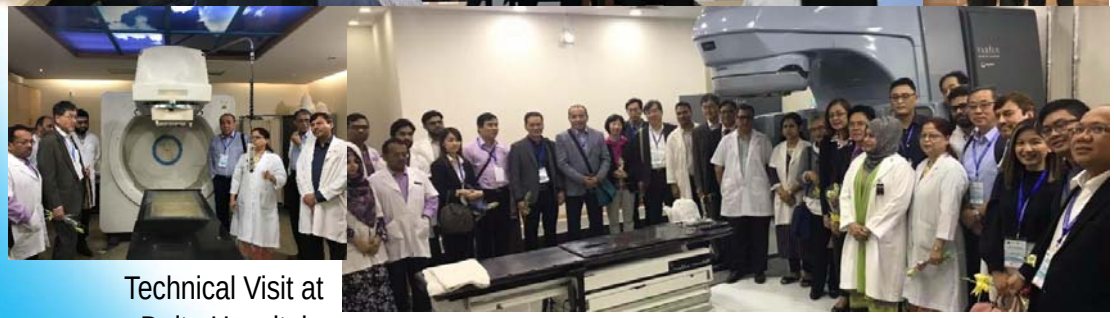
Prospective Observational Study of 3D-Image guided brachytherapy for Locally Advanced Cervical Cancer (CERVIX-V) - Philippine data presented by Dr. Rey de los Reyes

Phase II Study of Neoadjuvant Chemotherapy with Concurrent Chemoradiotherapy (CCRT) for Nasopharyngeal Carcinoma (NPC-III) – presented by Dr. Jerickson Flores

Phase II Study of Hypofractionated Radiotherapy for Breast Cancer (Postmastectomy Radiation Therapy (PMRT)/BREAST-I) – presented by Dr. Jaemelyn Fernandez

Drafting Workshop Minutes - Minutes drafted and session co-chaired by Dr. Jerickson Flores and Dr. Jaemelyn Fernandez

Technical Visits and Open Lecture Participation



Technical Visit at Delta Hospital Limited

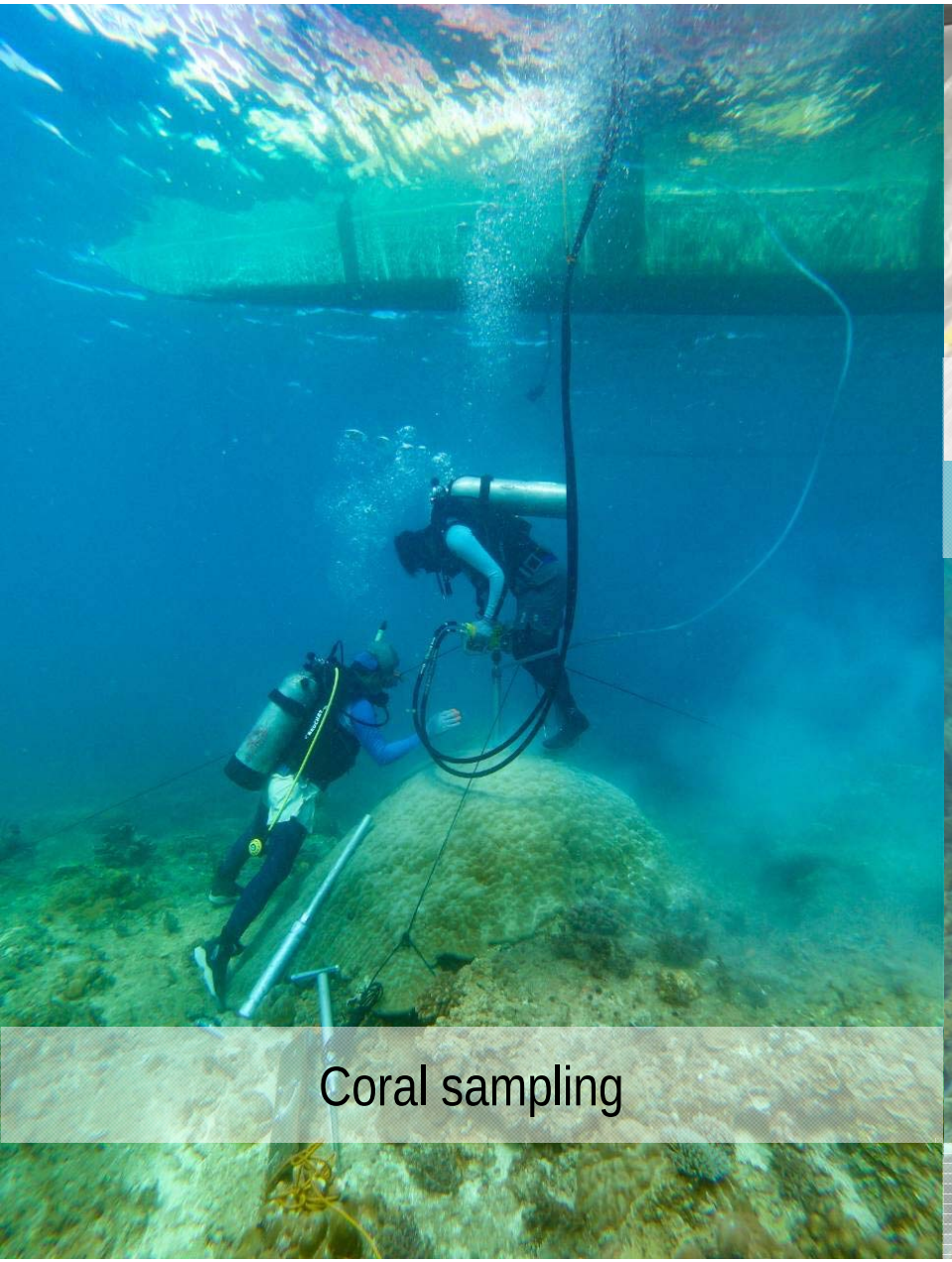
Technical Visit and IGBT Hands-on training at United Hospital Limited

Technical Visit and Open Lecture
at National Institute of Cancer Research and Hospital (NICRH)

Dr. Miriam Joy C. Calaguas, Project Leader of FNCA on Radiation Oncology in the Philippines, gave her lecture on “Past, Present, Future of Radiation Therapy in the Philippines: A Journey Through FNCA“

Climate Change Using Nuclear and Isotopic Techniques

RESEARCH

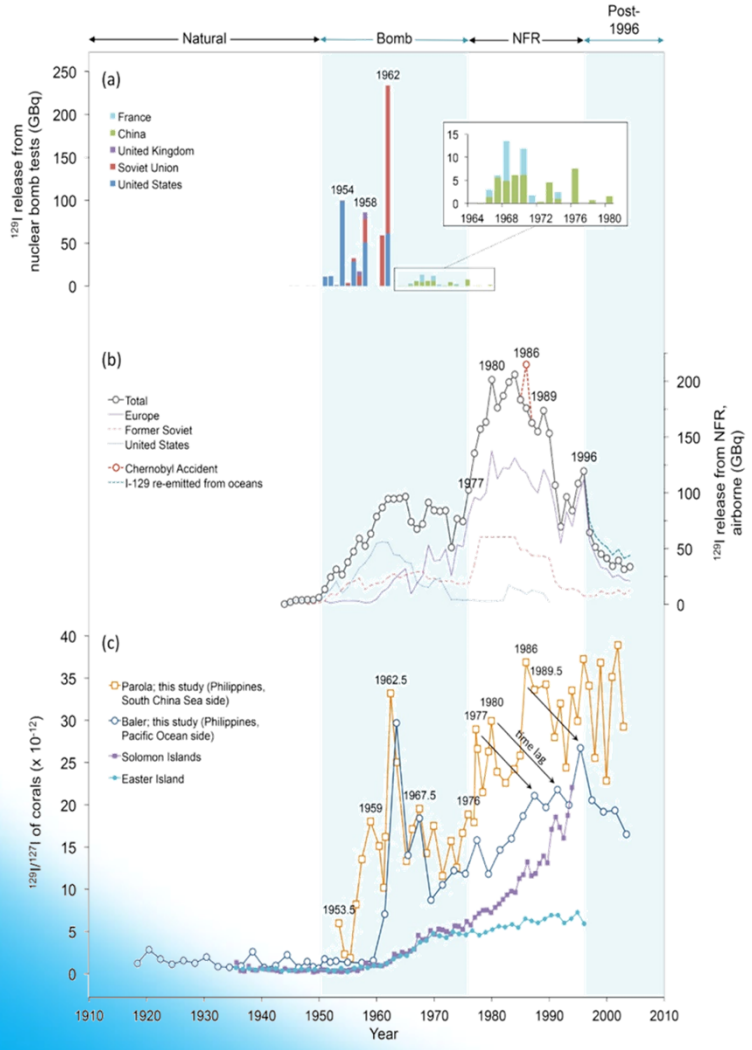


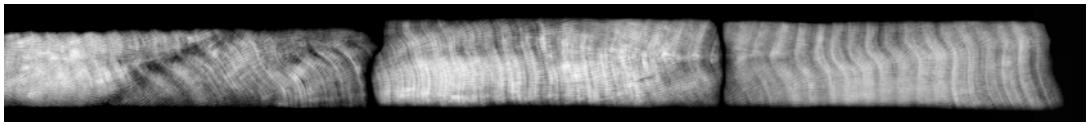
Coral sampling

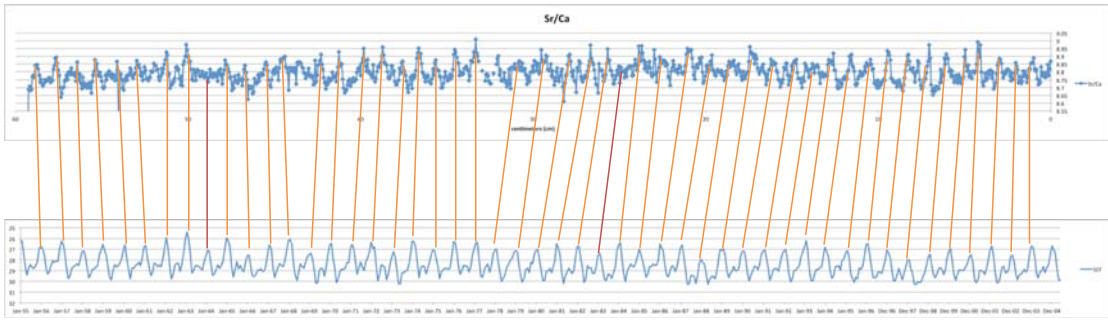
Coral Core Sample

(1m = ~100y record of environmental and climate change)

Porites spp. corals







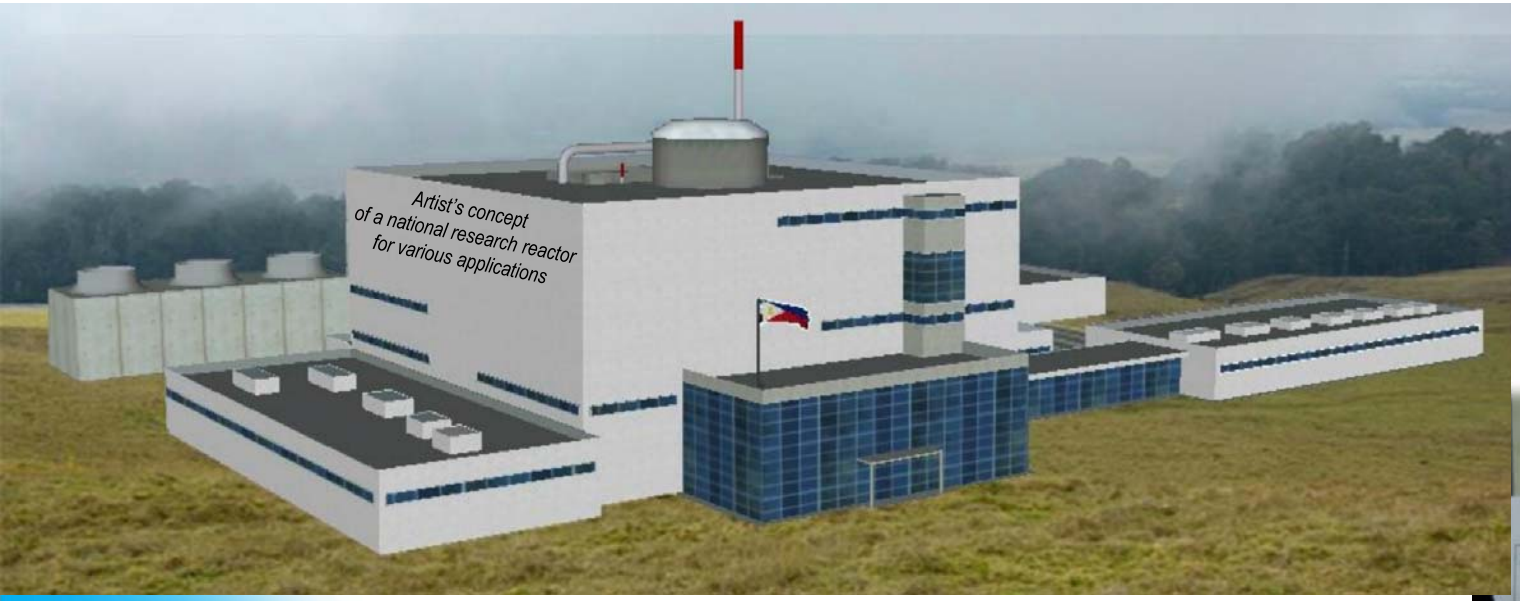
Trace and minor elements	
Sr/Ca	Sea surface temperature
U/Ca	Sea surface temperature
Mg/Ca	Sea surface temperature
Mn/Ca	Wind anomalies, upwelling
Cd/Ca	Upwelling, contamination
Ba/Ca	Upwelling, river outflow
Pb/Ca	Gasoline burning, pollution

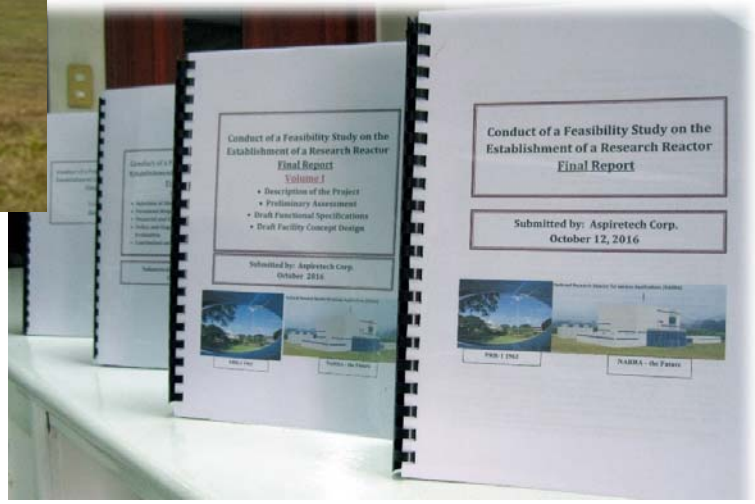
Research Reactor Utilization

PROJECT

Subcritical Reactor Assembly for Training, Education and Research (SATER) by using the PRR-1 TRIGA fuel elements expected to be commissioned by 2020

Feasibility study on the establishment of a 10MW Multipurpose Research Reactor (NARRA) concluded





Tc-99m Generator production facility waiting for supply of Mo-99

Feasibility study on establishment of a 30 MeV cyclotron concluded

National Project Leader recommends

to take a hiatus from the Research Reactor Utilization Project

since the Philippines is still establishing own research reactor

to be commissioned by December 2020

Nuclear Security and Safeguards

PROJECT

- Nuclear Materials accounting reports submitted annually through the Secure Communication
- Additional Protocol (AP) reports sent as per AP Agreement

PNRI Mobile Expert Support Team (MEST) participated in 2 major public events in 2017

PNRI MEST teams and Armed Forces of the Philippines (AFP) personnel in action as the Philippines hosted the Association of Southeast Asian Nations (ASEAN) 2017, in time for the intergovernmental organization's 50th anniversary.

A member of the PNRI Mobile Expert Support Team (MEST) discusses about the Mobile Detection System (MDS) van previously used by PNRI and police personnel during the APEC and ASEAN summits.

Radiation Safety and Radioactive Waste Management

PROJECT

Program on Radioactive Waste Management Pre-Disposal

- Policies and Regulations:
  - House Bill on “Hazardous and Radioactive Wastes Management Act” to develop comprehensive waste management programs
  - House Bill on “An Act Providing for a Comprehensive Nuclear Regulatory Framework” for the management of spent fuel and other radioactive wastes
  - DRAFT CPR Part 28: Licensing Requirements for Land Pre-Disposal of Radioactive Waste
  - DRAFT CPR Part 29: Licensing and Safety Requirements for Disposal of Radioactive Waste Utilizing the Borehole Disposal Facility

Program on Radioactive Waste Management Pre-Disposal

Inventory of Radioactive Waste

as of December 2017

I. SOLID AND LIQUID

Waste Type	Unconditioned		Conditioned		Radionuclide	Origin
	Vol./unit	Activity, Bq	Vol./unit	Activity, Bq		
Solid	~16 m^3	~1.5E+09	~36 m^3	1.3E+08	Th-232, H-3 Cs-137,C-14 Co-60	**Industry** *(Th mantles)* **Research** *(labelling expt.)* **Medical** (media culture, shielding
Aqueous (liquid)	~1.6 m^3	~2.2E+10	~2 m^3	~8E+09	Co-60, H-3, Cs-137,C-14	**Research** *(labelling expt.)* **Medical** *(media culture)*
Organic (liquid)	~3.6 m^3	~2.8E+10	~0.03 m^3	~6.7E+08	C-14,Cl-36, H-3,Sr-90	**Research** *(scintillants)*

II. DISUSED SEALED RADIOACTIVE SOURCES

Trench A		Trench B		Trench C		TOTAL		Radionuclide
Units	Activity, Bq	Units	Activity, Bq	Units	Activity, Bq	Units	Activity, Bq	
525	5.96E+13	324	1.29E+14	1572	2.07E+14	2421	3.96E+14	Am-Be, Co-60, Am-241, Ni-63, Cs-137, Sr-90, Ra-226, Pu-238, Ir-192

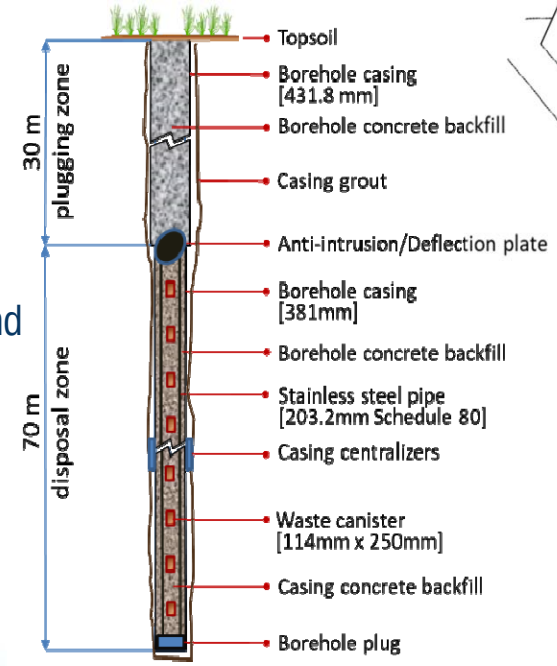
Program on Radioactive Waste Management Pre-Disposal

PRE-DISPOSAL STRATEGY

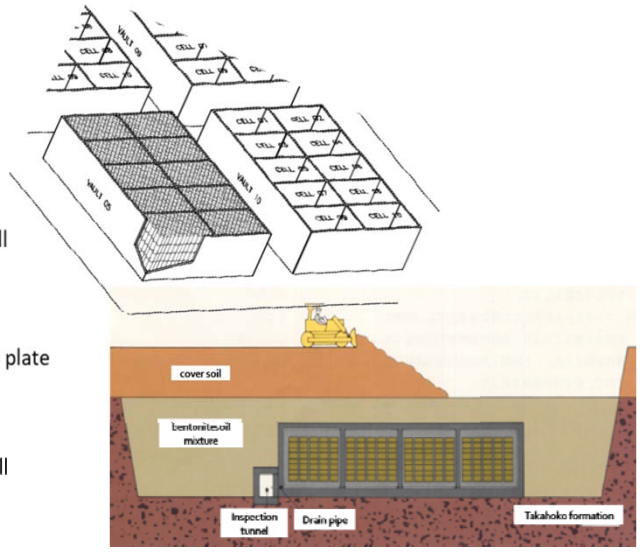
Category 1 to 2	•Conditioned sources stored in long term storage shield; unconditioned sources remained in original working shield
Category 3 to 5	•Sources retrieved and conditioned in stainless steel capsules, Unconditioned sources and devices that can not be retrieve are stored in storage shelves
Solid Waste	•Compacted in 100 L drum & cemented in 200L drum
Liquid waste, organic	•temporarily stored awaiting an identified treatment process
Liquid waste, aqueous	•waste are incorporated in cement mixture in 200L drum
Am-241	•repatriation to USA under the Off-Site Source Recovery Project (OSRP) → 849 Am-241 foil, 44 Am-241 sources, 26 Am/Be sources
Depleted Uranium	•assessing the depleted uranium (DU) from radioagraphic camera and teletherapy equipment for potential removal of DU from the Philippines for recycling in Europe

Program on Radioactive Waste Management Disposal

- Philippines is in the process of identifying a suitable disposal site for short - lived low - level, intermediate - level radioactive wastes, and spent highly active radioactive sources in the Philippines.
- A co-location of the Near Surface and Borehole Disposal Facility intended to manage both short and long-lived radionuclides



Borehole disposal design



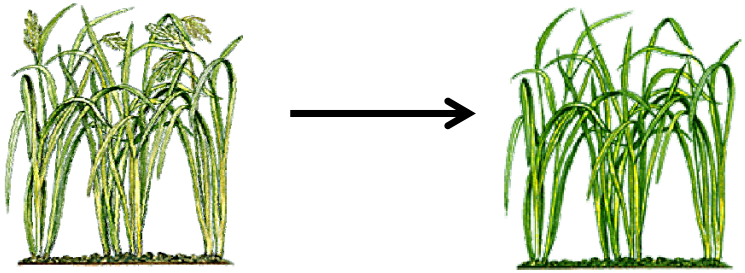
Near-surface disposal design

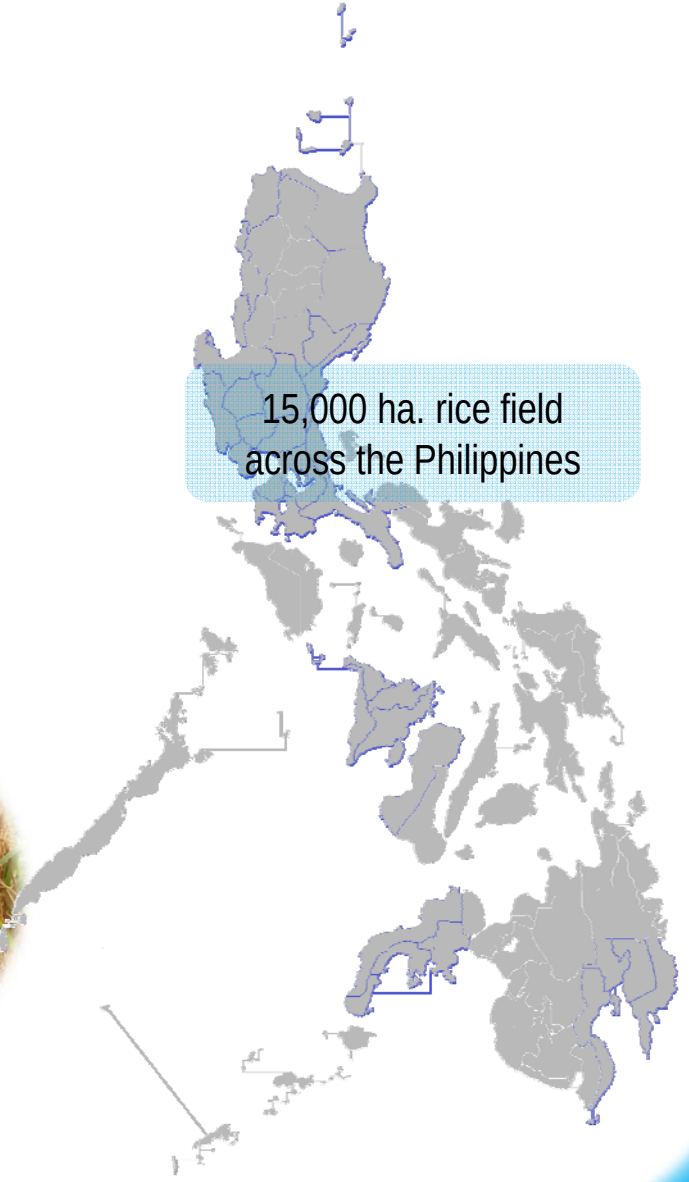
Co-location concept

Radiation Processing and Polymer Modification for Agricultural, Environmental and Medical Applications

PROJECT

FOLIAR SPRAYING





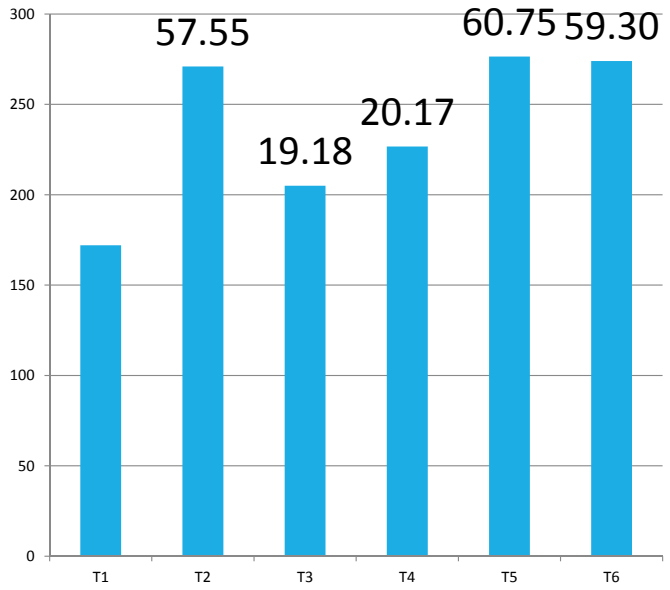
15,000 ha. rice field across the Philippines

No Carrageenan PGP

With Carrageenan PGP

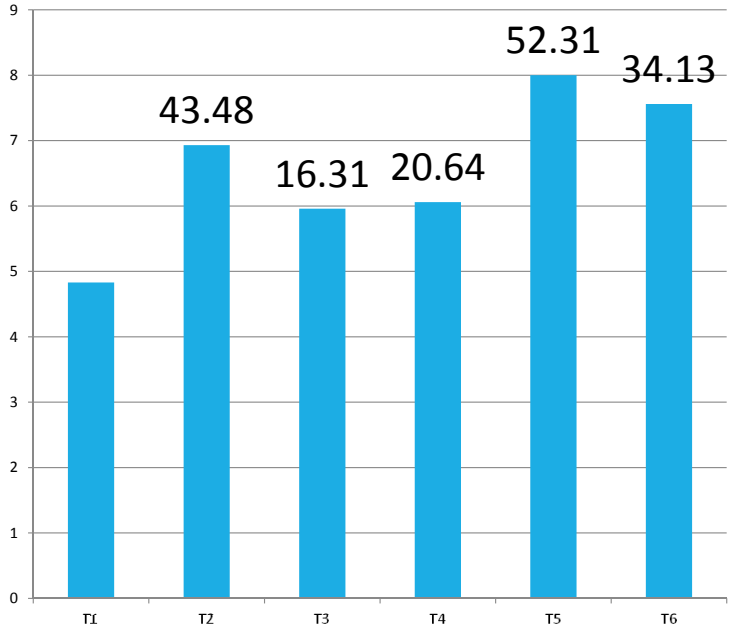
After Super Typhoon MANGKHUT "Ompong" (2018)

Fresh weight of corn (grams per ear) as affected by PGP, BF and chemical fertilizers



Legend:
T1 – Control
T2 – 100%chemical fertilizers (4 bags UREA-46-0-0)
T3 – 50% chemical fertilizers (2 bags 46-0-0)
T4 –50% chemical fertilizers + Oligochitosan
T5 – 50% chemical fertilizers +Bio N +Oligochitosan
T6 - 50% chemical fertilizers +Bio N

Dry yield of rice (kg/plot) as affected by PGP, BF and chemical fertilizers



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THANK YOU

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