



Enhancing Agricultural Productivity

Nuclear Science and Technology Working for You



Carrageenan Plant Growth Promoter

Carrageenan, which is extracted from red edible seaweeds, can be modified to become an effective foliar fertilizer by radiation processing using the Electron Beam Facility of DOST-Philippine Nuclear Research Institute.

With essential nutrients and plant growth promoters (PGP), Carrageenan PGP is effective in enhancing the vigor and increasing the yield of rice and other crops like mungbean, peanut, and green, leafy vegetables. At even a very small amount, Carrageenan PGP, rice yield is increased by 20-30%. Foliar application of Carrageenan PGP on mungbean can boost yield by 50% to 100%.

Carrageenan PGP is fully compatible with farmers' practices in different cropping systems. It can even lessen the use of inorganic fertilizers and yet stimulate an increase in yield. Based on multi-locational field tests conducted nationwide, this product provides resistance against rice tungro virus, bacterial leaf blight, and bacterial leaf streak, thus evading a possible loss due to the disease. This technology is environment-friendly. It is non-toxic to beneficial insects and anthropods.



Test field without Carrageenan PGP

Test field with Carrageenan PGP

Nuclear Techniques for Efficient Nutrient and Water Management for Agricultural Crops

Philippine Nuclear Research Institute scientists are developing precision farming methods in rice and corn using radioisotopes and stable isotope tracers such as nitrogen-15. Through these methods, the right amount and proper timing of fertilizer application at different growth stages of crops can be determined.

Soil moisture neutron probe is being used to optimize irrigation scheduling, while carbon-13 and oxygen-18 isotopes are used to evaluate and assess the effectiveness of different irrigation technologies.

Results show that better practices can increase fertilizer utilization up to 70 percent. Appropriate irrigation scheduling can improve crop water use efficiency and minimize losses by around 25 percent.



Monitoring and measurement of soil moisture using Soil Moisture Neutron Probe

These will serve as bases for updating the decades-old recommended levels of fertilizer and water inputs in agricultural production.

Crop Improvement through Mutation Breeding

The DOST-PNRI uses mutation breeding, a non-conventional method of plant breeding, to develop new and improved varieties of crops.

Mutation breeding is a method that uses mutational agents (mutagens) such as gamma radiation which can induce hereditary changes, or mutations, in the treated planting materials. Mutants with desirable attributes may arise/come out from these irradiated

materials which will be selected and developed as new varieties.

PNRI has developed mutant varieties of rice that are high yielding, disease-resistant, with shortened maturity, and have improved agronomic characteristics. The Institute's scientists are also using gamma radiation and related biotechnology to develop new and improved mutant varieties of fruit crops, and ornamental plants.



Dracaena 'Marea'



rice



Murraya 'Ibarra Santos'