

More information

Mr. Tong Socheath, Royal University of Agriculture, Phnom Penh, Cambodia;
tongsocheath@yahoo.com

Dr. Borarin Buntong, Royal University of Agriculture, Phnom Penh, Cambodia;
borarin@yahoo.com

Dr. Antonio L. Acedo Jr., AVRDC - The World Vegetable Center South Asia, ICRISAT Campus, Hyderabad, India;
jun.acedo@worldveg.org

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Contact:

AVRDC - The World Vegetable Center
P.O. Box 42, Shanhua, Tainan 74199, TAIWAN
Tel: +886 6 583 7801
Fax: +886 6 583 0009
Email: info@worldveg.org



CHITOSAN TECHNOLOGY

Gold from waste!

Technology Brief #5



Royal University of Agriculture

CHITOSAN TECHNOLOGY

Chitosan, a high-value safe input in horticulture, has been successfully extracted from shrimp shell waste, which is a continuing management and environmental problem of the seafood industry in Cambodia and other developing countries. Chitosan can be used as a biostimulant to stimulate plant growth and stress tolerance, control preharvest and postharvest diseases, and improve shelf life of horticultural crops.

Extraction

Shrimp shells are deproteinized with 5% NaOH, demineralized with 3% HCl, decolorized with 0.315% sodium hypochlorite, and subjected to deacetylation using >40% NaOH. The resulting chitosan yield is about 25%, with moisture content of 11.3%, total ash of 0.65%, solubility of 96.6%, degree of acetylation of 78%, and viscosity of 1536 mpa/s.

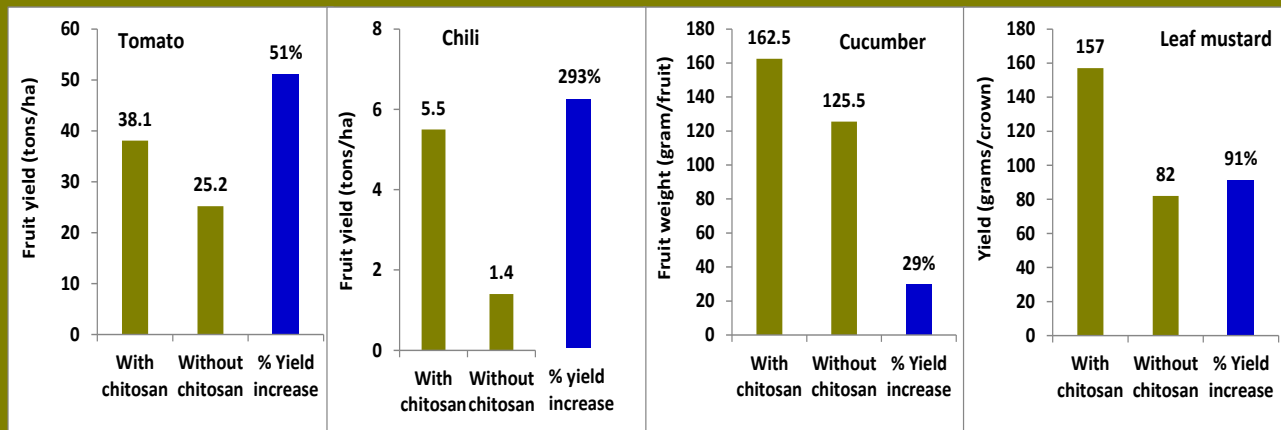
Application

PREHARVEST: 1% chitosan (10 g chitosan/liter water) is sprayed to runoff to the plants at 20 days after transplanting of tomato, chili and cucumber and 7 days after transplanting of leaf mustard, and every 5 days thereafter until 2 weeks before harvest.

POSTHARVEST: 1% chitosan is applied as a pre-storage coating by dipping produce in the solution for 5 min.

Benefits

Vegetable yield increases of 30-300% due to more vigorous growth and less diseases.



Fruit shelf life increases due to delayed ripening and reduced weight loss.

