

## Bio-Refined Nano Nutrients From Fish & Shellfish By-Product For Roof Top Gardening And Urban Horticulture

B.B. Sahu<sup>1</sup>, S.K. Das<sup>2</sup> and P. Mohanty<sup>3</sup>

<sup>1</sup> Mentor Scientist, CIFA-ICAR-AGRIN

<sup>2</sup> Ex-Principal, TATA, Marginal Farm Management Institute, Navsari, Gujrat

<sup>3</sup> Marketing Specialist

ARTICLE ID: 006

In-discriminatory usage of chemical fertilizers, pesticides, antibiotics, agro-chemicals in agriculture and water bodies has created many environmental and health issues. Culture and capture fisheries resources utilizes nutrients from the coastal water bodies which creates pollution in Bay of Bengal through river systems. Post harvests fish processing waste constitute around 50% in a fish are not commonly used in human feeding and are disposed off. Fish waste recycling into organic fertilizers is well in tuned with current food production concern, waste disposal, environmental responsibility and supply chain efficiency.

“Fish waste bio-refineries” are defined as sustainable processing of fish waste biomass into a spectrum of marketable products and energy for crop, animal and fish farming. Fish processing waste are promising renewable biomass.

Fish bio extracts are liquid organic fertilizers for plants and crops are used as a foliar spray and drenching. Solid bio-extracts are powdered organic fertilizer use for soil and aquaculture pond recharge.

Shellfish bio-extracts are immune-modulators, plant and animal disease prevention, anti fungal and anti bacterial activities. All these products provide resistance to plant and animals against climate change issues such as drought, flood and cyclone.

### Nutritional composition of liquid fish fertilizer (LFF)

Bio-available Primary nutrients	
Nitrogen	1.5%
Phosphorus	0.5%
Potash	0.4%
Carbon	33.7%

Bio-available Secondary nutrients	
Sulphur	1.52%
Magnesium	1.75%
Calcium	2.24%

Bio-available Micro nutrients	
Boron	10.4%
Zinc	17.9%
Haem iron	24.5%
Manganese	5.2%
Copper	3.5%
Choline and molybdenum	traces

**Benefits of organic fish fertilizer :**

Fish fertilizer is a liquefied organic fertilizer, excellent for fertigation and foliar spray.

**Agri-Horti-Vegi-Flori-Lawn Foliar spray :**

1 ml/litre liquid fish fertilizer (Planktofert) for foliar spraying once in every week.

**Agri-Horti-Vegi-Flori-Lawn Fertigation :**

2 litre /acre for fertigation/drip irrigation/green house farming

**Liquid planktofert dose :**

Drip irrigation – 1ml /ltr water  
Soil less planting – 1ml /ltr water  
Hydroponics – 1ml /ltr water  
Vertical gardening – 1ml /ltr water  
Aqua ponics – 1ml /ltr water

**Agri-Horti-Vegi-Flori Use :**

Lawn and Landscape – 6gm/sqft/every 15 days interval, 2 times

Floriculture flower beds – 6gm/sqft/every 15 days interval, 2 times

Rose plants/flower pots – 6gm/flower pot/every 30 days interval, 2 times

Vegetables/fruit plant beds – 6gm/sqft/every 30 days interval, 2 times

**Powdered biofert dose :**

Potting material preparation – 1kg /100kg /potting media

**Pestolyse dose :**

Liquid bio-organic immunostimulant, disease and pest control foliar spray 1ml/ltr water.

Planktofert and pestolyze are bio-organic and suitable for green house farming, spraying by drone and drip irrigation.