

The Nature and Benefits of Pro-Plant: 100% Organic, Microbial, Liquid Bio-fertilizer

1. Introduction

Pro-Plant is a very concentrated microbial, 100% organic, liquid bio-fertilizer and is made from fresh fish. It is made with in-house bio-technology techniques. It provides about 50 major, minor, and trace nutrients for plant growth. This is far more than foliar sprays generally that only provide a very small number of nutrients and focus on NPK. Agronomy recognizes that plants need 42 nutrients to grow healthily and abundantly.

Physical Properties: Concentrated brown-black liquid
Produced From: 100% fish enzymes by MCP
Methods of Analysis: AOAC (Official Methods of Analysis of the Association of Official Analytical Chemists)
pH: 5.0



Pro-Plant is the creation of Somkiet Panjanapongchai, who is one of the top people in Thailand in the area of agriculture-, aquaculture-, and waste-water-treatment-related bio-technology. Pro-Plant is very effective because of the bio-technology techniques used to make it. It is not like so many Indian and Chinese foliar sprays on the market, which are formulations and mixtures that are made from flowers, animals, seaweed, or humus.

2. Properties of the Bio-Liquid Fertilizer

- **Pro-Plant** is very concentrated and only a small quantity of this bio-liquid fertilizer is needed to accelerate plant growth and increase the yield.
- **Pro-Plant** is instantly usable by the leaves or roots.
- **Pro-Plant** stimulates the respiratory and photosynthesis system so that the plant can absorb nutrients as needed.
- **Pro-Plant** makes the plant healthy and tolerant to pests.
- **Pro-Plant** is very effective in speeding up the normal growth rate.
- **Pro-Plant** improves the soil structure by making the soil softer and crumbly.
- **Pro-Plant** stimulates fruit forming.
- **Pro-Plant** is harmless to touch and inhale, perfectly safe, and beneficial environmentally.

3. Some Advantages of Pro-Plant Bio-Liquid Fertilizer

- **Pro-Plant** enables farmers to stop using chemical fertilizers when it is used together with Bio-Plant, while increasing the crop productivity beyond what chemical fertilizers can achieve. It thereby also increases the wealth of the farmers.
- **Pro-Plant** increases both the major and minor nutrients in the soil, and provides the essential minor nutrients that chemical fertilizers do not provide. Pro-Plant essentially contains the major and minor minerals of fertile soil.
- **Pro-Plant** increases the absorption rate of nutrients.
- **Pro-Plant** makes the plant healthy, resulting in tolerance to pests and diseases. In rice, for example, the stems are much thicker than in chemical fertilizer rice, and insects find it very hard to bite them.

- **Pro-Plant** increases the quality and quantity of crop yield, resulting in increased income.
- **Pro-Plant** accelerates plant growth, blooming, and fruiting (fruit formation). In bio-chemical farming, for example, spraying Pro-Plant on the leaves in the productivity stages adds an extra 15% + to the yield.
- **Pro-Plant** helps to improve the soil structure.
- **Pro-Plant** supplements the carbon dioxide-fixing process.
- **Pro-Plant** enables vegetables to grow larger and become crispier and sweeter than when grown with chemical fertilizers.
- **Pro-Plant** enables fruit trees to produce more, and makes the fruit larger, crispier, tastier, and sweeter; and the vitamin C level is higher by about 20%.

4. Pro-Plant Promotes Root Exudation and Increases Nutrient Uptake: A Technical Explanation of How

Foliar fertilizers trigger greater root exudation which contributes to feeding soil microbes leading to increased nutrient uptake. Foliar fertilization is so important and crucial to good agricultural practices. A plant relocates carbohydrates, including sugars and proteins, to the rhizosphere versus consuming it all for fruit or seed production or overall plant development (above ground).

A number of research reports find that a significant proportion of plant photosynthates are transported below ground shortly after photo-assimilation and subsequently released to soil microbes (Dilkes et al., 2004; Bahn et al., 2009; Mencuccini & Holtta, 2010). This release can be through direct exudation from the surface of fine roots or by transfer to the extraradical mycelium of mycorrhizal fungi (Jones et al., 2004, 2009; Drigo et al., 2010). Both root exudation and transfer to mycorrhizal fungi occur rapidly after photosynthesis, ranging from a few hours in grasses to a few days in trees (Johnson et al., 2002; Dilkes et al., 2004; Kuzyakov & Gavrichkova, 2010).

Root exudation stimulates microbial decomposition of soil organic matter, which in turn improves nutrient availability along the rhizosphere (Kuzyakov, 2010; Bird et al., 2011; Philippot et al., 2013). Carbon (C) transfer to mycorrhizal fungi benefits the plant through direct nutrient transfer from the fungal hyphal network (Bever et al., 2009; Fellbaum et al., 2011; Kiers et al., 2011). In both cases, the plant's investment in below-ground C allocation is rewarded with increased nutrient availability, in particular nitrogen (N) and phosphorus (P) (Hodge & Storer, 2014).

Now we're finding out that this root exudation process not only improves nutrient uptake but also supports the growth of mycorrhizal fungi to help the plant's access to nutrients and water by extending its range into soil areas that are not accessible by roots or into nutrient rich soil "hot spots."

In addition, the extraradical hyphae which enlarge root areas, facilitate the distribution of recently assimilated plant carbon to the soil microbial community. This process, along with the sugar and protein responses through root exudation, may help the plant stimulate specific microbial responses, including enzyme production, to consume the nutrients that the plant needs.

Imagine, the plant is communicating with the microbial community, letting it know what it needs at any given time!

5. Additional Information

5.1 The Shelf Life at a Tropical Temperature After Opening the Bottle.

- About 9 months.

5.2 The Shelf Life of Pro-Plant When Mixed in Water. (Same for Bio-Plant.)

- 7 days.

5.3 The Survival of the Bacteria in Soil at Tropical and Cold Temperatures.

- 100% survival if the temperature is not over 60 degrees Celcius.
- 100% survival until the temperature drops to about minus 20 degrees Celcius.

5.4 How the Micro-organisms of Pro-Plant Work on Plant Leaves.

- Pro-Plant contains the major and minor elements of fertile soil, and amino acid. These are all soluble in water. Pro-Plant also contains micro-organisms which protect the plants by acting as a natural herbicide and fungicide. Some of the micro-organisms are absorbed through the leaves and they improve the plant's immune system. Some micro-organisms stay on the leaves and protect the plant from attack by bacteria and fungi.
- When the solution of Pro-Plant and water is sprayed onto the leaves, buds, and flowers before the fruit appears, the minerals enter the plant through the pores under the leaf skin surface. The advantage is that the minerals are usable instantly by the leaves, buds, and fruit flowers. In comparison, in the case of granular fertilizer, it takes several days longer for the minerals in the soil to reach the leaves.
- The Pro-Plant solution that falls to the ground provides the plants with the range of minerals they need through the roots. The micro-organisms act as a herbicide and protect the roots and the plants from fungus.
- In cases where the farmers have crop diseases we would ask them to mix Bio-Plant with the Pro-Plant in water (at the ratio of 5 cc Bio-Plant + 20 cc Pro-Plant in 20 litres of water) as the extra input of micro-organisms will protect the plants from infecting fungi and bacteria and also improve their immune system.

5.5 How to Spray Pro-Plant.

- Mix Pro-Plant at the ratio of 1 litre with 1,000 litres of water. This will be enough for two hectares per application.
- Spray it in a misty, foggy spray, diagonally upwards so that it hits the underside of the leaves and also lands on top of the leaves. Spray before 9 a.m.
- [Click here](#) to find out how to apply Pro-Plant to 60 different crops.

5.6 Efficacy of Pro-Plant.

- [Click here](#) to see Field Tests using Bio-Plant and Pro-Plant. Scroll down to Section 3, Part 2.
- See next page for two examples.

Conclusion of the Maize Test in Chanchaga Village, Niger State

“Any treatment that involves Pro -Plant is therefore highly recommended to maize farmers.”

The Director
Farm Input Support Services Department.
Federal Ministry of Agriculture and Rural Development.

100% Organic Farming Rice Field Test in Taraba State. Pro-Plant Used Only.



- The farmers did not prepare the soil with Bio -Plant and organic matter, and only sprayed Pro-Plant on the rice.
- Nevertheless, the farmers said that their crop yield was more than they ever got with Urea and NPK.
- There were no empty seed shells on the rice plants.
- Also, their costs were very much lower because they only needed one litre of Pro-Plant per hectare.