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How to Grow Cocoa with Bio-Plant and Pro-Plant

Stage When to Use the Bio-fertilizers	How to Use Them	Benefits
1. Nursery Stage: Seed Preparation	<ul style="list-style-type: none">• Soak up to 20 kgs of seeds for 18-24 hours in 20 litres of water that contains 20 cc of Bio-Plant before planting. Use this ratio for smaller amounts of seeds.• They can be kept in sacks after soaking for up to 48 hours to germinate before planting in black, plastic potting soil bags.	<ul style="list-style-type: none">• Soaking softens the seed coat for easy germination.• It also fills the seeds with micro-organisms, which prevent disease, increase the survival rate of the seeds, and enable healthy growth.• This inoculates the seeds against disease and ensures that the trees will become healthy.
2. Nursery Stage: Planting the Seeds Month 1	<ul style="list-style-type: none">• Make 5 MT of rich bio-compost with Bio-Plant mixed with water. Ratio 1 litre: 1,000 litres of water.• Leave it for 14 days for the micro-organisms to multiply.• Plant the seeds in black, plastic bags in potting soil made with the bio-compost.• Spray 100 cc of Bio-Plant mixed with 100 litres of water every 15 days on the soil only.• When the leaves appear spray 100 cc of Pro-Plant on the leaves every 15 days.	<ul style="list-style-type: none">• Bio-Plant's micro-organisms ensure strong root development; dissolve the nutrients in the soil and from Pro-Plant; make them available to the plant; and fix extra Nitrogen from the air.• Pro-Plant provides the seedlings with over 50 nutrients, including those essential for cocoa trees.• Both develop a strong immune system and protect the seedlings from disease.• Spray 100 cc in 100 litres of water per 1 acre. <i>(See page 4 for the spray dosage and frequency per acre.)</i>
3. Nursery Stage: Growing Seedlings Months 1-2	<ul style="list-style-type: none">• As the seedlings grow, spray 100 cc of Pro-Plant mixed with 100 litres of water every 15 days.• Spray with a fine, hazy spray before about 9 AM.• Direct the spray diagonally upwards so that the spray hits the underside of the leaves as well because this is where the pores (stomata) are.• Be thorough and generous when you spray.	<ul style="list-style-type: none">• Bio-Plant's micro-organisms ensure strong root development; dissolve the nutrients in the soil and from Pro-Plant; make them available to the plant; and fix extra Nitrogen from the air.• Both develop a strong immune system and protect the seedlings from disease. Pro-Plant coats the leaves with micro-organisms, which help to prevent disease.
4. Transplanting Month 3	<ul style="list-style-type: none">• Fill the holes with soil and compost made with Bio-Plant and Pro-Plant. Be generous with the bio-compost. 5 – 10 kgs per tree.• Mulch around the trees, but leave a space between trunk and mulch.• Continue to spray 100 cc of Bio-Plant mixed with 100 litres of	<ul style="list-style-type: none">• This will add disease protection and increase the multiplication of micro-organisms around the plant.• Bio-Plant's micro-organisms ensure strong root development; dissolve the nutrients in the soil, make them available to the plant;

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	<p>water every 15 days on the soil only. This could be provided by drip irrigation.</p> <ul style="list-style-type: none"> Continue to spray 100 cc of Pro-Plant on the leaves every 15 days. 	<p>and fix extra Nitrogen from the air.</p> <ul style="list-style-type: none"> Each month the soil will become more fertile. Fertile soil leads to earlier flowering and fruiting. Mulching will preserve moisture and prevent fungus diseases when rain splashes on the soil.
5. Planting Shade Trees	<ul style="list-style-type: none"> Provide shade for the sapling. Prepare the soil for the shade trees with compost made with Bio-Plant and Pro-Plant. 1 litre of Bio-Plant and 1 litre of Pro-Plant mixed with 5MT of organic matter. More bio-compost can be added monthly. Spray the leaves of the shade trees with Pro-Plant mixed with water. The frequency depends on the crop. Ratio: 1 litre Pro-Plant mixed with 1,000 litres of water per hectare with 450 trees (2 litres per tree). 	<ul style="list-style-type: none"> This enriches the soil with micro-organisms, increases root development, increases the absorption of nutrients, and strengthens the immune system. Pro-Plant's nutrients are instantly usable by the leaves. Spraying Pro-Plant also adds nutrients to the soil. The cocoa trees will benefit from the extra micro-organisms and nutrients.
6. Growth Stage: Apply compost made with Bio-Plant. Months 4-6	<ul style="list-style-type: none"> Spread 10-20 kgs of compost around the base of each tree on a regular basis once per month. Applying compost made with Bio-Plant once per month is best. But if you wish to spray Bio-Plant instead, spray 200 cc of Bio-Plant mixed with 200 litres of water every 15 days. Mulch leaves around the trees. <i>See Notes: How to Make Compost on page 4.</i> 	<ul style="list-style-type: none"> This will increase nutrients absorbed by the roots, increase disease protection, aerate the soil, increase the microbial life of the soil, increase flowering pod-bearing rates, the pods will be shinier, larger, and of greater quality. Spread 20 kgs of compost as opposed to 10 kgs, if the soil is poor. Spraying Bio-Plant works well, but the trees need lots of organic matter in the form of compost.
7. Growth Stage: Months 12-24	<ul style="list-style-type: none"> Spread 10-20 kgs of compost around the base of each tree on a regular basis once per month. Applying compost made with Bio-Plant once per month is best. But if you wish to spray Bio-Plant instead, spray 500 cc of Bio-Plant mixed with 500 litres of water once per month. Spray 500 cc of Pro-Plant with 500 litres of water once per month. 	<ul style="list-style-type: none"> Mulch leaves around the trees. If you wish, you could place compost in a trench in the middle between two rows with one trench per 4 trees. The roots will extend out into the compost in the trench. The trenches are called Rorak trenches.
8. Growth Stage: Months 25-30	<ul style="list-style-type: none"> If the trees have not started to flow yet, then continue to apply Bio-Plant and Pro-Plant as described in Section 7. above. 	<ul style="list-style-type: none"> Mulch leaves around the trees. If you wish, you could place compost in a trench in the middle between two rows with one trench per 4 trees. The roots will extend out into the compost in the trench. The trenches are called Rorak trenches.

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9. Flowering and Fruiting Stages: a) Apply Bio-Plant	<ul style="list-style-type: none"> • Main Crop Flowering and Fruit Stages: 7 months. • Mid-Crop Flowering and Fruit Stages: 4 months. • Spray Bio-Plant around the base of the trees as the buds appear. Spray 500 cc every 15 days during the flowering stage and the fruiting stage. • Pile up the leaves on the ground around the trees, and spray the pile around the tree with Bio-Plant mixed with water (at least 1 litre per tree). • Instead of spraying Bio-Plant onto leaves piled around the trees, spread 10-20 kgs of compost around the base of the cocoa trees. 	<ul style="list-style-type: none"> • When cocoa leaves and charrelles fall to the forest floor, they mix with the leaves of other trees and decay. The fungi and other micro-organisms in Bio-Plant will decompose this debris, which will feed the soil with essential nutrients, thus fertilizing the trees. • In addition, decaying leaves provide the perfect breeding ground for midges, the tiny insects that pollinate cocoa flowers. The sticky charrelles contribute to leaf litter and provide nice, juicy homes for the midge population. • Spraying Bio-Plant will provide more nutrients, thereby increase the yield, and protect from disease.
10. Flowering and Fruiting Stages: b) Apply Pro-Plant	<ul style="list-style-type: none"> • Start to spray 500 cc of Pro-Plant mixed with 500 litres of water twice a month as the buds appear and before the flowers appear. • Continue to spray like this on the buds and flowers during the flowering stage until shortly before harvest. • You should spray Pro-Plant: <ol style="list-style-type: none"> 1) Before the flowers form. 2) When the buds have formed, but not opened. 3) When the flowers have opened fully. 4) When one-third of the flowers have fallen off. 5) When the pods have formed. 	<ul style="list-style-type: none"> • Pro-Plant provides an abundance of instantly usable nutrients to increase flowering and fruiting. The trees will receive adequate Calcium, Potassium and Phosphorus, if the farmer sprays Pro-Plant often. • Spraying Pro-Plant during the fruiting stage reduces the competition for nutrition resources amongst the pods as they mature. • The abundance of nutrients will increase flowering and fruiting by providing more nutrients when they are needed. • The pods will be shinier, larger, and of greater quality. • Usually in trees the use of the bio-fertilizers reduces the number of flowers which drop off before turning into fruit. • Pro-Plant coats the leaves and flowers with micro-organisms, which prevent disease.
11. Spray Bio-Plant as a Fungicide, if there is fungus.	<ul style="list-style-type: none"> • Replace any chemical fungicides used, with Bio-Plant mixed with water. • Dosage: <ul style="list-style-type: none"> ○ A. 5-10 cc/20 litres of water. Spray on the tree. Avoid the leaves as much as possible. (For prevention.) ○ B. 10-20 cc/20 litres of water. Spray on the tree, if there is some fungus already. Try to avoid the leaves. 	<ul style="list-style-type: none"> • Farmers will be able to reduce their spraying costs significantly.

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	<ul style="list-style-type: none"> C. If the whole tree has fungus: <ol style="list-style-type: none"> 1. Spray 50 cc/20 litres of water only on the branches. <i>Or:</i> 2. The farmer can scrub or brush on the branches 50 cc/20 litres of water. Avoid the leaves. Spray every 7-10 days for better effect, if the trees have fungus already. 	

Notes: How to Make Compost

- See the file at *Section 3.2* called *How to Make Rich Compost with Bio-Plant – Handouts*. [Click here](#) for how to make rich compost with Bio-Plant. Scroll down to *Section 3.2*. Soil preparation with a lot of compost made with Bio-Plant will be invaluable in increasing growth. Add compost to the planting holes and spread it generously around each tree after planting. Add more compost around each tree monthly.
- If you do not make compost, refer to the file at *Section 3.7* called: *How to Prepare the Soil with and Without Compost*. Scroll down to *Section 3.7*. [Click here](#).

Number of Litres of Bio-Plant and Pro-Plant to Grow Cocoa over an Acre

1. Pro-Plant

Months 1-3:

- Spray 100 cc mixed with 100 litres of water twice a month every 15 days.
- Total: 600 cc in the 3 months.**

Months 4-6:

- Spray 200 cc mixed with 200 litres of water twice a month every 15 days.
- Total: 1.2 litres in the 3 months.**

Months 7-12:

- Spray 300 cc mixed with 300 litres of water twice a month every 15 days.
- Total: 3.6 litres in the 6 months.**

Months 13-24:

- Spray 500 cc mixed with 500 litres of water once a month.
- Total: 6 litres in the 12 months.**

Months 25-30 (and beyond):

- During the flowering stage and fruiting stage spray 500 cc mixed with 500 litres of water every 15 days.
- Total: 1 litre per month. 6 litres in the 6 months.**

Months 1-30

- **Total: 17.4 litres in the 30 months.**

Notes:

1. The dosage and frequency of spraying above assumes that the soil is poor in fertility and lacking nutrients.
2. Pro-Plant should be mixed with water and sprayed with a hazy, foggy spray before 9 a.m., which is until when the stomata are open the widest.
3. If the spray head produces a heavy spray, then the amounts below will have to be increased. For example: 100 cc in 100 litres of water might have to be increased to 150 cc in 150 litres of water.
4. Spraying Pro-Plant twice a month during the fruiting stage is very advantageous because the cocoa pods will then receive a lot of Calcium, which will help to increase the yield and quality.
5. The amounts shown are the minimum amounts. If you wish to spray more, increase the water accordingly, i.e. if you wish to spray 600 cc instead of 500 cc, increase the amount of water to 600 litres.

2. Bio-Plant

Months 1-3:

- Spray on the soil 100 cc mixed with 100 litres of water twice a month every 15 days.
- **Total: 600 cc in the 3 months.**

Months 4-6:

- Spray 200 cc mixed with 200 litres of water twice a month every 15 days.
- **Total: 1.2 litres in the 3 months.**

Months 7-12:

- Spray 300 cc mixed with 300 litres of water twice a month every 15 days.
- **Total: 3.6 litres in the 6 months.**

Months 13-24:

- Spray 500 cc mixed with 500 litres of water once a month.
- **Total: 6 litres in the 12 months.**

Months 25-30 (and beyond):

- From just before the flowers appear and during the flowering stage and fruiting stage spray 500 cc mixed with 500 litres of water twice a month every 15 days.
- **Total: 6 litres in the 6 months.**

Months 1-30

- **Total: 17.4 litres in the 30 months.**

Notes:

1. The dosage and frequency of spraying above assumes that the soil is poor in fertility and lacking nutrients.
2. Once the seedlings leave the Nursery and are planted in the ground, the farmer could either spray Bio-Plant mixed with water as shown above or provide compost made with Bio-Plant once a month. Providing compost would be the best option though.
3. Normally, 1 litre of Bio-Plant mixed with 5 MT of organic matter is enough per time (10 kgs per tree). But if the soil is very poor, then the farmer could consider doubling the amount of compost and use 2 litres mixed with 10 MT of organic matter per month. This will enable the farmer to place 20 kgs of compost around each tree every month instead of the standard amount of 10 kgs.
4. Once the soil has become soft and crumbly, the farmer could return to 1 litre of Bio-Plant in 5 MT of compost.
5. The amounts shown are the minimum amounts. If you wish to apply more compost, this is fine. If he wishes to spray more Bio-Plant, increase the water accordingly as in the case of Pro-Plant.