The Artemis & Angel Co. Ltd. Bio-fertilizer Credit Fund to Ensure Food Security in Nigerian States

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ปุ๋ยน้ำชีวภาพ (BIOFERTILIZERS)
ไบโอ-แพลนท 99
BIO-PLANT
สูตรดิน
เพิ่มธาตุอาหาร สร้างสารกระตุ้นการเติบโต
ปรับปรุง บำรุงดิน เพิ่มผลผลิตพืช ลดการใช้ปุ๋ย
1 ลิตร
U.S.A. Technology
หัวปุ๋ยน้ำชีวภาพ
โปร-แพลนท 99
PRO-PLANT
สูตรใบ
1 ลิตร
อาหารเสริมพืช เร่งการเจริญเติบโต
บำรุงดินดี เพิ่มผลผลิต
U.S.A. Technology

1. Credit Fund Offered to Each State in Nigeria

Credit Fund Terms

- In order to enable the state government to phase out chemical agriculture and replace it with bio-chemical and then 100% organic agriculture we will provide each state government these 2 advanced bio-technology, liquid, 100% organic bio-fertilizers on the following terms:
  - US$25 million (or more) per year for 5 years (US$125 million) in the form of the bio-fertilizers not cash;
  - No price increase during the 5 years;
  - 0% interest and an annual 12-months L/C;
  - The L/C must be guaranteed by an international bank;
  - 30% deposit at the beginning of each year and the remaining 70% paid at the end of the year.

Some of the Main Benefits

- In Year 1 chemical agriculture could be reduced by 50% and replaced with bio-chemical farming.
- In Year 2 & Year 3 the remaining 50% can be phased out.
- The Credit Fund will ensure each state's food security.
- Each year's Credit Fund supply will ensure an adequate and continuous supply of 100% organic, chemical-free, and toxin-free bio-fertilizer for all farmers in each state.
- All farmers will be able to receive the bio-fertilizers for their crops on long-term credit and pay the state government back after selling their crops.

More of the Main Benefits

- The bio-fertilizers will increase the quality and yield of crops significantly above what chemicals can achieve as the soil's fertility is restored, and for a lower cost. The nutritional content of food will be higher.
- Farmers not using any fertilizer will be able to restore their soil's fertility and increase their crop yield and crop quality.
- Healthy crops are not affected by crop pests and fungi.
- There will be a significant impact on the happiness, stress levels, health, and wellbeing of each state's population.

More of the Main Benefits

- In order to phase out chemical fertilizer gradually, the farmers can start off with bio-chemical farming whereby they can **halve** the amount of chemical fertilizer they use and still increase their yield.
- After 3 years, farming in the state could be 100% organic with fertile soil, higher yields, and lower costs, and no use of chemical sprays.
- The bio-fertilizers will restore the soil's microbial life and fertility. This will enhance crop yields, crop quality, and the state's income.
- The money saved on subsidizing chemical fertilizers and sprays can be used to develop rural infrastructure, irrigation, farming community and rural development projects, and strong, prosperous farming communities.

More of the Main Benefits

- The Credit Fund will provide the means to develop more arable land; increase crop cultivation; diversify crops; make agriculture sustainable; and ensure food security.
- Agriculture-related industries can be developed:
  - e.g. 100% organic flower industry. The bio-fertilizers improve the scent, quality, size, and freshness of flowers, which also keep longer.
  - Biofuels.
  - 100% organic cocoa and organic latex can be produced for exports.
- Each state can become an exporter of 100% organic food.
- Bio-Plant can also be used to turn waste into fertilizer as well as to treat waste water.

Would this Credit Fund help your state?

2. Chemical Agriculture is Unsustainable

Phasing out harmful chemical agriculture in Nigeria is inevitable and necessary. The future lies in organic agriculture.

Problems Faced By Chemical Farmers

- The ever-rising cost of chemical agriculture inputs.
- Because of the high cost of chemical inputs, farmers often use less, so their yield is low.
- Chemical agriculture has been ruining the soil's fertility for many years now.
- This endangers food security.
- Crop diseases result from continuous chemical agriculture, which weakens the immune system over time.
- Chemical sprays infuse so many poisons into the food chain. (Cancers, for example.)
- In short, chemical agriculture is harmful and unsustainable.

Cancers Caused by Pesticides

- Bladder Cancer ● Bone Cancer ● Brain Cancer
- Cervical Cancer ●Mouth Cancer ● Eye Cancer
- Gallbladder Cancer ● Kidney/Renal Cancer
- Larynx Cancer ● Leukemia ● Lip Cancer
- Liver/ Hepatic Cancer ● Lung Cancer ● Lymphoma
- Melanoma ● Colorecatal Cancer ● Multiple Myeloma ● Neuroblastoma ● Oesophageal Cancer
- Ovarian Cancer ● Pancreatic Cancer
- Prostate Cancer ● Soft Tissue Sarcoma
- Stomach Cancer ● Sinonasal Cancer
- Testicular Cancer ● Thyroid Cancer
- Uteran Cancer.

Cancers Caused by Herbicides and Insecticides

- The list is long.
- Cancer is a very painful and expensive way to die. Let's stop cancer-agriculture in Nigeria!
- Crops grown with the bio-fertilizers do not need any chemical sprays.
- Insect pests ignore healthy organic crops and go instead to attack the weak chemical crops. They sense which crops have a weak immune system.

3. Bio-chemical Farming as the Best Strategy for Change

Bio-chemical Farming as the Main Strategy for Change

- The main strategy to bring about change and to get chemical farmers off chemical farming in a way, which they can accept, is **bio-chemical farming**.
- Chemical farmers will usually not change directly to 100% organic farming as it requires too much sudden change to their habits, but they can accept bio-chemical farming because their costs drop about 45% at once, their yields increase, and their soil's fertility can be restored.

Using the Bio-fertilizers for Bio-chemical Farming

- When farmers mix 330 cc of Bio-Plant with each 50 kgs bag of chemical fertilizer in bio-chemical farming they can halve the amount of Urea & NPK they use.
  - Each 50 kgs bag can be used over twice the area.
  - Usually, their costs drop by about 45%.
- If they also spray Pro-Plant on the leaves (500 cc per hectare) the yield will rise 25%+.
- If the farmers soak the seeds in Bio-Plant and Pro-Plant as well, they will add 5% to the yield.

4. The Composition of the Bio-fertilizers and Their Benefits

Bio-Plant

- Bio-Plant contains a wide range of beneficial, micro-organisms and fungi in a very concentrated form. They multiply very fast (1 cell into 1 million in a day).
- The micro-organisms can withstand and function in very acidic chemical soil (pH 4).
- They restore the pH to the natural level of fertile soil.
- They enable the roots to obtain the 80% of NPK left unused in the soil by Urea and NPK.
- 1 litre mixed with 5 tonnes of organic matter fertilizers one hectare.

It Makes the Soil Crumbly, Soft, and Rich

Chemically depleted soil on the left VS nutrient-rich organic soil on the right.

Benefits of Spraying Pro-Plant

- Most plants require at least 16 nutrients. Pro-Plant provides 50+ major, minor, and trace nutrients.
- Pro-Plant coats the leaves with microbes, which prevent fungal diseases.
- The result of using it is large, mineral-rich plants with clear, glossy leaves.
- Plants are less attractive to pests and more resilient to stress.
- Vegetables, grains, and fruit taste better.
- Mix 500 cc litre with 500 litres of water per hectare.

5. Some Typical Field Test Results

Gombe State Field Test Results

Location	Treatment	Yield/Plot (Kg)	Yield/Hectare (Kg)
Pokata	T1 Bio-chemical	750	3,000
	T2 Chemical	325	1,300
Posulte	T1 Bio-chemical	500	2,000
	T2 Chemical	350	1,400


Chemical Maize
Bio-chemical Maize with Bio-Plant, and Pro-Plant sprayed on the leaves.

Comments

- The farmers were very happy with the results.
- These very good results were achieved in bio-chemical farming without any soil preparation as the tests started late in the maize season. In spite of this, the impact was so apparent.
- Pro-Plant also had an insecticidal effect on weevils, grasshoppers, and even aphids, which impressed the farmers in the area.

Group Photograph of the Farmers After Observing the Very Good Results

Typical Effects on Rice

- Unlike chemical rice, which is tall and has many green leaves, rice grown with the bio-fertilizers is yellowish-green, shorter, and has fewer leaves.
- The stems are stronger, so the rice plants do not lean over like chemical rice.
- If you pull up a rice plant, you will see about 20% more roots than on a chemical rice plant.
- The roots are stronger and longer.
- The rice heads contain much more grain.
- The rice seeds do not tend to fall off during harvesting.
- The soil is softer and more fertile, and has a lot of worms and insect life.

Typical Effects on Rice

- Bigger rice yields.
- There is no problem with the usual rice diseases because the micro-organisms develop in the rice plants a strong immune system.
- The quality of the rice is such that the seed becomes in demand as mother seeds.
- The taste of the rice is sweeter and more flavoursome.

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

In this field test on rice, 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 the crop yield was more that you ever got with Urea and NPK. In addition, their costs were very much lower because they only needed one litre of Pro-Plant per hectare.

Bio-chemical Farming Rice Dry Season Field Test in Jamaare, Bauchi State

- The rice seeds were soaked in Bio-Plant and water for 18 hours before planting.
- The soil was in poor condition. It was prepared with a bio-chemical mixture of Urea and Bio-Plant.
- Bio-Plant was mixed with NPK.
- Pro-Plant was sprayed regularly on the rice plants during the crop.
- No chemical sprays used.
- The farmers normally only produced 50 bags of rice per hectare, but this test produced 80 bags per hectare, which is a 60% increase.

Bio-chemical Farming Maize Field Test in Karfe Town, Suleja, Niger State, Nigeria

- The maize seeds were soaked in Bio-Plant and water for 12 hours before planting.
- The soil, which was in poor condition owing to years of chemical farming, was prepared with a bio-chemical mixture of Urea and Bio-Plant.
- Bio-Plant was mixed with NPK and this bio-chemical mixture was sprinkled around the maize plants during the crop. Pro-Plant was sprayed regularly on the maize.
- Normally, the farmers has problems with insects during their maize crops, but this time there were no problems with insect pests at all. No chemical sprays were used.
- The farmers almost doubled their yield. Normally, they only produced 30-40 bags of maize per hectare, but this test produced 60 bags per hectare.

Bio-chemical Farming Maize Field Test in Karfe Town, Suleja, Niger State, Nigeria

Gombe State, Nigeria
Bio-chemical Maize Field Test

- The yield increased 2X and 3X above the chemical Control areas.
- Pro-Plant also had an insecticidal effect on weevils, grasshoppers, and even aphids, which impressed the farmers in the area.

Typical Effect on Fruit

- Fruit trees produce more fruit, the fruit is larger, crispier, tastier, sweeter, and the Vitamin C level is higher by about 20%.
- Mangoes grow large and become very sweet. The taste of chemical mangoes pales in comparison.
- Excellent for 100% organic fruit exports.

Typical Effects on Pineapple

- The fruit is much sweeter than pineapple grown with chemical fertilizer. About 35% sweeter.
- The pineapples are heavier.
- The pineapples look fresher and more attractive to eat.
- There are more suckers and slips so that more pineapple plants can be planted and grown.
- There are more roots and the roots are longer.
- The problems with disease disappear.
- The pineapples keep longer after harvest.

Effect on Bananas

- The weight of bananas per tree is higher. The bananas are sweeter than bananas grown with chemical fertilizer.
- The bananas look more attractive to buy and eat as the skin is shinier.
- The bananas do not have black spots on them.
- The bananas keep longer after picking.
- The problems with disease disappear.
- The cost of growing the bananas drops significantly.

Effect on Mangoes

- The main difference is the taste. The mangoes are very sweet and the mango flavour is much stronger than with chemical mangoes.
- Another characteristic is the number of flowers on the tree in the flowering season. The trees are covered with flowers during the flowering season, more than the other mango trees, which do use fertilizer or which use chemicals. Pro-Plant causes fewer flowers to drop and the trees have more mangoes as a result.
- Trees rarely have a problem with disease. The reason is that the immune system of the trees becomes stronger and stronger. Farmers place Bio-Plant in organic matter around the trees every month, and spray Pro-Plant on the leaves, flowers, and fruit so that they get coated with micro-organisms, which protect the plants from disease.

Effect on Sugarcane

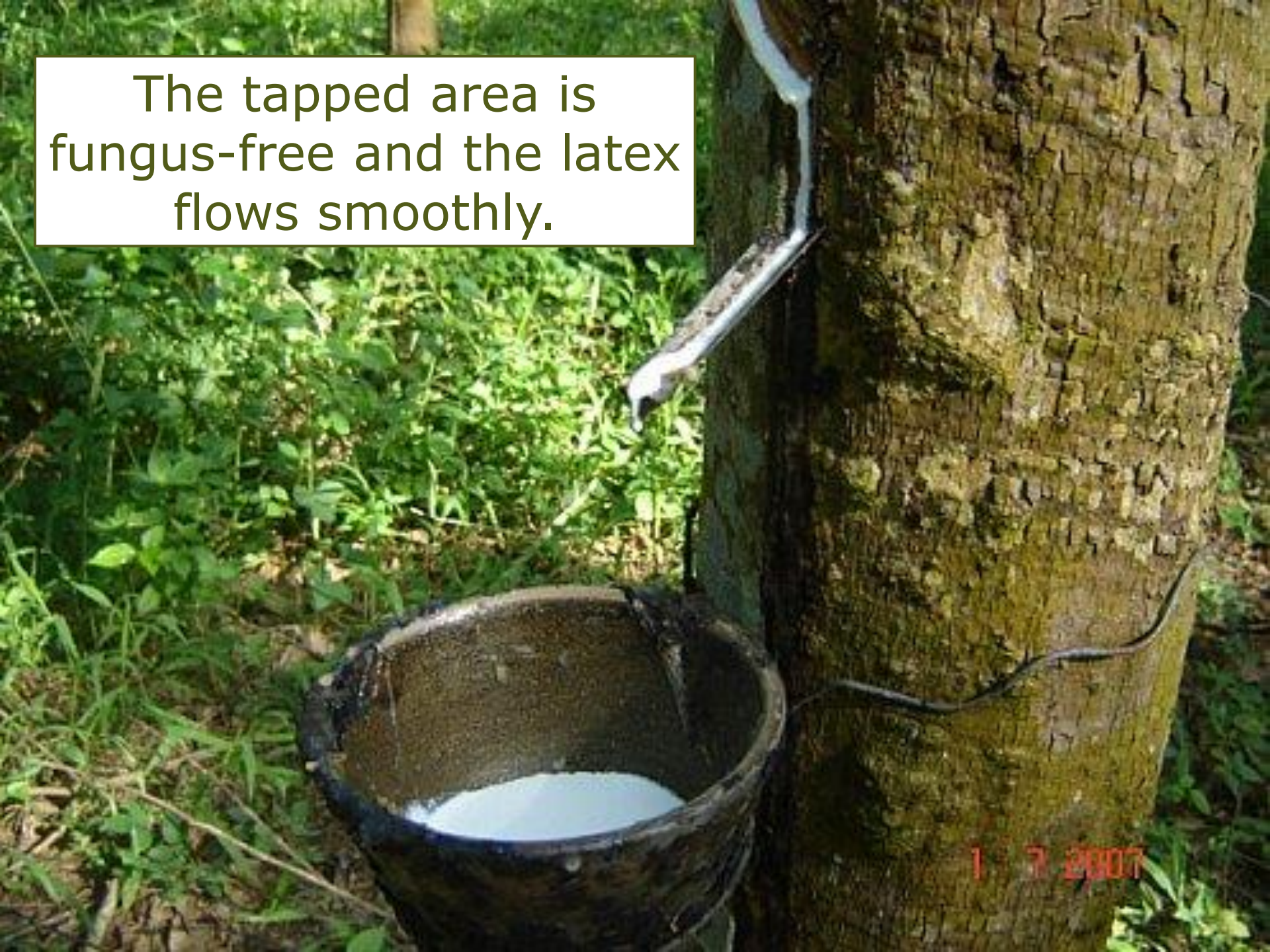
- There is a significant effect on the growth parameter:
  - number of internodes per cane
  - internodal length
  - tops weight
  - trash weight
  - sucrose contents
  - yield components (number of millable canes, cane length, cane diameter, weight per stripped cane and stripped cane yield).

Effect on Sugarcane

- There is a significant effect on the yield components:
  - number of millable canes
  - cane length
  - cane diameter
  - weight per stripped cane
  - stripped cane yield
- Many sugar factories only want to buy from farmers who grow their sugarcane crops with Bio-Plant and Pro-Plant, principally because the sugar from the sugarcane is sweeter than chemical sugarcane - usually about 20% sweeter on analysis.

Typical Effects on Rubber Trees

- In Vietnam almost all rubber plantations use Bio-Plant and Pro-Plant now, and produce 100% organic latex for export.
- The trees produce more latex than when chemicals were used in the past. Much lower costs.
- The latex is softer and flows easier.
- The growth of young trees is usually 20% - 25% faster than normal, and the saplings can be transplanted a month earlier than normal.
- Bio-Plant stops the growth of fungus when brushed onto the trees.


The tapped area is fungus-free and the latex flows smoothly.

Typical Effect on Tea Bushes

- The following benefits are common in tea plantations in Thailand and Vietnam:
  - The yield is 20%-30% higher.
  - The leaves look fresher and shine more.
  - The tea bushes have more leaves and branches.
  - The quality and fertility of the soil is superior.
  - The quality of the tea is higher.
  - The tea has a more pleasant scent.
  - The tea has less tannin.
  - The Vitamin C level is higher.
  - Fungicides and insecticides are no longer needed.

Effect on Tea Bushes

- OCIRTHE, the main tea association in Rwanda carried out tea plantation tests in 2010 with very positive physical and quantitative results.
- The tea leaf colour in the test areas changed from a dark green shade to a lighter green with a distinct shine visible. The leaves were softer and looked fresher.
- This change highlighted improvement in the health of the tea plants and a reduction in the tannin content.
- A noticeable increase in the size of the tea leaves as well as evidence of more leaves per tea bush. This change co-relates to the effective increase in yield.

Bio-fertilizer Tea Growing in North Thailand

Effect on Chillis

- Chillis are longer and heavier than chemical chillis, usually by 20% - 30% while the production costs are much lower both in bio-chemical farming and 100% organic farming.
- Like with all crops produced with the bio-fertilizers, the chillis keep fresh much longer – usually 1-2 weeks.

Effect on Tobacco

- In organic farming tests on tobacco in South China the yield increased about 30% compared to chemical tobacco.
- The tobacco leaves became larger, longer, and fresher-looking.

Effect on Coffee Trees

- There are many farmers in North Thailand growing coffee with the bio-fertilizers in a 100% organic manner.
- The organic coffee has more aroma, a better flavour, more body, and a fresher after-taste.
- The yield of the trees is especially good when the trees are grown from the sapling stage with Bio-Plant and Pro-Plant. Almost all the berries turn dark at the same time.

6. Comparison of Costs by Type of Farming

Financial Benefits for the Farmers

- Farmers of 3-month crops use about six 50 kgs. bags of Urea & NPK per hectare per season.
- At the market price of 6,000 naira (US$38 US) per bag, this would cost the farmer 36,000 naira (US$228 US) to buy the required amount.
- By mixing Bio-Plant with the chemical fertilizer, the farmers would use 3 bags (US$114) + 1 litre of Bio-Plant (US$18) = US$132, which is a 42% saving.

7. Bio-fertilizer Production Factory

Possible Future Project

- This high-investment project could be considered once the bio-fertilizers are widespread around Nigeria and the market is well-established.
- It could serve the needs of many African countries and be very profitable.

8. The Chemical Agriculture Producers

A Win-Win Relationship Is Essential

- Chemical fertilizer producing companies and their networks of agents are used to controlling the fertilizer market in Nigeria.
- With their connections they could stop change completely with a phone call. But this is Win-Lose.
  - Their profits will win, but the population will lose.
- Change is inevitable. Chemical agriculture has become so harmful to public health, their own family's health, the environment, the social structure, and the country's main resource (the soil) that it has become pointless.
- It will harm the country's economy more and more because countries are saying "No!" to chemical food.

A Win-Win Relationship With Chemical Fertilizer Producers

- Chemical fertilizer producing companies could become partners in the transformation of agriculture.
  - They would still sell their Urea and NPK as bio-chemical farming spreads.
  - Their income shortfall could be made up by producing granular bio-chemical fertilizer and by marketing Bio-Plant and Pro-Plant for 100% organic farming. Both markets will grow quickly.
  - In this way they would become leaders in the change process in a very profitable manner.

A Win-Win Relationship With Chemical Fertilizer Agents

- Chemical fertilizer agents could also become partners in the transformation of agriculture in Nigeria.
  - They could continue to sell Urea and NPK.
  - But as farmers change to bio-chemical farming, they could sell Urea and NPK together with Bio-Plant (and Pro-Plant).
  - As farmers change to 100% organic farming they could sell Bio-Plant and Pro-Plant.
  - In this way they would become leaders in the change process in a very profitable manner.

9. Comparison of Costs by Type of Farming

Financial Benefits for the Farmers

- Farmers of 3-month crops use about six 50 kgs. bags of Urea & NPK per hectare per season.
- At the market price of 6,000 naira (US$38 US) per bag, this would cost the farmer 36,000 naira (US$228 US) to buy the required amount.
- Per Hectare: By mixing Bio-Plant with the chemical fertilizer, the farmers would use 3 bags instead of 6 bags (US$114) + 3 x 165 cc (0.5 litre) of Bio-Plant with Urea + 3 x 165 cc (0.5 litre) of Bio-Plant with NPK (US$18) = US$132, which is a 42% saving.

Option 1

100% Organic Farming (3-month Crop)

	Bio-Plant (Used in Soil Preparation)	Pro-Plant (Sprayed on the Leaves)	Cost of Bio-Plant and Pro-Plant	Cost of Chemical Fertilizer (Excluding Chemical Sprays) Urea NPK	Savings
Standard Mix Ratio (20 litres of water)	1 litre per 5 MT of Organic Matter per hectare.	20 cc	-	-	-
Area : 1 acre	0.5 litres	250 cc x 5 sprays = 1.25 litres	US$31.5	US$38 x 1.5 bags = US$57 US$38 x 3 bags = US$114 = US$171	**US$139.5**
Area: 1 hectare	1 litre	500 cc x 5 sprays = 2.5 litres	US$63	US$38 x 3 bags = US$114 US$38 x 5 bags = US$190 = US$304	**US$241**
Notes	**Cost of Fertilizer:** Bio-fertilizer (US$18 per litre in this calculation – common price paid by farmers) and Urea / NPK / etc. (an average price of US$38 per 50 kgs bag is used). **Amount:** The amounts of Urea & NPK are 1 bag per acre each and 3 bags per hectare each. Add the cost of chemical sprays. Sprays are not needed with Bio-Plant and Pro-Plant. **Application:** Bio-Plant is mixed with organic matter, and applied to the soil. Pro-Plant is sprayed on the leaves. **Area:** 1 acre = about 4,046 square metres. 1 hectare = 10,000 square metres.				

Option 2

Bio-chemical Farming 1 (3-month Crop)

	Bio-Plant (Mixed with Urea / NPK)	Urea / NPK (Mixed with Bio-Plant)	Cost of Bio-Chemical Fertilizer Over Same Area as Chemical Fertilizer	Cost of Chemical Fertilizer (Urea / NPK) (Excl. Chemical Sprays)	Savings
Standard Mix Ratio (per 50 kgs bag)	330 cc	-	US$6 + U$38 = US$44 (The bag can then be used over double the normal area, so there is a big saving.)	-	-
Area : 1 acre	165 cc 165 cc	0.5 bag 0.5 bag	US$3 + US$19 = US$22 US$3 + US$19 = US$22	US$38 x 1 bag= US$38 US$38 x 1 bag = US$38	**US$32 (42%)**
Area: 1 hectare	0.5 litre 0.5 litre	1.5 bags 1.5 bags	US$9 + US$57 = US$66 US$9 + US$57 = US$66	US$38 x 3 bags = US$114 US$38 x 3 bags = US$114	**US$96 (42%)**
Notes	**Cost of Fertilizer:** Bio-fertilizer (US$18 per litre in this calculation – common price paid by farmers) and Urea / NPK / etc. (an average price of US$38 per 50 kgs bag is used). **Amount:** The amounts of Urea & NPK are 1 bag per acre each and 3 bags per hectare each. Add the cost of chemical sprays. Sprays are not needed with Bio-Plant and Pro-Plant. **Application:** Bio-Plant is mixed with organic matter, and applied to the soil. Pro-Plant is sprayed on the leaves. 330 cc of Bio-Plant is mixed with each 50 kgs bag of Urea / NPK, and applied to the soil. In the same way as chemical fertilizer. This bag can then be used over twice the normal area. **Yield:** With only Bio-Plant the yield will increase about 10%. Often the increase is much more though.				

Option 3

Bio-chemical Farming 2 (3-month Crop)
(Option 2 + Spraying Pro-Plant)

	Bio-Plant (Mixed with Urea / NPK)	Pro-Plant (Sprayed on the Leaves)	Cost of Bio-Chemical Fertilizer Over Same Area as Chemical Fertilizer	Cost of Chemical Fertilizer (Excl. Chemical Sprays)	Savings
Standard Mix Ratio (per 50 kgs bag)	330 cc	500 cc is mixed with 500 litres per hectare.	US$6 + U$38 = US$44 (The bag can then be used over 2X normal area.)	-	-
Area : 1 acre	165 cc 165 cc	250 cc x 5 sprays = 1.25 litres	US$3 (BP) + US$19 (urea) US$3 (BP) + US$19 (NPK) US$22 (PP) = US$66	US$38 x 1.5 bags = US$57 US$38 x 1.5 bags = US$57 = US$114	**US$48 (42%)**
Area: 1 hectare	0.5 litre 0.5 litre	500 cc x 5 sprays = 2.5 litres	US$9 (BP) + US$57 (urea) US$9 (BP) + US$57 (urea) US$45 (PP) = US$159	US$38 x 3 bags = US$114 US$38 x 3 bags = US$114 = US$228	**US$69 (30%)**
Notes	**Cost of Fertilizer:** Bio-fertilizer (US$18 per litre in this calculation – common price paid by farmers) and Urea / NPK / etc. (an average price of US$38 per 50 kgs bag is used). **Amount:** The amounts of Urea & NPK are 1 bag per acre each and 3 bags per hectare each. Add the cost of chemical sprays. Sprays are not needed with Bio-Plant and Pro-Plant. . **Application:** Bio-Plant is mixed with organic matter, and applied to the soil. Pro-Plant is sprayed on the leaves. 330 cc of Bio-Plant is mixed with each 50 kgs bag of Urea / NPK, and applied to the soil. In the same way as chemical fertilizer. Pro-Plant is mixed with water and sprayed on the leaves. 500 cc of Pro-Plant is mixed with 500 litres of water per hectare. 250 cc is mixed with 250 litres of water per acre. **Yield:** The total yield will increase more and more each year.				

10. Summary

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- Each year's Credit Fund supply will ensure an adequate and continuous supply of 100% organic, chemical-free, and toxin-free bio-fertilizer for all farmers in each state.
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- Farmers not using any fertilizer will be able to restore their soil's fertility and increase their crop yield and crop quality.
- Healthy crops are not affected by crop pests and fungi.
- There will be a significant impact on the happiness, stress levels, health, and wellbeing of each state's population.

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The End