



**Nipponfert**<sup>®</sup>  
**fertilizantes**  
High performance agriculture



**TECHNICAL  
BULLETIN**

1<sup>st</sup> edition



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#### CONSULTED BIBLIOGRAPHY

Brazilian Organ - Embrapa Solos

Soil Fertility and Plant Nutrition

Author: COAMO, COODETEC

Fertilization and Liming Manual for the state of Paraná/Brazil

Author: Volnei Pauletti / Antonio Carlos Vargas Motta

# TECHNICAL BULLETIN

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# Nipponfert

## Introduction

Nipponfert is a Brazilian industry with Japanese technology, specialized in high precision customized biofertilizer.

Development, innovation and investment are characteristics carried by the company since its foundation. With the advancement of its own technologies, the guarantee, quality and production capacity are high, making Nipponfert become a reference in the world market.

Our fertilizers are custom developed for each type of soil and crop, their function is to increase productivity and ensure healthy products, providing the right balance of nutrients to the soil. Fertilizers also help to keep the soil from being depleted, which would make cultivation even more difficult.



## Nipponfert and Agriculture in Brazil

Brazilian agribusiness has been one of the foundations of the national economy, generating jobs and wealth for the country. In addition, Brazil feeds approximately 1.3 billion people in the world, which represents something around 20% of the planet's population.

Brazilian agribusiness stands out in the production of several crops, among which sugarcane, soy, corn, wheat, coffee, orange, cassava, cotton and pasture, environments in which **NIPPONFERT** operates.

It is always possible to do better and, therefore, we constantly improve our processes so that the farmer has more peace of mind in his production.

## Nipponfert fertilization

In fertilization, the best results come when you follow nature's recipe, that is, when there is a natural fall of the leaves, owers, branches and fruits that form, on the soil surface, a green covering known as the organic horizon. In the decomposition of the vegetal mass, we have a significant presence of microorganisms and insects, in addition to a well-developed microflora and fauna. This process produces humus and releases mineral salts, which are plant nutrients, the well-known organic fertilizer formed naturally in the soil. In the **NIPPONFERT** fertilizer, which is aggregated into a single pellet, the organic material is mixed with mineral nutrients and is industrially carried out, followed by a biological treatment.

## Organic matter in Nipponfert fertilizers

Plant and animal residues need a microbial decomposition process to be assimilated by plants. In this cycle, the humus and mineral salts, when released, have macros and micronutrients, which are stabilized in their organic form until the mineralization process takes place.

In this regard, the technological advantage of **NIPPONFERT** fertilizers is remarkable. Through an industrial biodegradation process, excellent quality organic raw material is obtained, with a high concentration of macros and micronutrients. Biostabilized organic matter is also used, which is characterized by a low C/N ratio (humified organic matter). Therefore, **NIPPONFERT** fertilizers are easily assimilated by plants.

**Table 01 - Organic material analysis of NIPPONFERT fertilizers**

Macronutrients	Micronutrients	Physical Analysis
Nitrogen (N) 4.14%	Iron (Fe) 0.35%	Organic matter 54.84%
Phosphor (P2O5) 2.07%	Manganese (Mn) 510 ppm	Total Organic Carbon
Potassium (K2O) 3.50%	Copper (Cu) 130 ppm	16.92%
Calcium (Ca) 3%	Zinc (Zn) 511 ppm	Moisture 10.16%
Magnesium (Mg) 1.52%	Boron (B) 200 ppm	pH 8.2
Sulfur (S) 0.93%	Sodium (Na) 0.57%	Relationship C/N 4/1

Source: Nipponfert Analytics

The use of NPK in chemical fertilizers is estimated as follows:

- Nitrogen (N) is used between 30% and 70%.
- Phosphorus (P) is used between 15% and 25%.
- Potassium (K) is used between 50% and 70%.

Organic fertilizers and organominerals, however, according to Embrapa (Brazilian Organ), present the following rates of use in the first crop: 70% of nitrogen, 70% of phosphorus and 90% of potassium. It is also observed a residual effect of nitrogen and phosphorus of approximately 20% of the total applied during the first cultivation.

Thus, the literature indicates that we can have a five times more efficient use of the phosphorus available together with the organic matter and 66% more in the case of potassium, as shown in Table 02.

**Table 02 - Comparative efficiency of mineral fertilizers and NIPPONFERT fertilizers**

Nutrients	Mineral Fertilizer	Nipponfert Fertilizer
Nitrogen	50%	70%
Phosphor	20%	70%
Potassium	60%	90%

Source: Embrapa Solos (Brazilian Organ)

**Table 03 - Organic material analysis of NIPPONFERT fertilizers**

Nutrientes	Índice de Conversão*		
	1º Cultivo	2º Cultivo	Após 2º Cultivo
Nitrogênio (N)	70%	20%	70%
Fósforo (P <sub>2</sub> O <sub>5</sub> )	70%	20%	80%
Potássio (K <sub>2</sub> O)	90%	-	100%
*Cultivos em relação ao aproveitamento dos fertilizantes organominerais aplicados			

Source: Embrapa Solos (Brazilian Organ)

The nutrient utilization rates of **NIPPONFERT** fertilizers have a great advantage over mineral fertilizers.

In the various experiments carried out in the field, it appears that even **NIPPONFERT** fertilizers having a lower concentration of NPK in their composition, provide similar and even superior productivity results compared to mineral fertilizers that have higher concentrations of these elements.

It is known that phosphorus fixation is undesirable, a fact that is reduced by the **NIPPONFERT** fertilizer, because in its manufacture, the humified organic matter mixed with the mineral fertilizer involves the soluble phosphate - which prevents this nutrient, when applied to the soil, reacts freely with calcium, iron, manganese or aluminum, with which it would form insoluble phosphate.

Another undesirable phenomenon eliminated by **NIPPONFERT** fertilizers is the effect of using high doses of mineral fertilizer, with high salt levels used in crops during the summer period. The salts of mineral fertilizers dissolve in the soil in a concentration higher than that of the sap of the roots, dehydrating them by osmosis, causing the plasmolysis of the cells and, consequently, the wilting of the plants.

In turn, organomineral fertilization provides less risk of wilting in the event of Indian summer, since it contains less mineral salts and still keeps them conditioned to organic matter. In **NIPPONFERT** fertilizers, organic matter works as a conditioner for mineral fertilizers, as it has, in addition to this property, the ability to exchange cations and anions.

The cation exchange capacity (CTC) is the property of electrostatically adsorbing cationic nutrients such as potassium, calcium, magnesium, manganese, iron, copper, zinc, and others, subsequently transferring them to plant roots. The humus particle is so tiny that it receives the special name of humic colloidal micelle – which has negative electrical charges balanced by cations, as shown in Figure 01. These cations adsorbed by the humus are less carried or leached by the rainwater that passes through the profile.

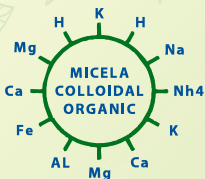


Figure 01- Representation of a colloidal humic micelle with organic

The anion exchange capacity (ATC) also has great influence on the soil because it electrostatically adsorbs anionic nutrients such as boron, chlorine, sulfur, phosphorus, nitrogen. This leads to the balance of positive and negative charges in the soil – consequently increasing anionic adsorption. This type of adsorption has low reversibility and is mainly responsible for the fixation of phosphorus in the soil.

The ability of organic matter to retain water by absorption is linked to the amount of humus colloid it contains. The property of humus to absorb water in high proportions - ten times more than clay soils - is important, as it guarantees the solubility of mineral fertilizer nutrients contained in **Nipponfert**, favoring its assimilation by the plant.

The humified organic matter contained in **NIPPONFERT** fertilizers provides a beneficial physical effect, leading to greater soil friability, which improves water infiltration and aeration. But, the greatest benefits promoted by the organic fraction of **NIPPONFERT** fertilizers are the protection, conditioning and enhancement of mineral fertilizers.



## Nitrogen in NIPPONFERT fertilizers

Organic nitrogen in the soil is only absorbed by the roots after mineralization. The same happens with **NIPPONFERT** fertilizers. This is good as the nitrogen is stored, making it available to the roots during the crop cycle. The gradual release of mineralized nitrogen is called “controlled availability fertilizer”.

It is known that the only way to store nitrogen in the soil is in organic form, as the mineral forms are easily carried away by rainwater, getting lost in the deeper layers of the soil profile (leaching), in addition to volatilization.

Mineral fertilizers that receive artificial treatments to make their solubilization difficult in the soil are classified as fertilizers with a retarding effect. In **NIPPONFERT** fertilizers, the organic matter contained in its formulation makes the fertilizer availability naturally controlled.

## Phosphorus in NIPPONFERT fertilizers

Plants can grow with small concentrations of soluble phosphate. However, it is necessary that these concentrations are constant throughout the vegetative cycle of the crop.

The role of **NIPPONFERT** fertilizer in the chemical balance of phosphorus in the soil is to release this nutrient in soluble form by mineralizing organic matter. Organic matter helps control the availability of phosphorus in the soil. Its release occurs whenever there is a deficiency of concentration, whereas it is withheld if there is an elevated presence.

Phosphorus applied through mineral fertilizers obtains a maximum utilization by the plants of 20%. Thus, due to the undesirable fact that fixation occurs, the amount of phosphorus applied has to be five times greater in order to obtain 100% utilization.

In **NIPPONFERT** fertilizers, the humified organic matter is mixed with mineral soluble phosphorus, surrounding and protecting it. This prevents it from reacting freely with calcium, iron, manganese and aluminum when applied to the soil, resulting in the formation of insoluble phosphate.

EI-Baruni & Olsen found that blending organic with simple superphosphate provided more phosphorus to the roots than separate applications of organic fertilizer and mineral fertilizer.

## Potassium in NIPPONFERT fertilizers

For good crop growth it is necessary to have a good relationship between the amount of potassium and the base saturation of the soil. A soil with good base saturation is one in which the sum of calcium, magnesium and potassium of its clay-humic colloidal complex is between 60 and 80%.

The amount of potassium fertilizer to be used is related to the cation exchange capacity (CTC) of the soil and the base saturation. Each gram of humus that **NIPPONFERT** fertilizers bring to the soil is worth 30 grams of clay - hence one of the reasons why the potassium associated with organic matter is better used by plants.

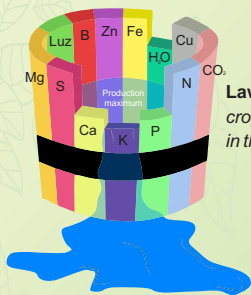
Mixing potassium with organic matter causes its positive charge to bind to the negative charges of humus in **NIPPONFERT** fertilizers. In this adsorbed form, potassium is readily available to the roots and resistant to leaching.

## Macronutrients in NIPPONFERT fertilizers

**NIPPONFERT** fertilizers contain the primary macronutrients N-P-K and the secondary macronutrients Ca-Mg-S. The element Ca, in addition to nourishing the plant, helps in the balance against the acidity caused by the chemical fertilizer.

## Micronutrients in NIPPONFERT fertilizers

All **NIPPONFERT** formulations contain micronutrients in balanced amounts. The chelating power present in the organic matter of **NIPPONFERT** fertilizers retains metallic nutrients, mainly iron, copper, zinc and manganese, thus ensuring their availability to the roots.



**Law of the Minimum:** "The growth and production of crops are limited by the nutrient that is in lesser quantity in the soil".

*Justus Liebig, 1850*

## Application of NIPPONFERT fertilizers

As a general rule, apply **NIPPONFERT** fertilizer in the same way as mineral fertilizers. The location should be made, whenever possible, beside and just below the seed or the roots of the seedlings, respecting the space of 5 cm between them.

**IMPORTANT:** if there is direct contact with the organomineral fertilizer, the probability of damage to the seed or roots is less than with mineral fertilizers, due to its dilution by the organic fertilizer.

## Side by side comparison

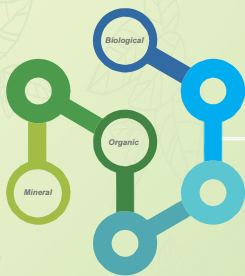
Field test applying **NIPPONFERT** fertilizer and competitor fertilizer on the same day in a cattle pasture in Mato Grosso / Brazil.

  
**Nipponfert®**

**Competitor**



*The effectiveness of Nipponfert fertilizer made the grass grow and seed*



## Success Cases

**Crop:** Soy

**City:** Loanda/PR - Brazil

**Property:** Fazenda Paraíso

**Harvest:** 2019/2020

**Result:** 67 sacks/ha

**Producer Testimony:** *"I didn't believe it was possible to produce in this soil, as it is very sandy - 90% sand and first planting area, I was surprised with the result and recommend the Nipponfert fertilizer"*



**Nipponfert®**

**Culture:** Beans

**City:** Ipiranga/PR - Brazil

**Property:** Fazenda Araucária

**Result:** Crop of **209 tons of beans**, producing 3.491 bags in 80ha (44 bags/ha), thus being 106 bags per bushel.

**Crop:** 2021

**Producer Testimony:** *"There was no rain when it needed it, so when the beans began to branch and fill with grain, excess rain occurred. Even with little photosynthesis on rainy days, Nipponfert's fertilizer proved to be super effective, obtaining 20% more production compared to competing fertilizers, we are very satisfied.»*



**Nipponfert®**

## Sacks and Bag

Our fertilizers are available in **50kg sacks** and **1,000kg big bags**.



BIOFERTILIZANTE



Nipponfert® fertilizantes



PREMIUM  
**Nipponfert®**  
fertilizantes  
Agricultura de alta performance

INDÚSTRIA BRASILEIRA

**50kg**  
PESO LÍQUIDO

日本肥料  
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Luziânia - GO 75012-000 FONE  
Maringá - GO 3542-1000 FAX  
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#### DEMAS INFORMACOES:

- Produto líquido, armazenar em local seco.
- Em aplicação, utilizar equipamento adequado para atomização fina e evitar que o produto seja inalado, ingerido ou absorvido de qualquer maneira.
- Conservar em lugar seco, abastado e ventilado.
- Evitar contato com produtos com caráter oxidante de armazenamento.
- Evitar contato com produtos com caráter oxidante de armazenamento.
- Embalagem reciclável: 100%.

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13161

#### MAÇOES:

- as agrotóxicos nocivos
- São proibidos, obrigatório para o agricultor a seguir as instruções de aplicação de profissional habilitado para isso, cultura e variedade.
- São proibidos para os efeitos a parte
- São proibidos observar condições de armazenamento
- para agrotóxicos
- Máximo: 3 Big Bags

PREMIUM  
**Nipponfert®**  
fertilizantes  
cultura de alta performance

INDÚSTRIA BRASILEIRA

**1000kg**  
PESO LÍQUIDO

日本肥料  
nipponfert.com



*Wherever there is Nipponfert, there is fertility!*

**Nipponfert®**

## PLANT PRODUCTIVE BOX

Productive Box	Nutrient Export	Nutrient Extraction
<ul style="list-style-type: none"> <li>• Climate conditions;</li> <li>• Sowing time;</li> <li>• Fertility and soil fertilization;</li> <li>• Type and quality of seed;</li> <li>• Spacing and plant population.</li> </ul>	Amount of a certain nutrient effectively removed by the grain in its final product.	Amount of a certain nutrient that the plant needs to remove from the soil or air to produce a ton.

## NIPPONFERT FERTILIZER MANUFACTURING PROCESS

This is one of the secrets of our fertilizer being the best on the market: every manufacturing process undergoes rigorous quality control and internal auditing at all stages.



**EXPORT**  
Ear, Grains or Seeds

**EXTRACTION**  
Root system



## Elements of NIPPONFERT Fertilizers

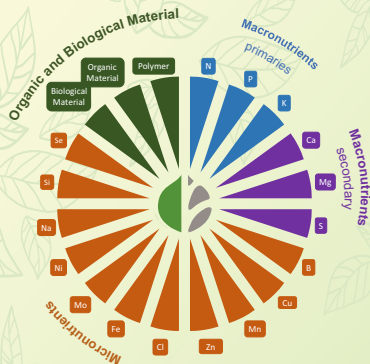


Table 04 - Export and extraction of main crops


CULTURE		N	P	K	Ca	Mg	S
		(Kg.t <sup>-1</sup> )					
Corn	Extraction	21,5	3,9	17,1	2,4	2,8	2,6
	Export	14,4	3,4	5,4	0,3	1,1	1,1
Soy	Extraction	66,1	6,1	30,1	9,5	6,3	13,4
	Export	47,1	4,5	14,2	2,3	1,8	4,7
Manioc	Extraction	4,6	0,3	2,2	1,2	0,6	-
	Export	2,4	0,2	1,5	0,2	0,2	-
Rice	Extraction	24,1	2,3	27,5	6,9	4,7	3,6
	Export	13,8	1,7	2,3	0,7	0,8	2,9
Wheat	Extraction	28	3,9	19,9	2,4	2,3	3,5
	Export	20	3,2	3,5	0,2	0,8	1,2
Bean	Extraction	46	05	38	18	07	10
	Export	27	04	14	02	02	05
Sugar cane	Extraction	1,43	0,19	1,74	0,87	0,49	0,44
	Export	57	21	33	31	24	16
Cotton	Extraction	57	21	33	31	24	16
	Export	43	15	10	08	11	07

Source: Manual of Fertilization and Liming for the State of Paraná, 2019

### Biological Nitrogen Fixation NIPPONFERT

NIPPONFERT fertilizer is a PIONEER in fixing nitrogen nodules in GRASS and VEGETABLES!

Pellets with different diameters and lengths allow control of the intensity of the gradual release of nutrients, always aiming at a balanced diet for the plant.



The image shows the letters 'NPK' where each letter is composed of different colored fertilizer pellets: 'N' is grey, 'P' is brown, and 'K' is orange. Below the letters are the words 'NITROGEN', 'PHOSPHOR', and 'POTASSIUM' in green. Underneath are two green fertilizer sticks, one whole and one broken into pieces.

Nipponfert is not limited to just NPK in the pellet, but in having all the elements in sufficient quantities necessary for the health and better performance of your soil and production.



A pair of hands is shown holding a large quantity of green, cylindrical fertilizer pellets. The background is a solid light green color.

Always respecting the requested proportionality to correct the existing deficiency in the soil, remembering that the lack of one element is not compensated for with another.

**Nipponfert** is fully aligned with the principles of sustainability and constant technological innovations.

At Nipponfert, we have the expertise to manufacture customized fertilizers for **any crop**, and we can provide complete technical assistance in the use of our fertilizers.



### **NIPPONFERT fertilizer recommendations**

Although it has a lower concentration of NPK in its composition, **NIPPONFERT** fertilizers are applied in the same amounts used for mineral fertilizers. This is possible because **NIPPONFERT** fertilizer has a better nutrient assimilation rate.



## Questions and answers

### 1) Why fertilize with nipponfert fertilizer?

The farmer is an investor. To increase production, it is not enough to use selected seeds, prepare the soil well, irrigate and fight pests. It is also necessary to fertilize the soil with high performance, and a correct fertilization with **NIPPONFERT** increases the result of the crops.

### 2) What is nipponfert fertilizer?

**NIPPONFERT** is a balanced fertilizer that provides macro nutrients (primary and secondary), micro and biological agents, as well as microorganisms, all at sufficient levels.

### 3) How is the nitrogen release in nipponfert fertilizer?

Plant roots assimilate nitrogen in the ammoniacal form ( $\text{N}_4\text{H}$ ); or nitric ( $\text{NO}_3$ ). Therefore, the organic nitrogen in Nipponfert fertilizer needs to be mineralized in the soil to be assimilated. Nitrogen only remains stored in the soil organically – in mineral form, it is leached.

Urea, widely used in agriculture, is a chemical fertilizer of the starchy type and, when applied, is rapidly hydrolyzed through a bacterial process that uses the urease enzyme. Thus, the immediate availability of nitrogen occurs, which, from the edaphic and physiological point of view, is not interesting, since its immediate release potentializes losses by leaching and even by volatilization.

Thus, the use of organic fertilizers with amino acid matrices tends to be better used, since the release occurs gradually, minimizing losses and making nitrogen available throughout the entire production cycle.

#### **4) Do plants benefit when phosphate mineral fertilizers are mixed with organic fertilizer?**

Yes, for every 100kg of phosphorus applied as fertilizer in the first year of cultivation, only 25kg are used by the plants. For this reason mineral fertilizer formulas contain higher proportions of phosphorus than nitrogen and potassium.

#### **5) How does organic fertilizer reduce soil phosphorus fixation?**

By avoiding direct contact of the fertilizer with the oxides and hydroxides of aluminum, iron and manganese in the soil, the super calcium phosphate mixed with organic matter ends up not coming into direct contact with the soil and does not react with the aluminum oxides, iron or manganese.

#### **6) Does nipponfert fertilizer help control the availability of phosphorus in the soil?**

Yes, the presence of organic phosphorus in Nipponfert fertilizers contributes to the chemical balance of phosphorus in the soil.

#### **7) Are the results better when mineral fertilizers are associated with organic fertilizers?**

Experiments have shown that the best results are obtained when organic fertilizers are associated with minerals.

#### **8) Is Nipponfert fertilizer a soil improver?**

The organic matter contained in Nipponfert fertilizer is a soil improver or conditioner, as it influences its physicochemical properties. For this to happen, organic matter must be used in large doses, but as its percentage in Nipponfert fertilizer is relatively small, this effect is only perceived in the long term. However, the organic matter in Nipponfert fertilizers is an immediate conditioner of the chemical fertilizers that are part of its composition, allowing the obtaining of mixtures that normally would not be recommended due to the physical incompatibility of the fertilizers that compose them.

### **9) Does Nipponfert fertilizer increase soil productivity?**

In order to increase soil productivity, it is recommended to lim it first whenever necessary and then apply Nipponfert fertilizer. Thus, the nutrients in this fertilizer will be better used by the roots, as acidic soils, with low base saturation, block the absorption of the food made available to the plants.

### **10) Does Nipponfert fertilizer have a residual effect on the next year's crop?**

The nutrients contained in the chemical fertilizer are used in the first year of culture in the following proportions: nitrogen (70%); phosphorus (70%); potassium (90%). The rest of these nutrients, if not leached, absorbed by microorganisms or insolubilized in the soil, will be used in the next year's crop. The NPK nutrients from the organomineral fertilizer are dispensable to the roots by about 70% in the first year and 20% in the second year. The mixture of organic fertilizer, with controlled availability, guarantees a greater residual effect of the nutrients in the second year of cultivation, which is why the combination of both has proved to be of high agricultural value.

### **11) When should Nipponfert fertilizer be applied?**

Nipponfert fertilizer can be applied at the following times:

- a) at the time of planting (basic fertilization);
- b) when the plant begins to grow more intensely, the fertilizer is distributed on the soil surface along the crop line or around the seedling, incorporating it into the soil with a slight scarification (cover fertilization);
- c) in adult plants in perennial crops, fertilizing in the rainy season or when weeding or other cultural treatments are carried out. The application is made by distributing the organomineral fertilizer in open furrows beside the crop line or by spreading it over the entire planted surface, incorporating it into the soil. In the case of pasture that does not allow for incorporation, fertilizer should be applied preferably in the rainy season so that the water can drag it into the land (fertilization to maintain fertility).

## 12) What are the ways to distribute Nipponfert fertilizer?

a) **in furrow**, the location should be made, whenever possible, beside and just below the seed or the roots of the seedlings, respecting the space of 5 cm between them.

b) **in holes**, when installing a permanent crop such as coffee plantation, orchard, forestry or reforestation. Fertilizer should be placed at the bottom of the pit, always mixing it with the surface soil.

c) **in crown or half crown**, in the case of trees or shrubs already formed. In this case, the fertilizer must be distributed in a circular strip away from the trunk, but not beyond the projection line of the plant's crown, and incorporation into the soil must be done by means of light scarification.

d) **broadcast in coverage**, distributing the fertilizer over the entire surface to be cultivated. This procedure can be done manually or using a limestone spreader, passing the disc grid afterwards, for incorporation into the soil. When incorporation is not possible, it must be distributed on rainy days so that the water can take care of this operation.

## 13) What are the recommended dosages of Nipponfert fertilizer?

Compared to dosages of NPK chemical fertilizers, a smaller dosage is used in NIPPONFERT fertilizer, as there is no insolubilization of nutrients, which allows for greater use by the plants.

Request technical information from NIPPONFERT salespeople and agronomists in order to correctly fertilize your land.



***“THE LIFE OF THE SOIL IS THE  
LIFE OF PLANTS, FEED THE SOIL  
AND IT WILL FEED THE PLANTS.”***

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