
earth
essentials
HAVE YOU FED YOUR PLANTS TODAY
?
Made in India
Complete Plant Nutrition
Natural & Organic
ECO-FRIENDLY
100%
NATURAL PRODUCT
No Animal Products

# Nutrients

## The Building Blocks for Plant Growth and Development

Like human beings, plants also require nutrients for their overall growth and development. The plant growth cycle depends on availability of nutrients. Therefore, it is necessary to provide them with essential nutrients, in the right quantity and at the right time. Sixteen (16) elements are vital for growth and survival of the plants. They are divided into two main groups: non-mineral and mineral.

- **Non-Mineral nutrients** are found in air and play an instrumental role in plant photosynthesis process. Plants use sunlight to convert $CO_2$ and water into starches and sugars - the plant's food.

- **Mineral nutrients** are dissolved in water and absorbed through the plant's roots. They are further divided into two groups: Macro-nutrients & Micro-nutrients.


**Non-Mineral Nutrients**
Hydrogen (H),
Oxygen (O) and
Carbon (C)


### Macro-Nutrients

**Primary macro nutrients:**

- **Nitrogen:** Necessary for metabolic processes involved in synthesis and transfer of energy. Helps in rapid growth.
- **Phosphorus:** Encourages blooming and root growth. Required for photosynthesis.
- **Potassium:** Building of protein, photosynthesis, fruit quality and reduction of diseases.

### Micro-Nutrients

- **Boron:** Aids in production of sugar & carbohydrates. Essential for seed and fruit development.
- **Copper:** Reproductive growth. Aids in root metabolism. Helps in the utilization of proteins.
- **Chloride:** Helps in plant metabolism.
- **Iron:** Formation of chlorophyll.
- **Manganese:** Functions with enzyme systems involved in breakdown of carbohydrates and nitrogen metabolism.
- **Molybdenum:** Basically it helps in utilization of protein.
- **Zinc:** Transformation of carbohydrates. Regulation of enzyme systems.

**Secondary macro nutrients:**

- **Calcium:** Provides support to plant cell wall structure. Counteracts the effects of alkali salts and organic acids within a plant.
- **Magnesium:** Helps in photosynthesis and regulates plant enzymes for growth.
- **Sulfur:** Synthesis of proteins and promoting enzymatic activity. Root growth and seed production, provides resistance to cold.

## Recognising Nutrient Deficiency


## Recognising Nutrient Deficiency

# Soil – Introduction

Soil holds an important place in the ecological cycle, as it has unique capabilities to support life. It is a hub of living organisms, various soil flora and fauna as well as plants. Healthy soil is essential for healthy plant growth. Soil nutrients are continuously required by plants for their growth and development, and thus, they need to be continuously replenished in the soil.

The development that comes with urbanization does not prioritize the preservation of soil health and characteristics in a way that can promote lush gardens and lawns.

Low levels of organic carbon in the soil leading to disturbance in bacteria life cycles, higher levels of pH and TDS in soil, and thus hardening of soil, results in problems such as dry twigs, browning of plants and dry patches in lawn areas.

# Soil Composition and Its Significance

## Soil pH

Soil pH is a measure of the acidity or basicity in soils. pH level in the soil is instrumental in -

- Availability of nutrients to the plants
- Soil physical conditions
- Plant growth pattern

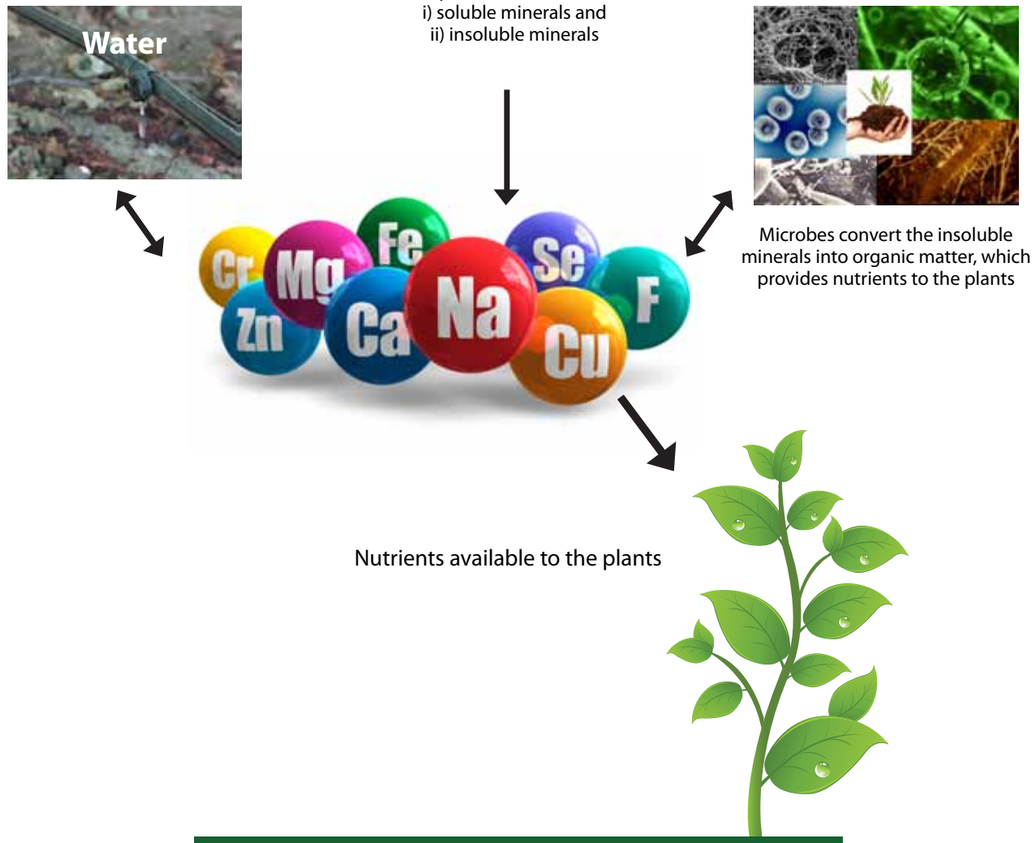
## Soil Organic Matter (SOM)

Soil Organic Matter comprises of all living soil organisms and the remains of previous living organisms in their various degrees of decomposition.

Organic matter has an indispensable role within the soil. It works as a habitat for soil organisms and its decomposition process helps in improving the physical, chemical and biological properties of the soil.


*...Most soils contain 2 to 10% organic matter. Adding more organic matter into the soil improves the quality of the soil...*

## Nutrient exchanges between organic matter, water and soil are essential to soil fertility and balanced pH ratio...




**Survival and growth of plants depend on presence of various soil components and their interactions**

## The composition and breakdown rate of the soil organic matter affects soil properties such as...

- Soil structure, texture and porosity
- Aggregation rate of soil particles and thus water infiltration and moisture holding capacity of the soil
- Protection of soil against rainfall, wind and sun
- Diversity and biological activity of soil organisms
- Plant nutrient availability

## Soil Organic Carbon – A Key Component of SOM

Soil Organic Carbon (SOC) is the carbon stored in Soil Organic Matter (SOM). One of the most important constituents of the soil, it affects plant growth as both, a source of energy and a trigger for nutrient availability through mineralization.

It promotes structural stability and water holding capacity of the soil. It prevents nutrient leaching and is integral to the organic acids that make minerals available to plants. Through this, it buffers soil from strong changes in pH, in the long term.

## Soil Organisms

Soil organisms – soil-flora and soil-fauna – are essential for gradual occurrence of changes in the soil due to their existence and activities. Soil microbes …

- Decompose organic residues
- Recycle nutrients from organic residues
- Enhance soil structure

## C:N Ratio

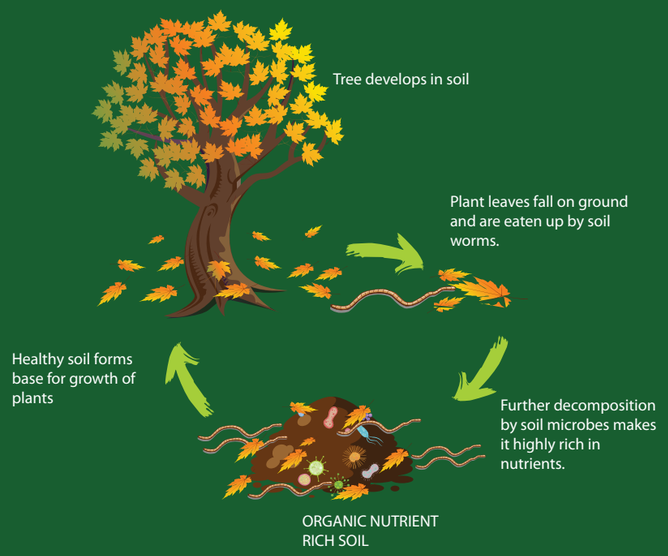
The ratio of organic carbon to nitrogen in the organic matter is called C:N ratio. It influences the rate of decomposition of organic matter. Optimal C:N Ratio of organic matter added to soil should be <= 20:1.

Microbes need 1 kg of N for every 8 kg of C (C:N Ratio is 8:1). Carbon is used for energy while Nitrogen is used for building plant tissues.

## Activated Carbon: A friend of the soil & plants

Activated carbon – biomass converted to a char-like material, having high soil stable carbon – increases soil carbon storage, improves soil fertility, as well as maintains the balance of soil ecosystems.

It effectively acts as a kind of soil fertilizer or amendment to increase crop yield and plant growth by supplying and retaining nutrients. It is believed to have long mean residence times in soil, ranging from 1,000 to 10,000 years.




## Nutrients and Plant Health

Green plant material is the initial source of organic matter, and when it dies it is progressively decomposed by a range of organisms. Decomposition is brought about by relatively complex biological processes.

Soil organisms breakdown organic matter to obtain energy and nutrients. In doing so, they progressively convert the organic matter to simpler materials.

Soil organisms in breaking down organic material will produce water-soluble compounds and nutrients. These nutrients are then available for plants to take up and utilize for various metabolic processes and thus support their growth and development.

earth essentials

# HAVE YOU FED YOUR PLANTS TODAY...?

Earth Essentials is a new and holistic concept in urban gardening that focuses on the direct relationship between soil health and plant nutrition. The Earth Essentials range of unique, nutrient-rich, natural and organic offerings are created using the platform of IPNM (Integrated Plant Nutrient Management), to provide solutions for all soil and plant problems, and help you keep your plants and gardens healthy and blossoming.

Earth Essentials products are the outcome of intensive research and combine the synergies and goodness of an array of natural sources such as organic matter, beneficial microbes and plant hormones to deliver rapid short term results and sustainable long term improvements in soil quality and health as well as growth and development of plants and landscapes.

The Earth Essentials range of products is 100% natural and carbon neutral, helping you to do your bit for the environment by keeping it clean and green.

Earth Essentials incorporates IPNM in its true form to develop its unique formulations which will deliver best of the best results for overall soil health and plant nutrition management.

## *Integrated Plant Nutrient Management*

**INPUT**

Macro Nutrients
Micro Nutrients

Organic Matter
Organic Carbon

Micro flora

**IMPACT**

- Nutrient Availability
- Nutrition Efficiency
- Rooting
- Soil aeration/Texture/Humus
- Water Absorption
- Microbial Activities
- Plant Immunity

**RESULTS**

Plant Health

Soil Fertility

Plant Protection

**BENEFITS**

Growth | Flowering | Fruiting | Colour | Vigor | Yield | Texture | Taste

**Mr. PRONTOS** Advanced Pelleted Soil Booster & Conditioner - is a judicious mix of macro and micro nutrients, organic carbon, organic matter, microbes and Plant Growth Regulators (PGRs). All these elements are integrated to deliver the nutrients necessary for growth and health of the plants and lawns.

Mr. Prontos is an all season, all purpose nutrient. It improves soil quality and fosters healthy plant growth with sustained nutrient release. It also enhances water retention capacity of plants.

Special pelleted form of Mr. Prontos enables

- Slow and Sustained release of nutrients
- Easy handling and application

Mr.Prontos' special characteristics are derived from a mixture of various components which are scientifically significant and each of them performs unique functions:

- ***Organic Matter and Activated Organic Carbon***, which serve as a home for soil flora and fauna
- ***Consortia of Beneficial Microbes*** in cyst form, which enhance nutrient levels by their microbial action on soil
- ***Essential Nutrients*** acting as complete nourishment for plants
- ***Plant Growth Hormones***, which proactively catalyze metabolic processes of the plants

A unique blend of microbes, organic matter and organic carbon along with Plant Growth Hormones is responsible for taking care of present and future requirements of plants and soil and thus it imposes immediate, mid-term and long-term effects on plants and soil.



| Contents | |
|---|---|
| **Particulars** | **Maximum (Upto)** |
| Nitrogen | 3.00% |
| Phosphorous | 2.50% |
| Potassium | 2.50% |
| Magnesium | 4800 mg/kg |
| Zinc | 50 mg/kg |
| Molybdenum | 2 mg/kg |
| Calcium | 2.50% |
| Iron | 650 mg/kg |
| Sulphur | 4.00% |
| Boron | 2300 mg/kg |
| Copper | 15 mg/kg |
| Manganese | 50 mg/kg |
| Humic acid | + |
| Auxin | + |
| Gibberellic acid | + |
| Cytokinin | + |

| Particulars | |
|---|---|
| pH | Neutral |
| C:N Ratio | 15-20:1 |
| Organic Matter | Upto 80% |
| Organic Carbon | Upto 45% |

Mineral solubilizing & mobilizing soil-beneficial bacteria
- N-fixation Bacteria
- P and K solubilizing bacteria
- Other mineralizing and mobilizing bacteria for Zinc, Calcium and silica

Plant protective beneficial fungal species to protect against insects, nematodes and pathogenic fungus

(The values mentioned above are based on in-house lab results, at the time of bulk production.)

| Type | Quantity | Application | Frequency |
|---|---|---|---|
| New Landscaping | 750-900 gms/sq mtr | Apply Mr. Prontos within 15cm depth of soil and mix properly. | 1 time |
| New Plants | 125-150 gms/plant | Mix Mr. Prontos with soil before planting. Plant & water. | 1 time |
| Existing Plants | 100-125 gms/plant | Apply Mr. Prontos in a circle within periphery of plant canopy. Water after application. | Every 3-4 months |
| Potted Plants | | | |
| 4" | 25gms | Apply Mr. Prontos in a circle within periphery of plant canopy. Water after application. | Every 3-4 months |
| 8" | 50gms | | |
| 12" | 75gms | | |
| 16" | 100gms | | |
| 20" | 125gms | | |

(For best results, apply Mr. Prontos slightly away from the plant stem. For details, refer our Best Practices Guide)

Garden Angel

Premium Activated Garden Nutrient
- helps in stimulating microbial action in soil and, thus, enhancing plant growth and development.

Guarden Angel is a superior holistic formulation designed using IPNM approach to take care of complete soil and plant health.

A perfect organic blend of cow dung, microbes, PGRs and nutrients provide complete solution for healthy, beautiful gardens and lawns.

Guarden Angel is suitable for all kinds of lawns, gardens and potted plants in all season.

Some distinct features of Guarden Angel are ...

- *Natural organic formulation* with goodness of cow dung from well managed, quality driven cattle with end-to-end controlled conditions.
- Follows *Internal Quality Assurance Approach*, passes through two biological cycles - one macro (cow), and the other micro earthworms, microbes), a unique innovation.
- *Activated format*, working as an instant dose of perfectly natural and organic beneficial nutrients to the soil and plants


## HOW "GUARDEN ANGEL" WORKS?


| Contents | |
|---|---|
| **Particulars** | **Maximum (Upto)** |
| Nitrogen | 3.00% |
| Phosphorous | 3.00% |
| Potassium | 1.70% |
| Magnesium | 1.50% |
| Calcium | 0.40% |
| Sulphur | 1.70% |
| Iron | 0.04% |
| **Particulars** | |
| pH | Neutral |
| C:N Ratio | 15-20:1 |
| Organic Matter | Upto 50% |
| Organic Carbon | Upto 25% |

**Plant growth hormones** that proactively catalyze the metabolic process of the plants

Mineral solubilizing & mobilizing **soil-beneficial bacteria**
- N-fixation bacteria
- P and K solubilizing bacteria
- Other mineralizing and mobilizing bacteria for zinc, calcium and silica

Plant protective **beneficial fungal species** to protect against insects, nematodes and pathogenic fungus

(The values mentioned above are based on in-house lab results, at the time of bulk production.)

| Type | Quantity | Application | Frequency |
|---|---|---|---|
| Lawns | 1250 - 1500 gms/sq mtr | Broadcast Guarden Angel. Water immediately. | Every 3-4 months |
| Plants | 200 - 250 gms/plant | Apply Guarden Angel in a circle within the periphery of plant canopy. Water immediately. | Every 3-4 months |
| Potted Plants | | | |
| 4" | 25 gms | Apply Guarden Angel in a circle within the periphery of plant canopy. Water immediately. | Every 3-4 months |
| 8" | 50 gms | | |
| 12" | 75 gms | | |
| 16" | 100 gms | | |
| 20" | 125 gms | | |

Note : Store in a dry and shaded place.

**Abellon** *Agrisciences*

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