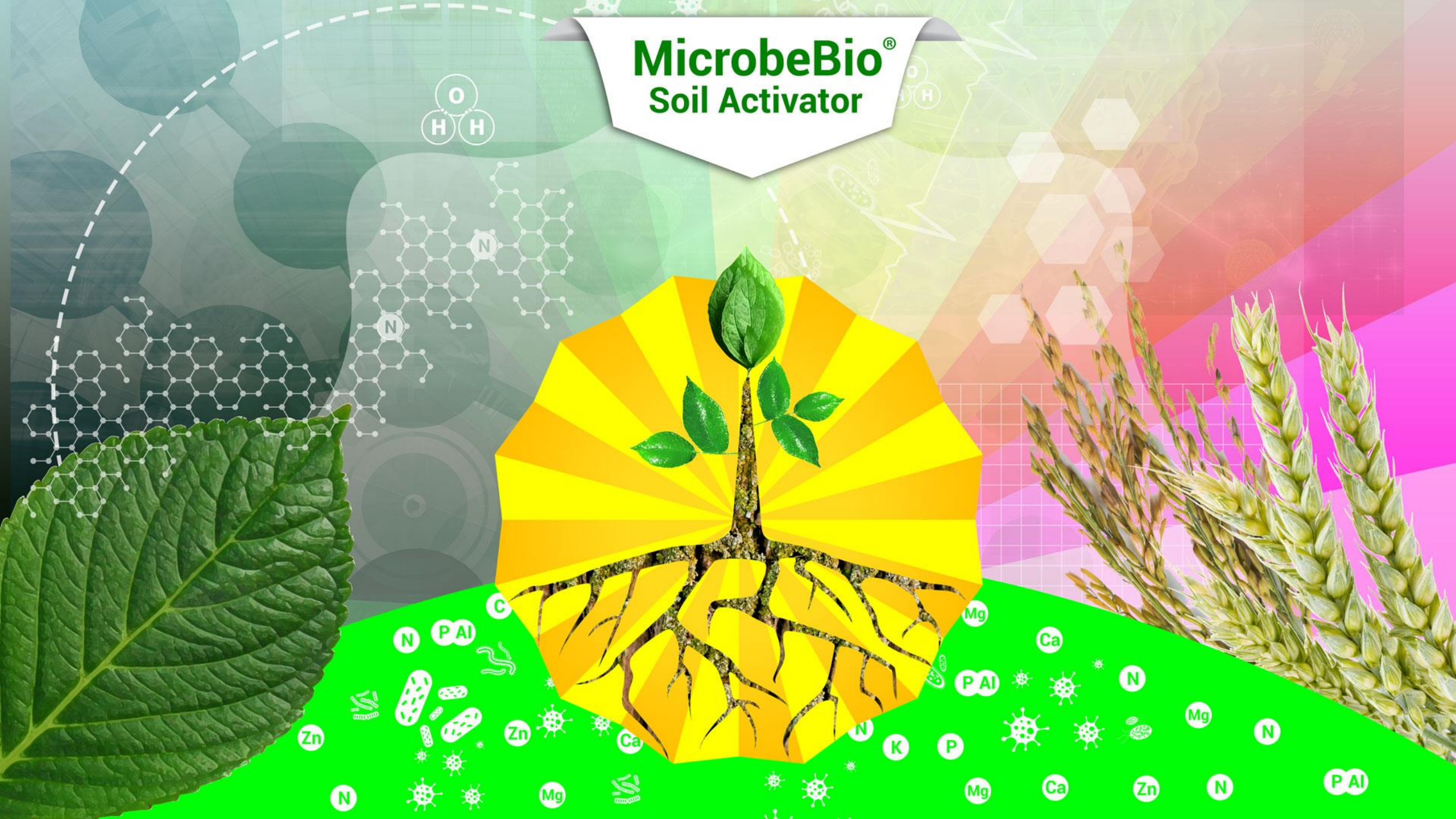
MicrobeBio®
Soil Activator
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INTRODUCTION:

MicrobeBio® Soil Activator is a powder microbial soil enhancer that only mixed with the agronomic soil.

Soil health is fundamental to profitable and sustainable agriculture. Vital organic matter and nutrients are often destroyed, depleted, or otherwise lost from the soil through overuse of fertilizers, erosion, and runoff as a consequence of unsustainable farming practices.

We harness nature’s technology to bring new solutions to modern agriculture. Our microbial formulation is postponed in an organic bio-stimulants that complement each other to promote soil quality, plant health, and fertility in several ways.

INTRODUCTION (cont.):

Vital soil nutrients and organic matter are usually demolished through the overuse of soil erosions, nutrient runoff, and unsustainable and chemical farming practices.

The combination of our products provide the energy and many of the mineral requirements for soil microorganisms. Beneficial soil microorganisms lack the photosynthetic organization to capture energy from the sun since must survive on residual carbon containing substances on or in the soil. Most energy stored within the carbon bonds functions to provide energy for various metabolic reactions within these microorganisms. Our beneficial soil microorganisms (algae, yeasts, bacteria, fungi nematodes, mycorrhizae, and small animals) perform many beneficial functions which influence soil fertility and plant health.

GENERAL BENEFITS:

Our microbial soil enhancers can rebuilt and maintain soil health and fertility in several methods:

- Biological Nitrogen Fixation – the process of assimilating a®ospheric nitrogen into organic compounds, especially by microorganisms.
- Phosphate Solubilization – the process of solubilizing bound phosphate in the soil and making it available for uptake by plants.
- Phytohormone Production – Which is the process of using carbon sequestration to increase healthy plant hormones and storing carbon in the soil which drastically increases the amount of available nitrate nitrogen.
- Mobilization and Mineralization – the process of mobilizing and mineralization of soil nutrients such as salt, phosphate, magnesium, and calcium into a form that is easily used by the plant.

GENERAL BENEFITS (cont.):

- Saprophytic Competence – saprophytes live on dead or decomposing matter. They help the microbes in MicrobeBio® Soil Activator products to compete with native soil microbes, allowing them to better perform their intended functions.
- Soil pH – MicrobeBio® Soil Activator products promote optimal soil pH under extreme environmental condition.

Where are our microbes from?

MICROBES IN AGRICULTURE:

- Microbes have a symbiotic relationship with nature. In fact, microbes found within the rhizospheres of plants are much greater than the concentration that is found in the rest of the soil. Those microbes play a crucial role in the decomposition of organic matter, as well as maintaining and returning nutrients to their mineral forms for plant nutrient uptake. Thus, microbes efficiently produce a variety of substances to promote plant growth and increase yields.
- MicrobeBio® products contain a combination of 50-plus species of microbes. These carefully-selected microbes are found in a variety of environments; from the Amazon jungle to deserts. This ensures our products will work in even the most extreme climates.

MICROBEBIO® ECOSYSTEM & SOCIAL HEALTH:

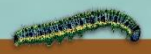
- MicrobeBio® products contain natural microorganisms which will help to reduce the use of inorganic fertilizers (NPK) from 50 - 80%. Not only does this reduce costs, but it also efficiently restores and enhances the quality of soil.
- Besides biodiversity, MicrobeBio® products effectively reduce the toxic chemical compounds remaining in the soil, thereby enhancing soil fertility.
- MicrobeBio® products are organic and eco-friendly. They are non-toxic and are safe to use around children, adults, pets, and livestock.

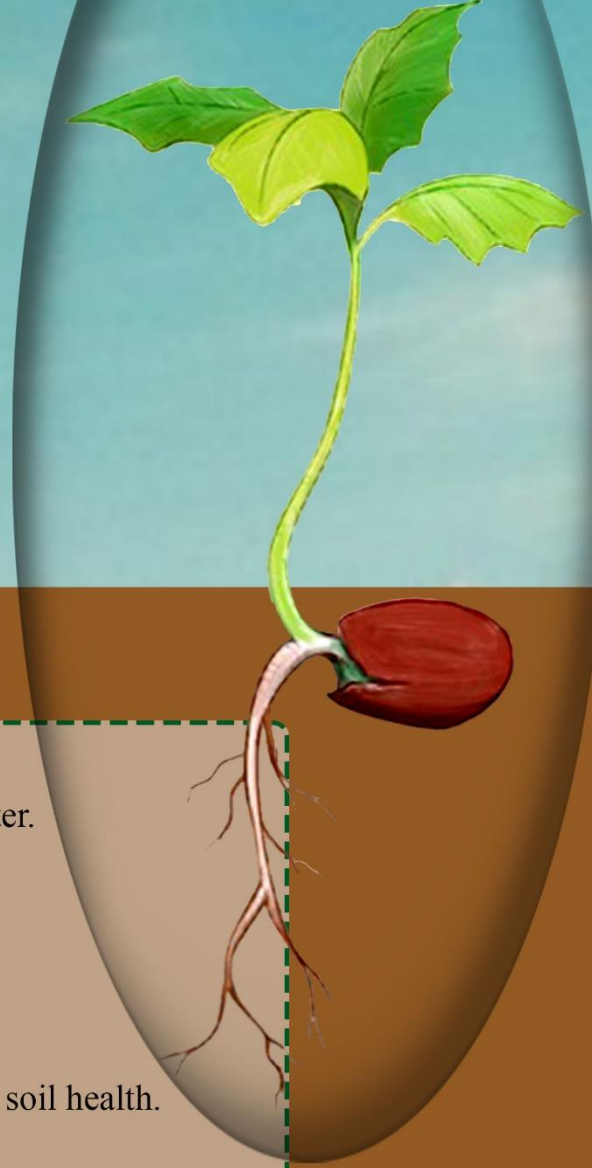
How Do Microbes Work?

MICROBEBIO® ECOSYSTEM & SOCIAL HEALTH:

- Farmers normally look for soil with high organic matter levels. Soil organic matter and the organisms that live in it, are critical to many soil processes. It helps provide high crop yields and reduces input costs. The combination of our products introduces micro-organisms that play vital roles in the decomposition of organic matter to make retained nutrients available to the plant. Soil life plays a major role in many processes that increase nutrition and water availability for agriculture productivity.
- The main activity of beneficial organisms is growing and reproducing. By-products from stable humus, roots and plant residue feeds soil organisms. In turn, soil organisms support plant health as they decompose plant residues, organic matter, cycle nutrients, enhance soil structure and control the populations of soil organisms, both beneficial and harmful (pests and pathogens) in terms of crop productivity. (cited from www.fao.org)

INCREASE YIELD
RESTORE & MAINTAIN SOIL HEALTH
CONTROL PESTICIDES





NUTRITIONAL FEEDS

ENERGY SOURCES:

Light energy, in the chemical bonds of organic compounds (sugars or starches), in the bonds of inorganic compounds.

BASIC ELEMENTS NEEDED TO MAKE AND REPLACE CELL STRUCTURE OF ORGANISMS:

Macro-nutrients

Secondary nutrients

Micro-nutrients.

IDENTIFICATION OF MICROBES ON THE BASIS OF HOW NUTRITIONAL NEEDS:

Heterrotrophs depend on the organic compounds in the environment - carbon sources, sugars, starches, fats, and other organic matters.

Autotrophs derive the energy from the non-organic sources with phototrophs and chemotrophs).

BENEFICIAL MICROORGANISMS

Make soil alive.

Break down organic matter.

Recycle nutrients.

Create humus.

Create soil structure.

Fix nitrogen.

Promote plant growth.

Control pests and diseases to help soil health.

Heal soil

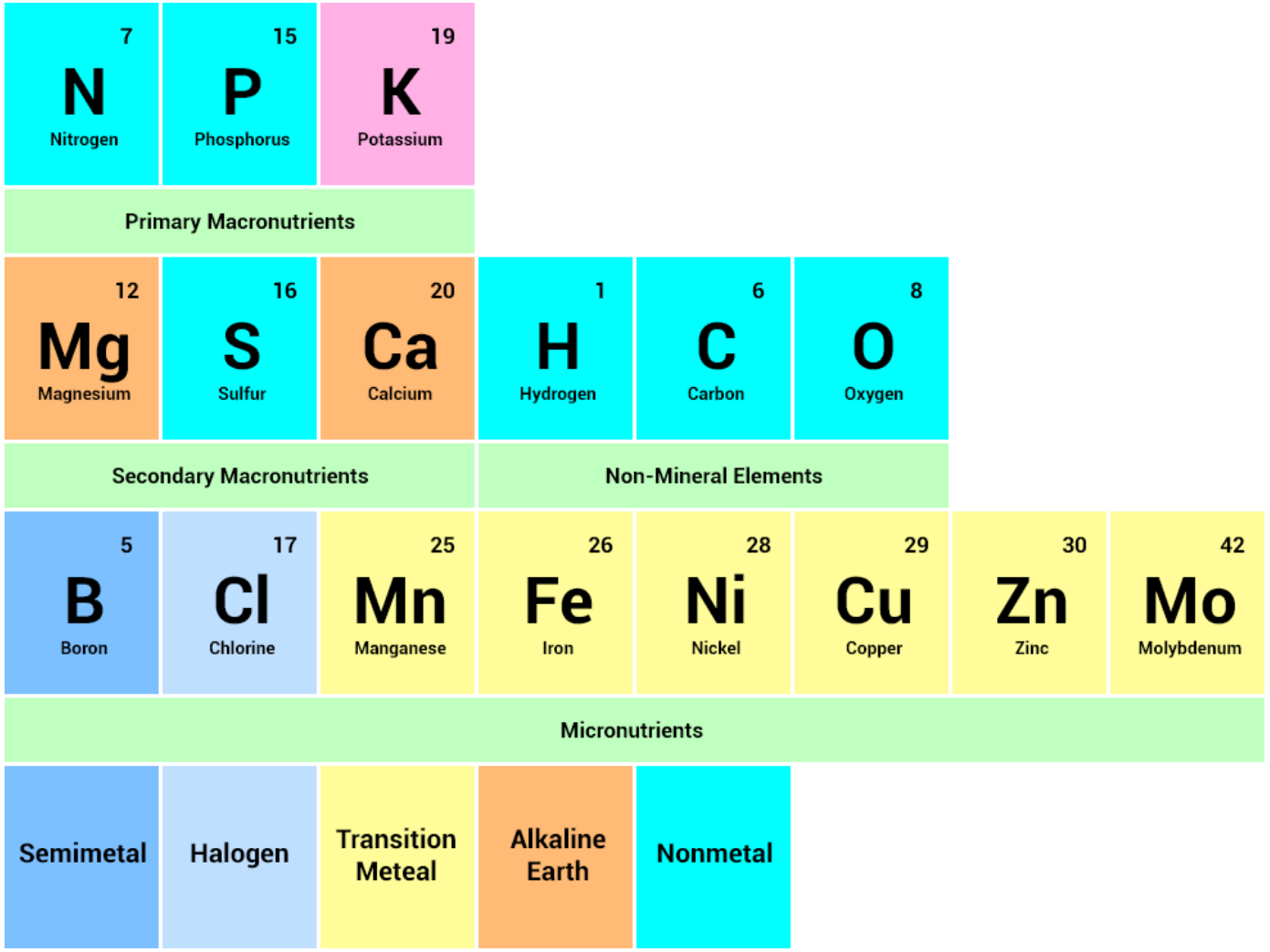
Reduce overuse of fertilizers, erosion, and runoff as a consequence of unsustainable farming practices.

Save cost and Increase yield.

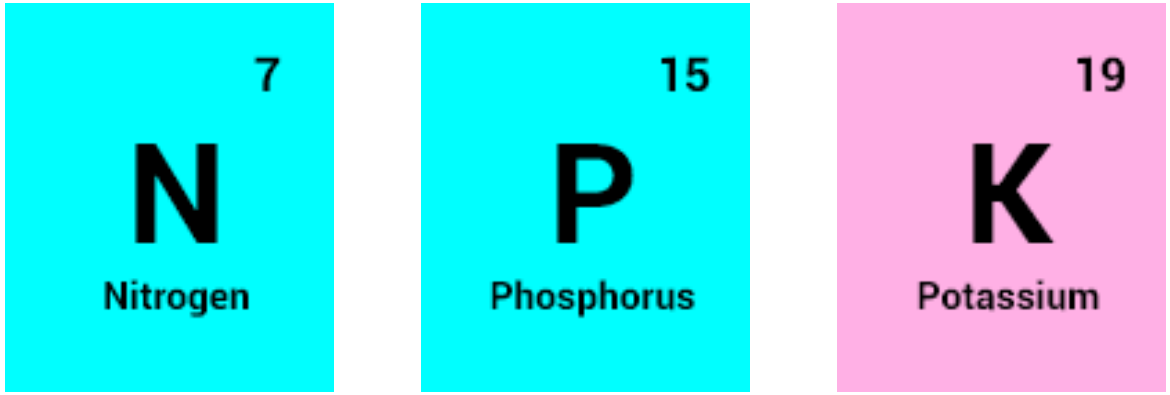
WHAT ARE ESSENTIAL NUTRIENT FOR PLANT GROWTH?

Plants are complex organisms that require many different forms of nutrients. There are 17 nutrients that are essential for plant health. The primary macronutrients (Nitrogen, Phosphorus, Potassium,) secondary macronutrients (Magnesium, Sulfur, Calcium,) micronutrients (Boron, Chlorine, Manganese, Iron, Nickel, Copper, Zinc, Molybdenum) and Non-mineral elements (Hydrogen, Carbon, Oxygen) are all nutrients needed for optimal growth and a healthy plant. It’s all about the biology of the soil and here is why it is so important.

WHAT ARE ESSENTIAL NUTRIENT FOR PLANT GROWTH?



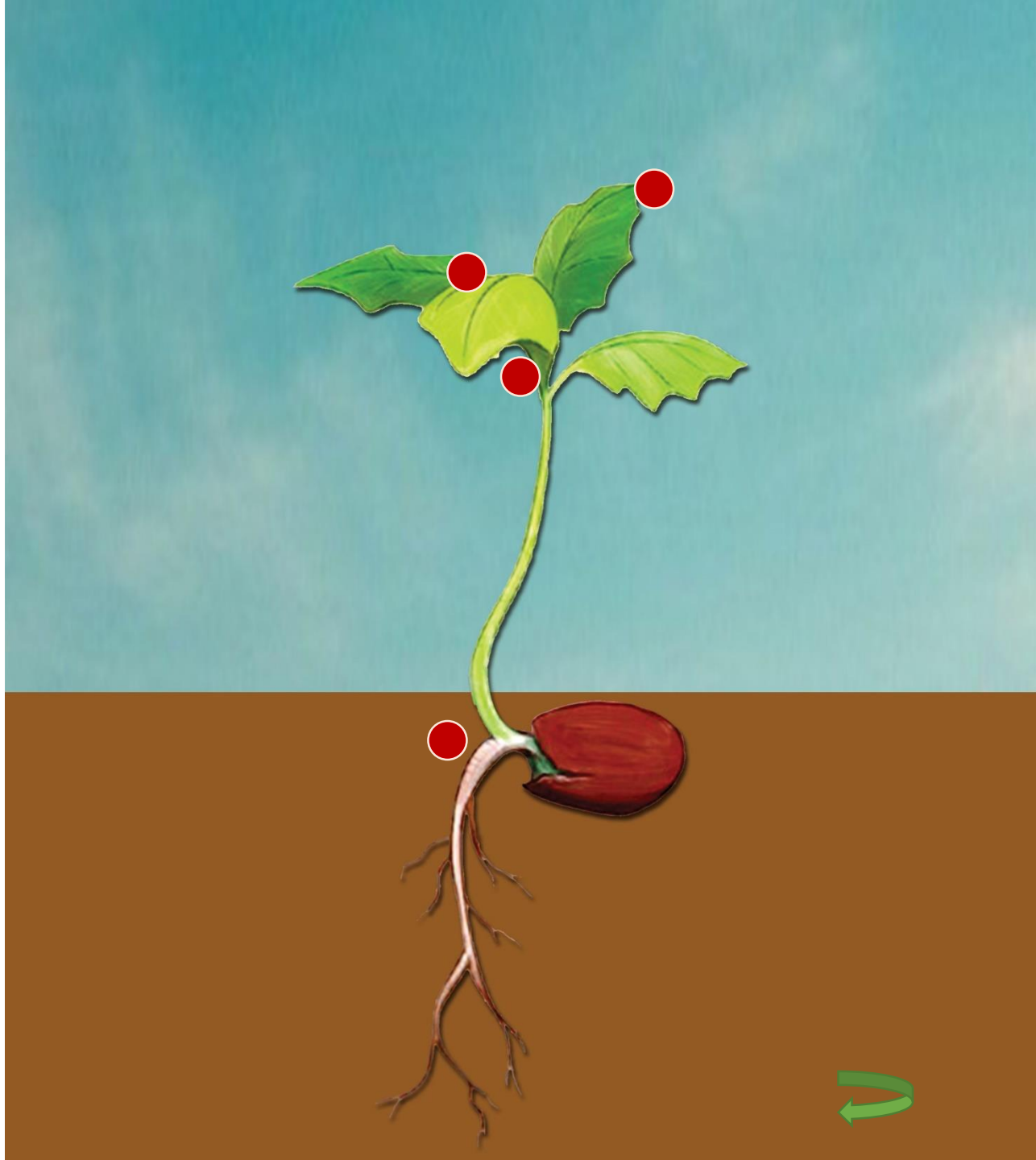
PRIMARY MACRONUTRIENTS



SECONDARY MACRONUTRIENTS

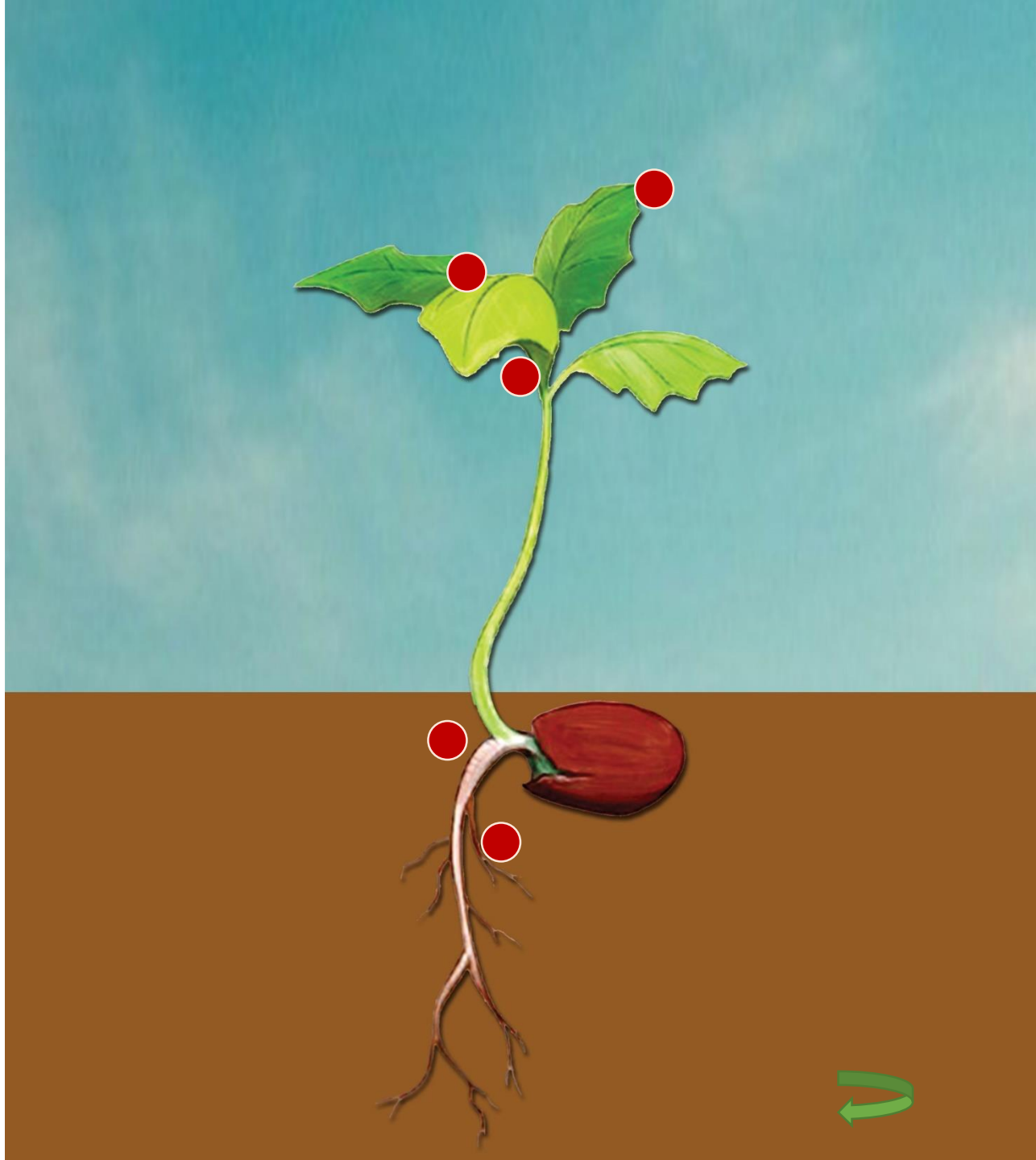
N (NITROGEN)

- Nitrogen (N) is important for plants and other living things. It plays a crucial role in plants and is responsible for chlorophyll synthesis and in the process needed to make protein. Most nitrogen is unavailable to plants because it is in a gas state in the atmosphere.
- MicrobeBio® helps provide more nitrogen for plants through Nitrogen Fixation. This is the process of taking the unusable nitrogen from the air and converting it into organic compounds that plants and organisms can use.



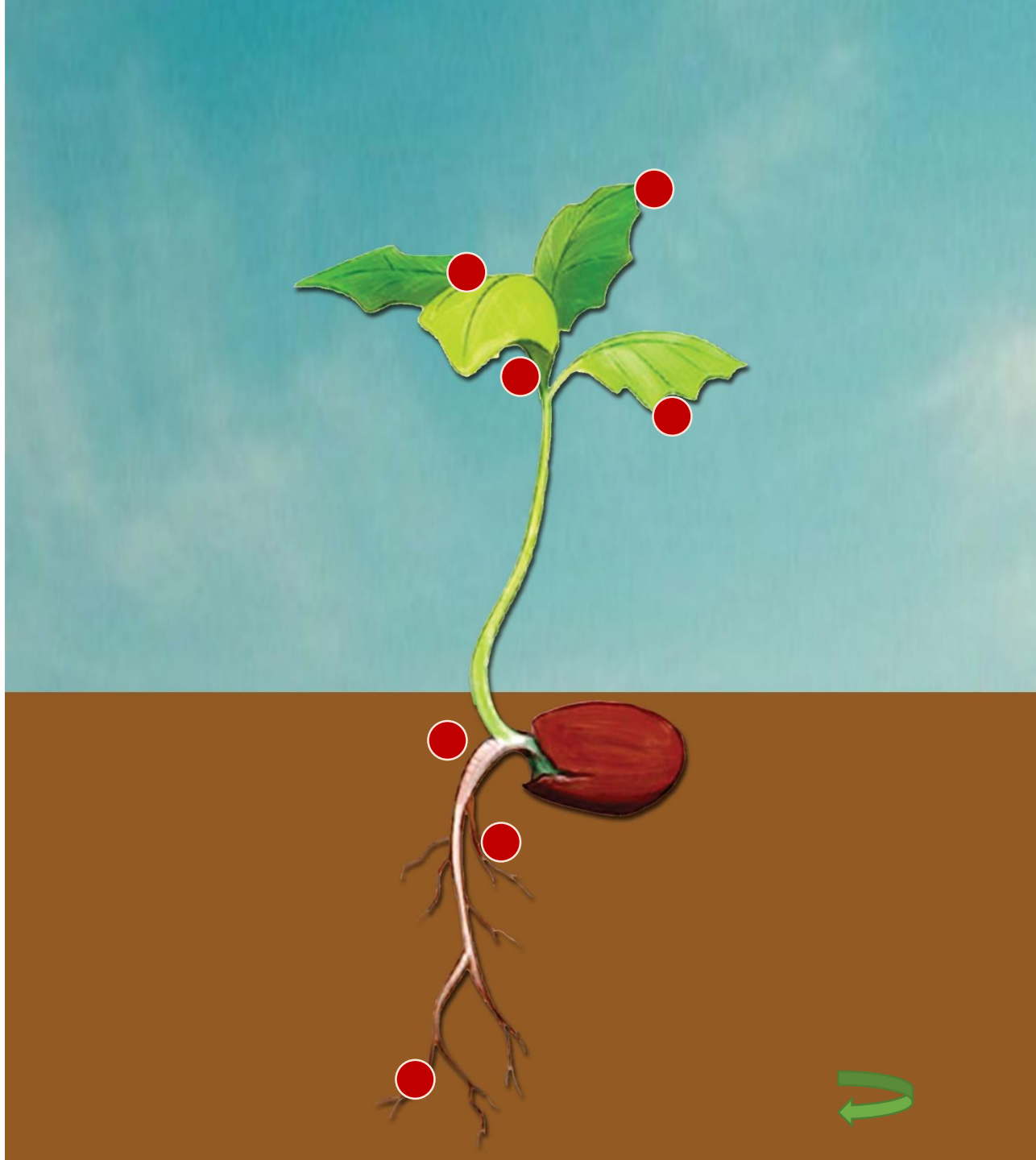
P (PHOSPHORUS)

- Phosphorus is one of the main nutrients plants need to grow healthy. Plants get the phosphorus from the soil by absorbing P from the soil as primary and secondary orthophosphates. It is essential plants get enough phosphorus because it is important for many of its production cycles including root growth, converting the sun’s energy into usable energy and make other key functions. A lack of phosphorus is detrimental to the plant and will cause it to not absorb nutrients.
- MicrobeBio® helps plants receive the amount of phosphorus they need to thrive. Our product accomplishes this through phosphate solubilization which is the process of solubilizing bound phosphate in the soil and making it available for uptake by plants.



K (POTASSIUM)

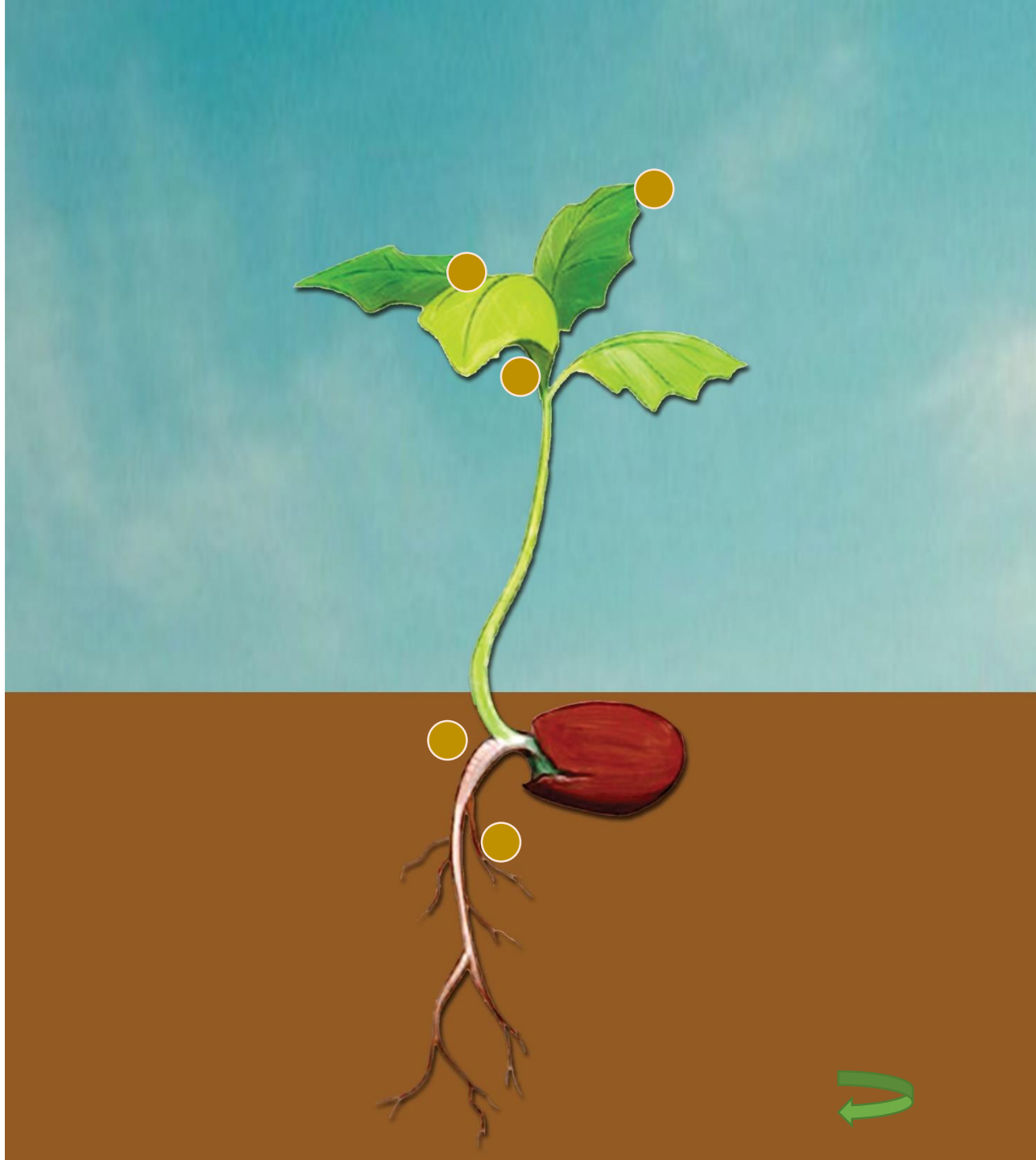
- Potassium is another essential nutrient that plants need in order to be healthy. It is vital to photosynthesis, protein synthesis and many other plant functions. Potassium builds cellulose and helps translocate sugars and starches. It also has a major impact on the plants size, shape, color, taste and other quality related measurements. Having enough potassium can also increase root growth and increase drought resistance.
- MicrobeBio® helps plants receive as much potassium as they need. The microorganisms in MicrobeBio® solubilize potassium, which is the process of breaking down potassium making is available to plants, and make it easier for plants to absorb it.



SECONDARY MACRONUTRIENTS

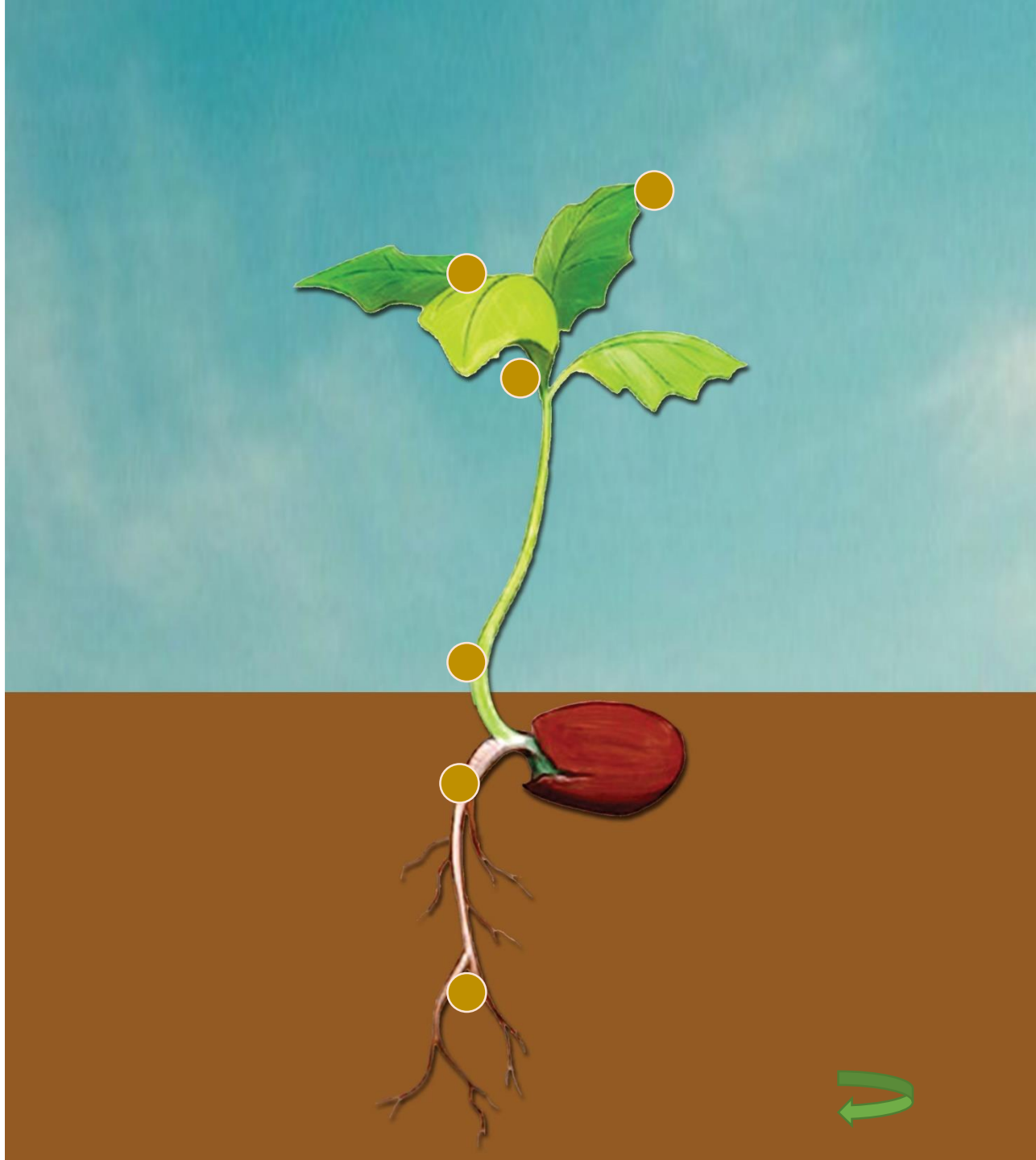
Mg (MAGNESIUM)

- Magnesium is important to a plants health. Magnesium is in every molecule of chlorophyll which means it is actively involved in photosynthesis. It also aids in phosphate metabolism, plant respiration and the activation of many enzyme systems. Magnesium is needed to capture the sun’s energy for growth and production through photosynthesis.
- Like many other nutrients, most magnesium is not available for plants. Microbes take this unusable magnesium and convert it into a compound that plants can absorb. MicrobeBio® microbes will ensure plants get the right amount of magnesium that they need.



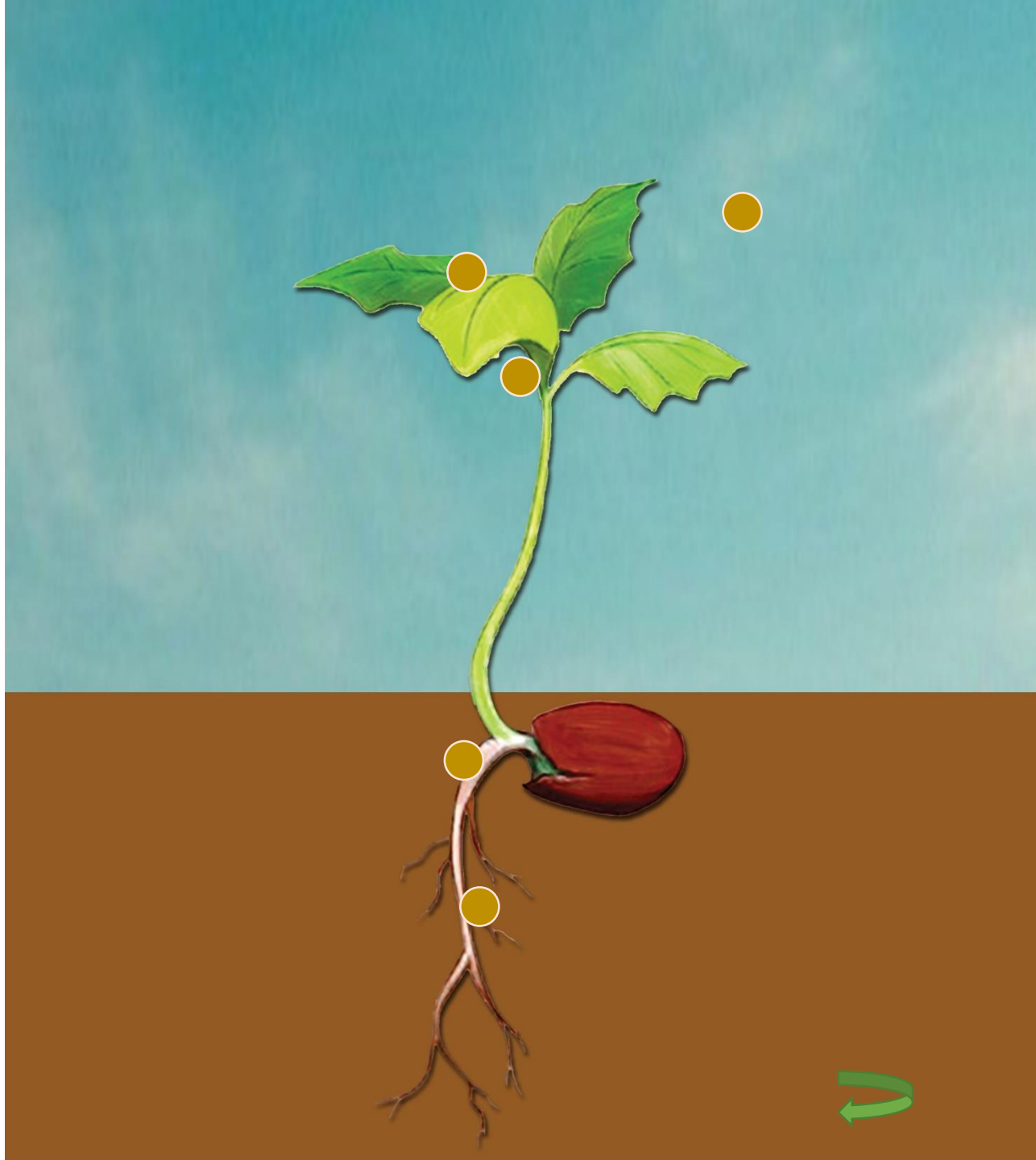
S (SULFUR)

- Sulfur is an important nutrient that plants receive through soil, but can also enter plant leaves as dioxide. Sulfur is needed for synthesis of certain amino acids and proteins, photosynthesis, seed production, nitrogen fixation and is also useful for winter crop hardiness. However, most sulfur in the soil is tied up in organic matter and cannot be absorbed by plants. This leads to the problem of plants not having enough sulfur. MicrobeBio®'s microbes help break up this matter and convert the sulfur in the organic matter into a compound that is easy for plants to absorb and use.

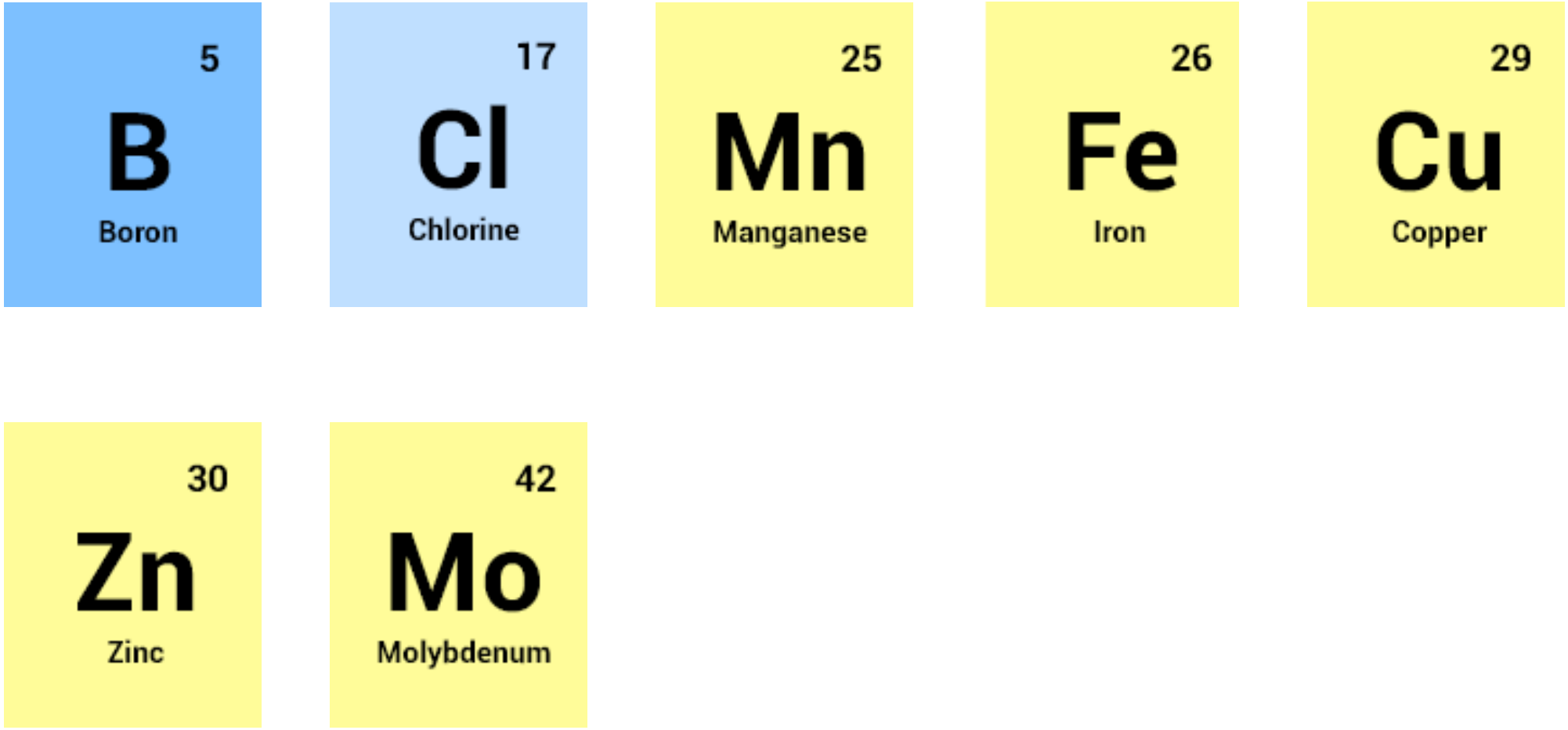


Ca (CALCIUM)

- Calcium is an important nutrient for plants because it is essential for their structure. Much like we need calcium for strong bones, plants need calcium to develop strong cell walls. This enables plants to stand upright and be better protected. Calcium also helps with cellular signaling which is a biological process critical to a plants healthy development. Deficiency in calcium can have negative effects on plant growth. Most calcium compounds found in the soil are insoluble and plants can’t use them. MicrobeBio®’s microbes help by taking the insoluble calcium and turning it into a soluble compound that plants can use.

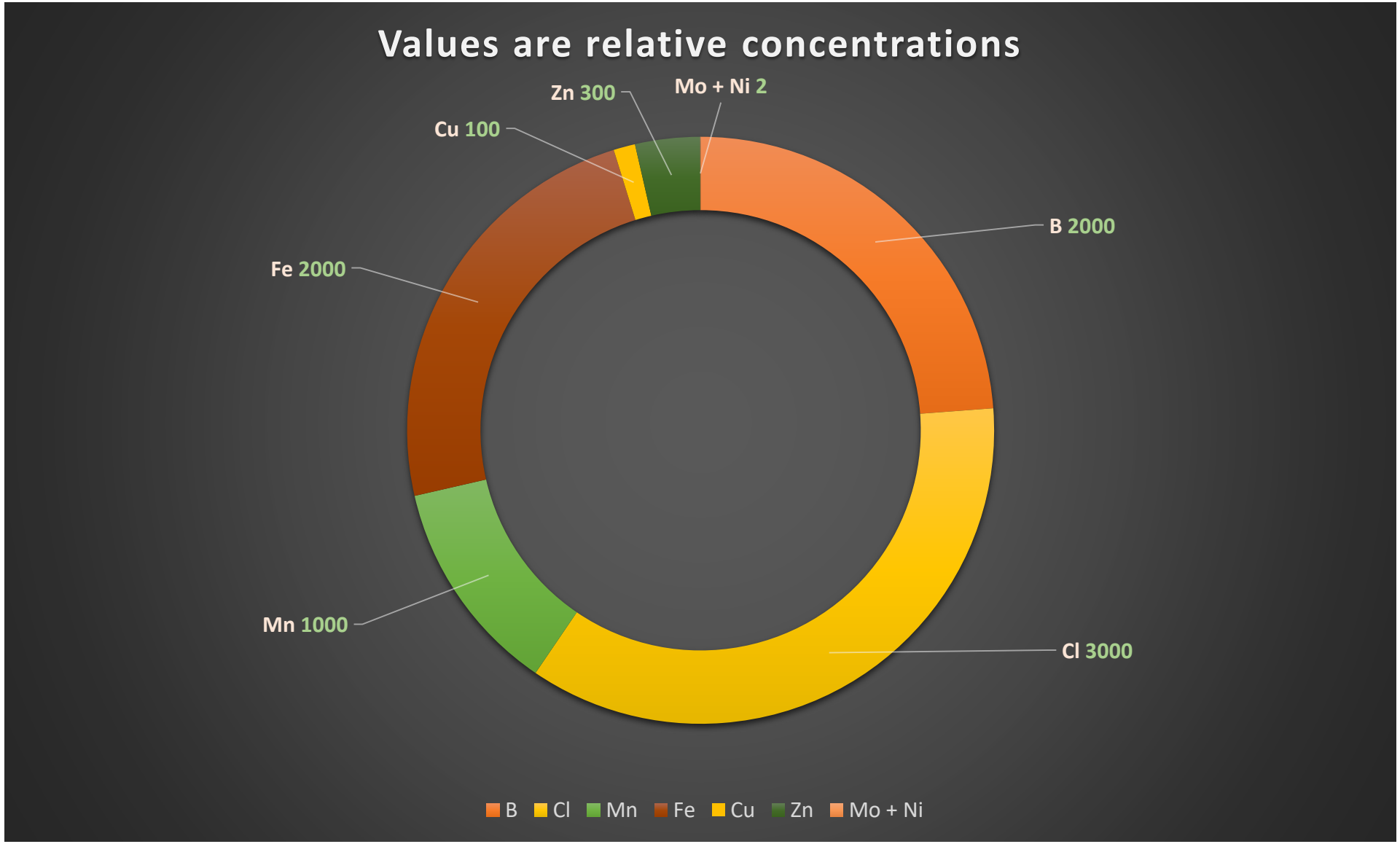


MICRONUTRIENTS



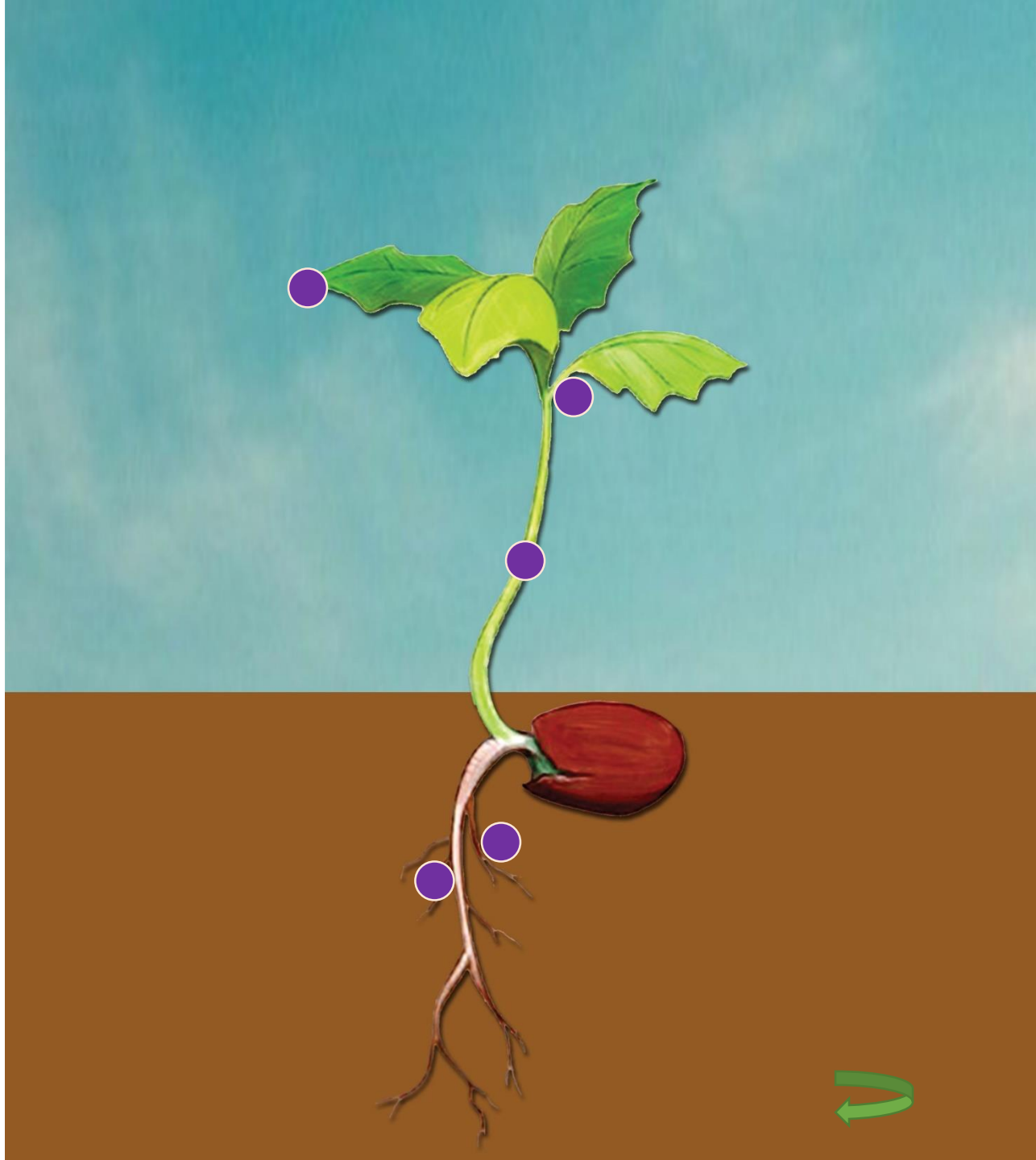
NON – MINERAL ELEMENTS

ACHIEVE FULL BALANCED NUTRITION *(Source: IPNI)*



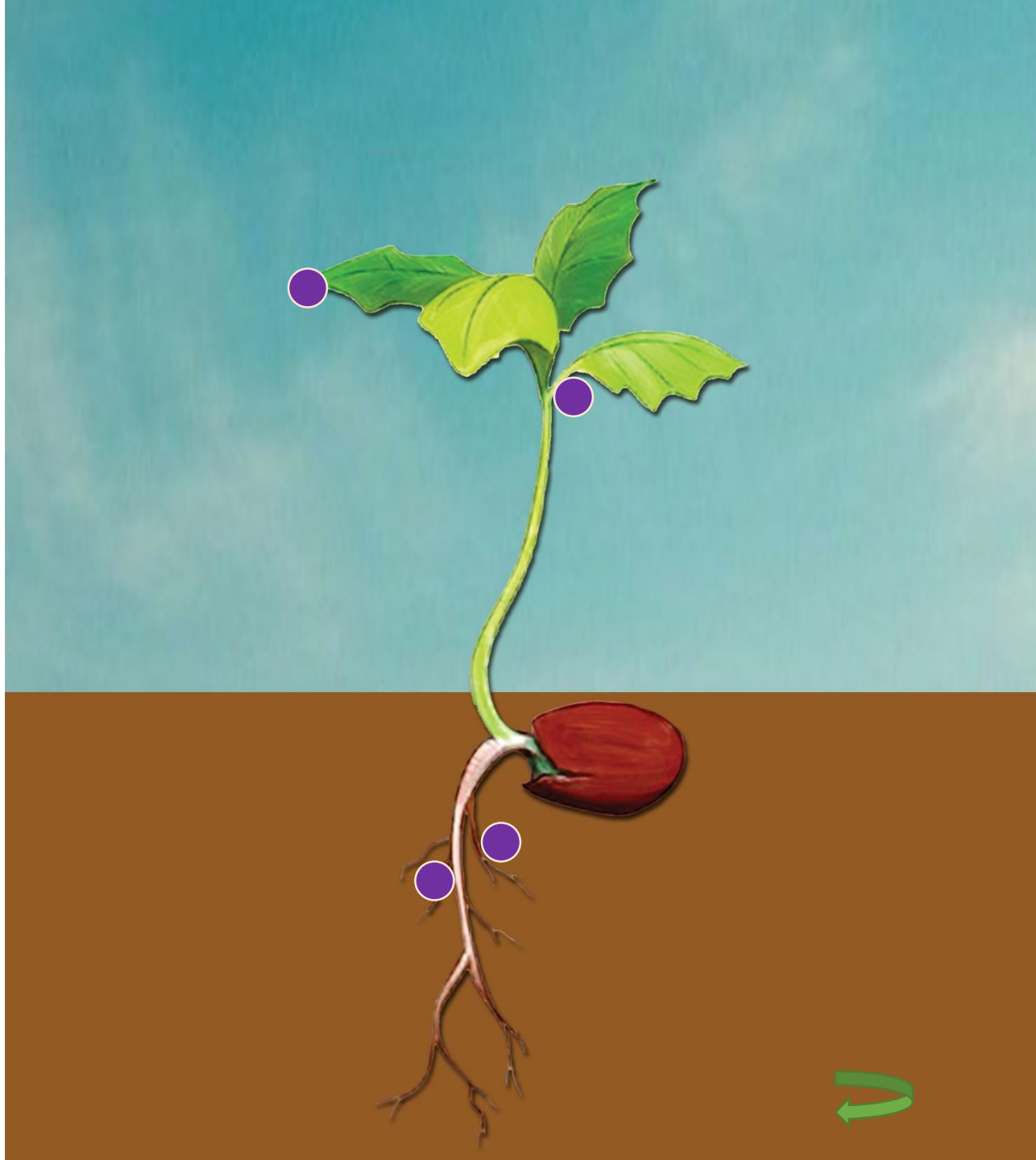
B (BORON)

- Boron is vital to plant health because it plays a key role in forming and strengthening cell walls. Boron also has an impact on the uptake of potassium and phosphorus. Boron is also one of the nutrients that usually has the biggest deficiency in plants. Deficiency in Boron affects the cell walls and reproductive organs of plants. Severe deficiency can lead to stunted growth and death of growth tissue. MicrobeBio®'s microbes go into the soil and any insoluble Boron is broke down and made into a soluble matter that plants can absorb.



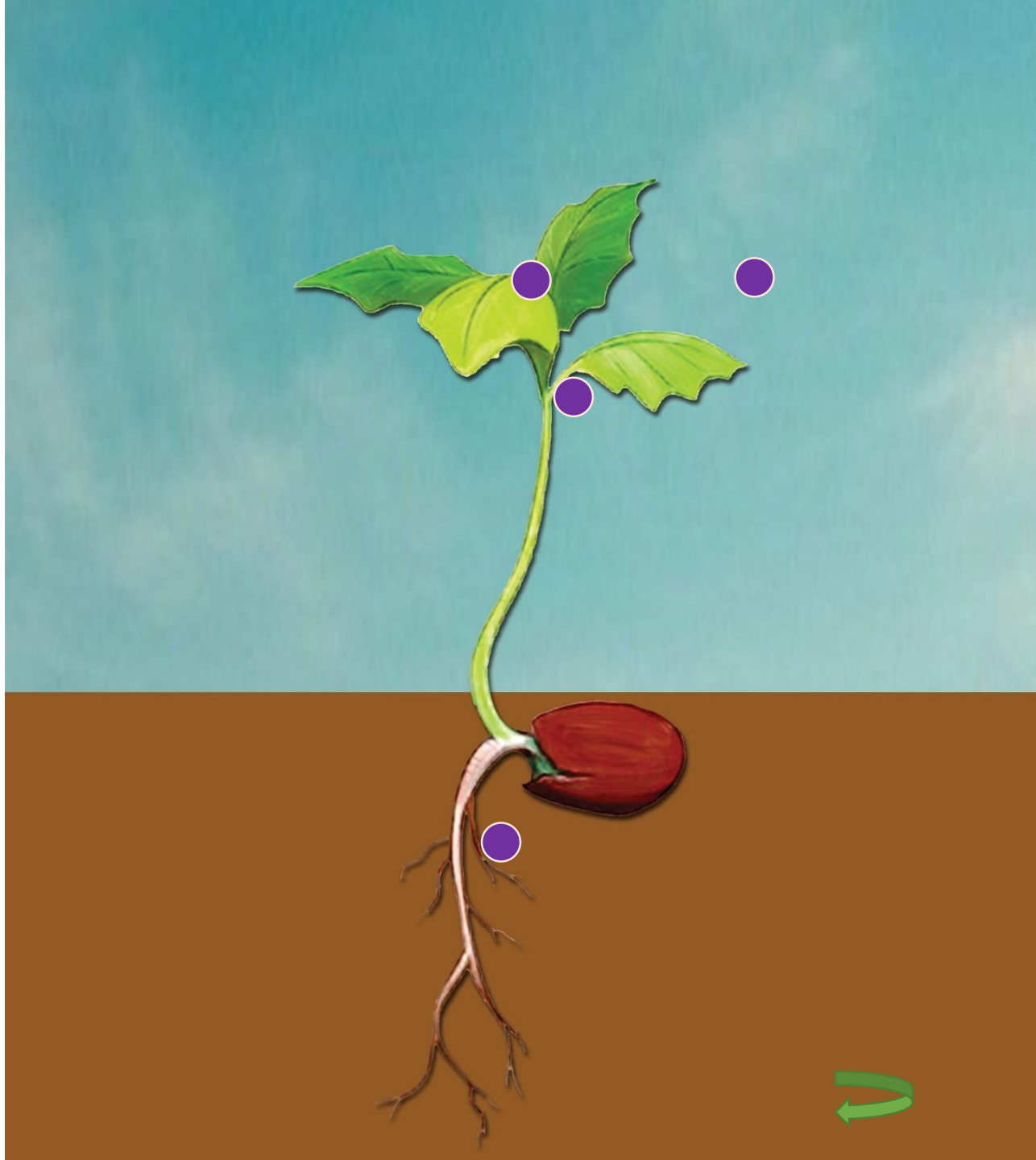
Cl (CHLORINE)

- Chlorine has a number of benefits for plant growth and is an essential nutrient for plants despite the fact it is classified as a micronutrient. It plays a key role along with potassium in the proper function of the plants stomatal openings. This allows plants to control their internal water balance. Chloride (Chloride element that plants absorb) also helps with the hydrolysis process in photosynthesis. Most chloride found in soil is soluble, but MicrobeBio® can be used in soil where the chloride is not soluble and help make it accessible to plants.



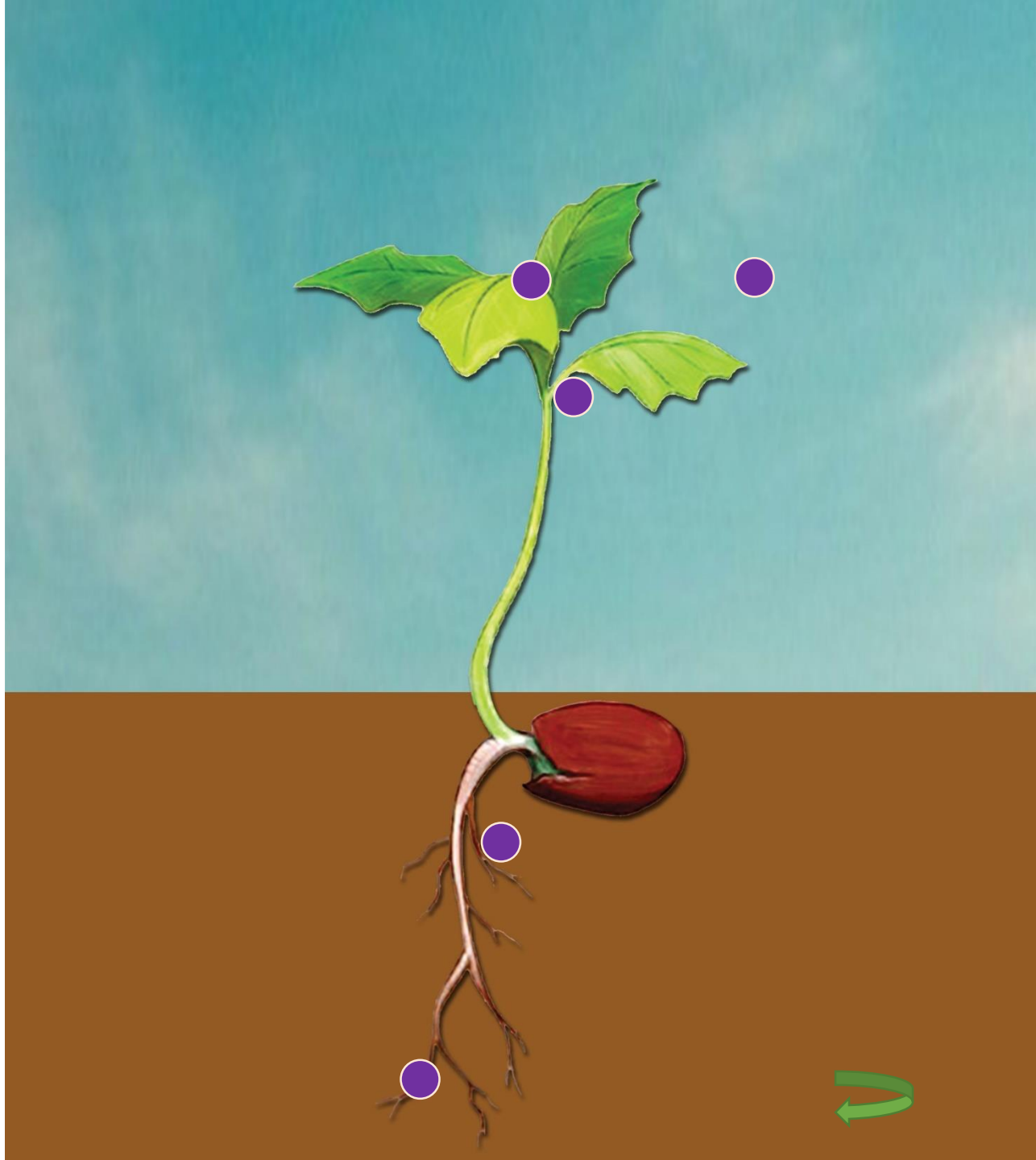
Mn (MANGANESE)

- Manganese is used in plants as a major factor to various systems including photosynthesis, respiration and nitrogen assimilation. It is also involved in the process for pollen tube growth, pollen germination and resistance to root pathogens. Deficiency in Manganese can stunt growth, cause yellow leaves and cause sunken spots to appear. MicrobeBio® helps break down Manganese in the soil, making it available for plants to take in.



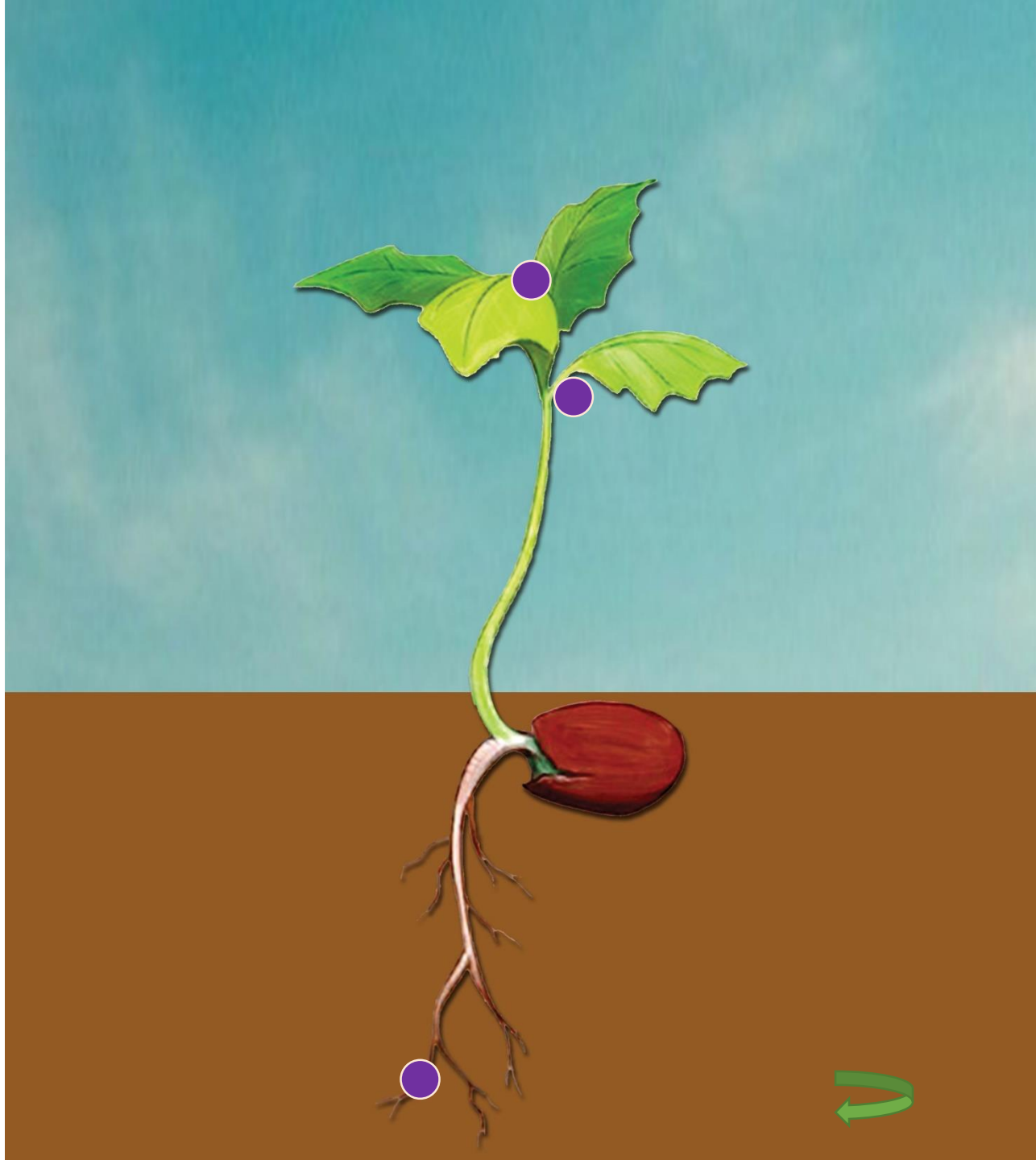
Fe (IRON)

- Iron is essential for plant growth and food production and is a key nutrient needed for energy transfer, nitrogen reduction and fixation and lignin formation. Plants also need iron in order to move oxygen through their system and keep their leaves green. Deficiency in iron can cause yellow leaves with green veins also known as chlorosis. MicrobeBio®'s microbes help plants receive the nutrients needed by getting iron from the soil (sourced from water or fertilizer) and making is accessible to plants.



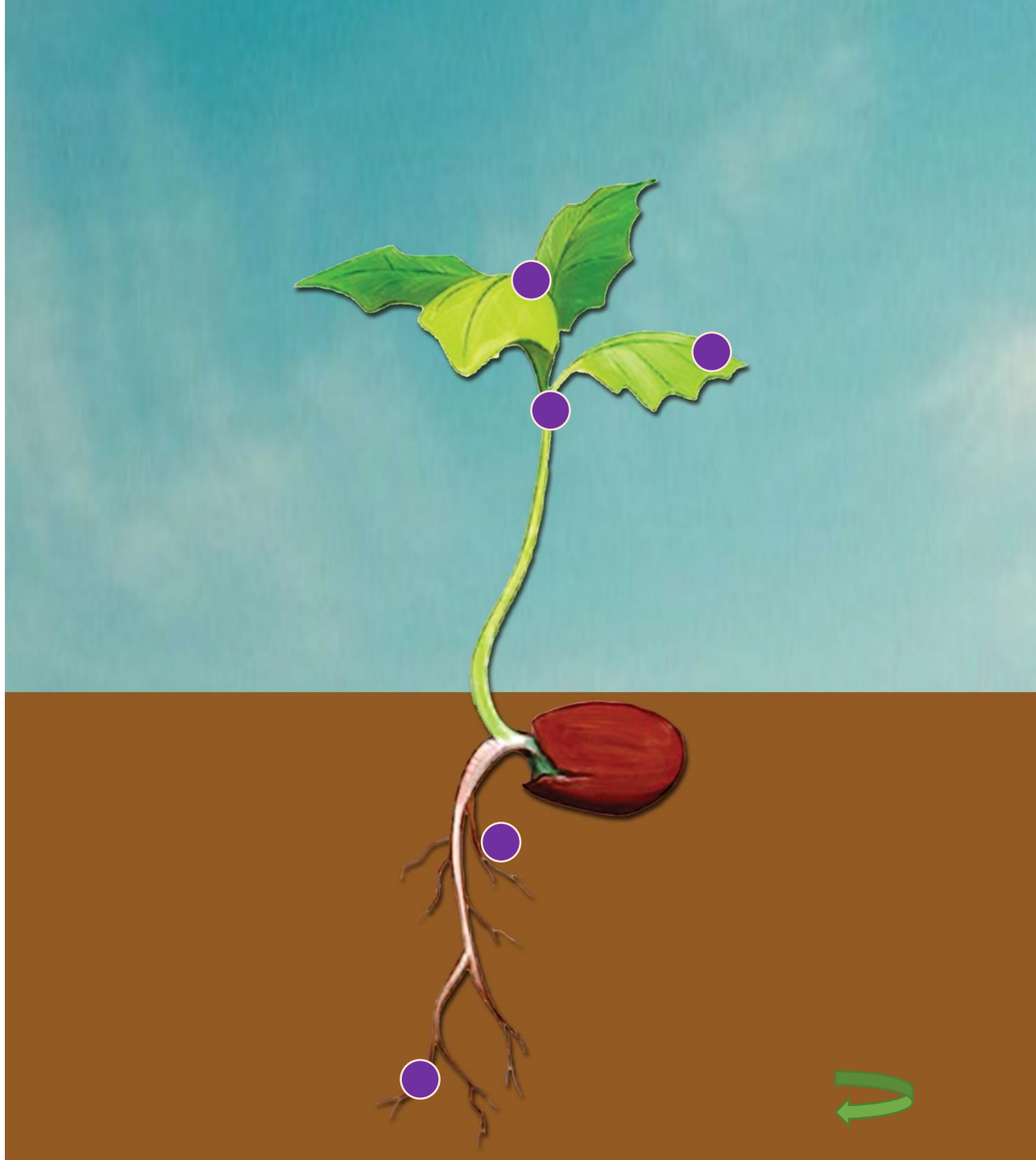
Ni (NICKEL)

- Nickel (Ni) was added to the list of essential plant nutrients late in the 20th century. Plants absorb Ni as the divalent cat ion Ni_2^+. It is required in very small amounts, with the critical level appearing to be about 0.1 parts per million. Furthermore, Nickel is necessary for the biosynthesis of the hydrogenase, carbon monoxide dehydrogenase, and of factor F430, found in a number of genera of bacteria.
- No Ni deficiencies have been observed under crop-growing conditions, but in crop research settings, argriculture scientists have reproduced deficiency symptoms such as chlorosis of young leaves and dead meristematic tissue.
- Nickel is a component of the urease enzyme and is, therefore, necessary for the conversion of urea to ammonia (NH_3) in plant tissue, making it important in plant nitrogen (N) metabolism.
- MicrobeBio® contains pieces of Four microbial enzymes are known to require nickel: hydrogenase, methyl coenzyme M reductase, carbon monoxide dehydrogenase, and urease. Recent biochemical and molecular biological experiments have provided clear evidence for the existence of multiple auxiliary genes that facilitate nickel incorporation into urease and hydrogenase.



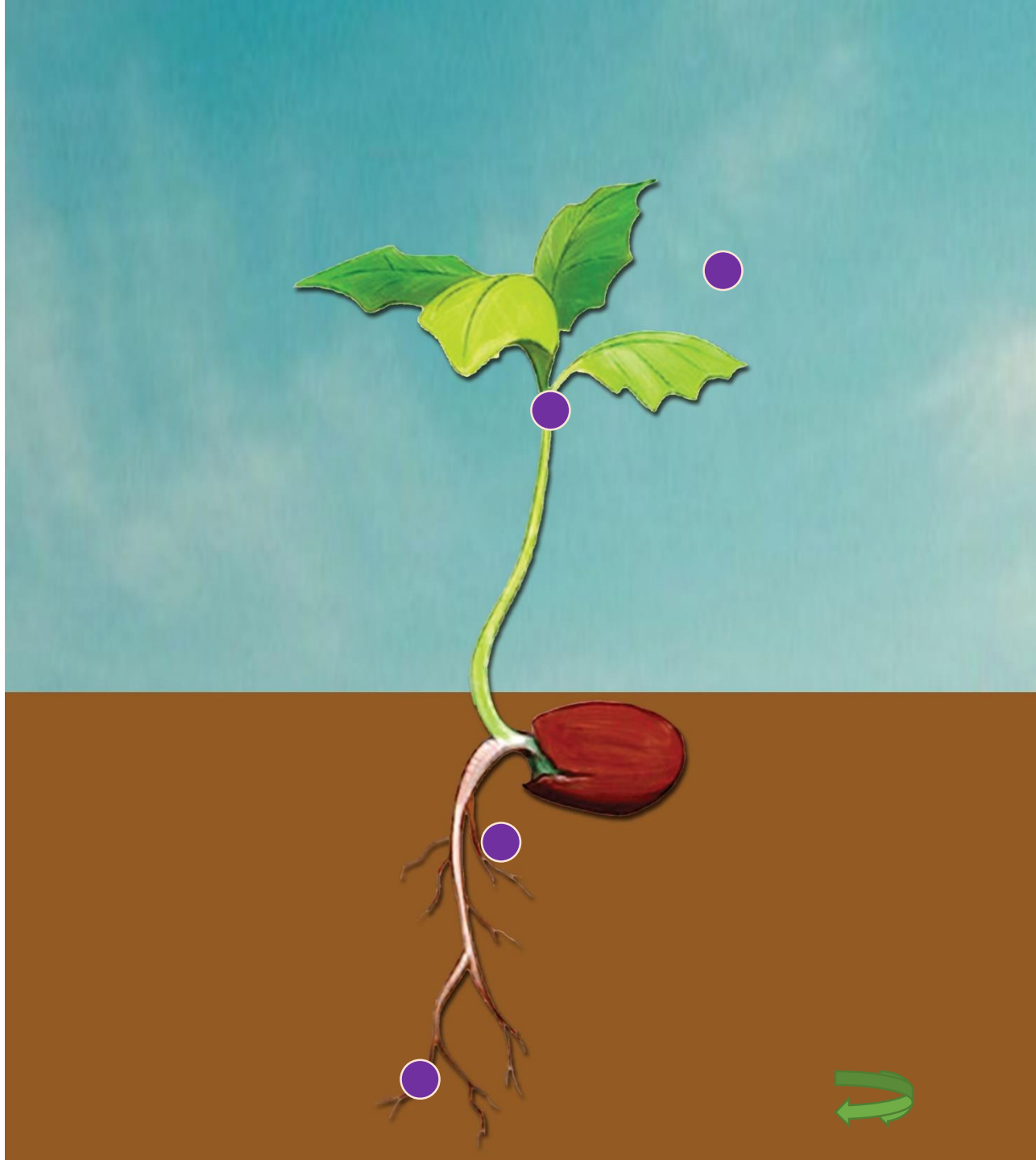
Cu (COPPER)

- Copper is used to activate enzymes in plants that are involved in lignin synthesis and it is also essential for many other enzyme systems. Copper is used in photosynthesis and also serves to intensify flavor and color in vegetables and color in flowers. Deficiency in Copper can cause new leaves to grow smaller, lose their sheen and eventually wilt. MicrobeBio®'s microbes help provide copper to plants by finding and creating copper compounds that are usable by plants.



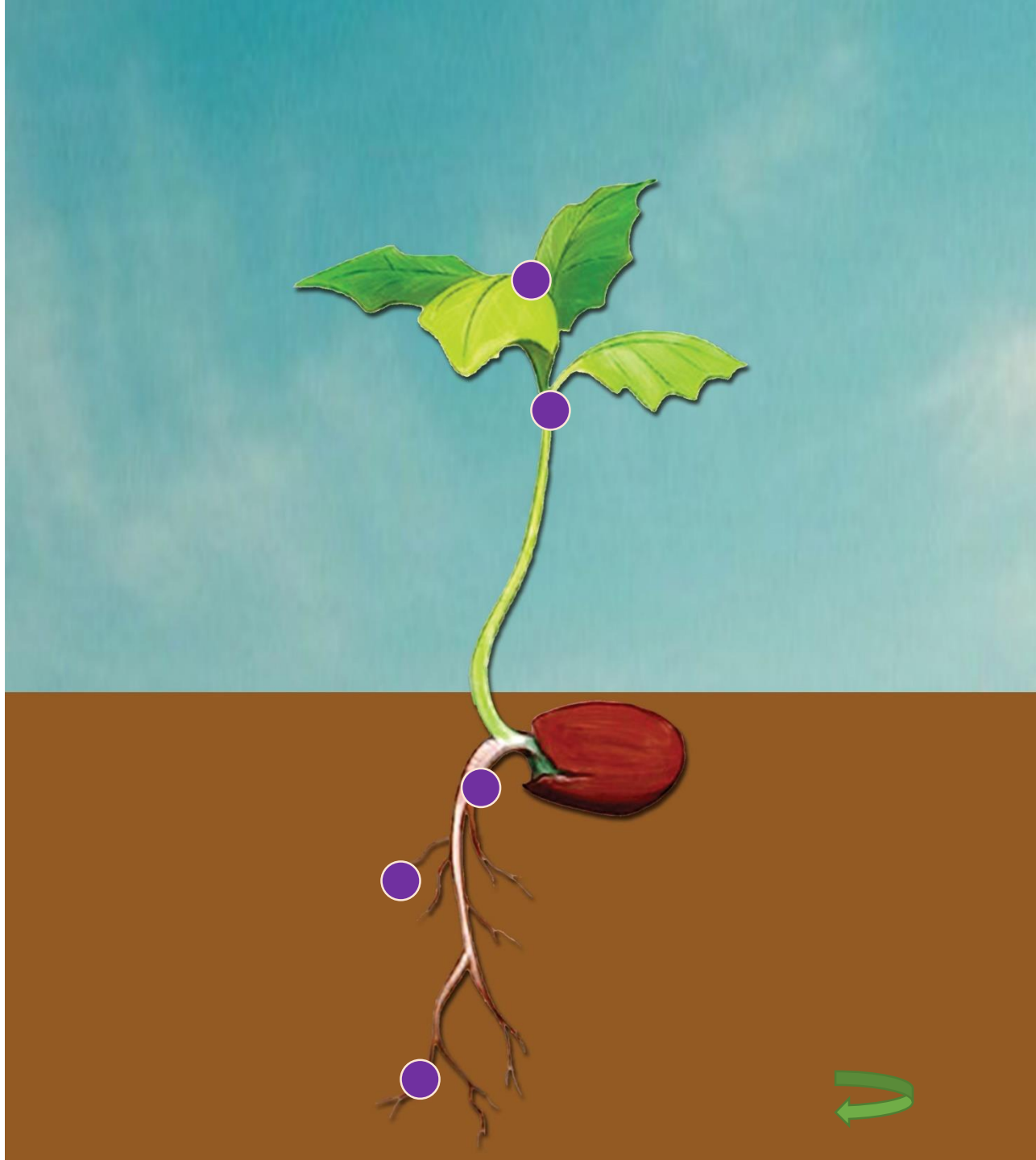
Zn (ZINC)

- Zinc is used to activate enzymes that are responsible for the synthesis of certain proteins. It is also used in the conversion of starches to sugars, the formation of chlorophyll and some carbohydrates, to help withstand cold temperatures and helps in the formation of auxins which help with growth regulation and stem elongation. Deficiency in Zinc leads to chlorosis and new leaves are often cupped upward or distorted. MicrobeBio®'s helps plants get the amount of Zinc they need by breaking down organic matter that contains Zinc and making it available for plants to use.

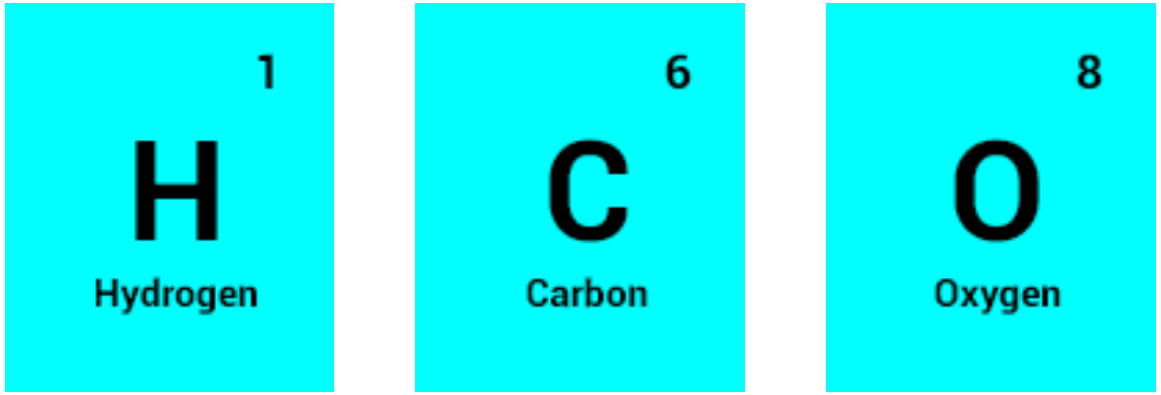


Mo (MOLYBDENUM)

- Molybdenum is an important nutrient that is used in two enzymes that convert nitrate into nitrite and then into ammonia before it is used to synthesize amino acids throughout the plant. Plants also use Molybdenum to convert inorganic phosphorus into organic forms and by symbiotic nitrogen fixing bacteria in legumes to fix atmospheric nitrogen. MicrobeBio® helps by turning Molybdenum into a soluble form that plants can use.

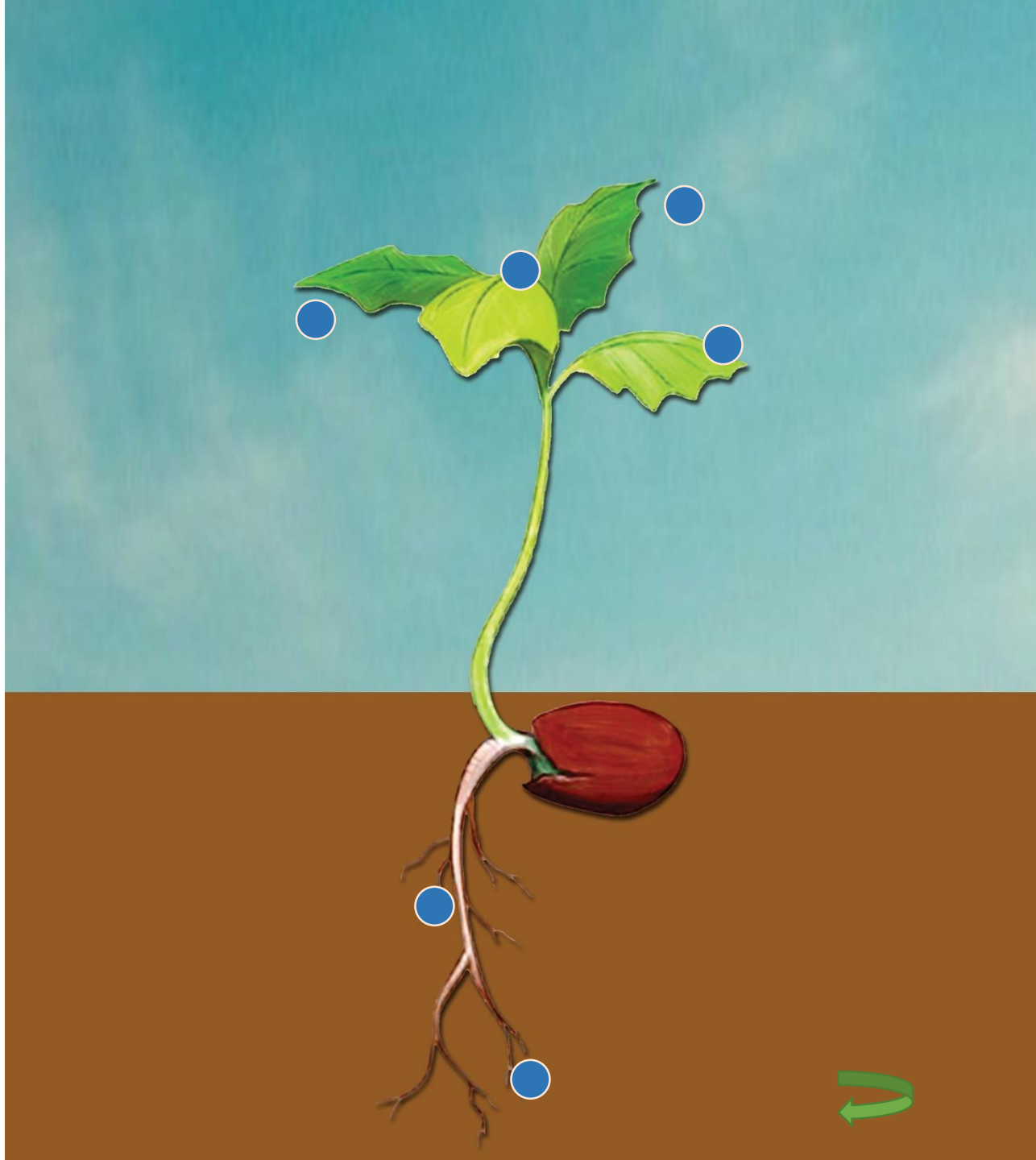


NON – MINERAL ELEMENTS



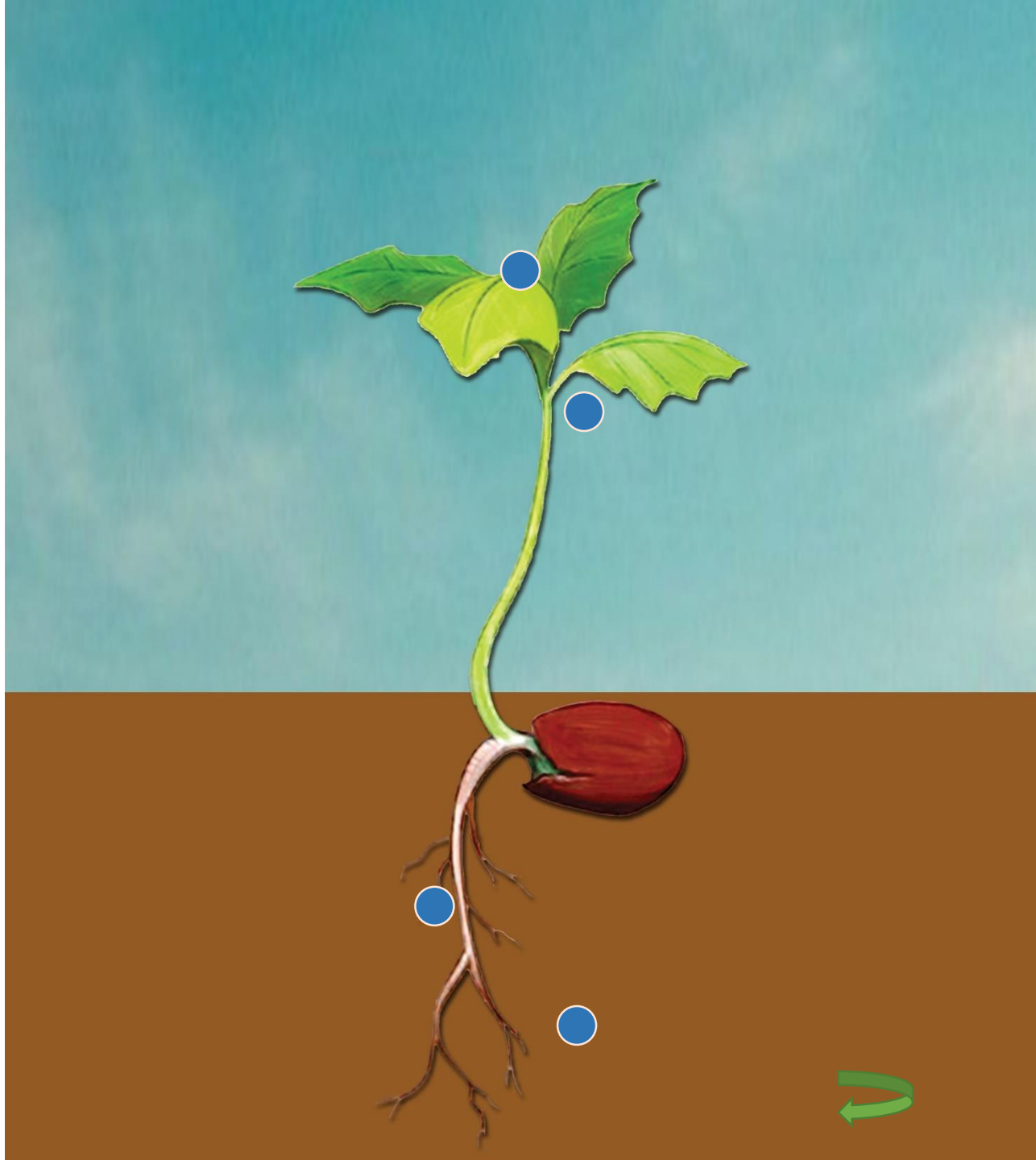
H (HYDROGEN)

- Hydrogen is an important compound for plants and it one of three that make up a majority of the plant. Hydrogen is needed in order to complete biochemical reactions. Hydrogen is mostly derived from water which means most hydrogen that a plant comes into contact with should be soluble so the plant can use it right away.



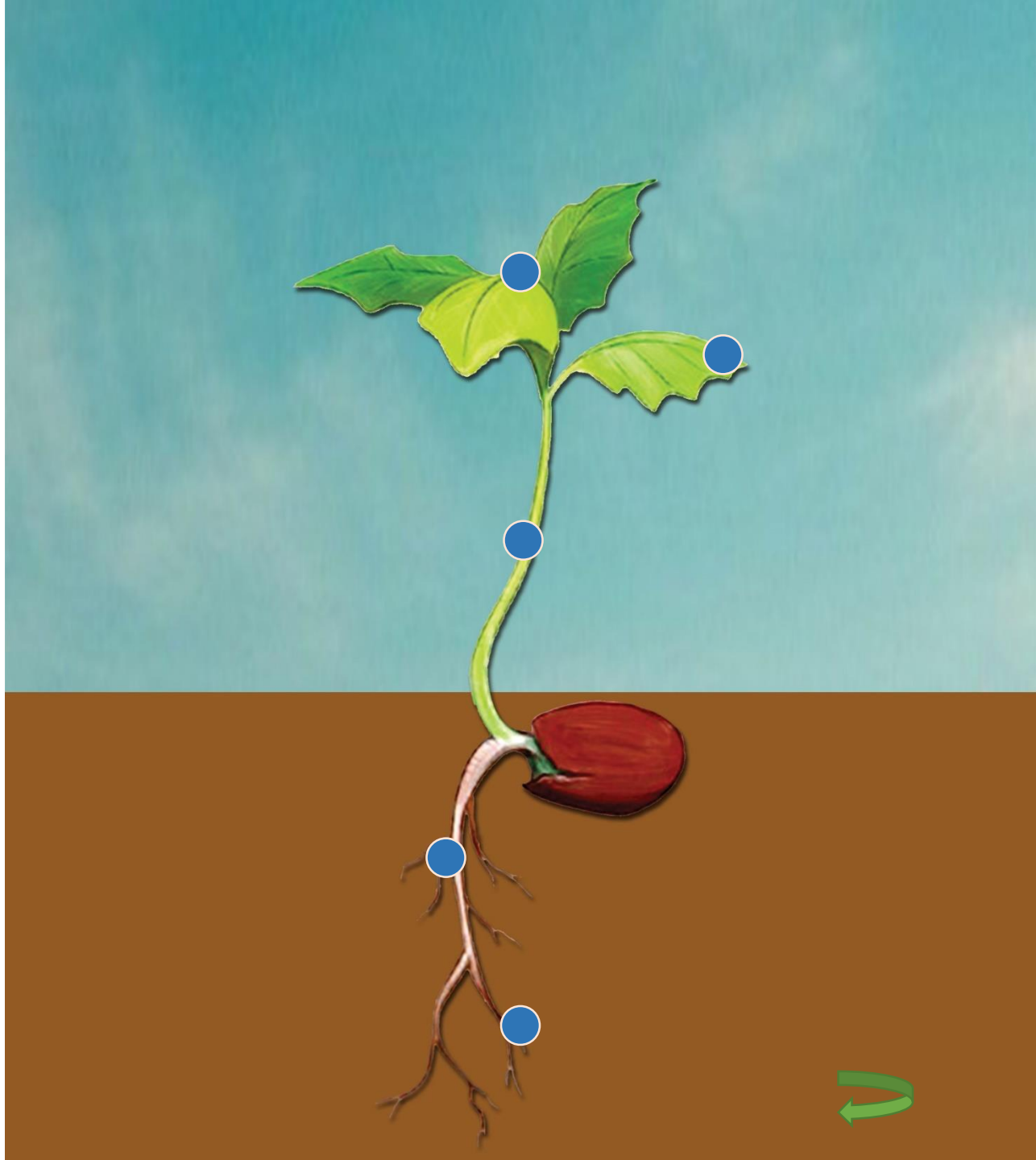
C (CARBON)

- Carbon is a crucial compound needed for plant growth and is one of three compounds that make up the majority of plant mass. Carbon is needed in every living and plants are no exception. Plants take CO_2 from the air and use the carbon from it for energy. This energy is then used to build essential biological compounds such as carbohydrates and proteins.
- MicrobeBio®'s microbes help build carbon in the soil through carbon sequestration, which is the process of taking CO_2 from the air and converting it into a solid state for long term storage. This creates more organic matter and carbon in the soil which causes microbes to begin a mineralization process and transition all carbon sources into plant available fertilization such as nitrate nitrogen.



O (OXYGEN)

- Oxygen is an important compound needed in plants and is one of three compounds that make up the majority of plant mass. Oxygen is responsible for cellular respiration in plants. Plants get oxygen by breaking down CO_2 during photosynthesis and releasing the majority of it as byproduct, while keeping a small portion for future energy. MicrobeBio® helps increase the amount of oxygen available to plants through carbon sequestration, which stores CO_2 in the soil until it is needed.



ELEMENT GROUPS

Semimetal

B: an element whose properties are intermediate between those of metals and solid non-metals or semiconductors.

Halogen

Cl: an element occupies group VIIA (17) of the periodic table. They reactive non-metallic elements which form strongly acidic compounds with hydrogen from which simple salts can be made.

Transition Meteal

Mn, Fe, Ni, Cu, Zn, Cu: Any of the set of metallic elements occupying a central block (Groups IVB–VIII, IB, and IIB, or 4–12) in the periodic table. Chemically they show variable valency and a strong tendency to form coordination compounds, and many of their compounds are colored.

Alkaline Earth

Mg, Ca: occupies group occupying Group IIA (2) of the periodic table. They are reactive, electropositive, divalent metals, and form basic oxides which react with water to form comparatively insoluble hydroxides.

Nonmetal

N, P, S, H, C, O: An element or substance that is not a metal.

PRODUCT BENEFITS:

- Increase organic matter
- Stimulate biological activity
- Unlock bound up nutrients
- Increase Brix levels
- Increase in 30% Yield
- Regulate pH in acid and alkaline conditions
- Creates larger, deeper, and denser root systems
- Boost Productivity
- Improve the Soil Health

CONCLUSION:

- Soil health is fundamental to profitable and sustainable agriculture. Vital organic matter and nutrients are often destroyed, depleted, or otherwise lost from the soil through overuse of fertilizers, erosion, and runoff as a consequence of unsustainable farming practices.
- Our products bring the best nutrients to your plants. The microbes work to break down organic matter in the soil to make macronutrients, secondary nutrients and micronutrients available for plants. It also provides reservoirs for nutrients so that they are readily available for plants. Along with all the benefits to soil health, farmers will also save cost from not having to buy traditional fertilizers.
- We utilize the relationship between microbes and organic matter to create healthier soil that is not damaged by chemical fertilizers and pesticides that provides the best growth and yield potential for your plants. We believe in helping farmers grow soil by harnessing the power of nature to drastically increase crop yields and produce sustainable food sources. Our microbial soil enhancer is dedicated to providing environmentally friendly products that create and maintain thriving eco-systems that promote healthy and sustained plant growth.