



J-PONICS

UNVEILING

Nature's Nutrient Symphony



IT'S NOT ABOUT ABUNDANCE

it's about the nutrient in shortest supply!

Picture this:

Justus von Liebig stumbles upon NPK, and chemical companies enthusiastically declare, "Sure, we can toss all of that into one bag!" Little did they know, a plot twist awaited. As farmers noticed their soil depleting and crops faltering, the NITROGEN, PHOSPHOROUS, POTASSIUM trio revealed its limitations.

Enter the unsung heroes: SULPHUR, CALCIUM, MAGNESIUM took the spotlight, followed by the trailblazing trace elements — SODIUM, IRON, MANGANESE, COPPER, ZINC. Yet, there's a lineup of underappreciated stars: COBALT, BORON, MOLYBDENUM, SELENIUM, NICKEL.

Hold on, it gets even more intriguing!

Von Liebig unveils the LAW OF MINIMUM, a secret governing plant growth. It shouts, "It's not about abundance; it's about the nutrient in shortest supply!" But there's a catch: all nutrients must dance in harmony. Dr. Harvey H Ashmead's Mulders Chart takes center stage, illustrating the delicate dance of nutrient antagonism and stimulation.

For instance, imagine Nitrogen taking the spotlight, causing a Potassium and Boron deficiency while sparking magnesium excitement. Calcium steps in, affecting magnesium, zinc, iron, potassium, and manganese, along with a nod to Boron. Potassium then steals the show, stimulating Iron and Manganese but locking horns with Magnesium and Boron. A nutrient drama unfolds where every excess or imbalance disrupts the intricate microflora ballet.

Nature's complexity, a puzzle for the average person venturing into nutrient calibration. Deciding which nutrient, how much — it's practically a nightmare! This is where our hero emerges: the well-balanced nutrient. It's not just for your hydroponic system; it's the virtuoso ready to perform in your vegetable garden, flower haven, and fruit orchard.

Join us on this journey through the intricacies of plant nutrition. Uncover the secrets, embrace the chaos, and witness the symphony of elements orchestrating a masterpiece in your green haven. Welcome to a world where balance reigns, and your plants sing the melody of prosperity!





NUTRIENTS AND THEIR ROLL

In the plant, in the soil and in hummans.

NITROGEN (N).

In the plant and soil:

It is vital for photosynthesis and a powerful tool for healthy leaf production.

Excess results in abundant foliage but flower drop occurs with little fruit production.

Deficiency causes plants to be spindly with small yellowish leaves.

Similar to a Phosphorous excess or Sulphur deficiency.

In Humans:

Needed for healthy food digestion and growth. Plays a crucial role in fetus development.

SULPHUR (S)

In the plant and soil:

Improves taste and keeping quality of fruit and palatability of grass and crops. Increases protein and root development. **Excess** This causes small leaves and slow growth in plants. Roots become hard.

Deficiency It is not very common, however does resemble Nitrogen deficiency. Protein production is reduced, and root systems become larger and softer.

In Humans:

Important for Pancreatic cells. Deficiency is thought to cause arthritis, eczema, memory loss and gastrointestinal issues.

CALCIUM (Ca)

In the plant and soil:

Essential for plant photosynthesis and cellular structure. Important for good blossom and fruit set.

Helps maintain PH levels. Activates enzymes, improves water penetration and increases disease resistance.

Excess Reduces the absorption of potassium, magnesium and trace elements and gives the effect that there are deficiencies in these elements. **Deficiency** Growing tips and young leaves become stunted; root growth is also stunted. Flowering fails and fruit will get brown spots and progress to blossom end rot, especially in tomatoes.

In Humans:

Important to the parathyroid cells and is instrumental in the control of rheumatism and muscle cramps.

IRON (Fe)

In the plant and soil:

Plays a major role in oxygen carrying systems and is needed for chlorophyll and protein synthesis and photosynthesis. **Excess** Slows plant growth. **Deficiency** Blossom drop occurs and the root system may turn yellow. May also be caused by excess of manganese, copper or zinc.

In Humans:

Important for growth and development. Used to make hemoglobin, a protein in red blood cells that carries oxygen from the lungs throughout the body. Also myoglobin, a protein that provides oxygen to muscles.



SODIUM (Na)

In the plant and soil:

Works with potassium and assists with balanced nutrition and helps with photosynthesis. **Excess** This causes wilted foliage and stunted growth and plant tissues become dry and discolored. **Deficiency** Generally, it is not a problem but does aid in metabolism and synthesis of chlorophyll.

In Humans:

Required to conduct nerve impulses, contract, and relax muscles and maintain the proper balance of water and minerals. Also aids with digestion.

MAGNESIUM (Mg)

In the plant and soil:

Is a mineral constituent of chlorophyll, involved in photosynthesis, aids phosphate metabolism and activates several enzyme systems. **Excess** Results in a cut and ragged appearance of mature leaves and fruit develop bright dry spots. Can also raise PH. **Deficiency** Flowering is decreased but rarely results in crop reduction. High magnesium levels can limit the uptake of calcium and can cause deficiency symptoms.

Note. Calcium/ magnesium ratio should always be 5-1 in Favour of calcium.

In Humans:

It helps to maintain normal nerve and muscle function, supports a healthy immune system, keeps heartbeat steady and helps bones. Also helps adjust blood glucose levels.

MANGANESE (Mn)

In the plant and soil:

Accelerates germination and helps fruiting and ripening of crops. It is an essential part of photosynthesis and plant enzyme systems. Directly involved with the uptake of iron and ascorbic acid.

Excess Leaves become yellow brown and may affect the availability of iron.

Deficiency Plant growth is stunted, flower buds fail to bloom, fruit production is small, and fruit develops spots.

In Humans:

It is found mostly in bones, liver, kidneys and pancreas. Helps the body form connective tissue, bones, and works with vitamin K to assist wound healing and blood clotting.

Also necessary for normal brain and nerve function.

ZINC (Zn)

In the plant and soil:

Required for normal growth and production. Aids in moisture absorption and regulates plant sugar use. High Phosphorous and Calcium can contribute to Zinc deficiency. High PH can reduce availability.

Excess May affect the availability of Iron and Sulphur.

Deficiency Maturity is delayed and the stems of the plant fail to elongate.

In Humans:

Essential for many of the body's functions and systems, including the immune system, wound healing, blood clotting, thyroid function, and the senses of taste and smell.

POTASSIUM (K)

In the plant and soil:

Increases vigor and disease resistance, helps move sugars and starch and improves fruit quality.

Excess Potassium is not usually absorbed into plants in excessive amounts, but high levels can lead to deficiencies in magnesium, manganese, iron and zinc. **Deficiency** Results in poor growth, small leaves, soft stems and young leaves drooping. Flowers are fewer, pale and lack brilliance.

In Humans:

It helps in maintaining fluid levels and supports normal blood pressure, regulation of heartbeat and removal of cellular waste.



COBALT (Co)

In the plant and soil:

A critical element necessary for plants to reach maturity. It helps promote stem growth in young plants and some believe Cobalt promotes health and longevity in plants and helps with drought resistance.

Excess Can result in pale leaves, discolored veins and loss of leaves. Can also cause iron deficiency.

Deficiency May include stunted growth, yellowing leaves, and reduced seed production.

Can cause vitamin B12 deficiencies in livestock.

In Humans:

Cobalt is a component of vitamin B12, an integral compound for red blood cell formation and neurological health.

BORON (B)

In the plant and soil:

The main function is cell wall development and resistance. It is responsible for good seed set, photosynthesis, nitrogen assimilation, sugar transport and hormone development, cell division and regulation of flowering and fruiting. **Excess** Leaves have a dry, cut and ragged appearance. Essential plant nutrient but becomes toxic if it exceeds 150 ppm. **Deficiency** Pollen formation is poor which results in poor fertilization of flowers. The fruit is often split and misshapen.

In Humans:

Beneficially impacts the body's use of estrogen, testosterone, and vitamin D. (long been known to be needed for the utilization of calcium and the balance of calcium and phosphorous, both critical for bone building.)

Also plays a role in strong memory and healthy brain function.

MOLYBDENUM (Mo)

In the plant and soil:

It is needed for chemical changes associated with Nitrogen nutrition. Plants use it to convert inorganic nitrates into organic forms in the plant. **Excess** Can cause copper deficiency within the animal.

Deficiency The plant will accumulate nitrates in the leaves and cannot use them to make proteins.

It then becomes stunted with symptoms similar to nitrogen deficiency.

In Humans:

The body uses Molybdenum to process proteins and genetic materials like DNA.

Helps break down drugs and toxic substances.

PHOSPHOROUS (P)

In the plant and soil:

Important for plant metabolism, structure and reproduction. Also, it is a vital constituent of all cells and promotes early root formation. **Excess** causes leaves to be bright brown in colour, similar to Nitrogen.

Affects the availability of copper and zinc. **Deficiency** results in slow plant growth, poor root development resulting in small plants and poor fruiting.

In Humans:

Important to make protein for growth, maintenance and repair of cells and tissues.

It also helps store energy.

COPPER (Cu)

In the plant and soil:

Often ignored in agriculture yet improves seed production, increases the sugar content in fruit and vegetables and is essential to chlorophyll formation in plants. **Excess** Causes yellowing of the leaves and defoliation.

Roots turn black. **Deficiency** Young leaves become misshapen and become pale yellow and spotted.

Plant growth is irregular and reduced with few or no flowers.

In Humans:

Essential to maintain healthy bones, blood vessels, nerves, and immune function. Together with Iron it enables the body to form red blood cells. It is also needed for proper brain function and development.

-Deficiency may cause cardiovascular diseases and other health problems such as anemia and osteoporosis.



SELENIUM (Se)

In the plant and soil:

Found to stimulate plant metabolism, decrease the negative effects of PH on plant growth, to support plant tolerance to environmental stress. **Excess** Negatively affects several physiological processes in plants.

Deficiency Plants don't generally show symptoms of Selenium deficiency, it is mostly a problem for people and animals who consume the crops.

In Humans:

Supports the healthy functioning of the body, including metabolism, immune system, reproduction and thyroid function.

NICKEL (Ni)

In the plant and soil:

Recognized as the 17th element essential for plant growth and development.

Requirement is low in the essential elements. **Excess** Reduces seed germination, root growth and production.

Deficiency Can cause chlorosis of young leaves and reduced leaf size and less leaf growth.

In Humans:

It is a micro nutritional essential for proper functioning of the body.

It increases hormonal activity and is involved in lipid metabolism and may assist with iron Absorption.

A profound comprehension of how nutrients function in the body and interact harmoniously brings forth a myriad of benefits for overall health and well-being. This knowledge enables individuals to maintain optimal health by ensuring a well-balanced intake of vitamins and minerals, thereby preventing various diseases. Understanding the intricate relationships between nutrients allows for strategic dietary choices, optimizing energy levels, and supporting specific health goals, be it weight management, muscle building, or immune system fortification. Moreover, this awareness contributes to enhanced mental health, aging gracefully, and improved athletic performance. The synergy of nutrients promotes healthy skin, hair, and nails, while also strengthening the immune system. In essence, a comprehensive understanding of nutrient interactions empowers individuals to make informed decisions, fostering vitality and longevity for a wholesome and fulfilling life.

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Discover the transformative power of J-ponics nutrient products

your gateway to a healthier body and a vibrant life.

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J-Ponics is your one-stop destination for holistic health and sustainable gardening we offer not only premium nutrient products to support a healthy body and vibrant life but also DIY hydroponic starter kits and wheatgrass kits to elevate your gardening experience. Our nutrient formulations are carefully crafted to provide your body with the essential elements it craves, promoting well-being and vitality.

Explore the world of hydroponics with our user-friendly starter kits, and witness the joy of cultivating your own nutrient-rich produce. With J-ponics, nourish your body and cultivate your own garden oasis.

A journey towards a healthier, more vibrant life awaits.



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MULDERS CHART

As we conclude this nutrient-rich journey, let's dive into the visual feast of the Mulders Chart. Each element plays its role, engaging in a dance of antagonism and stimulation. Witness the ballet of Nitrogen, Potassium, Boron, Calcium, and more, creating a vibrant tapestry of plant nourishment.

As you gaze upon the Mulders Chart, envision the harmony required for optimal growth and yields. It's not just a chart; it's a portal into the symphony of nature's balance. So, with newfound knowledge and a well-balanced nutrient in hand, step into your garden oasis, where the plants await their nutrient serenade, and the Mulders Chart guides you to horticultural bliss. Happy gardening!

