Ghadeer Inc (M) Sdn Bhd

Green Spot Fertilizer

Introduction

Ghadeer Inc (M) Sdn Bhd has been in operation since 26 December 2008, now we are manufacturing a wide range of liquid fertilizers that are tailor-made and marketed as “complex reached multi-nutrient” fertilizer.

Green Spot fertilizers are made through a novel chemical process involving a number of core technologies. Green Spot fertilizers have low chlorine levels and have chelated trace elements, slow releasing compounds to reduce leaching and others that are essential for growth and production.

With increasing demands on our land to perform better coupled with increasing labor and financial costs, we firmly believe that a complete multi-nutrient approach will enable us to confront the coming years with enthusiasm.

Our fertilizers are made in Malaysia which is tailored made and strictly for respective plant crop requirement.

We are also believed in “**A complete multi-nutrient and well balanced approach is the key to maximize economic yield**”.

Fertilizer Application Justification

Law of Restitution

It is essential that if the soil is not to be exhausted, all the fertilizing elements removed from it through crops harvested should be returned. It must also be understood that the elements that have been **leached** by rain, utilized by the plant and the elements that have **disappeared** as a result of the effects of the four major elements namely, Nitrogen, Phosphorus, Potassium and Calcium **must be replenished**. A classical example of the above law is the **removal of magnesium** by rainfall after the **application of potassium** based fertilizers.

Law of Minimum (Liebig's Law)

Harvested **yields** are **proportional** to the minimum amount of **fertilizing** elements present in the soil that is relative to the plant's need. "**Insufficient availability** of an element in the soil reduces the effectiveness of other elements and consequently **lowers harvested yields**".

Law of Maximum

Excess of an available element in the soil **reduces the effectiveness** of other elements and consequently lowers the harvested yields.

Critical Elemental Ratios Required For Growth Of Multi-Cellular Plants

Elements	Conc.In Dry Matter µg/g
Molybdenum	0.1
Copper	6
Boron	20
Zinc	20
Manganese	50
Iron	100
Chlorine	100
Sulphur	1,000
Phosphorus	2,000
Magnesium	2,000
Calcium	5,000
Potassium	10,000
Nitrogen	15,000
Hydrogen	60,000
Carbon	450,000
Oxygen	450,000

Molybdenum

Function In Plants: Molybdenum is a coenzyme for the enzymes of nitrate reduction in converting NO_3 to amines for protein synthesis and is an essential requirement for the function of symbiotic nitrogen fixing bacteria. Nodules will contain up to 15 times as much molybdenum as other parts of the root tissue.

Deficiency Symptoms: Symptoms resemble mild nitrogen deficiencies with pale yellow-green stunted plants that may show yellow mottling. “Green spots” are common in fruits and there is poor nodule formation on legumes. Deficiency can also cause whiptail of cauliflower; small, open, loose curds.

Copper

Function In Plants: Copper is involved in respiratory pathway. It acts as a coenzyme in several enzyme systems including tyrosinase, polyplenal oxidase, ascorbic acid oxidase and cytochrome oxidase (involved in building and converting amino acids to proteins). Its function also stretches out to chlorophy II formation.

Deficiency Symptoms: Yellowing and chlorosis of leaf margins occur when there is deficiency in copper. The leaf tips wither and droop, turn yellow and die. The youngest leaves become light green, dry up and turn necrotic. Dwarfing of plants occur as well with an inward rolling of leaves which develop a blue-green appearance. Leaves may become elongated. Onions bulbs are soft, with thin, pale yellow scales. There is a die-back of terminal twigs in fruit trees.

Boron

Function In Plants: Boron is essential for maintain a balance between sugar and starch and functions in the translocation of sugar and carbohydrates. It is also important in pollination and seed reproduction and is necessary for normal cell division, nitrogen metabolism and protein formation.

Deficiency Symptoms: Most common symptoms are death of terminal tissues through progressive deterioration, the growth of thick, curling and chlorotic leaves on short, squatty plants and the developing of an unusual brittleness on stems and petioles and a concurrent breakdown of conducting tissue in the stems. Some common examples may include corky centre in apples, cracked stem of celery, brown heart of beets, hollow heart of peanuts, brown rot on cauliflower and yellow top of alfafa.

Summary: It is suggested that boron may play a part in carbohydrate translocation or nucleic acid synthesis but no enzymes or coenzymes have been found which either contain boron or require it as an activator.

Zinc

Function In Plants: Zinc is a precursor of auxins, the growth hormones and helps activate enzymes in protein synthesis and grain formation. It is necessary for starch formation and proper root development and plays an important role for seed formation and maturity.

Deficiency Symptoms: Symptoms observed are severe stunting with chlorosis and stripping in grasses (mottled effect in broadleaf plants). There is also the possibility of rosette, white bud, or other terminal maladies apart from small, narrow, chlorotic leaves with veins, usually green, with shortened internodes on all plants. Small specific examples are small, reddish-brown spots on cotyledon leaves of beans, green and yellow broad stripping at base of leaves of corn and interveinal yellowing with marginal browning on beets.

Manganese

Function In Plants: Serves as a reducing agent to change Fe+++ to Fe++ in the plant. It acts as an aid in synthesis of chlorophy II and functions in photosynthesis and nitrate assimilation. Manganese also activates the fat forming (lipid) enzymes and functions in the formation of riboflavin, ascorbic acid and carotene. It is also essential for the assimilation of carbon dioxide in photosynthesis.

Deficiency Symptoms: Pale green to yellow-red colour is observed between green veins on soya beans, tomatoes and beets. Tips of small grains turn grey to white (Grey speck in oats) and there is a mottled effect of yellowing in most plants with veins remaining dark green to olive green in colour. Mottling is not as intense as with iron deficiency and appears on the youngest leaves. In beets, foliage becomes densely red. Onions and corn show narrow stripping of yellow.

Summary: It is an important enzyme activator, particularly for respiratory enzymes and fatty acid synthesis. It is an essential constituent of chloroplasts and may be an unidentified cofactor of photosynthesis.

Iron

Function In Plants: Iron is an essential component of several coenzymes and enzymes involved in photosynthesis and respiration. It is also important in the synthesis of unsaturated fatty acids and chlorophy II. Iron is essential for chlorophy II development and function in plants. It also functions in the respiratory enzymes and serves to transfer energy in the plant. Protein formation is also one of the roles of this element.

Deficiency Symptoms: The symptoms include severe chlorosis (yellowing of leaf tissue with veins remaining green finally becoming “bleached-out”). Distinct yellow or white areas appear between the veins on the youngest leaves. In grasses, leaves will show chlorotic striping. Severe deficiencies result in stunted growth.

Chlorine

Function In Plants: It is an essential constituent of chloroplasts, necessary for photosynthetic activity but its precise function is not clearly understood although specific metabolic roles for chloride have been noted in noncyclic photophosphorylation and in the riboflavin phosphate of cyclic photophosphorylation reactions of photosynthesis. These reactions are responsible for the capture and storage of light energy in the form of high energy phosphate bonds.

Deficiency Symptoms: Plants suffering from severe deficiency of chlorine have chlorosis and necrosis of leaf areas. Leaf tips wilt followed by a bronze coloration and eventually, necrosis.

Sulphur

Function In Plants: Sulphur is essential for the two amino acids, namely, cysteine and methionine which combine with other amino acids to from plant proteins. It is involved in the processes of photosynthesis, respiration, nitrogen and carbohydrate metabolism, the formation of chlorophyII, carotenoids and a number of vitamins, some hormones, enzymes and others. Sulphur is also present in the protein as sulfide bonds that maintain the particular structural formation of enzymes. It is present in glycosides that give characteristic odors and flavours to mustard, onion and garlic. The assimilation of other major elements is also improved with sulphur intake.

Deficiency Symptoms: Sulphur deficiency will tend to cause the same general disruption of metabolism as nitrogen and phosphorus deficiency. As the deficiency becomes more severe, chlorosis may occur on the entire plant. The youngest leaves are yellow, yellowish-brown or brown in colour with occasional necrotic spots. Stalks of plants are stunted and maturity is delayed. Some even develop anthocyanin pigmentation.

Phosphorus

Function In Plants: Phosphorus exerts a very important role in the plant in energy storage and transfer. This importance is due to the widespread effects of energy transfer and utilization on other metabolic processes.

Deficiency Symptoms: Generally, a lack of sufficient phosphorus result in a decreased rate of respiration before photosynthesis is slowed. When respiration slows down, sugars start to accumulate in the tissues. As a result of that accumulation a purple pigment, anthocyanin, develops and gives leaves and lower stems the characteristic of phosphorus deficiency. Usually the pigment develops on the lower leaves because phosphorus tends to be translocated from older leaves to new growth when in short supply. Stems are thin and shortened. Plants are stunted and maturity is delayed in most plants from a lack of sufficient phosphorus even though they retain their dark green colour.

Magnesium

Functions In Plants: Magnesium is an essential part of chlorophyll and is necessary for sugar formation. It regulates uptake of other plant nutrients and acts as a carrier of phosphorus in the plant. Among the many systems requiring magnesium is that of fatty acid synthesis, It has a general role as an enzyme activator and is required by even more enzymes than potassium. The requirement is not always specific and other divalent cations can often substitute, in particular, manganese. Apart from these, it also promotes the formation of oils and fats whilst active in the translocation of starches.

Deficiency Symptoms: There is a general loss of green colour starting at the bottom leaves and later moving up the stalk. Veins of leaves remain green. Older leaves show yellowing between the veins and may fall with prolonged deficiency.

Stalks are weak and roots are large and bunched. Corn plants develop striped appearance showing a light yellow or white between the parallel veins.

Summary: Magnesium is an essential part of the chlorophyll molecule without it which the plant cannot carry out its vital functions. Both magnesium and calcium are used in fairly large amounts by crops and should therefore not be allowed to become limiting factors in crop production.

Calcium

Function In Plants: Calcium is an essential component of the enzyme, amylase and is required as an activator by some enzymes. It is also a major component of the middle lamella of plant cell walls and may therefore have effect on the mechanical strength of tissues. A major function of Ca may be in maintaining cell membranes in a functional state and hence maintaining cell organization. Calcium promotes early root formation and growth while at the same time improving general plant vigour and stiffness of stalk. It influences intake of other nutrients while effecting neutralization of certain toxic substances within the plant. It also encourages grain and seed production, increases calcium content of food and feed crops and stimulates nodulation in legumes.

Deficiency Symptoms: Young leaves of terminal buds are hooked or distorted in appearance and then die back at the tips and along the margins. The leaves have a wrinkled appearance and in some cases, the young leaves never unfold. The roots, too become short and very bunched, The damaged roots become prone to infection by fungi and bacteria. Specific deficiencies include blossom-end rot of tomato, brown heart of escarole, celery blackheart and carrot cavity spot.

Summary: Calcium is one of the secondary nutrients but such terminology does not imply that calcium assumes a secondary role in their importance in crop production. It is a necessary constituent of the growing parts of the plant and is taken up in fairly large quantities. A deficiency or an imbalance of calcium can drastically curtail crop response to the major

nutrients. Thus, calcium is often needed in the soil to correct soil acidity and create a more favorable environment for other nutrients and plant growth.

Potassium

Function In Plants: The most important role potassium has is in the process of photosynthesis. Potassium supply and carbon dioxide uptake are related. Potassium is involved in maintaining structural integrity of cellular components and perhaps over the cellular membranes. Potassium increases the starch content of grains, increases sugar content of fruits, promotes protein development, increases the epidermal layer of cells and adds to insect and disease resistance. It is involved in many enzyme systems that include photophosphorylation, glycosis, oxidative phosphorylation, respiration, protein synthesis and glycogen and starch synthesis.

Deficiency Symptoms: Potassium is mobile and moves to the younger leaves when the supply is short. The deficiency symptoms first appear in the older leaves. Different species of plants has its own specific pattern but common signs of potassium deficiency on the older leaves show a light green to a scorched effect on the margins and tips. Chlorotic areas may develop throughout leaf. In severe cases, these areas may fall out leaving ragged edges. In corn, small grains and grasses, chlorosis starts at the tip of the leaves and proceeds down from the edges or margins usually leaving the midribs green. Plants that are deficient have poor root development and stalks are weak. Plants tend to bend, break over and lodge. Plants grow slowly, seeds and fruits are small and shriveled and plant resistance to certain diseases is reduced. Stomata resistance is considerably increased when K is deficient. It can also be noted that potassium deficient plants tend to transpire more than plants with adequate potassium.

Summary: The main function of potassium is as an activator of numerous enzymes; that is, the presence of K ions is necessary for activity of the enzymes although K is not a constituent of the actual enzyme molecule. Of 46 enzymes from plants or microorganisms which require a monovalent cation as activator, K was the most effective cation for 36 of these. Included are enzymes of carbohydrate metabolism (inc.photosynthesis and respiration), nucleic acid synthesis and amino and protein synthesis. A specific rate of K is needed in the opening of the stomata.

Nitrogen

Function In Plants: It is an important constituent of the chlorophyll molecule. It is also an essential constituent of amino acids, protein, nucleotides, nucleic acids, amines and amides.

Deficiency Symptoms: A general symptom of Nitrogen deficiency is chlrosis of the leaves. Since chlorophyll synthesis is inhibited, this leads to reduced photosynthesis while reduced protein synthesis will result in a general loss of “vigour”. Stems are thin, erect and hard.Leaves

are smaller than normal, pale green or yellow; lower leaves are affected first but all may be deficient. This is because nitrogen in the lower leaves is translocated to the new growing areas of the plant. As deficiency progresses, the leaves become more chlorotic and eventually die.

Chelates

(Pr. Keelates) are complex organic compounds in which the element is tightly held within a molecule. Yet when the chelate is taken up by the plant, the nutrient is liberated for use. To chelate a mineral involves the formation of an organic ring of atoms which suspends that mineral in the centre of the ring by two or more boods. Chelation of a mineral usually results in a stable organic mineral product in which the mineral is protected.

Composition of Green Spot Liquid Fertilizer

Elements	Source
Nitrogen	Urea
Phosphorus	Potassium Phosphate
Potassium	Potassium Phosphate
Trace Elements	Iron, Manganese, Zinc, Copper, are chelated with EDTA. Boron as Boric Acid
Others	Surfactants and Penetrants

Range of Green Spot Liquid Fertilizers

Nutrient	Conc	N	K
N	%	20	10
P_2O_5	%	8	8
K_2O	%	10	20
B	ppm	200	500
Fe	ppm	200	200
Mn	ppm	200	100
Cu	ppm	100	100
Zn	ppm	100	1000

Green Spot Solution – Rate and Method of Application:

Crop	Foliage	Fertigation	Type
	(% Solution)	(CC./Litre/Day)	
Vegetables	0.2-0.5	0.2	N & K
Fruit Trees	0.5-1.0	0.2	N & K
Horticultural Plants	0.2-0.5	0.2	N & K
Turf	0.2-0.5	0.2	N & K
Cereals	0.2-0.5	0.2	N & K
Strawberry	-	0.2	N & K

Note:

i. **Foliage Application**

Check for compatibility before mixing with pesticides.

Our solutions are compatible with most fungicides and insecticides.

ii. **Fertigation**

Most rates are applied at 0.2cc/liter/day whereby our solutions are used for correcting deficiencies.

In hydrophonic or soilless cultures, use solution at 1.0cc/liter on a daily basis.