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XPRESS FUNCTIONAL™

Article by: Dr Koos Coetzee - Head Scientist

Why is each of the elements important for the crop?

N Nitrogen

Nitrogen is an essential element of all amino acids. Amino acids are the building blocks of proteins. Nitrogen is also a component of nucleic acids, which form the DNA of all living things and holds the genetic code. Nitrogen is a component of chlorophyll, which is the site of carbohydrate formation (photosynthesis). Chlorophyll is also the substance that gives plants their green colour. Photosynthesis occurs at high rates when there is sufficient nitrogen. A plant receiving sufficient nitrogen will typically exhibit vigorous plant growth. Leaves will also develop a dark green colour.

Mn Manganese

Manganese (Mn), an essential trace element, is important for plant health. In plants, Mn serves as a cofactor in essential processes such as photosynthesis, lipid biosynthesis and oxidative stress. Mn deficient plants exhibit decreased growth and yield and are more susceptible to pathogens and damage at freezing temperatures. Despite the importance of Mn in plant development, relatively little is known about how it traffics between plant tissues and into and out of organelles. Several gene transporter families have been implicated in Mn transport in plants. Important in cellular processes, such as photosynthesis and protecting cells against reactive oxygen species (ROS). Manganese superoxide dismutase (MnSOD) is the key enzyme that protects the plant cell from oxidative damage, this means that Mn makes the plant resistant against stress conditions.

Zn Zinc

One of the most wide spread micro-element deficiencies in plants and humans. Zn is also essential for many enzymes which are needed for nitrogen metabolism, energy transfer and protein synthesis. Zn is closely related to the nitrogen metabolism pathway of plants, thus causing a reduction in protein synthesis for Zn deficient plants. Zn has important functions related to gene expression.

B Boron

Is mainly build into the structures of cell walls and is responsible for membrane properties. Rapid chances with B treatment have been recorded in growth of pollen tubes which requires not only rapid cell wall synthesis, but also rapid membrane formation. A deficiency of B can cause incomplete pollination of corn or prevent maximum pod-set in soybeans. Boron increases the rate of transport of sugars (which are produced by photosynthesis in mature plant leaves) to actively growing regions and also in developing fruits. Boron is essential for providing sugars which are needed for root growth in all plants and also for normal development of root nodules in legumes such as alfalfa, soybeans and peanuts. Flower initiation, fruit development, cell wall and tissue formation, and root elongation are all influenced by hormones. Boron plays an important role in regulating hormone levels in plants.

S Sulphur

Formation of chlorophyll, protein production, primarily because S is a constituent of three sulphur containing amino acids (cysteine, cystine and methionine), which are the building blocks of protein. About 90% of plant S is present in these amino acids. Synthesis of oils, this is why adequate sulphur is so crucial for oilseeds. Activation of enzymes, which aid in biochemical reactions within the plant. Increases crop yield and improves produce quality, both of which determine the market price a farmer would get for his produce. Specifically with reference to crop quality, S improves protein and oil percentage in seeds, cereal quality for milling and baking, marketability of dry coconut kernel (copra), quality of tobacco, nutritive value of forages etc.

Mo Molybdenum

Four enzymes directly linked to Mo are found in plants, i.e. nitrate reductase (NR), aldehyde oxidase (AO) for synthesis of abscisic acid (ABA), xanthine dehydrogenase (XDH) involved in purine catabolism and stress reactions and sulphite oxidase (SO) involved in detoxifying excess sulphite. Thus, deficiency of Mo will have a negative effect on these processes in the plant. The nitrate (NO_3) have to be reduced to amine (NH_2) in order to take part in the metabolism of the plant otherwise nitrate build-up will take place in the leaves of the plant.

What is the composition of X-Press Functional?

N	Mn	Zn	B	S	Mo	pH	SG
g/kg							kg/L
49.7	44.1	29.8	2.2	40.3	0.4	2.1	1.36
g/L						Contains GET™ Genetic Expression Technology	
67.62	59.97	40.48	2.97	54.82	0.54		
molar							
4.83	1.09	0.62	0.28	1.71	0.005		

What is the meaning of the numbers?

The numbers in the first row show the weight of each element in a kg of the product. In the next row the numbers tell us the weight of each element in a litre of the product. The numbers in the last row are an indication of the number of atoms of each element present in one litre of the product.

Why then use X-Press FUNCTIONAL instead of separate products for the different elements?

If we now stand back and have a less detailed look at the functions of the six elements in X-Press FUNCTIONAL, we realise that the functions are related. S is closely related to N and plays a role in the forming of photosynthesis products such as sugars, thus energy in the plant, and Zn is important for transferring the energy. B also plays a role in transporting the sugars, not only to the roots of the plants during the vegetative stage, but also to the fruit during reproductive stage. The NR enzyme responsible for NO3 reduction needs Mo, but Zn is also needed for the synthesis (building) of the enzyme. Everybody accept the fact that nitrogen fertilisation has a direct influence on yield, but remember that most of the nitrogen fertiliser applied to the soil will eventually end up as nitrate (NO3). This NO3 is of no use to the plant if cannot be changed to NH2 by the plant. Without Zn the enzyme responsible to do this cannot be made and without Mo the enzyme cannot be effective. Zinc and boron are both important for flower and fruit formation. Boron, mainly for rapid cell wall forming of pollen stems, and Zn improves pollination and therefore fruit set while S will improve the quality of the fruit. All the above processes can only take place when the plant is healthy. Therefore the Mn in X-Press Functional will help the plant in its defence against stress due to pathogens attacks and oxidation in the cells. The phosphite will also help with defence against fungal attacks.

X-Press FUNCTIONAL also contains Gene Expression Technology (GET) that will result in increased plant height, increased root development, increased fruiting branches, increased fruit setting ratio, prevention of fruit dropping and resistance against diseases.

GET in X-Press FUNCTIONAL also aims at balancing the ratio of Auxin to Gibberellic acid to Cytokinin in the plant to ensure optimum growth.

Therefore X-Press FUNCTIONAL should be applied during early growth (V4) of the crop to ensure healthy, strong plants for a good yield. They will also benefit from a second application during early reproductive stages (R1), but application of X-Press MOB at this stage will ensure better movement of sugars to the fruit.

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N LABORATORIES
Biotechnology & Chemistry Excellence

No 144. 2nd Avenue
Modder East Orchards
Delmas, 2210
Tel: +27 (0) 82 738 0080
Email: info@mbfi.co.za
Web: www.mbfi.co.za