

Foliar feeding

An important crop nutrition strategy for the sustainable and productive management of crops.

Foliar feeding is an effective method of providing essential nutrients to plants when soil nutrient availability is limited. Foliar feeding is the method by which a nutrient solution is applied to the leaves of a plant, where the nutrients are absorbed and translocated within the plant to the parts where it is required. When used correctly, foliar feeding is more environmentally friendly, target specific and more effective than soil fertilisation since nutrients can be directly delivered to the plant tissue during critical stages of plant growth.

Soil fertilisation have traditionally been considered as the obvious and only method to feed plants, where the plant roots are meant to absorb water and nutrients. In recent years foliar feeding has become an important method to supply plants with nutrients and supplement soil applications. Foliar feeding is effectively used to supplement nutrient supply to the plant where conventional soil fertiliser applications falls short due to soil limitations or root restrictions.

Soil applied nutrients might become unavailable to plants due to factors like leaching, antagonism between certain nutrients, fixation of nutrients, soil nutrient imbalances and soil chemical properties like high or low soil pH conditions. Even if there are sufficient levels of plant-available nutrients in the soil, there might not always be a continuous supply to the plant due to root restrictions. These root restrictions could be caused by too low or high soil temperature, lack of moisture, lack of oxygen during excess water periods and physical damage to the roots caused by nematodes and root diseases. Anything that restricts root growth and activity reduces nutrient uptake. The readily available nutrients provided by foliar feeding are more effectively utilised by plants, because foliar absorption is a physical and chemical process and not a biological process, as is the case with granular fertilisers. The purpose of foliar feeding is not to replace soil fertilisation but to supplement any shortages and increase the effectiveness of soil applied fertilisers.

Foliar feeding has proven to be the most effective way of supplying plant requirements of secondary nutrients (calcium, magnesium

and sulphur) and trace elements (boron, cobalt, copper, iron, manganese, molybdenum and zinc), while supplementing macro nutrients (nitrogen, phosphorous and potassium) requirements during critical growth stages. The primary function of foliar feeding is to delay the natural leaf senescence process, increase photosynthesis and chlorophyll production in the leaves, which in turn increases the uptake of soil applied nutrients. Due to the increased need for water by the leaves, more nutrients are supplied to the plant via the root system. Foliar feeding is targeted at the growth stages where the photosynthesis rate is declining, and where root growth and nutrient absorption are levelling off. Foliar feeding can also be an effective tool to favourably influence the early growth stages by stimulating vigorous vegetative growth or regrowth and maximising the yield potential by compensating for environmental stresses and poor nutrient availability during this growth period.

The key advantages of foliar feeding include:

- A highly effective method to supply essential nutrients at critical growth stages

- A means to compensate for soil or environmentally induced nutrient deficiencies
- Foliar absorbed nutrients are immediately available to the plant
- More control with less risk
- Allows for easy and continuous adjustment of the crop nutrition program during the growing season

Not all fertiliser formulations are suitable for use as a foliar application. The primary objective of foliar feeding is for maximum absorption and translocation of nutrients; therefore, foliar applied formulations should meet certain standards in order to be effective and minimise possible damage to the foliage. These factors affect the bioavailability of nutrients to the plant and include:

- High solubility
- High purity
- Low salt index
- Small particle size and molecular weight.

Introlab manufactures a wide range of world class foliar fertilisers that include aminogluconate chelated nutrients, suspension

concentrate nutrients, water soluble nutrients and crop stage specific Gel nutrients.

Introlab's foliar fertilisers are specifically formulated to effectively supply nutrients to the plant at critical growth stages by utilising different formulation types for different and specific objectives. The wide range of different formulation types enable the grower to create a complete and tailor-made crop nutrition program for each crop type, ensuring constant supply of nutrients and prevent any nutrient deficiencies during the growing season.

The Intro Range is an aminogluconate chelated foliar feeding range consisting of single-and-multiple nutrient formulations. It is recommended for use as a deficiency corrector and preventor as the chelated nutrients are quickly absorbed and translocated within the plant. Glycine, one of the smallest amino acids, is used to chelate the nutrients in the Intro Range formulations. The plant recognises this aminogluconate molecule as a protein like nitrogen, allowing it to travel in the phloem quite readily to where the nutrient is required. The chelated nutrients improve absorption

tempo by the plant, improve translocation within the plant, increase compatibility with other agrochemicals and decrease toxicity. The aminogluconate chelation technology method of delivery is not conventional, like the delivery methods of products such as oxides, sulphates and synthetically chelated nutrients. The latter products can marginally reduce a deficiency, but the speed at which the nutrients are released and transported are very slow compared to the aminogluconate chelated form.

The Opty Range consists of highly concentrated and micronized nutrients in a suspension concentrate formulation. The small particle size, < 4 micron, allows for effective absorption and continuous longer lasting nutrient supply to the plant. It is recommended for use as maintenance foliar fertilisers, ensuring nutrient supply levels are maintained during the whole growing season. The Opty Range products have a very low salt index, making them extremely safe on even sensitive crops.

The IntroSol Range is a balanced all-in-one water-soluble fertiliser range. The products in this range can be used to supplement macro, secondary and micro-nutrients at specific crop growth stages. The IntroSol Range products are 100% water soluble and chlorine free.

The IntroCel Range is a new-generation water-soluble gel fertiliser range that combines the benefits and advantages of water-soluble crystalline and liquid fertilisers into a single Gel formulation. The range consist of balanced formulations containing the correct ratios of macro, secondary and micro-nutrients for each crop growth stage.

Contact us for more information or assistance with an innovative, tailor-made foliar feeding solution that will outperform the norm and unlock the full genetic potential of your crop.

Hendri Botha, Introlab International Sales & Marketing Manager