

# Will your summer grain crop suffer from hidden hunger next season?



On the 1st of September, countries across the Southern Hemisphere celebrated Spring Day. This day celebrates the dawn of spring – a season that is signified by greenery, growth, and new beginnings. For most people, what captures this season the best are the new leaves that make their appearance on bare, winter-plagued trees and plants.

In agriculture, leaves have an even more meaningful significance. Leaves symbolise a new season (in more ways than one), but also, and more importantly, the plant's ability to survive, grow, and produce. A plant's leaves function as the food factory because that is where carbon dioxide, sunlight and water is converted to starch and sugars through the process of photosynthesis. This is why, without leaves, there would be no life.

The term "hidden hunger" is such an accurate description because, by the time these deficiencies become discernible, the opportunity to achieve maximum yield has been lost as damage may be irreversible. Leaves are therefore also an indicator of the plant's overall health; the leaves normally show the first visible signs of malnutrition.

The challenge farmers face is identifying the hidden hunger before it becomes visible.



For more information contact your Laeveld Agrochem agent.

## Liebig's Law of Minimums

German chemist, Justus von Liebig, determined that an increase in excess nutrients will not improve plant growth, and that yield is affected by the quantity of the scarcest plant-available nutrient (the limiting factor) that is present in the soil. This is known as Liebig's Law of Minimums. Yields can only be improved by increasing the quantity of the scarcest soil nutrient.

This may seem like a straightforward principle, but without knowing what the limiting factor in the soil is, a producer cannot begin (or end) a new season successfully. By obtaining this knowledge, the right inputs can be purchased and applied in the right quantities. When considering the predictions for the 2017/2018 summer grain season, this approach can mean the difference between a profitable and an unprofitable season.

Fortunately, there is hope . . . and it is called ITEST Leaf™ – a method and principle that asks the plant how it is performing.

## Good soil doesn't always equal good nutrition

Before explaining how ITEST Leaf™ enables producers to prevent damage and profit losses due to poor nutrient availability, it is important to understand that optimal soil does not necessarily mean that a plant will have optimal plant-available nutrients – many producers make this mistake. Various environmental and soil factors, such as cold soil, saturated soil, compacted soil, as well as physical and chemical problems can create an unseen barrier in terms of a producer's soil nutrient availability.

Another factor that complicates the matter is the soil's chemical composition. On average, a plant requires approximately 16 inorganic nutrients for normal vegetative growth and reproduction. These elements also interact with each other, making the ratios a crucial and determining factor in a plant's overall health.

All these unseen barriers can create nutrient deficiencies in plants, which leads to a plant's hidden hunger.

Fortunately, with Agri Technovation's scientifically tested methods, producers can proactively take corrective action to prevent crop damage:

### • DRIS analysis (Diagnosis and Recommendation Integrated System)

DRIS is a comprehensive system that identifies all the nutritional values that limit the production of crops, and therefore improves the probability of a higher yield by making more effective plant nutrition recommendations. A benefit is that both the standard minimum/maximum norms, as well as the relationships between the elements, are used to compile a crop's specific risk profile during the season. Another benefit of this method is that the period in which the sample is taken does not affect the results.

### • ITEST Leaf™ analysis

With the ITEST Leaf™, the plant's nutrient values are compared with well-known optimal values or norms, as well as the DRIS indices. The best method to obtain these values is to conduct a leaf analysis on the plant's tissue under controlled circumstances in a laboratory. Traditionally, the interpretation of leaf analyses utilised the critical and optimal values, and only the individual concentrations of every element were taken into account – not the relationships between the different elements. Both approaches are important.

### Hit the bullseye every season

Arguably, the biggest benefit of an ITEST Leaf™ analysis, is the comprehensive indication of what is going on inside the plant within the specific growth period in which the sample is taken, which is especially valuable for summer and winter grain producers. This is why it is more than analysis – it is a management tool, which enables producers to identify nutrient deficiencies before the physiological stress becomes visible in the plant.

With the insights an ITEST Leaf™ analysis generates, producers can identify problems, evaluate current fertiliser programmes (for

summer grains, this feature is especially valuable as fertiliser programmes are usually developed before the season) and plan the next season's fertiliser programme.

In essence, the ITEST Leaf™ method protects producers by saving them from a shotgun approach, which rarely works. Without a focussed fertiliser strategy based on sound scientific methods, trying to cover all the bases is both expensive and ineffective. Besides spending more on inputs than needed, the problem is not solved, and the producer runs the risk of losing potential income. In partnership with Laeveld Agrochem, Agri Technovation has helped many summer grain farmers to benefit from avoiding shotgun approaches and using a targeted, bullseye approach with tried and tested methods, such as the ITEST Leaf™.

It is also critical for producers to realise that other factors also necessitate management tools like the ITEST Leaf™. For instance, micro-elements (with the exception of molybdenum and boron) are not available at higher soil pH-levels, making leaf analysis the most effective method to address the limiting elements through specific foliar products in such scenarios. This is just another way in which the ITEST Leaf™ can steer producers away from risk and towards profit.

### Plants need proactivity

The benefits of the ITEST Leaf™ are vast: It provides a detailed guideline for effective crop production; identifies nutritional profiles of various cultivars and genetics; provides producers with the ability to act proactively instead of reactively; and leads to a more effective use of resources, which leads to cost-savings.

Now, with sound, scientific methods like ITEST Leaf™ available, producers can proactively prevent crop damage, or a decrease in potential yield and quality. All that it takes is the realisation that a shotgun approach may save a few rands at the beginning of the season, but may come at a very high price at the end of the season.