

A&L Canada Laboratories Inc.

# A STEP BEYOND TRADITIONAL LAB ANALYSIS

June 2021 NEWSLETTER



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## DISEASE DIAGNOSTICS

### Are you unsure of where to begin?

All species of plants are vulnerable to disease. However, each species is more susceptible to a set of characteristics of diseases – the prevalence of plant diseases varies depending on the presence of the pathogen, environmental conditions, season, and the crops in question.

Our expert team of PhD plant pathologists can give you one-on-one help to determine what tests on what plant tissue, water or soil needs to be conducted based on your symptoms or concerns in a cost effective and confidential manner. We can help you select or design a package that ensures you get the answers you need so you can move forward with remediation and management strategies.

Some pathogens can be very difficult to diagnose visually as they do not all produce the same or even any obvious phenotypic changes. However, there are certain general symptoms that are cause for concern and need to be diagnosed before it spreads to other plants, decreases your yield or destroys your crop entirely.

### Symptoms you should be looking out for while monitoring your crop includes:

- **Discolouration and chlorosis** - the fading of plant tissue due to lack of chlorophyll. This fading may be observed in general throughout the leaf, around the leaf edges, or can form spots, streaks and other inconsistent patterns across the plant.
- **Asymmetry in the leaves or dwarfing & stunting** in any aspect of the plant.
- **Leaf narrowing, shoe stringing or blistering throughout the plant** is also cause for concern, as is necrotic spotting or flecking in all aspects of the plant- so any areas of dead tissue found throughout your plants.
- **General reduction in plant growth** despite no changes in other variables is a great reason to send us your sample so we can help you figure out what is going on.



Ultimately, symptoms may include a detectable change in colour, shape, or function of the plant as it responds to the pathogen and needs to be sent for diagnosis as soon as possible before it kills your plants or spreads to the rest of your crop. Once you have a diagnosis and determine the source, proper strategies can then be put into place to ensure a healthy crop moving forward.

Unfortunately, many of these symptoms are not obvious to even the most experienced agronomist or may not be present until it is too late to prevent transmission. Therefore, we also recommend that routine testing be conducted as a part of your crop protection and risk management strategy to ensure you are optimizing your yield and protecting your future crops.

Using the most advanced technology here at A&L, we have the capabilities to test for pathogens in a wide range of samples including row crops, horticulture, and greenhouse crops. We also offer disease testing for water systems, soils and other growth mediums to ensure these elements are not acting as vectors for pathogen transmission.

To submit a sample please visit our website [www.pdd.alcanada.com](http://www.pdd.alcanada.com), send us an email or give us a call and our staff will be more than happy to get you the help you need!

**PLANT DISEASE DIAGNOSTICS (PDD)**  
SCOPE OF CROPS

- ORNAMENTAL
- VEGETABLES
- CANNABIS
- FRUITS
- FIELD CROPS
- TURFGRASS

[www.pdd.alcanada.com](http://www.pdd.alcanada.com)

**AGRONOMY CORNER**

## Micronutrients

Our experience in the past years both from a soil and a tissue analysis view, have shown commonly deficient micronutrients include Zinc, Manganese, and Boron.

### Zinc requirements by a plant are quite complex

Zinc acts as either a major metal component of an enzyme or as a functional, structural or regulatory cofactor of a large number of enzymes. One major role of Zinc in the plant is in the production of IAA (Indoleacetic Acid Synthesis). This auxin promotes leaf area and bud growth in plants. Zinc deficient plants will exhibit small inefficient leaves. Other nutrients such as P, and soil conditions can greatly affect the uptake of Zinc by plants, therefore the placement of Zinc in certain cropping systems becomes very important. An example of this is in cool, wet, heavy soils in the spring, even with good soil zinc levels, highly sensitive crops may not be able to pick up the required zinc without further application in the seed band.

### Manganese is absorbed by the root system

Primarily as Mn<sup>2+</sup>, however it can be found in soil in three different forms: Mn<sup>2+</sup>, Mn<sup>3+</sup>, Mn<sup>4+</sup>. The Mn<sup>4+</sup> form is highly stable and a very inert oxide. This form is usually associated with pH value of 8 or greater. The Mn<sup>3+</sup> form is less stable and favours a soil pH near the neutral range. The Mn<sup>2+</sup> form that

is taken up by the root favours acid soil conditions. High organic soils or soils that have had a lot of cereal straws incorporated can tie up Mn. Bacteria that break down organic matter, particularly cereal straw, require Mn to function and can tie up soil Mn rendering it unavailable to plants. In spring where high straw residues have been plowed down even a soil with optimum Mn levels, Mn may still be unavailable for a period of time when the small seed is germinating or during seedling growth. Later when the bacteria die off and release the Mn back to the soil Mn will again be available to the plant and this temporary Mn deficiency often times goes undetected. In some seasons when this Mn ties up, it can cause poor or slow germination and rhizoctonia will be a problem. In some cases, due to this, cereal straw plowed down have been associated with rhizoctonia problems.

### Boron nutrition is very complex in a plant

Although required in very small amounts, soil applications are critical. B does not move by phloem therefore if applied foliar it may not reach the fruit and roots where it is required. Application of Boron is best applied broadcast to the soil and worked in. Boron is very water-soluble and can be leached easily in course soils. Band application of Boron is not advisable because of its toxicity and difficulty in blending such a small amount of material evenly.

THE ROLE OF ZINC, MANGANESE, and BORON IN PLANTS		
ZINC	MANGANESE	BORON
<ul style="list-style-type: none"> <li>• Needed for synthesis of auxins and protein</li> <li>• Essential for uniform maturity and seed formation</li> <li>• Aids in chloroplast formation and internodal and cell elongation</li> <li>• Enzyme activator</li> <li>• Increase leaf size, fruit size and quality</li> <li>• Important for Calcium translocation in plant tissue</li> </ul>	<ul style="list-style-type: none"> <li>• Acts as a coenzyme, important in oxidation-reduction reactions</li> <li>• Aids in nitrogen utilization and assimilation</li> <li>• Assimilates CO<sub>2</sub> in Photosynthesis</li> <li>• Essential for phosphorus and magnesium uptake</li> <li>• Aids in chlorophyll synthesis</li> </ul>	<ul style="list-style-type: none"> <li>• Aids in translocation of calcium, sugars and growth regulators</li> <li>• Essential for reproduction aids in formation of pollen tube</li> <li>• Required for protein synthesis</li> <li>• Important for early growth, flowering, and fruit set</li> <li>• Maintains balance between sugar and starch</li> <li>• Helps regulate auxin</li> <li>• Necessary for cell division and differentiation, shoot and root tip development</li> <li>• Aids in terminal bud growth and blossom retention</li> <li>• Aids in fruit formation and quality</li> </ul>

## AGRONOMY CORNER

## The Role of Sulfur

Sulfur is as important to plant metabolic functions as Nitrogen, Phosphorus and Potassium and it is an integral component in the manufacture of plant proteins. Approximately 90% of the sulfur in plants is found in the amino acids which make up plant protein. Sulfur plays an important role in the production of enzymes and vitamins of plants. An example on one of these processes is the production of chlorophyll. Plants lacking sulfur will become yellow and chlorotic.

In most cases plant roots take up sulfur as the sulfate ion but also through the leaf foliage which is then available to the plant. In crops such as beans, corn, wheat and potatoes, sulfur is found in amounts equal to phosphorus in the tissue. Crops such as alfalfa, cabbage and turnips contain larger amounts of S than P in their tissue.

Sulfur deficiency has a pronounced effect on plant growth causing chlorosis, stunting, thin stem, and spindly growth usually resembling N deficiency; Sulfur however cannot be translocated from older plant parts to younger plant parts.

### Factors Attributing to Increased S Deficiency

1. **Increased use of sulfur free fertilizer**
2. **Decreased use of sulfur as an insecticide and fungicide**
3. **Decreased concentration of sulfur in the atmosphere**
4. **Increased crop yields that require larger amounts of S**

A deficiency of sulfur can cause accumulation on non-protein nitrogen in plants, which can be detrimental to ruminant animals if it is not corrected by feeding supplements containing sulfur in either the organic or inorganic form. Ruminants are able to utilize sulfate, sulfide and to a lesser extent, elemental sulfur in the synthesis of proteins. Non

ruminants cannot and must have methionine in their diets. In non-leguminous plants that have been given liberal quantities of nitrogen fertilizers, nitrates as well as amides may accumulate in the tissues. Nitrates in large quantities are toxic to animals. If sulfur is limiting, nitrates accumulate in plant tissue.

### **Sulfur not only plays a major role in plant growth and metabolism as a nutrient, it also has a pronounced effect on soil chemistry and the availability of other nutrients**

Test have shown inter-relationships between high soil level phosphorus, sulfur, magnesium, and zinc. Where soil phosphorus levels are high and soil sulfur levels are low, we have often noted low tissue magnesium levels even though the soil magnesium is abundant. The application of sulfur with proper placement has not changed tissue sulfur levels to any marked degree but has raised the magnesium levels in plant tissue.

In the soil environment, the application of the acid forming sulfur may be causing the release of magnesium that has been tied up by the phosphorus. Another case is the competitive effect between K and Ca and how it can influence crop quality and yield, High Ca levels in soil interfere with the uptake of K especially early in the growing season when K is so important. If percent saturation of K is much lower than ideal and the percent saturation of Ca is high in cold waterlogged soils during the spring, K is less available. The plant replaces K with Ca and yield and quality are greatly reduced. Cell structure, moisture regulations of tissue and root formation can greatly be influenced in later stages of growth. Due to the excessive levels of Ca in some soils, balancing K: Ca may be difficult and costly. However, tests have shown that the use of sulfur can have a marked effect on this relationship.

# 14 ESSENTIAL NUTRIENTS

## FOR IMPROVING AND PROTECTING PLANT HEALTH

Plants need essential nutrients from the soil in order to grow and flourish. Just like us, if they don't get enough nutrients it can seriously affect their health. To coincide with the International Year of Plant Health in 2020, here's a look at how all 14 essential plant nutrients benefit plant health (in addition to improving yields):

**NITROGEN**  
Nitrogen is an essential component of amino acids for building proteins, nucleic acids, and chlorophyll which converts the sun's energy into sugars. It is vital for plant metabolism, growth and health.

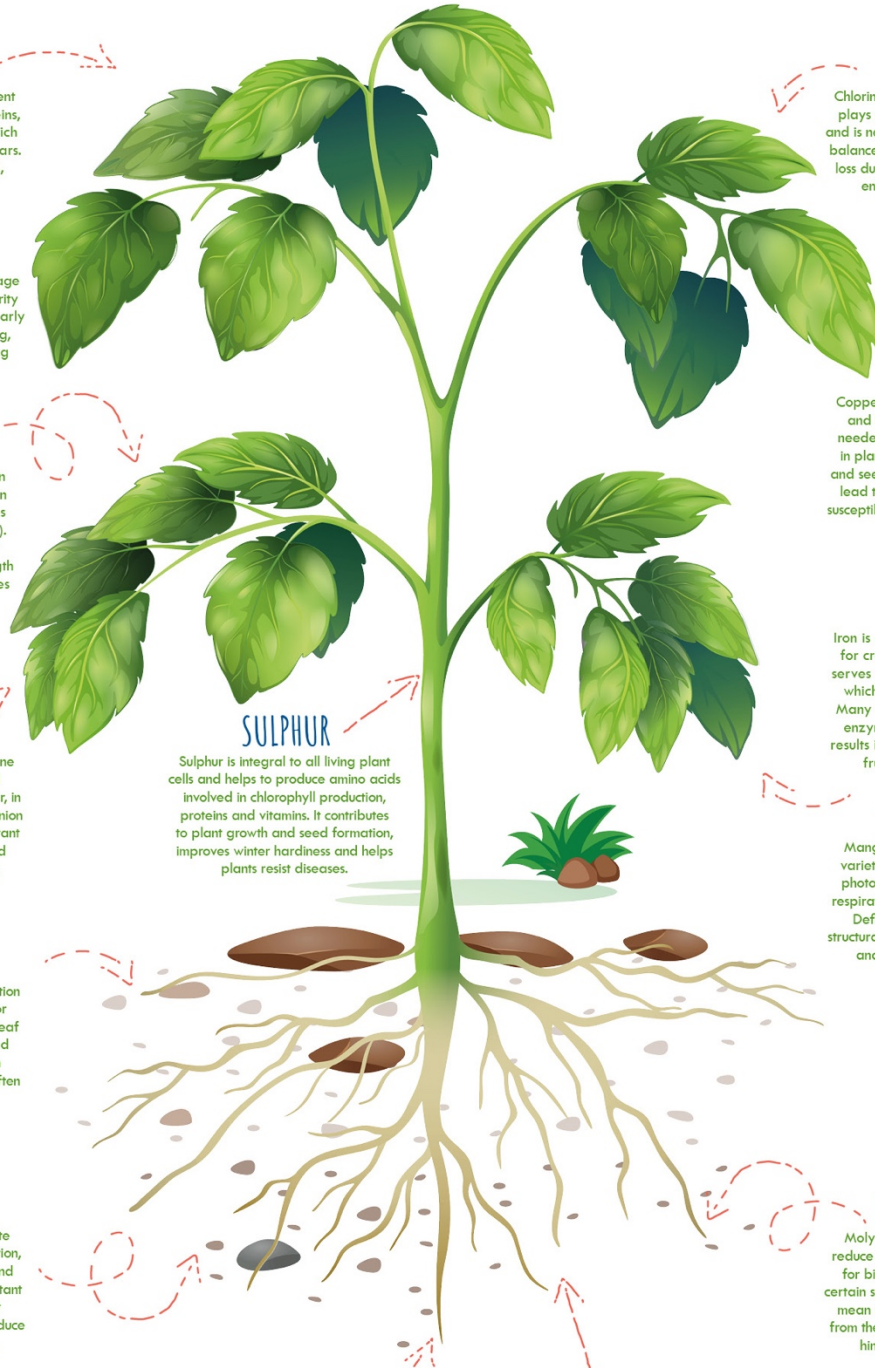
**PHOSPHORUS**  
Phosphorus is vital for energy storage and transfer and membrane integrity in plants. Particularly important in early growth stages, it promotes tillering, root development, early flowering and ripening.

**POTASSIUM**  
Potassium has major functions in enzyme activation, transpiration and the transport of assimilates (the products of photosynthesis). It helps plants to retain water during droughts, provides strength to plant cell walls and decreases susceptibility to diseases and insects.

**CALCIUM**  
Calcium is needed for biomembrane maintenance. It helps in cell wall stabilization as an enzyme activator, in osmoregulation, and in the cation-anion balance and thus also plays important roles in resistance to diseases and abiotic stresses such as drought, heat and cold.

**MAGNESIUM**  
Magnesium is central to the production of chlorophyll which is needed for photosynthesis and healthy green leaf tissue. It reduces crop stress caused by exposure to the sun and high temperatures, while a deficit can often cause stunted growth.

**BORON**  
Boron is required for carbohydrate metabolism and transport, lignification, nucleotide synthesis, respiration, and pollen viability and plays an important role in plant cell walls and plant metabolism. It has been found to reduce the severity of many diseases.



**CHLORINE**  
Chlorine improves plant productivity, plays a role in plant photosynthesis and is needed for osmosis and ionic balance. It can help to minimize water loss during stressful dry periods and enhance disease resistance.

**COPPER**  
Copper plays a key role in nitrogen and hormone metabolism and is needed for many enzyme activities in plants, as well as for chlorophyll and seed production. Deficiencies can lead to crop failure and increased susceptibility to diseases such as ergot.

**IRON**  
Iron is another essential component for creating chlorophyll and also serves as a catalyst for cell division which is central to plant growth. Many plants also use iron for their enzyme functions. A lack of iron results in yellowing leaves and poor fruit quality and quantity.

**MANGANESE**  
Manganese plays a key role in a variety of plant functions including photosynthesis, enzyme activation, respiration, and nitrogen assimilation. Deficiencies can cause weaker structural resistance against pathogens and less tolerance to drought and heat stress.

**MOLYBDENUM**  
Molybdenum is used by plants to reduce nitrates into usable forms and for biological nitrogen fixation by certain species. Insufficient molybdenum mean some plants can't fix nitrogen from the air to make proteins and can hinder normal plant growth.

**NICKEL**  
Nickel is important in plant seed germination, photosynthesis, enzyme functions and nitrogen metabolism. A deficiency affects plant growth, antioxidant systems and response to stress.

**ZINC**  
Zinc participates in chlorophyll formation, is needed to activate many enzymes in plants and is needed for plant immune responses. As a result, it is important for increasing plant resistance to diseases and pests.



## PLANT TISSUE NUTRIENT TESTING

## Multiple in-season tissue tests will optimize your fertility program and yields

Check plant nutrient levels at critical crop growth stages to identify existing and potential problems

By Treena Hein ([Article originally appeared in Grainews.ca](#))

Plant tissue analysis is a nutrient management tool that has been around for a few years, but as more farmers and agronomists realize the valuable insights it can provide, its use is growing among both these groups.

“Tissue testing is not new, but interest in it is increasing as another way for producers to make sure they’re optimizing inputs to get their highest yield possible,” explains Nevin McDougall, president and chief commercial officer at A&L Canada Laboratories.

“In addition to other tools, tissue testing adds a further dimension for farmers to make the best decisions about in-season fertility. Most crop farmers are moving past the point where they plant seeds in the spring and only look out for disease and pest issues during the growing season. There is a lot of opportunity to also better manage fertility during the summer to ensure maximized profits.”



*This photo shows potassium deficiency in soybean. A crop with high-yield potential may run out of certain nutrients or be approaching that critical point faster than farmers may anticipate. Tissue testing at critical crop growth stages can identify both existing and potential fertility problems.*

The other tools used to make in-season fertility decisions are generally field scouting and results of soil tests done the spring or fall before. McDougall says some progressive farmers in Canada and around the globe also use normalized difference vegetation index (NDVI), which measures plant health based on how the plant reflects different wavelengths of light, measurements from UAVs and satellite imagery. On large-acre farms, he says, there is a place for NDVI to show where a crop is achieving higher and lower productivity, and this narrows down the areas of the farm where tissue testing is most effective.

However, for any amount of acreage, a crop with high-yield potential may run out of certain nutrients — or may be approaching that critical line — faster than farmers had anticipated, due to new genetics, exceptional growing conditions or a combination of both. That’s why several years ago, laboratories started offering programs that help farmers check their plant nutrient levels at critical crop growth stages. Tissue testing at those stages can identify both existing fertility problems and potential fertility problems before physical symptoms of deficiency are present (at which point yield can already be affected). Tissue testing can also validate recommendations made by agronomists, giving them the assurance that they are providing accurate guidance.

### When, where and how often

McDougall recommends starting with one sample per 25 acres, but the appropriate number of samples is dependent on field size and degree of variability across the field. When to sample is also dependent on several factors, such as geography, field size and yield goals. Some growers may be aiming to compare different fertility programs or drive a crop to its highest achievable yield and quality by top dressing or adding foliar nutrition.

***More farmers and agronomists are using multiple in-season tissue test results to optimize fertility programs***

“Even one sample tested in late June is valuable, but if you take samples at three points in the season, you can really see how nutrient uptake is happening and because you get your test results back very quickly, with us within 24 hours of sample receipt, and you can take action immediately with a foliar application. When the results don’t indicate immediate action is required, you or you with your agronomist have the opportunity to accurately look at the costs of fuel and fertilizer versus potential yield/profit gains of various levels of applications of various nutrients,” says McDougall.

McDougall believes that multiple in-season tissue tests will become standard very soon. “If you look at innovation that is being brought into agriculture, the genetic advances, seed treatments, seed placement and so on, things are continuing to advance and improve,” he says. “Management of fertility must keep up.”



## Getting familiar with PMP – A&L’s Plant Monitoring Program

Track your crop throughout the growing season! **Free to enroll**

1. Evaluate your cropping plans prior to the growing season and select the field to be monitored
2. Enroll your fields by completing and submitting a PMP Enrollment Form  
[https://www.alcanada.com/pdf/Submission/A&L-F-011\\_PMP\\_Enrollment\\_Form.pdf](https://www.alcanada.com/pdf/Submission/A&L-F-011_PMP_Enrollment_Form.pdf)
3. A unique Plant Monitoring ID (PMID) is assigned for each field
4. Plant samples are to be submitted with a PMP Submission Form  
[https://www.alcanada.com/pdf/Submission/A&L-F-004\\_Plant\\_Submission.pdf](https://www.alcanada.com/pdf/Submission/A&L-F-004_Plant_Submission.pdf)
5. Sample analyses are reported on an A&L PMP Report (Sample Report  
<https://www.alcanada.com/pdf/technical/plant/plantreport.jpg> )



### LEARN MORE

**YouTube Video (Open Access):** In-Season Plant Analysis to Monitor Crop Performance (Plant Nutrient Tissue Testing)

• Why we do it and what we are looking for

<https://www.youtube.com/watch?v=DC5X39Jrs3E&t=25s>



# TISSUE TESTING SAMPLING PROCESS



ORDER tissue bags!  
alcanadalabs@alcanada.com  
1-855-837-8347

## 1 Supplies

- Submission sheets
- A sharpie marker for labeling bags and submission sheets
- An A&L sample collection bag or a brown paper lunch bag (no plastic bags)
- Flags or a GPS if the sample site is to be retested following application(s)



## 5 A&L Reports

- Plant tissue analysis results turnaround time (TAT) are next day from the lab receiving the samples
- Once your results are finished you will be emailed or faxed a copy of your analysis or you can also log on to the A&L DataWeb to view your report online

## 1 Supplies



## 2 Conditions /Method



## 2 Conditions/Method

- Ensure with grower that the field is safe to enter
- With clean hands & a sample bag - walk into the field a few hundred metres
- Flag or GPS locate the sampling area as to be able to return later
- Record growth stage of crop on submission form
- Begin collecting leaf samples from a representative area NOTE: Morning is best to prevent heat stress
- Be sure to take samples at the same time of day and weather if trying to compare results before and after application(s)
- Collect leaves or petioles from 15 to 30 plants depending on the crop (approximately a softball size of loosely packed leaves is necessary for analysis)
- AVOID irregularities such as high or low areas of the field - Or, take separate samples from these areas
- Collect the most recently mature leaves or the whole plant without the roots if in early growth stages. Ensure different application/seeding areas are sampled separately
- If a poor area of a field is being investigated for deficiencies remember to take a sample from a good area as well to compare results with the poor area



## 5 A&L Labs Reports

## 4 Ship to A&L Labs

## 4 Ship to A&L Labs

- Send samples & information sheets via courier to: A&L Laboratories, 2136 Jetstream Road, London, ON N5V 3P5
- Samples can also be dropped off at the A&L Canada Laboratories office at the same address
- It is important that samples are sent to the lab quickly to ensure the leaves do not begin to decompose

## 3 Sample Preparation

- If samples have fertilizer, spray, or dust residue on them, they should be washed or wiped off as this will cause a potential bias in the lab results
- Allow samples to air dry samples in a clean area free from contamination
- Complete plant tissue submission sheets listing each individual sample
- Place samples (that are in sample bags) and sheets in boxes and send to A&L Canada Laboratories, Inc.

For more information on A&L Tissue Testing Services visit [www.ALCanada.com](http://www.ALCanada.com)



A&L Canada Laboratories Inc.

## UNDERSTANDING YOUR PLANT ANALYSIS REPORT

Plant Tissue Tests can help identify if an essential nutrient in the plant is within the expected normal sufficiency range for that particular stage of growth during the season. This offers the opportunity to address the deficient nutrients during the growing season, or elect to adjust next seasons fertility program

### A&L Plant Analysis Report

Date Sampled	Lab Number	Nitrogen (%)	Nitrate Nitrogen (%)	Sulfur (%)	Phosphorus (%)	Potassium (%)	Magnesium (%)	Calcium (%)	Sodium (%)	Boron (ppm)	Zinc (ppm)	Manganese (ppm)	Iron (ppm)	Copper (ppm)	Aluminum (ppm)	Chloride (%)
2019-07-05	188167	6.23		1.21	0.40	2.95	0.66	2.16	0.30	35	26	67	95	7	21	
Normal Range		3.99 6.00		0.59 0.90	0.27 0.60	2.79 5.10	0.24 0.82	1.39 3.00	0.03	29 60	24 70	29 250	49 250	4 25	300	

	N/S	N/K	P/S	P/Zn	K/Mg	K/Mn	Fe/Mn	Ca/B
Actual Ratio	5.1	2.1	0.3	153	4.5	440	1.4	620
Expected Ratio	6.7	1.3	0.5	93	7.4	282	1.1	489

Plant analysis findings are useful in determining if the soil fertility level and applied fertilizer program were sufficient in meeting the needs of the crop requirements

#### Actual Nutrient Analysis

- This is the actual nutrient content measured in the plant at the time the sample was taken
- Note that the major (macro and secondary) are reported in % due to higher concentration in the plant. The micronutrients are lower in concentration, so reported in ppm

#### N:S Ratio

- The main goal of plant analysis and nutrient ratio balancing is to be as close to the expected ratio as possible at the particular plant growth stage
- When reviewing ratios, it's important to first understand the crops nutrient requirements to grow high yields and better product qualities
- The N:S ratio tells us the balance between these two nutrients. If out of line, too much of one nutrient to the other could lead to reduced yields and further problems

#### Normal Range

- Based on research, nutrients should be in a particular range at certain growth stage
- Plant growth stages must be identified on the submittal form for the report to compare with our expected ranges for the stage of growth
- If the actual nutrient analysis falls within the normal range the plant is progressing nicely. If the actual nutrient analysis falls outside the normal range, there may be environmental conditions, hidden deficiencies or excesses, which will impact both yield and quality

#### N:K Ratio

- The importance of the N and K relationship is well documented and researched and correlates to both improved yield and quality
- Based on plant nutrient requirements, we need almost as much available K to grow a bushel as we do N
- Having this balance in the plant is tremendous. Full season plant tissue monitoring (A&L PMP report) allows early deficiency detection, and any nutrient balance issues can be corrected as needed



# A&L's 'One-Stop Shop' Suite of Services

For a producer or advisor to know the true health of their soils, understanding its bioactivity and overall capacity to help a given crop succeed should be their top priority. At A&L, a one-stop shop for all your agricultural analytical testing needs, understanding your results and turning information into actionable solutions to help improve your crop is our main objective.

## A&L SOIL HEALTH SUITE

Soil Tests	Used for	Package Components	Code
Standard Soil Test + Micronutrients	Understanding Soil Nutrients	• See Table Below	• See Table Below
VitTellus® Soil Health	Soil Health Index for Decisions	<ul style="list-style-type: none"> <li>• VitTellus® Soil Health Report + Index</li> <li>• Solvita CO2 Test Results</li> <li>• Reactive Carbon</li> <li>• Standard Soil Fertility Test Results</li> <li>• A&amp;L Crop Recommendations</li> </ul>	<b>SHTEST1</b> <b>OPTION:</b> <b>SHTEST2</b> - VitTellus Soil Health Test + Water Extracted Carbon & Nitrogen <ul style="list-style-type: none"> <li>• NRCS Soil Health Score</li> </ul>
VitTellus Bio™	Quantifies the Beneficial Soil Microbes	<ul style="list-style-type: none"> <li>• Complete VitTellus Bio™ Report</li> </ul> <b>PLUS:</b> <ul style="list-style-type: none"> <li>• VitTellus® Soil Health Report + Index</li> <li>• Solvita CO2 Test Results</li> <li>• Reactive Carbon</li> <li>• Standard Soil Fertility Test Results</li> <li>• A&amp;L Crop Recommendations</li> </ul>	<b>SHTEST3</b>
Soil Organic Carbon (SOC)	Measure for Soil Organic Matter	• By Dry Combustion	<b>GTCS411</b>
Bulk Density	Indicator of Soil Compaction		<b>SBD</b>
Particle Size Analysis/Texture	Indicator of Soil water movement, Soil erosion and Soil solute movement		<b>SHTEXT</b>
Aggregate Stability	Measures resistance of soil aggregates to breakdown or degradation		<b>SHVAST</b>
C:N Ratio	Indicator of Residue decomposition and Nitrogen cycling; important for microbial activity		<b>SHSCN</b>

A&L Soil Tests	Macronutrients														Micronutrients					Add.			
	Organic Matter	Phosphorous (Sodium Bicarb)	Potassium	Magnesium	Calcium	Sodium (Ammonium)	Soil pH	Aluminum	Saturation of Cation	Calculated C:E.C.	Saturation %P	%K/Mg Ratio	Buffer pH	Nitrate	Hydrogen	Zinc	Manganese	Sulfur	Boron	Iron	Copper	Chloride	E.C.
• S1B	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•								
• S2	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•						
• S3	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•					
• S4	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•				
• S5	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			•	•		
• S6	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•		
• S7	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	
• SW1B2	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•						
• SW	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•						
• SW1	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•					•	•
• SWB - Sub-Surface Analysis	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•						

## A&L NEWS

Click on the article title to view on the A&L website

### **AGvisorPRO: Know Your Soil's True Health: An A&L Canada Laboratories Tech Direct Guide**



- AGvisorPRO is excited to have A&L Canada on board as one of our newest Tech Direct Partners

### **A&L Canada Laboratories selected to provide soil data and analytics in Veripath Farmland Funds' soil management program**

- Veripath Farmland Funds announced it has partnered with A&L Canada Laboratories and Deveron to assist in its soil management program
- Fund meets UN-backed Principles for Responsible Investment (PRI) Farmland Guidelines incorporating environmental, social, and governance (ESG) factors

### **A&L Canada Laboratories and Deveron join forces with US based Woods End Laboratories to create a leading Soil Health Service platform**

- A&L Canada Laboratories and Deveron form new joint venture company and have acquired the assets of Woods End Laboratories
- US based Woods End Laboratories to offer an enhanced range of soil health and precision ag products and services

### **A&L Canada Laboratories and Hawthorne to offer Cannabis Production Workshop**

- A&L and Hawthorne to offer complimentary webinar "Unlock Your Plant's Potential" highlighting best management practices for production of Cannabis

To register, visit <https://mientzu.com/live-detail/al-hawthorne-cannabis-workshop>

Unlock Your Plant's Potential

# Cannabis Production Workshop

Wed. May 26, 2021  
1:30-4:00 PM EDT

FREE TO SIGN UP  
[mientzu.com](https://mientzu.com)

- ✦ **PLANT NUTRIENT TESTING & ANALYSIS**  
 Greg Patterson, Certified Crop Advisor  
 A&L Canada Laboratories
- ✦ **MEDIA & WATER MANAGEMENT**  
 Jean Pierre Fortin  
 Technical Sales Support, Hawthorne
- ✦ **LIGHTING OPTIMIZATION**  
 Brandon Robinson  
 Technical Services Engineer, Hawthorne

Complimentary Mien Tzu Webinar Sponsored by:

A&L Canada Laboratories - Cannabis Services Quick URL: [www.alcannabislabs.com](http://www.alcannabislabs.com)

The Hawthorne Gardening Company - Grow Solutions: [www.hawthornegc.ca](http://www.hawthornegc.ca)

# We are here to help - At A&L, our commitment is to drive positive outcomes!



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