



## JUNE 2020 NEWSLETTER

A&L Canada Laboratories Inc.

### June 2020 ISSUE:

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- AGRONOMY CORNER: Sulfur and Plant Nutrition
- AGRONOMY CORNER: Boron
- PMP (Plant Monitoring Program) Reminder
- WEBINAR: Join Us! Deveron/A&L Plant Tissue Testing Webinar - June 18<sup>th</sup>
- A&L Contact Information and Social Media

### Welcome Holland Cahill – Maritime Representative



Holland Cahill  
Maritime Provinces  
A&L Canada Laboratories

A&L is pleased to welcome Holland Cahill to the A&L Team! Holland is joining us as the Agronomy and Business Development Representative for the Maritime Provinces.

We have boots on the ground across Canada! If you're in the United States, drop us a line at [alcanadalabs@alcanada.com](mailto:alcanadalabs@alcanada.com) and we'll let you know how we can support you!

Our team of Agronomy and Business Development Representatives look forward to hearing from you and discussing ways we can help:

## Find the A&L Agronomy & Business Development Representative in your Area:

- Holland Cahill, Maritime Provinces – [hcahill@alcanada.com](mailto:hcahill@alcanada.com)
- Chris Meier, Eastern Ontario & Quebec – [cmeier@alcanada.com](mailto:cmeier@alcanada.com)
- Mike Folkard, Southwestern Ontario – [mfolkard@alcanada.com](mailto:mfolkard@alcanada.com)
- Noah Bertholet, North Saskatchewan – [nbertholet@alcanada.com](mailto:nbertholet@alcanada.com)
- Jill Debenham, South Saskatchewan & Manitoba – [jdebenham@alcanada.com](mailto:jdebenham@alcanada.com)
- Norm Dueck, Alberta & British Columbia – [ndueck@alcanada.com](mailto:ndueck@alcanada.com)
- **Brain Coutts**, Food & Pharma, Strategy and Business Development Manager – [bcoutts@alcanada.com](mailto:bcoutts@alcanada.com)



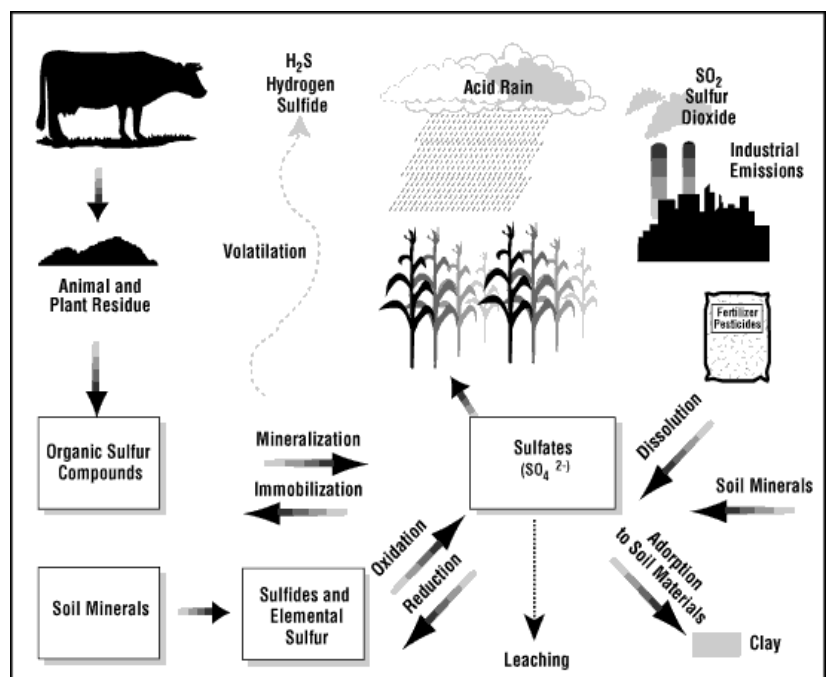
## AGRONOMY CORNER

### Sulfur and Plant Nutrition

Due to the amount of attention that sulfur has been getting lately, here is some information that we hope you will find useful.

#### The Sulfur Cycle

Sulfur, like other nutrients is found in many different forms. It must be converted into the sulfate ( $\text{SO}_4^{2-}$ ) in order to allow for root uptake and sulfur dioxide ( $\text{SO}_2$ ) to be absorbed through the plant leaves. The illustration to the right shows us that sulfur can end up the soil in several ways. Specifically, industrial emissions, volcanic activity, fertilizer, manure & plant residue. Once the sulfur has reached the soil, microorganisms convert the various forms into sulfate and the plant can then utilize it.

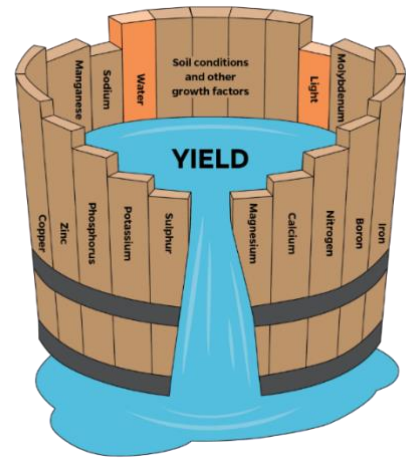


Other than plant up-take sulfur can also be removed from the soil by volatilization and leaching, or it can be bound up in the soil making it unavailable to the plant.

### Why Is Sulfur Important?

In some instances, the uptake of important nutrients such as nitrogen, potassium, phosphorus and magnesium can be limited by the amount of sulfur available. Sulfur plays a critical role in many plant functions. Approximately 90% of the sulfur in plants is found in the amino acids.

Plant Proteins (in the form of enzymes) are then used in to perform other functions within the plant such as; glucose synthesis, carbon dioxide assimilation, N<sub>2</sub> fixation, etc. Sulfur is also used to help with nodule formation in legumes and helps the seed to survive in low temperatures.



### Sulfur in Soil

In addition to Sulfur's role in the plant maintaining adequate soil levels is also important for:

- Maintaining a balance with nitrogen - try to maintain a N:S ratio of 10:1 when applying fertilizer
- Maintaining proper balance with other nutrients in the soil
- Acidulation in high pH soils to help the process of facilitated diffusion - this allows the plant to have access to nutrients that might otherwise not be available
- Formation and decomposition of organic matter - approximately 90% of available sulfur is contained in organic matter
- Aids with the breakdown of residue

The influence of soil type and pH has implications with the availability of applied sulfur:

- Sands are more prone to leaching but do not require a large quantity of sulfur to see a crop response
- Clays will bind sulfur, which leaves it much less prone to leaching, but needs a higher soil test level to get a crop response
- Soils with pH's less than 6.0 will reduce the availability of sulfur
- It is also important to note that 95% of a plants sulfur uptake comes from mass flow - therefore, during dry conditions sulfur deficiencies can occur more frequently



## Net Sulfur

Over time the amount of sulfur available in soil has been dropping because of the reduction of; sulfur emissions in pollution, sulfur use as for fungicide and pest control, and sulfur in chemical fertilizers. Also, ever increasing uptake from high production crops put further strain on sulfur levels in the soil. A 200-bushel crop of corn will take 32 lbs of sulfate from the soil, with 14 lbs being re-moved in the grain and 18 lbs in the stover. The net result is a significant depletion of sulfur reserves.

Common Forms of Sulfur Fertilizer		
Name	Percent Sulfur	Notes
Elemental Sulfur	90	Highly concentrated, slow release
Ammonium Sulfate	24	Fast release, also contains nitrogen
Calcium Sulfate	18	Fast Release, also contains calcium
Ammonium Thiosulfate	26	Liquid
Potassium Sulfate	17-18	Low salt index, also contains potassium
Potassium Magnesium Sulfate	21-22	Commonly used on sand soil to correct Mg & K issues

## Micronutrients: Boron

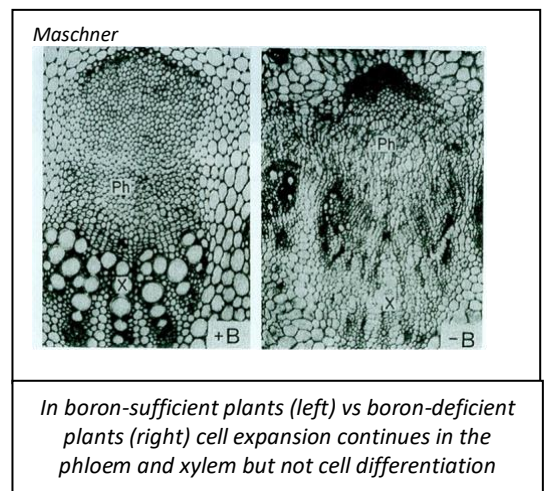
### Why Is Boron Important?

**Boron is, of all the micronutrients, the least understood. Boron is neither an enzyme constituent nor does it affect enzyme activities in the plant.**

Boron, however, is involved in or plays a major role in a number of plant functions, some of which are not clearly understood, but in the absence of Boron, these processes are greatly affected.

The roles of Boron in the plant are: a) sugar transport, b) cell wall syntheses, c) lignification, d) cell wall structure, e) carbohydrate metabolism, f) RNA metabolism, g) respiration, h) indole acetic acid, (IAA) metabolism, i) phenol metabolism, j) membranes, k) root growth, and l) pollination. Boron also plays a major role in the plants ability to uptake potassium & stop the efflux of K from plant cells and tissue.

Boron plays a role in the maintenance of the plant's phloem. It is the phloem that carries all the sucrose that the plant produces to the parts of the plant that need it. It feeds the roots, tubers and crops that we produce. When the phloem is not functional, such as in times of low boron, the crop quality



and yield decrease. A boron deficiency also causes a reduction of exudates and sugars from plant roots, which in turn can reduce the attraction and colonization of mycorrhizal fungi in the rootzone. We must maintain boron levels in the plants optimum range during the growing season to ensure high yields and high quality.

Boron has also been noted to have a synergistic relationship with potassium and its uptake. This relationship of boron and potassium influences sugar & carbohydrate transport within the plant. Plants that are large consumers of potassium require boron levels greater than 20 ppm in the tissue in order to uptake the necessary potassium. Furthermore, heavy users of potassium in the bulking stage of production require boron levels in the tissue in the 60 to 80 ppm range in order to take up the potassium they require.

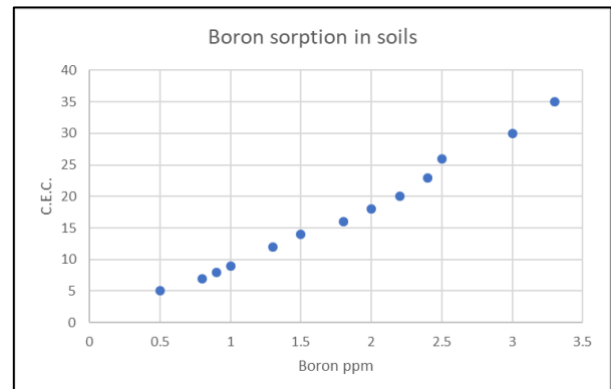
### Boron in Soil

Boron levels in soils have been dropping across North America. They are now at very low levels in most regions. Furthermore, tissue analysis also indicates very low boron levels in plant tissue.

The form of boron in soils typically depends on the soil type and the amount of organic matter. Boron can be found in minerals or bound with organic matter. The soluble form of boron found in soils is mainly boric acid  $B(OH)_3$ . Undissociated boric acid is the main form available for absorption by plants. However, due to its charge it is readily leached from sandy soils or soils that are low in organic matter.

A&L's research along others, has demonstrated that optimum soil boron levels to maintain plant uptake is much higher than once understood. It is also now understood that boron has an affiliation with clay; the higher the CEC the stronger the bond or fixation of Boron.

Like sulfur, boron uptake by the plant is mainly attributed to mass flow. This means moisture is needed in the soil for boron to be taken up by the plant. During periods of drought boron deficiency is more common. Plant available boron can also be restricted by soil pH. The optimum soil pH for boron uptake is between 6.0 and 6.5.



*This chart is from research data that shows the linear relationship to the increase in boron fixation and increase in clay soil content or CEC.*

Common Forms of Boron Fertilizer	
Name	Percent Boron
Borax	11%
Boric Acid	17%
Solubor	20%

## PMP Reminder

The Plant Monitoring Program (PMP) is a nutrient management tool used to track the nutrient levels of a crop. By regularly analyzing a crop and examining nutrient levels and trends, existing and potential nutritional problems can be identified before physical symptoms of deficiency are present. The PMP provides a valuable tool for growers to monitor and track the nutrient levels presented by these analyses, and in turn, tailor nutrients appropriately during the growth stages of the crop.

Getting stated:

- Growers can enroll samples in the PMP (Plant Monitoring Program) by completing and submitting a PMP Enrollment Form which can be found on [www.alcanada.com](http://www.alcanada.com) under quick links and submission forms
- A unique Plant Monitoring ID (PMID) will then be assigned to each individual sample by the lab
- Tissue samples can then be submitted using their individual sample name and PMID
- These samples will then be reported on our special PMP report format (below) - you can also request the information in a .CSV file

**PMP Enrolment Form**

**A&L Canada Laboratories Inc.**  
2136 Jetstream Road - London, Ontario - N5V 3P5  
Phone (519) 457-2575 - Fax (519) 457-2664

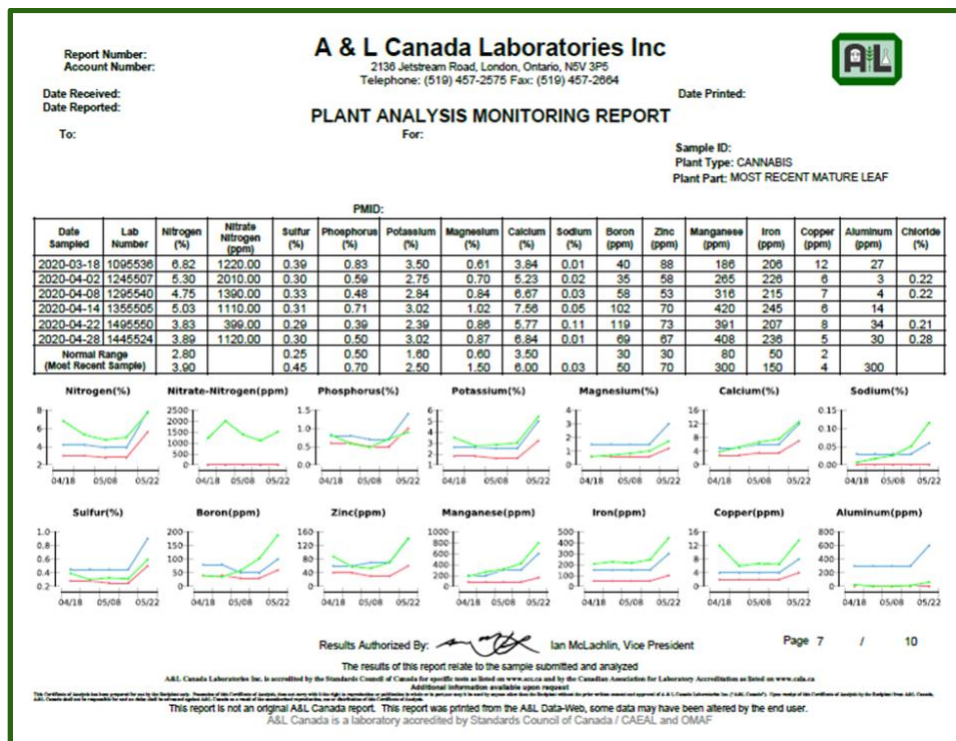
Complete this form to enroll fields in the 2011 Plant Monitoring Program (PMP). Please submit one form for each grower. A Plant Monitoring ID (PMID) will be assigned for each field and will be shown on the report.

<b>Submitted By</b>		<b>Sample Reference</b>	
		<b>Grower Code</b>	
		<b>Grower Name</b>	
		<b>Address</b>	

**Email Address for data:** \_\_\_\_\_  
**Email Address for PDF reports:** \_\_\_\_\_

PMID* <small>(Lab use only)</small>	Field Name	Crop Type	Variety	Sample ID

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## You are invited to a Zoom Webinar: “Tissue Testing Made Easy”

With tissue testing season now upon us, we will walk through the tissue testing services available to you from A&L Canada Laboratories and Deveron UAS.

Please join our webinar to better understand the services available to your farm or to your farm customer:

 [Tissue Testing Made Easy - June 18, 2020 at 10:00 am ET \(10:00 am CT\)](#)

Tissue Testing provides you with valuable in season insights giving you key information regarding your crop’s nutrient uptake. Better understand how your crop is performing and if there are any areas of the field that are being affected by hidden hungers.

- Can your high production areas supply enough nutrient during critical growth stages?
- Are there nutrient deficiencies robbing yield from your bottom line?
- Are your low production areas a nutrient or water deficiency issue?

Tissue testing will answer these questions and give you the in-season knowledge to validate that your nutrient investment is being utilized by your crop. A properly implemented tissue collection program will validate your soil sampling and nutrient application program by adding critical information needed to determine nutrient requirements in key areas of your field.

**Register for the “Tissue Testing Made Easy” webinar with Deveron UAS and A&L Canada Laboratories:** [https://zoom.us/webinar/register/WN\\_SQR2KUi2RbqTV8P\\_iHNndA](https://zoom.us/webinar/register/WN_SQR2KUi2RbqTV8P_iHNndA)

Watch for upcoming news:

**[A&L and Deveron To Launch National Plant Tissue Testing Service](#)**

## A&L Canada Laboratories Contact Information

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### A&L Canada Labs Social Media

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YouTube: <https://www.youtube.com/user/alcanadalabs>

