Identifying Nutrient Deficiencies in Potatoes

Erica MacDonald

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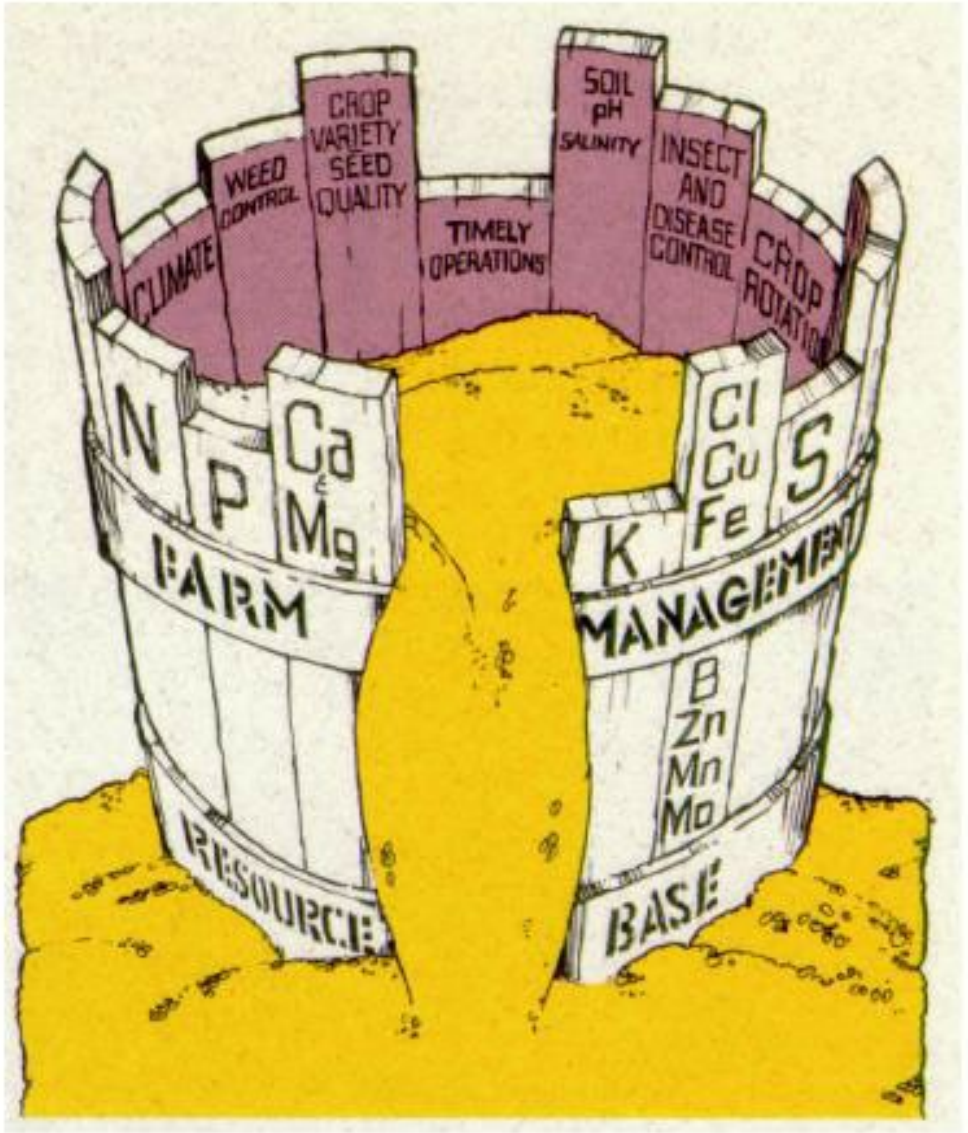


“Law of the Minimum”

Primary Macronutrients

H Nitrogen		C Phosphorus		K Potassium
N		**P**	S	**K**
Ca	Mg	Fe	Mn	Zn
B	Cu	Mo	Cl	Co
Ni	Na	Se	Si	Al

Nitrogen

- Plays a major role in photosynthesis
- Important during both vegetative growth and tuber bulking
- Over application can be just as harmful as under application
  - Reduce yield
  - Effect dry matter content
  - Delay maturation
  - Tuber quality and storage

Nitrogen

Nitrogen

- Mobile in plants
- Deficiency symptoms:
  - Pale yellow-green/chlorosis
  - Stunted growth
  - Yellowing of older leaves
  - Upward cupping of leaves

Phosphorous

- Part of ATP = important for energy storage & transport
- Plays a role in respiration, photosynthesis, cell division and multiplication
- Important in early vegetative growth, tuber initiation and development
- Effects specific gravity

Phosphorous

Phosphorous

- Mobile in plants
- Deficiency symptoms:
  - Dark green in color
  - Stunted
  - Smaller upwards curling leaves
  - Brownish spots, potential purple coloring

Phosphorous (ppm)-PEI soil trend

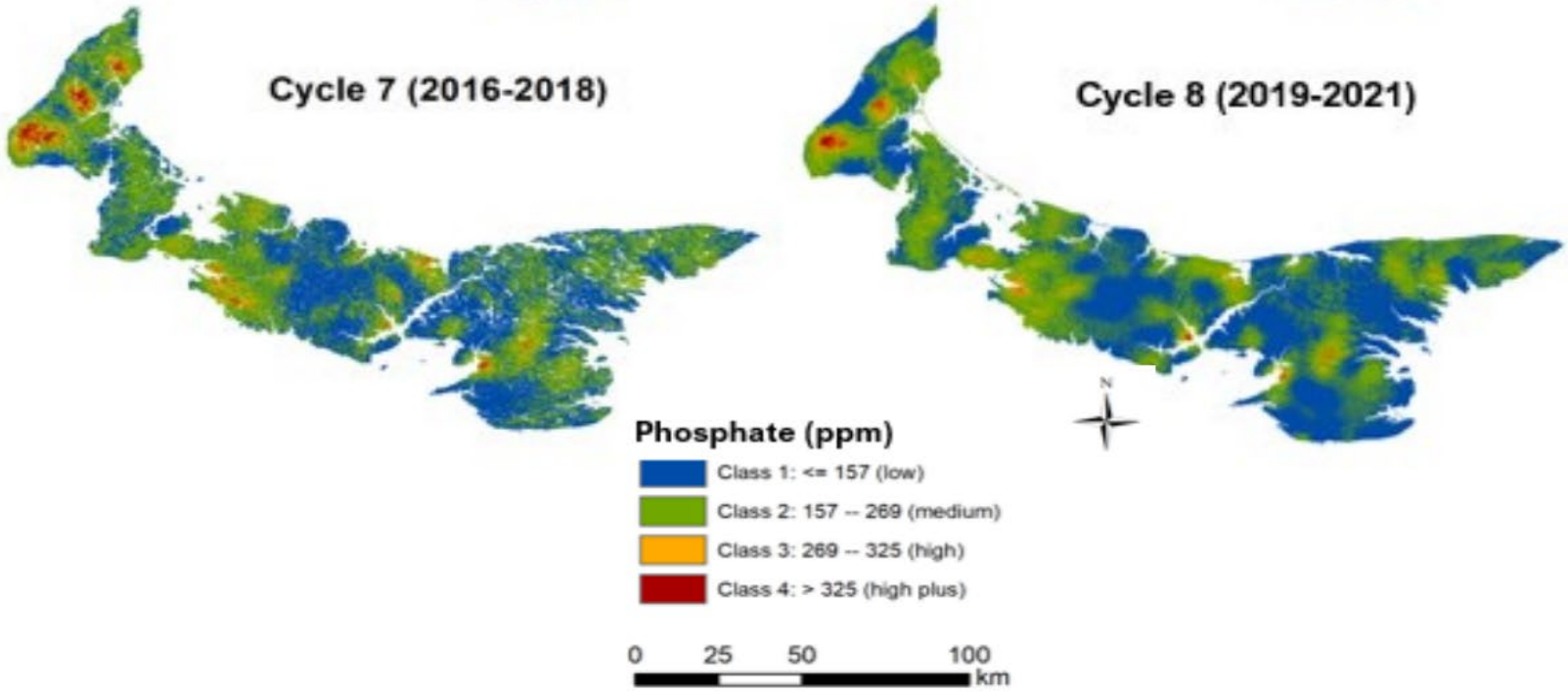


Figure 4. Soil phosphate (P_2O_5) levels spatially distributed using a regression-kriging model from data acquired through the PEI Soil Quality Monitoring Project, up to and including until end of cycle 8.

Phosphorous (%P)-PEI soil trend

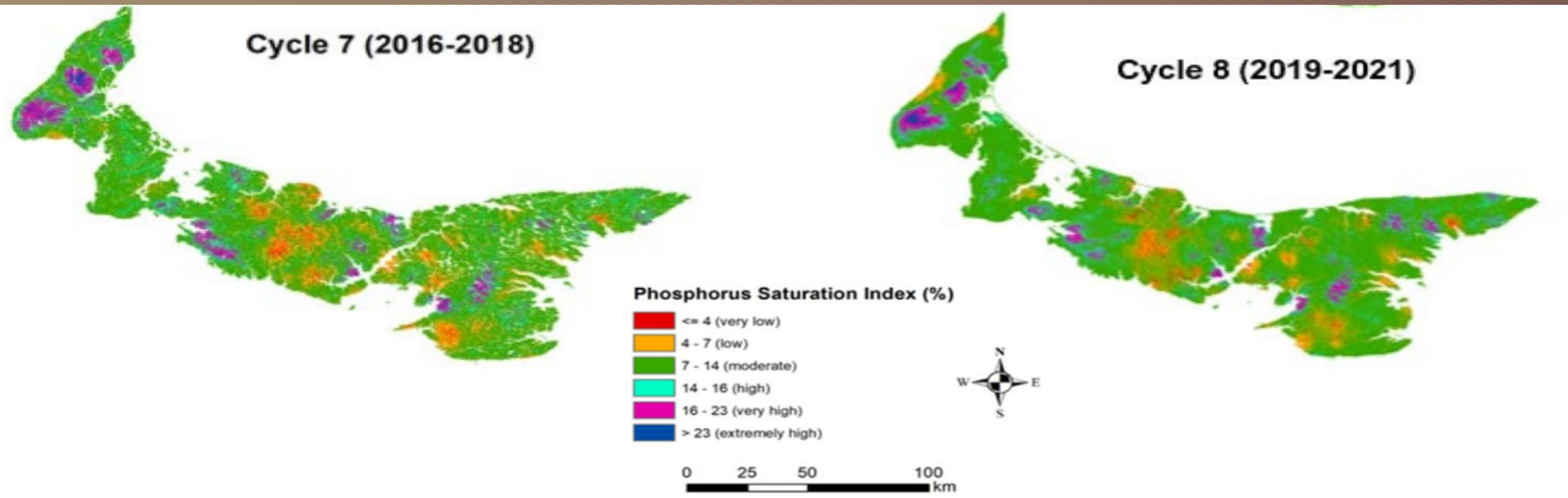


Figure 5. Phosphorus Saturation Index (PSI) levels spatially distributed using a regression-kriging model from data acquired through the PEI Soil Quality Monitoring Project, from cycles 3 until end of cycle 8. Cycles 1 and 2 are unavailable due to aluminum level analysis beginning in 2004 at PEI Analytical Laboratories (Benjannett et al. 2018).

Potassium

- Enzyme activation and coenzyme function
- Protein synthesis
- Stomatal regulation = C02 uptake/osmoregulation
- Influences tuber yield and size, specific gravity, fry color and storage properties
- Sufficient quantities can reduce blackspot bruising/hollow heart

Potassium

Potassium

- Mobile in plants
- Deficiency Symptoms:
  - Edges/tips of lower leaves first effected
  - Yellowing spreads between the veins as deficiency worsens
  - Curling of leaf margins
  - Stunted growth

Potassium (ppm)-PEI soil trend

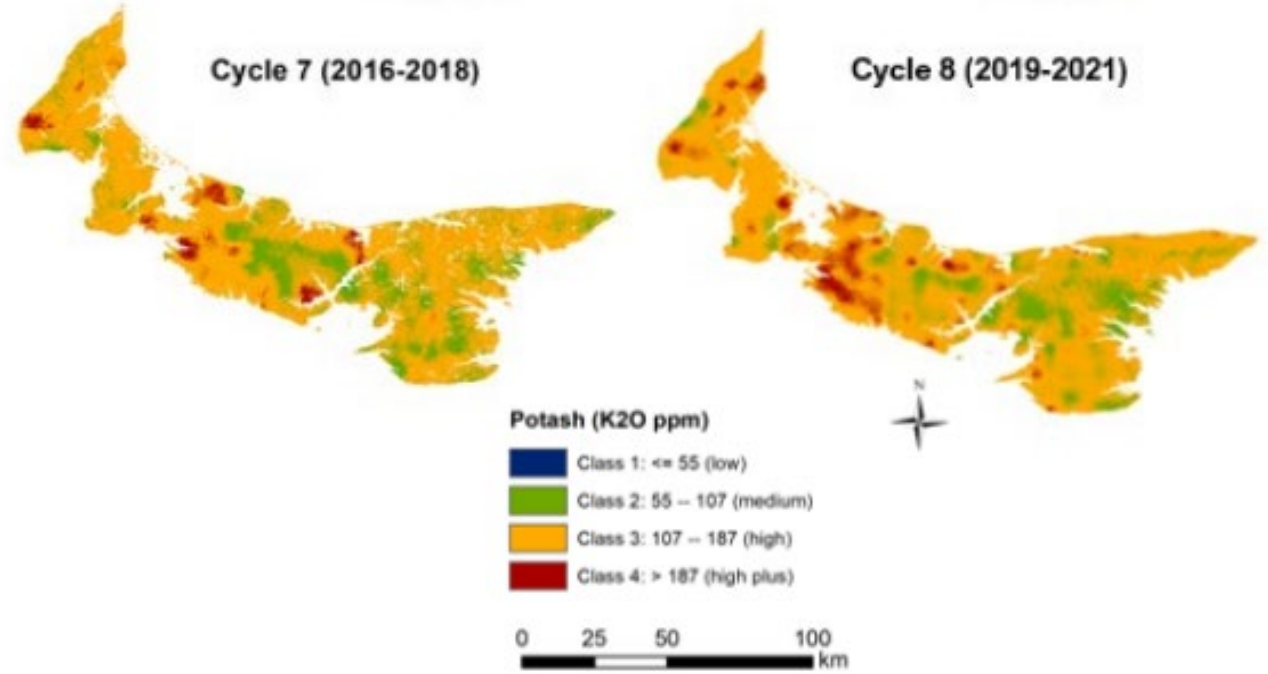


Figure 6. Soil potash (K_2O) levels spatially distributed using a regression-kriging model from data acquired through the PEI Soil Quality Monitoring Project, up to and including until end of cycle 8.

Secondary Macronutrients

H		C		O
N		P	S	K
Ca	Mg	Fe	Mn	Zn
B	Cu	Mo	Cl	Co
Ni	Na	Se	Si	Al

Calcium

Magnesium

Sulfur

Calcium

- Helps with plant cell elongation and is important in cell wall structure
- Helps regulate stomata and protects against heat stress
- Involved in activation of enzymes, regulating many growth and development processes
- Influences root development, stem number, tuber set and size
- Plays a role in potato quality
  - Reduction in internal defects (internal brown spot, hollow heart, black spot bruise)
  - Improved seed quality
  - Improved storage qualities

Calcium

Calcium

- Immobile in plants
- Deficiency symptoms:
  - Young shoots are poorly developed/spindly
  - Curled, chlorotic upper young leaves
  - Young leaf tips are deformed or “burnt” looking
  - Brown necrosis on leaf margins
  - Plants are wilted and/or stunted

Calcium (ppm)

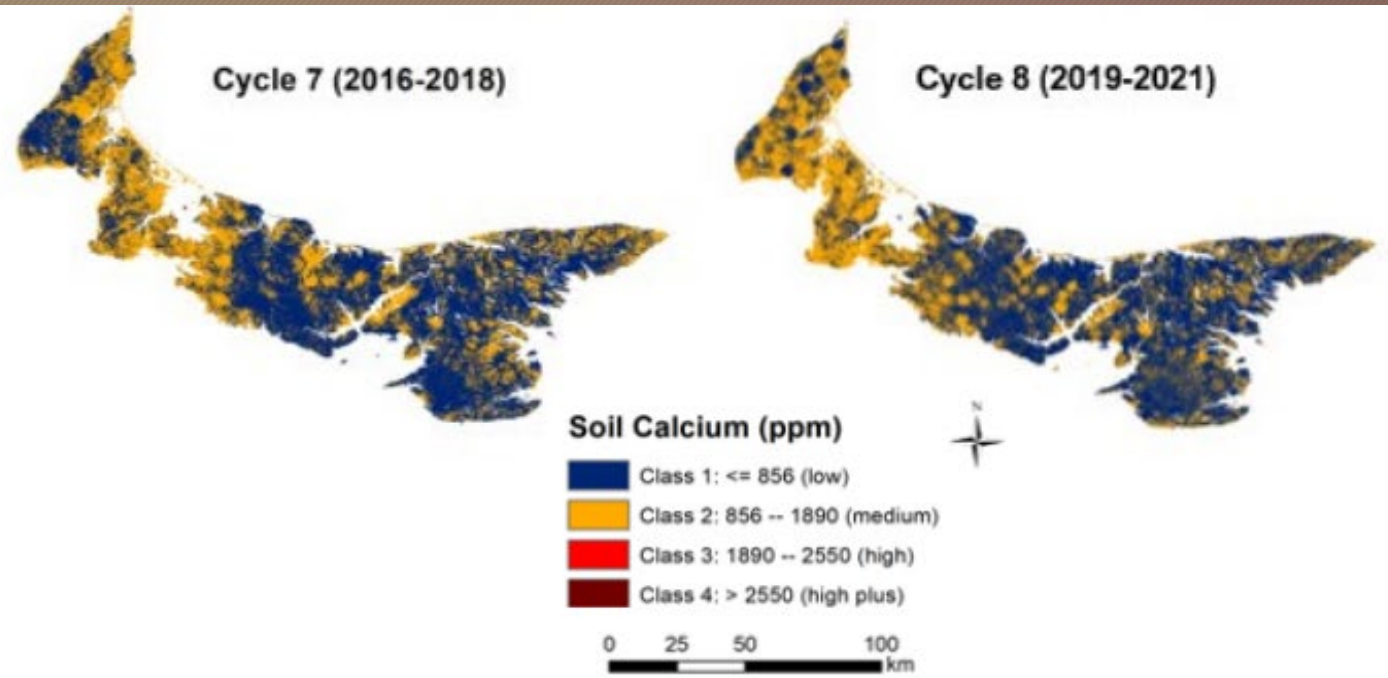
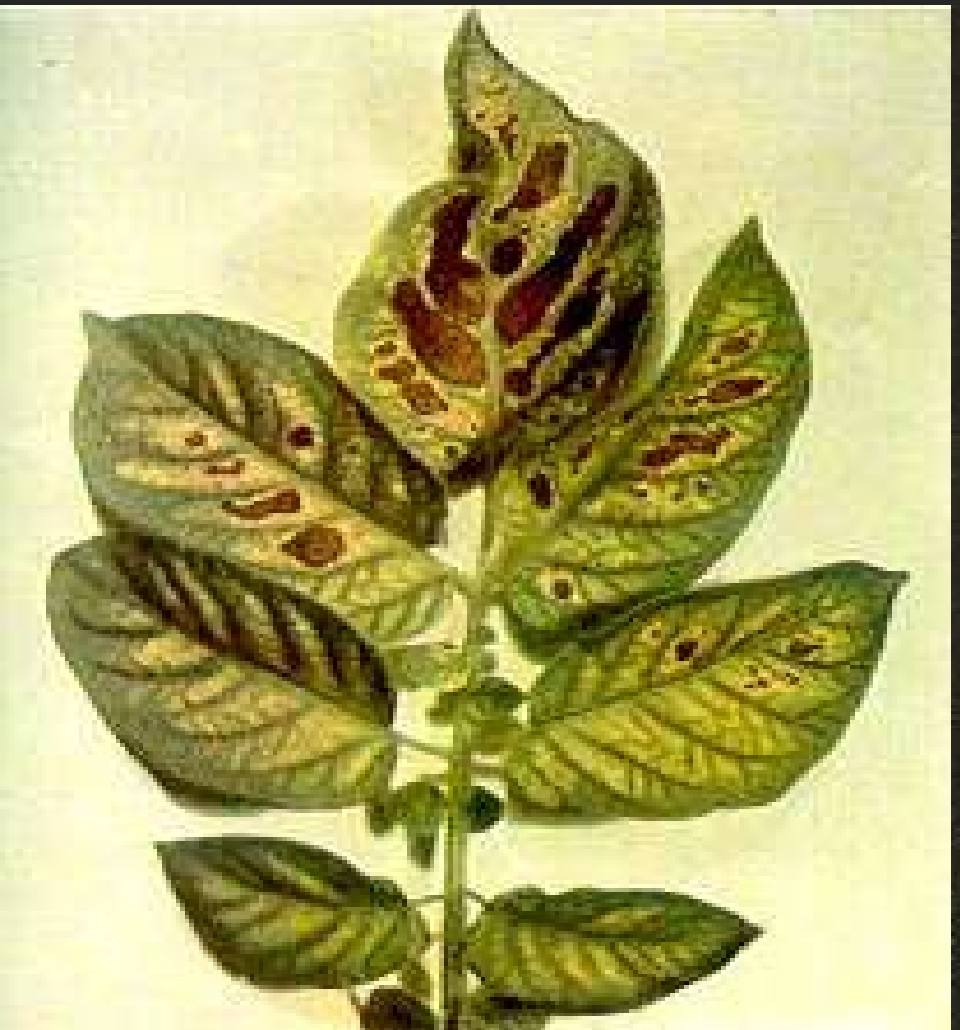


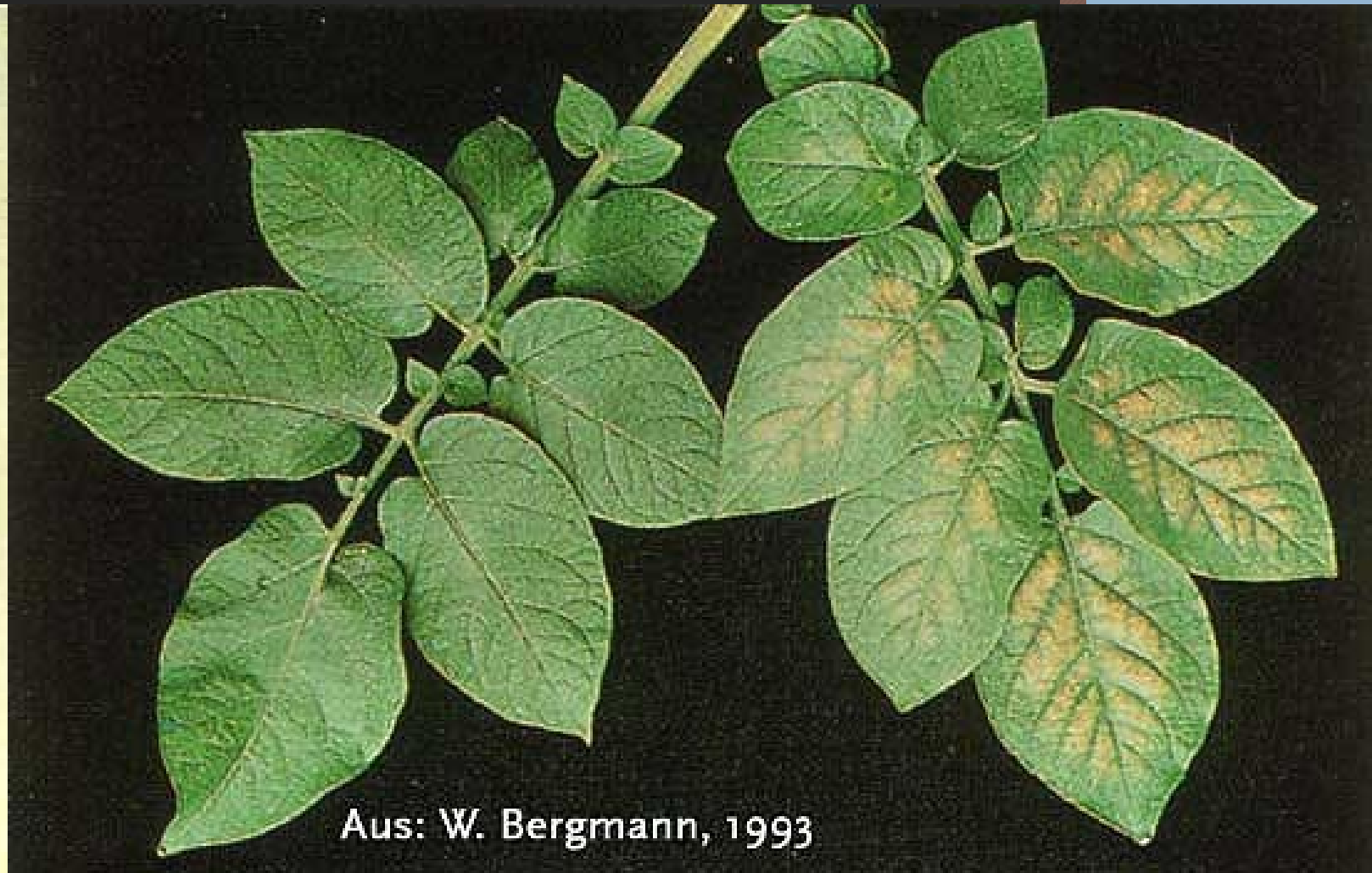
Figure 7. Soil calcium (Ca) levels spatially distributed using a regression-kriging model from data acquired through the PEI Soil Quality Monitoring Project, up to and including until end of cycle 8.

Magnesium

- Central part of the chlorophyll molecule = photosynthesis
- Involved in phosphate and nitrogen metabolism
- Protein synthesis
- Involved in water uptake
- Important during tuber bulking
- Effect starch content, specific gravity
- Needed when high amounts of N/K are applied

Magnesium





Magnesium

- Mobile in plant
- Deficiency symptoms:
  - First noticed at base of plant
  - Interveinal chlorosis
  - Accumulation of reddish pigments at leaf margins
  - Necrotic patches in leaf areas, leading to leaf scorch
  - Stunted growth

Magnesium (ppm)

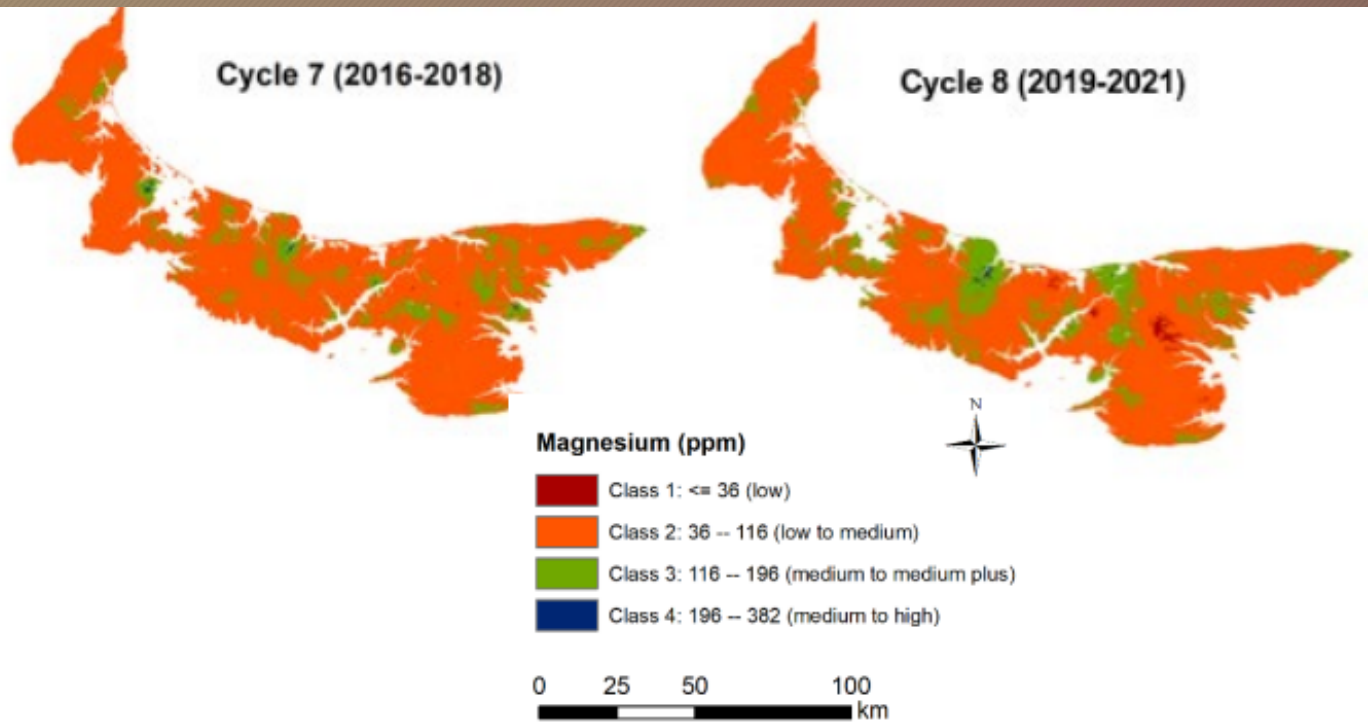


Figure 8. Soil magnesium (Mg) levels spatially distributed using a regression-kriging model from data acquired through the PEI Soil Quality Monitoring Project, up to and including until end of cycle 8 (Nyiraneza et al. 2019).

Sulfur

- Found in amino acids
- Essential for chorophyll formation
- Important for metabolism of nitrogen
- Effects yield and quality
- May cause a reduction in scab/black scurf
- Lack of sulfur may cause early maturation

Sulfur

Sulfur

- Immobile to partially mobile in plants
- Deficiency Symptoms:
  - Yellowing of young leaves and leaflets slightly roll upward
  - Symptoms appear on new growth
  - Stunted

Sulfur (ppm)

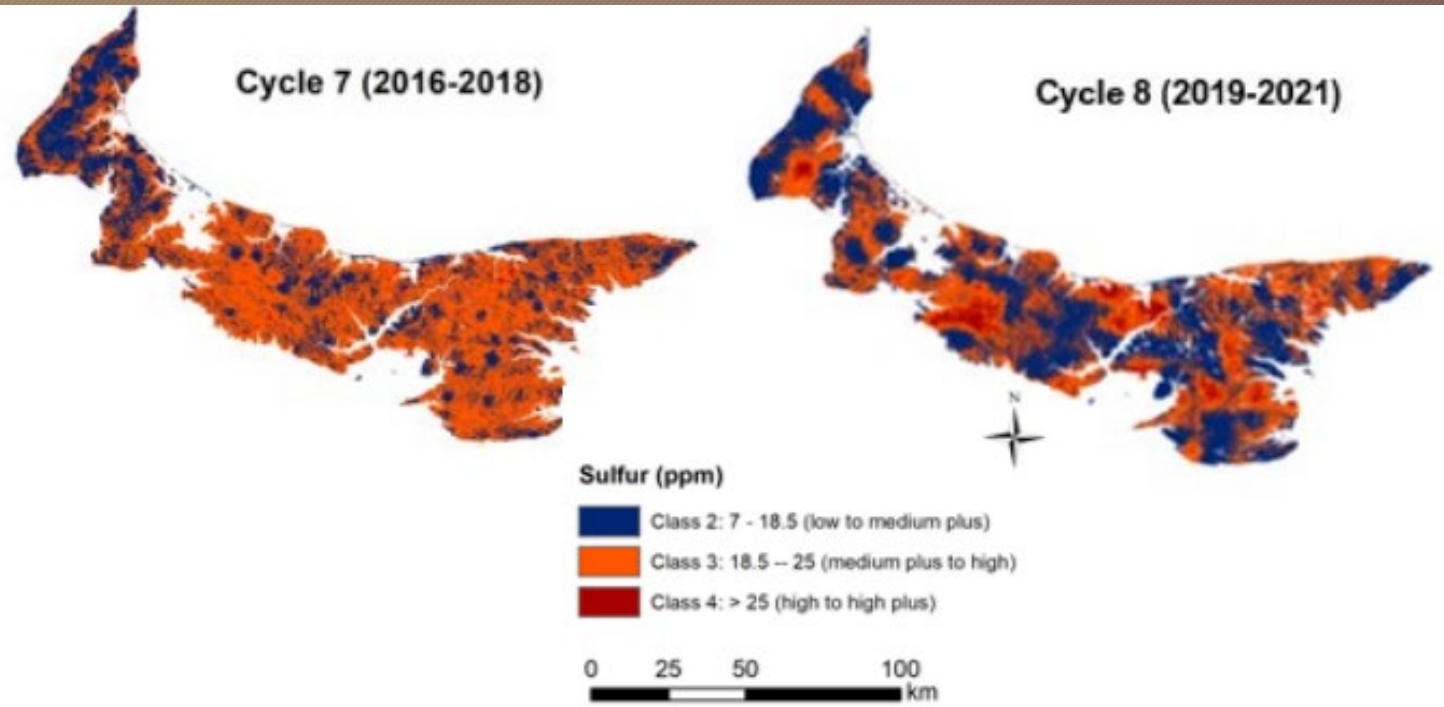


Figure 9. Soil sulfur (S) levels spatially distributed using a regression-kriging model from data acquired through the PEI Soil Quality Monitoring Project, up to and including until end of cycle 8 (Nyiraneza et al. 2019).

Essential Elements (micronutrients)

H		C		O
N		P	S	K
Ca	Mg	Fe	Mn	Zn
B	Cu	Mo	Cl	Co
Ni	Na	Se	Si	Al

Boron Copper Iron Manganese Zinc Molybdenum Chloride Cobalt Nickel

Zinc

Zinc

- Immobile in plants
- Deficiency Symptoms:
  - Young leaves become chlorotic
  - Narrow, upward cupping leaves
  - Tip burn
  - Green veins/spotting/dead tissue

Boron

Boron

- Immobile in plant
- Deficiency Symptoms:
  - Growing buds die
  - Changes in leaf texture (thickening)
  - Leaves roll upwards
  - Bushy plants

Manganese

Manganese

- Immobile in plants
- Deficiency Symptoms:
  - Black or brown spots on younger leaves
  - Yellowing leaves
  - Interveinal chlorosis or pale striping in some cases

Copper

Copper

- Immobile in plants
- Deficiency Symptoms:
  - Young leaves become flaccid and wilted
  - Terminal buds fall off at flower bud development
  - Necrotic leaf tips
  - Stunted plants

Where do you see symptoms?

- Base of the plant = MOBILE nutrient
  - N, P, K, Mg
- Top of the plant = IMMOBILE nutrient
  - Fe, Mn, B, Ca, Zn, Cu
- Whole (mid) part of the plant = PARTIALLY MOBILE nutrient
  - S, Mo

Nitrogen VS Phosphorous (Mobile)

- NITROGEN
- Uniform chlorosis, followed by necrosis on lower leaves (base)
- Stunting
- Possible red color

- Early flowering
- Leaf drop

- PHOSPHOROUS
- Uniform chlorosis, followed by necrosis on lower leaves (base)
- Severe stunting
- Possible purpling

- Deep green foliage
- Roots are longer and fewer

Magnesium VS Potassium (Mobile)

- MAGNESIUM
- Interveinal chlorosis on older leaves (base)
- Necrosis of older leaves
- Possible red spots on older leaves

- POTASSIUM
- Chlorosis at tip and margins of older leaves (base)
- Rapid necrosis of leaf margins or spotting across old leaf blades

Calcium and Boron (Immobile)

- CALCIUM
- Distortion, necrosis, chlorosis
- Incomplete flower formation
- Roots are short, densely branched & thick

- BORON
- Distortion, necrosis, chlorosis
- Incomplete flower formation
- Roots are short, densely branched & thick

- Short internodes – resetting
- Thick leaves
- Abortion and branching

Copper and Zinc (Immobile)

- COPPER
- Young and recently mature leaves affected
- Leaves roll and curl
- Variable chlorosis
- Rapid necrosis of young fully expanded leaves

- Smaller lighter colored flowers or no flowers

- ZINC
- Young and recently mature leaves affected
- Leaves roll and curl
- Variable chlorosis
- Rapid necrosis of young fully expanded leaves

What is it??

Potassium

MOBILE NUTRIENTS

Older or lower leaves affected
- NO → Effects mostly localized; chlorosis with or without spotting
- YES → Effects mostly generalized; plants dark or light green
  - NO → Chlorosis with interveinal chlorosis; leaves sometimes red or with dead spots
    - YES → **MAGNESIUM (Mg)**
    - NO → No interveinal chlorosis; chlorotic areas with a burning of leaf margins; spotting sometimes along leaf margins
      - YES → **POTASSIUM (K)**
      - NO → No interveinal chlorosis; distinct chlorotic and necrotic lesions (spotting) with abrupt boundary between dead and live tissue
        - YES → *** CHLORIDE (Cl)**
  - YES → Plants dark green, often developing purple or red color
    - YES → **PHOSPHORUS (P)**
    - NO → Plants light green with leaves light green or yellow; no necrotic spotting
      - YES → **NITROGEN (N)**
      - NO → Plants light green; necrotic spotting on leaves; pale leaves sometimes scorched, cupped or rolled
        - YES → *** MOLYBDENUM (Mo)**

*If symptoms don't meet any of the key descriptions, either go back through the key another time or refer to text for more specific symptom descriptions.

What is it?

Sulfur

IMMOBILE NUTRIENTS

Newer or younger leaves affected; symptoms localized

YES

Growing point (terminal bud) dies

NO

Growing point typically remains alive

YES

Young leaves of terminal bud become light green at bases; leaves become twisted and brittle and die back at growing point; chlorosis of young leaves

YES

BORON (B)

NO

Young leaves of terminal bud typically hooked at first, finally turning brown and dying back

YES

*** CALCIUM (Ca)**

YES

Chlorosis without interveinal chlorosis

NO

Young leaves with interveinal chlorosis

YES

Young leaves light green; typically no chlorotic spotting or striping

YES

SULFUR (S)

NO

Chlorosis of young leaves; tips appear withered and will eventually die

YES

*** COPPER (Cu)**

YES

Sharp distinction between veins and chlorotic areas

YES

IRON (Fe)

NO

No sharp distinction between veins and chlorotic areas; spotty appearance

YES

MANGANESE (Mn)

NO

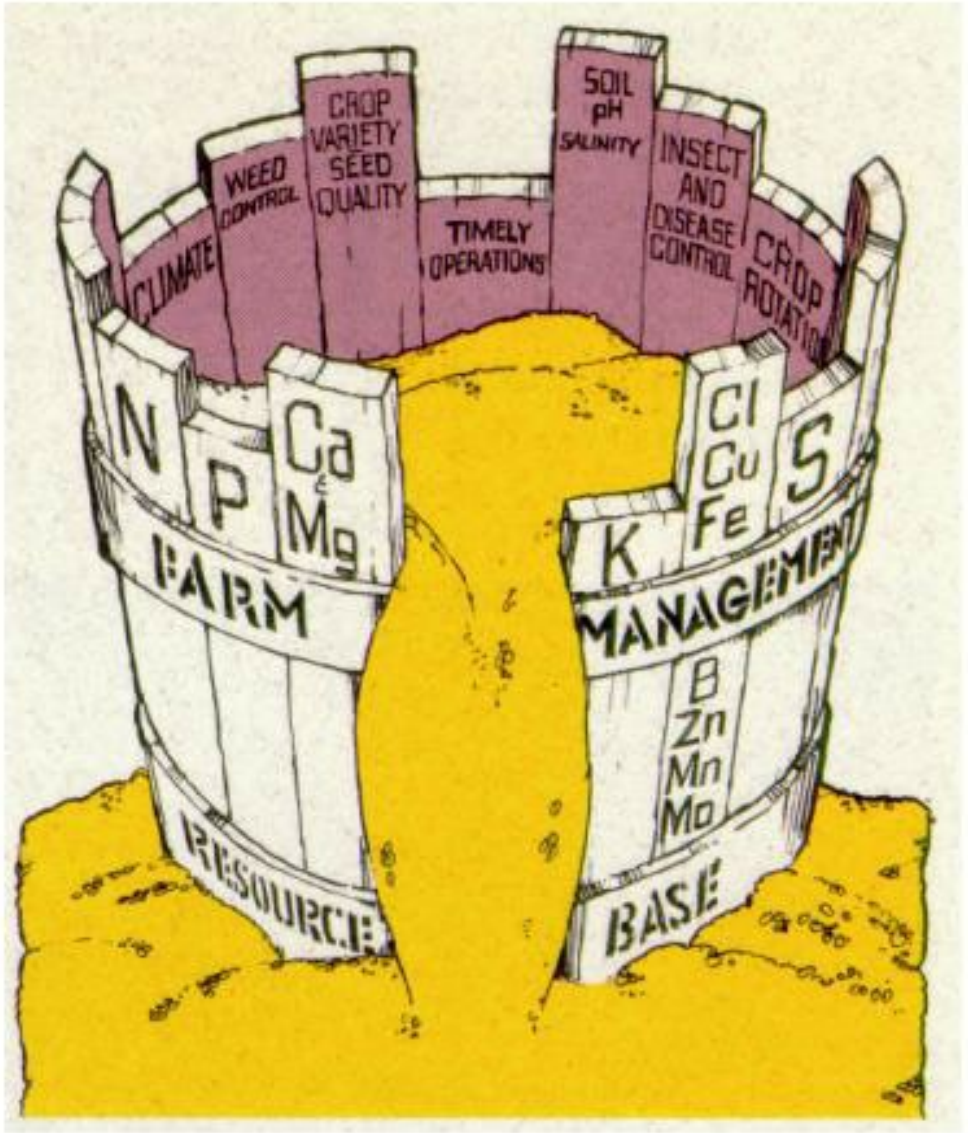
Middle leaves with interveinal chlorosis; stunted growth

YES

*** ZINC (Zn)**

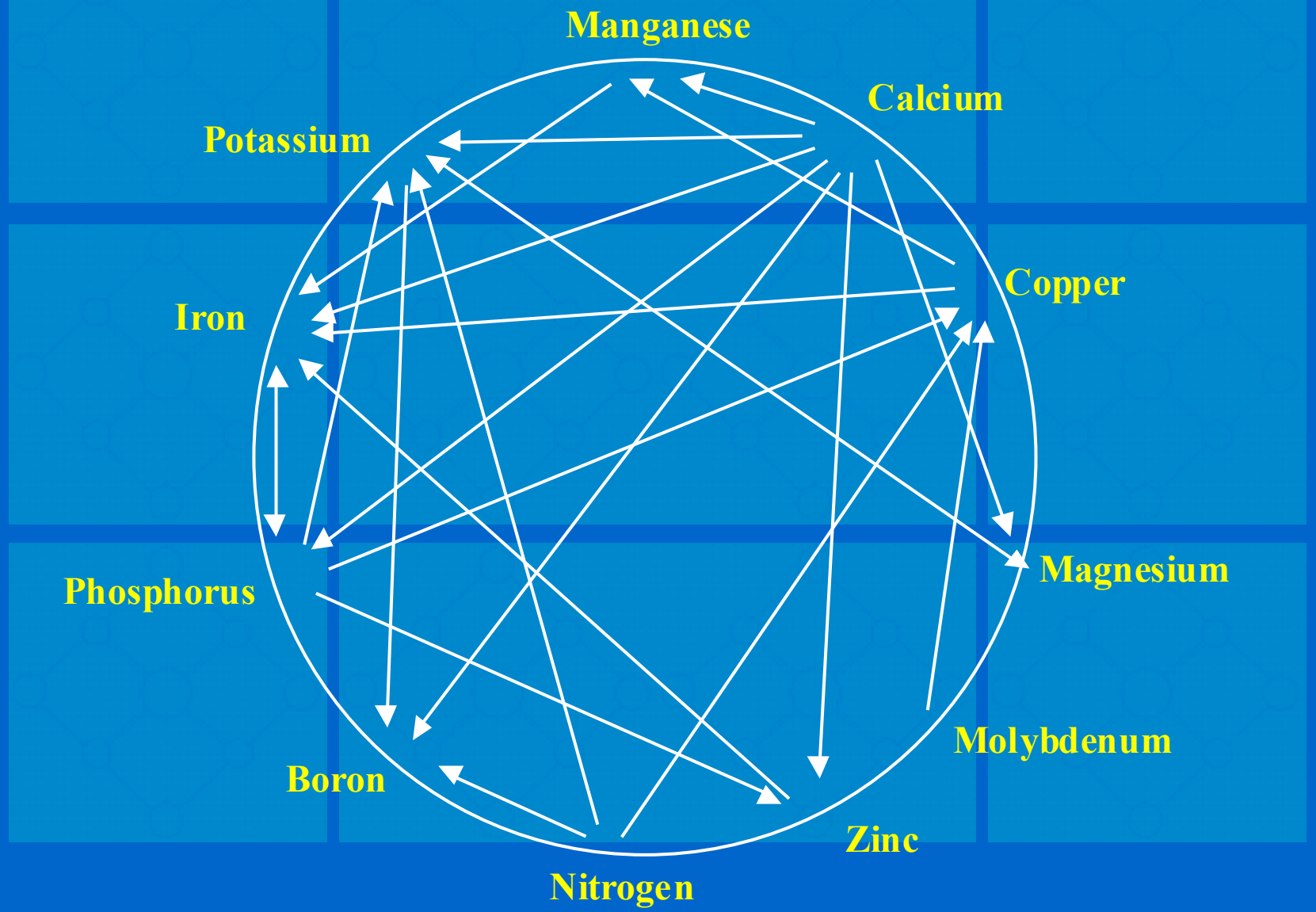
(Initial symptoms occur in middle leaves, with young and/or old leaves becoming chlorotic in later stages of deficiency)

NOTE: Since nickel (Ni) was only recently added as an essential nutrient, specific Ni deficiency symptoms are not well defined. Common symptoms include chlorosis and interveinal chlorosis in younger leaves.

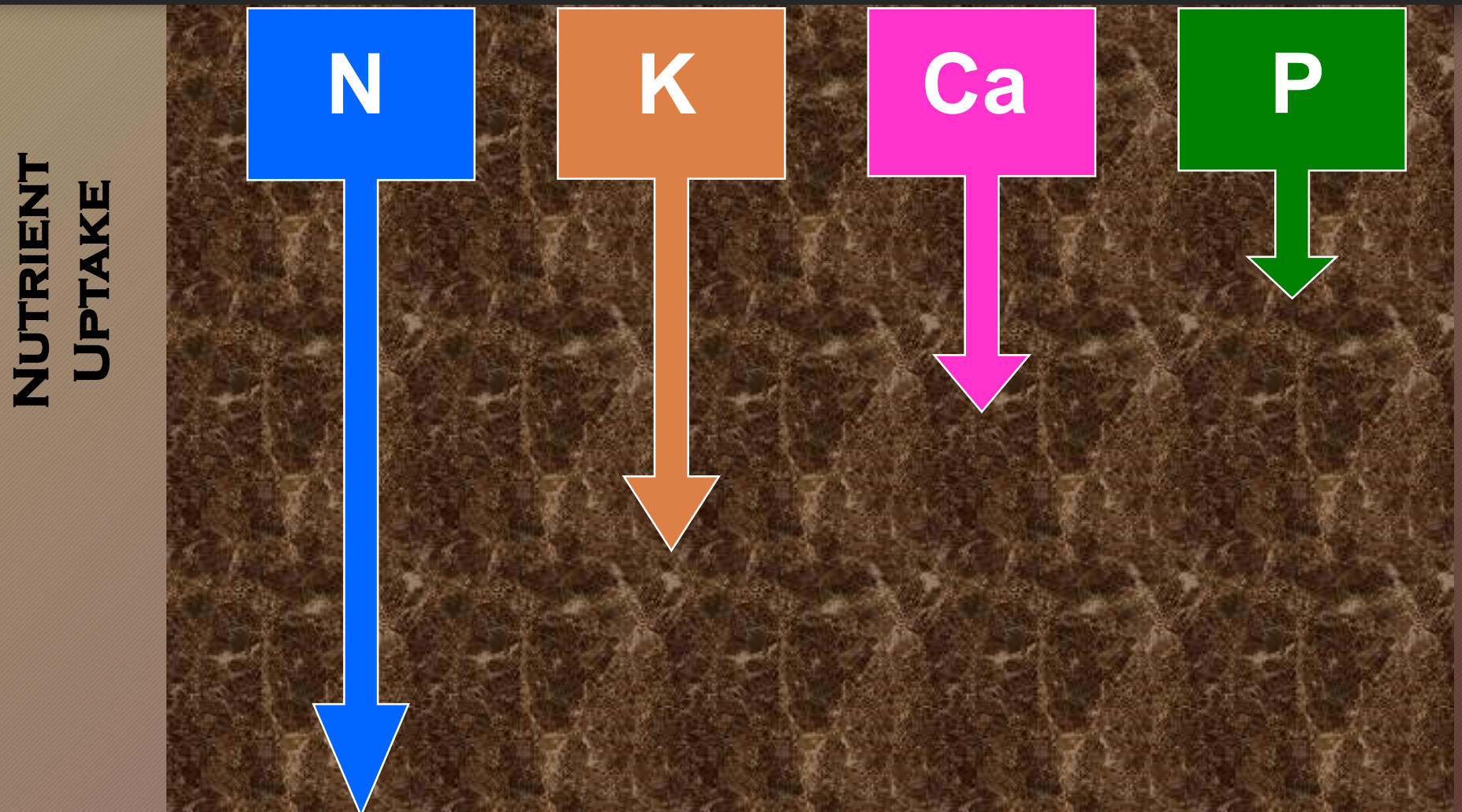


“Law of the Minimum”

MULDER'S CHART- element interactions



Consider Relative Movement Of Nutrients In The Soil



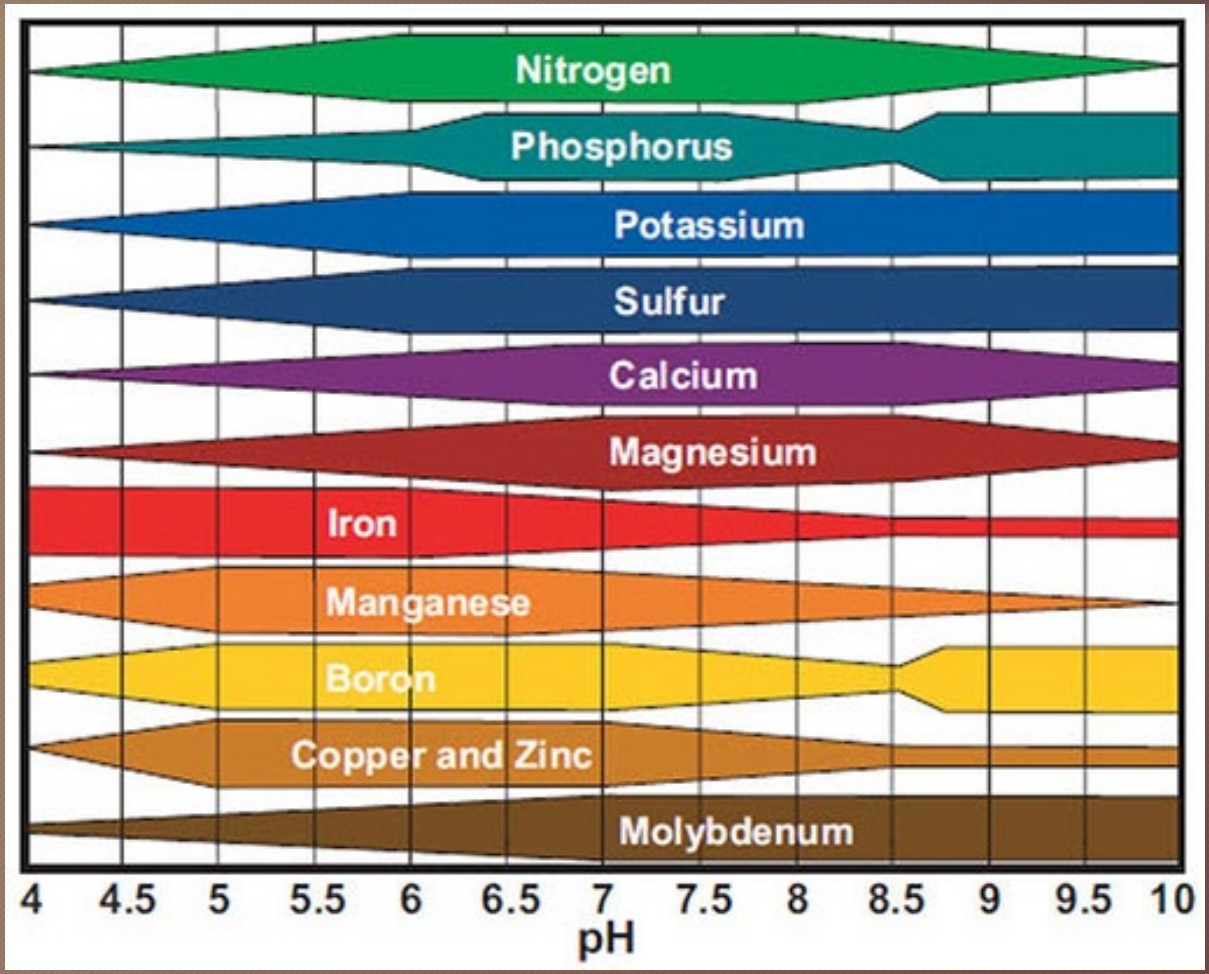
How Nutrients Reach Roots

- Mass flow with water
- Diffusion from soil to roots
- Root interception

Temperature and nutrient uptake

- Soil temperature can have an effect on nutrient uptake
  - N (rate of mineralization)
  - K
  - P

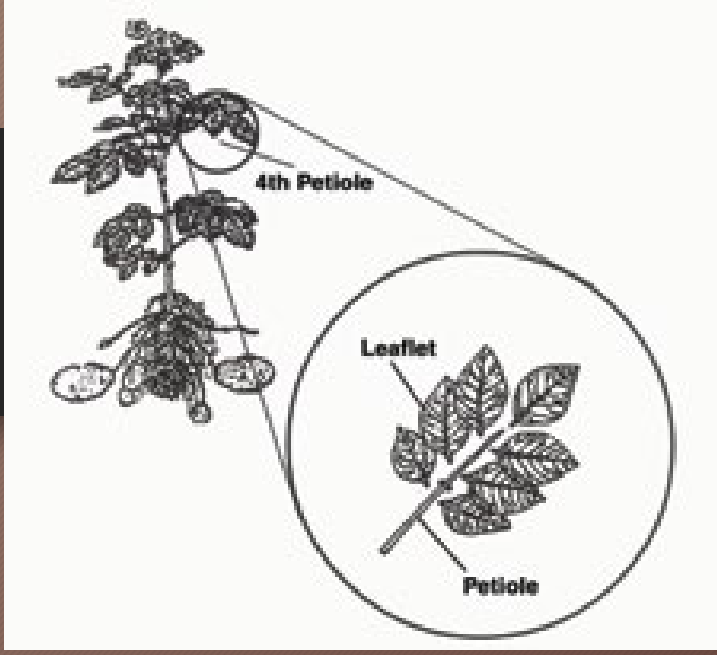
pH


Nitrogen
Phosphorus
Potassium
Sulfur
Calcium
Magnesium
Iron
Manganese
Boron
Copper and Zinc
Molybdenum
4 4.5 5 5.5 6 6.5 7 7.5 8 8.5 9 9.5 10
pH

Tissue Sampling

- Why tissue sample?
  - Information gathered is another tool used in crop management
  - Can provide a snapshot in time
  - May help to diagnose a problem
  - Nutritional disorders may be corrected throughout the growing season
  - Tissue results may help prevent similar problems in future years
  - Can monitor changes in crop nutrient status over time
- When to sample?
  - As early possible
  - As often as possible
  - Depends on what you're trying to accomplish…

Tissue Sampling



- Identify the sample area
- Note the growth stage
- Follow suggested procedure for sampling
- Take a representative sample
- Make sure you have enough petioles for a sample (~60-80 petioles)
- Petioles (and your hands) should be clean
- Place petioles in a sample bag (paper preferred over plastic)
- Keep sample cool/dry and submit to the lab ASAP
- Make sure submission paperwork is complete

Tissue Test!

Plant Tissue Report

01-Jan-20XX

PEI Analytical Laboratories
Department of Agriculture & Land
23 Innovation Way
PO Box 2000, Charlottetwon, PE, C1A 7N8
Fax: (902) 368-6299
Tel: (902) 620-3300

Client: 0000000000
Accession No: TXXXXXXXXX
Samples Received: 01-Jan-20XX
Samples Reported: 01-Jan-20XX

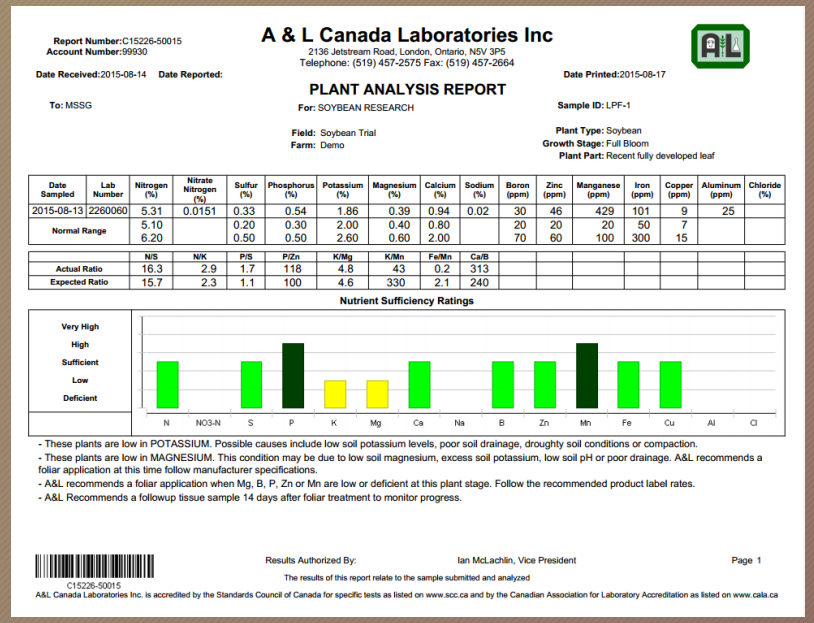
ANALYSIS PERFORMED*	**Lab #:** TXXXXXXXXX-1 **Sample ID** A **Type:** Potato	**Lab #:** TXXXXXXXXX-2 **Sample ID** B **Type:** Potato	**Lab #:** TXXXXXXXXX-3 **Sample ID** C **Type:** Potato	**Lab #:** TXXXXXXXXX-4 **Sample ID** D **Type:** Potato
Nitrate-N %	0.99	2.55	2.50	1.20
Phosphorus %	0.39	0.36	0.34	0.32
Potassium %	9.37	8.35	8.15	8.75
Calcium %	0.70	0.84	0.82	0.77
Magnesium %	0.26	0.45	0.45	0.35
Boron ppm	26.38	24.31	24.71	25.60
Copper ppm	6.15	7.43	8.10	5.81
Zinc ppm	26.16	26.75	28.16	24.77
Sulfur %	0.28	0.26	0.27	0.27
***Results reported on a dry matter basis**				

The Leaf Tissue Report result(s) relate only to the actual submitted and tested sample(s). Dates of analysis are available in Appendix A of this report. Please take a moment to complete our client satisfaction survey at **https://peial.questionpro.ca**

Copies To:	**Approved By:** JG Laboratory Supervisor	We are a member of the North American Proficiency Testing Program

Tissue Test!

Poor



Report Number:C15226-50015
Account Number:99930

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

Date Received:2015-08-14 Date Reported: Date Printed:2015-08-17

PLANT ANALYSIS REPORT

To: MSSG
For: SOYBEAN RESEARCH
Sample ID: LPF-1
Field: Soybean Trial
Farm: Demo
Plant Type: Soybean
Growth Stage: Full Bloom
Plant Part: Recent fully developed leaf

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 (%)
2015-08-13	2260060	5.31	0.0151	0.33	0.54	1.86	0.39	0.94	0.02	30	46	429	101	9	25	
Normal Range		5.10 6.20		0.20 0.50	0.30 0.50	2.00 2.60	0.40 0.60	0.80 2.00		20 70	20 60	20 100	50 300	7 15		

	N/S	N/K	P/S	P/Zn	K/Mg	K/Mn	Fe/Mn	Ca/B
Actual Ratio	16.3	2.9	1.7	118	4.8	43	0.2	313
Expected Ratio	15.7	2.3	1.1	100	4.6	330	2.1	240

Nutrient Sufficiency Ratings

- These plants are low in POTASSIUM. Possible causes include low soil potassium levels, poor soil drainage, droughty soil conditions or compaction.
- These plants are low in MAGNESIUM. This condition may be due to low soil magnesium, excess soil potassium, low soil pH or poor drainage. A&L recommends a foliar application at this time follow manufacturer specifications.
- A&L recommends a foliar application when Mg, B, P, Zn or Mn are low or deficient at this plant stage. Follow the recommended product label rates.
- A&L Recommends a followup tissue sample 14 days after foliar treatment to monitor progress.

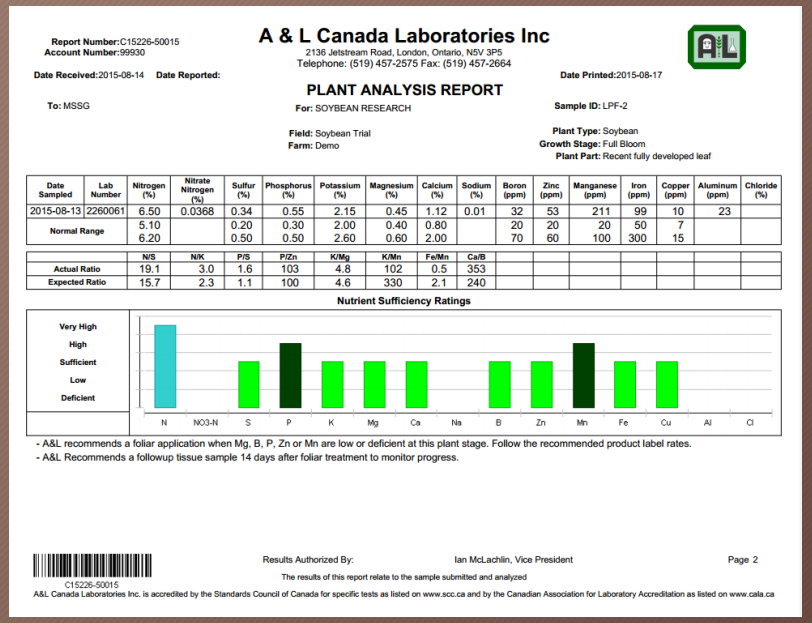
Results Authorized By: Ian McLachlin, Vice President Page 1

C15226-50015

The results of this report relate to the sample submitted and analyzed

A&L Canada Laboratories Inc. is accredited by the Standards Council of Canada for specific tests as listed on www.scc.ca and by the Canadian Association for Laboratory Accreditation as listed on www.cala.ca

Good



Report Number:C15226-50015
Account Number:99930

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

Date Received:2015-08-14 Date Reported: Date Printed:2015-08-17

PLANT ANALYSIS REPORT

To: MSSG
For: SOYBEAN RESEARCH
Sample ID: LPF-2
Field: Soybean Trial
Farm: Demo
Plant Type: Soybean
Growth Stage: Full Bloom
Plant Part: Recent fully developed leaf

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 (%)
2015-08-13	2260061	6.50	0.0368	0.34	0.55	2.15	0.45	1.12	0.01	32	53	211	99	10	23	
Normal Range		5.10 6.20		0.20 0.50	0.30 0.50	2.00 2.60	0.40 0.60	0.80 2.00		20 70	20 60	20 100	50 300	7 15		

	N/S	N/K	P/S	P/Zn	K/Mg	K/Mn	Fe/Mn	Ca/B
Actual Ratio	19.1	3.0	1.6	103	4.8	102	0.5	353
Expected Ratio	15.7	2.3	1.1	100	4.6	330	2.1	240

Nutrient Sufficiency Ratings

- A&L recommends a foliar application when Mg, B, P, Zn or Mn are low or deficient at this plant stage. Follow the recommended product label rates.
- A&L Recommends a followup tissue sample 14 days after foliar treatment to monitor progress.

Results Authorized By: Ian McLachlin, Vice President Page 2

C15226-50015

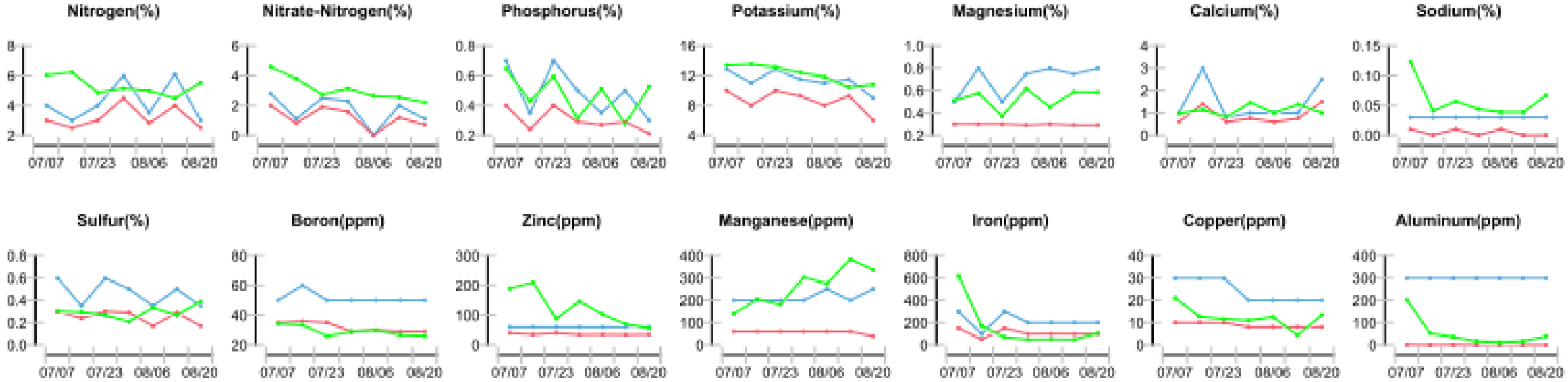
The results of this report relate to the sample submitted and analyzed

A&L Canada Laboratories Inc. is accredited by the Standards Council of Canada for specific tests as listed on www.scc.ca and by the Canadian Association for Laboratory Accreditation as listed on www.cala.ca

Plant Monitoring Program

PMID: 0532

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 (%)
2014-07-07	1900159	6.05	4.6007	0.30	0.65	13.41	0.51	0.98	0.12	34	190	140	622	21	202	
2014-07-16	1980096	6.25	3.8110	0.29	0.43	13.55	0.58	1.14	0.04	33	210	206	170	13	52	
2014-07-23	2050201	4.86	2.7364	0.27	0.60	13.16	0.37	0.82	0.06	26	88	181	69	12	35	
2014-07-30	2120025	5.16	3.1415	0.21	0.31	12.46	0.62	1.46	0.04	29	146	304	47	11	16	



Nutrianalytics

Our data analysts are farmers too.

Our team continues to innovate in the field and combine agronomy with data science to provide the best answers for farmers.

We built the technology.

We combine farming knowledge with technology to interpret the data using a method that is proven to improve crop quality and yield.

Ai

Artificial Intelligence Engineered By NutriAg Agronomists and Scientists.

NUTRIANALYTICS

NUTRIAG Innovators in the field

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We predict marketable yield potential by identifying and quantifying nutrient imbalances and providing actionable, crop and region specific, nutrient recommendations.

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What we do:

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- Provide unique crop specific foliar recommendations
- Maximize nutrient use efficiency
- Improve your ROI on inputs
- Keep it simple by leveraging traditional tissue sampling methods
- Help you grow the healthiest crops possible
- Easy to use dashboard of all your information

Visualize your data with your personal dashboard.

Access your crop profile anywhere. You can easily review nutrient reports, compare current data with historical critical values and receive your custom recommendations.

NUTRIANALYTICS

NUTRIAG Innovators in the field

Soil Test!

- There are a number of different tests you can choose based on what you are trying to diagnose
  - Nutrient deficiency – S3 (Complete) Analysis
  - Soil Health – Soil Health Test

S3 Soil Analysis

Soil Analysis Report

06-May-2024

PEI Analytical Laboratories
Department of Agriculture
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Client:
Accession No:
Samples Reported:
Samples Received:

Sample Information		Soil Test Values and Ratings								
Lab Sample #	Field Number	Organic Matter (%)*	pH*	Phosphate P_2O_5 (ppm)*	Potassium K_2O (ppm)*	Calcium Ca (ppm)*	Magnesium Mg (ppm)*	Boron B (ppm)*	Copper Cu (ppm)*	Salt (mS/cm)
1	Kenny J	3.1	6.1	275 H	38 L	684 L	77 M	0.4 L	1.8 M+	
2	Ark	2.9	6.8	207 M	48 L	844 L	138 M+	0.4 L	1.2 M	
3	Mark G	2.3	7.2	429 H+	186 H	1366 M	84 M	0.6 M	1.8 M+	
4	Dads	2.9	6.7	304 H	50 L	957 M	116 M	0.4 L	3.3 H+	
5	Valley	2.7	7.1	360 H+	183 H	1059 M	103 M	0.5 M	3.6 H+	

Lab Sample #	Field Number	Zinc Zn (ppm)*	Sulfur S (ppm)*	Manganese Mn (ppm)*	Iron Fe (ppm)*	Sodium Na (ppm)*	Aluminum Al (ppm)*	Lime Index*	Nitrogen N (%)	Nitrate-N NO_3-N (ppm)
1	Kenny J	0.8 L-	16M+	45 H	223 H+	26	1436	6.6		
2	Ark	0.9 L-	14M+	42 H	181 H+	34	1389	6.9		
3	Mark G	1.4 L	12M	91 H+	310 H+	34	1032	7.2		
4	Dads	1.1 L	14M+	56 H+	231 H+	21	1280	6.9		
5	Valley	1.2 L	13M+	58 H+	218 H+	21	1270	7.1		

L-: Low L: Low M: Medium M+: Above Medium H: High H+: Very High

To convert HECTARES into ACRES multiply by 2.47				To convert T/HECTARE into T/ACRE mulitply by 0.45			To convert kg/Ha to lbs/acre multiply by 0.9		
Sample Information				Limestone application (T/Ha) to achieve			Recommended Applications (kg/Ha)		
Lab Sample #	Field Number	Field Size (Ha)	Crop to be Grown	pH 5.5	pH 6.0	pH 6.5	Nitrogen N	Phosphate P_2O_5	Potash K_2O
1	Kenny J		Corn			3	120		150
2	Ark		Corn				120	45	150
3	Mark G		Corn				120		50
4	Dads		Corn				120		150
5	Valley		Corn				120		50

Lab Sample #	Field Number	% P/Al	Ratio Ca/Mg	Man	Sod	CEC (Meq/100g)	Base Saturation % K	% Mg	% Ca	% H	% Na	Total % Base Saturation
1	Kenny J	8.36	9:1	0	0	9	0.9	7.1	37.8	53.3	1.2	45.8
2	Ark	6.51	6:1	0	0	7	1.5	17.1	62.6	16.6	2.2	81.2
3	Mark G	18.15	16:1	0	0	8	4.7	8.3	80.6	4.7	1.7	93.6
4	Dads	10.37	8:1	0	0	7	1.5	13.3	65.9	18.0	1.3	80.7
5	Valley	12.38	10:1	0	0	7	5.4	11.8	72.5	9.0	1.3	89.7

The Soil Analysis Report result(s) relate only to the actual submitted and tested sample(s). Dates of analysis are available in Appendix A of this report. Please take a moment to complete our client satisfaction survey at https://peial.questionpro.ca

Comments: All fertilizer recommendations are based on a pH of 6.0.
To convert P2O5 to P, divide by 2.29. To convert K2O to K, divide by 1.2.

Methods: SFL_22M - pH*
SFL_23M - Organic Matter*

Soil Health Analysis

Tillage Depth:	Cropping System:	Amendments Applied (manure, etc):
Yield:		☐ Yes ☐ No

Soil Texture:

Sand (%)	57.4
Silt (%)	3.9
Clay (%)	8.7

Soil Texture Class: Sandy Loam

Test	Results	Score (out of 100)	Rating
Organic Matter	3.1 %	64	M
Active Carbon	515 µg/g	50	L+
Soil Respiration	0.82 mg/g	85	H
Aggregate Stability	47.2 %	52	M
Biological Nitrogen Availability	30.2 mg/kg	66	M
Available Water Capacity	13.4 %	50	L+
pH	6.1		
Phosphorous Index (P/Al)	13.44 %		
C:N Ratio	10.00		
Total Carbon	1.80 %		
Total Nitrogen	0.18 %		

http://www.princeedwardisland.ca/labservices

Dates of analysis available upon request.
Organic Matter is calculated from Total Carbon.

ND** - CN ratio could not be accurately calculated due to Total Nitrogen or Total Carbon being below detection limit

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Questions?

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