

Mining Labserve's data for your benefit

Presented by Larne Auerswald

Researched and compiled by Michael Bufé and Tariena Nel

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Layout

- Introduction
- Soils
- Leaves
- Compost
- Water
- MRLs

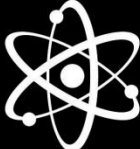


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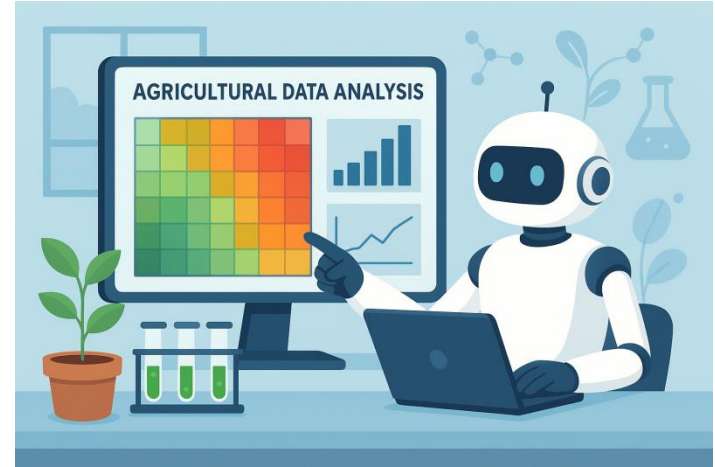
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Introduction

- New Laboratory Integrated Management System Software (LIMS) since mid-2023
- Over 2 years of data analysed
- Previous technical day in Nelspruit–manually analysed patterns
- Chat-GPT used to assist in pattern identification
- Right prompts needed + some learning



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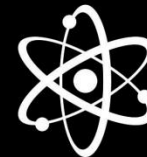
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Introduction

- “Correlation does not imply causation; however, sometimes people commit the opposite fallacy of dismissing correlation entirely. Correlational evidence from several different angles may be useful for prediction despite failing to provide evidence for causation.”



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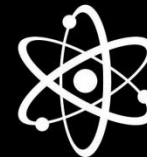
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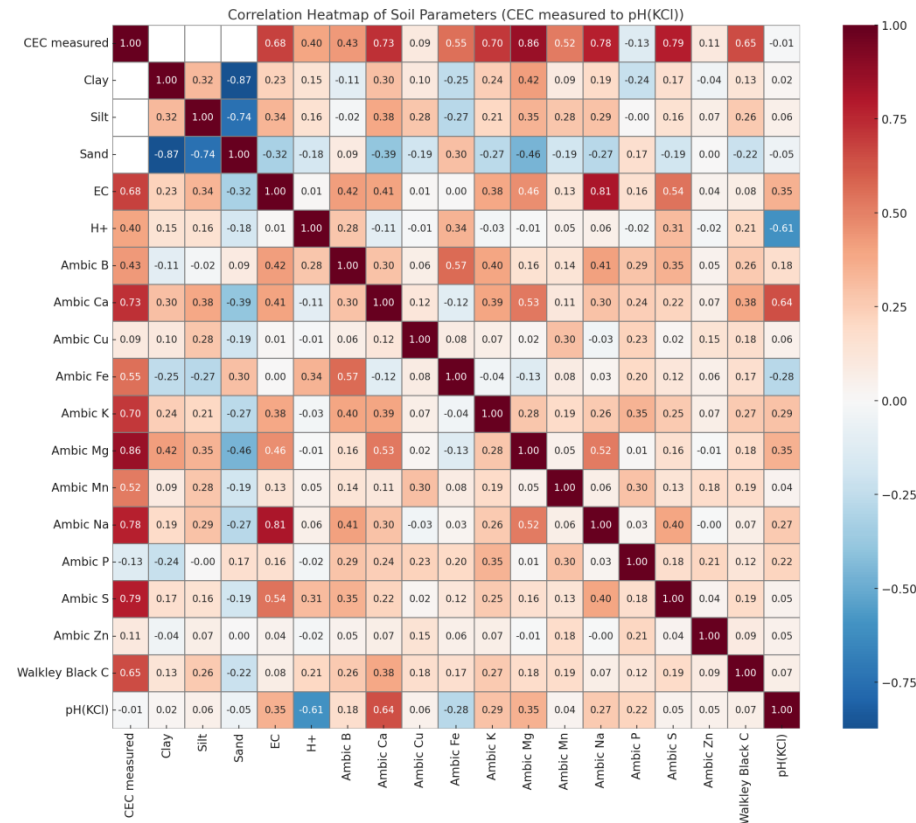


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Soils

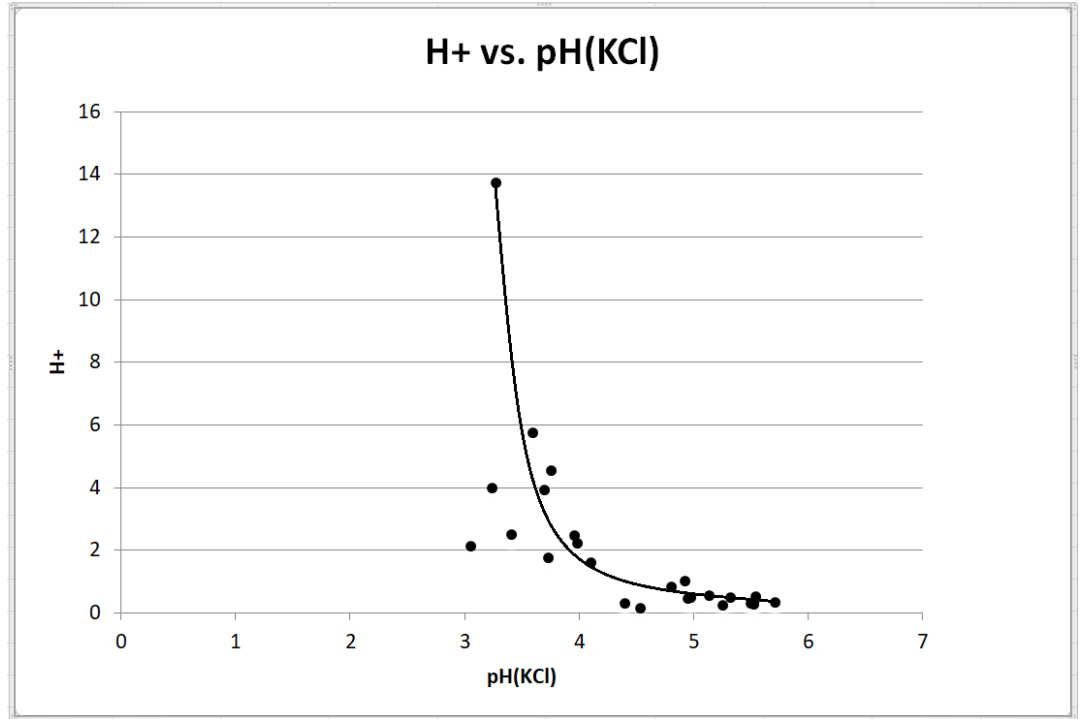
- Over 17 000 samples
- Pearson correlation coefficient (r or ρ)

$$\rho_{X,Y} = \frac{\text{cov}(X, Y)}{\sigma_X \sigma_Y}$$



Soils

- Titratable acidity H^+ and pH (KCl)
- $r = -0.61$.
- $pH = -\log[H_3O^+]$



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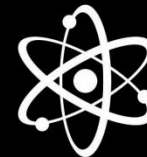
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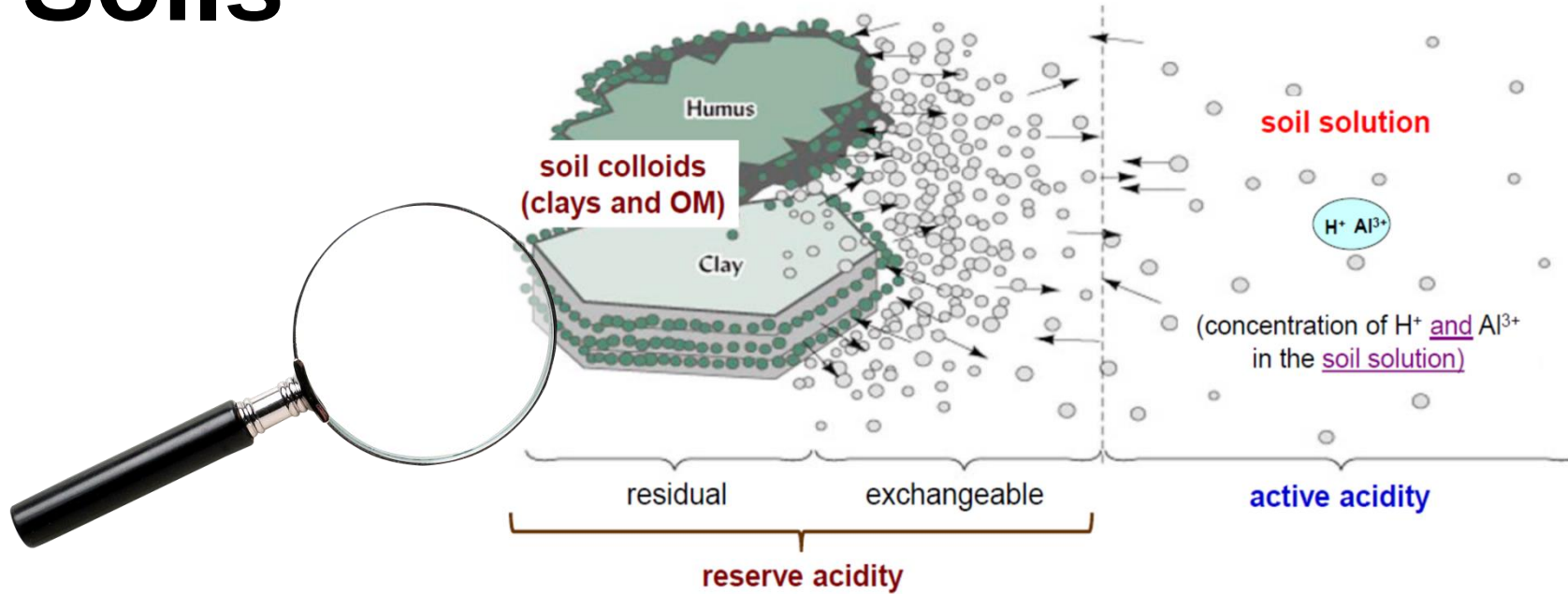
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Soils

$$\text{total acidity} = (\text{residual} + \text{exchangeable}) + \text{active}$$



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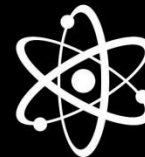
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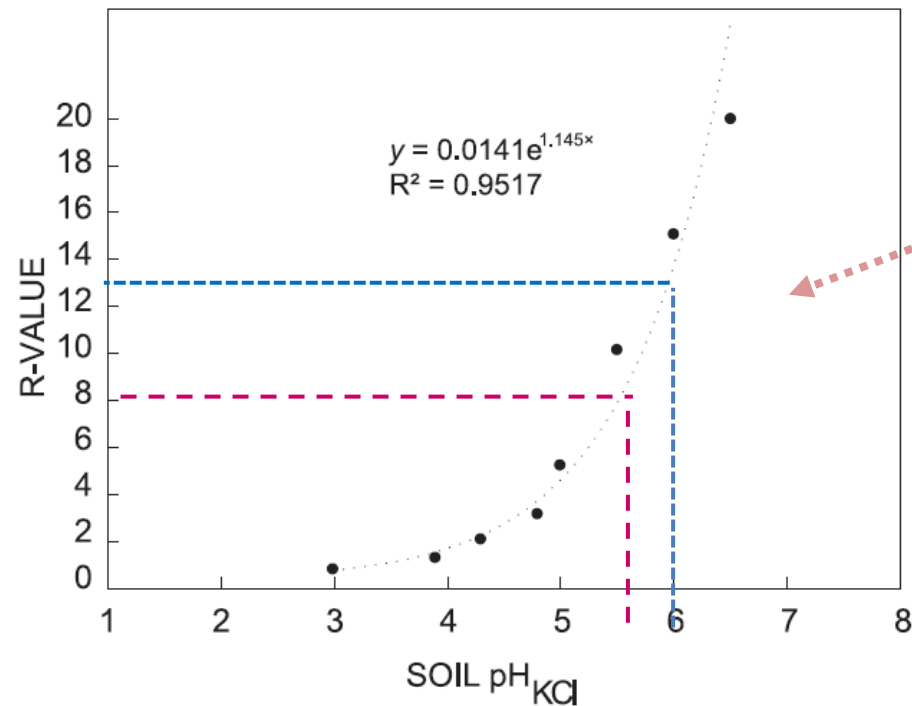
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$$R = Ca + Mg / H$$



$$H = Ca + Mg / R$$

Eksteen L. 1969. The determination of the lime requirements of soils for various crops in the winter rainfall region. Fertilizer Society of South Africa Journal 2: 13–14.

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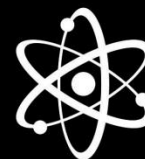
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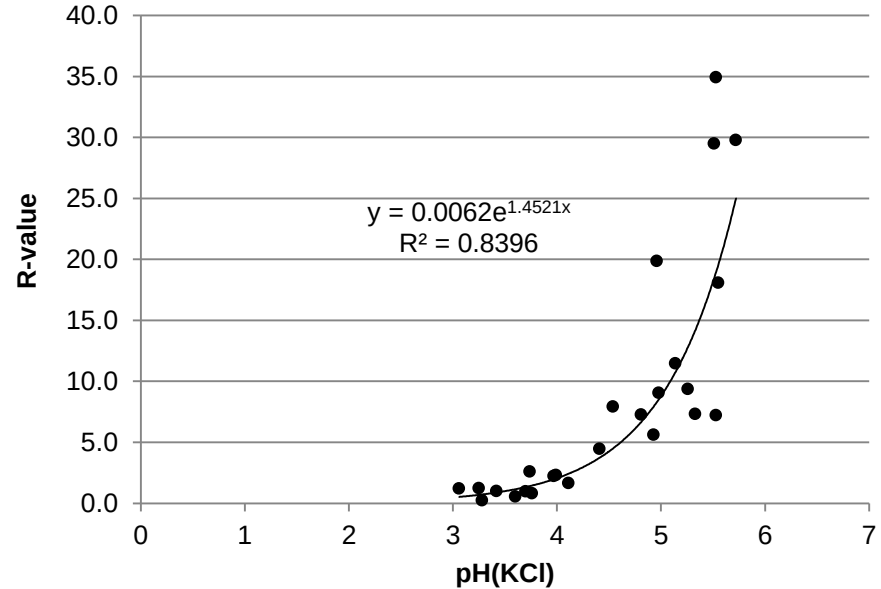
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pH(KCl)	H+	Ca (cmol+/kg)	Mg (cmol+/kg)	Expected R	Actual R	% difference
5.53	0.3	8.87	1.61	19.3	34.9	58%
4.93	0.98	4.31	1.21	8.1	5.6	-36%
4.98	0.46	3.05	1.13	8.7	9.1	4%
5.51	0.28	6.81	1.45	18.7	29.5	45%
3.97	2.44	2.98	2.50	2.0	2.2	11%
3.25	3.94	1.96	2.90	0.7	1.2	55%
5.14	0.52	5.14	0.83	11.0	11.5	5%
4.11	1.56	2.06	0.54	2.5	1.7	-38%
3.6	5.72	1.90	1.22	1.2	0.5	-73%
3.76	4.5	1.81	1.83	1.5	0.8	-59%
3.28	13.7	1.51	1.82	0.7	0.2	-101%
4.96	0.42	6.81	1.53	8.4	19.9	81%
3.99	2.18	2.91	2.13	2.1	2.3	11%
3.7	3.9	1.48	2.31	1.4	1.0	-33%
5.72	0.3	7.94	1.00	25.4	29.8	16%
3.74	1.72	3.44	1.05	1.4	2.6	58%
3.06	2.1	2.11	0.42	0.5	1.2	77%
3.42	2.48	1.97	0.49	0.9	1.0	10%
5.55	0.5	7.63	1.42	19.9	18.1	-9%
5.33	0.46	2.75	0.62	14.4	7.3	-65%
4.81	0.78	4.01	1.66	6.8	7.3	7%
5.26	0.2	1.64	0.23	13.0	9.4	-33%
5.53	0.24	1.51	0.23	19.3	7.2	-91%
4.54	0.12	0.86	0.09	4.6	7.9	54%
4.41	0.26	1.07	0.09	3.8	4.5	16%

R- value vs. pH(KCl)



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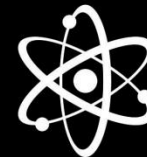
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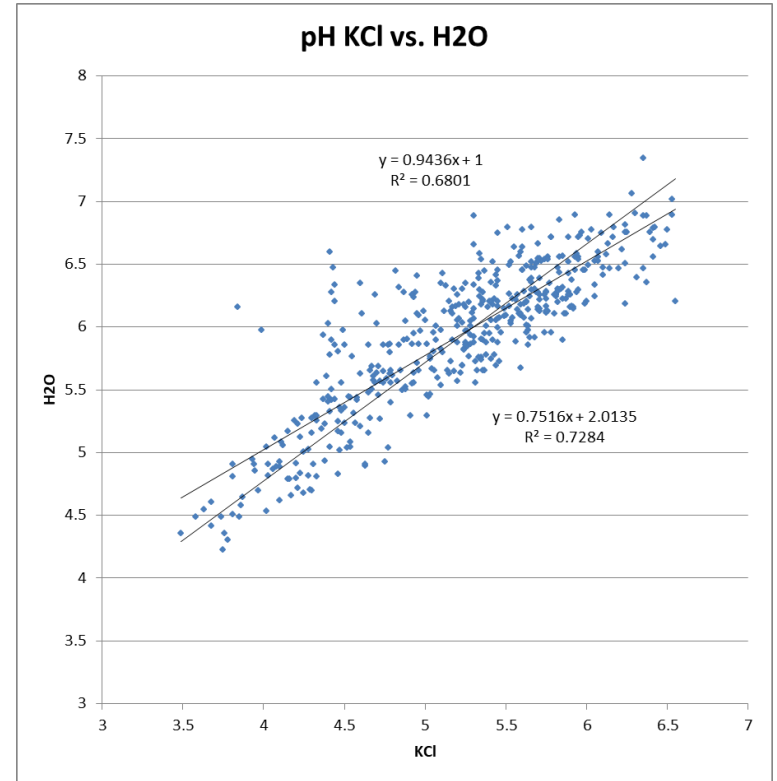
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Soils

- Mpumalanga and Limpopo
- pH (H₂O) vs. (KCl)
- Average difference (468 samples) is 0.72



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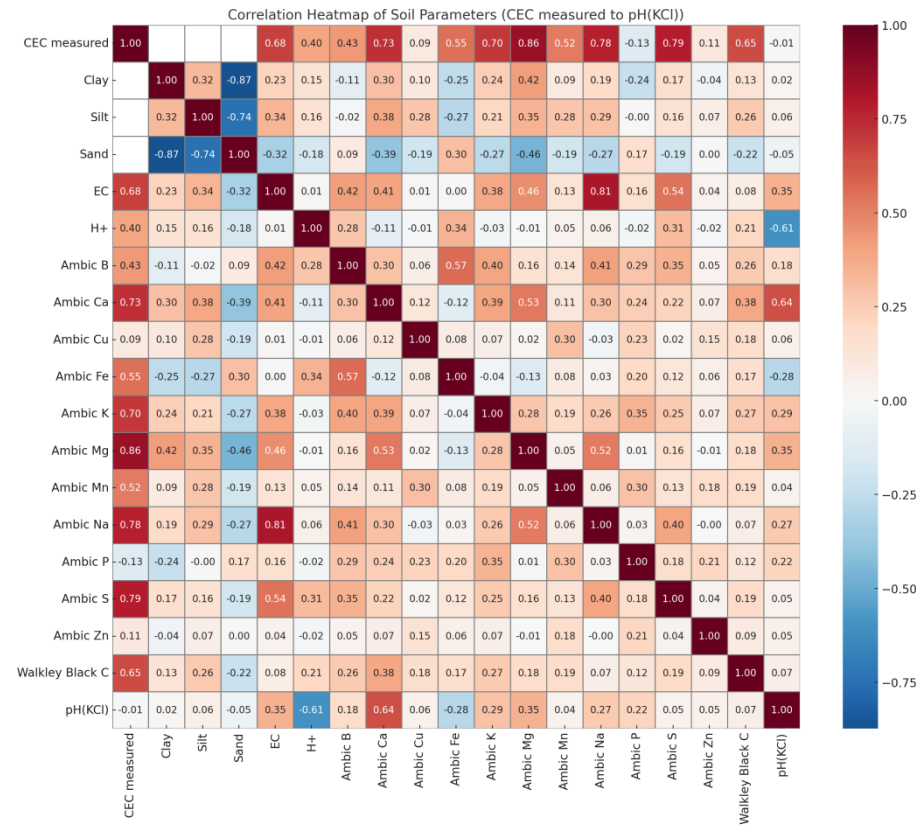
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Soils

- pH (KCl) vs. [base cations]
- $r(\text{Ca}) = 0.64$, $r(\text{Mg}) = 0.35$, $r(\text{K}) = 0.29$, $r(\text{Na}) = 0.29$



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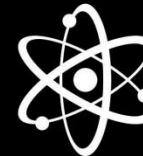
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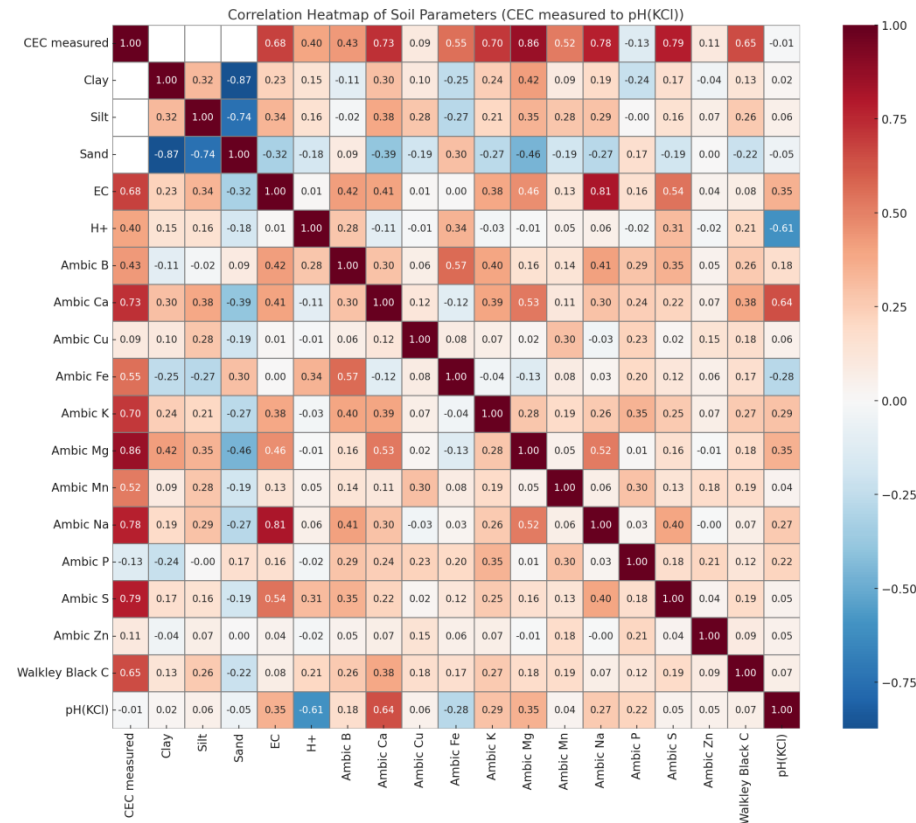
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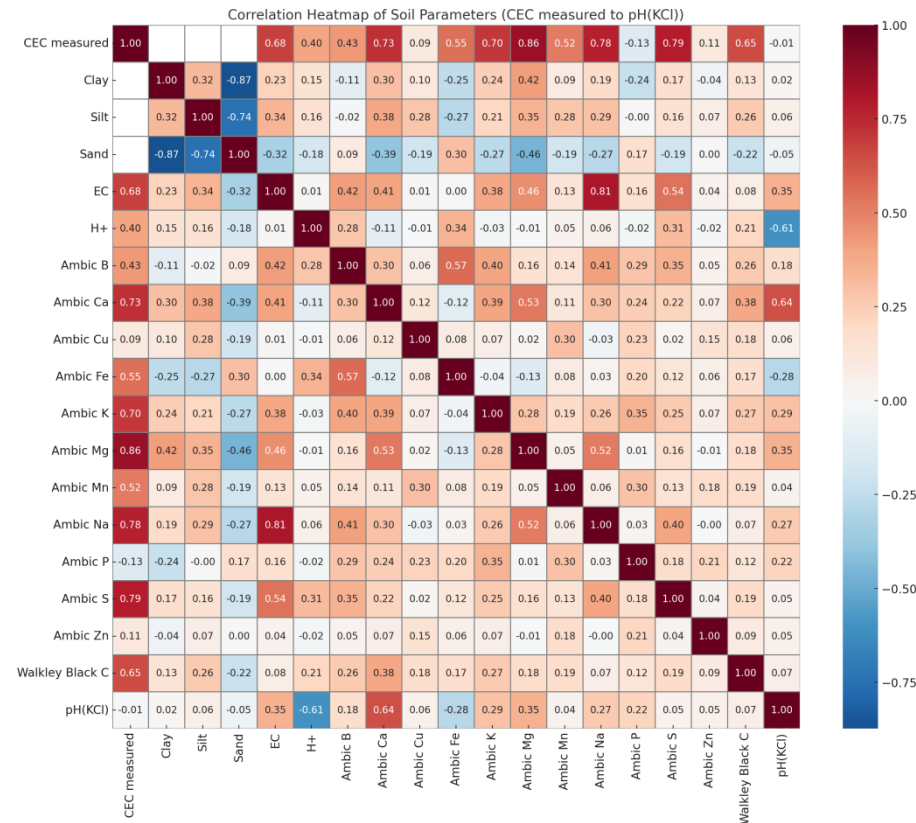
Soils

- EC vs. [Na, K, Ca, Mg, S]
- $r = 0.81, 0.38, 0.41, 0.46, 0.54$ respectively



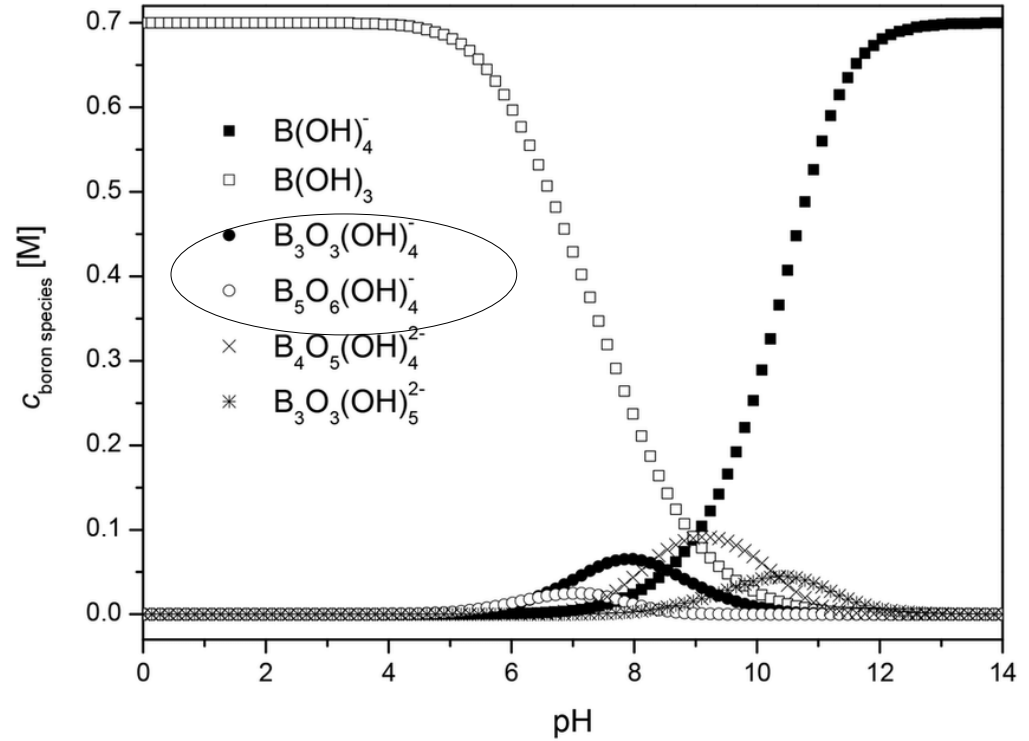
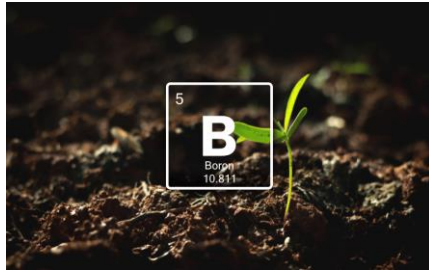
Soils

- **Measured CEC vs.**
 - Walkley Black C% $r = 0.65$
 - [Base cation], $r(\text{Ca}) = 0.73$, $(\text{Mg}) = 0.86$, $(\text{K}) = 0.7$, $(\text{Na}) = 0.78$
 - T-val, $r = 0.85$ (with H+ +/- 100 samples)
 - S-val, $r = 0.82$ (H+ removed, same samples)
 - EC, $r = 0.68$



Soils

- [B] vs. [Fe]
- $r = 0.57$
- +Fe = +AEC?



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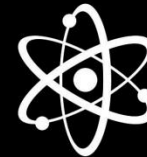
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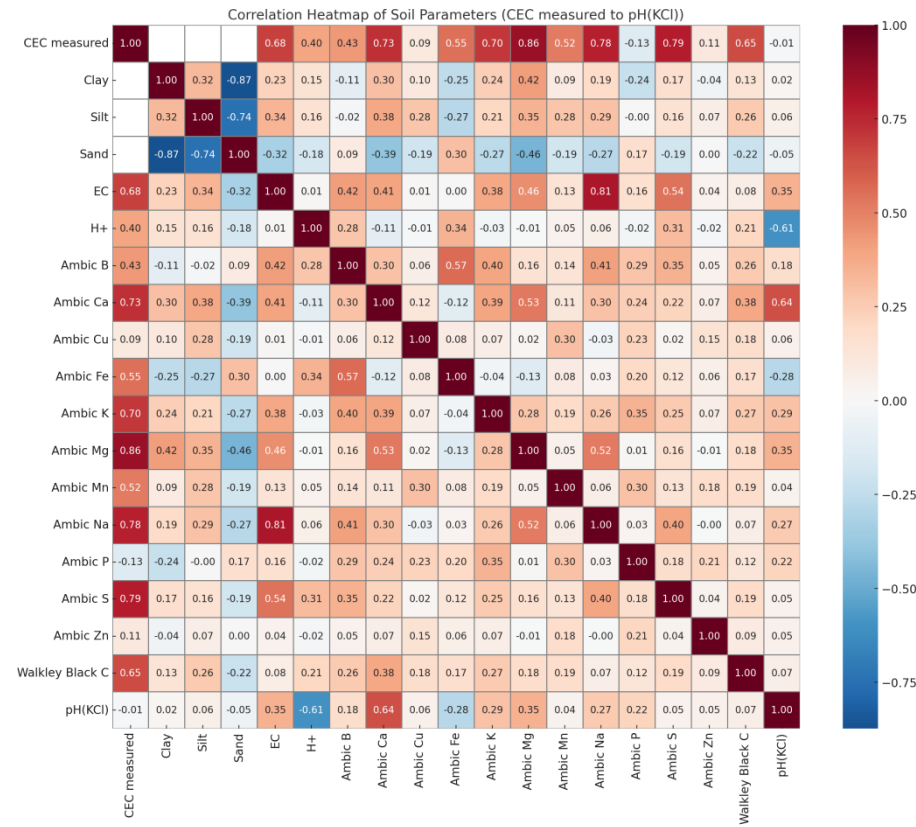
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Soils

- Sand% vs. [base cations]
- $r(\text{Ca}) = -0.39$, $r(\text{Mg}) = -0.46$,
 $r(\text{Na}) = -0.27$ $r(\text{K}) = -0.27$



Leaves

- Citrus
- Grapes – Leaf Blade Veraison
- No yield data – Can't correlate



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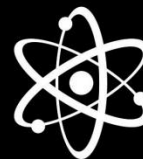
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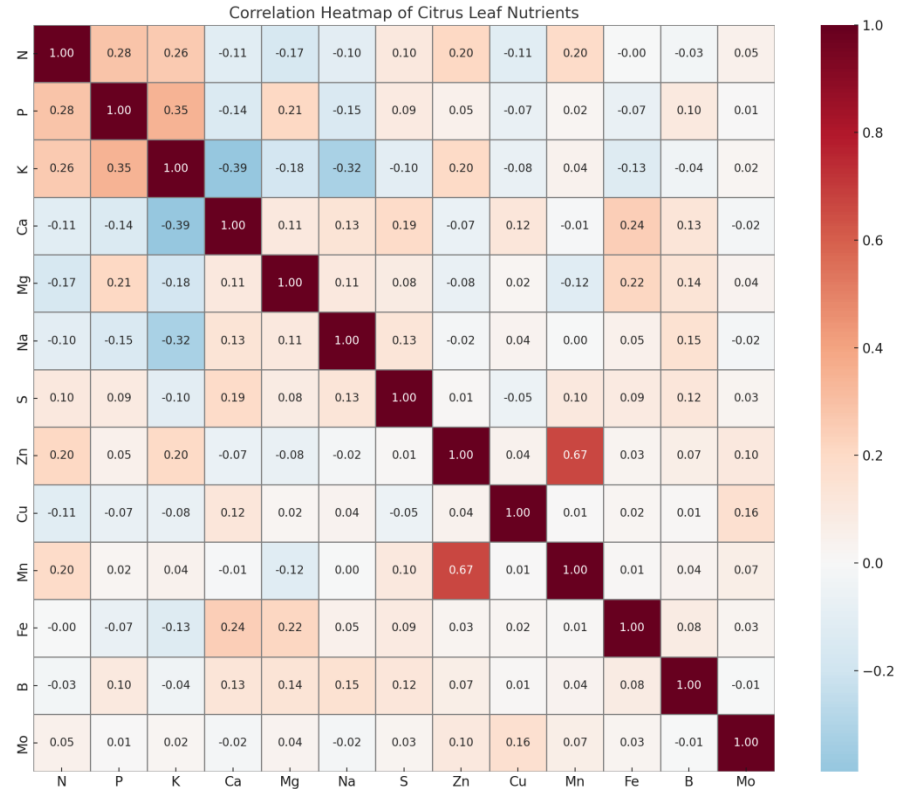
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Citrus

- Over 1000 samples
- Mn and Zn = Mancozeb?



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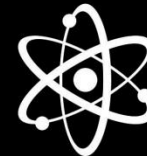
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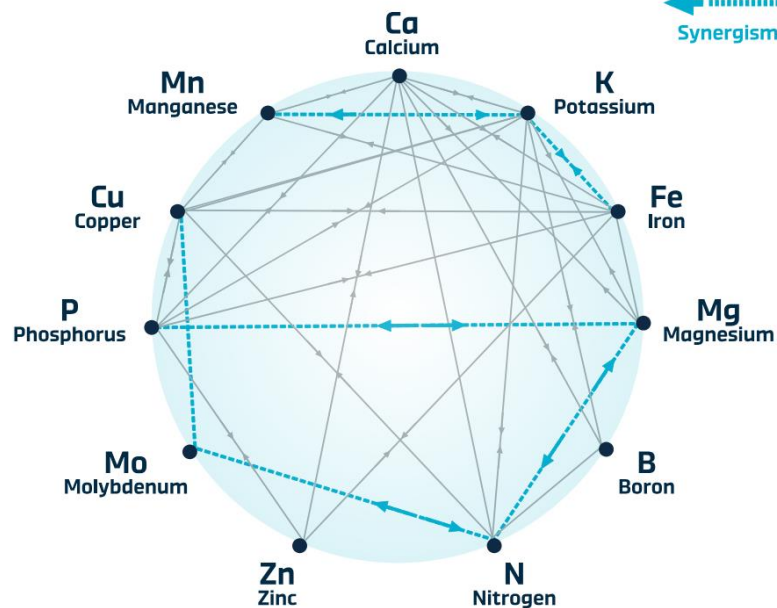
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Mulder's Chart



Correlation Heatmap of Citrus Leaf Nutrients



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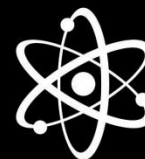
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Citrus

	N %	P %	K %	Ca %	Mg %	Na %	S %	Zn ppm	Cu ppm	Mn ppm	Fe ppm	B ppm	Mo ppm
2024	2.22	0.11	1.07	2.92	0.34	0.11	0.28	54.02	14.99	53.89	154.13	76.24	0.55
2025	2.65	0.12	1.33	2.70	0.34	0.05	0.24	69.45	10.57	58.59	153.00	73.73	0.47

Low
Norm
High

N	P	K	Ca	Mg	Na	S	Zn	Cu	Mn	Fe	B
%	%	%	%	%	%	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
2.1 - 2.5	0.12 - 0.15	0.90 - 1.5	3.5 - 6.0	0.35 - 0.50	<0.25	0.20 - 0.30	25 - 100	5.0 - 20	25 - 100	>40	75 - 200

- **2024 (408) + 2025 (579):**
 - February to July
 - Excluding the north, research and possible chemical trials



Citrus

Citrus Leaf Norms

A summary of the norms supplied in the CRI production guidelines (Coetzee, 2007)

Cultivar/ Selection	Norm	N	P	K	Ca	Mg
Valencias in hot areas	Deficient	<1.9	<0.10	<0.60	<2.50	<0.25
	Optimal	2.3-2.6	0.12-0.15	0.90-1.50	3.5-6.0	0.35-0.50
	Excess	>2.8	>0.17	>1.80	>7.00	>0.75
Valencias in other areas	Deficient	<1.9	<0.10	<0.60	<2.50	<0.25
	Optimal	2.1-2.3	0.12-0.15	0.90-1.50	3.5-6.0	0.35-0.50
	Excess	>2.5	>0.17	>1.80	>7.00	>0.75
Deltas & Mid- knights	Deficient	<2.10	<0.10	<0.60	<2.50	<0.25
	Optimal	2.4-2.6	0.12-0.15	0.90-1.50	3.5-6.0	0.35-0.50
	Excess	>2.8	>0.17	>1.80	>7.00	>0.75
Mandarins	Deficient	<1.9	<0.10	<0.60	<2.50	<0.25
	Optimal	2.3-2.5	0.12-0.15	0.90-1.50	3.5-6.0	0.35-0.50
	Excess	>2.75	>0.17	>1.80	>7.00	>0.75
Clementines	Deficient	<1.9	<0.10	<0.60	<2.50	<0.25
	Optimal	2.2-2.4	0.12-0.15	0.90-1.60	3.5-6.0	0.35-0.50
	Excess	>2.6	>0.17	>1.80	>7.00	>0.75
Navels	Deficient	<1.9	<0.10	<0.50	<2.50	<0.25
	Optimal	2.4-2.6	0.12-0.15	0.70-1.10	3.5-6.0	0.35-0.50
	Excess	>2.8	>0.17	>1.50	>7.00	>0.75
Lemons	Deficient	<1.9	<0.10	<0.60	<2.50	<0.25
	Optimal	2.3-2.6	0.12-0.15	0.80-1.20	3.5-6.0	0.35-0.50
	Excess	>2.8	>0.17	>1.50	>7.00	>0.75
Grapefruit	Deficient	<1.7	<0.10	<0.60	<2.50	<0.25
	Optimal	1.8-2.2	0.14-0.16	0.80-1.00	3.5-6.0	0.35-0.50
	Excess	>2.4	>0.18	>1.25	>7.00	>0.75

	S	Cl	Na	Cu	Fe	Mn	Zn	B	Mo
<0.15				<3	<40	<25	<15	<40	<0.05
0.20-0.30				5-20		40-150	25-100	75-200	
>0.50	>0.65	>4000	>40			>300	>200	>300	
<0.15				<3	<40	<25	<15	<40	<0.05
0.20-0.30				5-20		40-150	25-100	75-200	
>0.50	>0.65	>4000	>40			>300	>200	>300	
<0.15				<3	<40	<25	<15	<40	<0.05
0.20-0.30				5-20		40-150	25-100	75-200	
>0.50	>0.65	>4000	>40			>300	>200	>300	
<0.15				<3	<40	<25	<15	<40	<0.05
0.20-0.30				5-20		40-150	25-100	75-200	
>0.50	>0.65	>4000	>40			>300	>200	>300	
<0.15				<3	<40	<25	<15	<40	<0.05
0.20-0.30				5-20		40-150	25-100	75-200	
>0.50	>0.65	>4000	>40			>300	>200	>300	
<0.15				<3	<40	<25	<15	<40	<0.05
0.20-0.30				5-20		40-150	25-100	75-200	
>0.50	>0.65	>4000	>40			>300	>200	>300	
<0.15				<3	<40	<25	<15	<40	<0.05
0.20-0.30				5-20		40-150	25-100	75-200	
>0.50	>0.65	>4000	>40			>300	>200	>300	

Element	Unit	Norm
N	%	2.1 - 2.5
P	%	0.12 - 0.15
K	%	0.90 - 1.5
Ca	%	3.5 - 6.0
Mg	%	0.35 - 0.50
S	%	0.20 - 0.30
Zn	mg/kg	25 - 100
Cu	mg/kg	5.0 - 20
Mn	mg/kg	25 - 100
Fe	mg/kg	>40
B	mg/kg	75 - 200

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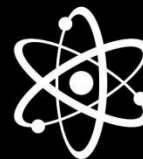
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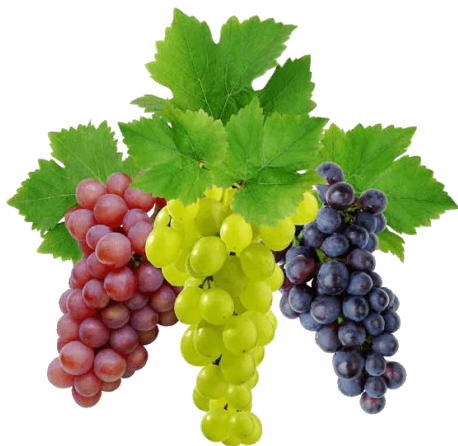
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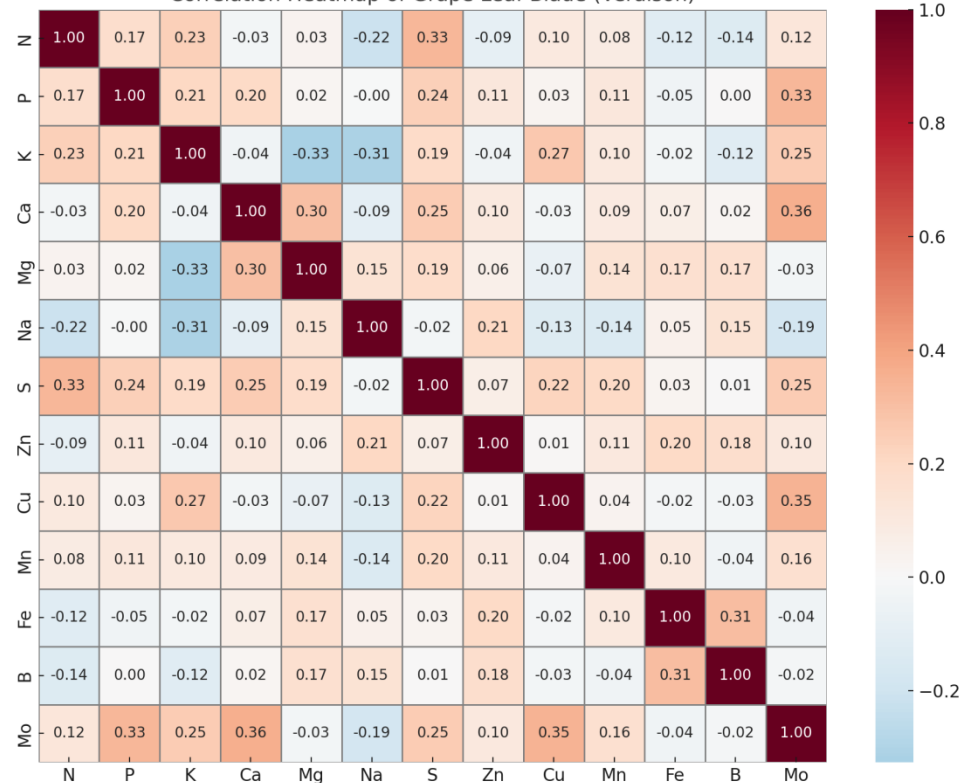
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Grapes

- Leaf blade veraison
- Over 1100 samples



Correlation Heatmap of Grape Leaf Blade (Veraison)



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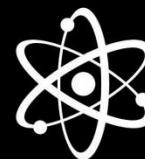
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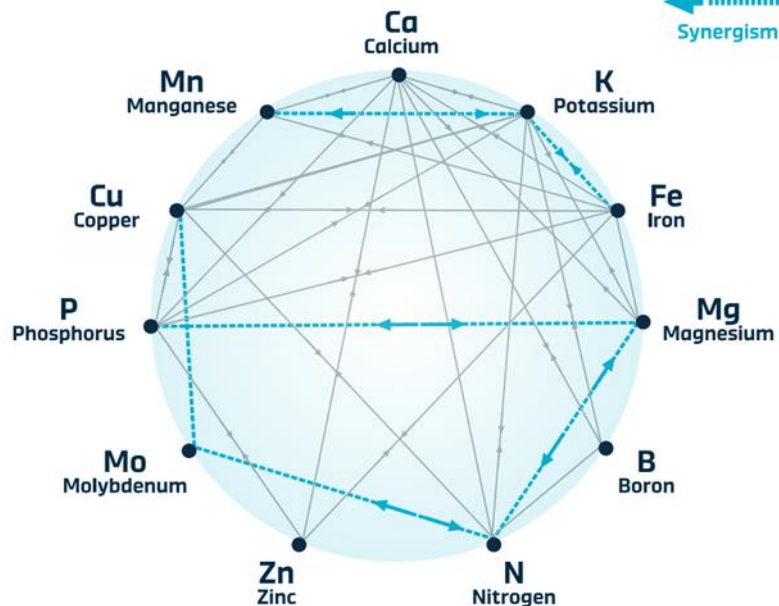
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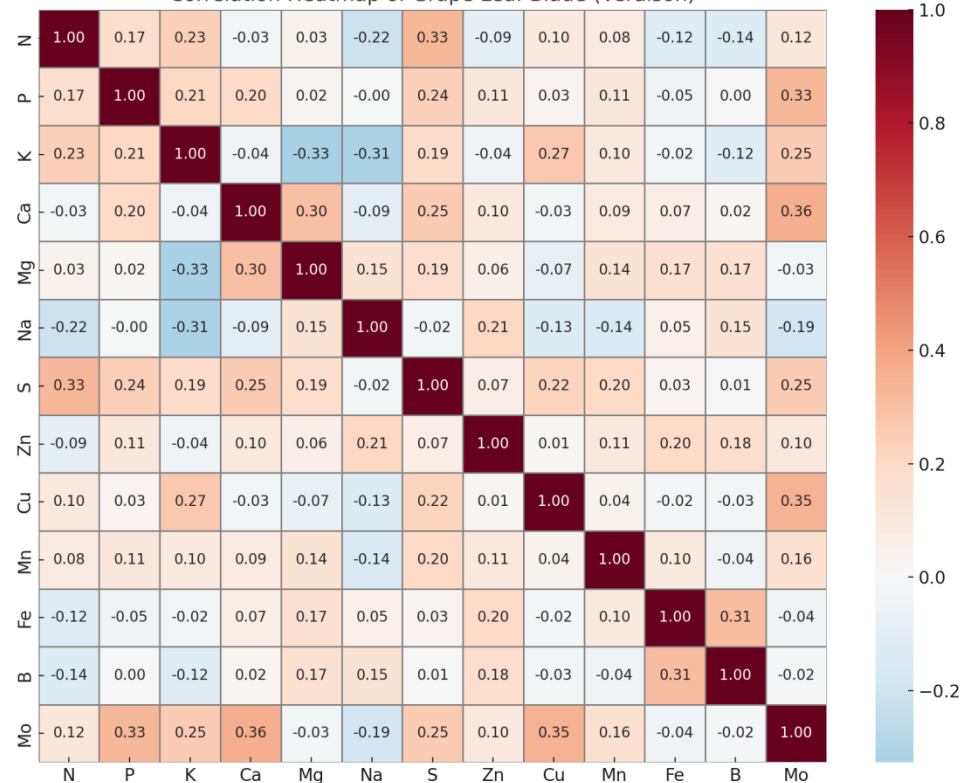


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Mulder's Chart



Correlation Heatmap of Grape Leaf Blade (Veraison)



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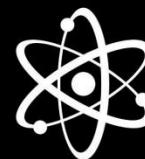
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Grapes

	N %	P %	K %	Ca %	Mg %	Na %	S %	Zn ppm	Cu ppm	Mn ppm	Fe ppm	B ppm
2024	2.30	0.20	0.86	1.94	0.34	0.05	0.21	42.88	72.05	91.71	183.09	51.71
2025	2.38	0.21	1.02	2.00	0.37	0.04	0.20	49.91	118.92	107.61	198.94	50.97

Low
Norm
High

N	P	K	Ca	Mg	Na	S	Zn	Cu	Mn	Fe	B
%	%	%	%	%	%	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
1.5 - 2.4	0.12 - 0.45	0.55 - 1.05	1.5 - 2.4	0.20 - 0.60	< 0.25	-	20 - 50	3.0 - 20	20 - 300	60 - 200	25 - 100

- **2024 (659) + 2025 (416):**
January and February
Excluding the north, research and possible chemical trials



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Composts



Parameter:	Unit:	Results:
Nitrogen as N	%	1.63
Phosphorus as P	%	0.65
Potassium as K	%	1.59
Calcium as Ca	%	1.52
Magnesium as Mg	%	0.62
Zinc as Zn	mg/kg	234
Copper as Cu	mg/kg	54
Manganese as Mn	mg/kg	411
Iron as Fe	mg/kg	14607
Moisture	%	46
Boron as B	mg/kg	29
Sulphur as S	%	0.43
Sodium as Na	%	0.23
Aluminium as Al	mg/kg	8370
Carbon	%	45
Carbon:Nitrogen	Ratio	25:1
pH @ 25°C	pH units	8.17
Conductivity @ 25°C	mS/m	552

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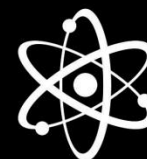
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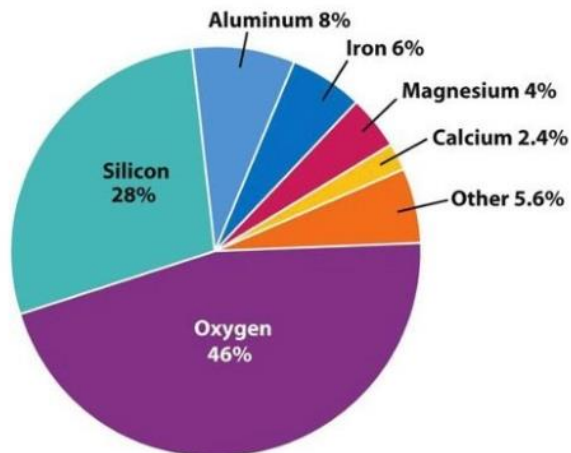
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Composts



Parameter	Aged manure	Compost
Dry matter (%)	63.2	74.0
Volatile solids (% db)	67.5	43.7
Total nitrogen (% db)	2.18	2.11
Total phosphorus (% db)	0.80	1.31
Potassium (% db)	1.86	2.49
Sodium (% db)	0.30	0.43
Sulfur (% db)	0.45	0.52
Calcium (% db)	2.22	1.91
Magnesium (% db)	0.86	0.93
EC1:5 (dS/m)	8.3	16.1
pH	7.2	7.3
Ammonia-N (mg/kg db)	1,431	1,016
Nitrate-N (mg/kg db)	307	714
Boron (mg/kg db)	22	23
Cobalt (mg/kg db)	7	-
Copper (mg/kg db)	35	37
Iron (mg/kg db)	11,700	5,300
Manganese (mg/kg db)	387	351
Molybdenum (mg/kg db)	4.3	5.7
Ortho-phosphate (mg/kg db)	944	3,100
Zinc (mg/kg db)	221	254

Organic Material	C:N ratio
Wood chips	700:1
Cardboard (corrugated)	560:1
Sawdust	500:1
Wood bark	300:1
Newspaper	150:1
Pine needles	80:1
Straw	75:1
Cornstalks	60:1
Peat moss	60:1
Leaves	55:1
Horse manure	25:1
Coffee grounds	25:1
Compost	20:1
Food waste	20:1
Grass clippings	15:1
Cow manure	15:1
Pig manure	15:1
Alfalfa hay	12:1
Poultry manure	6:1
Blood meal	4:1

Slower Decomposition
Faster Decomposition

Immobilization

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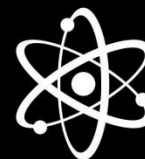
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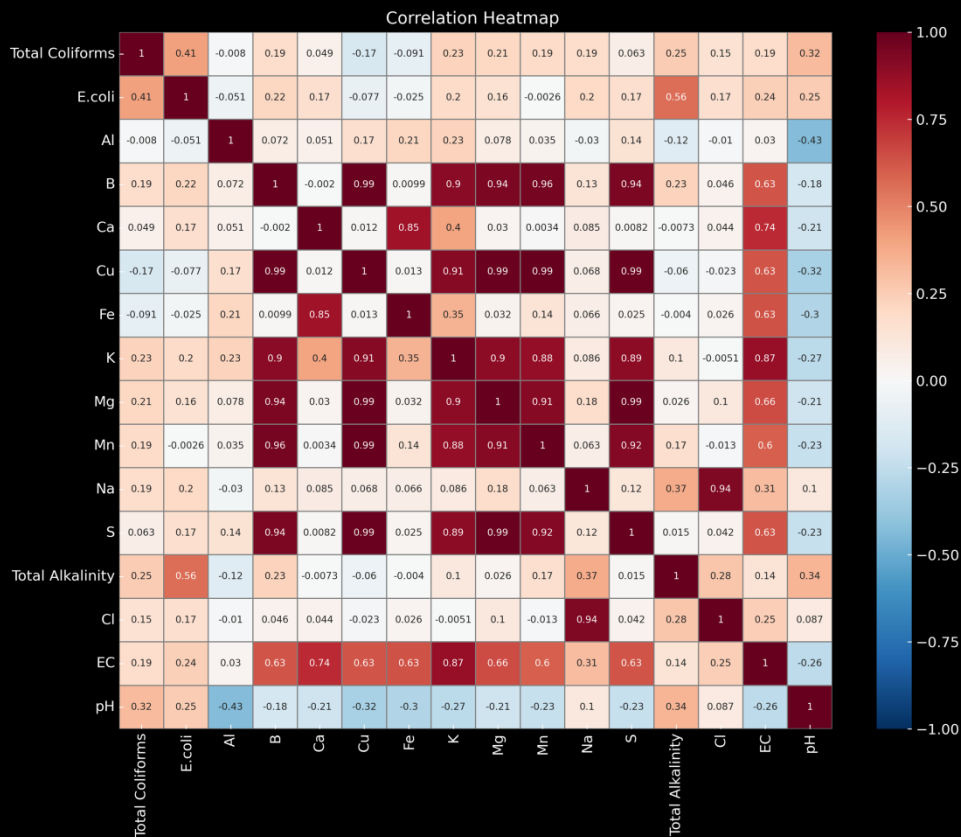
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Water

- Over 500 samples from Cape
- Mostly irrigation water



Water

- *E.coli* and coliforms $r = 0.41$
- Abundant environmental TC



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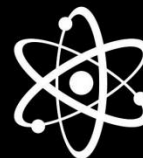
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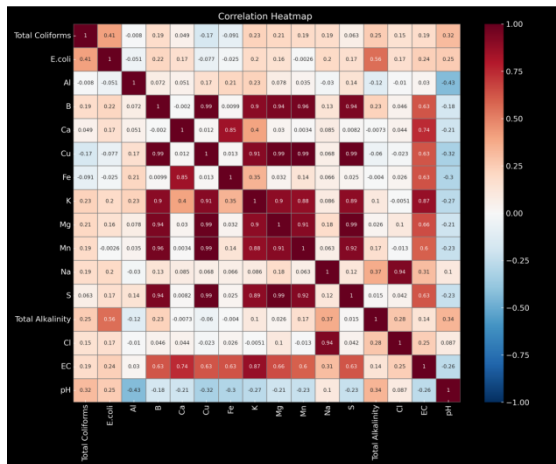
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Water

- Elemental associations e.g. Cu and S: $r > 0.9$
- Fertiliser runoff?



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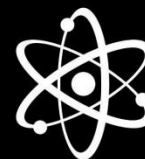
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Water

- EC with ions: K, $r = 0.87$; Ca, $r = 0.74$;
- B, Cu, Fe, Mg, Mn, S, $r \geq 0.6$



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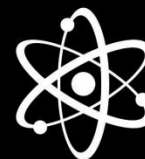
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Water

- pH with ions: Al, B, Ca, Cu, Fe, K, Mg, Mn, S; r between -0.18 and -0.43



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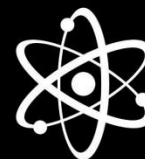
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Water

- ***E.coli* and total alkalinity $r = 0.56$**
- **WHO (World Health Organization, 2011) - *Guidelines for Drinking-water Quality, 4th Edition*:**
Notes that *E. coli* survival is prolonged in waters of neutral pH, while extreme pH reduces persistence.



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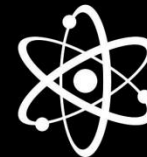
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Water

- Mpumalanga
 - Surface water
 - Borehole water - remote



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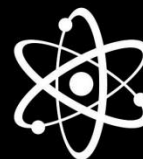
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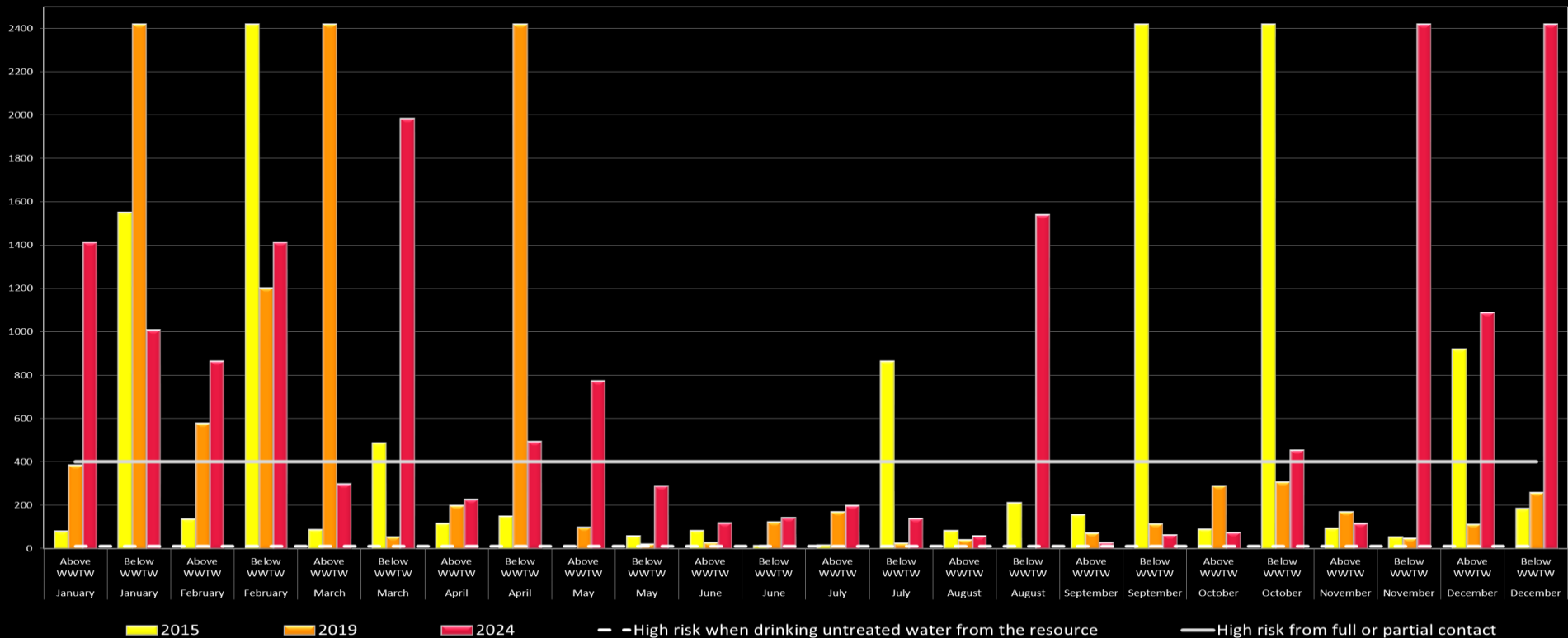
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E.coli (MPN/100ml)



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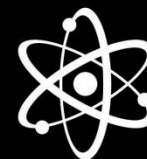
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Water

		Dec 2023	Jan 2024	Feb 2024	Mar 2024	Apr 2024	May 2024	Jun 2024	Jul 2024	Aug 2024	Sep 2024	Oct 2024	Nov 2024	Dec 2024
Parameter:	Unit:	Results:	Results:	Results:	Results:	Results:	Results:	Results:	Results:	Results:	Results:	Results:	Results:	Results:
Dissolved Sodium as Na	mg/l	265	304	247	325	339	298	331	99	91	89	181	237	80
Total Hardness as CaCO ₃	mg/l	452	497	407	472	497	466	478	284	266	261	389	446	192
Conductivity @ 25°C	mS/m	192	224	183	252	253	239	233	86	88	88	154	208	76
Total Alkalinity as CaCO ₃	mg/l	401	430	420	586	520	493	488	264	282	225	371	422	191
Chloride as Cl	mg/l	382.6	499.3	395.9	592.9	513.1	381.8	426.3	147.6	163.7	123.8	301.7	467.6	115.34
Langelier Index @ 25°C		0.74	0.18	0.15	0.84	0.48	0.53	0.73	0.40	0.31	0.58	0.83	0.40	-0.55
Total Coliform	MPN/100 ml	4	<1	2420	9	<1	165	<1	<1	<1	<1	<1	3	32
E. coli	MPN/100 ml	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1

- Borehole - remote wildlife area



MRLs

- Citrus: analytes detected
- all regions



Year	2022	2023	2024
Analytes	2,4-D	Acetamiprid	Acetamiprid
	Azoxystrobin	Azoxystrobin	Azoxystrobin
	Bromophos-methyl	Buprofezin	Buprofezin
	Buprofezin	Carbendazim	Clothianidin
	Carbendazim	Clothianidin	Fenpyroximate
	Carbendazim (SUM)	Fenpyroximate	Fludioxonil
	Chlorantraniliprole	Fludioxonil	Imazalil
	Etoxazole	Imazalil	Imidacloprid
	Fenpyroximate	Imidacloprid	Malathion
	Fludioxonil	Malathion	Methoxyfenozide
	Imazalil	Methoxyfenozide	Prochloraz
	Imidacloprid	Prochloraz	Pyraclostrobin
	Malathion	Pyraclostrobin	Pyrimethanil
	Methidathion	Pyrimethanil	Pyriproxyfen
	Methoxyfenozide	Pyriproxyfen	Thiabendazole
	Propiconazole (SUM)	Sulfoxaflor (SUM)	Thiamethoxam
	Propoxur	Thiabendazole	Trifloxystrobin
	Pyraclostrobin	Trifloxystrobin	
	Pyrimethanil		
	Pyriproxyfen		
	Thiabendazole		
	Trifloxystrobin		
Total	22	18	17

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MRLs

- Citrus; Most used Multi Residue test analytes:

Analyte
Imazalil
Methoxyfenozide
Pyraclostrobin
Pyrimethanil
Thiabendazole



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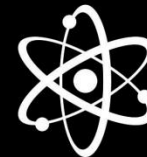
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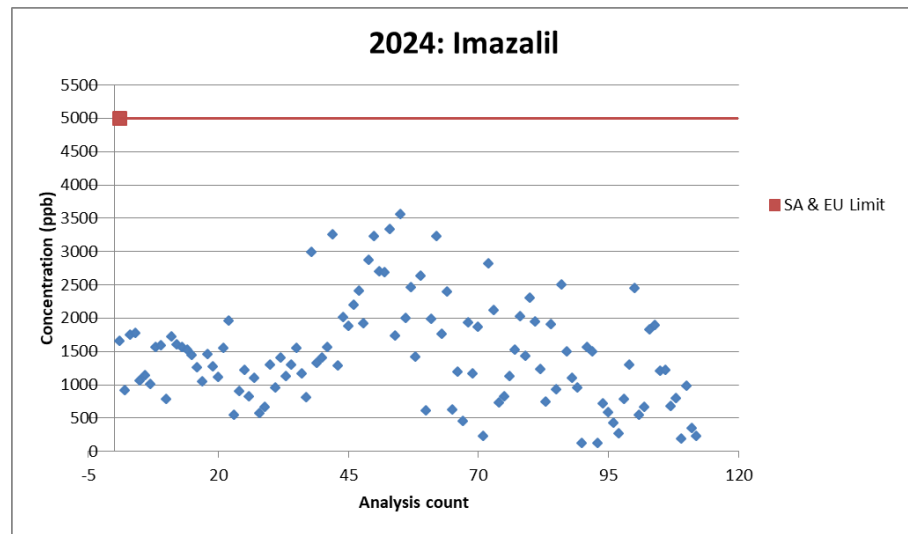
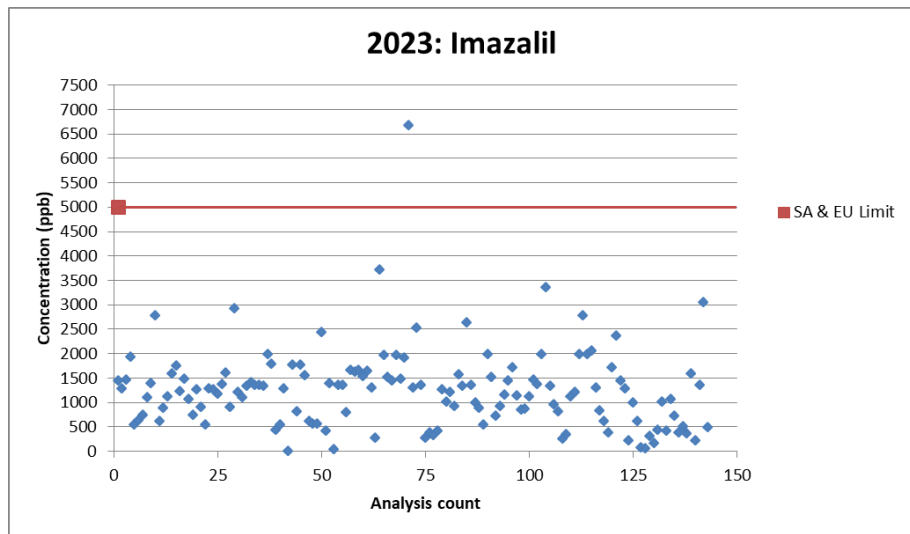
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MRLs



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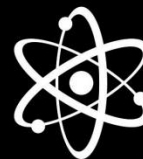
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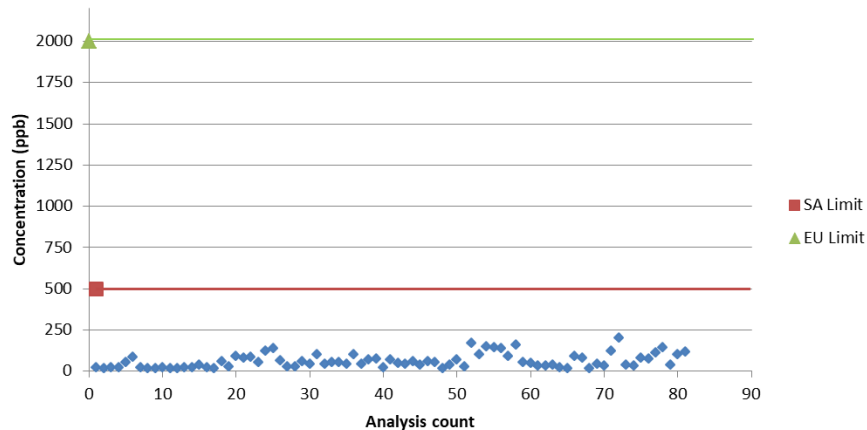


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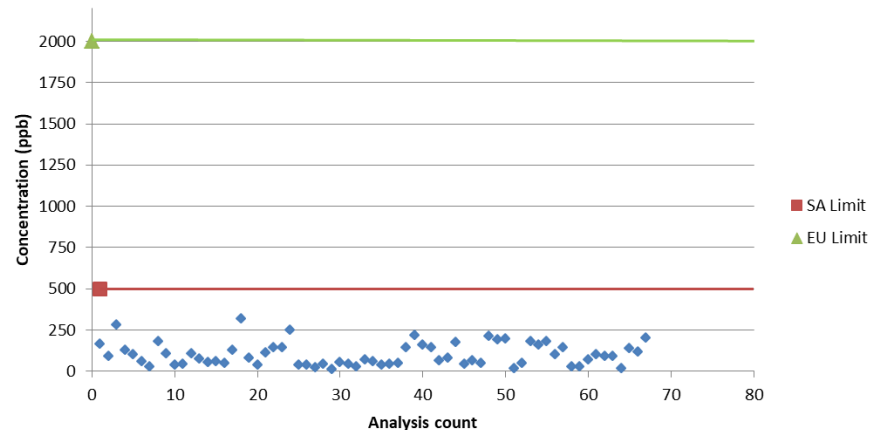
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2023: Methoxyfenozide



2024: Methoxyfenozide



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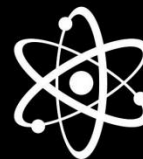
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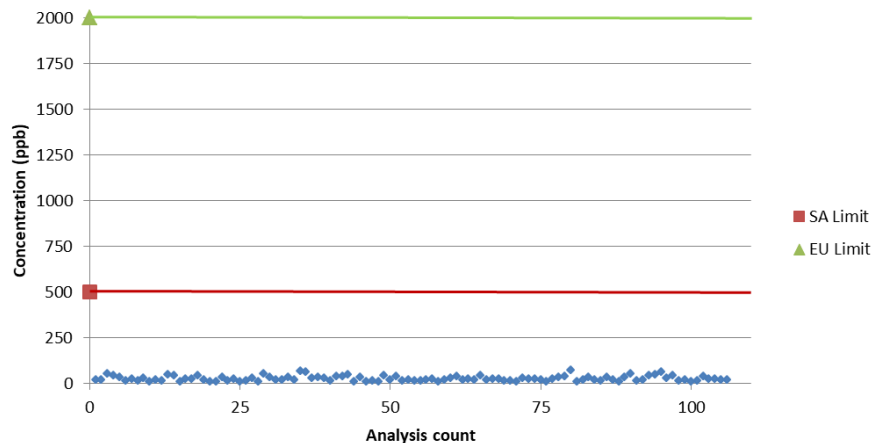


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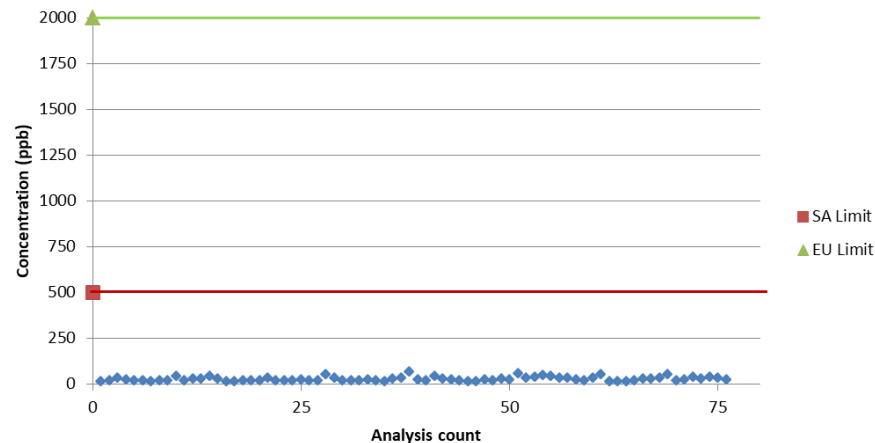
MRLs



2023: Pyraclostrobin



2024: Pyraclostrobin



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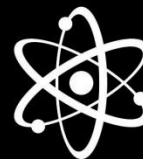
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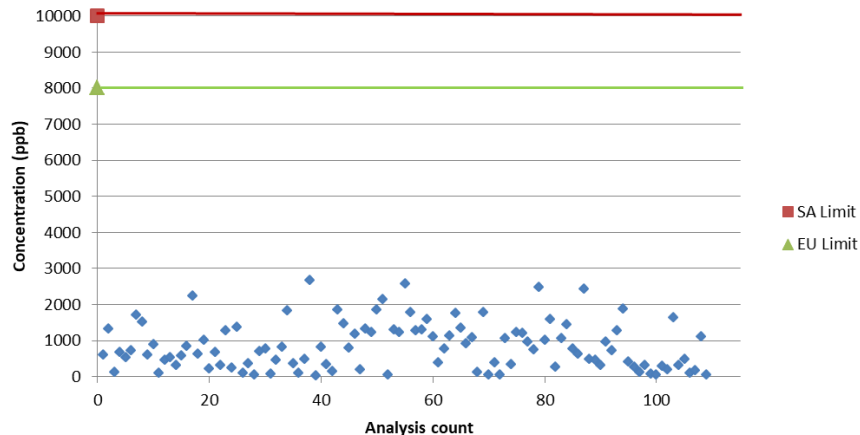


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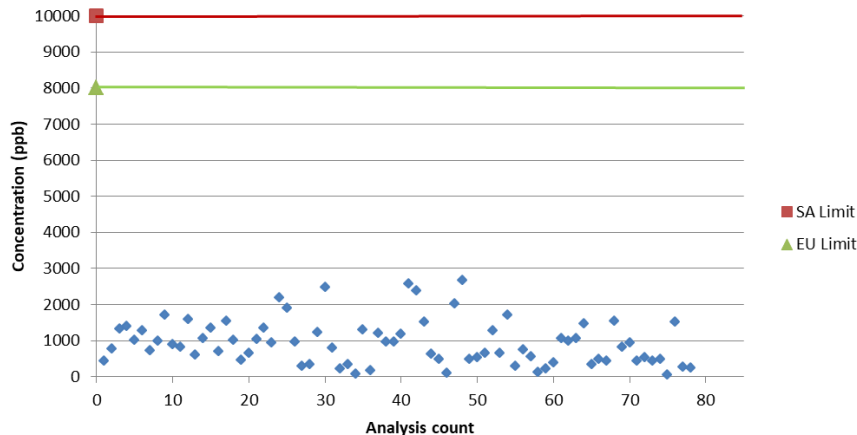
MRLs



2023: Pyrimethanil



2024: Pyrimethanil



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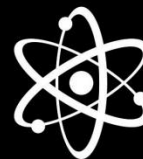
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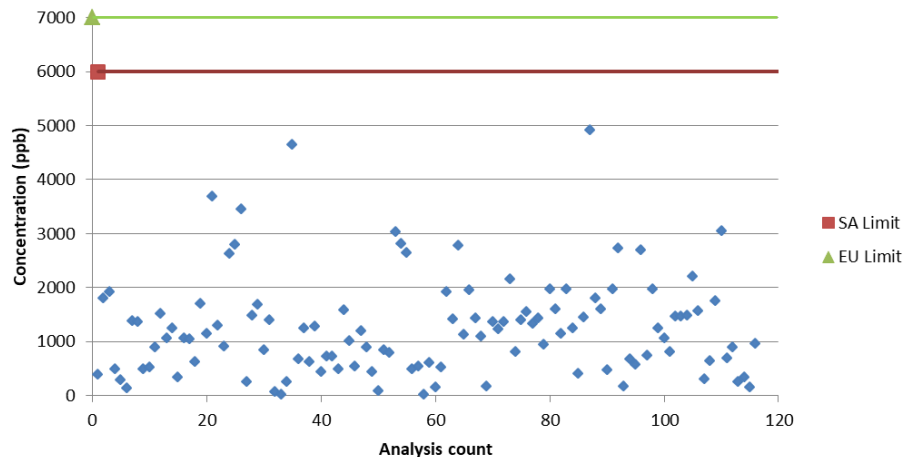


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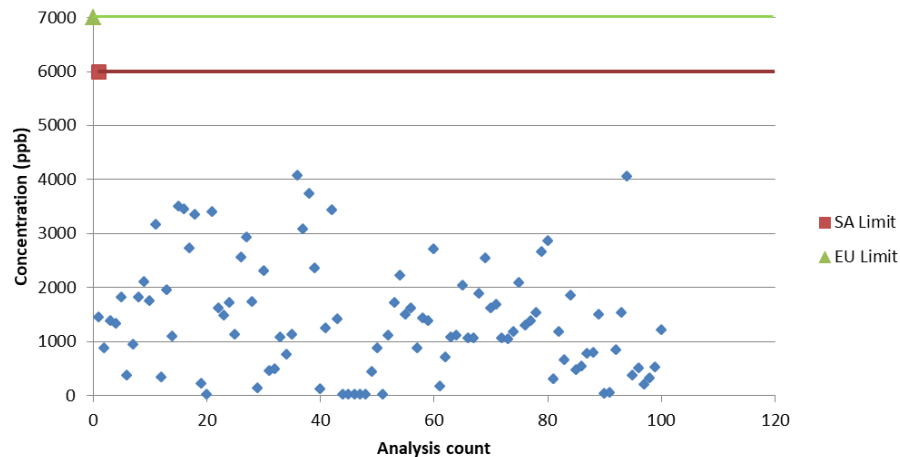
MRLs



2023: Thiabendazole



2023: Thiabendazole



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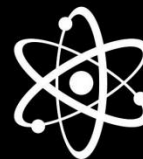
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Conclusion

- We have the data – let us know if you want us to investigate.
- Practice doesn't always align with theory.
- We will continue to share.



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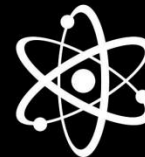
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- Labserve and Eurofins Co-Operation
- Technology transfer
 - Access to 900 (!) Labs and experts
 - Reduced TAT
 - More parameters and data
- More Co-Op coming...



Thank You • Dankie

REFERENCES:

- Wakeel, A., Gul, M. and Sanaullah, M., 2013. Potassium dynamics in three alluvial soils differing in clay contents. Emirates Journal of Food and Agriculture, 25(1), p.39.
- McCarty, C.G. and Vitz, E., 2006. pH paradoxes: Demonstrating that it is not true that $\text{pH} \equiv -\log [\text{H}^+]$. Journal of Chemical Education, 83(5), p.752.
- <https://www.mla.com.au/globalassets/mla-corporate/research-and-development/>
- <https://icl-growingsolutions.com/agriculture/knowledge-hub/understanding-mulders-chart-the-key-to-balanced-soil-nutrition/>
- Dahlquist, Georgia. (2017). FOUNDATIONS FOR A GEOBIOCHEMICAL CHARACTERIZATION OF MUDPOTS IN YELLOWSTONE NATIONAL PARK.
- Fertilization Manager **Source:** Eurofins Agro Testing **Website:** www.soil-health-solutions.com

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