CERFRANCE
MAYENNE-SARTHE

PLANT SAP ANALYSIS

03/10/2022 – GUILLAUME TANT

kg/m²	Left	Middle	Right
Early winter	1	0.7	1
Late winter	2.7	1.6	2.2
N unit	120	150	120
Yield	4.2T	4.1T	4.2T

Essai méteil 72 CER

[redacted]

135 vert sur la partie non fissuré, 155 sur le reste, rien entre em et rien, reste à voir l'humidité. 12:44

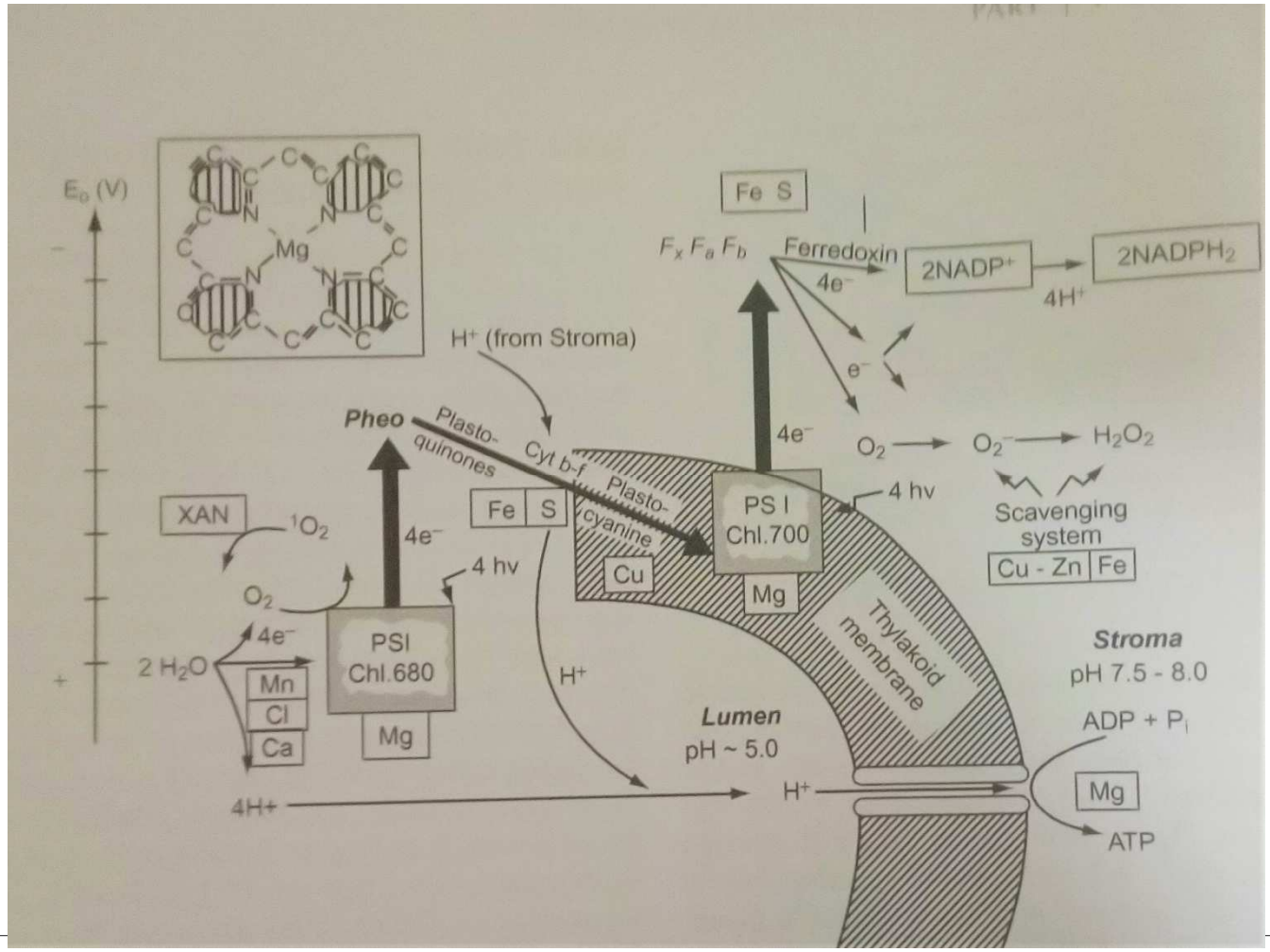
[redacted]

Photosytesis

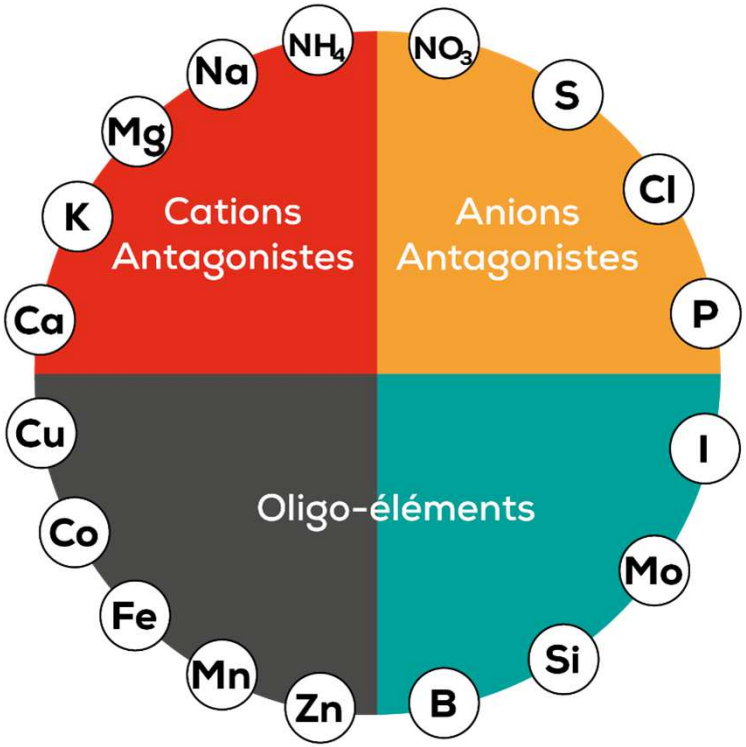
$+ CO_2 \rightarrow C_6H_{12}O_6 + O_2$

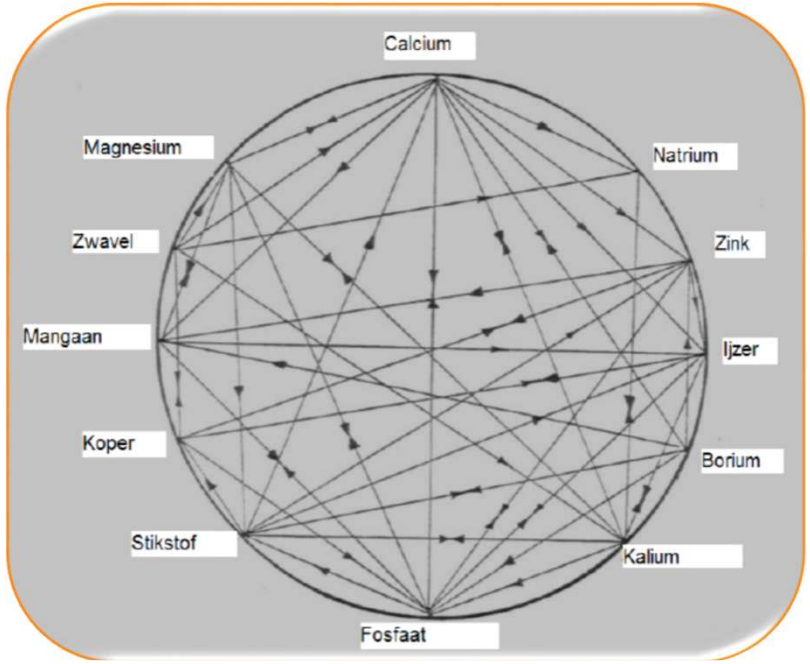
Mn, Fe, N, Mg

HUMUS


E_0 (V)
Mg
Fe S
F_x F_a F_b
Ferredoxin
4e⁻
2NADP⁺
2NADPH₂
4H⁺
H⁺ (from Stroma)
e⁻
Pheo
Plasto-quinones
Cyt b-f
Plasto-cyanine
4e⁻
O_2
O_2^-
H_2O_2
4 hv
PS I
Chl.700
Fe S
Cu
Mg
Scavenging system
Cu - Zn Fe
XAN
$^1O_2$
4e⁻
4 hv
O_2
4e⁻
2 H_2O
Mn
Cl
Ca
PSI
Chl.680
Mg
H⁺
Thylakoid membrane
Stroma
pH 7.5 - 8.0
ADP + P_i
Lumen
pH ~ 5.0
4H+
H⁺
Mg
ATP

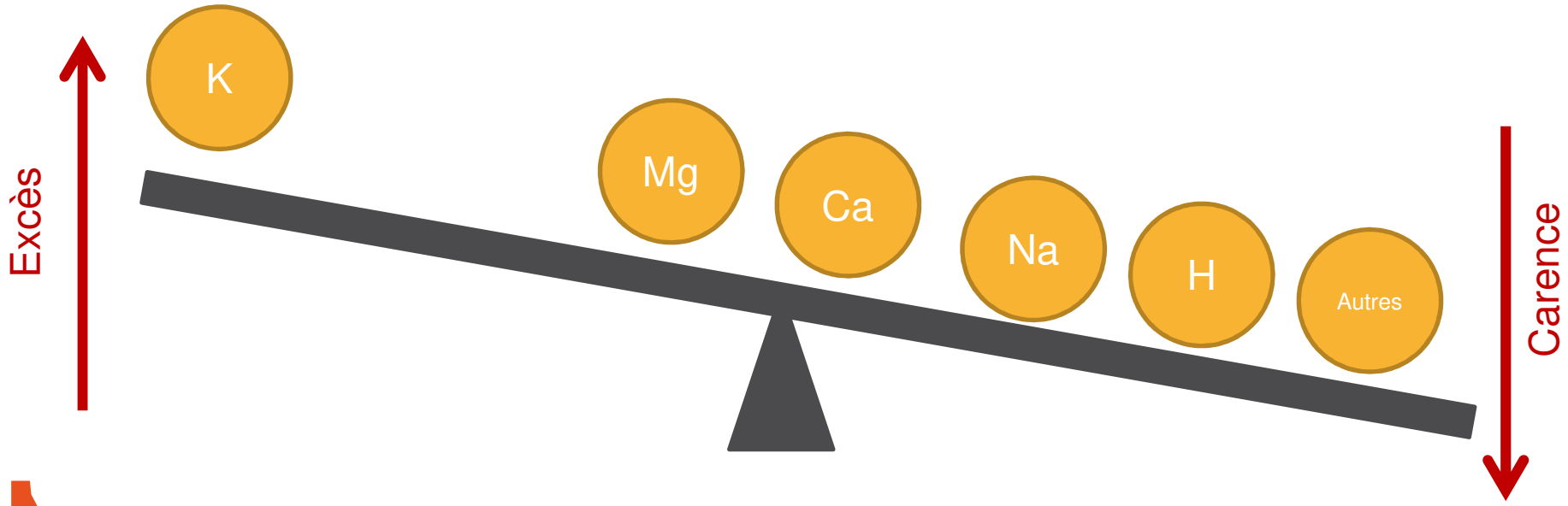
Interactions Antagonistes





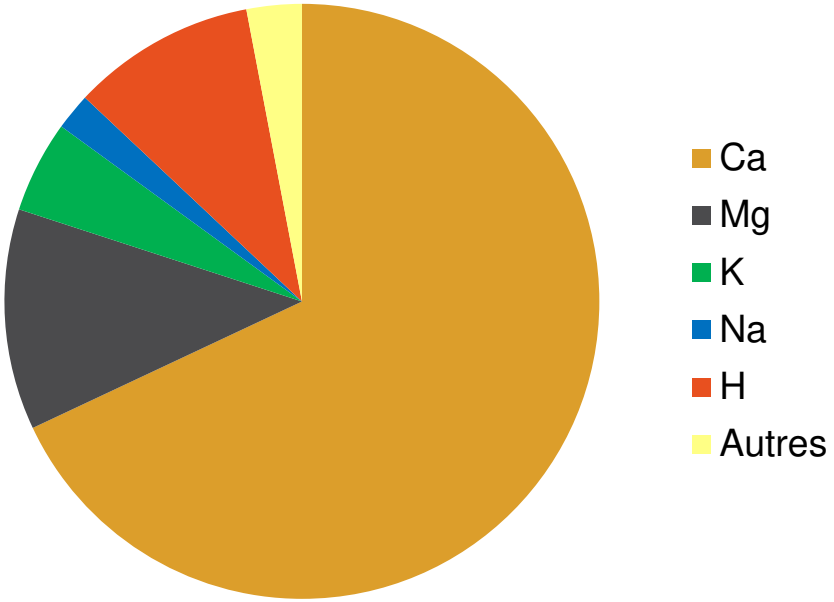
Entre Cations and Anions

Interactions



… Soil test! (William Albrecht, 1888-1974)

CEC		%
Calcium	Ca	68
Magnésium	Mg	12
Potassium	K	5
Sodium	Na	1 à 3
Hydrogène	H	10
Autres		2 à 4



Without

53061 Laval
France

Crop: Corn
Plant part: ¹ Leaf (young) ² Leaf (old)

Remarks

Mineral		Current level	
Total Sugars	%	4,7	1
	%	3,3	2
pH		5,9	1
		5,6	2
EC	mS/cm	13,9	1
	mS/cm	14,7	2
K - Potassium	ppm	5648	1
	ppm	5314	2
Ca - Calcium	ppm	1548	1
	ppm	2399	2
K / Ca		3,65	1
		2,22	2
Mg - Magnesium	ppm	348	1
	ppm	416	2
Na - Sodium	ppm	25	1
	ppm	42	2
NH4 - Ammonium	ppm	159	1
	ppm	110	2
NO3 - Nitrate	ppm	<20	1
	ppm	97	2
N in Nitrate	ppm	<5	1
	ppm	22	2
N - Total Nitrogen	ppm	1338	1
	ppm	1092	2
Cl - Chloride	ppm	651	1
	ppm	489	2
S - Sulfur	ppm	257	1
	ppm	266	2
P - Phosphorus	ppm	585	1
	ppm	344	2
Si - Silica	ppm	34,3	1
	ppm	34,1	2
Fe - Iron	ppm	2,77	1
	ppm	2,42	2
Mn - Manganese	ppm	6,18	1
	ppm	6,51	2
Zn - Zinc	ppm	4,79	1
	ppm	2,96	2
B - Boron	ppm	4,37	1
	ppm	0,89	2
Cu - Copper	ppm	1,80	1
	ppm	1,32	2
Mo - Molybdenum	ppm	<0,05	1
	ppm	<0,05	2
Al - Aluminium	ppm	<0,50	1
	ppm	0,58	2

With biology

Name: Cerfrance Mayenne Sarthe (AGC)
Address: Rue Albert Einstein Parc Technopole de Chang
53061 Laval
France

Location/plot: Corn
Cultivation: Em Pastoureau
Crop: Corn
Plant part: ¹ Leaf (young) ² Leaf (old)

Remarks

Mineral		Current level	
Total Sugars	%	3,4	1
	%	3,5	2
pH		5,9	1
		5,6	2
EC	mS/cm	14,5	1
	mS/cm	13,1	2
K - Potassium	ppm	6470	1
	ppm	5139	2
Ca - Calcium	ppm	2003	1
	ppm	1401	2
K / Ca		3,23	1
		3,67	2
Mg - Magnesium	ppm	406	1
	ppm	212	2
Na - Sodium	ppm	25	1
	ppm	16	2
NH4 - Ammonium	ppm	243	1
	ppm	72	2
NO3 - Nitrate	ppm	<20	1
	ppm	181	2
N in Nitrate	ppm	<5	1
	ppm	41	2
N - Total Nitrogen	ppm	1726	1
	ppm	803	2
Cl - Chloride	ppm	507	1
	ppm	359	2
S - Sulfur	ppm	501	1
	ppm	240	2
P - Phosphorus	ppm	761	1
	ppm	301	2
Si - Silica	ppm	45,6	1
	ppm	37,1	2
Fe - Iron	ppm	3,92	1
	ppm	1,50	2
Mn - Manganese	ppm	11,76	1
	ppm	4,24	2
Zn - Zinc	ppm	7,72	1
	ppm	2,24	2
B - Boron	ppm	10,71	1
	ppm	0,54	2
Cu - Copper	ppm	2,26	1
	ppm	0,82	2
Mo - Molybdenum	ppm	0,08	1
	ppm	<0,05	2
Al - Aluminium	ppm	<0,50	1
	ppm	<0,50	2

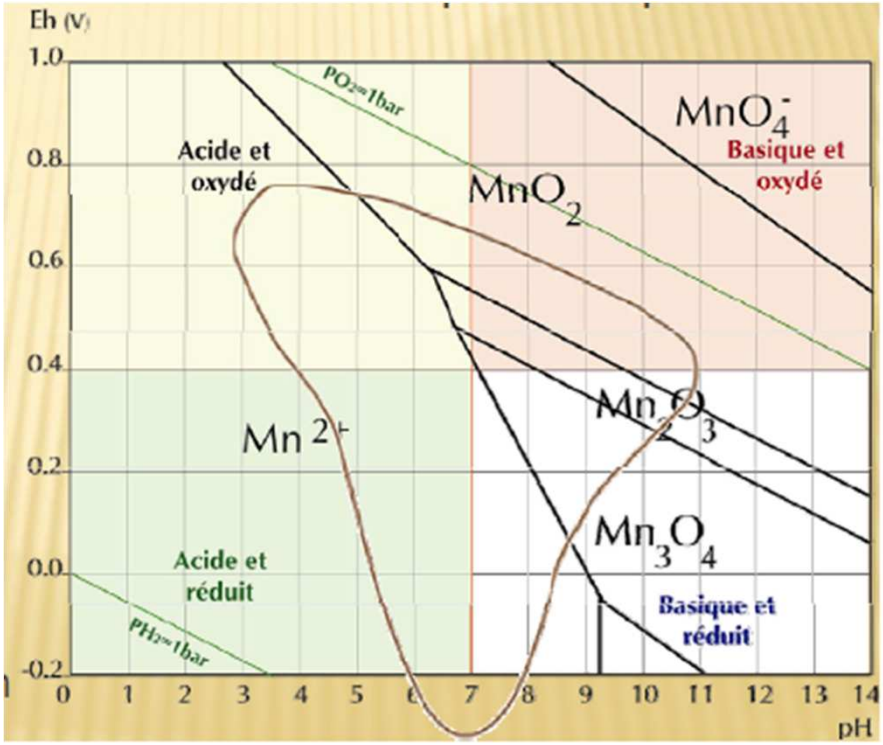
Oxygen and mineral absoption

Herbicides Chélatant - Huber

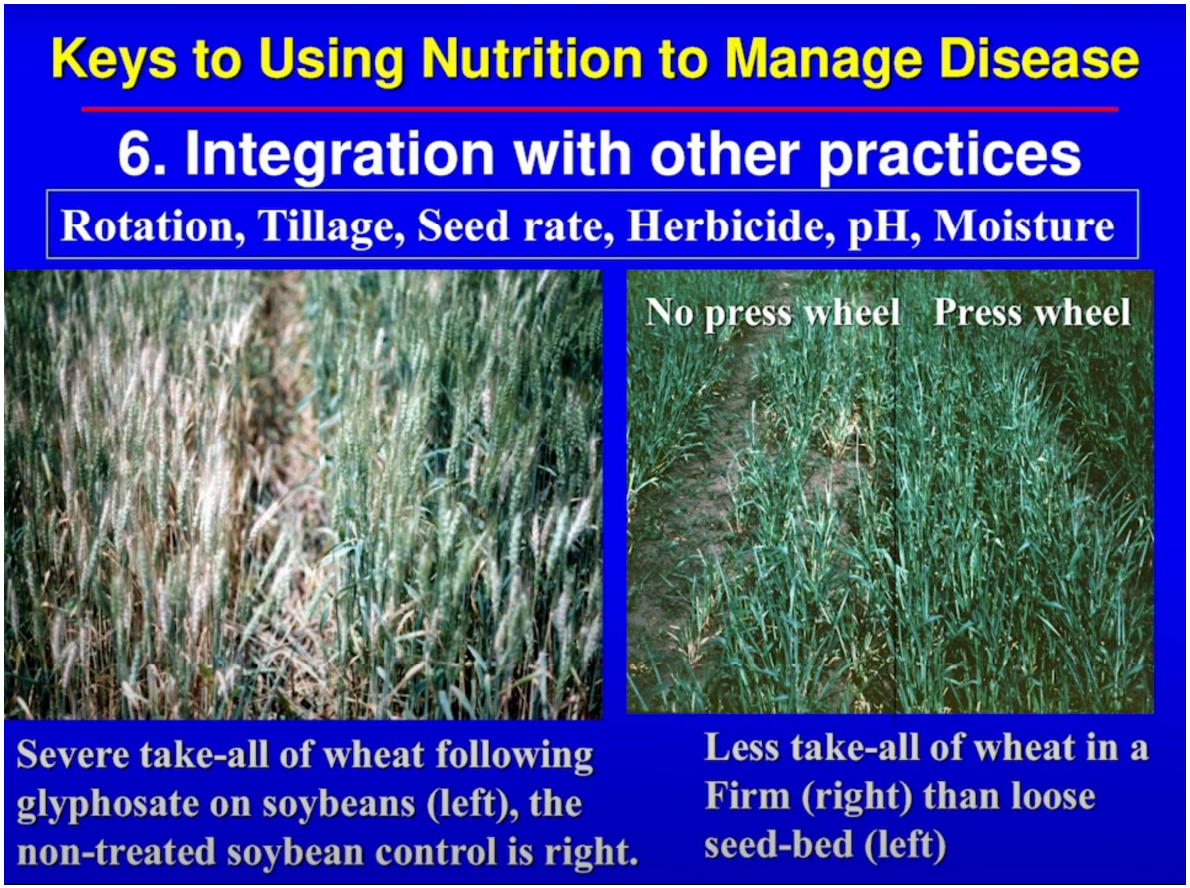
Minerals Chelated by Herbicides

Chemial Family	Active Ingredient	Commercial Name	Elements affected
Sulfonylureas	Trifloxysulfuron metil	Krismat	P
	Halosulfuron	Sempra	P
Imidazols	Imazapic	Okateau	
	Imazapir	Arsenal	
Triazines	Ametrine	Gesapax	Mn, K, Zn, Mg
	Atrazine	Gesaprin	Mn, K, Zn, Mg
	Hexazine	Velpar	Mn, K, Zn, Mg
	Terbutrine	Igran	Mn, K, Zn, Mg
Ureas	Diuron	Karmex	Mn, K
Isoxasoles	Isoxaflutole	Merlin	Mg
Glycines	Glyphosate	Roundup	Mn, Co, Cu, B, Fe, Zn, K
Phosphonic acids	Gluphosinate	Finale, Liberty	Mn, Co, Cu, B, Fe, Zn, K
Dinitroanalines	Pendimethalins	Prowl	
Chloroacetamidas	Acetochlor	Harness	Mg, K
Phenoxy-carboxylic acids	2,4-D	2, 4-D	Cu
Phenoxaprop		Puma	Cu
Phenoxaprop		Puma Gold	Cu
Tordon	Picloran	Tordon	Cu

Redox


Eh (V)
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
pH
PO2=1bar
PH2=1bar
Acide et oxydé
Basique et oxydé
Acide et réduit
Basique et réduit
MnO4-
MnO2
Mn2O3
Mn3O4
Mn 2+

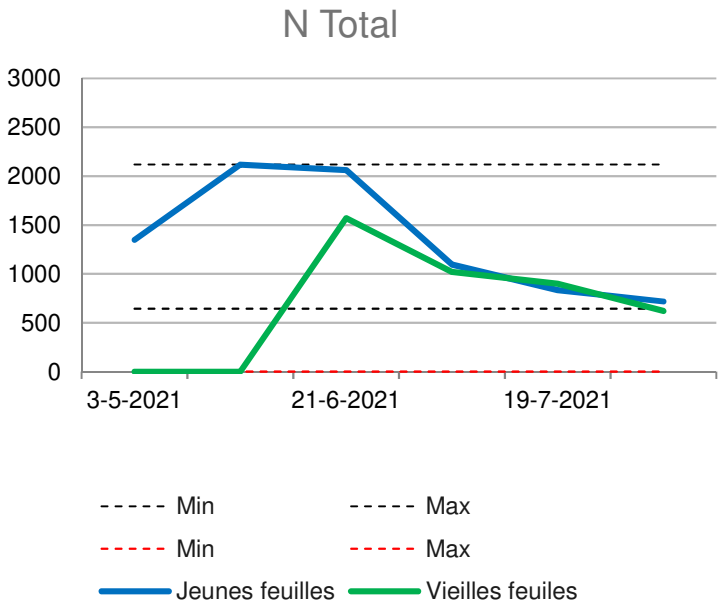
Manganese - Don Huber

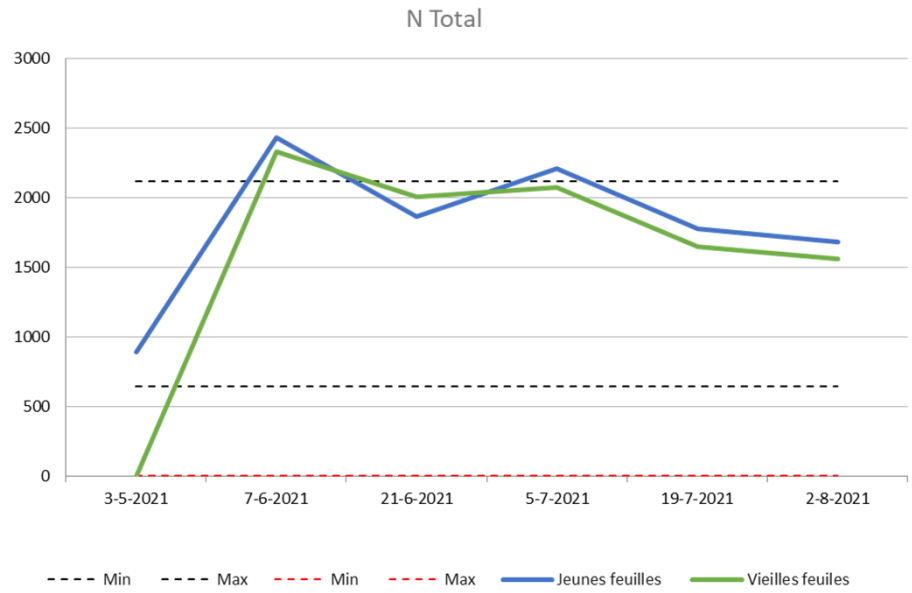


TANT MAIL

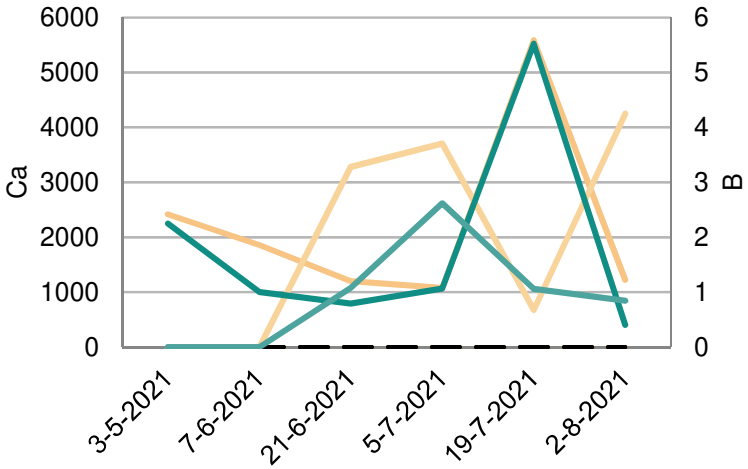
Sap Interpretations

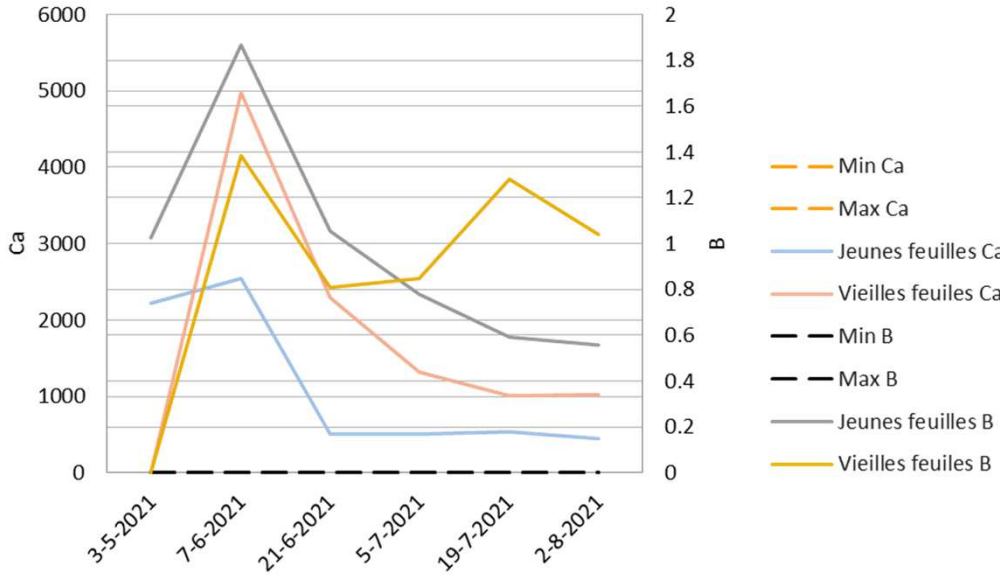
French exemple : Cabbage





Bore et calcium

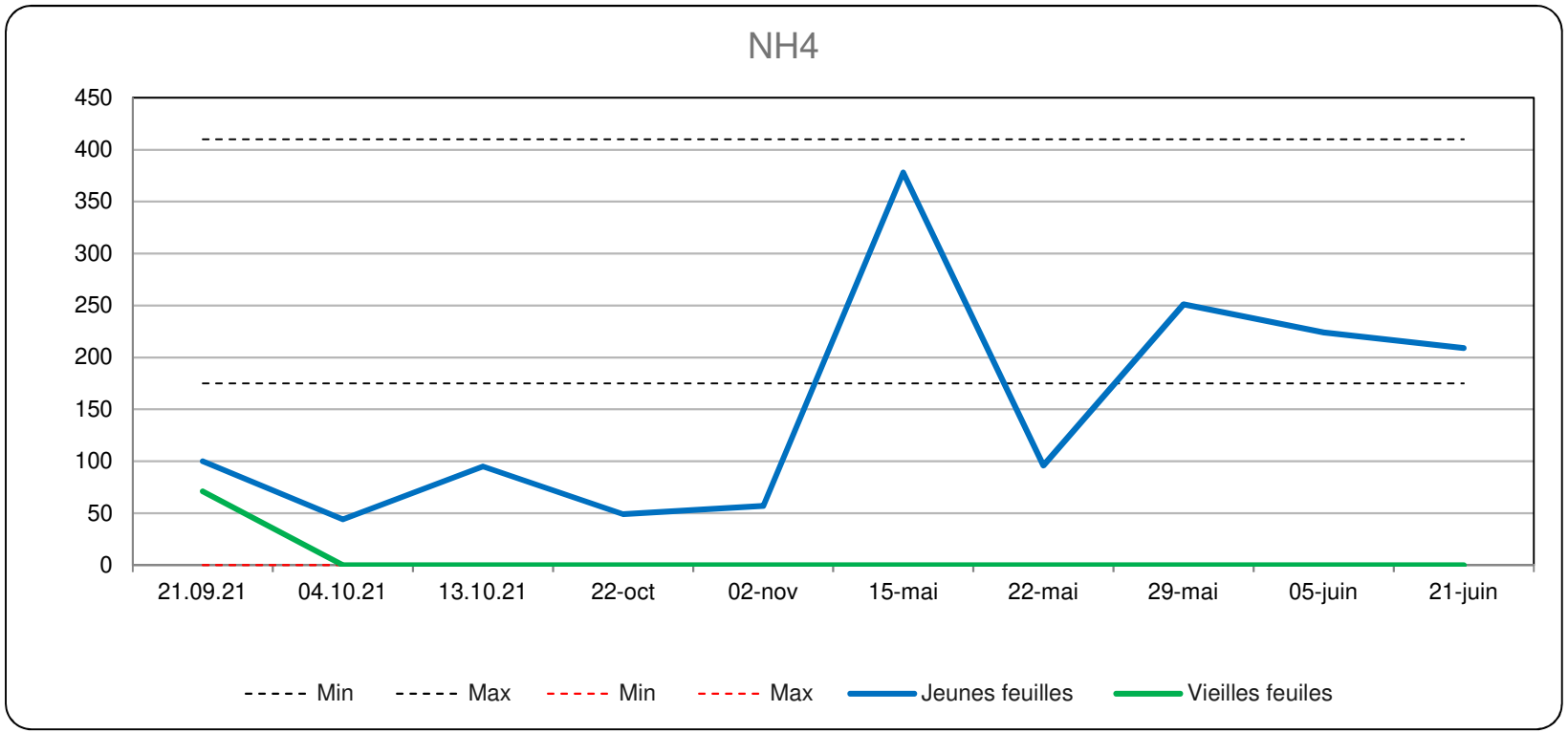




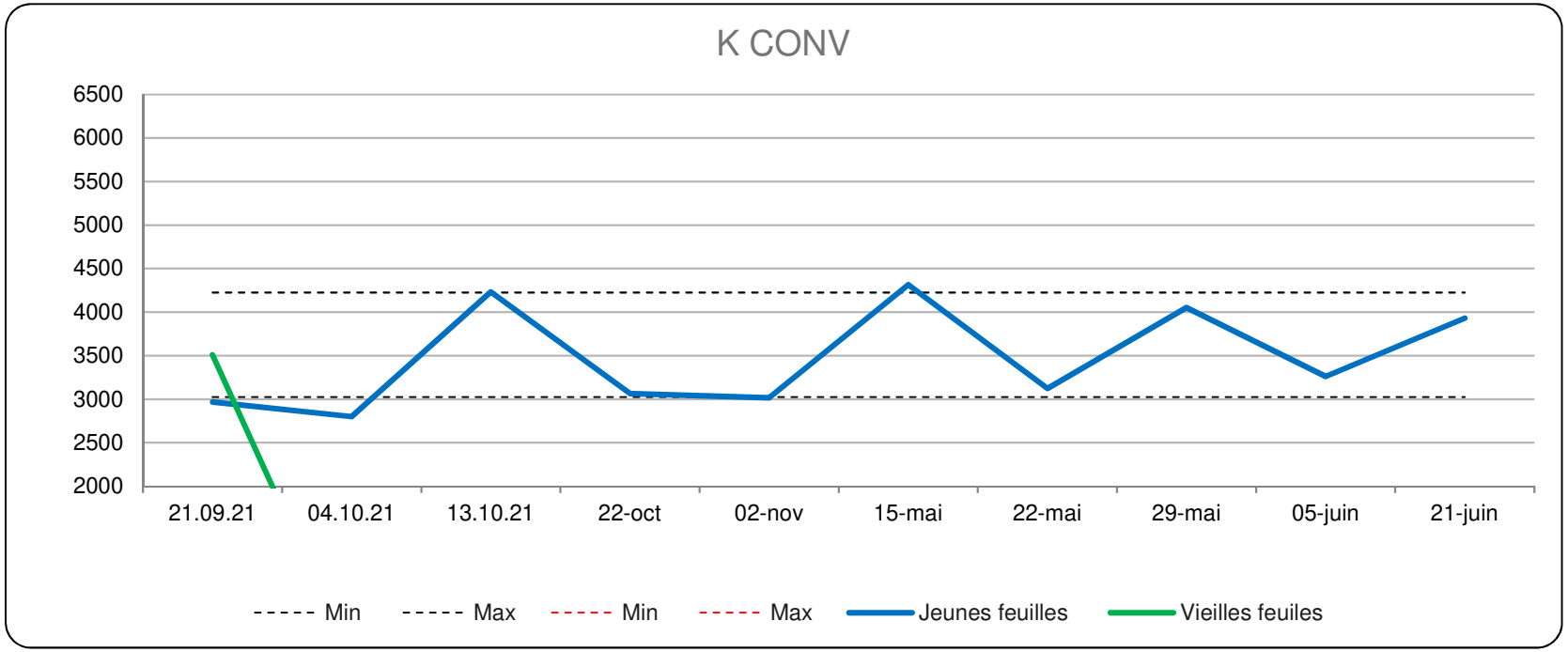
Context

- Canola 2021
- Harvest 2022
- High lime soils
- minimal tillage
- Apply P and K on the basis of soil map
- Applied N levels on cereals vary from 100-150kg/ha.

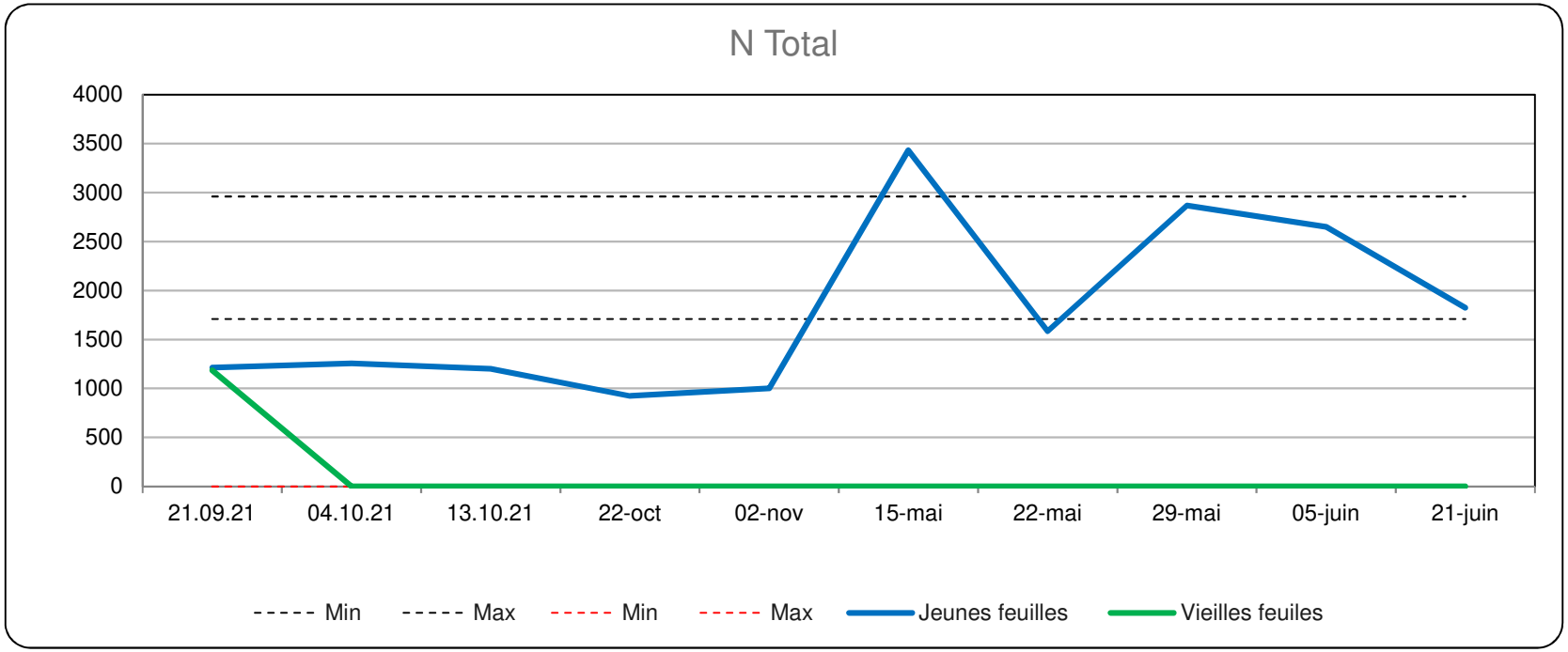
Canola NH4


NH4
450
400
350
300
250
200
150
100
50
0
21.09.21
04.10.21
13.10.21
22-oct
02-nov
15-mai
22-mai
29-mai
05-juin
21-juin
Min
Max
Min
Max
Jeunes feuilles
Vieilles feuiles

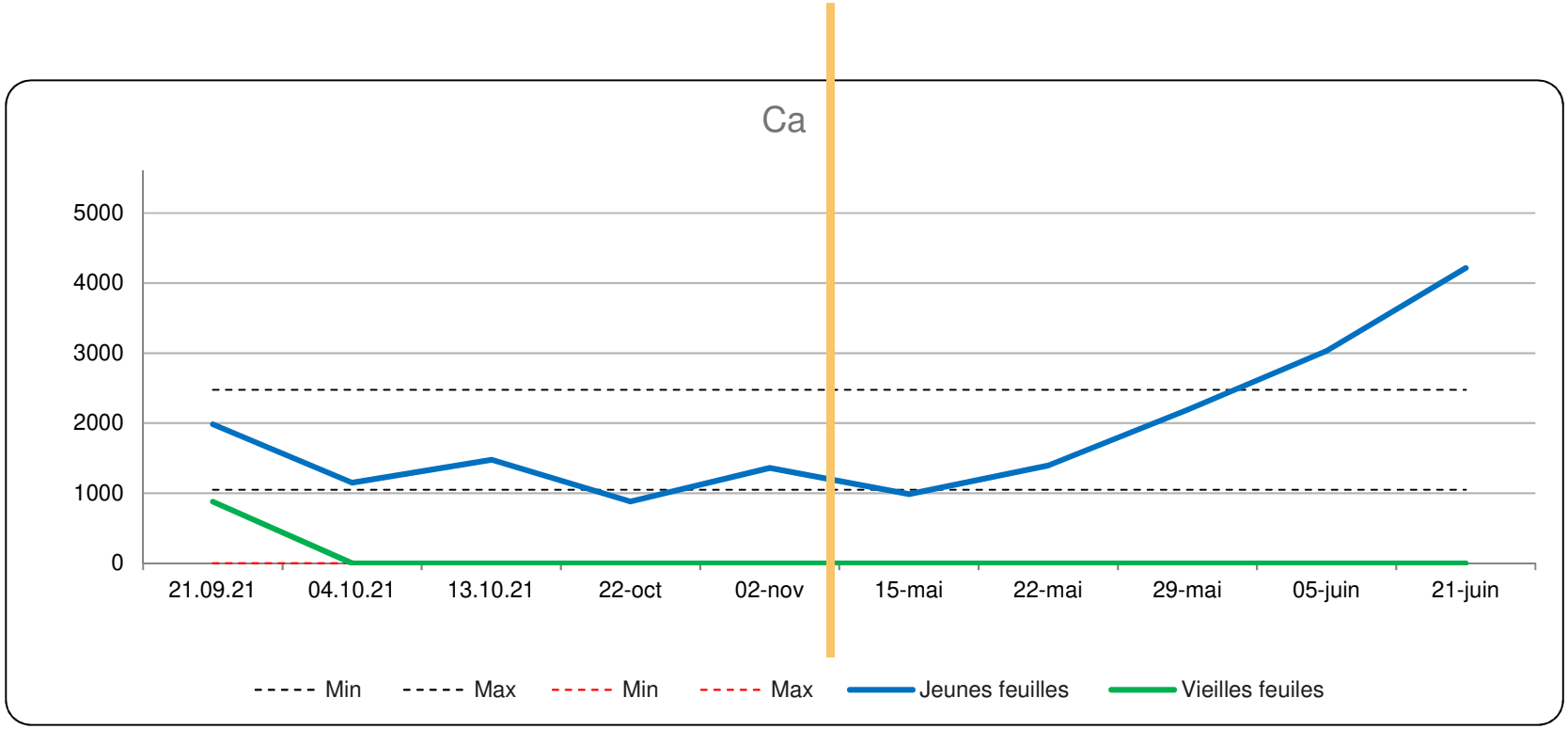
Canola Potassium



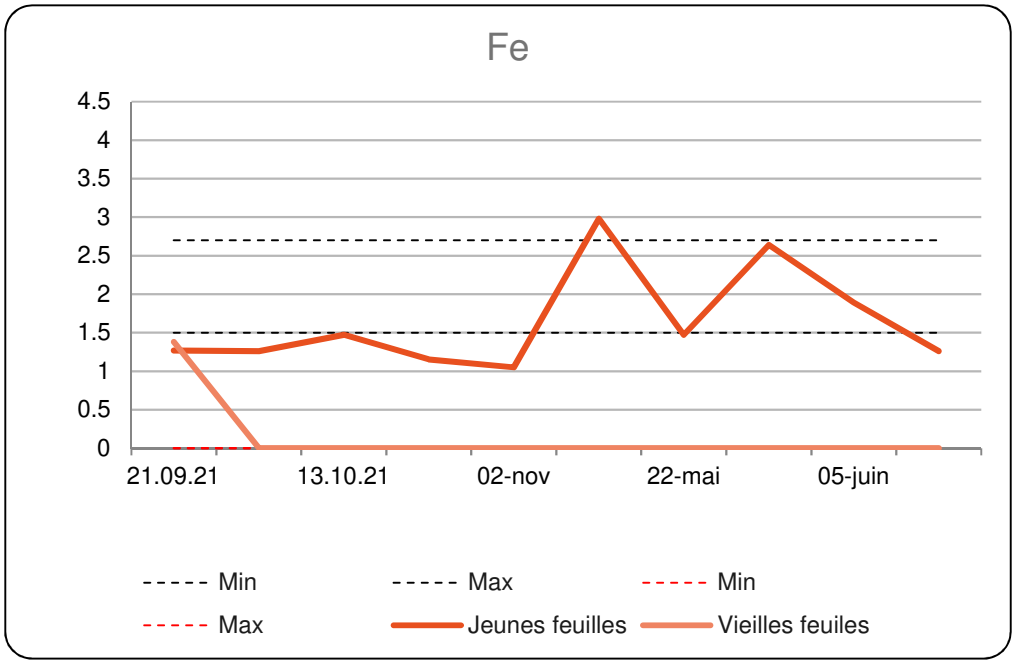
Canola Nitrogen

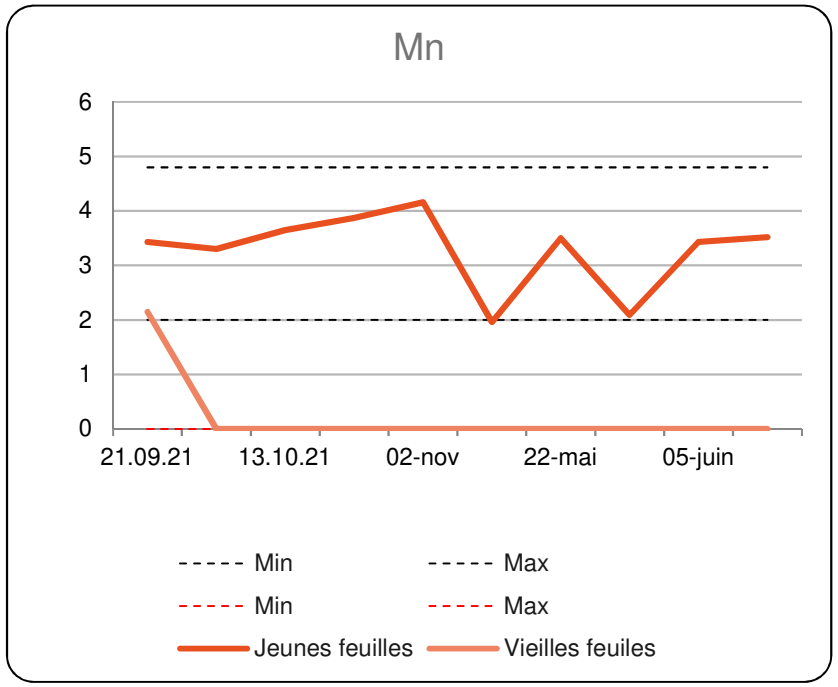


Canola calcium



Micros


Fe
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
21.09.21
13.10.21
02-nov
22-mai
05-juin
Min
Max
Min
Max
Jeunes feuilles
Vieilles feuiles


Mn
6
5
4
3
2
1
0
21.09.21
13.10.21
02-nov
22-mai
05-juin
Min
Max
Min
Max
Jeunes feuilles
Vieilles feuiles

Recommandations – Sap analysis

- Double sampling (young and old leaves)
- 1 every 3 weeks
- at least every keys stages
- Soil sample

- Compare !

Thank you