



Your Sustainability Partner

Protan™

Organic Bio-Stimulant



Introduction to: Protan™

- Protan™ is an organic product derived from natural plant material.
- The high protein content ensures growth stimulation, biotic-and abiotic stress management in crop production.
- The product can be used as soil-and foliar applications.
- Protan™ consists of three major components: L-Amino acids, Organic acids and Phytohormones.
- Protan™ does not contain any Seaweed extracts, Fish-hydrolysates products, Fish emulsion or Molasses.



Protan™ Typical Analysis

BENEFITS

- Decreases plant physiological stress during stress periods.
- Complexes and hold nutrients in more useful forms
- Increases root growth & health
- Promotes greater nutrient uptake and utilisation by the plant
- Improved nutrient cycling reduces input costs through efficiency
- Highly concentrated liquid results in greater use efficiency for your farming system
- Renewable and sustainable
- A free flowing liquid that will keep booms and sprinklers free of blockages

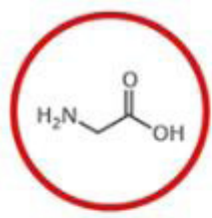


AMINO ACIDS	g/L	g/kg
Glutamic Acid	13.68	15.59
Proline	9.21	10.50
Alanine	10.79	12.30
Leucine	7.98	9.10
Arginine	7.98	9.10
Tyrocine	1.86	2.60
Glycine	5.87	6.70
Serine	5.44	6.20
Valine	5.79	6.60
Threonine	4.21	4.80
Aspartic Acid	3.86	4.40
Histidine	5.00	5.70
Phenylalanine	3.42	3.90
Isoleucine	3.32	2.80
Lysine	6.00	5.26
Methionine	1.93	2.20
Tryptophan	0.44	0.50
Cysteine	1.66	1.90
HO Proline	0.26	0.30
TOTAL	98.54	111.26

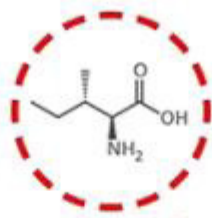
PHYTO HORMONES	
Auxines (IAA)	716.81 ug/L
Auxines (PAA - Weak)	5987.22 ug/L
Cytokines - (tZ, dZ, cZ, iP)	114.23 ug/L
ORGANIC ACIDS	
Abscisic Acid	11.71 ug/L
Jasmonic Acid	36.78 ug/L
Salicylic Acid	1022.13 ug/L
Lactic Acid	30.83%
Fulvic Acid	1.3%
Humic Acid	<0.05%
COMPOSITION	
Phase	Liquid
pH	3.75
SG	1.14



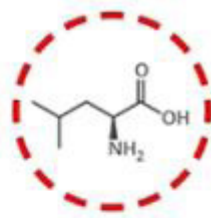
L-Amino acids: Protan™



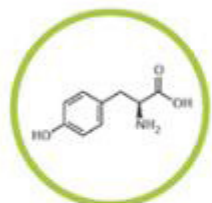
GLYCINE **G**
Gly
GGT, GGC, GGA, GGG



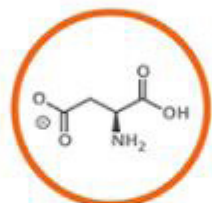
ISOLEUCINE **I**
Ile
ATT, ATC, ATA



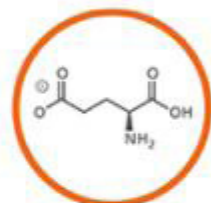
LEUCINE **L**
Leu
CTT, CTC, CTA, CTG, TTA, TTG



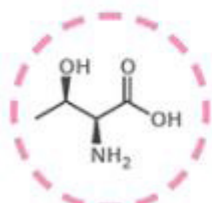
TYROSINE **Y**
Tyr
TAT, TAC



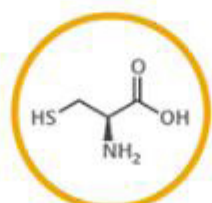
ASPARTIC ACID **D**
Asp
GAT, GAC



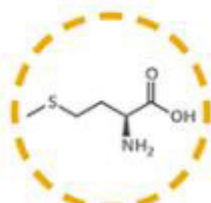
GLUTAMIC ACID **E**
Glu
GAA, GAG



THREONINE **T**
Thr
ACT, ACC, ACA, ACG



CYSTEINE **C**
Cys
TGT, TGC

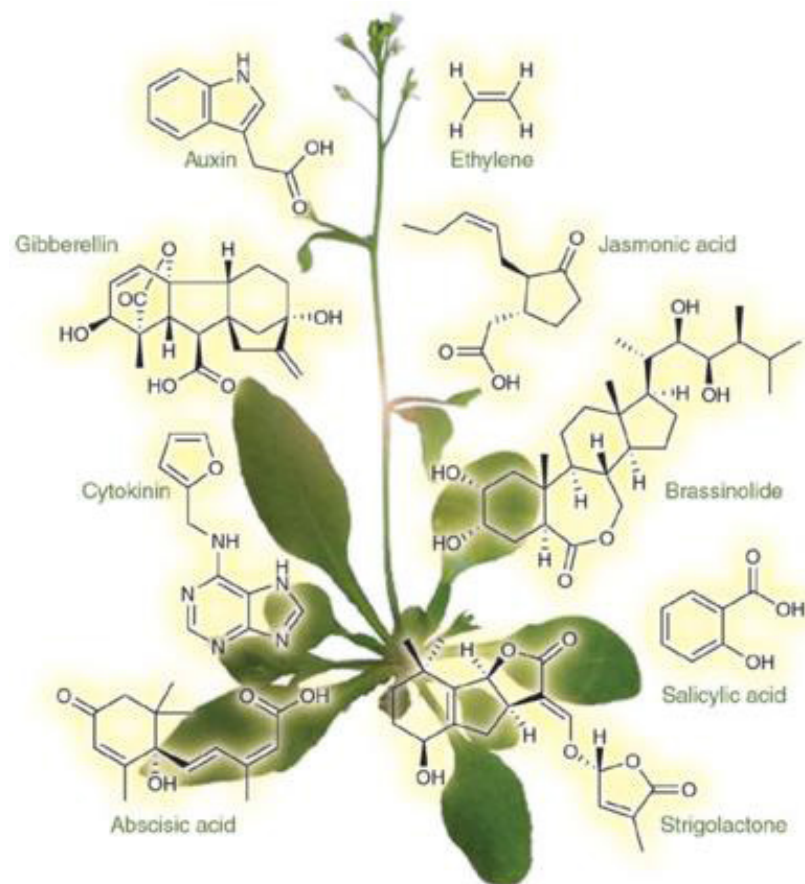


METHIONINE **M**
Met
ATG

- Amino acids are the building blocks of proteins, and they are integral to the chemistry of life.
- L-Amino acids are the purest form of plant amino acids and are readily absorbed by the plant. They are a vital source of organic nitrogen and essential components in various metabolic processes.
- Three of the most important L-amino acids are Tryptophane, Phenylalanine and Tyrosine.
- These amino acids improve the plant's immune system. They are also prerequisites for the plant's ability to naturally produce cytokines & auxins for growth, lignin for tissue structure and phyto-alexins for immunity/plant health.
- Stress factors from agrochemicals (e.g., glyphosate), frost, draught, fertilizer burn etc., inhibit the synthesis of among others, these three amino acids.



Phytohormones: Protan™



- Phytohormones are chemical messengers that co-ordinate cellular activities. Protan™ contains two groups of natural phytohormones namely auxins and cytokines.
- Indoleacetic acid (IAA) is the biological active phytohormones in the auxin group. It regulates growth and development processes such as cell division and elongation, tissue differentiation, apical dominance, and responses to light, gravity & pathogens.
- Cytokines are responsible for cell division. There are four biological active hormones in this group. tZ, cZ, DZ and iP.
- Stress factors inhibit the plant's ability to use amino acids and produce hormones. Applying Protan™ bridges this obstacle.





Organic acids: Protan™

Organic acids are early products of photosynthesis and occupy a central position in the metabolism of plants. Protan™ contains six essential organic acids:

Abscisic acid (ABA)

Movement of ABA is an important mechanism of plant responses to drought stress. ABA functions in many plant developmental processes, including seed and bud dormancy, the control of organ size and stomatal closure.

Jasmonic acid (JA)

The major function of JA is to regulate plant responses to abiotic and biotic stresses as well as plant growth and development.

Lactic acid (LA)

Improves plant growth

Salicylic acid

Salicylic acid increases the plant's response to abiotic and biotic stress conditions. It increases the plant's resistance to Systemic Acquired Resistance (SAR)

Fulvic Acid

Iron and magnesium ions are indispensable for photosynthesis. Fulvic acid promotes the function of transporting those ions into plant cells by a chelating effect.

Humic acids

Acting as a natural chelator, humic acid helps plant to absorb nutrients more efficiently to create a long-term positive effect on productivity.

Case Studies: Protan™



Control



Treated 3 days prior to severe frost with Protan™ @ 3L/ha

Frost damage Tomatoes, July 2021:

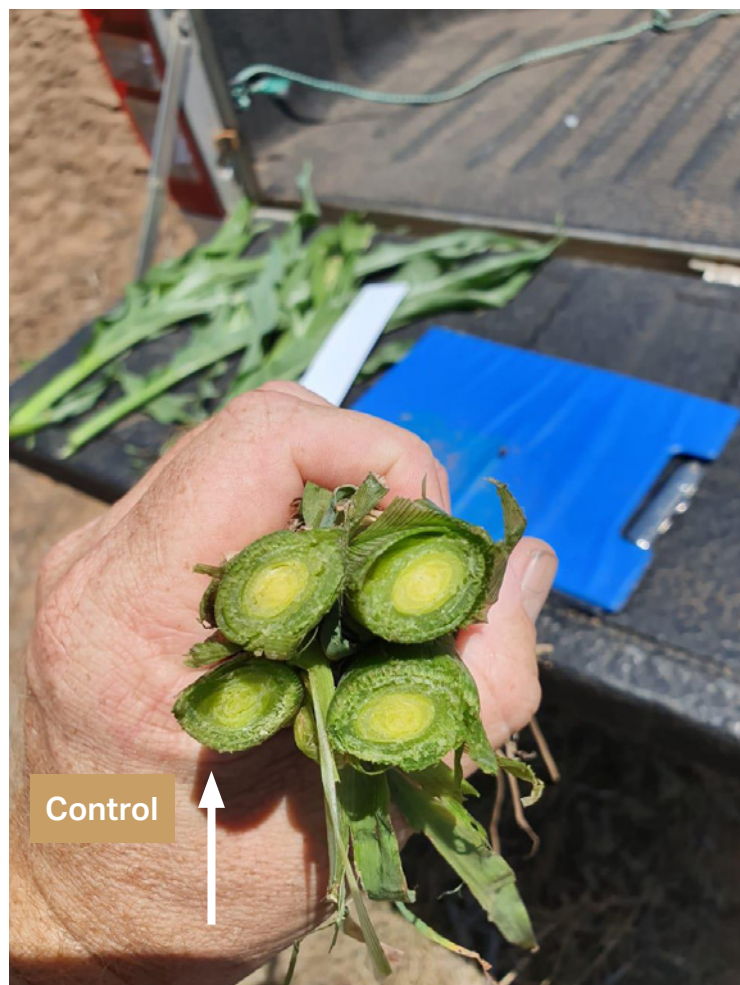
- Treated 3 days prior to severe frost with Protan™ @ 3L/ha

Results:

- 5 days after treatment significant more resistance shown in Protan™ treated block. Recovery time significantly reduced in Protan™ block. Untreated block died back completely.



Volume Application: Protan™



Maize, Lichtenburg 2020:

Stem thickness, root
development and overall
plant health significantly
improved on treated plants

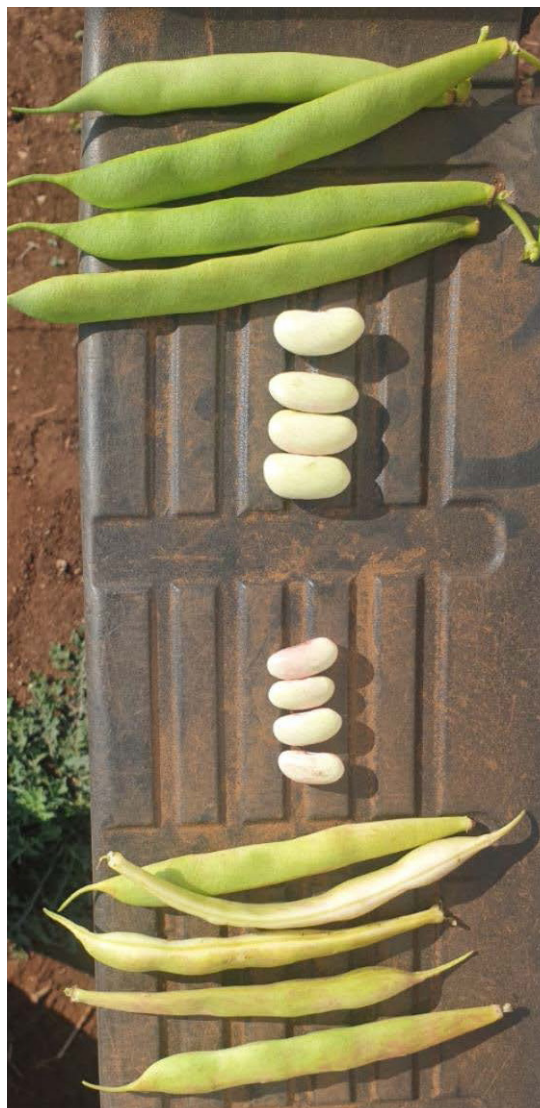




Treated block at 2L/ha



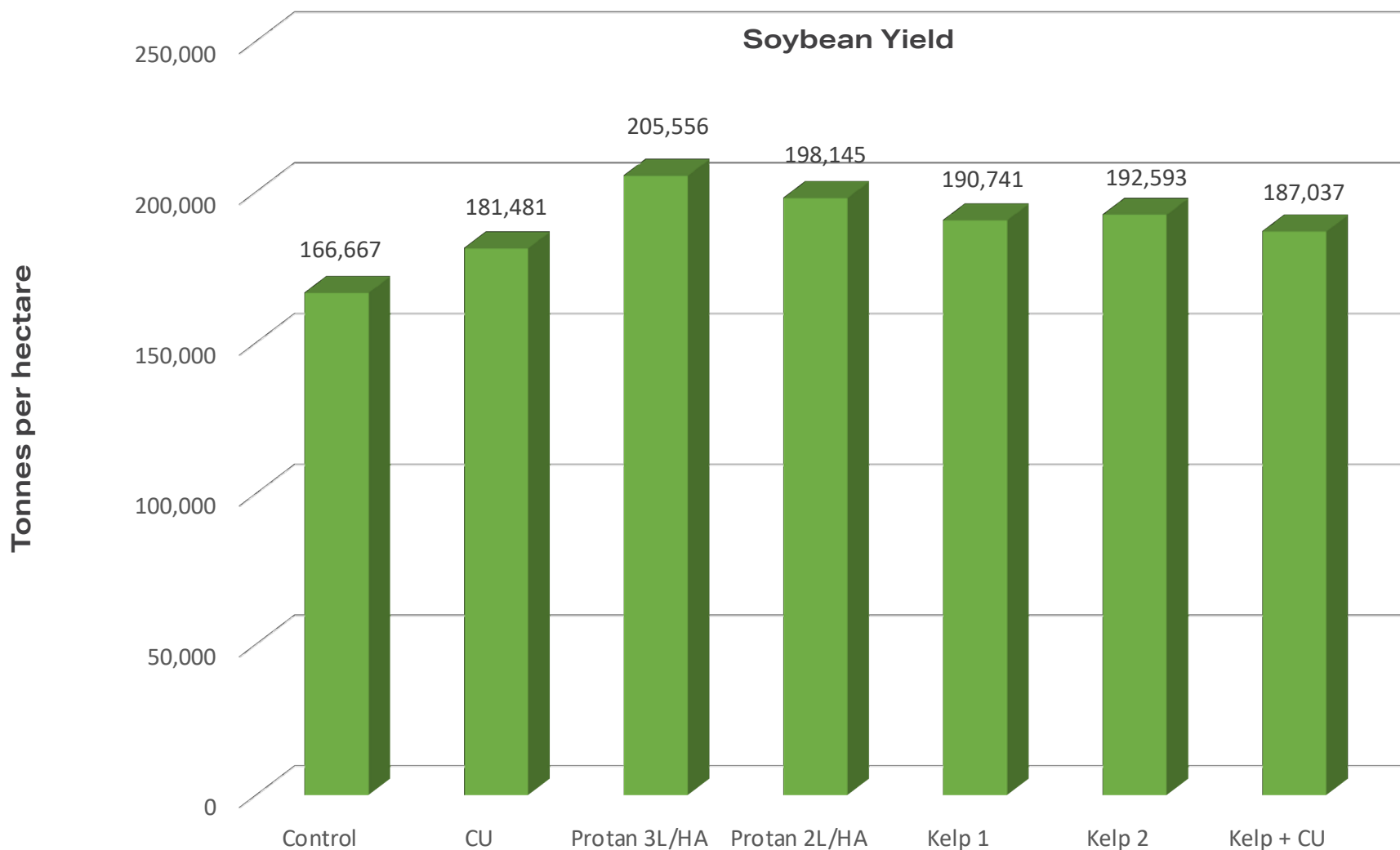
Control



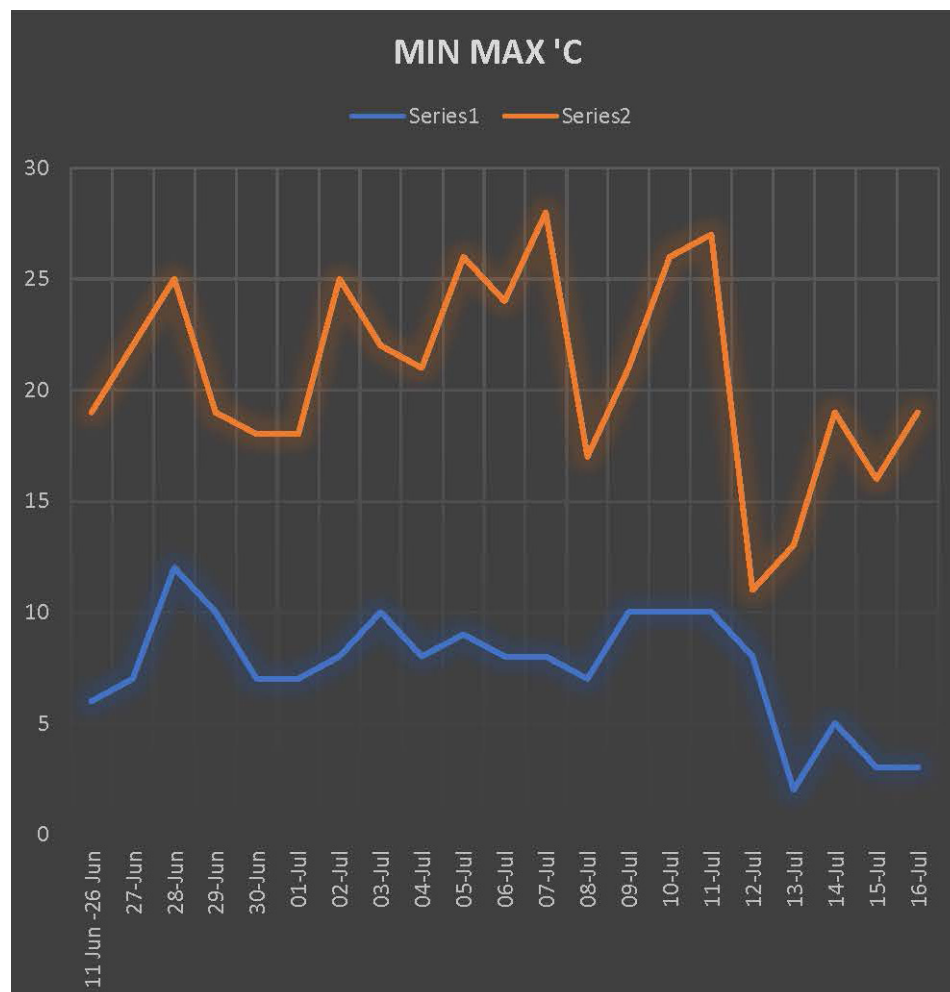
Crop Yield in Sugar Beans, June 2021:

- Increased vegetative growth.
- Increased yield.

Performance vs industry leading products: Protan™



Low temperature germination: Protan™



Low temperature germination: July 2020

11/06/2020 –16/07/2020 35 days after planting

- Sandy soils (<15% clay).
- No additional fertilizers.
- 10 reps/treatment.
- Control, 1L/ha, 2L/ha.



Plant stress and the working of Protan™

Germination:

10 REPLICATES/TREATMENT

Day	Control	1L/Ha	2L/Ha
1	-	-	-
16	-	2	5
17	-	3	7
18	-	4	8
19	-	5	8
20	-	6	9
21	-	6	9
22	-	7	10
23	-	7	10
24	1	8	10
25	2	8	10
26	5	9	10
27	7	9	10
28	7	10	10
29	7	10	10
30	7	10	10
31	7	10	10
32	7	10	10
33	7	10	10
34	7	10	10
35	7	10	10

← 6 days to 100% emergence

↑ 12 days to 100% emergence



Root development on sweet potato cuttings: Protan™



Control



Protan

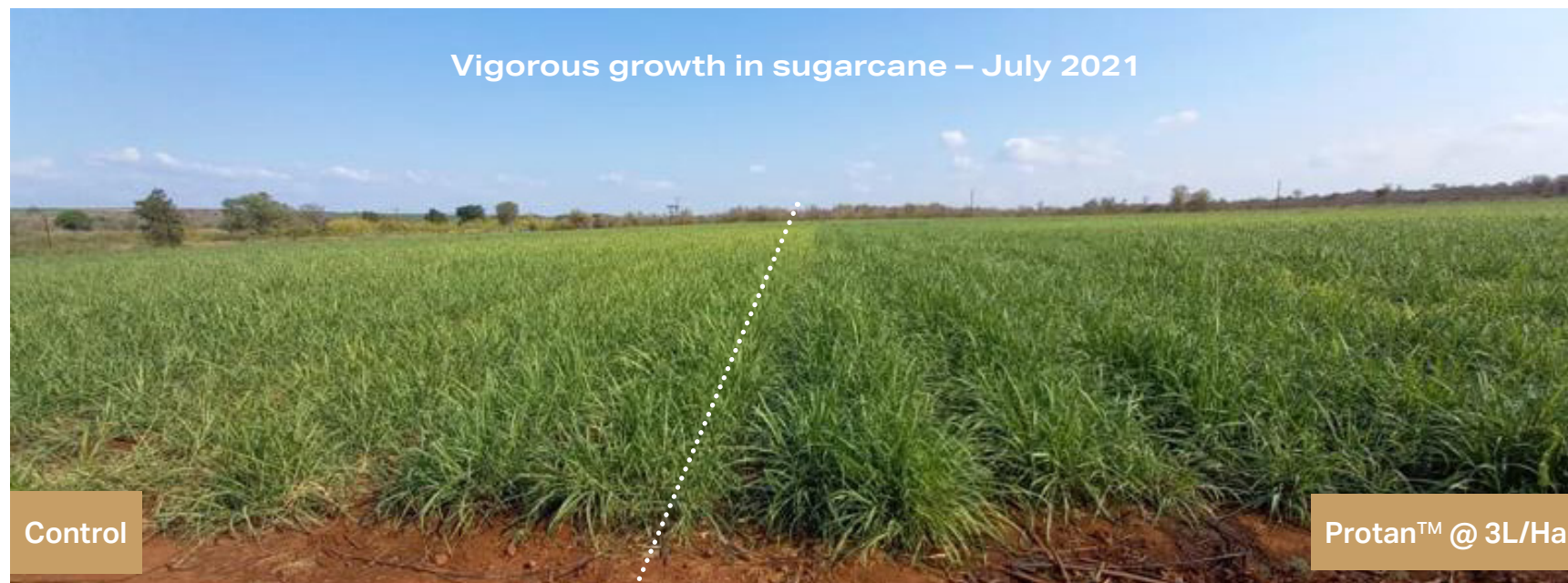
Root development on sweet potato cuttings:
October 2021

07/10/2021

- 50ml Protan™/10L water sprayed on cuttings just before planting. 7 days after planting - Significant root development on treated cuttings at every node.



Vigorous growth in sugarcane: **Protan™**



Early flowering: Protan™

Early flowering in Green peppers: July 2021



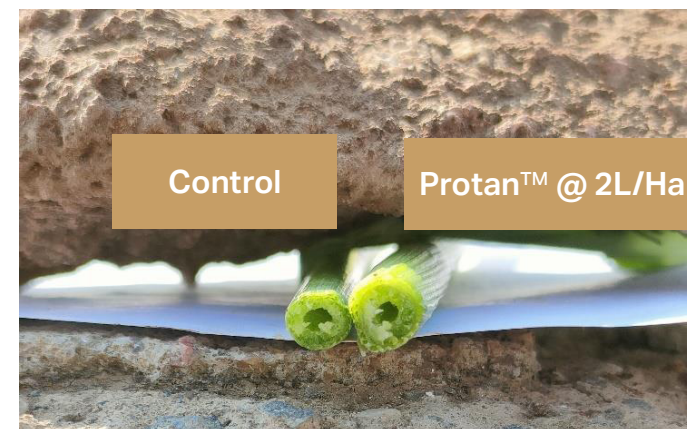
General plant development: Protan™



Wheat August 2021 2L/ha
Protan™ mixed with Moddus

Results:

85kg/ha @ \$470/ =
\$39.95 – \$16.00 =
\$23.95/ha return



Leaf analysis: Protan™

Wheat was planted 9 June 2022, 2L Protan™ p/ha was applied in the furrow with planting.

The leaves were tested July 25, 2022. Protan™ analysis outperforms the other products and controls.

#	LAB No	Reference	Description	Type	N	P	K	Ca	Mg	S	Na	Fe	Mn	Zn	Cu	B	Mo
12	L9-16845	AT-VTMJ01324	20 Ha Rev	Wheat	5.78	0.62	3,96	0.39	0.22	0.43	501	296	58	38	10	7	0.92
13	L9-16846	AT-VTMJ01325	20 Ha Rev	Wheat	5.93	0.61	3,68	0.38	0.22	0.45	453	247	68	43	11	8	0.99
14	L9-16847	AT-VTMJ01326	20 Ha Rev	Wheat	6.37	0.73	3.94	0.33	0.21	0.5	282	223	81	44	12	9	0.87
15	L9-16848	AT-VTMJ01327	20 Ha Rev	Wheat	5.88	0.61	4.09	0.42	0.22	0.46	399	285	64	37	12	7	0.94
16	L9-16849	AT-VTMJ01328	20 Ha Rev	Wheat	5.85	0.62	4.21	0.41	0.21	0.45	323	347	78	37	14	7	0.91

Product 1

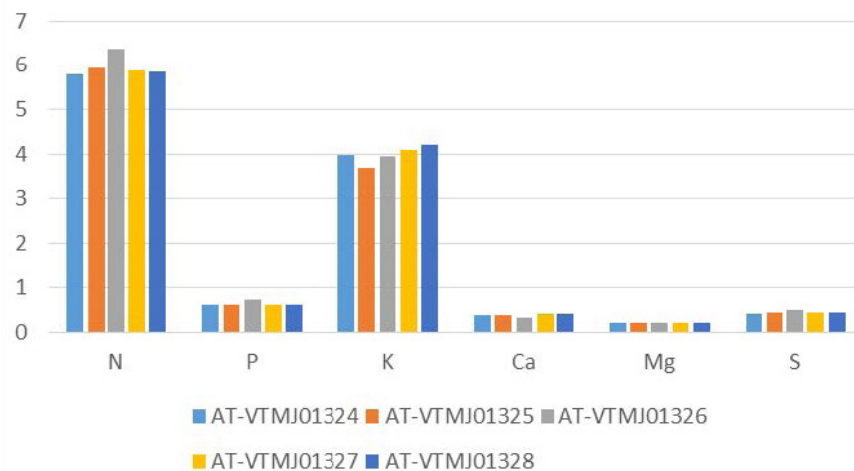
Control

PROTAN @ 2L/ha

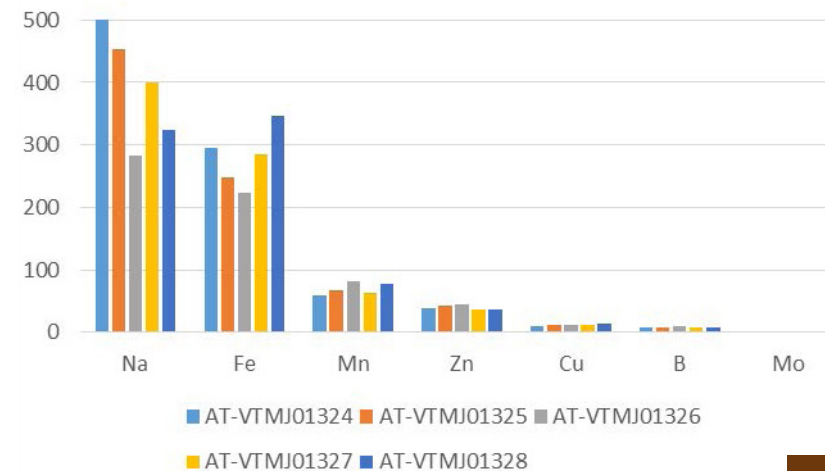
Product 2

Product 3

Makro-elemente (%)



Mikro-elemente (mg/kg)



Plant stress due to herbicide: Protan™

Soyas sprayed with PROTAN and without Protan™ - 2022

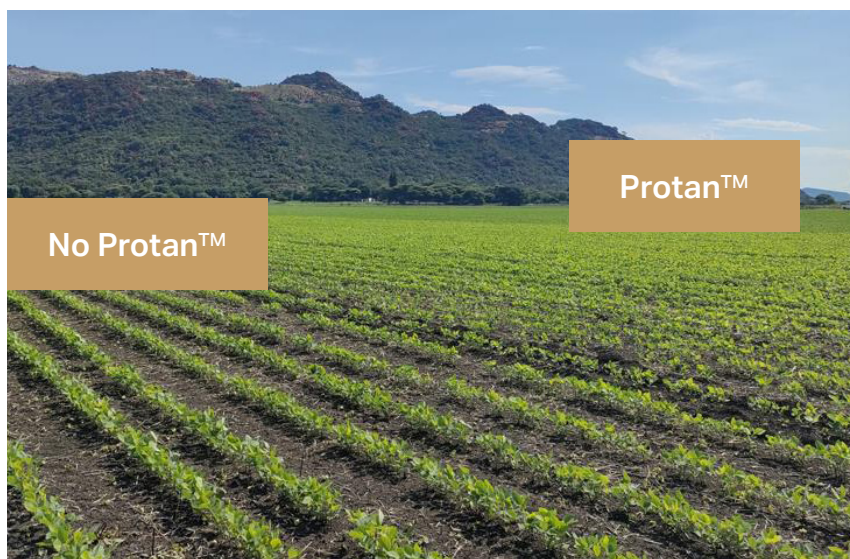
Mixture in the tank was 4L Glyphosate, 1 x 14g packet of Elegance and 2L Protan™ per ha.

Results: Soya's pretty green and +-98% of the Morning Glory died.
BRIX reading is an average of 7

Mixture in the tank was 4L Glyphosate and 1 x 14g packet of Elegance per ha.

Results: Soya's are yellow and +-30% of the Morning Glory died.
BRIX reading is an average of 5

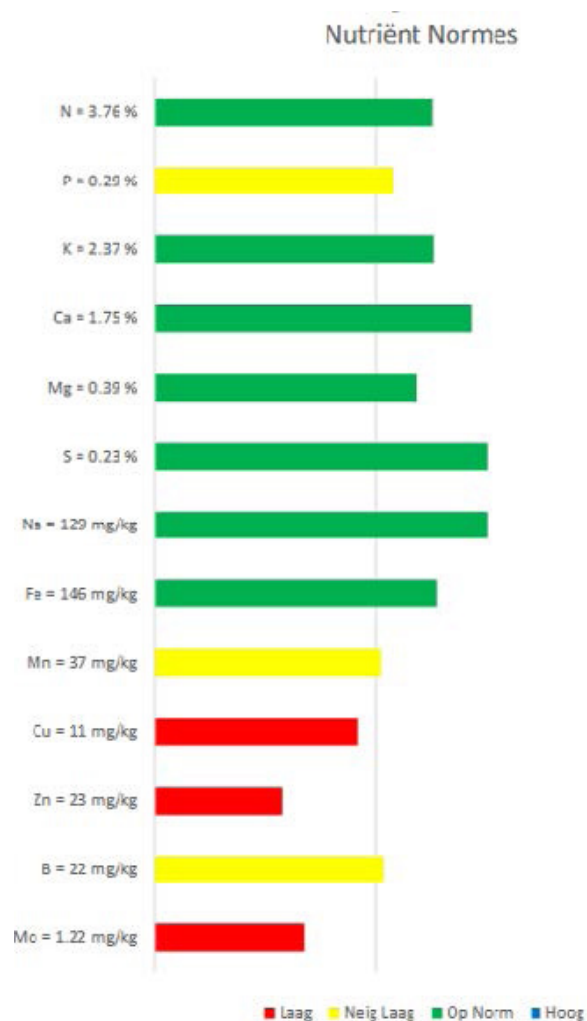
The spraying was done on 22 Dec 2022. BRIX was tested on 24 January 2023.





Leaf analysis: Protan™

Industrial Product



Sugar beans - 2023

Where Protan™ was applied most of the Macro and Micro elements were higher than where the Industrial product were applied & Sodium levels were significantly lower than the Industrial product.

Protan @ 2L/ha

