HUMA GRO™

COLLOIDAL Liquid Fertilizers

"MEASURES, efficiency and uptake of HUMA GRO® colloidal nutrition vs. conventional fertilizers in certain types of soils"

PERFORMANCE TRIAL OF HUMA GRO® SUPER K™ FERTILIZER WITH MICRO CARBON NUTRITION IN RED GLOBE/FREEDOM, SHIFT 1, VALVE I3

Previously fertilized
FIELD DATA

- CROP: VINE
- VARIETY: Red/Freedom
- AGE: 24 months
- PHENOLOGY Formation
- DOSES OF POTASSIUM APPLIED HUMA GRO® : 15.6 (2.4 LITERS) of HUMA GRO® SUPER K™/valve 1.48 ha
- DOSES OF POTASSIUM : 15.6 (16.74 kg potassium nitrate + 35.19 kg potassium sulfate) CONVENTIONAL 2.48 ha valve
- EXPERIMENTAL DOSE: Shift 01 Valve I3 (HUMA GRO®)
- (CONTROL PLOT): Shift 01 Valve H3

GOALS

- To show the effective potassium uptake after applying HUMA GRO® SUPER K™, with ***Micro Carbon Technology®,*** as measured after some hours of being applied using a drip system to demonstrate the improved cation-exchange capacity in the soil-plant solution.
- However, to illustrate the activity of the ions in the soil solution, we measured the ions with the highest incidence - NO3, K and Ca.
- The behavior of the soil solution was also monitored once the fertilizers were applied.
- (EC and pH)

SAMPLING AND SAMPLE READING METHOD

Preparation of saturated paste - Picture

- Saturated paste preparation method:
- About 150 ml of soil (volume) were extracted and put into a beaker, adding 150 ml of distilled water.
- The mixture was shaken for 15 minutes and then left to settle for 5 minutes more so as to extract the material to be measured.

Saturated paste extract

Samples were collected before applying the fertilizers in both valves

The leaves were randomly extracted from the middle section of the loaders

Collected leaves were prepared by removing most of the leaf blade and leaving the ribs and the petiole to extract the sap.

Horiba equipment calibration with the respective buffer

The leaves were chopped and then pressed to extract the sap

The sap was poured into the Horiba gauges to determine ion concentration

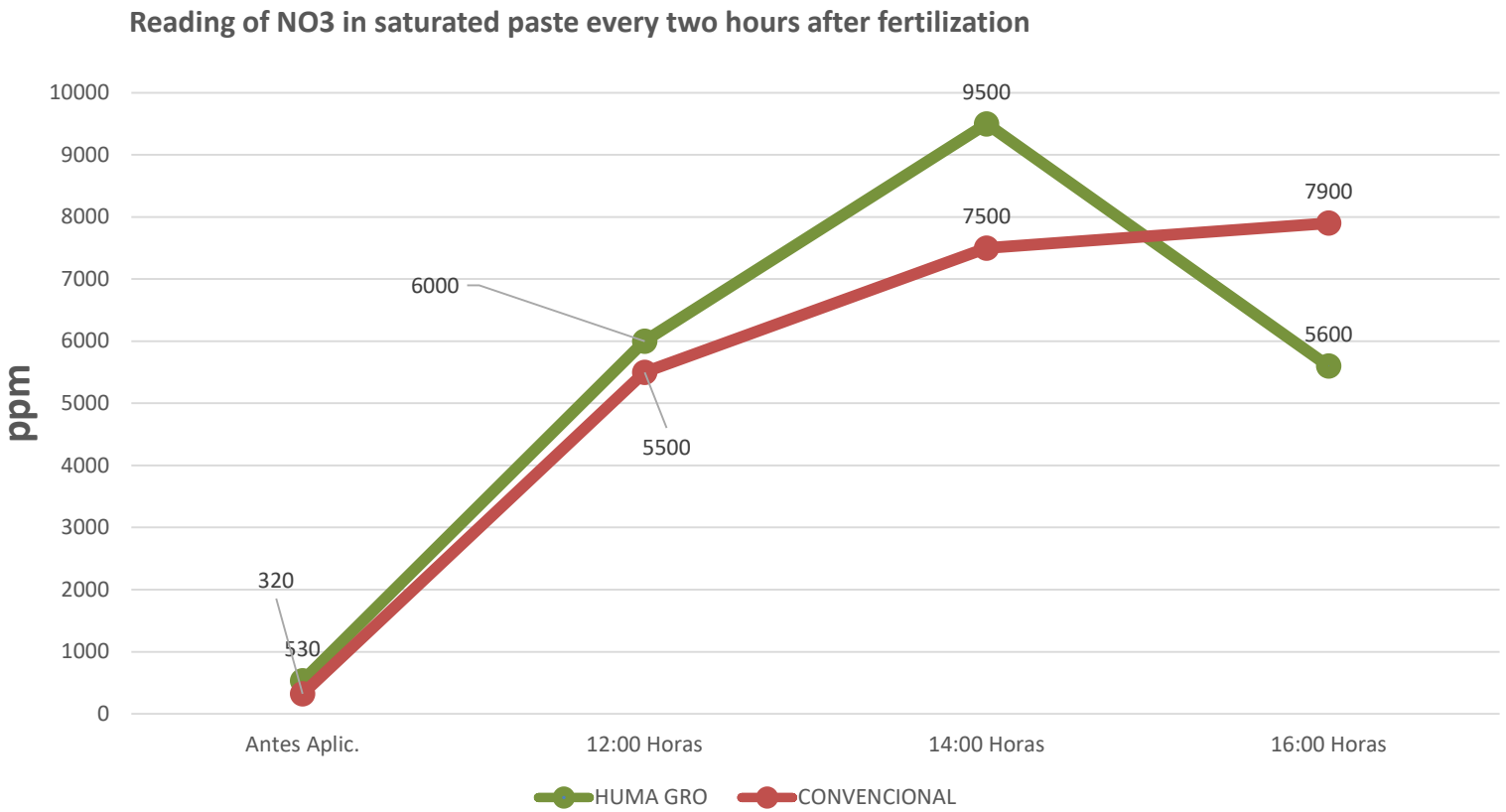
Sap ion concentration was measured using a method called spectrometry

RESULTS:

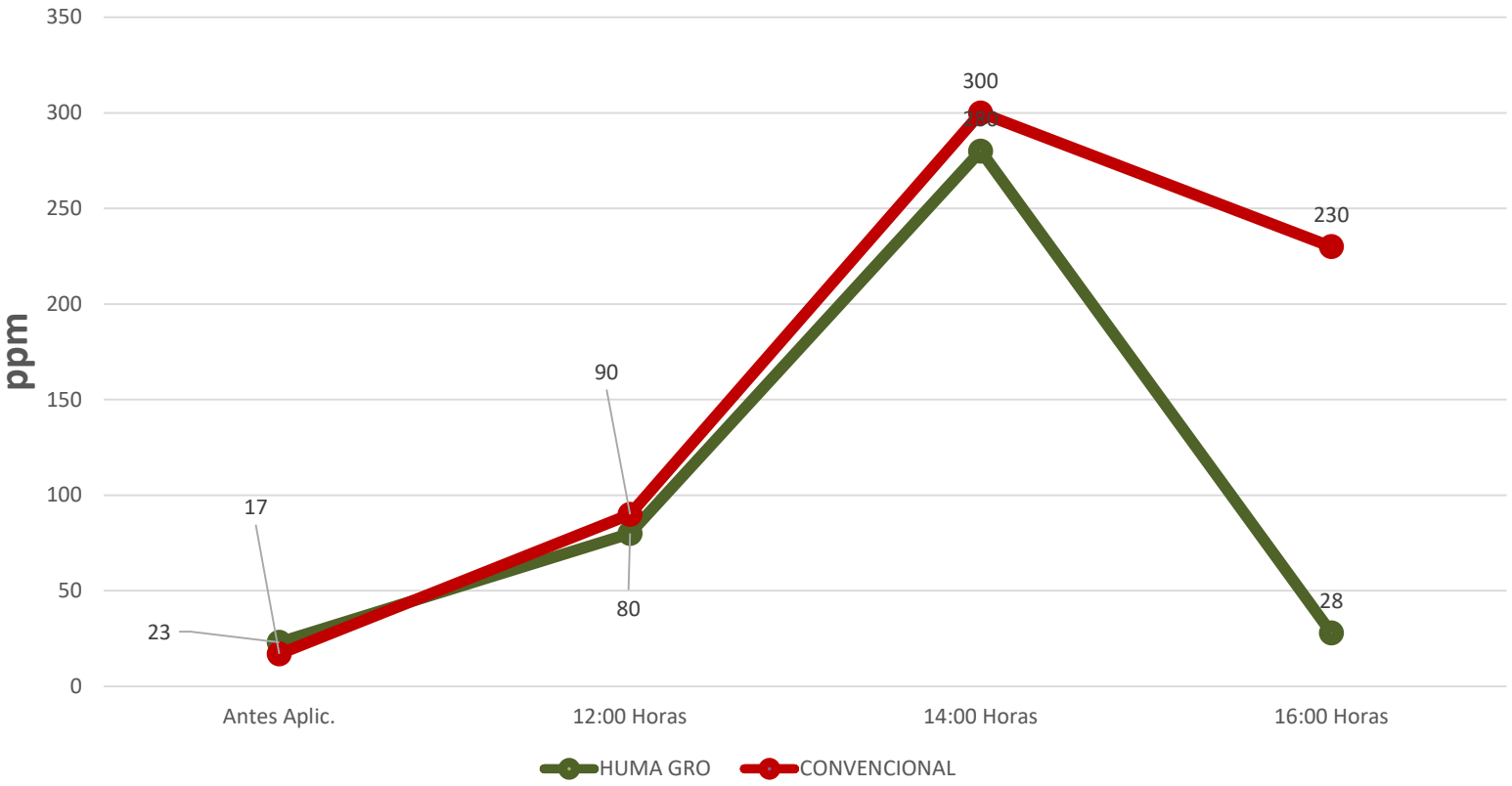
In saturated soil paste

Ion	Lectura pasta saturada antes y despues HUMA GRO				Lectura pasta saturada antes y despues Convencional			
	Antes	12:00 Horas	14:00 Horas	16:00 Horas	Antes	12:00 Horas	14:00 Horas	16:00 Horas
NO3	530	6000	9500	5600	320	5500	7500	7900
K+	23	80	280	28	17	90	300	230
Ca	21	250	280	54	29	24	440	300
Na	28	200	500	150	50	29	750	870
Ph	8.4	7.5	7.6	7	8.6	8.6	8.5	8.6
CE	0.3	0.3	0.56	0.76	0.49	0.56	1.14	1

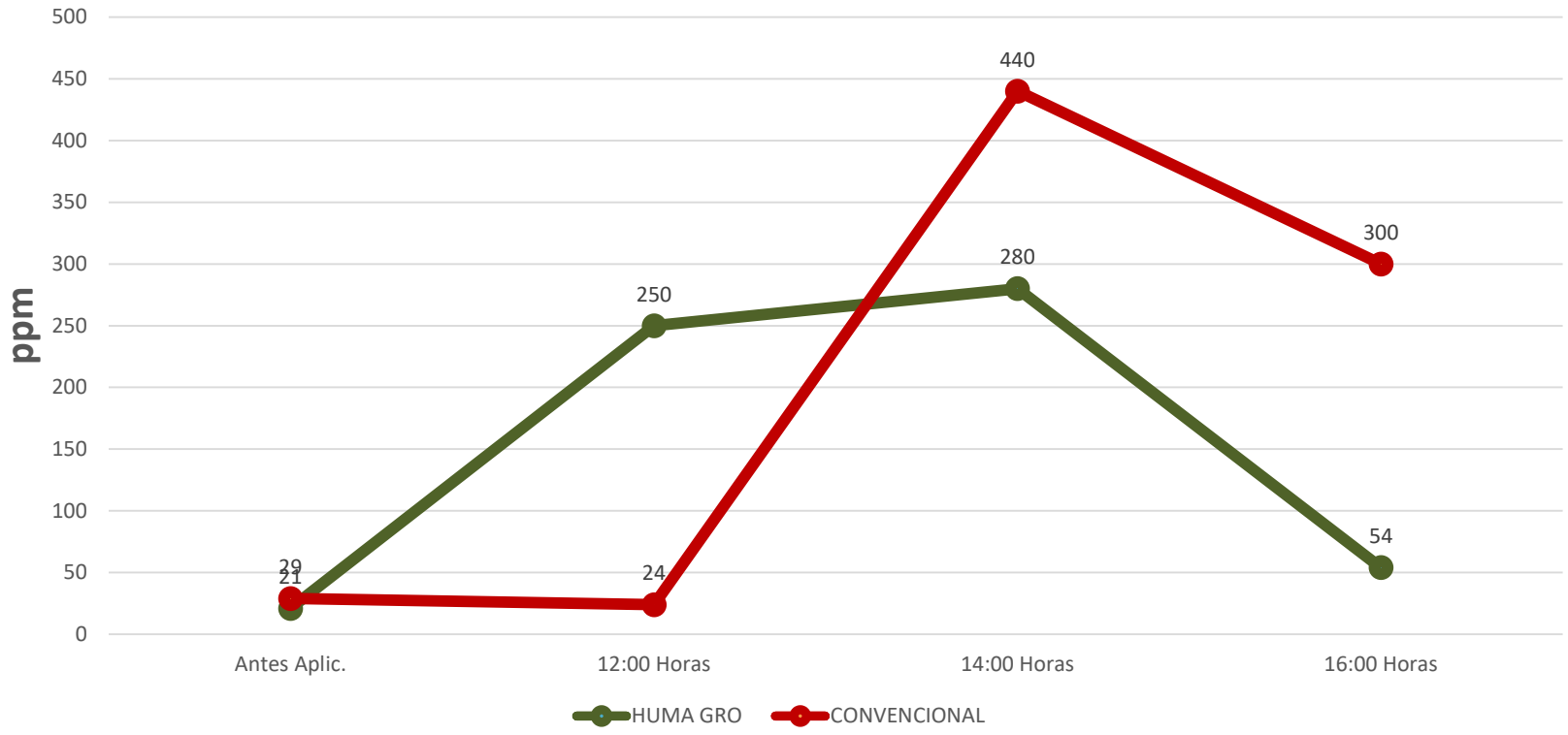
SATURATED SOIL PASTE EXTRACT



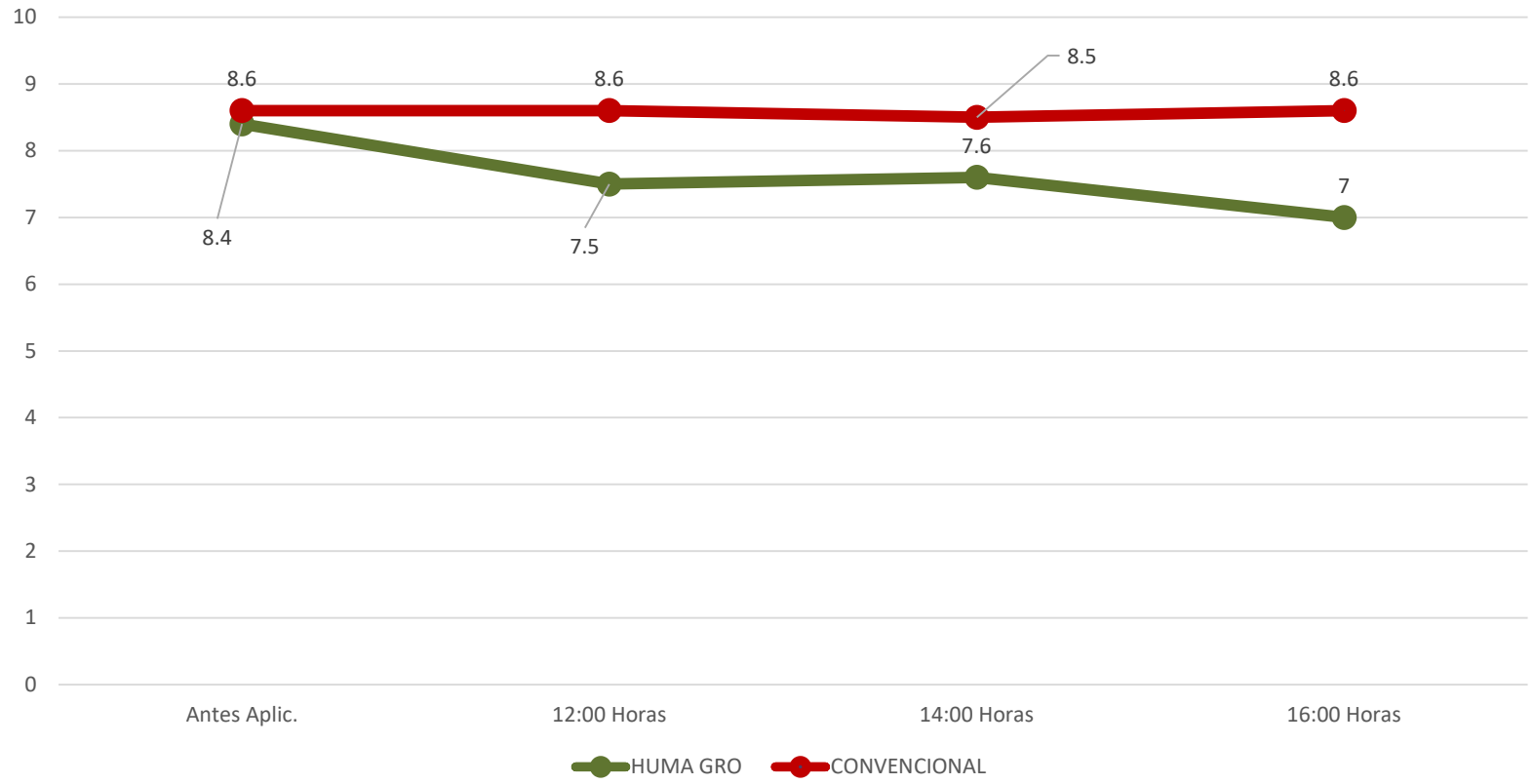
Reading of K+ in saturated paste every two hours after fertilization



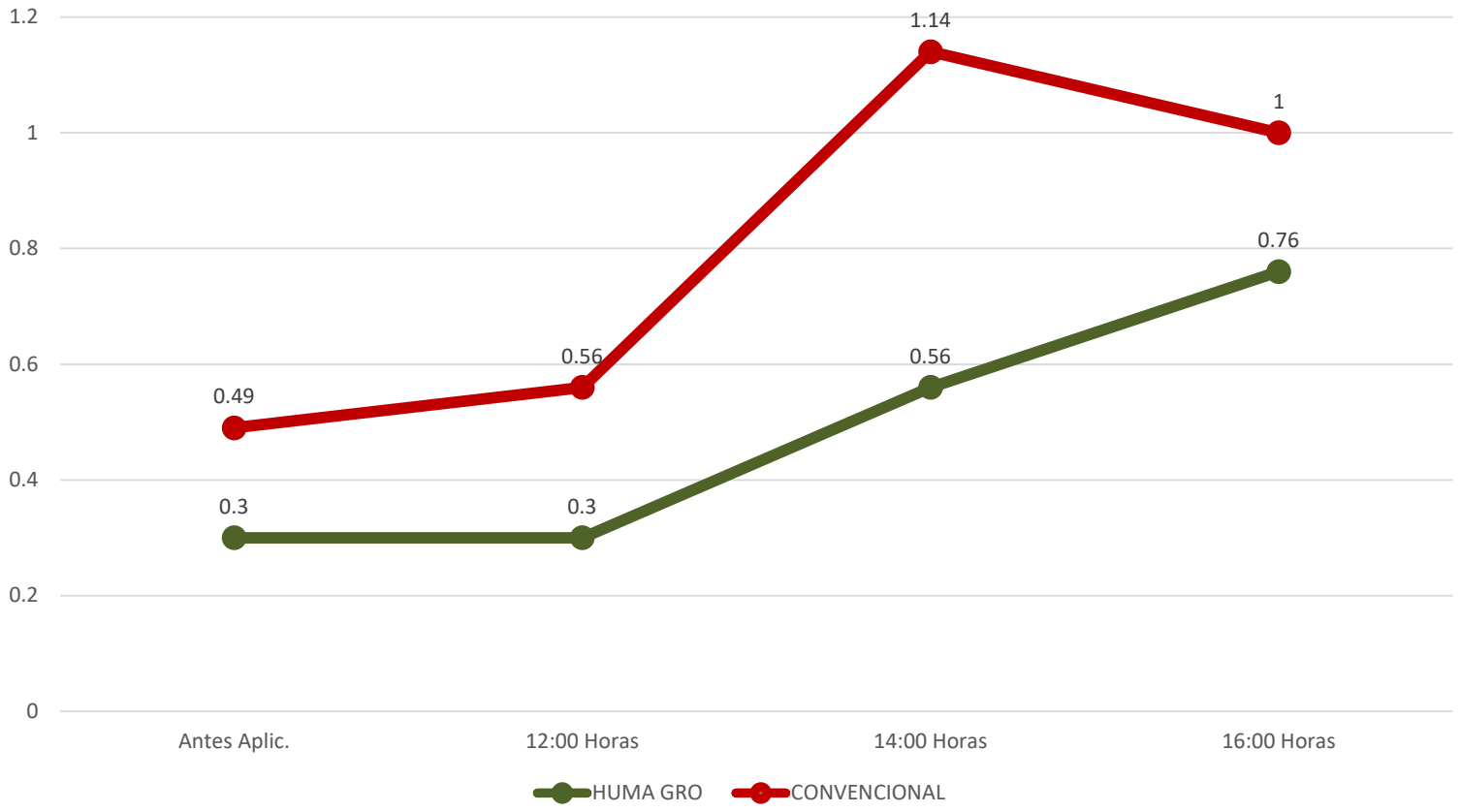
Reading of Ca++ in saturated paste every two hours after fertilization



Reading of pH in saturated paste every two hours after fertilization



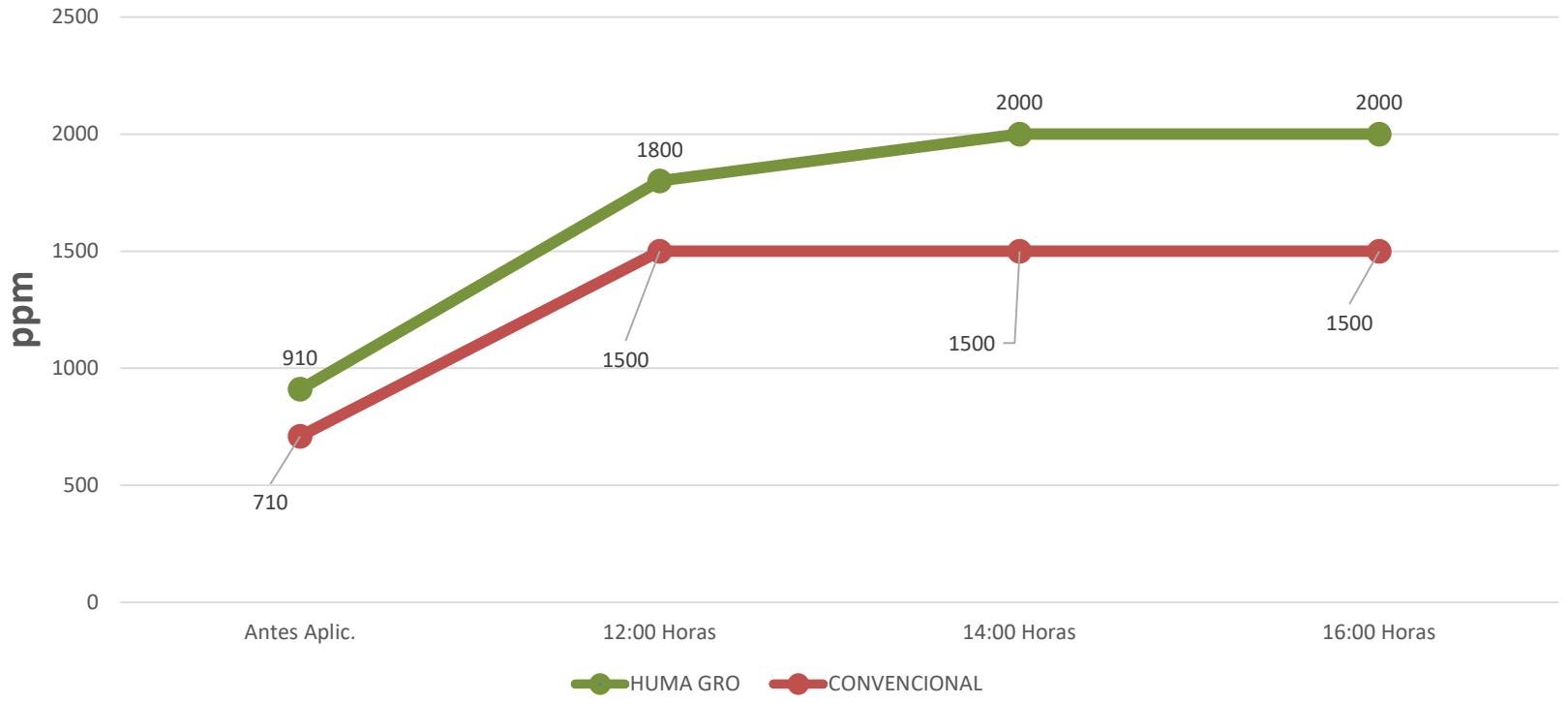
Reading of EC in saturated paste every two hours after fertilization



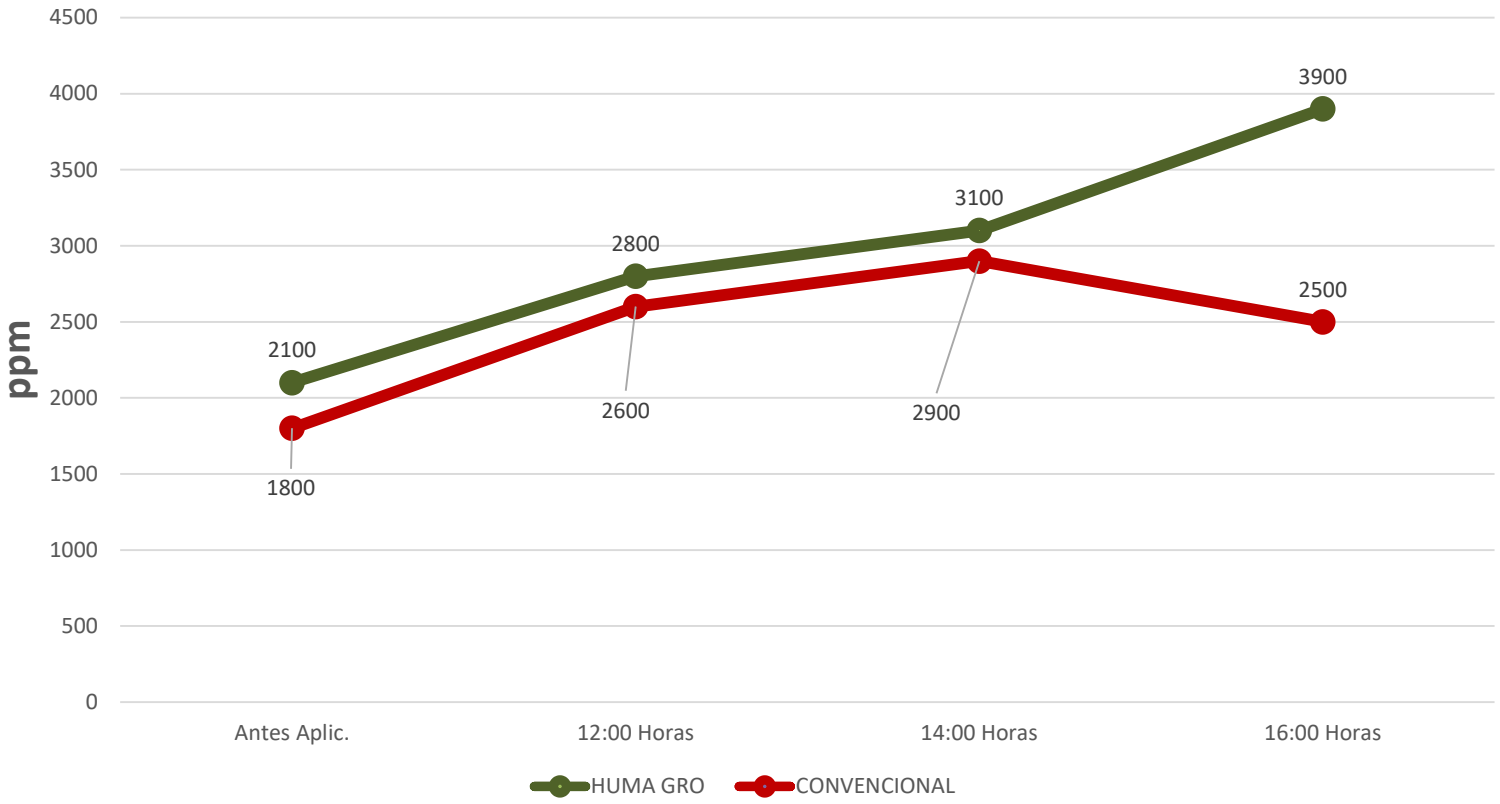
RESULTS: SAP Reading

Ion	Lectura SAVIA antes y despues HUMA GRO				Lectura SAVIA antes y despues Convencional			
	Antes	12:00 Horas	14:00 Horas	16:00 Horas	Antes	12:00 Horas	14:00 Horas	16:00 Horas
NO3	910	1800	2000	2000	710	1500	1500	1500
K+	2100	2800	3100	3900	1800	2600	2900	2500
Ca	55	52	52	50	73	68	45	46
Na	320	450	450	450	340	380	400	420

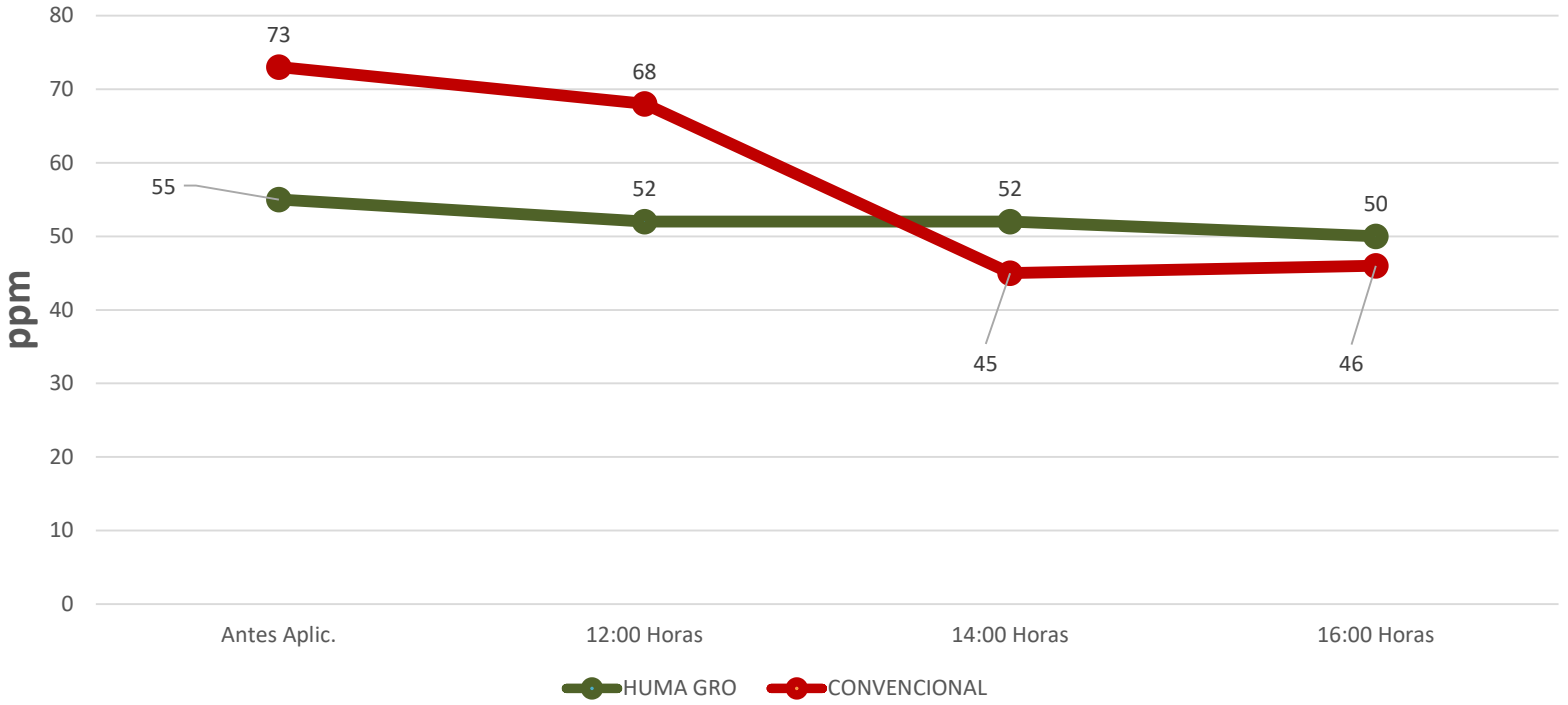
Reading of NO3 in SAP every two hours after fertilization



Reading of K+ in SAP every two hours after fertilization



Reading of Ca++ in SAP every two hours after fertilization



ASSESSING THE EFFICIENCY OF FUNGICIDES FOR CONTROLLING LASIODIPLODIA THEOBROMAE

I GENERAL GOAL:

To determine the efficiency of fungicides (in-vitro) for controlling pathogens.

II SPECIFIC GOAL:

To determine the efficiency of products with copper sulfate-based formulations.

III GROUNDS:

To develop an entry control program for new fungicides.

IV METHODOLOGY:

- **PATHOGEN ISOLATION:**

  Isolate the fungus from the affected tissue by inoculating the culture medium.

- **TRIAL SET-UP:**

  -Disinfect the material.

  -Determine the doses and dilutions of the products to be used.

- **POISONED FOOD TECHNIQUE:**

  -Prepare the culture medium (PDA) and add each product dose.

  -Chop a small portion of the isolated pathogen again to add it to each of the culture mediums prepared.

  - Incubate the plates at 25 °C.

- **FOLLOW UP:**

  Measure mycelial growth (radius) 7 times on a daily basis.

Lasiodiplodia theobromae

METHODOLOGY

FLOW

PATHOGEN ISOLATION

MATERIAL DISINFECTION

TRIAL SET-UP

DETERMINING EACH PRODUCT DOSE

POISONED FOOD TECHNIQUE:

FOLLOW UP

IV TREATMENTS:

7 daily measurement were performed

Set-up dates: August 5, 2016

TRATAMIENTO DE PRODUCTOS FUNGICIDAS

PRODUCTO	Dosis (Lt/Ha) campo		Dilución (prod/agua) Laboratorio (ml)
Phyton	300 L/Há	0.45 L/Há	0.15/100
Copper		0.45 L/Há	0.15/101
TESTIGO ABSOLUTO			

Set-up:

The pH was determined in:

*Water-diluted fungicides (pre-mix)

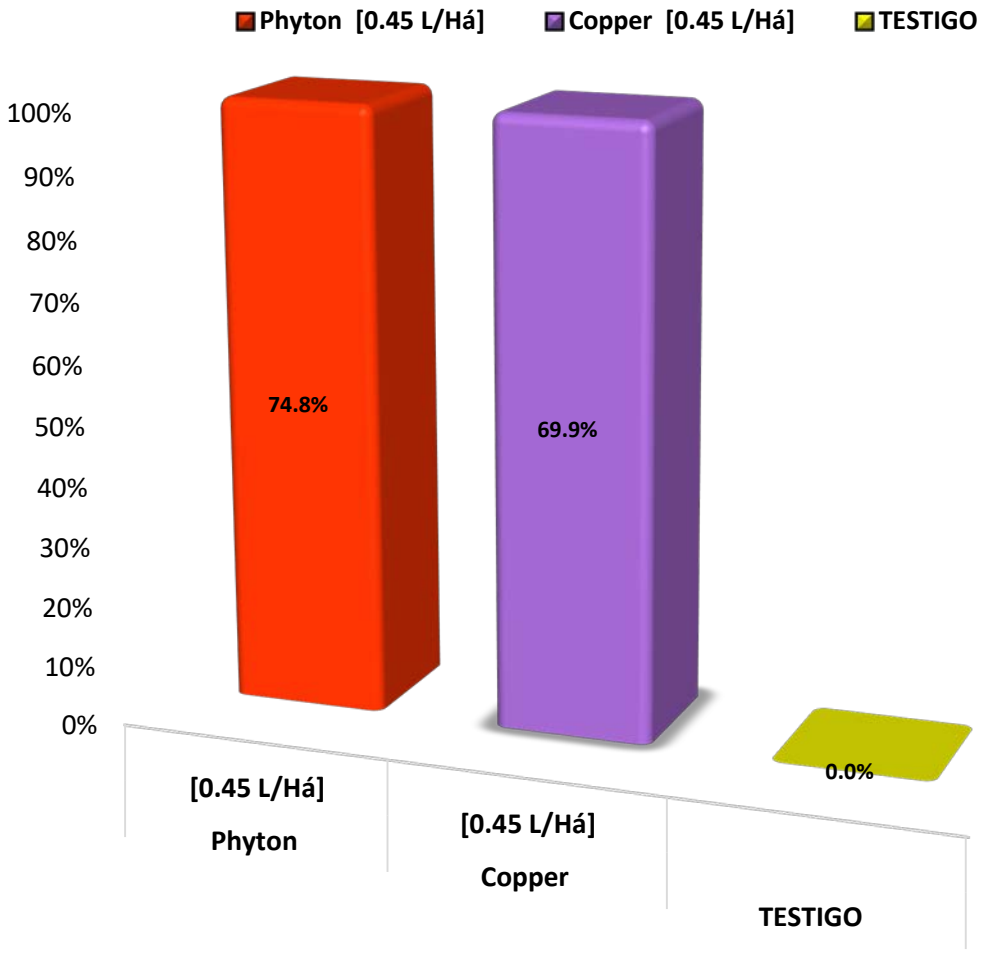
*Fungicides in set-up plates (field)

pH EN PRODUCTOS FUNGICIDAS

		Potencial de hidogeno (Ph)	
PRODUCTO	**Dosis (Lt/Ha)**	**Producto con agua**	**Producto con PDA**
Phyton	**[0.45 lt/ha]**	4.7	5.7
Copper	**[0.45 lt/ha]**	3.1	5.5
TESTIGO		**5.8**	5.8

IV RESULTS:

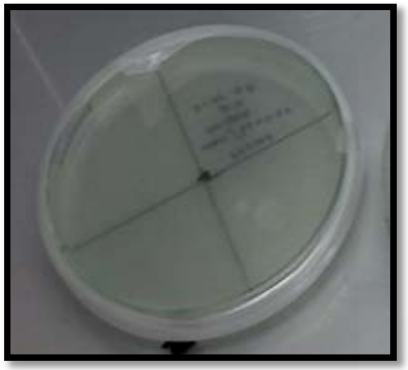
% OF FUNGICIDE CONTROL



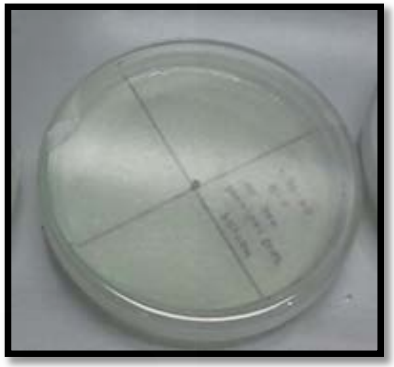
COMPARACIÓN DE CONTROL DE FUNGICIDAS

FECHA DE INSTALACIÓN: 05 de agosto del 2016

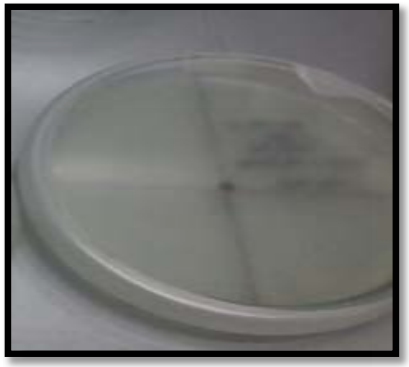
TESTIGO



PHYTON



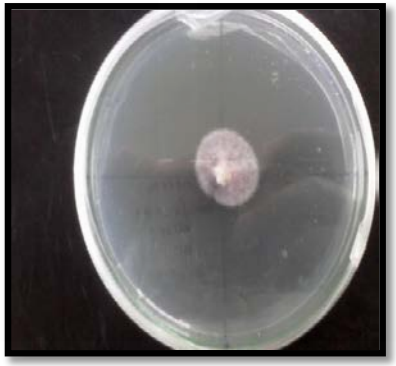
COPPER



FECHA DE CULMINACIÓN: 12 de agosto del 2016

TESTIGO

PHYTON



COPPER

Report of recent applications to a coffee field

Coffee nutrition - Peru

General information

- Location:
  - Department: Cajamarca/Province: Jaen
- Variety: Catimor
- Density: 4000 plants x HA
- Plant age: 2 years
- Trial duration: Annual cycle

Fertilization plan to be used

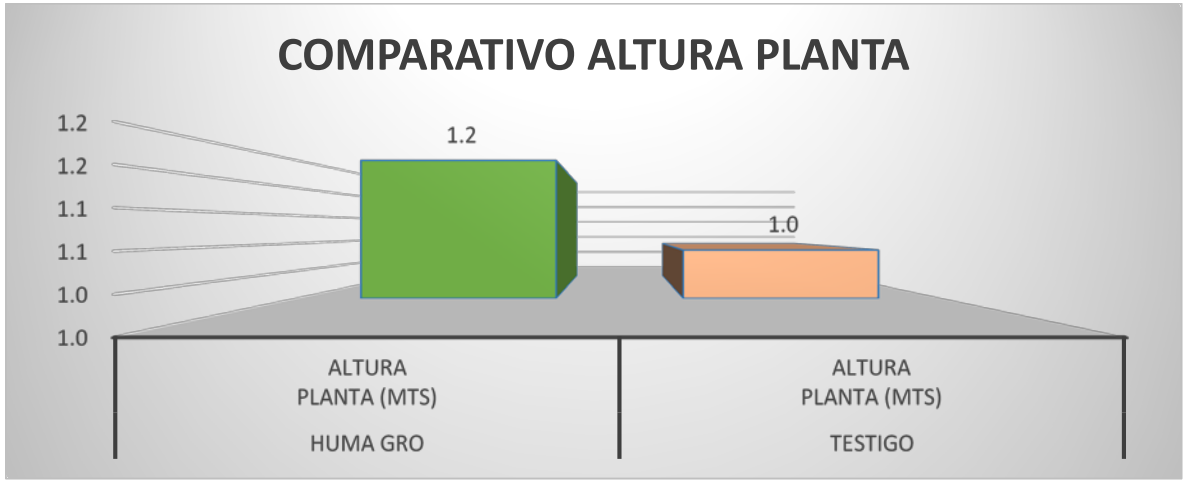
Ion	UNIDADES	*Producto*	*Und. Med*	*Dosis 1 16/02/2016*	*Dosis 2 28/05/2016*	*dosis 3 08/09/2016*	*TOTAL*
N	80	*N30*	Lts	*10*	*15*	*15*	**40**
P	31.96	Phosmax	Lts	0.94	0.94	1.88	**3.76**
K	205.79	Super K	Lts	13.33	13.33	5	**31.66**
Ca	53.34	Calcium	Lts	8.89	8.89	17.78	**35.56**
Mg	26.637	44 Mag	Lts	5.13	5.13	10.23	**20.49**
S	16	Sulfur	Lts	0.5	0.5	1	**2**
B	0.18	Boro Max	Lts	0.03	0.03	0.06	**0.12**
Zn	0.525	Z - Max	Lts	0.09	0.09	0.17	**0.35**
Mn	0.3	Manganese	Lts	0.05	0.05	0.1	**0.2**
Fe	0.675	Iron	Lts	0.11	0.11	0.23	**0.45**
Cu	0.195	Copper	Lts	0.03	0.03	0.07	**0.13**
TOTAL DE LITROS				**39.1**	**44.1**	**51.52**	**134.72**

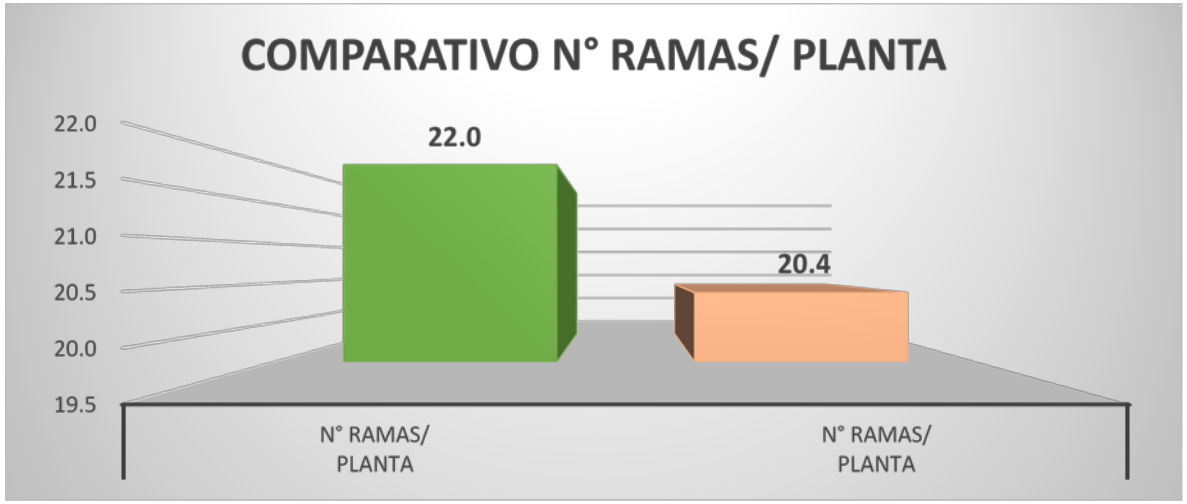
PREPARATION OF FERTILIZERS

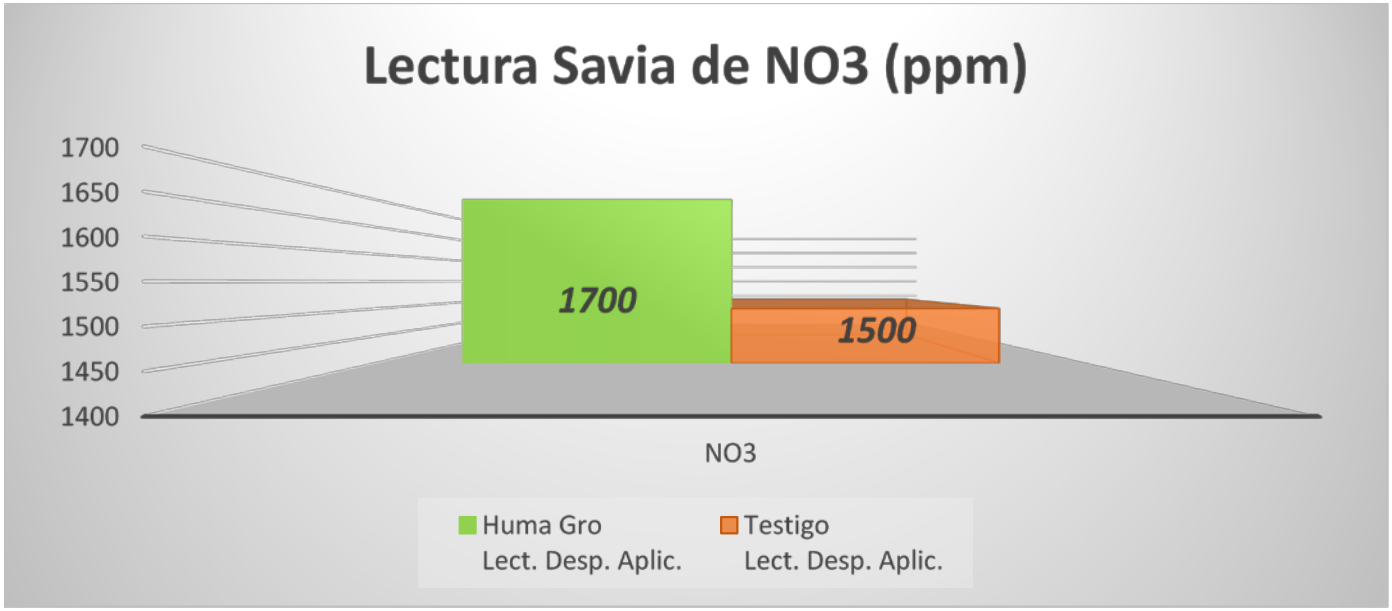
Assessing the development of a coffee crop fertilized with HUMA GRO® 05/28/2016 vs. a conventional fertilizer

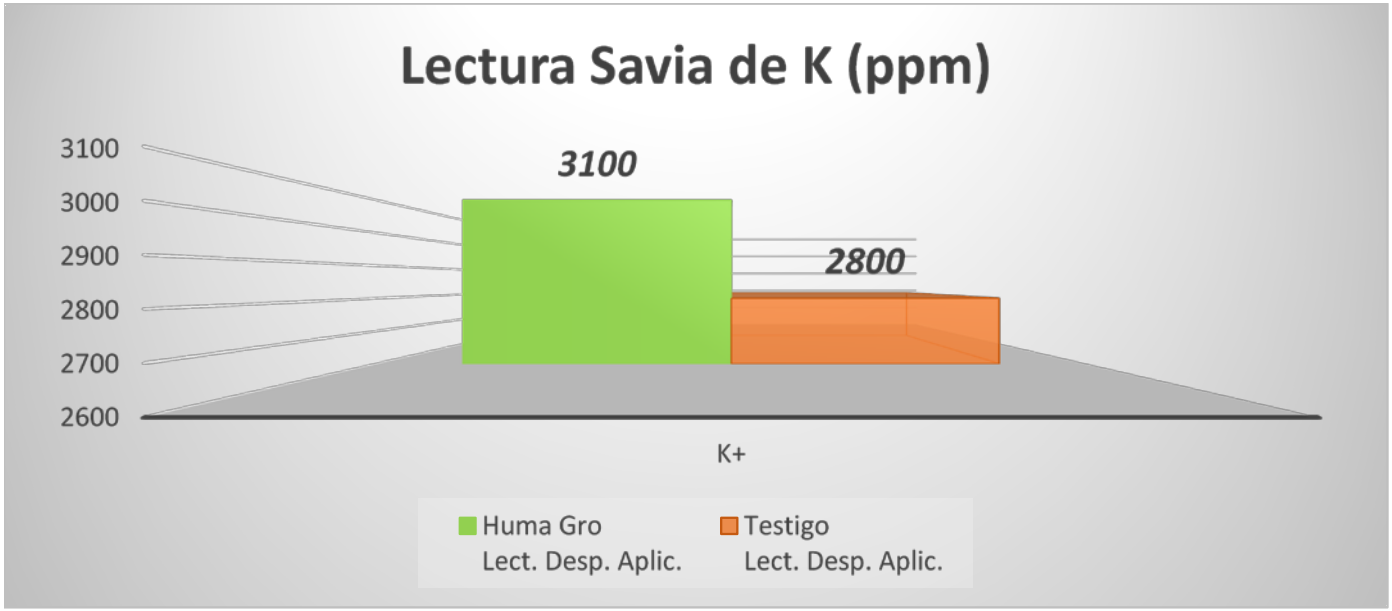
Resultados Evaluación:

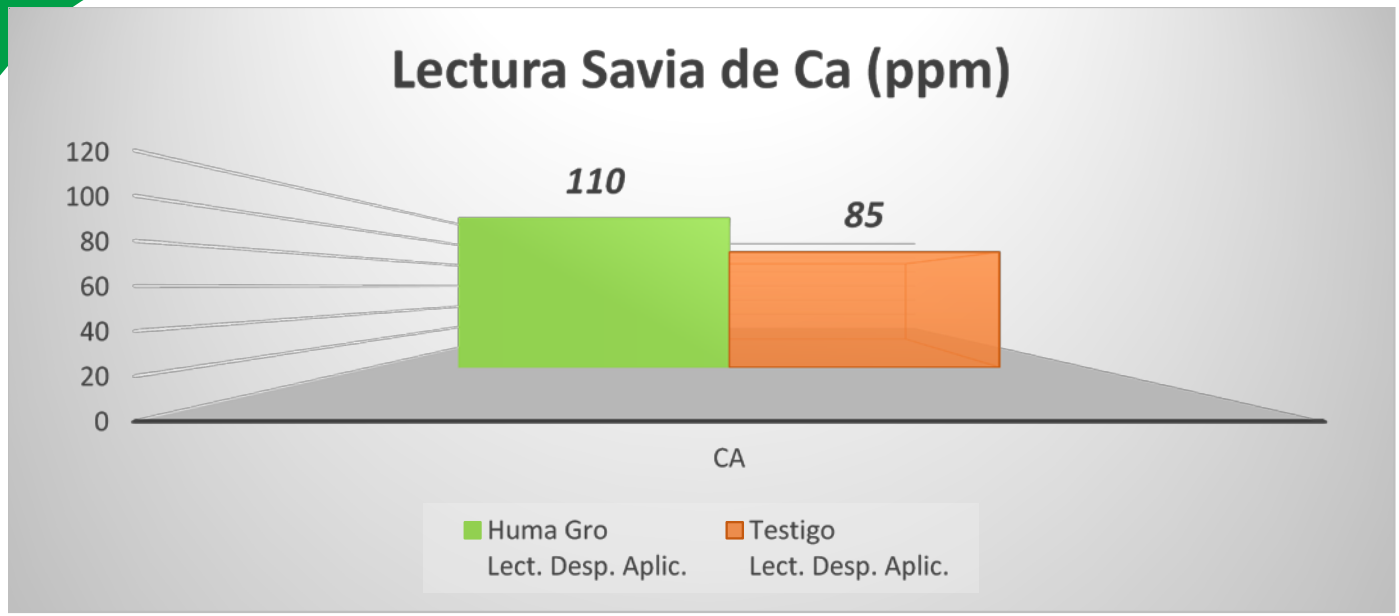
MUESTRA	HUMA GRO		TESTIGO	
	ALTURA PLANTA (mts)	N° RAMAS/ PLANTA	ALTURA PLANTA (mts)	N° RAMAS/ PLANTA
PROMEDIO	1.2	22.0	1.0	20.4

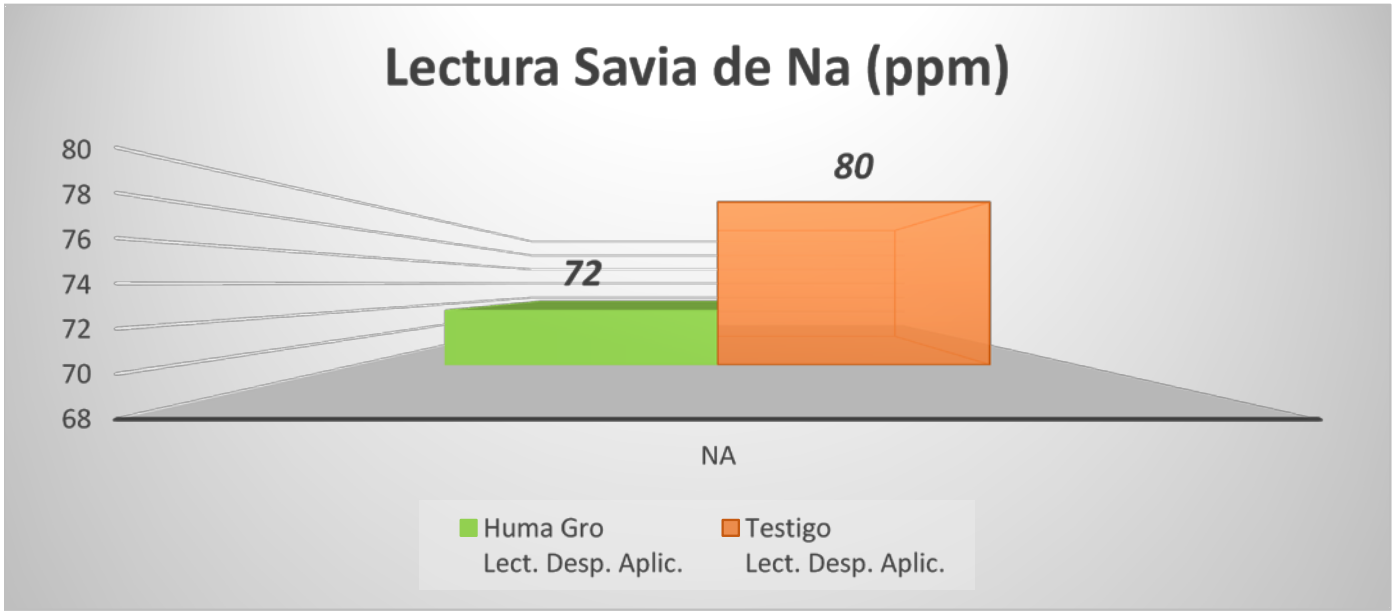








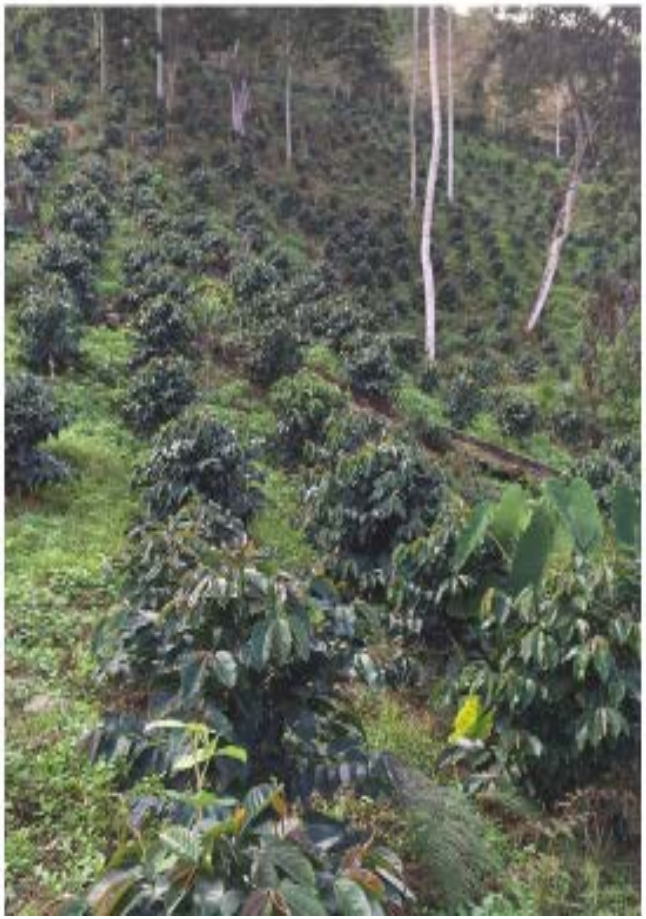




Lote Huma Gro.

Lote Testigo.

Lote Huma Gro

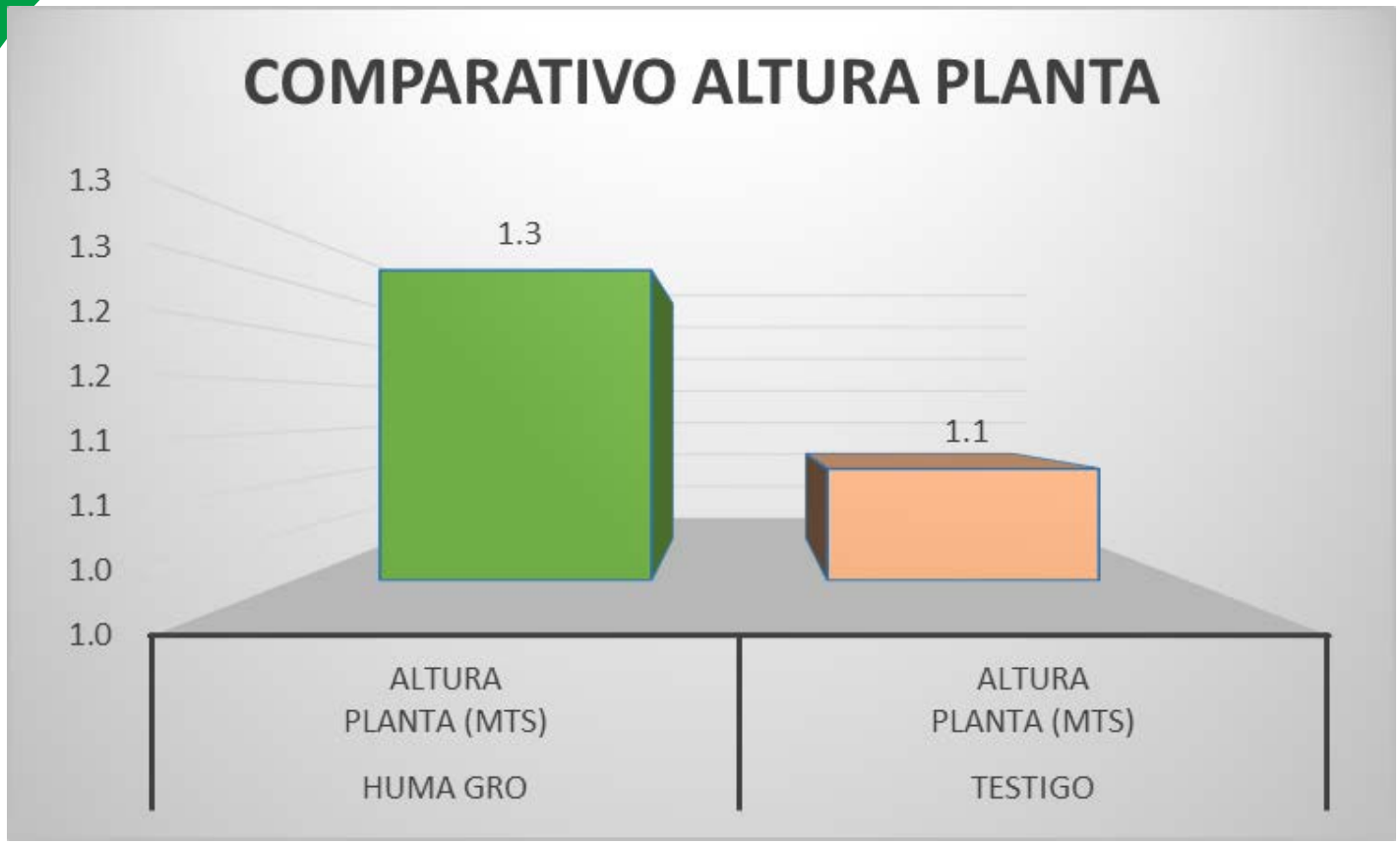


Lote Testigo.

Lote Huma Gro

Lote Testigo

Assessing the development of a coffee crop fertilized with HUMA GRO® 09/08/2016 vs. a conventional fertilizer

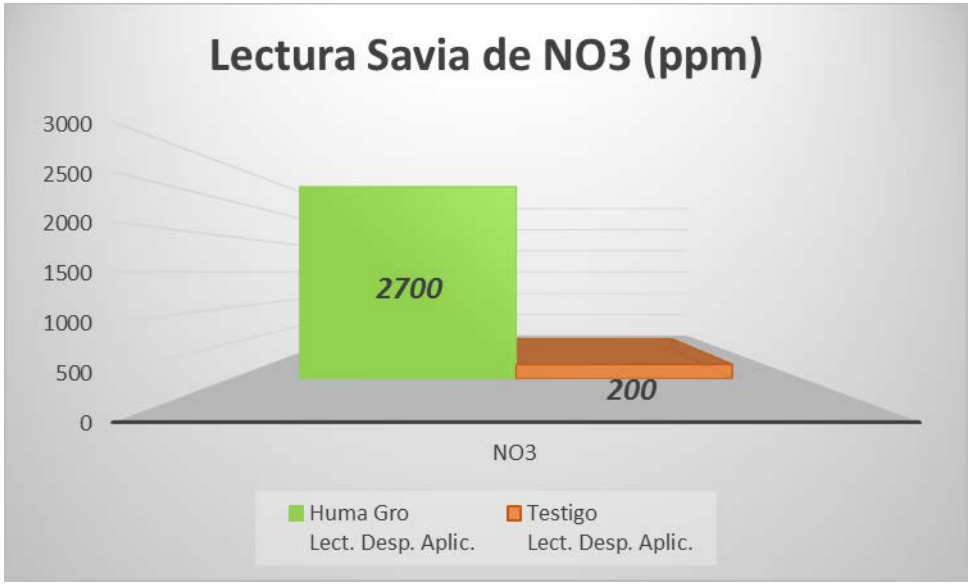


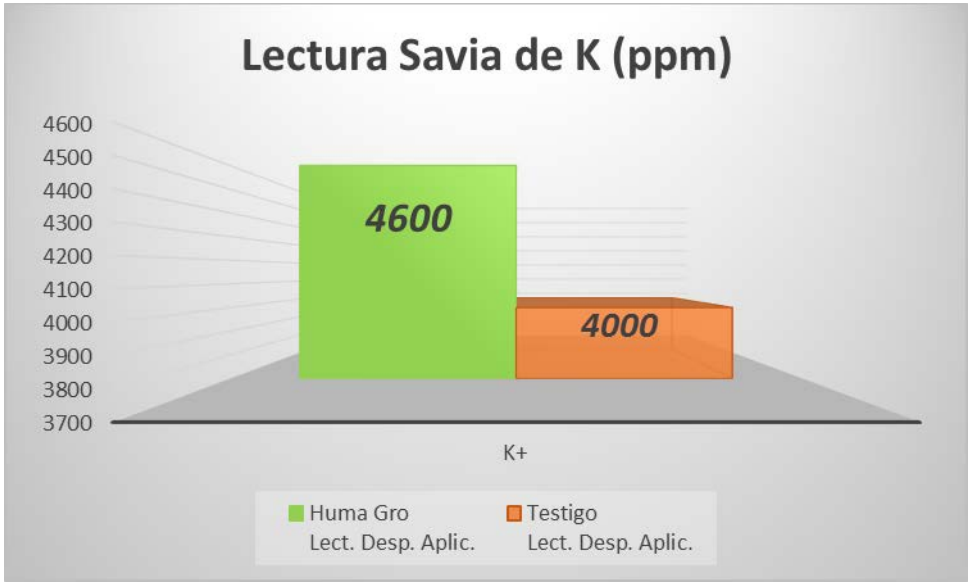
MUESTRA	HUMA GRO		TESTIGO	
	ALTURA PLANTA (mts)	N° RAMAS/ PLANTA	ALTURA PLANTA (mts)	N° RAMAS/ PLANTA
PROMEDIO	1.3	24.0	1.1	21.4

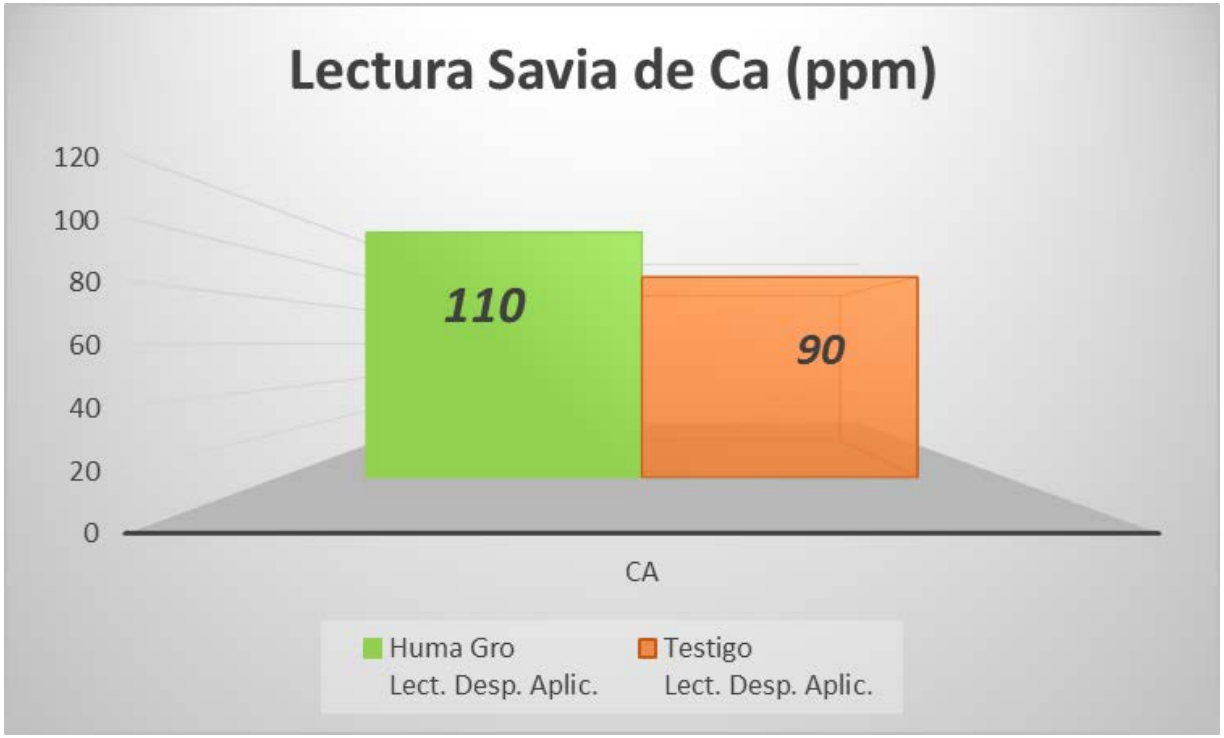
HUMA GRO™

Measurement of nutrient concentration in sap

Horiba equipment calibration with the respective buffer







HUMA GRO

CONVENTIONAL
FERTILIZER

HUMA GRO

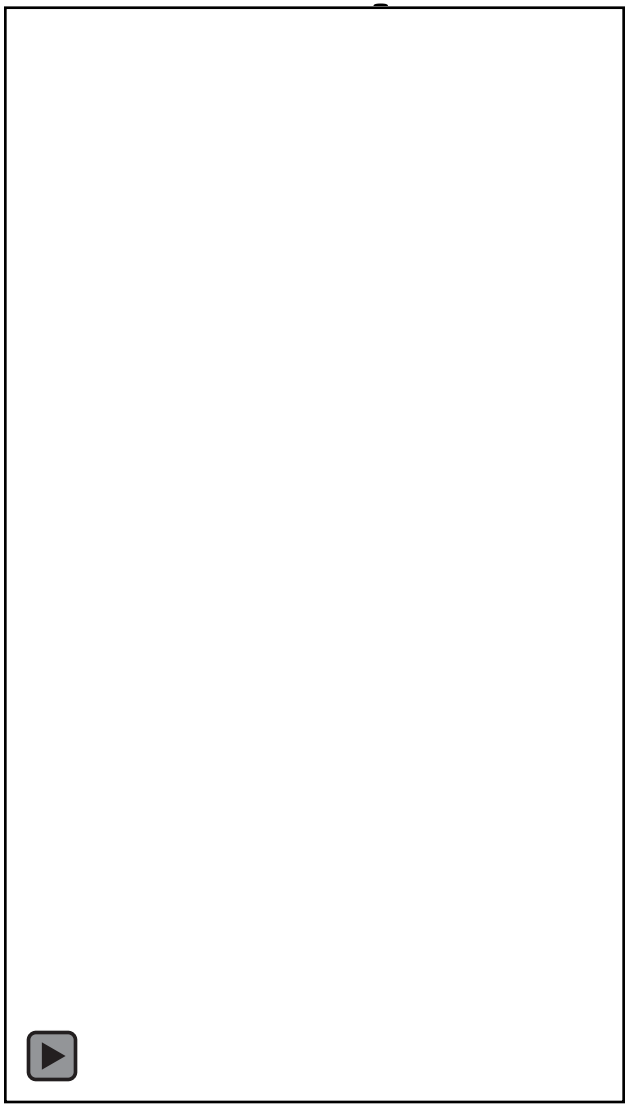
CONVENTIONAL
FERTILIZER

HUMA GRO

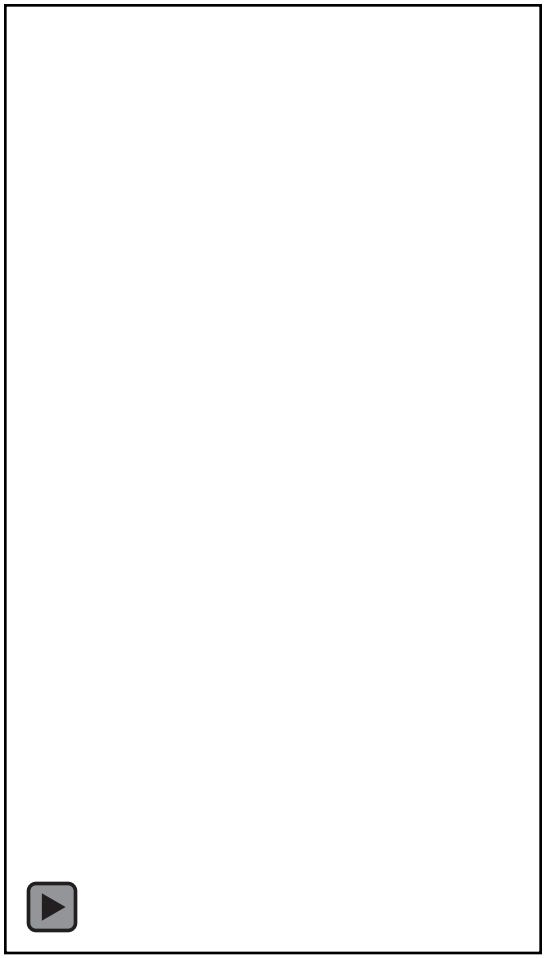
CONVENTIONAL FERTILIZER

from Bio Huma Netics, Inc.

Assessing a conventional control



Assessing HUMA GRO®



Coffee biometrics

Conventional fertilizer (control plot)

Branches: 20
Number of knots: 11
Number of cherry beans: 12

2,640 cherry beans / ha

607.7 kg of parchment beans
1000 lb of parchment beans

HUMA GRO® TREATMENT

Branches: 24
Number of knots: 16
Number of cherry beans: 26

9,984 cherry beans/ ha

2296.32 kg of parchment beans
3800 lb of parchment beans

3.78x increased production

and improved rate

Cherry/parchment bean ratio: 15/3.5

23% of remaining parchment beans

FERTILIZATION OF AVOCADOS IN GREENHOUSES

- Avocados were fertilized with liquid Huma Gro fertilizers throughout the production period of the plants (6 months).
- Continuous fertilization was applied using only fertilizers, not soil improver and rooting solutions.

BENEFITS OBTAINED

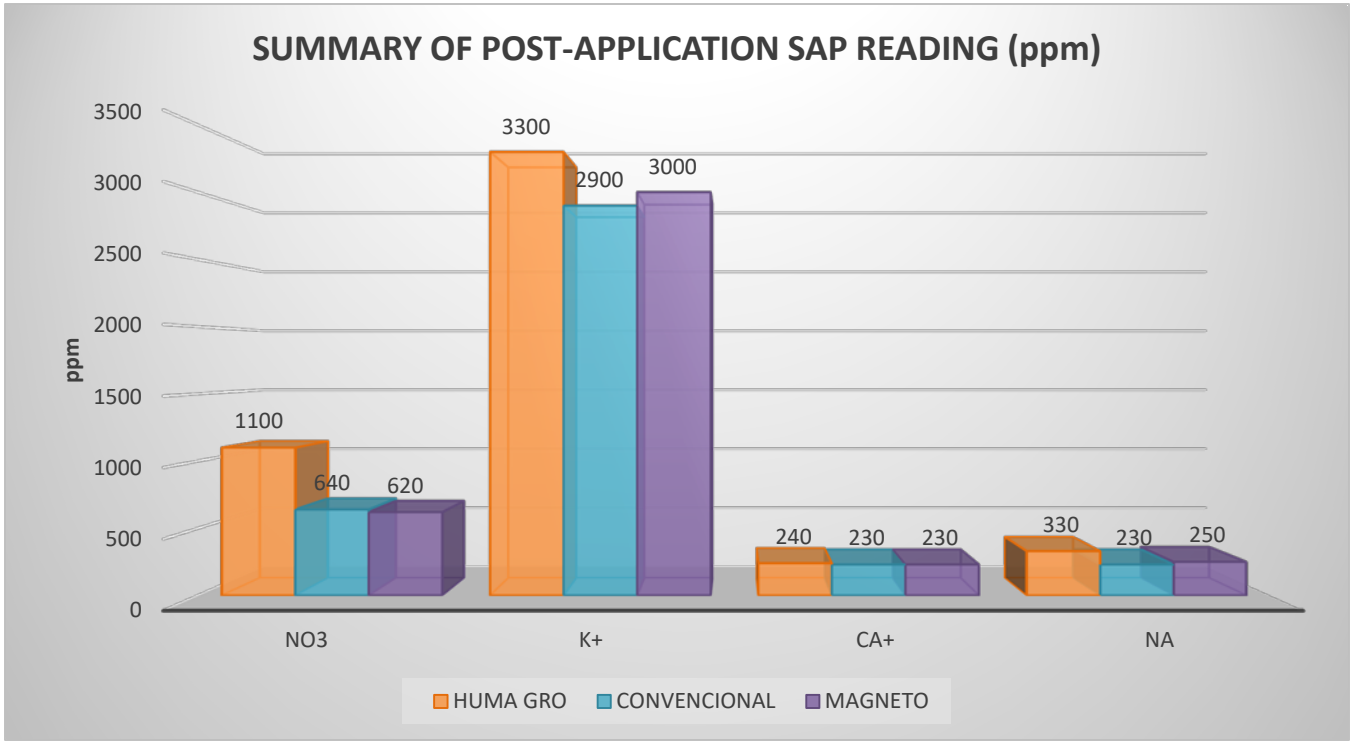
- THE PRODUCTION CYCLE OF THE PLANT WAS REDUCED TO 35 DAYS, GETTING A BETTER DEVELOPED PLANT.
- A GREATER ROOT MASS WAS OBTAINED; THEREFORE, THE PLANTS PERFORMED BETTER WHEN ENDURING THE PLANTING SHOCK WITH A HIGHER POST-SOWING GROWTH RATE.

Previously fertilized
FIELD DATA

- COMPANY: Fundo América
- LOCATION: Arequipa
- CROP: ONION
- VARIETY: RED - KNOB
- AGE: START - HARVEST
- HUMA GRO DOSES
- APPLIED: THE ENTIRE NUTRITIONAL PACKAGE WAS REPLACED WITH HUMA GRO®
- EXPERIMENTAL DOSE
- (HUMA GRO): Shift 2 Valve 10
- (CONTROL PLOT): Shift 2 Valve 11

RESULTS:

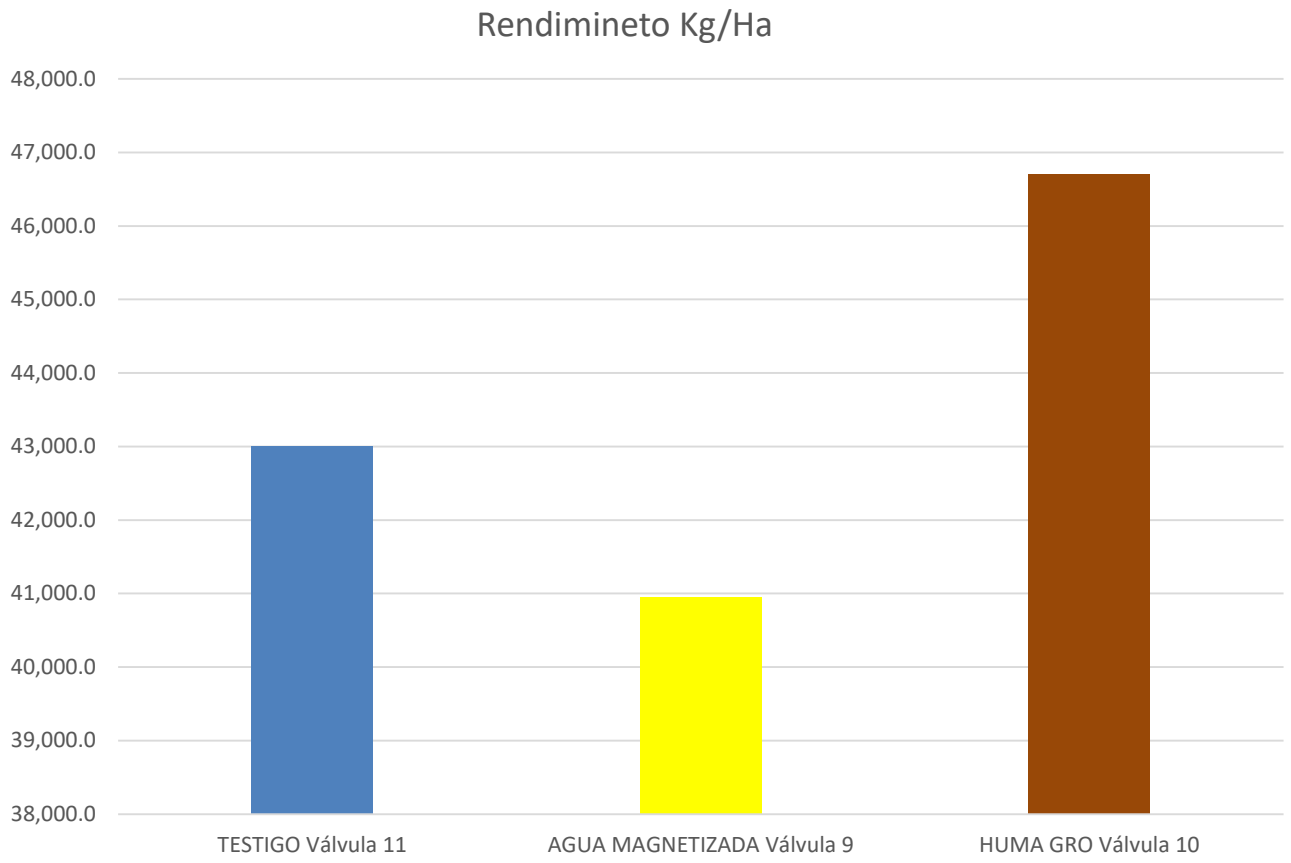
SAP READING



RESULTS:

YIELD AND QUALITY RATE

SUMMARY OF YIELD AND QUALITY PER HA			
TREATMENT	CONTROL PLOT Valve 11	MAGNETIZED WATER Valve 9	HUMA GRO Valve 10
Yield Kg/Ha	43,008.0	40,946.0	46,697.0
% First	74.4	79.7	79.2
% Second	17.0	6.1	10.0
% Blossoming	8.6	14.2	10.8
Kg First	31,998.0	32,634.0	35,583.1
Kg Second	7,311.4	2,497.7	6,669.7
Kg Blossoming	3,698.7	5,814.3	4,444.2



HUMA GRO™

Thanks