



Test Results on Dairy Pastures

Plant Guard (liquid monosilicic acid)

L-Amino PGR (biology + amino acids)

Good river XIV Region of the Rivers

Chile

February 2020



PLANT GUARD[®]
organic leaf & root protection

Evaluation of the Plant Guard, L-Amino PGR program on the dairy pasture meadow.

Objective

To evaluate Plant Guard and L-Amino PGR products and their effect on parameters in dry matter in grasslands. Additionally measure the physical-chemical changes of the soil solution on the sum of bases, availability of P, K, Mg, Ca, and saturation / extractable / interchangeable aluminium and grass variables.

Below is the detail of the treatments.

Table 1. Description of the treatments.

Treatment

T0 = Traditional handling

T1 = 2L Plant Guard + 200 grams L-Amino PGR applied once on December 10, 2019

The design of this test corresponds to a strip design with 1 treatment (T1) with 1 repetition of 1 Ha. and a control treatment (T0) of the same surface.

The treatment has 5 monitoring plots, or repetitions, of 1 m².

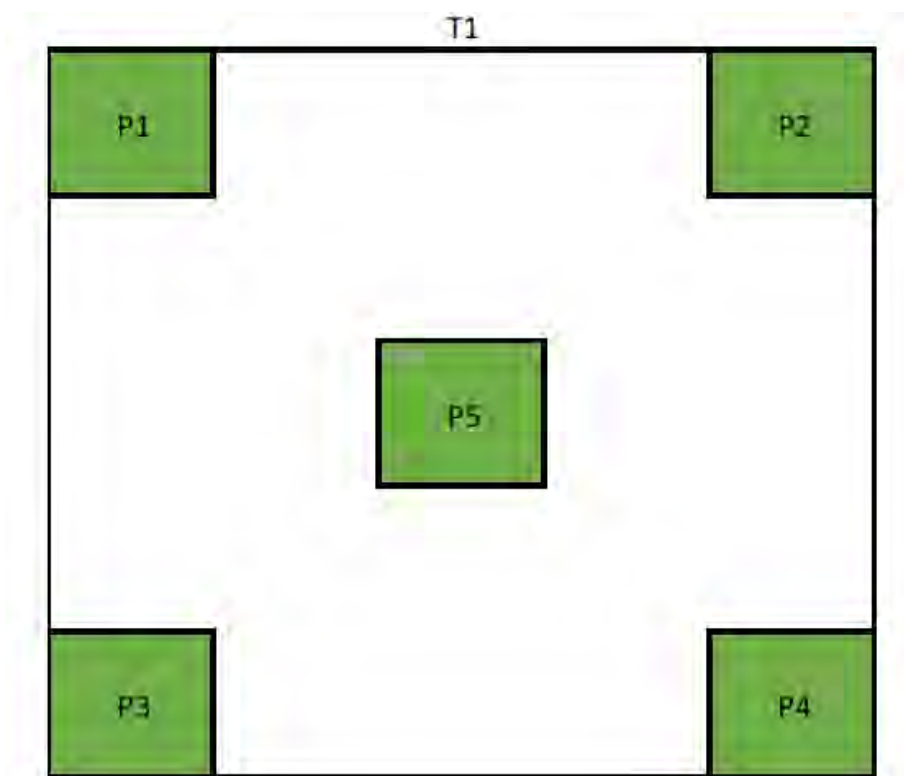




Table 2.

Summary of the essay

Type of Experimental Design

No. of treatments = 2

No. of repetitions = 5

Experimental unit = 2 Ha

Observation unit = 5 times T (1 mt² each)

Field Data

Agricultural Manager: Fundo Huiquenco.

Region: Trapi sector Commune Rio Bueno. XIV Los Ríos Region

Cultivation: Lagging meadow

Base fertilization: 2 Ton Cal / Ha + 350 kgs Urea / Ha

Performance 1st cut: 4 Bowling / Ha

1st Cut Date: December 6, 2019

Estimated bowling 2nd cut: 4-5

Closed Bowling 2nd cut: 6

Soil analysis

The soil analyses were carried out on December 6, prior to the application in 5 points detailed in Table 1 with their respective geo reference. Subsequently they were made 2 days before the second cut January 21, 2020.

The measurements were made between 0-20 cm deep and 20-40 cm (Annex 3)

Soil Analysis Prior application

ID MUESTRA / POTRERO		0-20	20-40
Profundidad	cm.		
Superficie	há.		
Tipo Suelo			

RESULTADOS

Parámetros		Unidad		
pH en agua	1:2,5		5,9	5,9
pH CaCl ₂	1:2,5		5,1	5,1
Materia Orgánica		%	19,1	19,1
Fósforo	Olsen	mg/kg	5,5	6,1
Calcio	Intercambiable	cmol+/kg	2,90	2,97
Magnesio	Intercambiable	cmol+/kg	0,40	0,38
Potasio	Intercambiable	cmol+/kg	0,24	0,25
Potasio	Intercambiable	ppm	93	98
Sodio	Intercambiable	cmol+/kg	0,06	0,06
Aluminio	Intercambiable	cmol+/kg	0,08	0,07
Suma de Bases	Intercambiable	cmol+/kg	3,59	3,65
CICE		cmol+/kg	3,67	3,72
Saturación de Aluminio		%	2,18	1,88
Azufre	disponible	mg/kg	n/a	n/a
Boro	disponible	mg/kg	n/a	n/a
Zinc	disponible	mg/kg	n/a	n/a
Hierro	disponible	mg/kg	n/a	n/a
Cobre	disponible	mg/kg	n/a	n/a
Manganeso	disponible	mg/kg	n/a	n/a
Aluminio Extractable		mg/kg	n/a	n/a

Nota 1: LABORATORIO DE SUELOS COLUN ACREDITADO por CNA y SAG



Biomass Measurement

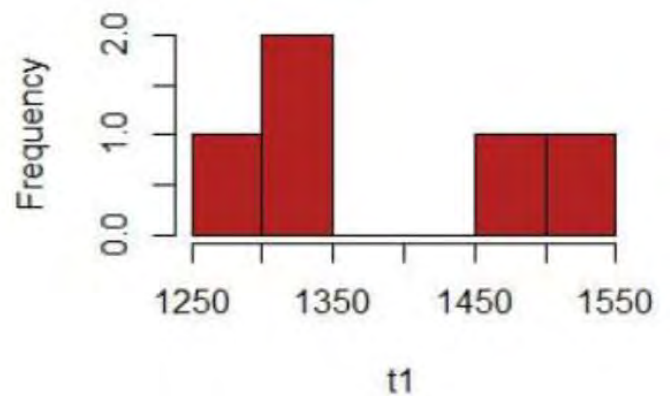
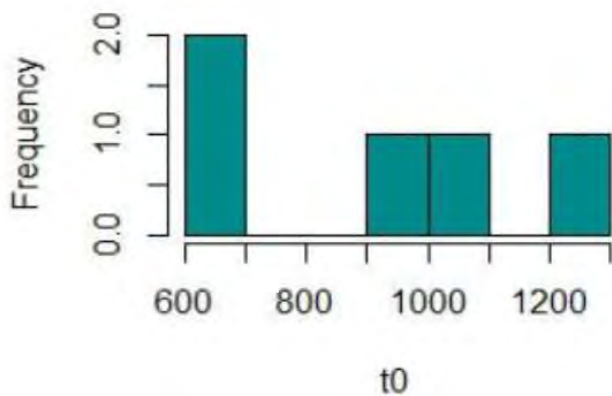
Two days prior to the cut at the points marked and georeferenced in T0 and T1, a grass cut was made on an area of 1 mt², which were weighed and from which a portion was extracted to generate the leaf samples.

In the statistical analysis, the distribution was not normal, so Mann Whitney U test was used.

Table 2

Foliar Weights

	T0	T1
1	1090	1527
2	1202	1307
3	700	1293
4	983	1328
5	671	1477



The difference between the probabilities that observations of one population exceed those of another DIFFER significantly (p -value = 0.0079). That is, the medians of both groups differ.

Data

	T0	T1
Average Weight	929.2	1386.4

Foliar Analysis T0 vs T1

Tipo Muestras	Pradera	Pradera
ID Muestras	T0	T1
Parámetros	% en base MS	% en base MS
Materia Seca	22,34	18,58
Proteína Cruda	13,93	21,05
Proteína Soluble (%PC)	9,22	24,61
PCIDA (% PC)	0,87	0,73
FDA	33,03	27,69
aFDN	50,35	44,12
Ca	0,83	0,76
P	0,22	0,30
Mg	0,21	0,21
K	1,30	2,93
S	0,18	0,25
Azúcar (WSC)	14,28	11,85
Almidón	3,23	2,71
pH	n/a	n/a
EM 3X NRC 2001 (Mcal/Kg)	2,30	2,52
EM 1X NRC 2001 (Mcal/Kg)	2,40	2,69

Although in dry matter T1 it is almost 4 points low at T0, in biomass T1 it surpasses by about 30% at T0. Furthermore, in T1 crude protein it exceeds T0 by 51% and in Soluble Protein it is 166% higher than T1. For practical purposes, less amount of T1 grass will be needed to calculate rations. On the other hand, all measured nutrients, with the exception of Ca, are higher in T1.

Post harvest soil analysis

This analysis was carried out after harvesting at the georeferenced points on January 21, 2020. 42 days after application.

ID MUESTRA / POTRERO		0-20	20-40
Profundidad	cm.	0-20	0-40
Superficie	há.	1	1
Tipo Suelo			
RESULTADOS			
Parámetros	Unidad		
pH en agua	1:2,5	5,9	5,9
pH CaCl ₂	1:2,5	5,1	5,2
Materia Orgánica	%	21,7	22,8
Fósforo	Olsen mg/kg	5,4	5,6
Calcio	Intercambiable cmol+/kg	3,83	4,77
Magnesio	Intercambiable cmol+/kg	0,53	0,67
Potasio	Intercambiable cmol+/kg	0,25	0,25
Potasio	Intercambiable ppm	98	98
Sodio	Intercambiable cmol+/kg	0,06	0,07
Aluminio	Intercambiable cmol+/kg	0,03	0,03
Suma de Bases	Intercambiable cmol+/kg	4,67	5,76
CICE	cmol+/kg	4,70	5,79
Saturación de Aluminio	%	0,64	0,52
Azufre	disponible mg/kg	n/a	n/a
Boro	disponible mg/kg	n/a	n/a
Zinc	disponible mg/kg	n/a	n/a
Hierro	disponible mg/kg	n/a	n/a
Cobre	disponible mg/kg	n/a	n/a
Manganeso	disponible mg/kg	n/a	n/a
Aluminio Extractable	mg/kg	n/a	n/a

Nota 1: LABORATORIO DE SUELOS COLUN ACREDITADO por CNA y SAG

After this analysis, the interaction of the products with the physico-chemical composition of the soil is indisputable, showing the improvements and greater availability of the essential elements



The below Table shows the most important variables to evaluate in this trial.

Comparison table before application vs post application

Tabla 3

Parámetro	0-20 cms (cmol+/kg)	20-40 cm(cmol+/kg)
P	-0,1	-0,5
K	+0,01	0
Mg	+0,13	+0,29
Ca	+0,93	+1,97
Al	-0,05	-0,04
Saturación Al	-1,54%	-1,36%
Suma Bases	+1,08	+2,04

In this comparative table in units of these seven parameters, there is no doubt about the effects on the soil solution.



Results (General)

- The use of Plant Guard, L-Amino PGR on prairie brings a number of unquestionable benefits to the prairie, both in biomass and its quality, in addition to yields at the time of harvest.
- From the harvest, 4 to 5 bolos were expected for that hectare. The previous harvest 4 boluses were harvested. In the post-application harvest 6 were harvested, 5 being the average of the field. That is, the harvest with treatment doubled the yield of the first cut and was 30% more than the average of the field. As far as the program is concerned, under this variable alone it covers the treatment application expenses.
- Regarding biomass and its quality. The biomass of the grass treated with the program is about 32% higher than the control, which is related to the amount of bowling obtained in the harvest. On the other hand, the biomass under treatment did not show rust.
- Soil analysis. At this point the improvements and guarantee promoted by the use of the program are indisputable. In the first place, the decrease in Al saturation by 1.5% is very high, being this one of the main ones, but the main one, a problem of the soils of this area, directly affecting the amendments and the costs associated with it. Adding the increase in the presence of exchangeable Calcium reaching almost 2 unit points (cmol / Kg) in the 20-40 cm depth. Also due to the results the costs of Lime and operational of this work are significantly reduced. The magnesium also continues being superior under the treatment and the Potassium, nevertheless the presence of Phosphorus is not affected by the treatment, analysis that should be done with more measurements and studies.
- In general, this grassland program is totally effective and efficient, as well as being a dual purpose in promoting better and more biomass such as the greater availability of nutrients in the soil and its better condition. Minimizing the improvement costs with other products or amendments.



Annex 1.

Field location. Test





Annex 2.

Application



Annex 3.

Sampling



Annex 4.

Visual comparison Treatments

T0



T1

