22/23 Harvest

Results

Applied research conducted by
Professor Dr. Alceu Linares

Unaí| MG
Partnership: Universidade Federal dos Vales do Jequitinhonha e Mucuri (UFVJM)

Polli
Fertilizantes Especiais

Objective

Performance

To compare the performance of Polli **SE Mag** fertilizer and conventional dolomitic limestone regarding nutrition, correction, and productivity in soybean crops.

Unaí| MG

Study Parameters

Soybean	BRS 8381 variety
Planting	December 2022
Application	Broadcast fertilization (November 2022)
Harvest	April 2023
Experimental plots	20 ha plots per treatment

Polli
Fertilizantes Especiais

Unfertilized Soil

1

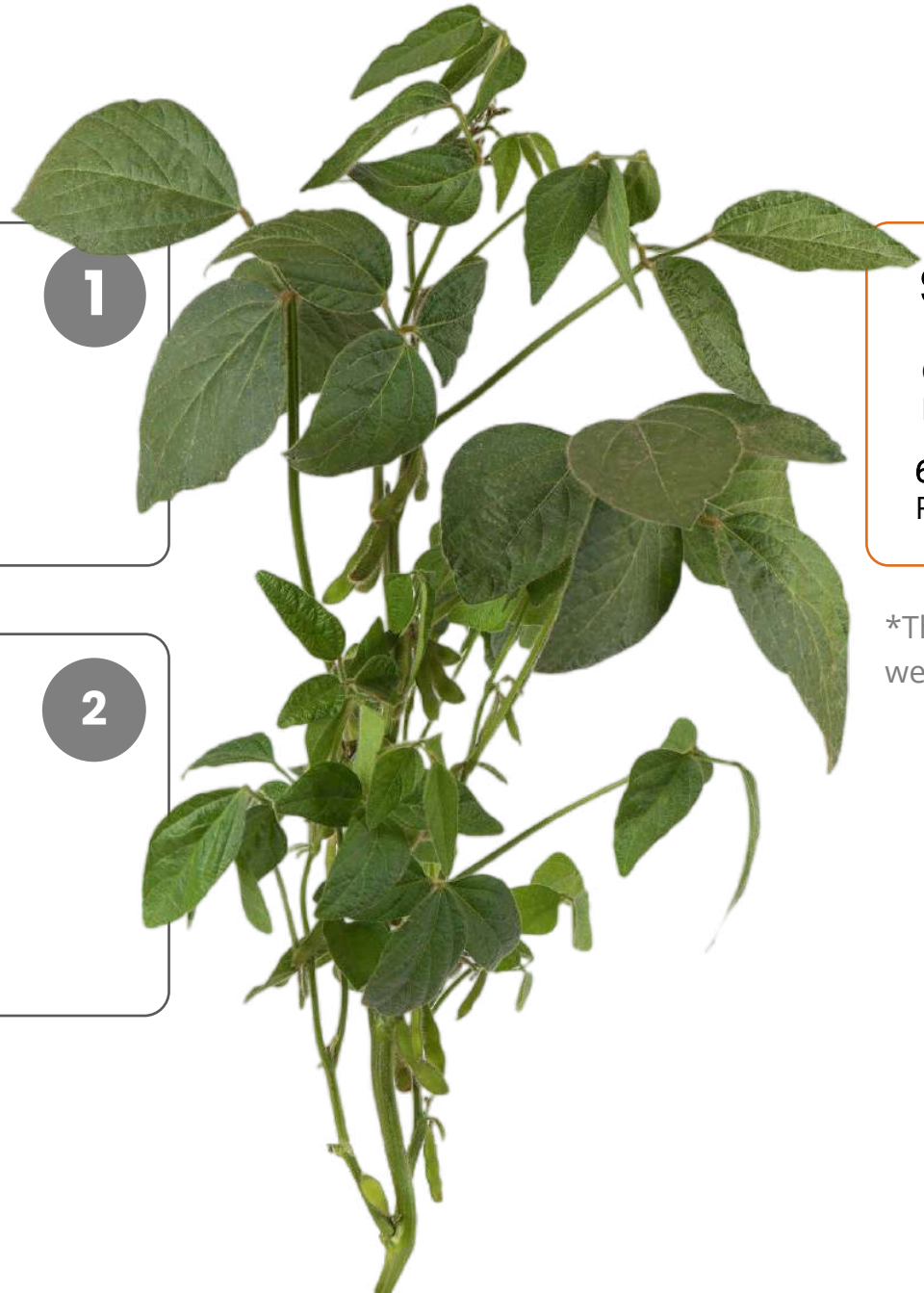
0 Kg ha^{-1}

Dolomitic Limestone

2

CaO 30.5%
MgO 18.5%

2000 Kg ha^{-1}
Flat rate



SE Mag

3

Ca 24% (CaO 33,57%)
Mg 8% (MgO 13,27%)

600 Kg ha^{-1}
Flat rate

*The remaining soil treatments were the same for all treatments.

Analized parameters

Chemical soil analysis

Soil sampling was performed in 3 periods

- Before planting (October/22)
- 90 days after product application (February/23)
- Post-harvest (May/23)

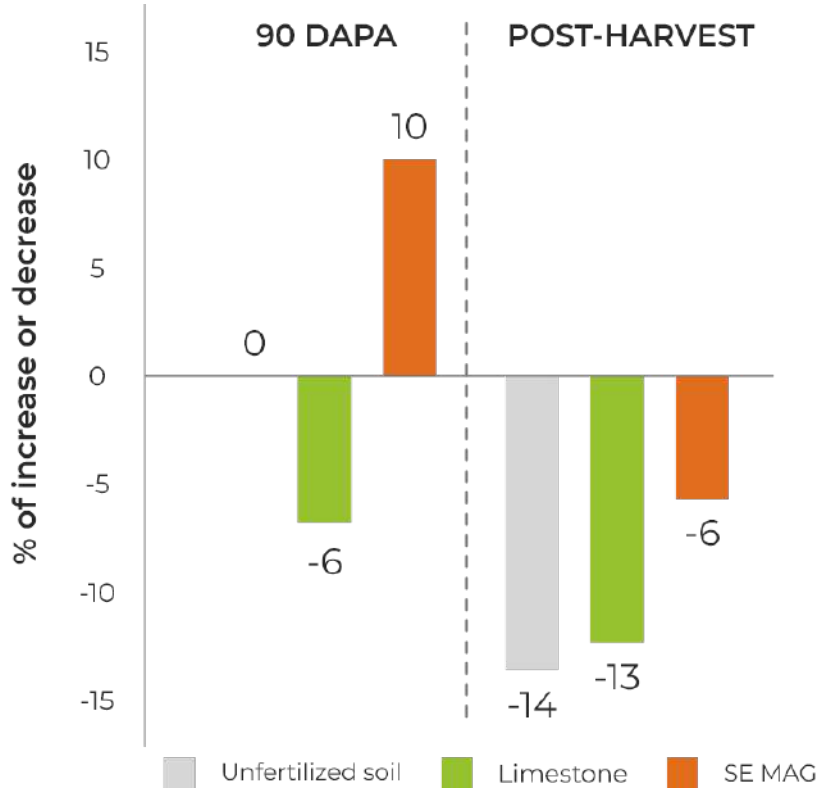
4 samples per treatment, at each depth

Collection depth 0-20; 20-40 cm

Results

Performance on soil

Chemical soil parameters
SE Mag 600 Kg ha^{-1}



SE Mag outperformed limestone, increasing soil pH by 10% after 90 days and experiencing a 7% smaller pH drop post-harvest.

Absolute pH values ($CaCl_2$)			
Time of sample extractions	Soil Treatments		
	Unfertilized soil	Limestone	SE Mag
Before planting	0**	5.24	4.85
90 DAPA*	4.78	4.91	5.32
Post-harvest	4.1	4.54	4.53

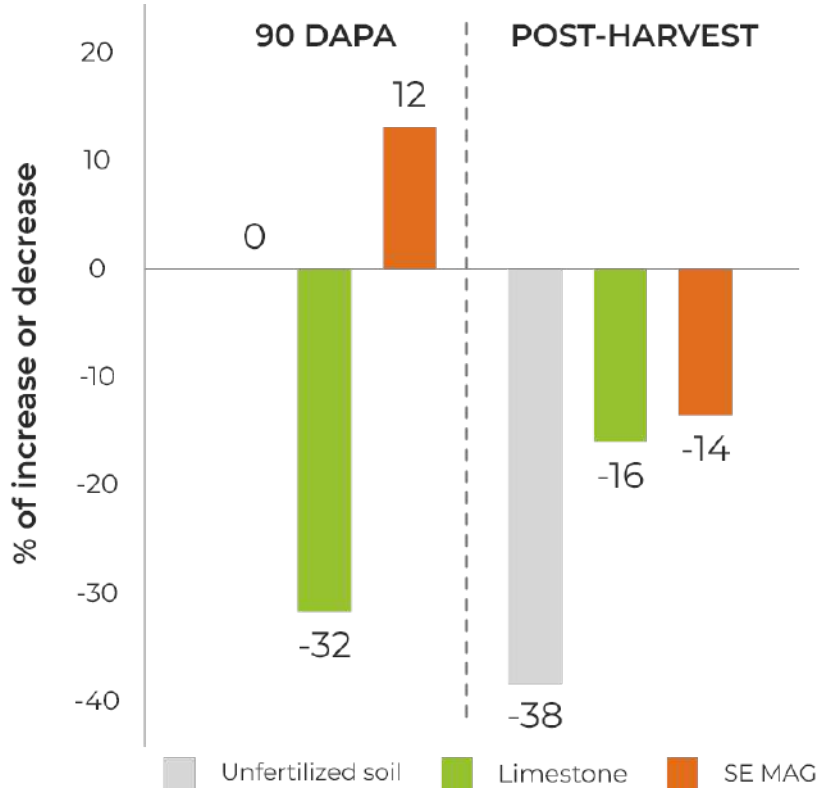
*Days after product application

**The sample from the unfertilized soil was collected after 90 DAPA.

pH ($CaCl_2$)

0–20 cm

Polli
Fertilizantes Especiais



SE Mag resulted in a 12% increase in Calcium 90 days after application and a 2% smaller decrease compared to limestone after harvest.

Absolute calcium values ($cmol_c\ dm^{-3}$)			
Time of sample extractions	Soil Treatments		
	Unfertilized soil	Limestone	SE Mag
Before planting	0**	2.885	2.35
90 DAPA*	2.2	1.9525	2.47
Post-harvest	1.36	2.4125	1.88

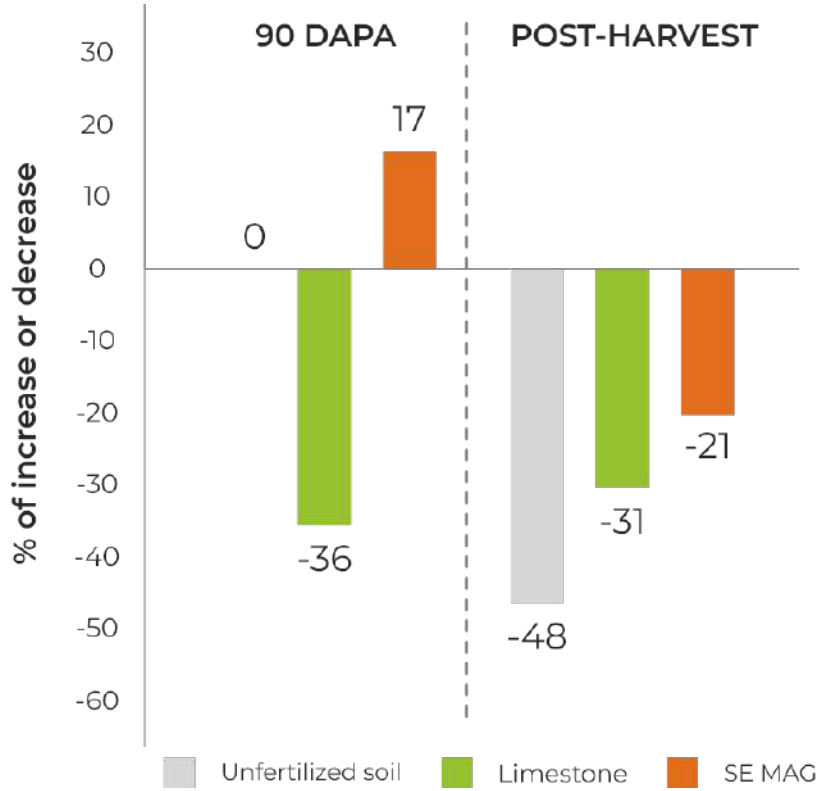
*Days after product application

**The sample from the unfertilized soil was collected after 90 DAPA.

Calcium

0–20 cm

Polli
Fertilizantes Especiais



SE Mag resulted in a 17% increase in magnesium 90 days after application and a 10% smaller decrease compared to limestone after harvest.

Absolute magnesium values ($cmol_c\ dm^{-3}$)			
Time of sample extractions	Soil Treatments		
	Unfertilized soil	Limestone	SE Mag
Before planting	0**	1.15	1.00
90 DAPA*	0.83	0.74	1.03
Post-harvest	0.43	0.78	0.71

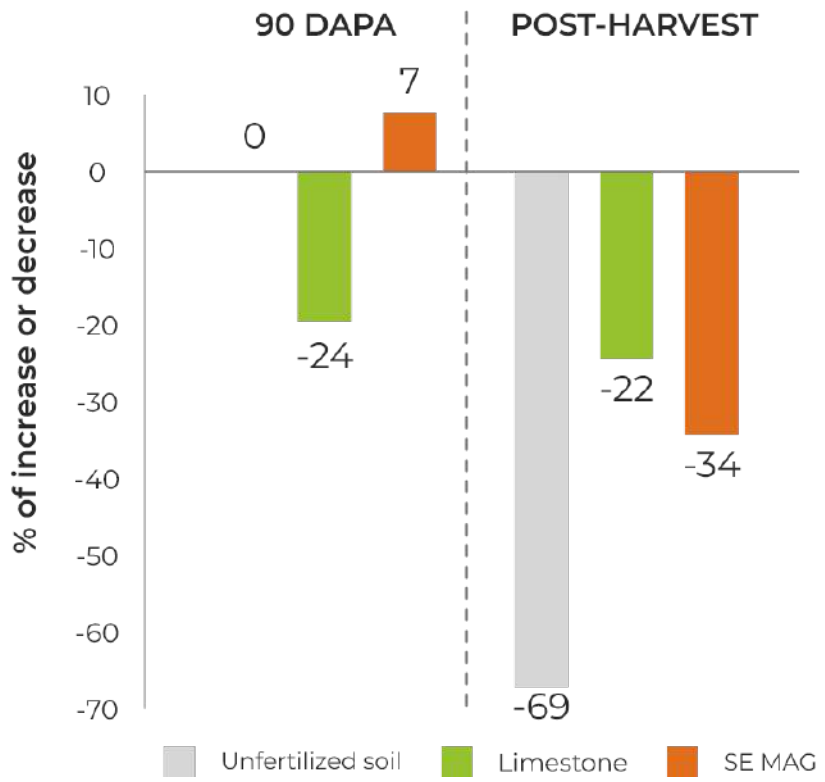
*Days after product application

**The sample from the unfertilized soil was collected after 90 DAPA.

Magnesium

0–20 cm

Polli
Fertilizantes Especiais



All treatments received the same potassium dose. The 12% reduction in K+ in the **SE Mag** treatment compared to limestone is explained by the higher extraction and export of this element to the grains and its movement in the 20-40 cm layer.

Absolute potassium values (mg dm^{-3})			
Time of sample extractions	Soil Treatments		
	Unfertilized soil	Limestone	SE Mag
Before planting	0**	1.15	1.00
90 DAPA*	0.83	0.74	1.03
Post-harvest	0.43	0.78	0.71

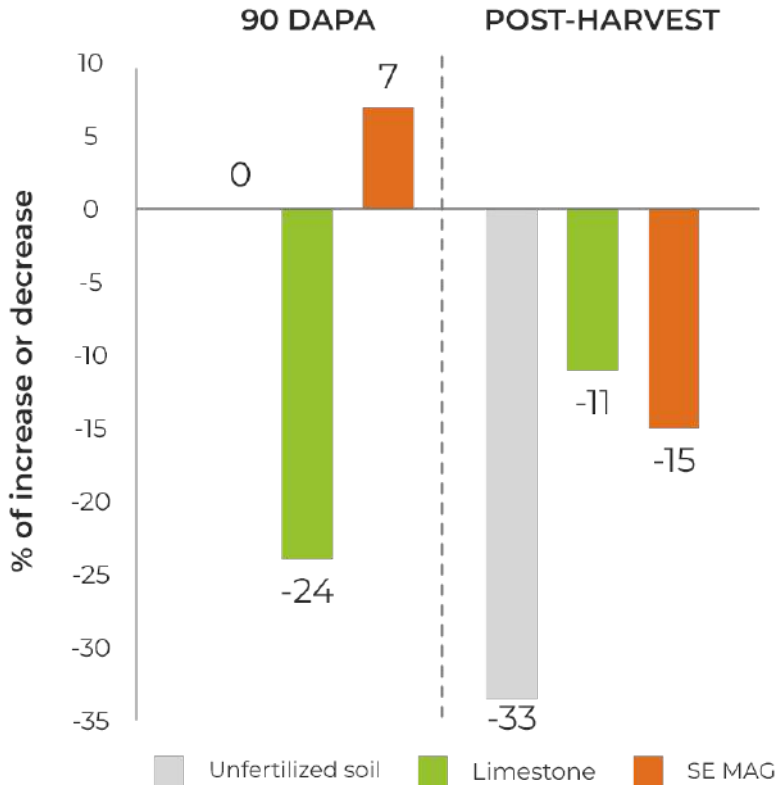
*Days after product application

**The sample from the unfertilized soil was collected after 90 DAPA.

Potassium

0–20 cm

Polli
Fertilizantes Especiais



SE Mag promoted a 7% increase in V% 90 days after application. However, due to the greater decrease in potassium in the post-harvest period, the V% was 4% lower compared to limestone at this time.

Absolute values of base saturation (V%)			
Time of sample extractions	Soil Treatments		
	Unfertilized soil	Limestone	SE Mag
Before planting	0**	63	57.25
90 DAPA*	55	47.75	60.25
Post-harvest	37	56	47.75

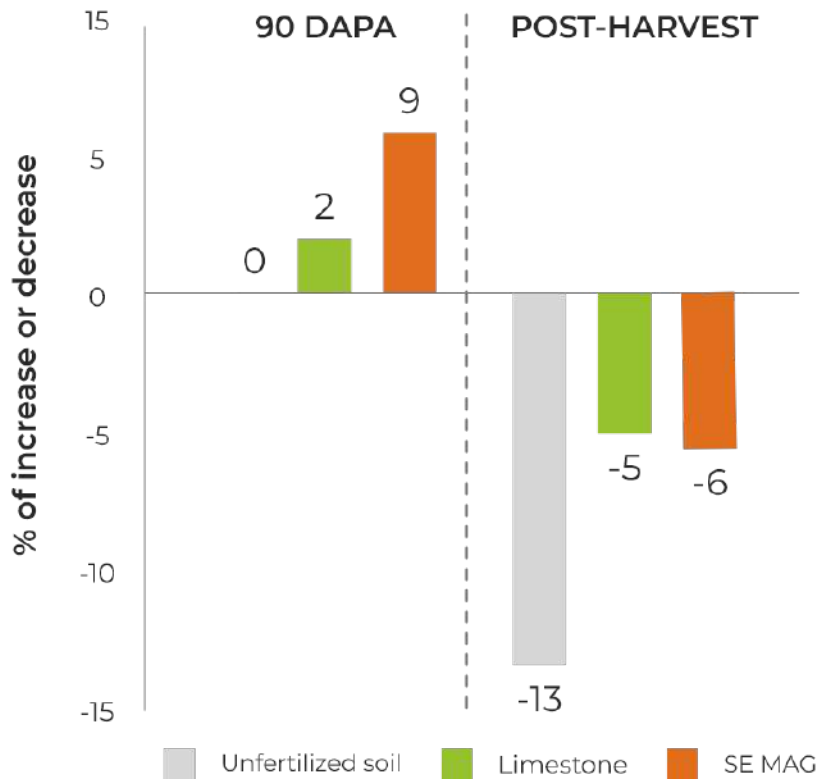
*Days after product application

**The sample from the unfertilized soil was collected after 90 DAPA.

V%

0–20 cm

Polli
Fertilizantes Especiais



SE Mag promoted a 9% increase in pH 90 days after subsurface application. Post-harvest, it resulted in a 7% smaller pH decrease compared to the control.

Absolute pH values ($CaCl_2$)			
Time of sample extractions	Soil Treatments		
	Unfertilized soil	Limestone	SE Mag
Before planting	0**	4.84	4.68
90 DAPA*	4.68	4.91	5.08
Post-harvest	4.06	4.61	4.39

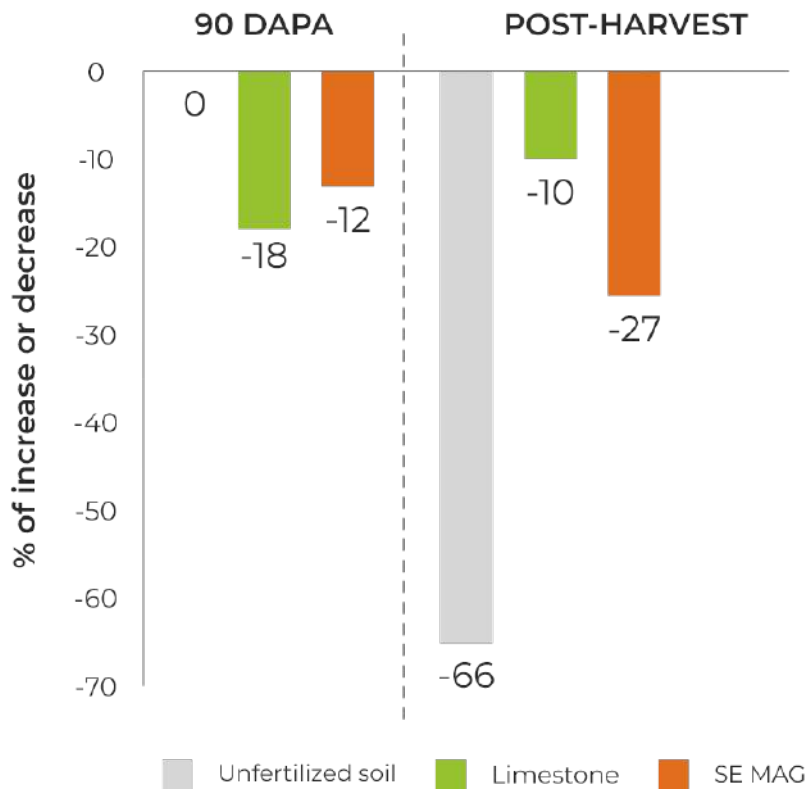
*Days after product application

**The sample from the unfertilized soil was collected after 90 DAPA.

pH ($CaCl_2$)

20–40 cm

Polli
Fertilizantes Especiais



Both treatments showed a decrease in calcium, but the order of decreasing calcium was limestone, **SE Mag**, and unfertilized soil. However, this is explained by the higher extraction and export to grains in the **SE Mag** treatment and higher productivity.

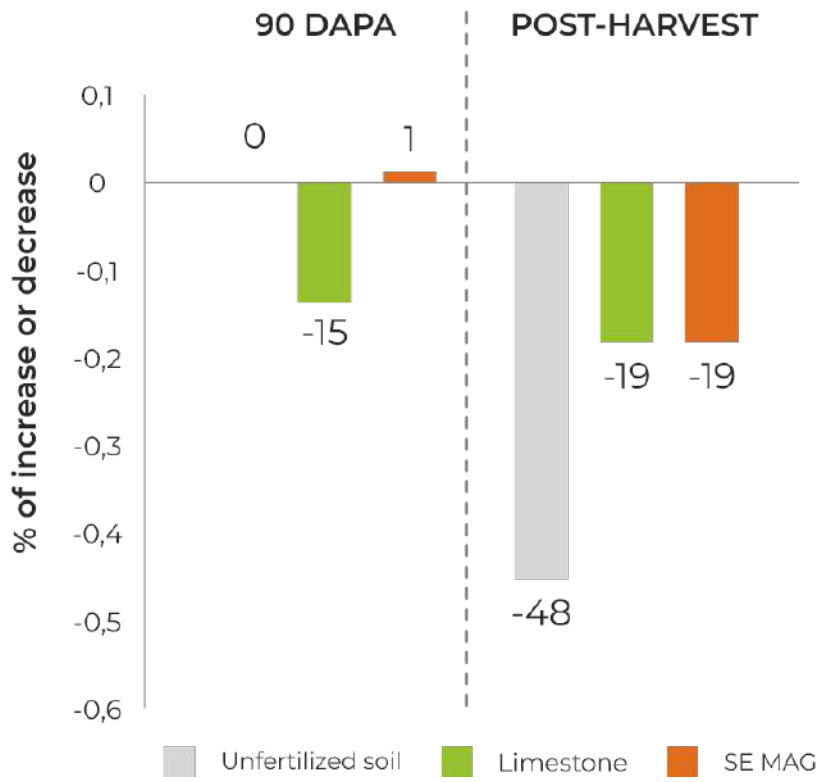
Absolute calcium values ($cmol_c\ dm^{-3}$)			
Time of sample extractions	Soil Treatments		
	Unfertilized soil	Limestone	SE Mag
Before planting	0**	1.84	1.77
90 DAPA*	2.15	1.46	1.53
Post-harvest	0.73	1.61	1.29

*Days after product application

**The sample from the unfertilized soil was collected after 90 DAPA.

Calcium

20–40 cm



SE Mag showed a 1% increase in magnesium 90 days after application and the same decrease as limestone in the post-harvest period. However, it should be noted that the **SE Mag** treatment favored higher extraction, export, and soybean productivity.

Absolute magnesium values ($cmol_c\ dm^{-3}$)			
Time of sample extractions	Soil Treatments		
	Unfertilized soil	Limestone	SE Mag
Before planting	0**	57.39	62.03
90 DAPA*	45.26	61.44	57.87
Post-harvest	35.84	65.88	76.70

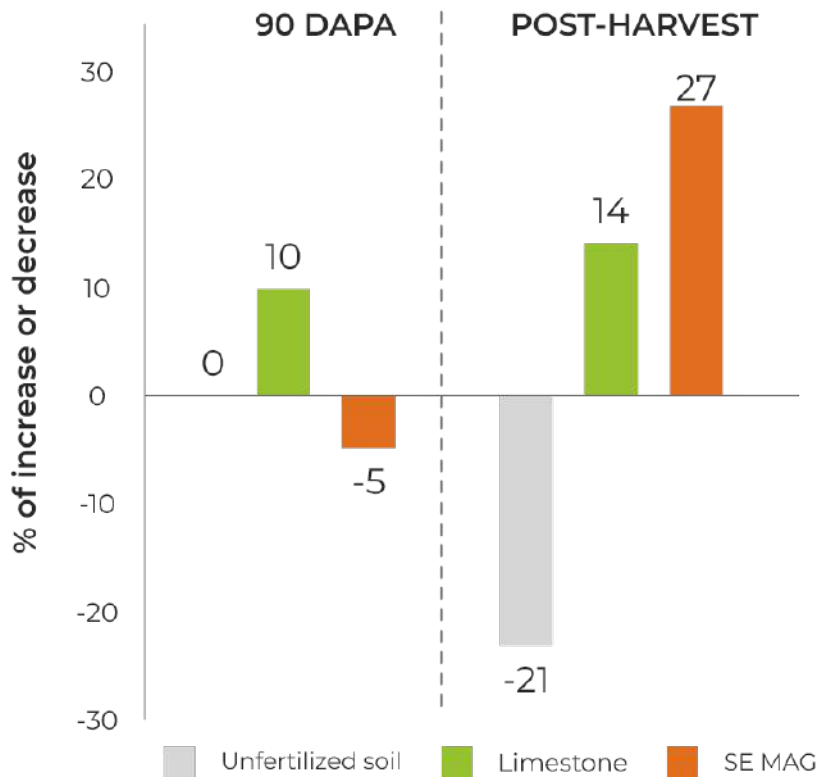
*Days after product application

**The sample from the unfertilized soil was collected after 90 DAPA.

Magnesium

20–40 cm

Polli
Fertilizantes Especiais



Potassium showed an average increase in both treatments, except for the unfertilized soil plot. Since the potassium dose was the same in all treatments and the tested products do not contain potassium, the results are due to the mobility in the profile, linked to extraction/export and the dynamics of the element in the soil.

Absolute potassium values (mg dm^{-3})			
Time of sample extractions	Soil Treatments		
	Unfertilized soil	Limestone	SE Mag
Before planting	0**	57.39	62.03
90 DAPA*	45.26	61.44	57.87
Post-harvest	35.84	65.88	76.70

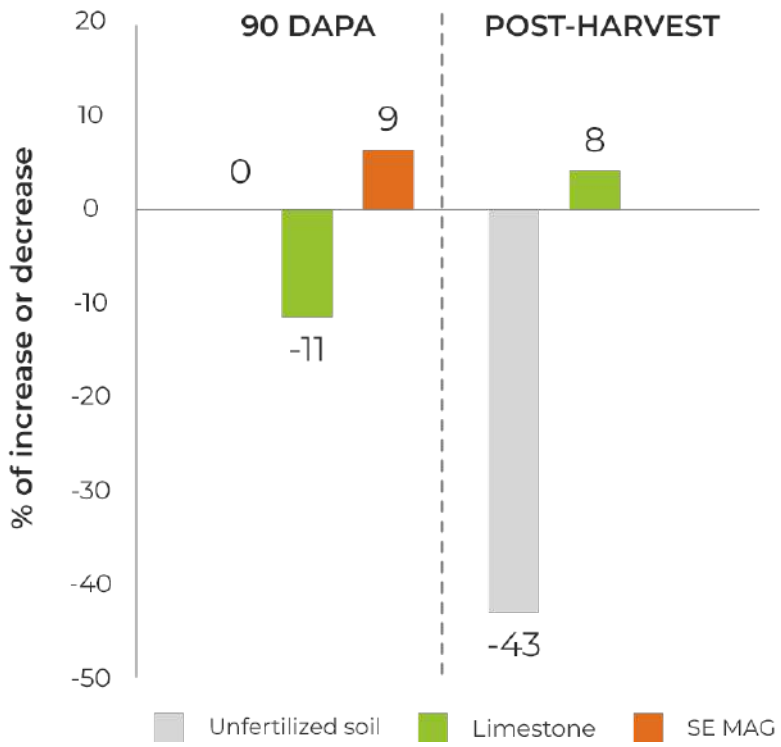
*Days after product application

**The sample from the unfertilized soil was collected after 90 DAPA.

Potassium

20–40 cm

Polli
Fertilizantes Especiais



SE Mag showed a 9% increase in V% 90 days after application, while limestone showed an 8% increase post-harvest. The increase in V% for limestone occurred due to the increase in K, as Ca and Mg decreased at this depth, and also due to lower extraction and export by soybean, culminating in lower productivity.

Absolute values of base saturation (V%)			
Time of sample extractions	Soil Treatments		
	Unfertilized soil	Limestone	SE Mag
Before planting	0**	51	49.25
90 DAPA*	58	44.25	53.25
Post-harvest	33	54.5	49

*Days after product application

**The sample from the unfertilized soil was collected after 90 DAPA.

V%

20–40 cm

Polli
Fertilizantes Especiais

Analized parameters

Plant analysis

Plant material collection – nutrient extraction conducted at the R5.5 stage.

Four replicates were performed per treatment, with 5 plants collected per replicate.

Grain collection – nutrient export. Collection was carried out at harvest time, with 4 replicates composed of 5 plants per treatment.

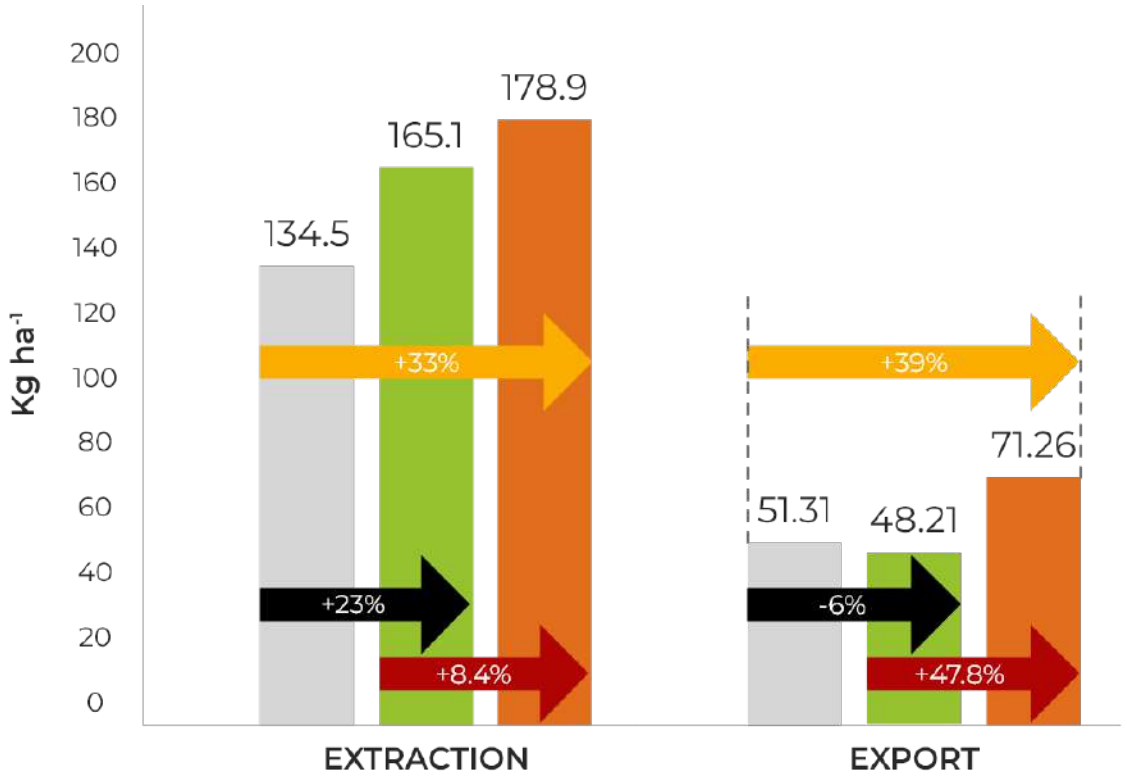
Results

Performance on plants

NUTRITION AND PRODUCTIVITY

Analysis of Extraction, Export, Grain Weight, and Productivity

SE Mag 600 Kg ha^{-1}

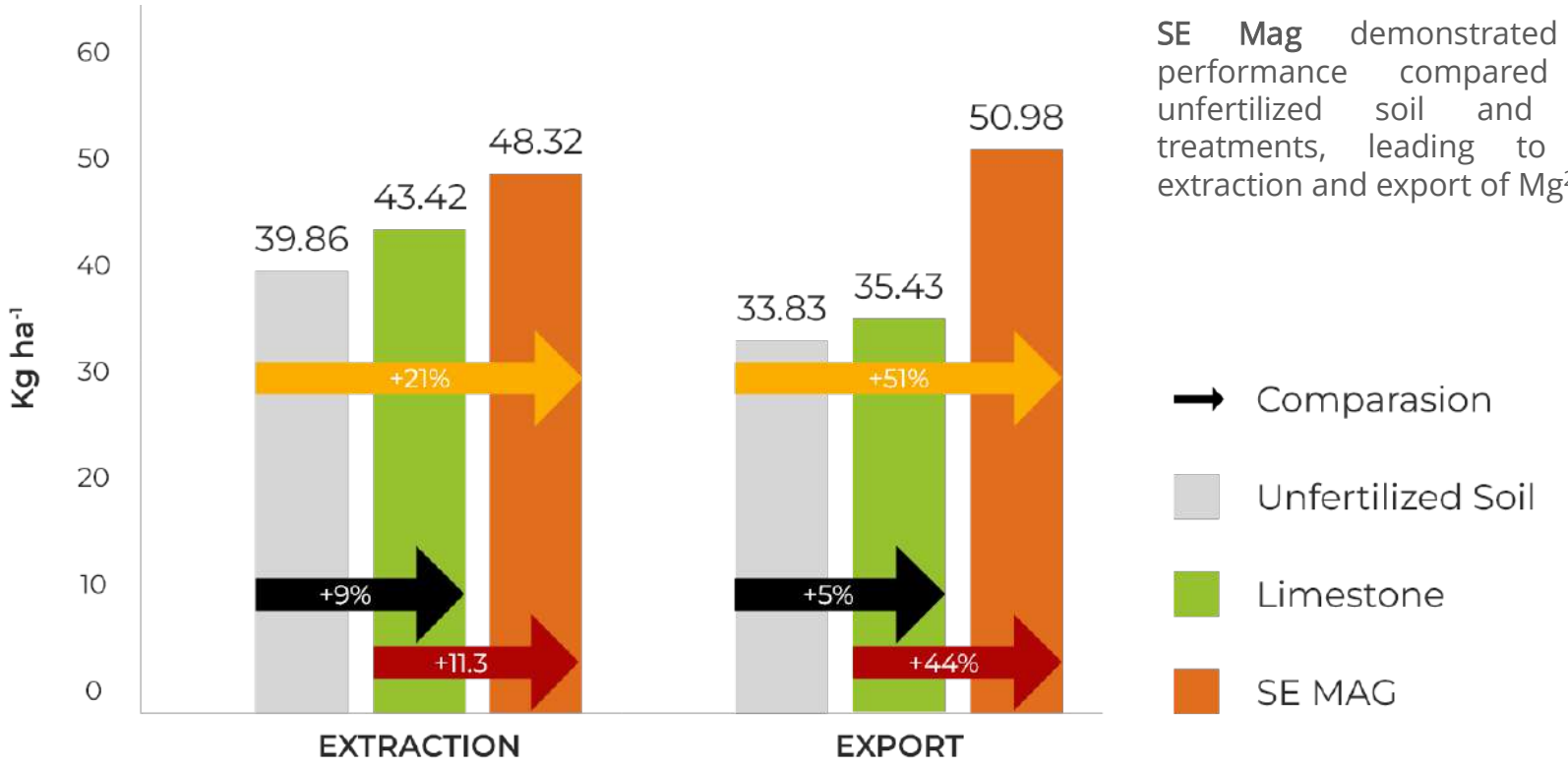


SE Mag efficiently supplied Ca^{2+} to the soil, resulting in higher extraction and export of this nutrient by soybeans.

Calcium

Extraction and Export

Polli
Fertilizantes Especiais

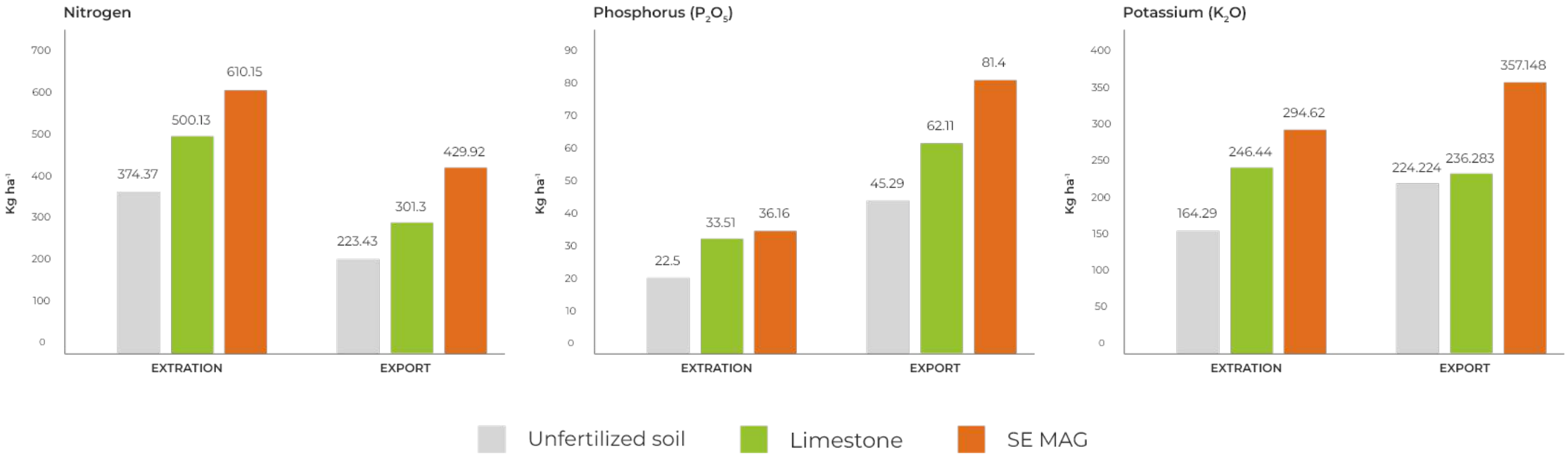


SE Mag demonstrated superior performance compared to the unfertilized soil and limestone treatments, leading to increased extraction and export of Mg^{2+}.

Magnesium

Extraction and Export

Polli
Fertilizantes Especiais

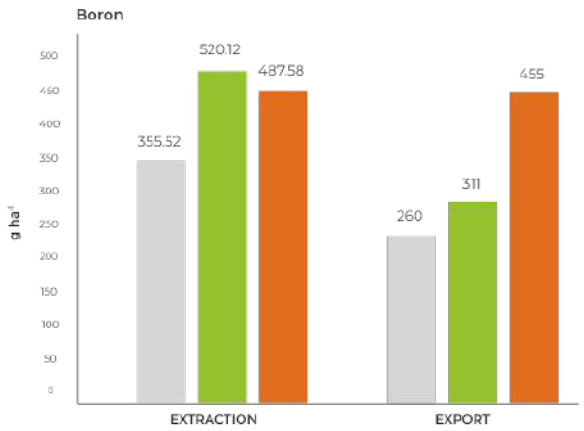


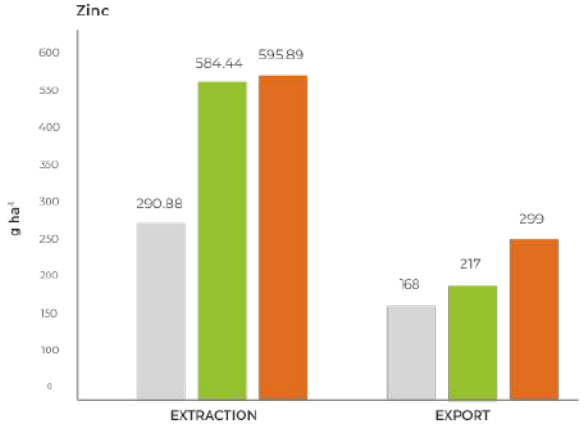
SE Mag enhanced the availability and absorption of primary macronutrients (NPK), demonstrating superior performance compared to both limestone and the unfertilized soil treatment.

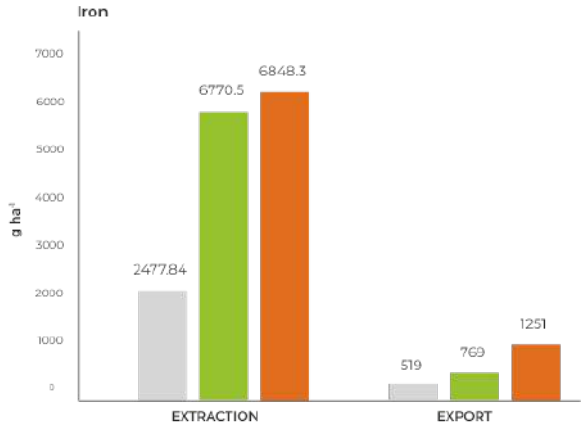
NPK

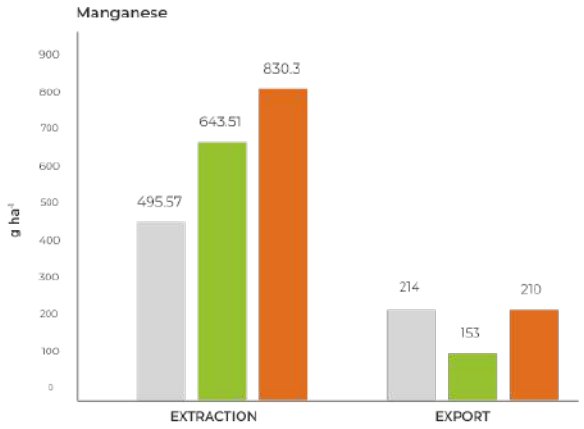
Extraction and Export

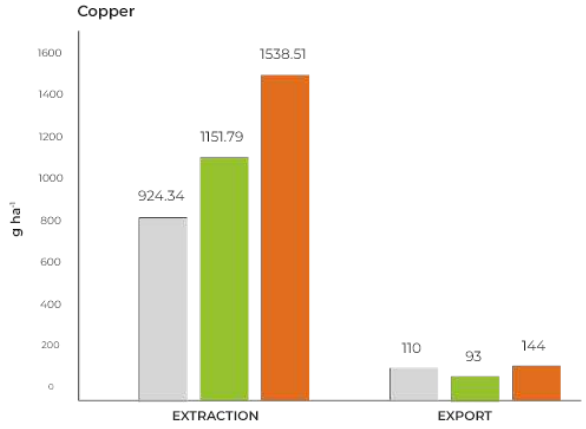
Polli
Fertilizantes Especiais











Overall, soybeans treated with **SE Mag** exhibited higher export of micronutrients compared to both the control and limestone treatments, indicating that this product improved the absorption and/or availability of micronutrients in this soil.

B, Zn, Fe, Mn e Cu

Extraction and Export

Polli
Fertilizantes Especiais

Treatments	Average weight (g)		Average number of pods			
	Humid	Dry	1 Bean	2 Beans	3 Beans	4 Beans
Unfertilized Soil	36.4 b	33.2 b	9.0 ab	18.6 a	40.8 b	1.4 a
Limestone	40.7	37.0 b	7.4 b	25.6 a	52.7 b	1.3 a
SE MAG	60.8	54.9 a	10.2 a	29.0 a	79.0 a	1.5 a

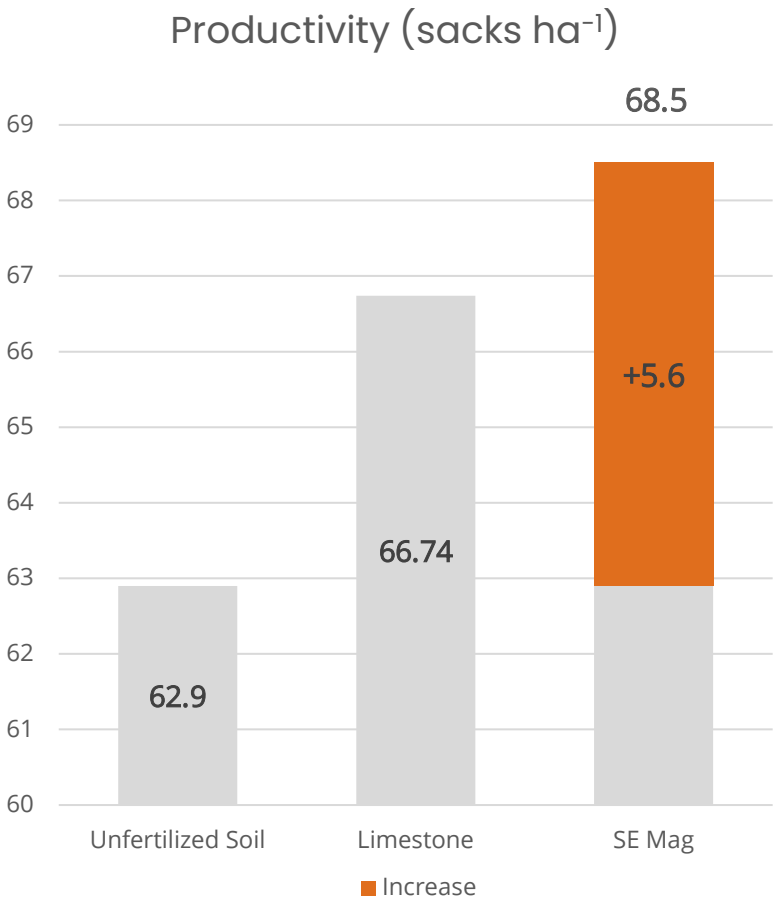
Averages followed by different letters differ from each other using the Tukey 5% test.

There's evident increase on weight and pod number in the fields where **SE Mag** was applied.

Grain weight and Number of pods

Treatments consisting of 4 repetitions with 5 plants per repetition

Polli
Fertilizantes Especiais



SE Mag (600 Kg ha^{-1})

+6 sacks

In comparison to the unfertilized soil

SE Mag (600 Kg ha^{-1})

+2 sacks

In comparison to limestone

Productivity

increase

Polli
Fertilizantes Especiais

Productivity

The application of 600 Kg ha^{-1} of **SE Mag** led to a significant yield increase of 6 bags per hectare compared to the untreated control and 2 bags per hectare compared to the limestone treatment.

Conclusions

Polli vs Limestone

Polli Fertilizante's **SE Mag** outperformed conventional limestone in terms of nutrient supply, leading to higher soybean yields.

SE Mag also proved to be a more effective tool for maintaining soil fertility under crop removal conditions. Further research will focus on the residual effects of both products.

Our Company

Address
R. Victor Tosin, 563 | Colombo-PR

Telephone
(41) 3656-3244

E-mail
contato@pollifertilizantes.com.br

Website
www.pollifertilizantes.com.br

Thank you!

Follow us

@pollifertilizantes