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Research Article

Bioactivators in Culture Corn Crop

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Abstract

The objective of this work was to evaluate the bioenergetic Penergetic K and P (bentonite clay based product) in the hybrid corn Riber 9110 PRO to increase the size of foams, weight of 1000 grains and productivity The experiment was conducted in the city of Corbélia - PR. The design was done with randomized linear blocks, eliminated for four days and five replications: Treatment 1-control without penergetic; Treatment 2 - penergetic K Treatment 3 - Penergetic P; Treatment 4 - Penergetic P + K. In the base fertilization, 400 kg ha -1 of the fertilizer 10-15-15 was used. The tests were more productive, with a larger swath size and greater weight of 1,000 grains, in comparison with the other treatments with K, P and K + P, which were related to all evaluated items.

Keywords: *Penergetic; Hybrid; End Production*

Introduction

Maize is considered a plant of tropical origin originating in the Americas, probably from Mexico, Right Cultivated For at least 5000 years in almost all regions of the world for being a plant of wide adaptability [1].

It Is an important raw material, an excellent source of energy that has several types of uses mainly serving as a basis for the production of rations coming from 70 - 80% of the purpose of consumption within Brazil [2].

Maize production in Brazil is widely dispersed, covering most of the states, with an estimated production of approximately 78.5 million tons being MT the state with the highest production reaching 23.5 million tons followed by PR with 22.9 million Tonnes [3].

Maize is a culture that responds very well to fertilization because it is highly demanding in nutrition, bringing For The culture a greater return in terms of productivity and profitability [4].

Segundo Malavolta., *et al.* [4], mineral fertilizers are composed of three natures: inorganic, natural or synthetic, which provide nutrients to vegetables.

According to results disclosed by the company Penergetic In the Cascavel-PR region, the Fertilizer use On average can bring increase up to 14 sc^{-1} of maize ha^{-1}, with a reduction of 30 - 100% of fertilization, except for nitrogenous [5].

Objective of the Study

The objective of this work was to evaluate the response of Penergetic K and P bioactivator (bentonite clay-based product) in the culture of hybrid Riber 9110 PRO maize With regard to the size of ears, weight of 1000 grains and yield.

Materials and Methods

The experiment was conducted in the year 2014 in the locality Campininha, City of Corbélia - PR, with latitude 24º48'31" South, 53º15'57" West and an altitude of 740 meters.

The cultivar used in this work was the hybrid RIBER 9110 PRO® High productive and superprecocious potential.

The design was done in randomized linear blocks with plots of 6,3 X 5 meters totaling 31,5 m^2, each block consisting of 7 lines with spacing of 90 cm between the lines, being 4 treatments with 5 replications totaling 20 plots.

The sowing was carried out on February 22, 2014, and mechanized, using a seeder with line spacing of 90 cm, with approximately 5.4 seeds per linear meter and sowing depth of three centimeters. The base fertilization was performed with the concentrated formulation 08 - 20 - 20 of NPK, at the dosage of 400 kg ha^{-1}.

The treatments tested were:

- T1 = Witness.
- T2= Penergetic K at the dose of 317 g ha^{-1}, on day 06/03/2014, when the plant was with 3 leaves (V3).
- T3= Penergetic P at a dose of 317 g ha^{-1} On the day 06/03/2014 when the plant was about 3 leaves (V3), and after 19 days was performed the second application of P when the plant was already about 7 leaves (V7).
- T4= Penergetic K + P on the same dates and doses as previously mentioned.

317g^{-1} has been used for Bioactivator in a 300 l ha^{-1} syrup, that is, 5g of penergetic was applied with 4.75L of water for the 5 repetitions of each treatment, which was applied with a costal sprayer with a capacity of 20l of syrup, except for the control.

All the cultural tracts during the crop cycle were carried out with pesticides registered in ADAPAR/SEAB/PR for the maize crop, pesticides for the control of pests, diseases and weeds, through a tratorized sprayer.

The evaluation of the ear size was made with a ruler after harvesting the ears when it had reached its harvest point.

It reached harvest point on July 28, 2014, totaling 156 days of cycle.

The Harvest was carried out manually, and four samples were collected within each plot, randomly, with a linear 1m each, with approximately five ears.

After harvesting, the to clean of these grains with a sieve, and M sequence all samples submitted-Moisture analysis of the grains in a universal equipment.

It was performed Weighing a volume of 1,000 Grains of each of the samples collected and weighed on a precision scale, an order to achieve productivity sc^{-1} has of each treatment, after was held Weighing Total of each sample collected. Thus, the parameters evaluated were: productivity (kg^{-1}), mass of 1,000 grains and size of ears.

The results obtained were subjected to analysis of variance and the averages compared with the Tukey test at 5% probability.

Results and Discussion

According to table 1, it can be observed that all the averages of the treatments of ear size, weight of 1,000 grains and yield were significant at the level of 5% of probability.

Treatments	Spike size	Weight of a thousand grains	Productivity
Witness	14,58[a]	303,04[a]	113,52[a]
K	13,82[b]	299,39[a]	105,88[a]
p	13,81[b]	293, 14[ab]	103.48[ab]
K + P	13,66[b]	269,66[b]	88,16b
Average	13,96	291,3	102,96
CV%	2,26	4,52	8,49

Table 1

Analyzing figure 1 we can observe that there was a large decrease in the size of the ears in relation à Witness with other treatments, and within the treatments used K, P and K + P respectively, proves that there are statistical differences where the witness produced more. The bioactivators Work The metabolism of the plant, acting on growth, increasing the synthesis of hormones improving the plant development and the production of Photoassimilates [6].

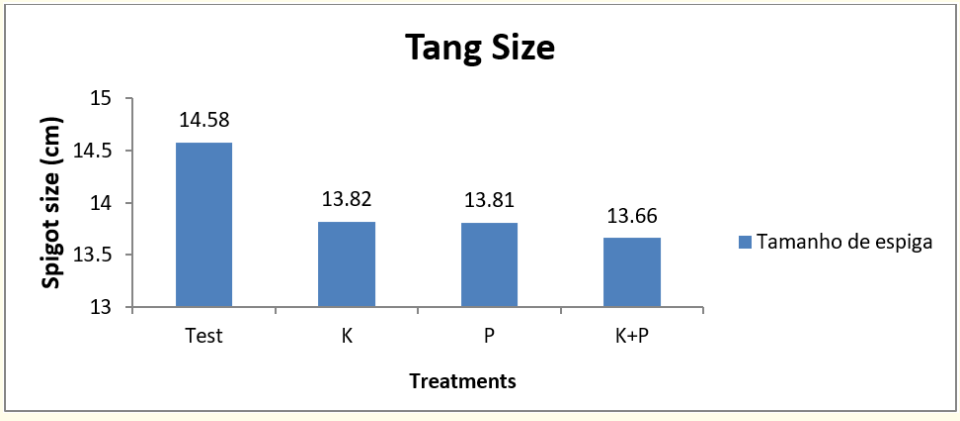

Figure 1: *Spike Size (cm) in relation to the treatments performed in the maize crop.*

It can be observed that there was a constant weight drop of 1000 grains between the control, K and P, subsequently when the two K+P products were added, there was an even greater decline.

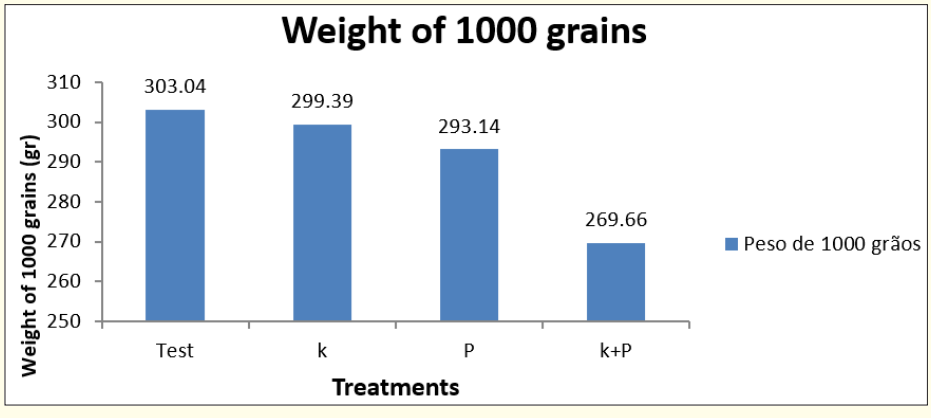

Figure 2: *Weight of 1,000 grains (GRS) in relation to the treatments performed in the maize crop.*

The Witness was the most distinguished treatment, proving that the reconciliation of the bioactivator with basic fertilization becomes unfeasible. Bioactivation consists in the optimization of the three main products for the production that is water, light and nutrients, able to promote high in the indices of vitality and equilibrium of the soil systems and plant transforming in increased production of grains, cellulose or [5].

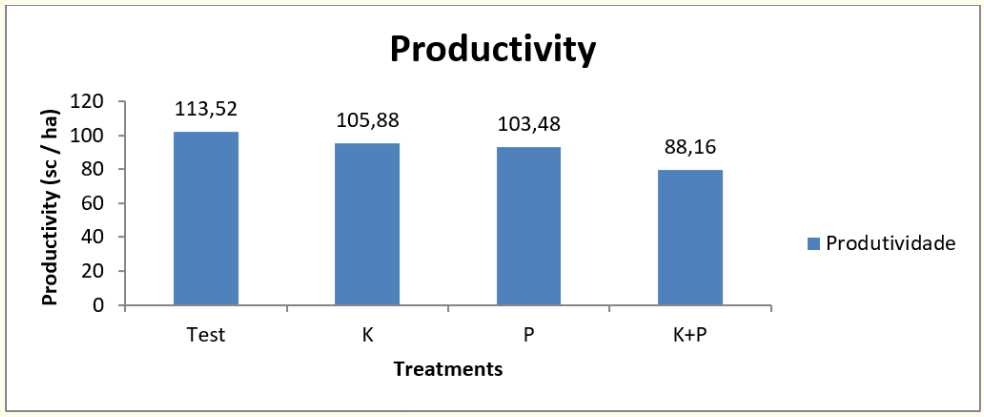

Figure 3: *Productivity (SC Has^{-1}) in relation to the treatments performed in the maize crop.*

It Can be observed that the productivity of the control was statistically higher than the other treatments where K, P and K + P treatments, respectively, had a great decrease in productivity.

There are estimates that about 10% of the maize produced in Brazil are processed in the industries generating an immense quantity of products and by-product moving around R $1.5 billion per year [7].

According to the company Penergetic [5], are products with technology capable of promoting the increase of vitality and balance the biological systems of production.

Some benefits brought by the product are included: The use of fertilizers, the release of the Phosphorus Fixed in the soil, increased productivity and sanity, better product quality, rebalancing of soil microorganisms and better utilization of agricultural inputs [5].

The penergetic K is considered a soil bioactivator, increases and balances the microbiological activities in the soil, already the penergetic P is bioactivator of plants, provides more energy for the photosynthetic process and facilitating the interaction plant + Beneficial Microorganisms [5].

Conclusion

A Control was more productive, had a higher size of ears and higher weight of 1,000 grains, compared with the other treatments.

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