

Wissenschaftlicher Bericht/Scientific Report

Produkt/Product:

penergetic b
penergetic p

Verantwortlich/Responsible:

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Datum/Date:

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Scientific Report on Soybean in Brazil

Tests carried out in the summer harvest 2017/2018 between the months of December 2018 and April 2018.

Interaction of the Penergetic technology with biological agents

- Seeding in no-tillage system
- Soybean cultivation used: Nidera 5909
- Phytosanitary management using biological agents and chemical molecules
- Artificial irrigation: not used
- Fertilization following the official recommendation for the soil used

Season of application

Table of treatments evaluated in the test

Treatment	penergetic b	penergetic p	Seed treatment*
1	-	-	-
2	Pre-planting (250g)	V3 (250g)**	-
3	Pre-planting (250g)	V3 (250g)	Trichoderma asperellum
4	Pre-planting (250g)	V3 (250g)	Bacillus subtilis
5	Pre-planting (250g)	V3 (250g)	Trichoderma asperellum + Bacillus subtilis
6	-	-	Trichoderma asperellum + Bacillus subtilis

* Seeds treated with biological agents for the control of soil diseases

** single application in V3

Results

The use of Penergetic (PNG) as a soil bioactivation tool provided significant uniformity in soybean yield. Treatment 2 (PNG b + p) resulted in lower variation between the smaller and larger number of pods per plant. This result is observed in the field and is shown as characteristic of the Penergetic technology.

When PNG is used together with biological agents (biological in seed treatment; treatments 3, 4 and 5), it is observed that the productive gain is higher. However, the presence of the biological agent results in increased variation in the number of pods. This effect occurs due to the action of amino compounds and organic acids released by the biological agents that act in the development of the plant. The effect on the plant depends directly on the nutritional, physiological and biochemical state of each root system. In this way, the presence of the biological agent in the bioactivated plants acts on the productive increase but results in unevenness between plants.

Table 1: Effect of Penergetic and the use of biological agents on the uniformity of soybean plants Var. Nidera 5909 (Average of 40 plants per experimental unit).

Treatment	Pods per plant	Minimum	Maximum	Variation (%)
Control	64.9 b*	46	74	37.8
PNG (250g b + 250g p)	73.4 ab	66	82	19.5
PNG + Trichoderma asperellum	77.3 ab	67	92	25
PNG + Bacillus subtilis	79 a	68	91	25.2
PNG + Bacillus subtilis	79.8 a	69	89	22.4
T. asperellum + B. subtilis	71.6 ab	56	81	30.8

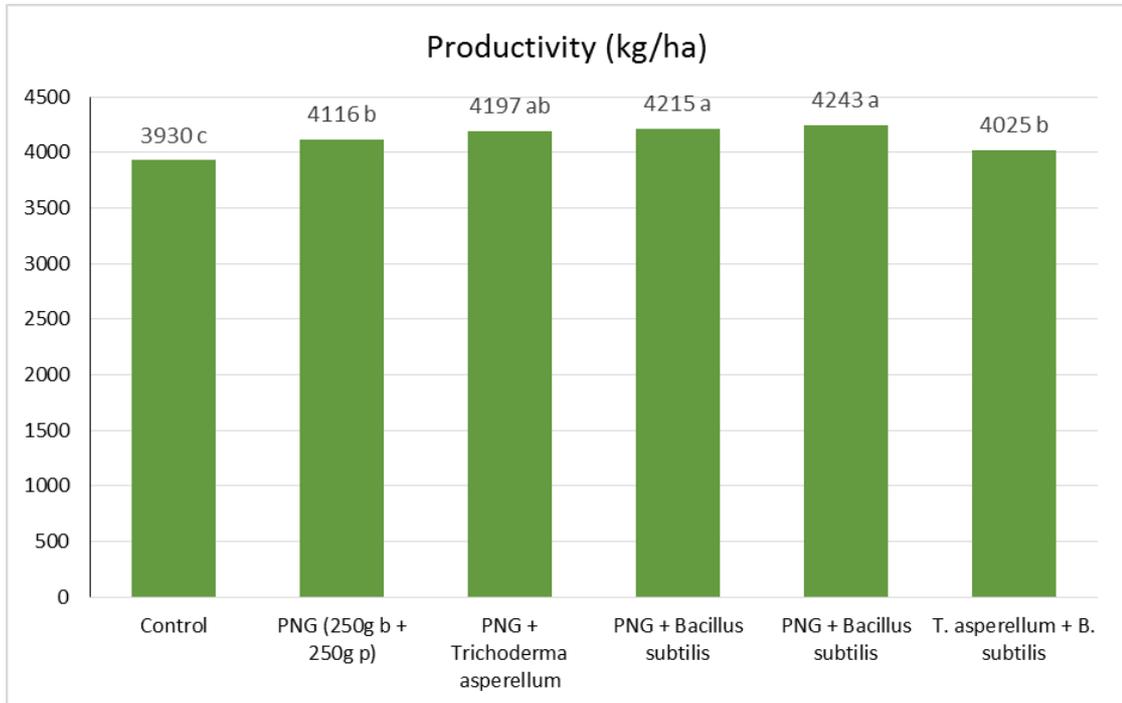
*Means followed by the same letter do not differ by the Tukey test at 5% probability

The use of biological agents without the use of PNG (treatment 6), despite providing superior productivity to the control treatment, presents a lower result than PNG use. The use of PNG is fundamental for productive gain in the soybean crop.

It is observed that the interaction of PNG with the biological agents most used in soybean cultivation in Brazil (Trichoderma and Bacillus) is positive and is presented as a management tool for high yields.

Figure 1: Average yield of soybean, cultivation Nidera 5909, submitted to different treatments.

*Means followed by the same letter do not differ by the Tukey test at 5% probability.



Preliminary conclusions

- The use of Penergetic results in significant productive gain in the soybean crop
- The interaction of Penergetic with biological agents is positive in the soybean crop
- The effects of biological agents on the productive increase are intensified when in interaction with Penergetic
- The use of biological agents does not replace soil bioactivation with Penergetic

