

EVALUATION OF THE USE OF A BIOSTIMULANT: RATE AND TIME OF APPLICATION

CROP: SOY

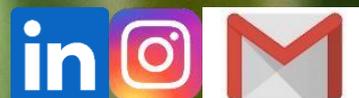
VARIETY: DM66R69sts_

YEAR: 2022

APPLICANT: DISA



AGr⁺D



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1. Executive Summary

The objective of this study was to evaluate the use of a biostimulant iQForte, on the performance of a soybean crop. The effect of making applications at different times of the cycle, at different rates and in combination with Glyphosate. A randomized block design was performed where each treatment consisted of 4 repetitions of 9 m². The treatments were: TC: without biostimulant; T1: IQ 750 cc (V5) + 750cc (R3); T2: 750cc (V5) + 750cc (R3) + herbicide; T3: 1200cc in V5; T4: 1200cc V5 + herbicide and T5: 12000 (R3). The climatic conditions of the year, added to the good level of nutrients in the soil (organic matter and phosphorous) allowed the soybean variety used (with great productive potential) to reach very good yields. There were no significant differences for plant growth variables. There was a higher rate of SPAD in treatments T1, T2, T3 and T5. Estimated yield per hectare it was greater in T3 and this differed statistically from CT and T2. Explained by higher PMG in comparison with CT. There is a tendency to a higher yield in treatments with a rate of 1200cc. There are no significant differences between the times of application. Regarding grain quality (% protein) the treatments with the highest yield show good levels of grain protein. The fact that no statistical difference is observed between the treatments with and without herbicide allows us to infer that the mixing of the products does not generate a negative effect on the performance parameter.

2. Methodology

This study was to evaluate the use of a biostimulant **iQForte**, on the yield of a soybean crop, variety DM66R69sts. Soybeans were planted on 11/4/2021. The effect of making applications indifferent times of the cycle and in different rates. It will be evaluated through performance and other parameters intermediates. The trial was carried out in a single site located near Rincón del Pino.

The treatments are:

- TC: without biostimulant
- T1: 750cc IQ (V5) + 750cc IQ (R3)
- T2: 750cc IQ (V5) + herbicide + 750cc IQ (R3)
- T3: 1200cc IQ (V5)
- T4: 1200cc IQ (V5) + herbicide
- T5: 1200cc (R3)

Each treatment consisted of four repetitions. Each plot was 3m by 3m. The evaluations are in the center of the plot, discarding the first and last meter. The plots were spaced a meter.

The applications were made on 12/13/21 y 02/01/2022

As for the herbicide, granulated glyphosate was used at a rate of 2kg/ha, which is the management carried out by the producer.

3. Results

3.1. *Climatic Records*

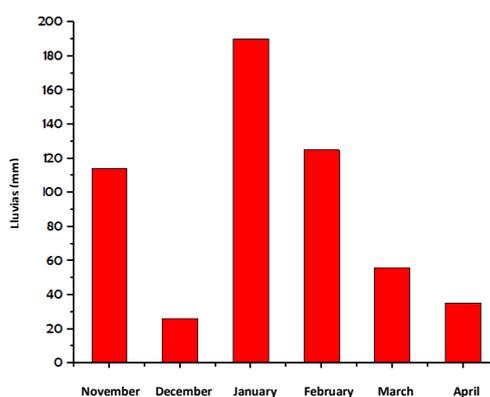


Figure 1: Rainfall record in the area during the production cycle

During the crop cycle, 546 mm occurred, with the highest record in the month of January.

3.2 *Height and number of nodes per plant*

There are no significant differences for the variables number of nodes per plant or plant height for the date of 01/04/2022.

Table 1: Plant height and number of nodes per plant according to treatment (01/04/2022)

Treatment	plant height (cm)	Number of knots/pl
TC – Testigo Comercial	47.1 a	8.6 a
T1 – 750cc IQ (V5) + 750 IQ (R3)	48.0 a	8.8 a
T2 – 750cc IQ (V5) + herbicida + 750cc IQ (R3)	46.1 a	7.8 a
T3 – 1200 IQ (V5)	47.3 a	9.3 a
T4 – 1200cc IQ (V5) + herbicida	45.8 a	9.0 a
T5 – 1200cc (R3)	45.2 a	8.8 a

Different letters indicate significant differences according to Tukey 10%

3.2. SPAD index

Figure 2 shows the evolution of the SPAD index. For this measurement healthy leaves were chosen, located in the upper third of the plant and well exposed. It was evaluated on two dates: 01/10/2022 and 02/01/2022. The results show an increase in SPAD from the beginning of the evaluations.

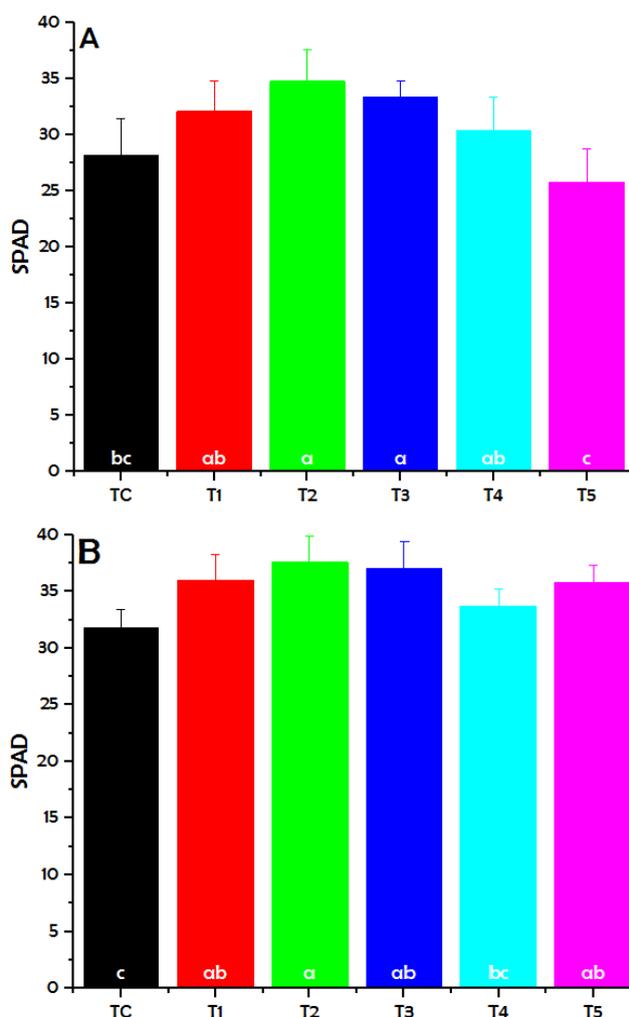


Figure 2: Evolution of the SPAD index by treatment by date. A- 01/10/2022. B- 02/01/2022

On the first date, the treatments were ordered as follows (from highest to lowest): T2 (34.8), T3 (33.4), T1 (32.1), T4 (30.4), TC (28.2), and T5 (25.8). Treatment T2 and T3 were the ones statistically different from treatment TC and T5.

On the second date, the treatments were ordered (from highest to lowest): T2 (37.6), T3 (37.0), T1 (36.0), T5 (35.8), T4 (34.0) and TC (31.8). For this date the T2 treatment differs statistically from the T4 and TC treatments.

3.3. Performance

The harvest was carried out on 04/23/2022 and all the plants that were in the central meter of each repetition. There were no statistical differences in the number of plants for each treatment. On average there were between 39-45 plants per replicate. Table 2 shows the values average per treatment for the variables humidity and hectoliter weight. For performance estimation per hectare all yields were taken to the same moisture value (13%).

Table 2: % moisture and hectoliter weight according to treatments at harvest time

Treatment	% Humidity	Hectoliter weight (g/l)
TC – commercial witness	19.0	679
T1 – 750cc IQ (V5) + 750 IQ (R3)	20.0	778
T2 – 750cc IQ (V5) + herbicide + 750cc IQ (R3)	20.6	795
T3 – 1200 IQ (V5)	19.6	735
T4 – 1200cc IQ (V5) + herbicide	19.7	791
T5 – 1200cc (R3)	20.2	829

Different letters indicate significant differences according to Tukey 10%

The treatments are ordered from higher to lower yield (tt/ha) as follows: T3, T4, T5, T1, T2 and CT. All treatments with product application differed statistically from the CT. In addition, T3 was statistically different from T2. Treatments T1, T4 and T5 did not differ statistically between them nor with T3 and T2. As for the combination with herbicides there is no difference statistics between treatments at the same rate (T1 vs T2; T4 vs T5). In turn, there are no differences between T2 and T1, which would allow us to say that there is no effect on the performance of the use of a herbicide mixed with the product. This same result is repeated for T3 and T4.

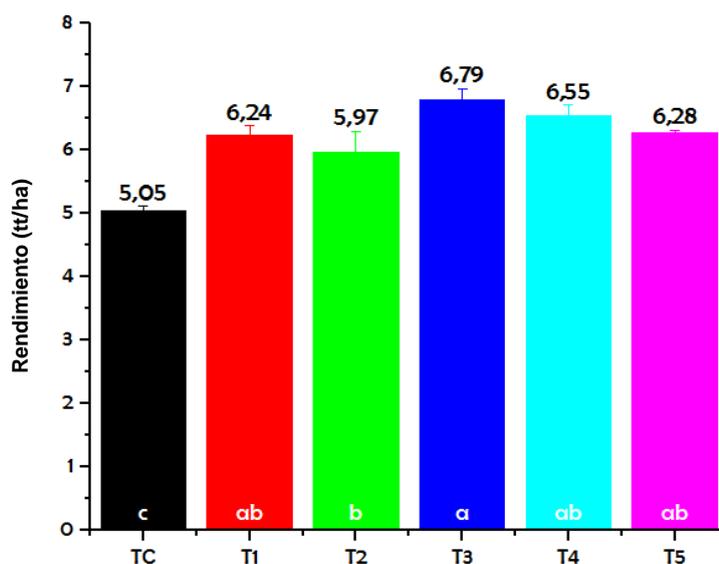


Figure 3: Yield according to treatments

Table 3: Yield (t/ha) and yield components according to treatments

Treatment	Seedc e/pl	Grain/seddca se	PMG
TC – Commercial witness	35.6 b	2.3 b	161 b
T1 – 750cc IQ (V5) + 750 IQ (R3)	40.1 a	2.4 ab	193 a
T2 – 750cc IQ (V5) + herbicide + 750cc IQ (R3)	37.6 ab	2.4 ab	193 a
T3 – 1200 IQ (V5)	37.4 ab	2.4 ab	188 a
T4 – 1200cc IQ (V5) + herbicide	35.7 b	2.4 ab	182 a
T5 – 1200cc (R3)	36.1 b	2.5 a	193 a

Different letters indicate significant differences according to Tukey 10%

Regarding the yield components (Table 3), the treatments show differences significant according to the variables evaluated.

The treatments present significant differences for the variable number of pods per plant. For this variable, the treatments were ordered as follows (from highest to lowest): T1, T2, T3, T4, T5 and TC. Treatment T1 differs statistically from treatment TC, T4 and T5.

Regarding the number of seeds per pod, treatment T5 was the one with the highest number of grains per pod, with an average of 2.5 grains per pod, differing from the TC treatment.

For the grain weight variable (PMG), all treatments show significant differences with the CT. The treatments were ordered from highest to lowest PMG as follows: T5, T1, T2, T3, T4 and CT. There are no significant differences according to the moment or the rate of the product.

3.5. grain quality

A composite sample was made for each treatment and the % protein was analyzed. The data are expressed on a fresh basis.

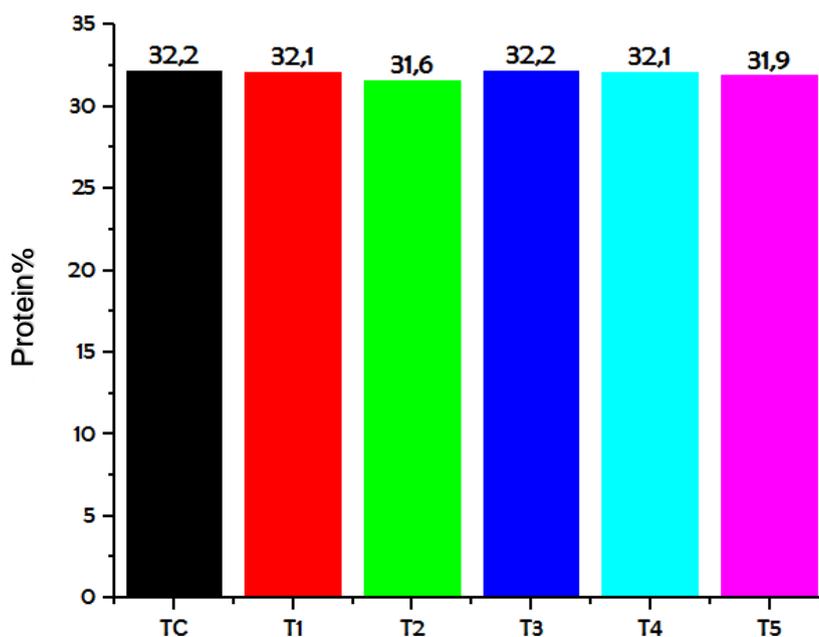


Figure 4: % of protein according to treatment

The results show that all treatments have a similar percentage of protein expressed in fresh foundation. In general, yield and protein are inversely correlated, so that the lower the yield, the higher the protein. This

DISA – IQ FORTE

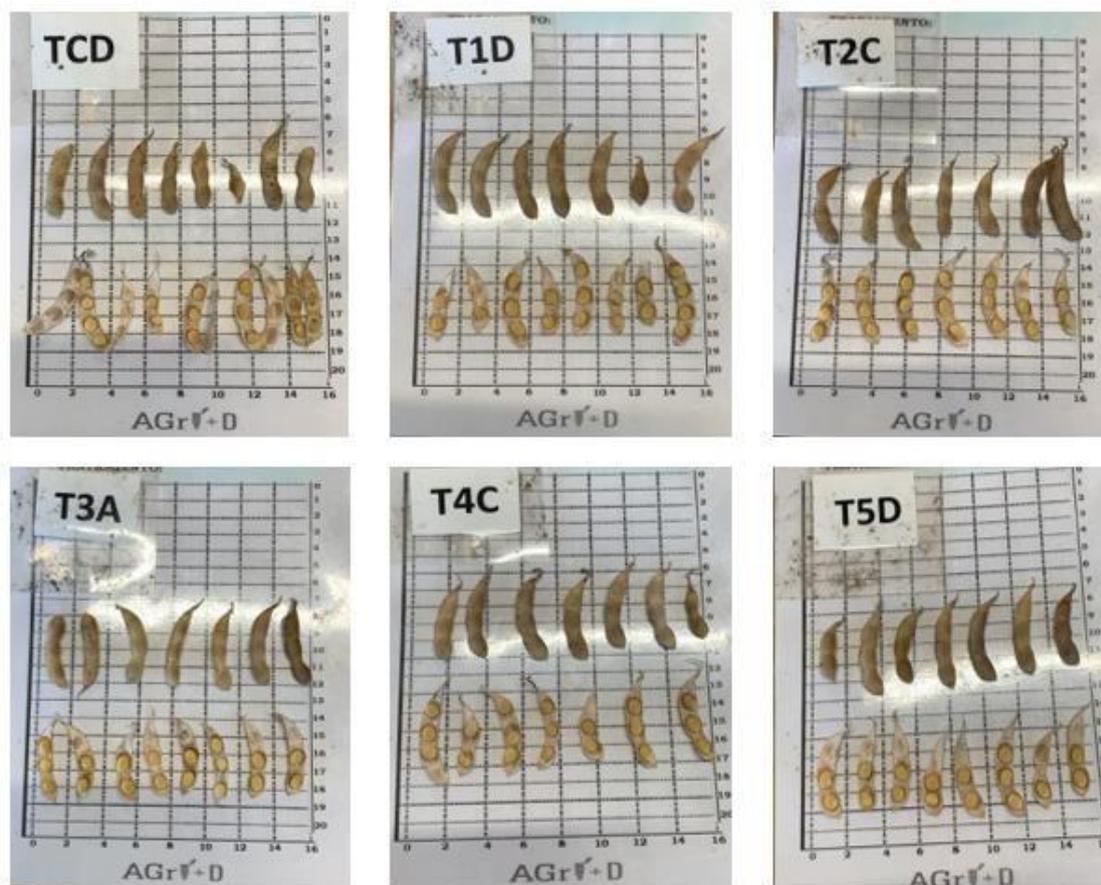
is interesting when the % protein is compared to the yield obtained in each treatment. For example, the T3 treatment increased more than 1.5 tons per hectare, but managed to maintain the same level of protein as the control.

4. Final comments

- There were no deviations from what was planned
- The climatic conditions did not show limitations for the development of the crop
- There were no statistical differences in plant growth. There is a trend of higher nitrogen content in the plant in treatments
- Yield per hectare was higher in treatment T3 (1200 IQ (V5)) and differed statistically from CT and T2. The highest performance in favor of treatments with product would be explained by an increase in grain weight.
- Regarding product rates, treatments with 1200cc of IQ Forte presented a higher performance, although there are only significant differences between treatment T3 and T2.
- There are no statistical differences between the application with or without herbicide. Which suggests that the mixing the product with the herbicide does not have a negative effect on yield..

5. Photographic record





6. Annex

Sample admitted to the laboratory 09/24/21

results sent: 01/10/2021

number of sheets: 1

Muestra	K (meq/100g)	Ca (meq/100g)	Mg (meq/100g)	MO (%)
Moreira La Ruta	0,40	2,76	0,72	4,5

Muestra	pH	P-Bray 1 (ppm)	N-NO3 (ppm)
Moreira La Ruta	4,9	53,3	5

The samples of this report will be stored for 30 days after completing the requested analysis

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