EVALUATION OF BIOSTIMULANT FERTILIZER IN SOYBEAN

2021-22 CAMPAIGN

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OBJECTIVE

The objective of this work was to evaluate Prodinsa's IQForte technology in soybean cultivation.

Materials and methods

The test was carried out in a plot of the experimental field of the EEA of INTA Oliveros. It was implanted in direct sowing, on a corn crop as a predecessor, in a typical Argiudol soil, Maciel series, in a lot with more than 50 years of agricultural history.

The treatments consisted of comparing different doses of the IQForte product applied at two moments of the crop cycle (V5 and R3) with a control (Table 1).

Table 1 – Treatments evaluated in soybean trials

Treatment	Name Treatment	Product dose
T1	Sample	-------
T2	IQForte1	250 ml/ ha V5 + 250 ml/ ha R3
T3	IQForte2	500 ml/ ha V5 + 500 ml/ ha R3
T4	IQForte3	750 ml/ ha V5 + 750 ml/ ha R3
T5	IQForte4	1000 ml/ ha V5 + 1000 ml/ ha R3

Treatments were arranged in a randomized complete block design with four replications. The experimental units were

5 furrows 52 cm wide by 15 m long. The test implementation characteristics can be seen in Table 2.

Table 2 – Trial implementation characteristics

Cultivate	Planting date	Spacing between lines
NK 52x21 st	24-11-2021	0.52

Insects and weeds were adequately controlled. At planting, soil sampling was carried out to determine pH, available P, organic matter and micronutrients. The trial was fertilized with P and S to avoid deficiencies of these nutrients. The harvest was carried out with an experimental harvester. Yield corrected at 13.5% moisture and weight of 1000

seeds. The information was analyzed through analysis of variance, to detect differences between treatments.

Climatic conditions during the soybean crop cycle

The agricultural campaign was characterized by low rainfall throughout the crop cycle (344 mm), which was 33% lower than historical records, affecting to a greater extent during the first reproductive stages (R1-R5), in which rainfall accumulated were 51% lower than historical records. During grain filling, slight improvements in water conditions were observed, with the accumulated R5-R7 similar to the historical average (Figure 1).

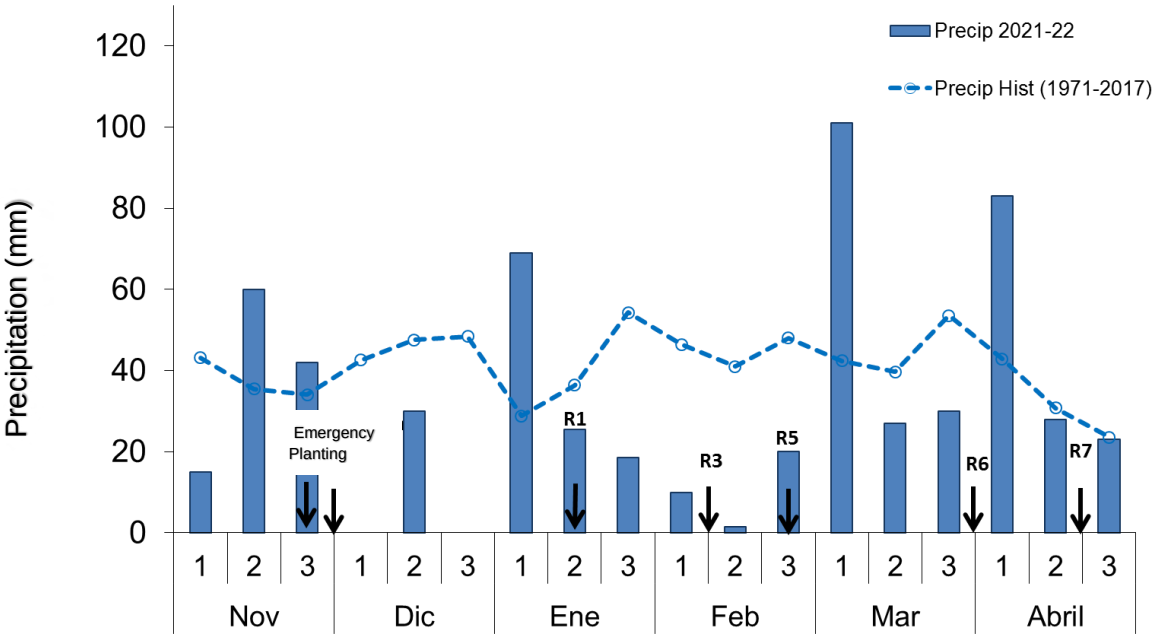

Figure 1 – Accumulated rainfall during the soybean crop cycle and historical average probability of the Oliveros climatic series. The arrows and black letters indicate sowing, emergence and the moment of R1, R5 and R7 in soybean.

The temperature during the crop cycle was higher both during the vegetative and reproductive stages for maximum records compared to the historical values, and they were even more extreme between the beginning of flowering (R1), pod formation and the beginning of grain filling (R5). The highest temperatures were recorded in the period of greatest sensitivity of the R1-R3 crop (Figure 2), which together with the low contributions of rainfall caused the abortion of flowers and reduced the potential number of grains per plant. The minimum records presented values similar to the historical record for vegetative stages. Starting from R1, where there was a maximum temperature peak, the values remained below the historical one.

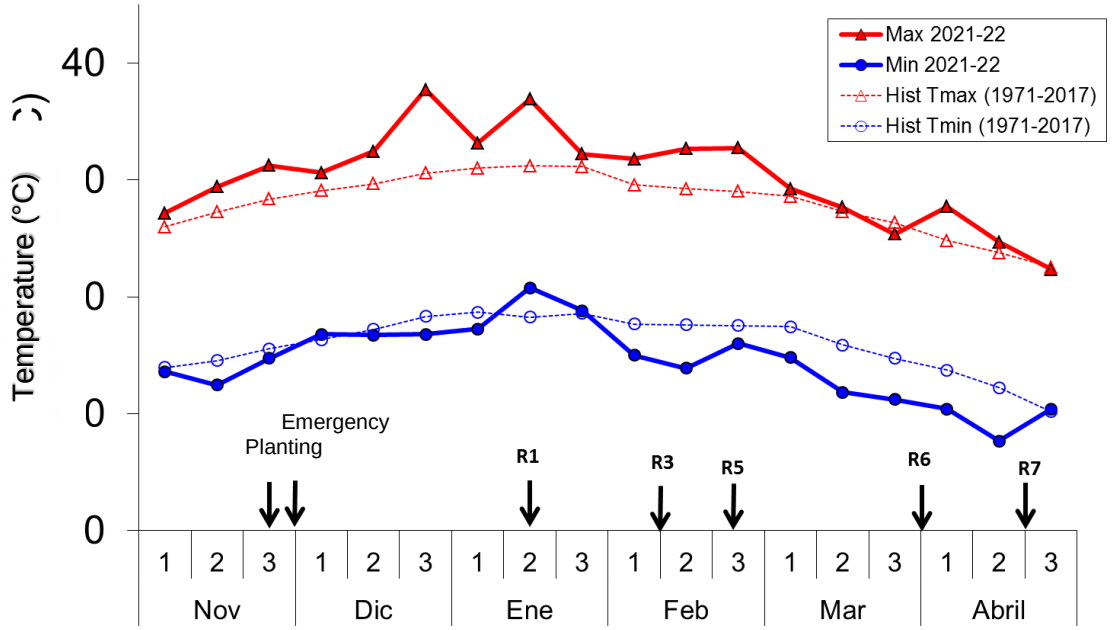

Figure 2 – Average maximum and minimum temperatures recorded during the soybean crop cycle and the historical average probability of the Oliveros climatic series. The arrows and black letters indicate sowing and emergence, and the moment of R1, R5 and R7 in soybean.

Chemical characteristics of the soil where the test was implemented.

The soil where the experiment was carried out is representative of agricultural lots with chemical degradation in the south of Santa Fe, with organic matter content close to 2.8% and P Bray content of 18 ppm. The content of B and Zn is considered below the response thresholds, while the content of K is above response levels according to international reports (Table 3).

Table 3 – Chemical analysis of the soil at the soybean trial site.

Depth	NO3	pH	MO	P Bray	S-SO4	K	Ca	Mg	B	Zn	Mn
			(%)					ppm			
0-20	14	5.7	2.8	18	9.9	321	1465	196	0.6	0.67	57

RESULTS

The average yield of the trial was 3355 kg ha-1, while the control treatment yielded 3309 kg ha-1. A significant increase in yield was observed due to the application of the IQForte2 treatment (500 ml/ha in V5 + 500 ml/ha in R3) of the order of 11% compared to the control without the application of stimulants. No differences were observed in the other doses evaluated with respect to the control. These trends were also reflected in the number of grains per unit area. The individual weight of the grains averaged 164.1 mg, observing values in the IQForte 4 and 5 treatments of 2% lower than the rest of the treatments.

Table 4 – Analysis of variance and yield averages, number of seeds and weight of one thousand seeds per fertilization treatment. Same letters within the same column do not differ from each other according to the LSD test.

	Treatment	Yield (kg ha^{-1})	Number of seeds m^{-2}	Thousand Weight Seeds(g)
T1	Sample	3309 b	2002 b	165.3 a
T2	IQForte1	3233 b	1969 b	164.2 a
T3	IQForte2	3664 a	2201 a	166.5 a
T4	IQForte3	3275 b	2028 b	161.5 b
T5	IQForte4	3295 b	2023 b	162.9 ab
	E.S.	78	48	1.9

E.S.= estandar error of the media

CONCLUSIONS

The application of 500 ml/ha in V5 + 500 ml/ha in R3 of the IQForte product increased the yield and the number of grains per surface unit. It is important to carry out this analysis with a set of tests that repeat the same treatments to reach a more complete conclusion of the evaluation of this technology.