INFLUENCE OF BIOSTIMULANTS ON GROWTH AND INITIAL VIGOR OF SEEDLINGS IN VARIOUS SNAP BEAN VARIETIES

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ABSTRACT

The snap bean, belonging to the same botanical species as the common bean (Phaseolus vulgaris), is a legume with high economic value. The use of bioregulators in its cultivation shows great potential. This study aimed to evaluate the effects of applying four commercial chemicals on the germination and vigor of snap bean seedlings.

Keywords: Snap bean, Bioregulators, Germination, Seedlings vigor.

INTRODUCTION

The snap bean, belonging to the same botanical species as the common bean (Phaseolus vulgaris), is a legume with high economic value. The use of bioregulators in its cultivation shows great potential. This study aimed to evaluate the effects of applying four commercial chemicals on the germination and vigor of snap bean seedlings.

MATERIAL AND METHODS

In the laboratory, a completely randomized design with eight replicates was used, while in the germination plot, a randomized block design with four replicates was applied. Both conditions followed a 5 x 5 factorial scheme, involving five cultivars (Trepador Torino, Feijão Maravilha de Veneza Amarelo, Teresópolis Manteiga, Hx10093000, and Macarrão Favorito), all using certified seeds treated with the fungicide Captan, and four commercial seed treatment chemicals (Stimulate®, Acadian®, Ever®, and Profol NiCoMo®) at the manufacturer's recommended doses, along with a control treatment using water. In the laboratory, the parameters evaluated were normal plants (PN) and abnormal plants (PAN). In the soil, the emergence speed index (IVE), emergence percentage (E), root length (CRaiz), shoot length (CPA), fresh shoot weight (MFPA), fresh root weight (MFRaiz), dry shoot weight (MSPA), and dry root weight (MSRaiz) were measured. The data were analyzed using analysis of variance, and in cases of significance, means were compared using the Scott-Knott test at a 5% probability level.

RESULTS AND DISCUSSION

In the soil assay, the Manteiga and Hx10093000 cultivars showed greater responsiveness to the application of biostimulants. Regarding biostimulants, the Acadian biostimulant resulted in the highest root dry matter weight (Table 1), though no significant differences were observed for the other evaluated variables. This aligns with findings from Lima et al. (2009), who reported similar results when using Stimulate at two concentrations and liquid gibberellins on Artocarpus heterophyllus Lam. seeds. In the laboratory evaluations, a significant interaction was found between biostimulants and cultivars (Tables 2 and 3). Acadian® produced the highest values for normal seedlings across several cultivars (Table 2). The lowest occurrence of abnormalities was observed in the Hx10093000 cultivar (Table 3), with similar means and no statistically significant differences in the presence of biostimulant treatments.

Table 1: Average values of CPA and CRaiz in cm; MFPA, MFRaiz, MSPA and MSRaiz in grams and percentage of emergence (E) of snap bean concerning the cultivars and biostimulating products

Cultivars	CPA	CRaiz	MFPA	MFRaiz	MSPA	MSRaiz	IVE	E
Veneza	9.34d	9.39b	13.41a	5.82	1.80	1.66	5.51d	47.50d
Torino	11.22c	11.41a	11.17b	4.95	1.69	1.36	9.84c	71.90c
Favorito	14.71b	14.71a	11.78b	5.31	1.50	1.49	18.21b	84.90b
Manteiga	15.59a	11.25a	14.21a	4.81	1.55	1.68	21.43a	94.40a
Hx10093000	16.20a	13.11a	13.78a	4.30	1.47	1.16	22.88a	96.20a
Products								
Ever	13.44	10.55	12.98	4.49	1.63	1.19b	15.58	79.90
Stimulate	13.16	10.95	13.31	5.11	1.62	1.44b	15.07	78.40
Acadian	13.31	1.14	12.25	5.36	1.63	2.05a	16.83	78.20
Profol	13.78	11.13	12.77	4.85	1.51	1.40b	15.29	79.20
Test	13.37	11.19	13.03	5.34	1.62	1.31b	15.10	79.20

Within each factor, means followed by the same letter belong to a same group by the Scott-Knott test at the level of 5% of probability.

Table 2. Average values of the normal seedlings as regards the first (five days) and the second (9 days) counts of the emergence test of the snap bean conducted concerning the cultivars and biostimulating products

Cultivars	**Products**				
	Acadian	**Ever**	**Profol**	**Stimulate**	**Testemunha**
Veneza	50cA	46cA	39cB	50cA	38cB
Torino	92aA	88bA	78bB	85bA	87bA
Favorito	86bA	84bA	85bA	81bA	82bA
Manteiga	96aA	97aA	97aA	81bB	87bB
Hx10093000	96aA	95aA	91aA	99aA	98aA

Means followed by the same capital letter in the rows and small letter in the columns do not differ by the Scott-Knott test at the level of 5% of probability.

Table 3. Average values as regards the abnormal plants concerning cultivars and biostimulating products

Cultivares	**Produtos**				
	Acadian	**Ever**	**Profol**	**Stimulate**	**Testemunha**
Veneza	50cA	53cA	61cB	50cA	61cB
Torino	8aA	11bA	21bB	14bA	12bA
Favorito	14bA	16bA	15bA	17bA	17bA
Manteiga	3aA	2aA	8aA	18bB	12aA
Hx10093000	3aA	5aA	3aA	1aA	1aA

Means followed by the same capital letter in the rows and small letter in the columns do not differ by the Scott-Knott test at the level of 5% of probability.

REFERENCES

1. Lima, J. F., Fonseca, V. J. A., Moraes, J. C. C., Vieira, E. L., & Peixoto, C. P. (2009). Germinação de sementes pré-embebidas e crescimento de plantas de *Artocarpus heterophyllus* Lam. *Scientia Agraria*, 10(06), 437-441.