Effects of Biostimulants and Fertilizers on Specialty Bell Pepper

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ABSTRACT

An experiment was conducted in July-November 2014 in Mayagüez, Puerto Rico, to determine the effects of biostimulants and fertilization on growth, yield, and quality of ‘Chocolate Beauty’ bell pepper grown in containers in a high tunnel protective structure. The plants were grown in a 3:1 mixture of alluvial soil and sphagnum peat mix (Promix® BH), fertilized with either (1) 22.67 kg N-P-K/40 ha pre-plant and 45.35 kg N/40 ha in 10 weeks later using granule urea + field fertilizer recommendation by Ag Experiment Station, UPR, or (2) 22.67 kg N-P-K/40 ha pre-plant and 45.35 kg N/40 ha in 10 weeks later using granule urea + field fertilizer recommendation by Ag Experiment Station, UPR, or (3) 22.67 kg N-P-K/40 ha from organic 6-6-5-SCa + 0.05-15-1Ca pre-plant and 45.35 kg N/40 ha from organic 6-0-6-SCa (Biofertil). Every 14 days the crop leaves were sprayed with different biostimulant solutions. The biostimulants tested were 1) a blend of amino acids-fermented mixture (Promix® BH), 2) a solution of 4-6-6-5-SCa + 0.05-15-1Ca (Biofertil), 3) an organic 6-0-6-SCa from organic 6-0-6-SCa (Biofertil), 4) 4-6-6-5-SCa + 0.05-15-1Ca (Biofertil). The results showed that the combination of the organic amendments with the biostimulant solutions had a positive effect on the yield and quality of bell pepper. The treatments did not affect the number of non-marketable fruit, but plants treated with granular fertilizer resulted in a larger weight of non-commercial fruits. These results indicate that the yield of this specialty pepper may be regulated with modifications or combinations of fertilizers and biostimulants.

INTRODUCTION

The need to increase food production in a sustainable manner is a priority in many regions of the world. The use of biostimulants and fertilizers in agriculture has been a common practice in temperate regions of the world (Javieh et al., 2005), but the benefits of their use may also be of use in countries with a tropical climate like Puerto Rico. The introduction of new crops into the market has been associated with the potential to increase the number of non-marketable fruit, which can be regulated with modifications or combinations of fertilizers and biostimulants.

OBJECTIVES

- Evaluate the effect of biostimulants and fertilization methods on the yield of ‘Chocolate Beauty’ bell pepper grown under protected structures.
- Determine the effect of biostimulants and fertilization methods on the growth dynamics and productivity of ‘Chocolate Beauty’ bell peppers (Capsicum annuum L.).

METHODOLOGY

The experiment was conducted under a high tunnel protected structure of the Arecibo Experiment Station in the University of Puerto Rico in Mayagüez Campus. ‘Chocolate Beauty’ bell pepper seeds were planted in greenhouse trays (Fig. 1) and were uniformly selected to transplant one seedling for each replicate in the 6-5-6-5-SCa bag. The medium used in each container was a 3:1 mixture of alluvial soil and sphagnum peat mix (Promix® BH).

RESULTS

The computer program ANOVA was used to find statistical differences (p < 0.05) between the different factors. This analysis was analyzed as a factorial treatment in a completely randomized design with two factors: Factor A (Fertilizer) and Factor B (Biostimulant). A significant effect was found between the fertilizer treatments and the number and total fruit yield per plant. The number and total fruit per plant were significantly higher by using biostimulants and/or combinations of fertilizers and biostimulants.

CONCLUSION

These results indicate that the yield of this specialty pepper may be regulated with modifications or combinations of fertilizers and biostimulants.

REFERENCES


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