



# Effect of an extract of the brown alga *Ascophyllum nodosum* on the fruit retention of Tahiti lime (*Citrus latifolia*) managed organically

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## INTRODUCTION

○ Fruit number is a direct component of fruit yield. In Tahiti lime, fruit abortion is commonly around 95%, and there is ample opportunity to increase fruit yield by decreasing fruit drop during early fruit development. By modifying the hormonal balance of the plant, biostimulants have the potential to regulate fruit retention in crops.

○ Extracts of the brown alga *Ascophyllum nodosum* are known to contain plant hormones such as cytokinins, gibberellins, and auxins, as well as other growth-regulating substances. Extracts of *A. nodosum* have been used to modify the physiology of a number of crops.

○ The objective of this research was to determine the effect of time and rate of applications of a commercially available organic biostimulant based on an extract of *A. nodosum* on the fruit load of Tahiti lime (*Citrus latifolia* Tanaka).

## MATERIALS AND METHODS

○ The research was conducted in a 5-year old orchard in the Agricultural Experiment Station of the UPR-Mayaguez in Lajas, Puerto Rico, in 2010. We used a randomized complete block design with 2 trees per treatment, replicated 6 times. The orchard was managed following organic practices.

○ Aqueous solutions of the alga extract (Stimplex™) were sprayed to cover the tree canopy, delivering 0 (check treatment), 6, or 12 ml of the extract per tree per application.

○ Applications were performed every 21 days from January-March (from the pre-flowering stage through full bloom stage) or January-April (from the pre-flowering stage through the fruit set stage).

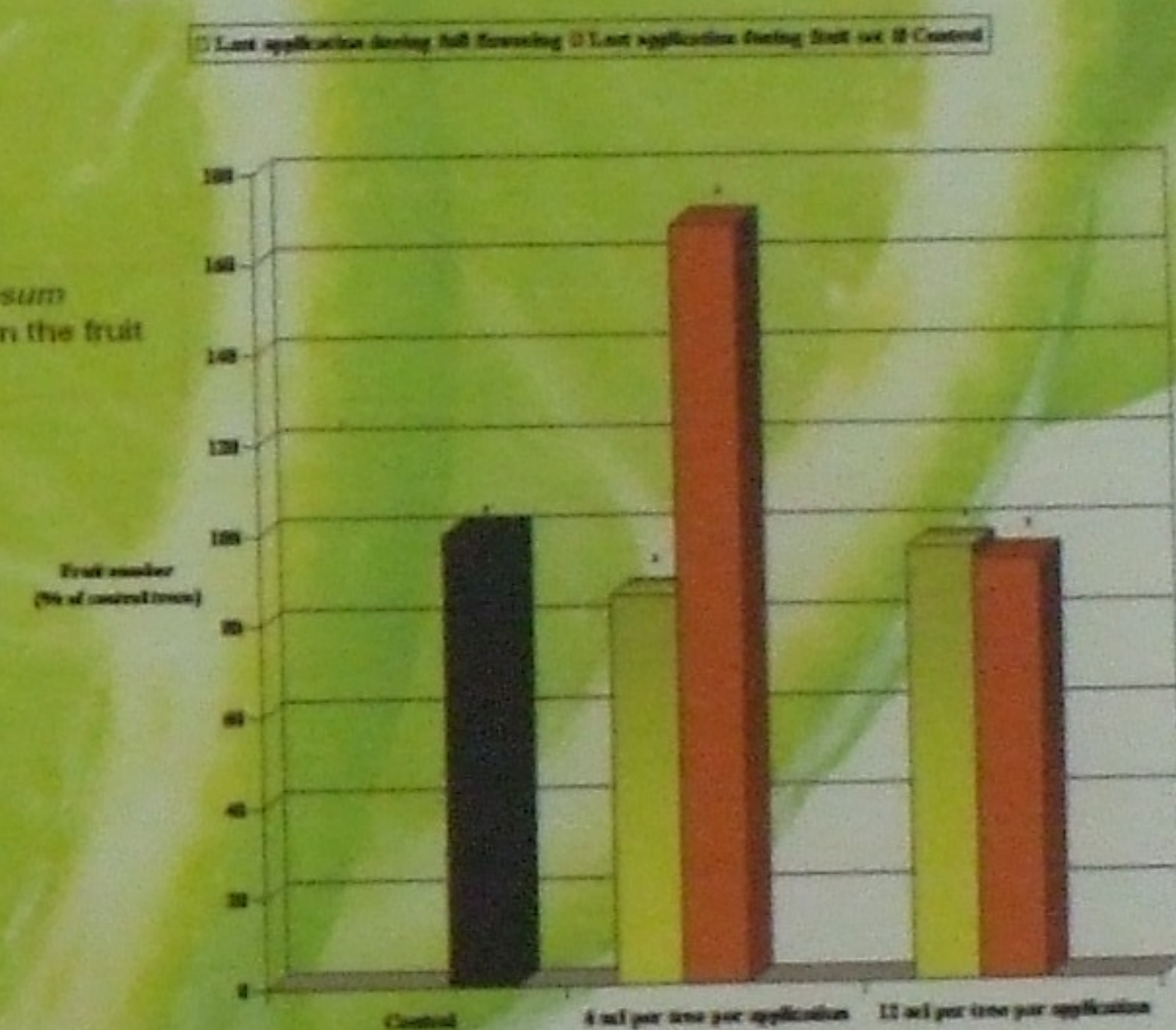
○ Fruit number per tree was assessed every 3 weeks until mid-May. Analysis of variance (5% level) was conducted on the resulting data.

## RESULTS

➤ When the *A. nodosum* extract was applied at the rate of 12 ml per tree (regardless of the application time) or when it was applied at the rate of 6 ml per tree though full bloom, Tahiti lime fruit load was not significantly increased (Figure 1).

➤ However, application of the *A. nodosum* extract at the rate of 6 ml per tree from pre-flowering through the fruit set stage resulted in fruit number being 68% higher than in control trees (Figure 1). This response is likely the result of a change in the hormonal balance of the trees.

Figure 1. Effect of rate of an *Ascophyllum nodosum* extract and physiological stage at application on the fruit load of Tahiti lime in Lajas, Puerto Rico, 2010.



## Preliminary conclusions and future research

✓ Crop developmental stage and extract rate were important factors in eliciting a significant fruit load response in Tahiti lime treated with the *A. nodosum* biostimulant. In this research, best results were found when the extract was applied through fruit set.

✓ Future research will include other application times and rates of the *A. nodosum* biostimulant, as well as other physiological regulators.

## Acknowledgement

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